PROCEEDINGS OF THE 13th INTERNATIONAL CONFERENCE ON INNOVATION AND MANAGEMENT

November 28-30, 2016

Chief Editors

Rubiyah Yusof, Ken Kaminishi, Wang Aimin

Associate Editor

Ma Ying, Geert Duysters, Arnoldo de Hoyos, Josu Takala

【Summary】

The proceedings include Organizational Innovation, Institutional Innovation and Management Integration Innovation; University-Industry Cooperation and Strategic Alliances; Product Innovation, Technological Innovation, Industrial Innovation and Regional Innovation; Environmental Innovation and Sustainable Development; Systems Engineering, Financial Engineering and Industrial Engineering; Operation Innovation and Modern Manufacturing Innovation; Risk Management and Innovation; Technological Economy, S&T Policy, Intellectual Property and Knowledge Management; Miscellaneous.

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A Comparative Study on Personnel Recruitment and Selection in Chinese Telecom Sector: The Case of Huawei in Senegal and China

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Abstract: Nowadays personnel recruitment and selection comes with challenges that human resource department must grapple with. Thus, better recruitment and selection strategies result in improved organizational performance. To this end, this paper puts a light on Huawei's recruitment and selection processes in Senegal and China. The main objective is to identify general practices that Huawei uses to recruit and select employees in Senegal and China; therefore, spot out the main problems and challenges that it faces during the process of recruitment and selection, and finally analyze the efficiency of recruitment and selection practices at Huawei. The methodology applied is both quantitative and qualitative. Out of a sample of 100 questionnaires, 80 responses were collected from the different Human resource personnel at Huawei in China and Senegal. The nature of data is both primary and secondary. The findings have shown that, first of all, Huawei uses different recruitment channels in Senegal and China. Also, they indicate that both in Senegal and China, in order to get the required talent, Huawei adopts different processes in recruitment and selection. In addition, Huawei Company uses internal and external sources in its recruitment processes in both countries. Finally, the results regard the lack of qualified and appropriate employees for positions, long recruitment process and working conditions as a big barrier to an effective recruitment.
Key words: Recruitment; Selection; Challenges; Human resource; Effectiveness

1 Introduction

Within today's challenging business environment, Human resource management, also known as human capital management plays a vital role in organizations irrespective of their origin, size, structure and sector. In fact, recruitment and selection is becoming top of the agenda for numerous companies throughout the world. The organization leaders and human resource managers spend considerable time and energy to recruit talent who fit well into their organizational culture. Nonetheless, many enterprises have not come to recognize the importance of recruitment and selection until now. Recruitment is very crucial and important for any organization because it's very necessary for an organization to select a right person for right job. The employees of the organizations directly affect on the performance of the organization and its important decision like to select right person for right job on right time. Nowadays, very few researches have been made on the issue of Personnel Recruitment and Selection practices at Huawei Technologies with the focus on the Senegalese and Chinese context. This topic has raised the researcher's interest because, as stated above, the emphasis is laid on the Chinese multinational telecom manufacturer, Huawei Technologies, which also operates in Senegal. Therefore, there exists unavoidable problems in the framework of personnel recruitment and selection practices both in China and Senegal. Yet, different issues and problem of recruitment are identified like; environmental influence like; technology, social, economic demand, political, recruitment timing, delays in recruitment, methods or sources of recruitment, lack of independencies, increasing pressure from the applicant, sources of recruitment…etc. Finally, this research will give insights on the effectiveness and eventually the shortcoming of the of Huawei's recruitment and selection practices with all its challenges both in Senegal and China.

2 Literature Review

As James A. Breaugh and Mary Starke (2000) put forward: "Over the last thirty years, the amount of research on recruitment topics has increased dramatically…. etc. In order for future studies to result in a better understanding of the recruitment process, such studies need to be designed with an appreciation of the complexity of the recruitment process (i.e., the number of variables involved and the nature of their relationships). In this regard, we offer an organizing framework of the recruitment process".

2.1 Recruitment: definitions, strategies and processes

Recruitment is described as "those practices and activities carried on by the organization with the

primary purpose of identifying and attracting potential employees" (Barber, 1998). In other words, the recruitment process provides the organization with a pool of potentially qualified job candidates from which judicious selection can be made to fill vacancies. Successful recruitment begins with proper employment planning and forecasting.

Bratton and Gold (2007) differentiate the two terms while establishing a clear link between them in the following way: 'Recruitment is the process of generating a pool of capable people to apply for employment to an organization. Selection is the process by which managers and others use specific instruments to choose from a pool of applicants a person or persons more likely to succeed in the job(s), given management goals and legal requirements.' In addition to that, Companies are now using a good selectivity in the hiring process to ensure getting the right skilled and qualified people for the right job (Pfeffer, 1994; Huselid, 1995). According to Koch and McGrath (1996), there exists a positive relationship between HR recruitment and selection and labor productivity.

In this recruitment process, Barber (1998) described three phases (i.e., generating applicants, maintaining applicant status, and influencing job choice decisions). That is, (a) certain recruitment activities (e.g., advertising) may influence the number and type of individuals who apply for a position, (b) certain activities (e.g., professional treatment during a site visit) may affect whether job applicants withdraw during the recruitment process, and (c) certain recruitment actions (e.g., the timeliness of a job offer) may influence whether a job offer is accepted.

In the past, it appears that many organizations have had the simple recruitment goal of attracting a large number of job applicants for a variety of reasons. For instance: the cost of processing applications (Wanous, 1992). Although recruitment activities have been linked to some of these post-hire outcomes, some researchers like (Williams, Labig, & Stone, 1993) have argued that in recruiting many employers are not overly concerned with post-hire outcomes. Rather, they are interested in pre-hire outcomes such as the number of individuals who apply for a position, the quality of these applicants, their diversity…etc. To sum up, we believe that the first stage of the recruitment process should be the establishment of objectives. If clear objectives have not been established, it is difficult to develop a sound recruitment strategy (Rynes & Barber, 1990).

2.2 Sources of recruitment

Generally, organizations choose the candidates for its recruitment purposes from two kinds of sources: internal (like transfer of employees from one department to other, promotions, internal advertisements…etc.) and external sources (like outsourcing, public advertisement, virtual job fairs (Elizabeth Agnvall, 2007), on-campus recruitment (Fisher, Schoenfeldt and Shaw, 2006) E- recruitment (De Avila. J.2009) …Etc.)

2.3 Trends and challenges in recruitment and selection

Nowadays the trend in recruitment and selection is that the new technology tools such as social medial and internet-based recruitment have paved the way to reduce recruitment costs.

1) Social networking sites, such as Facebook and Twitter, allow individuals to post and share personal information, which has led many US employers to use social networking sites to screen job applicants (Shea and Wesley, 2006). A reason for using social networking sites to screen employees is that employers might want to verify information provided by applicants.

2) Reducing Recruitment Costs: Challenging economic times are prompting employers to rethink they go about recruiting, with an emphasis on cost cutting (Dessler, 2012).

3) Advertising: while Web-based recruiting is rapidly replacing help wanted ads, a glance at almost any paper or business or professional magazine will confirm that print ads are still popular. To use help wanted ads successfully, employers have to address two issues: the advertising medium and the ad's construction.

3 Data Collection and Research Methods

3.1 Research approach

The researcher, in order to well approach this topic has adopted an inductive quantitative and qualitative case study, which is based on questionnaires. And that is due to the fact that this research aims to generate an in-depth understanding of strategic recruitment and selection practices at Huawei in the Senegalese and Chinese context. In fact, we hear by inductive approach or research, the fact of moving from particular situations to make or infer broad general ideas/theories. Therefore, the purpose of the research is theory building not theory testing.

3.2 Research strategy

A survey technique has been used in this work. Thus, this research strategy has been adopted in this study because it helped the researcher to collect information from a sample of employees at Huawei Company in Senegal and China through questionnaires.

3.3 Sample selection For this research, a total sample of 100 different human resources personnel was surveyed at Huawei in China and Senegal. During the data collection stage, all the 100 questionnaires (50 in Senegal and 50 in China) were distributed in different managerial level like top level, middle level, lower level managers, and some other employees of human resource department who are directly to the recruitment process of the company but only 80 (38 from Senegal and 42 from China) were returned in the end.

That is, to help enable the researcher get a more representative sample in the framework of personnel recruitment and selection at Huawei in Senegal and China.

In order to get more appropriate and accurate results, the Statistical Package for Social Sciences (SPSS) was used in order to analyze the data obtained from the questionnaires.

4 Analyses and Findings
4.1 Frequency analysis

Table 1　Recruitment and Selection Sources that Apply to Huawei (Senegal)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	internal sources	4	10.5	10.5	10.5
	external sources	9	23.7	23.7	34.2
	both internal and external sources	25	65.8	65.8	100.0
	Total	38	100.0	100.0	

Table 2　Recruitment and Selection Sources that Apply to Huawei (China)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	internal sources	1	2.4	2.4	2.4
	both internal and external sources	41	97.6	97.6	100.0
	Total	42	100.0	100.0	

The two tables above and graphs below have shown that most of the respondents to question concerning the recruitment and selection sources that apply to Huawei Company in the Senegalese and Chinese context have chosen "both internal and external sources" with respective percentages of 65.8% and 97.6%. As for the lowest percentage, it is 10.5% for "internal sources" in Senegal, compared to 0% for "external sources" in China.

Table 3　Huawei's Main Recruitment Channels (Senegal)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Online recruitment	1	2.6	2.6	2.6
	Newspaper Ads	3	7.9	7.9	10.5
	Direct recruitment	10	26.3	26.3	36.8
	Campus recruitment	2	5.3	5.3	42.1
	Others (any combination of the responses above)	22	57.9	57.9	100.0
	Total	38	100.0	100.0	

Table 4　Huawei's Main Recruitment Channels (China)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Online recruitment	1	2.4	2.4	2.4
	Direct recruitment	1	2.4	2.4	4.8
	Campus recruitment	13	31.0	31.0	35.7
	Others (any combination of the responses above)	27	64.3	64.3	100.0
	Total	42	100.0	100.0	

Concerning Huawei's main recruitment channels, the answer "Others" in the tables above and graphs below appeared to be the most dominant in Senegal and China with 57.9% and 64.3%, respectively. In the Senegalese context, online recruitment has the lowest percentage (2.6%) compared to China where online recruitment and direct recruitment have the lowest and equal percentage of 2.4%.

Table 5   Analysis about the Way in which Huawei Conducts its Tests during the Selection Process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Screening Cvs	2	5.3	5.3	5.3
	Interviews	15	39.5	39.5	44.7
	Others	21	55.3	55.3	100.0
	Total	38	100.0	100.0	

Table 6   Analysis about the Way in which Huawei Conducts its Tests during the Selection Process (China)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Screening Cvs	1	2.4	2.4	2.4
	Aptitude test	7	16.7	16.7	19.0
	Personality test	2	4.8	4.8	23.8
	Interviews	8	19.0	19.0	42.9
	Others (any combination of the responses above)	24	57.1	57.1	100.0
	Total	42	100.0	100.0	

As indicated in the tables above and graphs below, both in Senegal and China the highest percentage (55.3% and 57.1%, respectively) of the respondents concerning the manner in which Huawei conducts its tests during the selection process appeared at "Others".

Table 7   Analysis of Problems and Challenges Huawei Faces during the Personnel Recruitment (Senegal)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Salary issues and competition	3	7.9	13.0	13.0
	Communication issues	4	10.5	17.4	30.4
	Lack of qualified and appropriate employees for the positions	6	15.8	26.1	56.5
	Long recruitment process (interviews, timing…et) and working conditions (Overtime works, culture…etc.)	6	15.8	26.1	82.6
	Others	4	10.5	17.4	100.0
	Total	23	60.5	100.0	
Missing	333.00	15	39.5		
	Total	38	100.0		

Table 8   Analysis of Problems and Challenges Huawei Faces during the Personnel Recruitment (China)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Salary issues and competition	3	7.1	11.1	11.1
	Lack of qualified and appropriate employees for the positions	10	23.8	37.0	48.1
	Long recruitment process (interviews…etc.) and working conditions (Overtime works, …etc.)	7	16.7	25.9	74.1
	Others	7	16.7	25.9	100.0
	Total	27	64.3	100.0	
Missing	333.00	15	35.7		
	Total	42	100.0		

　　　Both in Senegal and China, only 60.5% and 64.4% respectively responded to the question related to the problems and challenges that Huawei company faces in its personnel recruitment process. All the remaining ones have avoided the question as it is shown by "Missing" in the tables above and graphs below. Most of the respondents in Senegal (15.8% and 15.8%) and China (23.8% and 16.7%) mentioned "the lack of qualified and appropriate employees for the positions" and "long recruitment process and working conditions" as the major problems generally faced by Huawei. Another specific and recurrent problem for Huawei in Senegal lies on communication (linguistic barrier) amounting 10.5%.

4.2 Cross tabulations

Table 9　Level of Education * Position in the Telecommunication Industry Cross Tabulation (Senegal)

		Position in the telecommunication industry					Total
		HR Director	HR Manager	HR Assistant Manager	HR Personnel	HR Assistant/ Specialist	
Level of Education	Master Degree	0	1	0	11	7	19
	Bachelor Degree	0	0	0	11	0	11
	Baccalaureate	0	0	0	5	0	5
	Others (Above Master Degree and other Professional Certifications)	1	1	1	0	0	3
Total		1	2	1	27	7	38

Table 10　Level of Education Position in the Telecommunication Industry Cross Tabulation (China)

		Position in the telecommunication industry					Total
		HR Director	HR Manager	HR Assistant Manager	HR Personnel	HR Assistant/ Specialist	
Level of Education	Master Degree	2	1	10	18	2	33
	Bachelor Degree	0	1	1	5	0	7
	Baccalaureate	0	0	0	0	2	2
Total		2	2	11	23	4	42

　　　As shown in the results of the cross tabulations in the tables above, the level of education tends to determine the position of employees at Huawei both in China and Senegal. In Senegal, the HR Director specially has the first ranking in "Others" (Above Master Degree and professional Certifications…etc.), then comes the HR manager holding a Master Degree, after that, the HR Assistant manager follows within the category of "Others", besides HR Assistant/ Specialist comes, all holding Master Degrees. Finally, we have the HR personnel. As for China, the HR Director also remains in the categories of highest degree holder "Master Degree", and then follows the HR managers with "Master and Bachelor Degrees". Afterwards, the HR Assistant managers most of whom hold Master Degree, HR Assistant/ Specialist follow and finally, HR personnel of which the majority hold a Master Degree as well.

Table 11　Experience in the Telecommunication Industry Position in the Telecommunication Industry Cross tabulation (Senegal)

		Position in the telecommunication industry					Total
		HR Director	HR Manager	HR Assistant Manager	HR Personnel	HR Assistant/ Specialist	
Experience in the telecommunication industry	0-5 years	0	0	1	16	0	17
	5-10years	1	1	0	11	7	20
	>15years	0	1	0	0	0	1
Total		1	2	1	27	7	38

Table 12   Experience in the Telecommunication Industry Position in the Telecommunication Industry Cross Tabulation (China)

		Position in the telecommunication industry					Total
		HR Director	HR Manager	HR Assistant Manager	HR Personnel	HR Assistant/ Specialist	
Experience in the telecommunication industry	0-5 years	0	0	11	16	1	28
	5-10years	0	1	0	5	2	8
	10-15es	1	1	0	2	1	5
	>15years	1	0	0	0	0	1
Total		2	2	11	23	4	42

As indicated in the tables above, in Senegal the HR Director and one of the two HR Managers are the most experienced employees (more than 15 years). The other HR Manager, all the HR Assistant/Specialist, and, out of the twenty-seven HR Personnel, eleven appeared to be the second highest experienced employees (10-15years). Finally, the HR Assistant Manager and remaining sixteen HR Personnel have the lowest experience level (0-5 years) in Huawei Company. As in the case of China, the most experienced employee is one of the two HR Directors with more than 15 years; the other HR Director, one of the two HR Managers, two of the twenty-three HR Personnels and one of the four HR Assistant/Specialist fall in the second highest range of experienced employees (10-15years). The remaining HR Manager, five HR Personnel and two HR Assistant/Specialist have 5-10 years of experience; and at last all the rest of respondents are 0-5 years experienced employees. These results have shown a tendency that "years of experience" is a determinant of position at Huawei Company both in Senegal and China.

5 Discussion

The analyses above were carried out in order to answer our research questions. Therefore, based on the findings, in Senegal and China, the main difference about the recruitment channels adopted by Huawei Technologies is highly observed on direct recruitment and campus recruitment. In Senegal, direct recruitment amounts for 26.3% after "Others", which represents any combination of the responses (Online recruitment, Newspaper Ads, Direct recruitment, Campus recruitment, Others) under the question related to the main recruitment channels in the questionnaire. As for China, campus recruitment is the most used channel in the process of recruitment with a percentage of 31.0% also ranking after "Others". The results from our questionnaire indicated that both in Senegal and China, Huawei Company used mostly both internal and external sources in its recruitment and selection process. The choice of both internal and external sources is not fortuitous since by internally appointing an employee to higher position will not only reduce the cost of recruitment and selection process but also constitute a means of motivation and employee retention through performance appraisals.

The external source of recruitment on its side, will allow the company to get new talents that can give a new orientation to the company. Concerning the main problems and challenges faced by Huawei in its personnel recruitment process, it appeared that they are almost the same namely the lack of qualified and appropriate employees for the positions, long recruitment process (interviews, timing) and working conditions (Overtime works, culture…etc.) in both countries although in Senegal, communication is a big barrier to the recruitment process. Moreover, both in Senegal and China, there are higher percentages of respondents who did not answer the question about the main problems and challenges faced by Huawei in its recruitment process indicated as "missing" in the tables. Finally, the cross tabulations' output pointed out that Huawei tends to pay much more attention to the level of education and professional experience in the attribution of different positions.

6 Conclusions

In a nutshell it is clear that recruitment and selection plays paramount important role in every organization. The study reveals that Recruitment is the first stage in the process which continues with selection and ends with the placement of candidate.

After completing this study, we have learnt that research on recruitment and selection practices in Senegal and China are vital for Huawei. The main objective of this research paper was to investigate on

the personnel recruitment and selection process at Huawei Technologies in the Senegalese and Chinese context, and then, spot out the main problems and challenges it faces in the process.

The results of the research have shown that in order to recruit in a more effective and strategic manner and make wiser selection decisions, the top management team needs to create short-and long-term strategic plans (demands of staff), particularly by taking into account the cultural values, the timing, and the communication issues that somehow hinder Huawei's recruitment and selection process in Senegal. Likewise, in China Huawei has to consider the salary issues by increasing the employee wages, improving the working conditions, and reducing the recruitment process timing.

Furthermore, direct recruitment and campus recruitment are the main channels used by Huawei in Senegal and China, respectively. Accordingly, the level of education and professional experience of candidates appeared to be factors which influence the attribution of positions at Huawei in both countries. In sum, the study revealed that there do exist some similarities and differences in the process of recruitment and selection at Huawei in Senegal and China.

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Empirical Study on the Antecedents Predicting Organizational Innovation of the Small and Medium Enterprises in Bangladesh

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Abstract: In the era of global competition, innovation has become a central object to obtain a sustainable future by an organization outrunning their counterparts. Based on the questionnaires survey on Ready-made Garment (RMGs) and small and medium enterprises (SMEs) in Bangladesh, this empirical study aims at finding the impact of transformational leadership (TL), knowledge management (KM), citizenship behavior or positive deviance (PD), and intrinsic motivation (IM) on organizational innovation (OI). Stratified random sampling has been used for collecting the responses of the SMEs in Bangladesh. Data analysis shows that TL, KM, IM, and PD can predict OI significantly. Limitations, implication and further research directions have also been discussed in this article.
Key words: Transformational leadership; Knowledge management; Positive deviance; Intrinsic motivation; Organizational innovation

1 Introduction

In the era of global competition, innovation has become a central object to have a sustainable future for an organization outrunning their counterparts. The past century has seen the rapid advances in innovation. OI has been defined as the successful implementation of noble and useful creative ideas within an organization (Radzi, Hui, Jenatabadi et al., 2013). Amabile (1988) advocated that creative ideas can be 'anything from ideas for new products, processes, or services within the organization's line of business to ideas for new procedures or policies within organization itself.' Recently, researchers have paid interests in this field because of its critical role in the competitive business world for having sustainable performance. Empirical studies mirrored that the antecedents predicting OI are TL, KM, citizenship or PD, organizational climate, and IM which are virtually mentioned in several studies. Besides, organization needs employees' dedication, cooperation, and a little extra effort for achieving competitive edge. This little extra effort by the voluntary works of employees is really a matter for the organizations to improve it further (Yilmaz and Tasdan, 2009). Employees' creative and innovative behavior is the key resource for sustainability. If an individual gets bored, it is irrelevant to expect any creative contribution from him. Amabile (1988) posits that individual's propensity to work and degree of enthusiasm for the activity is the primary condition of IM. Research showed that IM is one of the precursors to the employees' creativity which leads the firm into the OI. It is imperative for an organization to pile tangible and tacit resources to accomplish OI. A company's excellence is linked with the utilization of its knowledge resources, i.e. the knowledge of the organization and its employees (Chait, 1999; Ericsson and Avdic, 2003). Hence, dynamic organization requires handful leadership to turn all those antecedents for arousing individual intrinsic motivation for leading to OI.

2 Theoretical Background and Hypothesis Development

The theory of reasoned action (TRA) suggests that immediate antecedent of any behavior is the intention to perform that behavior approved by his social pressure. In the words of Ajzen and Madden (1986, p.454), "the stronger a person's intention, the more the person is expected to try, and hence the greater the likelihood that the behavior will actually be performed." Ajzen (1991) theorized in 'the theory of planned behavior (TPB)' that individual's behavioral intention leading to behavior is contingent upon individual's perceived control of his/her behavior, attitude, and subjective norms. It exhibits, in addition to the previous theory; that those employees who are certain of their positive outcome by their controlled behavior tend to behave positively. Self-determination theory (SDT) opined on the degree to which an individual decision is self-motivated and determined without external interference. Ryan and Deci (2000) noticed that three needs-competence, relatedness, and autonomy-that

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affect the inherent growth tendencies towards the subjects. Social exchange theory (SET), proposed by Blau (1964), and the norms of reciprocity (NR) posited by Gouldner (1960) forwards these same tenets a step further from a different perspective that employees feel obliged to reciprocate more if their employer value their contributions and efforts they give in. First three theories revealed that individuals have inherent needs to create and grow and, moreover, that behavior has been regulated by their intention, behavior control, and social approval or disapproval. Social approval or disapproval and perceived behavioral control by them have been affected by the organizational retreat and recognition. SET and NR theories go further that when organization treats employees well, it makes them morally, personally, and socially responsible to bounce it back to organization's wellbeing. In views with the perceived organizational supports (POSs), creative individuals and innovative teams tend to get demoralized when employees see the absent of POSs and equity among themselves.

Previous theoretical explanation strengthens the understanding that employees have inherent tendency to grow, relate, compete (SDT theory) with their firm control of their behaviors in a social interaction (TRA and TPB theories). SET and NR theories show how employees react to the organizational response to them. IN model, and CMC narrated that how an organization can better accomplish their sustainable competitive advantage. Empirical studies state that TL significantly predict IN (Chang, 2016; Tajasom, Hung, Nikbin et al., 2015) and KM (Birasnav, 2014; Han, Seo, Yoon et al., 2016) because TL, like POS theory, foster supportive climate for individual initiative, on the other hand, it helps employees create, transfer, and utilize of knowledge among stakeholders. The supportive climate prepared by TL also instigates the employees to helping each other. This cooperation from TL supportive attitude drives employees' intrinsic motivation and citizenship behavior to the innovative organization (Humphrey, 2012; Jaiswal and Dhar, 2015, Teigland and Wasko, 2009).

H_1: Transformational leadership significantly predicts organizational innovation;

Besides, KM is found correlated with the upgrading of organizational creativity and sustainable innovation. Shieh (2011) mentioned that KM created new knowledge and shared it to other employees. Other literatures also found that KM significantly predicts OI (Darroch, 2005). Therefore, the prevailing studies elucidate that organization needs TL and fair climate to mould KM, the employees' IM and PD for fostering organizational innovation. The following hypotheses have been proposed for further studies:

H_2: Knowledge management significantly effects organizational innovation;

H_3: Citizenship behavior significantly predicts organizational innovation;

H_4: Intrinsic motivation significantly predicts organizational innovation;

3 Research Methods

3.1 Data characteristics

Self-administered questionnaires were sent to RMGs and the other SMEs using stratified random sampling in the greater commercial City-Chittagong of Bangladesh. Analyses of demographic characteristics showed that of the 204 responses, 73.5 per cent represents men and the rest 26.5 per cent represents women. Their age's group consists of 6.4, 51.0, 35.8, and 6.8 per cent belonging to above 18, e 25, 35, and 45 years respectively. Educational profile shows that 15.7 per cent, 57.8 per cent, and 26.5 per cent have completed their bachelor, master, and others, i.e. doctorate or diploma certificate. The analysis of the respondents' job position reports that 37.3 per cent, 51.0 per cent, and 11.7 have been serving lower, mid and top levels respectively.

3.2 Survey instruments

A total of 300 questionnaires were delivered through off line and online survey, but 230 responses were received. In screening tests, 26 responses were dropped out to address the issue of common method bias, missing data, outliers, and data normality. Survey instruments of transformational leadership (Podsakoff, MacKenzie, and Bommer, 1996), intrinsic motivation (Tierney, Farmer, and Graen, 1999), citizenship behavior (Ritz, Giauque, Varone et al., 2014), knowledge management (Gold, Malhotra, and Segars, 2001) and organizational innovation (Miller and Friesen, 1983) were used in this analysis. SmartPLS 2, and IBM SPSS 20 software packages were used for producing the results.

4 Analysis and Findings

In order to estimate the validity of the model and instruments, several statistical test has been tried. Indicators' validity can be measured by performing bootstrapping test through Smart PLS 2. All indicators scored above the cut off value of 0.70 and found significant at *p<0.000* that demonstrate the

sufficient level of validity (Urback and Ahlemann, 2010). Besides, internal consistency, like Cronbachs Alpha, of all instruments score above 0.77 (see table 1) which is also above the threshold limit. For convergent validity testing, average variance extracted (AVE) has been recommended. It's been found that that AVE of each construct in this study exceeds 0.69 whereas the minimum rule of the thumb is advised to be at least 0.50. Table 1 also shows the correlation matrix for discriminant validity which reveals that the square root of AVE of each construct is higher than the construct's highest correlation with any other construct in this study (Hair Jr, Hult, Christian et al., 2014).

Table 1　Assessment of the Data and Model Quality

Convergent validity of the items						Discriminant validity among the instruments					
Latent Variables	Mean Value	Standard Deviation	AVE	Composite Reliability	R^2	Cronbachs Alpha	Latent Variables	1	2	3	4	5
1. IM	1.91	0.64	0.690	0.918	0.447	0.888	1. IM	**0.831**				
2. KM	2.11	0.72	0.725	0.913	0.638	0.873	2. KM	0.667	**0.851**			
3. OI	1.93	0.66	0.681	0.865	0.727	0.765	3. OI	0.781	0.703	**0.825**		
4. PD	1.95	0.71	0.697	0.920	0.690	0.891	4. PD	0.807	0.694	0.806	**0.835**	
5. TL	2.05	0.73	0.714	0.926	0	0.900	5. TL	0.669	0.799	0.702	0.686	**0.845**

Before going to find the effects of subject variables, researchers control the demographic variables (Table 2) to find the magnitude of their effects on OI. It's been noticed in model 1 (table 2) that demographic variables altogether explain OI by 6.40 per cent, however, age ($\beta = -0.175; p<0.016$) and gender ($\beta=0.189, p<0.088$) of demographic factors are only found significant. Model 2 shows that TL has a significant ($\beta=0.635; p<0.000$) effect on OI with a R^2 value of 0.444. Observation of model 3, model 4, and model 5 reveal that KM ($\beta=0.348; p<0.000$), IM ($\beta=0.543; p<0.000$), PD ($\beta=0.338; p<0.000$) have a very significant effect of OI with R^2 value of 0.05, 0.141, and 0.04 respectively.

Table 2　Hierarchical Regression Analysis on OI

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	β	Std error	Sig.	β	Std error	Sig.	β	Std error	Sig.	β	Std error	Sig.	β	Std error	Sig.
Constant	2.036	.266	.000	.631	2.868	.005	.557	.210	.009	.285	.176	.106	.276	.165	.095
Age	-.175	.072	.016	-.113	-2.151	.033	-.100	.050	.048	-.129	.041	.002	-.113	.039	.004
Education	.016	.074	.829	.074	1.375	.171	.060	.051	.247	.076	.042	.074	.073	.040	.068
Job Position	.029	.078	.710	.083	1.466	.144	.033	.055	.553	.053	.046	.250	.041	.043	.337
Gender	.189	.110	.088	-.020	-.242	.809	-.017	.078	.832	-.031	.064	.630	-.054	.060	.369
TL				.635	13.353	.000	.353	.075	.000	.182	.065	.005	.136	.061	.027
KM							.348	.074	.000	.162	.064	.012	.103	.061	.094
IM										.543	.057	.000	.326	.067	.000
PD													.338	.063	.000
R^2		**0.064**			**0.507**			**0.557**			**0.698**			**0.737**	
Adjusted R^2		0.045			0.495			0.544			0.688			0.726	
ΔR^2					**0.444**			**.050**			**0.141**			**0.04**	
F		3.376			40.769			41.315			64.830			68.260	
Sig.		**0.010**			**0.000**			**0.000**			**0.000**			**0.000**	

5 Discussion

This empirical study goes for finding the predictor variables of organizational innovation. In this connection, four antecedents have been picked up from previous literatures which are found theoretically and empirically connected to OI. The prime objective of this study is to figure out the relative importance of each predictor variable to OI. Hierarchical regression analysis shows that all hypotheses are significantly influencing subject variables at $p<0.000$. Of the predictor variables, TL is the most dominating antecedent explaining OI. Empirical research and theories of leadership, POSs, TPB, and TRA supported these findings that TL drives organizational innovation by engaging the followers' attention for the fullfilment of the organizational vision (Ajzen, 1991; Ajzen and Madden, 1986; Tajasom et al., 2015; Teigland and Wasko, 2009; Tierney et al., 1999). KM is found to effect OI significantly. Theoretically, RBVs signifies the impact of knowledge along with other resources to enhance the capability of the organization (Warnerfelt, 1984). Knowledge creation, transfer, and storing of it help the users to generate new ideas. KM has a significant effect on OI which is found consistent with other empirical findings (Birasnav, 2014; Radzi et al., 2013). Hypothesis 3 assumes the effect of IM on OI. Result shows that it has significant effect on OI which is found consistent with previous theoretical and empirical studies (Ajzen, 1991; Ajzen and Madden, 1986; Amabile, 1988; Coelho,

Augusto, and Lages, 2011; Dewett, 2007; Eisenberger and Shanock, 2003; Ryan and Deci, 2000; Wernerfelt, 1984). Last hypothesis intends to find the effect of PD (citizenship behavior) on OI. It's been noticed that it is also a significant predictor of OI. SET, NR, POSs, TRA, TPB and SDT explain that employees have control on what they behave to their surroundings (TRA, TPB, and SDT) and sometimes they are controlled by the way their surroundings (SET, NR, and POSs) treat them (Ajzen, 1991; Ajzen and Madden, 1986; Blau, 1964; Gouldner, 1960; Ryan and Deci, 2000). This study is also found consistant with empirical findngs (Raja and Johns, 2010; Zhang and Begley, 2011).

6 Conclusions

This study, Firstly, aims at finding the potential impact of TL, KM, IM, and PD (citizenship behavior) on OI of the SMEs in Bangladesh. It's been proved that all of them have a significantly influence on OI. Secondly, it is purported to measure the extent of each predictor variable on OI and result shows that TL has larger influence than other variables on OI. Therefore, it is highly recommended that enterprises require to emphasize more on the effective leadership to mould the employees' attitude to OI. It also holds true that KM, IM, and PD are contributing a lot to the OI. It contains several implications both for professionals and academics. The least they might do is to ensure enough resource commitment from the top level management. Two of the few limitations of this study are the scope and size of the research and sample respectively, i.e. 204 samples from RMGs and the other RMGs, and time span used in this research. Further research might be suggested with relatively large size accompaning multiple cross-sectional data. In addition, moderating and mediating effects of other variables might have been used in this study to trace out any latent variable existences.

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Measuring the Impact of Staff Governance on Enterprise R&D Output: A Comparative Study

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Abstract: This paper is based on Stakeholder Theory and Technological Innovation Theory, classifying 207 A-share listed companies to conduct a comparative study, using the Person correlation analysis and linear regression to explore the relationship between employees involved in corporate governance and R&D output. The results show that, in the capital and technology intensive enterprises, there is a significantly positive relationship between staff governance and R&D output, and for the labor-intensive enterprises, no significant correlation is found between the two. This paper's contribution lies in the research perspective, scope and measurement method: Firstly, it breaks the past research limitation that only see the staff as employees who are hired by firms, this paper explores its impact on innovation performance from a new perspective that regard them as stakeholders; Secondly, in view of the different types of industry enterprise, this paper further excavates the different influence of staff governance on corporate R&D; Finally, thanks to patent database updates, the measure indicators of R&D output is more diverse and more reasonable in this paper, so the results have strong persuasion.

Key words: Staff governance; Innovation performance; Stakeholders; Capital technology intensive enterprise; Labor- intensive enterprise

1 Introduction

In recent years, with the slowdown in China's economic growth, China began to enter the industrial transformation and upgrading period, enterprises "innovation" has been received the unprecedented attention. Government Work Report 2016, the "innovation" has been mentioned 59 times. Building an innovative country should have the following four characteristics:1)high innovation input, R&D (research and development) expenditure percentage of GDP is generally more than 2%;2) scientific and technological progress contribution rate more than 70%; 3)the independent innovation capability is strong, the country's foreign technology dependence index is usually below 30%;4)high innovation output, the number of invention patents around the 20 innovative countries accounted for 99% of the global total. Visible, the driving role of R&D inputs and outputs for the innovation performance is crucial. R&D activities is the most intuitive and critical reflection of enterprise technology innovation, so exploring the key factors that affect the company's R&D activities has important significance.

Many previous studies have shown that a country's population size, level of economic development, legal system, fiscal policy, the degree of competition in the industry and so on will affect the company's innovation activities. As Teitel.S (1994) by comparing the level of innovation in different countries, noting that the population size of the country, units of capital gains have an important impact on the patent and R&D investment. Aghion (2005) pointed out that the country's financial system to support innovation activities for the high cost research activities is very necessary. Chen, Puttitanun (2005) found that the higher the degree of competition in the national market, the better the situation of intellectual property protection, as well as the national innovation level. Sharma studies have shown that a country's financial markets are more developed, the enthusiasm of small business research and innovation is stronger. Widening Chinese scholars, Xiang Yu found that, due to the differences of bank credit for r&d investment project, so our corporate R&D activities are also negatively affected to some extent. Li Danmeng (2009) found that for private enterprises, the higher the degree of industry competition in the market, the greater the intensity of enterprise R&D investment. Weimin and Tang Qingquan (2009) also confirmed that technological innovation subsidies provided by the government for business R&D activities have a significant incentive. Lin (2010) by conducting field research and interviews in more than 10 cities, also found that enterprise R&D activities is significantly positively related to property rights protection policy. Cable, Fitzory (1980) and other empirical study shows that, regardless of the nature of business, industry marketization level and R&D investment has a significant positive correlation.

Clarkson introduced the concept of exclusiveness investment into the "stakeholder theory", put forward that stakeholders invest the physical, human and financial capital or some other valuable things into the enterprise, so as to share a part of the risk of the enterprise. Blair (1995) argue that residual

income is matched with the rest of the risk, for employees, unemployed as a direct result of the enterprise bankruptcy, so employees are more involved in corporate governance requirements. Through the study, Rajan and Zingales (2000) pointed out that with the arrival of knowledge economy, convenience financing resulting decrease in the importance of physical capital, which have led to human capital has more and more important role in the enterprise. Chen Zhongxiang (2007) found that in market economy developed countries, the employees involved in the governance is common, and mainly through the participation of the decision-making, ownership, and benefit sharing of these three ways to participate in corporate governance. Margaret (1995) analyzed the rationality of employee participation in management; employees are given certain rights by institutions to participate in governance, so that their own interests are effectively safeguarded. Blaine (2001) argues that employee participation can improve the efficiency of company management, affect the management decision-making, so as to realize corporate governance. Hiroshi Osano and Mami Kobayashi (2005) starting from the trend of population aging, discusses the labor shortages would happen in the future, and put forward the status of the employees would increase as the trend and, therefore, the enterprise will reform its governance mechanism, give employees more administrative power to adapt to the trend of development.

2 Theoretical Backgrounds and Hypothesis

First, the R&D investment includes not only capital investment, but also involves the investment of talent. Some employees held their knowledge and skills are formed through education, training and other aspects of the investment over time, and these are value-added. Especially in the high-tech enterprises, the employees hold the company's core technology, and the creative work of the staff is the fundamental survival and development of enterprise. Employee participation in corporate governance can not only improve their reward but also provide an opportunity to display their talent. Employees for their own interests on the one hand, on the other hand in order to realize their own value, it will make every effort to put his core technologies and other key human capital, which for R&D investment and innovation performance improvement has an important influence.

Secondly, the staff through participating in corporate governance, that is, to share the control of the company. In the past, most employees don't have control of the enterprise, leading to staff for business situation indifferent, and even secretly against non-cooperative attitude with the management. Sharing control of the enterprise not only let employees shift their identity into a part of the company's managers, mentally for their own interests, will be more active in focusing on the long-term development of the enterprise. Therefore, long-term interest in the company to increase R&D investment and other decisions, employees will choose to take a supportive attitude. This is to some extent; help to improve the company's R&D output.

Thirdly, employee participation in corporate governance is based on the principle of voluntary, and employees with respect to external investors easy access to information, they have a comprehensive understanding of the company's management capabilities and quality. Therefore, the advantage of the information can let the staff to make more scientific decision and improve the efficiency of R&D investment.

Finally, as Li Bingyan put forward the concept of "benefit-sharing" in "Sharing Public Economic Theory", employees to participate in dividends and management is a practice of "benefit-sharing". Due to the success of the research and innovation can bring unlimited excess returns for the company, profit driven directly motivate employees to be more support and increased investment in research, and constantly improve the company's R&D output performance.

According to the theory of enterprise innovation, the lack of funds investment is often the bottleneck of restricting the developing of the enterprise's R&D activity. Zhao, Li Xiaohua through the empirical study show that enterprise's R&D investment has significant positive impact on the enterprise patent applications. Bai Yanzhuang, also found that corporate R&D investment can promote the patent output level. Therefore, employees of the enterprise R&D investment positive impact will transfer to the corporate R&D output. Based on the above reasoning, this paper put forward hypothesis:

Employees participation in corporate governance is positively related to the corporate R&D output.

3 Methods
3.1 Sample

This paper chooses a total of 207 A-share listed companies in Shanghai and Shenzhen from 2007 to 2014, since China from 2007 officially adopted the new accounting standards, the accounting treatment of research and development has made significant changes, this article selected R&D and staff governance situation after 2007 as samples.

In this paper, all data on the condition of employees' shareholding are from WIND database, the total number of patent applications and inventions are derived from Chinese Listed Companies patent research database (CSMAR). In addition, the basic information, financial data and other information of listed companies are from CSMAR database.

3.2 Measures

3.2.1 R&D output

Due to the lack of Chinese listed companies patent statistical databases, Previous studies on innovative output often use ROE and other comprehensive index to measure the results of research and development. This indicator covers too many influencing factors to test enterprise real R&D output. The more accurate and intuitive indicators of R&D output should be the enterprise authorized patent number and the application situation. In the light of the business licensing conditions under the influence of external factors such as the patent policy and audit, enterprise's patent application number is more reasonable. Therefore, we selected the latest data CSMAR patent application database as a measure of corporate R&D output.

ESOP is a measure based on a long-term incentive and its stake in a certain period with the stability, and therefore we choose the average annual number of patent applications after the formal implementation of the ESOP as the measure.

3.2.2 Staff governance

The main way of employee participation in corporate governance is by holding shares in the enterprise; this paper selected its proportion of shareholding to measure the effectiveness of employee participation in governance.

Proportion of employee shareholding=number of internal worker shares / total equity

3.2.3 Control variables

Due to differences in the scale of business, large and small companies invest in R&D efforts will be quite different, large companies usually get more specific assets, including personnel, finance, technology, it implies the need and the ability to have more R&D output. This paper selects total revenue to represent the firm size.

Companies usually longer listed in capital market have richer experience, it also affects the corporate R&D output. Therefore, this article will also choose listed years as a control variable.

4 Results

4.1 The descriptive statistics of main variables

As it can be seen from the Table 1, the maximum and minimum ratio of 207 listed companies in the studies were 9.996% and 0.175%, respectively, for the number of patent applications 1 and 265.4, employee's governance and R&D output gaps between different companies, further proved the necessity of classification comparative study of different industries. The proportion of employee stock ownership and the average number of patent applications were 2.95% and 19.52, it shows that employee shareholding of listed companies in our country is low and less company R&D output in general.

Table 1   Descriptive Statistics

Variable	minimum	maximum	Mean	SD	N
Proportion of employee shareholding	0.175	9.996	2.954303	1.8234506	207
Patent application number	1	265.4	19.5206	23.85693	207
Listed Years	2	24	7.95	4.482	207
Firm size	1.90356672E+08	1.089E+11	3.13505293E+09	9.35071345E+09	207

4.2 The correlation analysis of different types of enterprises

Given the different nature of the industry have different demand for R&D, according to the "Industry Classification of Listed Companies Guidelines", this article will divide the 207 listed companies into capital and technology-intensive (144) and labor-intensive (63): capital and technology intensive industries that are dependent on complex and sophisticated use of advanced scientific

knowledge and technology, including the electronics industry, aircraft and aerospace industries etc.; labor-intensive industries rely on large-scale use of labor, it mainly refers to agriculture, forestry and textiles, clothing, toys, leather, furniture and other manufacturing industries.

4.2.1 Capital and technology intensive enterprises

Through the Table 2 results, for capital technology intensive enterprise, employee shareholding and corporate patent application number has significant positive correlation, employees' participation in corporate governance has a positive role in promoting corporate R&D output, it consistent with the hypothesis of this article.

Table 2   Person Correlation Analysis in Capital and Technology Intensive Enterprise

Variable	Proportion of employee shareholding	Patent application number	Listed Years	Firm size
Proportion of employee shareholding	1	.858**	.045	.158
Patent application number	.858**	1	.068	.152
Listed Years	.045	.068	1	.524**
Firm size	.158	.152	.524**	1

4.2.2 Labor-intensive enterprises

By Table 3 we can see that the number of employee shareholding in labor-intensive enterprises has no significant positive correlation with patent applications, the effect of staff governance in the enterprise on R&D output is not obvious, and it's not consistent with assumption.

Table 3   Person Correlation Analysis in Labor- Intensive Enterprise

Variable	Proportion of employee shareholding	Patent application number	Listed Years	Firm size
Proportion of employee shareholding	1	.109	.418**	.412**
Patent application number	.109	1	-.067	-.018
Listed Years	.418**	-.067	1	.316*
Firm size	.412**	-.018	.316*	1

4.3 Linear regression analysis

It can be seen from Table 4 and Figure 1, in capital and technology intensive enterprises, the number of employees' ownership and the R&D output showing a linear relationship, R square is 0.736, indicating a good model fit, Sig 0.00 is below significance level 0.005, indicating a linear relationship between the two is significant.

Table 4   Model and Parameter

equation	model					estimate of parameter	
	R square	F	df1	df2	Sig.	constant	b1
liner	0.736	395.056	1	142	0	-7.711	8.919
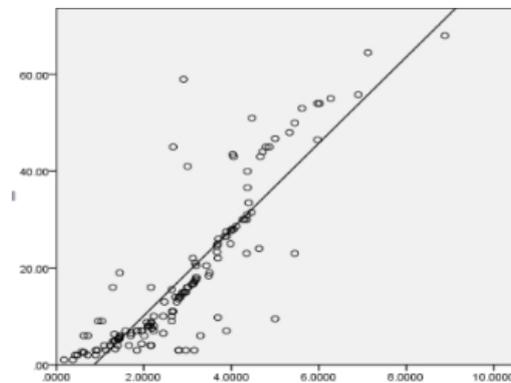
Figure 1   Liner Relationship

5 Conclusions

Based on the Stakeholder Theory and Technological Innovation Theory, 207 A-share listed companies is divided into two categories according to the data about staff governance and R&D output, through the empirical comparative analysis, the conclusions are as follows: first of all, for capital technology intensive enterprises, staff governance is significantly positively related to enterprise R&D output; second, for labor-intensive enterprises, there is no significant correlations between staff governance and R&D output; but firm size and the years of listed is related to the enterprises R&D output. The study's findings suggest that for different industry types, staff governance has different effect on R&D output. We should improve employees' governance mode through considering the nature of the enterprise, strategic objectives, market positioning, business model and so on.

1) The study found that in labor-intensive enterprise, employees did not promote the R&D performance, which explains the low subjective consciousness of employees to participate in corporate governance and the staff own cultural and technical level, will greatly influence the effect of the staff governance. To better use staff governance, the company should improve the awareness and ability of staff to participate in governance.

2) In the study, we found that most of the companies employees shareholding ratio is low, and many companies did not implement employee stock ownership plan (ESOP), in addition, while the ESOP is the main way for employees to participate in corporate governance, but it also includes the board of directors and board of supervisors, staff congress, etc. By analyzing the annual report data of listed companies, found that many companies did not set up employee supervisors, only a few listed companies set up staff director. This shows that staff governance in the listed companies of China attaches no great importance, a part of the management of listed companies don't realize the important role of employees' participation in governance. They view employees just as the employer, rather than the company's stakeholders.

3) Although some companies recognize the importance of employee participation in corporate governance, but in reality there is no system in place but only stay on the surface. Although many companies have implemented employee stock ownership plan, but most is by the means of financing under the difficult circumstances, rather than an incentive policy. And some managers worried about staff governance will disclosure trade secrets, the employee only share interests but has no right to vote, and they did not really participate in the company's internal governance process, and therefore cannot play its role.

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Corporate Governance from Islamic Perspective: Review and Synthesis from the Literatures

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Abstract: This paper reviews and synthesizes the literatures on corporate governance in Islamic banks with the aim of identifying key elements and dimensions of corporate governance from Islamic point of view. Drawing from proliferation of literatures in the Islamic banks and corporate governance fields, this study provides the primary elements and attributes of corporate governance from Islamic perspective that have been largely used in studies of governance to date. A review on fifty-seven (57) journal articles, conference papers, reports, and theses, have identified twenty-four (24) dimensions of corporate governance in Islamic banks. From these dimensions, the six most frequently used as corporate governance dimensions in Islamic banks are: sharia scholars, stakeholders' role, responsibility, ownership, transparency, and sharia compliance. The synthesis of governance from Islamic perspective will make several noteworthy contributions to address the gaps in literatures for corporate governance in Islamic banks. This study will provide the basis for researchers to empirically examine the dimensions of corporate governance in Islamic banks and add additional empirical methods in future research.
Key words: Corporate governance; Islamic banks; Islamic finance; Literature review

1 Introduction

The current global financial meltdown has gained interest in corporate and banking sector world-wide. Amongst the lessons learned has been the importance of corporate governance (CG hereafter) frameworks to drive accountable, transparent, and efficient business organizations. There have been several studies in the literature reporting that CG is one of the causes of economic crisis (T. A. R. Dalwai,et al,2015; H.-A. N. Al-Malkawi, et al,2012). Moreover, CG practice is also equally important in the Islamic banking and finance. Islamic banks need a prudent CG framework albeit Islamic moral system protects the right of stakeholders (M. U. Chapra and H. Ahmed, 2002). In addition, some of the failures of Islamic banks is due to the existence of weak CG system. The failure of Islamic Bank of South Africa in 1997 and the collapse of Ihsan Finance House of Turkey in 2001 have confirmed that the importance of CG system for Islamic financial institutions (K. Ginena,2014).

Islamic banking and finance has witnessed as one of fastest growth in the global financial industry, with the current market sizes in a range of USD1.6 trillion to USD2.1 trillion (ISRA,et al,2016). This prospective segment is predicted to reach USD3.4 trillion by the end of 2018. Nonetheless, despite with the industry has matured and gained experience, the legal and governance framework for Islamic banks remains underdeveloped. ISRA & Thomson Reuters (2015) also confirm that the importance of the application of CG in Islamic banks. Therefore, even though Islamic banking and finance have done very well so far, they should have a prudent CG mechanism.

CG is defined as the system by which firms are directed and controlled (Cadburry Code, 1992). It refers to relationship between corporations and constituents, more specifically, the link between shareholders and management of the firm (M. K. Lewis,2005). Moreover, Organization for Economic Co-operation and Development (OECD) defines CG as a set of relationship between a company management, its board, shareholders and other stakeholders (OECD, 2004)[1]. The topic of CG in contemporary business institutions is one of the most active areas in corporate finance research today. The bulk of research in the form of journal articles, book review, conference papers, and other materials has increased remarkably. Many researchers have argued that CG of financial industry is different with the non-financial industry due to highly regulation, excessive risk-taking, and business model (R. La

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[1] OECD in 2004 has issued "Principle of CG" that says: the CG framework should promote transparent and efficient market, in line with the rule of law and the division of responsibilities among supervisory, regulatory, and enforcement authorities.

Porta,2000) -(G. Caprio, et al,2007) In addition, most of the studies on CG have evolved against a setting of capitalism corporate system and mostly based on developed countries (G. Caprio, et al,2007) -(E. H. Kim,2013) Table 1 below specifically provides the publication of CG in banking sector from 1980-2015.

Table 1　Publication of Corporate Governance Research from 1980-2015

Database or publisher	Total no. of journals	No. of bank corporate governance articles
Science Direct	5177	239
Scopus Elsevier	5300	992
Emerald Insight	84	307
Wiley-Blackwell	53	28
Springer	92	35
Taylor & Francis	168	23

[a] All Journal are categorized under the subject of economics, finance, accounting, business, and management
[b] Using keyword 'corporate governance or 'bank corporate governance
Source: author's compilation (2016)

Despite the proliferation of the CG concept in conventional literature, however to the best of author knowledge, there is still sparse research on CG in Islamic banks. Thus, this study attempts to shed light on that important aspect of CG in Islamic banks by the way of addressing the literature gaps of the existing studies on the CG in Islamic banks and its mechanisms. Specifically, in order to address the literature gaps of CG, this study endeavours to identify the key elements and dimensions of corporate governance from Islamic point of view.

This study is organized as follows. Section 2 provides an overview of CG theories. Section 3 reviews the existing studies of CG in Islamic banks from various aspects. Section 4 provides dimension of CG from Islamic perspective. Finally, section 5 is the conclusion and suggestions for further explorations.

2 An Overview of Corporate Governance Theories

The first code on CG can be traced back in 1992 during which Sir Adrian Cadbury (The Chairman of the UK committee on the financial aspects of CG) was launched the Report and Code of Best Practice of CG, also well-known as the Cadbury Report (Cadbury, A, 1992). The report was launched to discover the issues of corruption in UK corporations and to ascertain an accountability frameworks of the BOD. According to Cadbury Code, CG can be defined as the system by which the company is directed and supervised by several parties, for instance board of directors (BOD), management, auditors, to ascertain that the company is moving towards their goals (Cadbury, A, 1992). A later effort arose in 1999 that was presented by Bank for International Settlements (BIS) to which establishing Basel Committee on Banking Supervision (BIS-committee). The BIS-committee had issued the guidelines and mechanisms of CG practices to ensure that there is effective corporate governance at every banking institution.[1] These guidelines were then revised accordingly in year 2006, 2010, and 2015[2] (Basel Committe on Banking Supervision,2015). The BIS guideline of CG, accordingly, is regarded as the most widely accepted framework of CG in conventional finance (Mizushima, 2013). According to the latest version of BIS guidelines, CG is the division of authorities and responsibilities by which the business affairs of a bank are directed and controlled by its board and senior management.

Prior to BIS initiative on CG, Organisation for Economic Co-operation and Development (OECD) has determined the principles of CG which have become a global benchmark for policy makers, investors, and other stakeholders. According to OECD, CG is a set of relationship between a company management, board of directors (BOD), shareholders and other stakeholders (OECD,2015) In latter stage, OECD has issued the revised version of CG principles in 2015[3]. According to OECD (2015), the

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[1] <http://www.bis.org/BIS/publ/d328.htm>. Retrieved at 24 February 2016
[2] The first revision of BIS guidelines of CG, "Enhancing Corporate Governance for Banking Organizations", was launched in February, 2006. The second revision, "Principles for enhancing Corporate Governance", was issued in October, 2010. Lately, in July 2015, BIS has issued "Guidelines: Corporate Governance principles for Banks"
[3] The revised version of OECD principles of CG was issued at the G20 Finance Ministers and Central Bank

CG mechanism should encourage transparent, efficient, and fair market. This mechanism should be in line with the rule of law and ascertain effective supervision and enforcement.

These OECD principles are attempted to support economic efficiency, sustainable growth and financial stability. To do so, the principles suggest that good CG framework should provide the right incentives to shareholders, BOD, executives, financial intermediaries, and service provides to achieve objectives that are in the interest of company and shareholders. Moreover, good CG should facilitate effective checks and balances for the well function of an economy (Mizushima, 2013; OECD, 2015). In short, table 2 below exhibits the definition of CG from several standard-setting bodies.

Table 2   Definition of CG from Various Standard-setting Bodies

No	Standard-setting bodies	Definition of CG
1	Cadbury Report (1992)	the system by which the company is directed and supervised by several parties, for instance board of directors (BOD), management, auditors, to ascertain that the company is moving towards their aims
2	organization for Economic Co-operation and Development; OECD (2015)	A set of relationship between a company management, board of directors (BOD), shareholders and other stakeholders to promote transparent, fair markets, and the efficient allocation of resources. It should be harmony with the rule of law and support effective supervision and enforcement
3	Basel Committee on Banking Supervision at BIS (2015)	CG involves the division of authority and responsibilities in which the business affairs of a bank are governed and controlled by its board and senior management.

3 Existing Studies on Corporate Governance in Islamic Banks

Despite the proliferation of publications in the Islamic banking and finance in the form of journal articles, book chapters, conference papers, and reports has been increased substantially, there is sparse research of CG practices in Islamic banks. Research on Islamic banks, particularly on CG, are underdeveloped due to several reasons, among of which the limited quality and quantity of reputable publication avenues dedicated to the subject of Islamic banking and finance[1]. In fact, journals in this discipline is lack of visibility

CG is not a new phenomenon in Islam. The fundamentals of organizing the contractual relationship between partners with respect to the division of responsibilities has been continuously practiced in earlier civilizations[2]. Islam stipulates the concept of writing all forms of transactions and the contract should be free from any exploitation. From maqasid al-shariah (objectives of shariah) perspective, CG is the process and structure in managing business and affairs of the company with the goal of maximization of shareholders wealth within the values and principles of maqasid al-shariah (Lahsasna, 2013). Maqasid al-shariah in any muammalat transaction, including in Islamic banks, should be place as an ultimate objective. Ibn-Ashur (2006) highlights the importance of maqasid al-shariah in determining the level of maslahah (benefit) and mafasid (evil) that existed in particular case, including in the case of Islamic banks. Shariah has governed the banking product innovation and services, hence, shariah compliance is the backbone of Islamic banking business and regulations (Abu, Jasin, Abd Razak, and Sharif, 2014). To uphold shariah compliance principles and ascertain the stakeholders of what Islamic bank doing so, shariah governance is necessitated (Ginena, 2014). Concurrently, shariah governance framework is also used to preserved shariah innovation and promoting stability in the market (Nazri, 2012). One of the importance element in such governance is the existence of shariah supervisory board (SSB), which is responsible in supervising Islamic banks to be comply with shariah principles (AAOIFI, 2010).

In the context of standard-setting bodies, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), Islamic Financial Services Board (IFSB, 2006), and Bank Negara Malaysia (BNM) had issued the CG frameworks for Islamic bank. The governance standards for IFI are the tools used to realize the sharia prescriptions and meet the need of the IFI. Table below listed the

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Governors meeting in Ankara Turkey on September 2015. This revised CG principles were subsequently acknowledged at G20 Leaders Summit in Antalya Turkey on 15-16 November 2015. <Source: http://www.oecd.org /corporate/principles- corporate-governance.htm>. Retrieved at 29 February 2016

[1] Definition of reputable and quality journal is referred to journal ranking and impact factors, i.e. Thomson Reuters Journal Citation Reports (JCR) Impact Factor, Institute for Scientific Information (ISI) Web of Science h-index, and SCOPUS indexed which are the renowned indexing system for journals today.

[2] Said Bouheraoua, Shari'ah Fundamentals of Governance. in ISRA – Thomson Reuters Islamic Commercial Law Report 2016, p.14

definition of governance with regard to Islamic standard-setting bodies.

Table 3　Definition of CG from Islamic Standard-setting Bodies

No	Standard-setting bodies	Definition of CG
1	Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI)	Not provided
2	Islamic Financial Services Board (IFSB)	A set of organizational arrangements in which the actions of management of IFIs are controlled in line with the interests of its shareholders, which provide the proper incentives for the BOD, SSB, and management to pursue objectives and facilitate effective monitoring, and comply with sharia rules and principles.
3	Bank Negara Malaysia (BNM)	The process and structure used to manage and control the business and affairs of the institutions in attempt to enhance business prosperity and accountability with the main objective of achieving long-term shareholder values, whilst considering the interests of other stakeholders.

From Islamic point of view, a stakeholder can be defined as the individual or any group whose property rights are at stake or at risk as the consequences of the companies' actions (Iqbal and Mirakhor, 2003). According to these definitions, the company is expected to protect property rights of not only the shareholders but also those who have actively engaged in the process of company seeking profit, and those who adversely affected due to companies' operation. They also argued that any group or individuals who have any express and implied contractual obligations to the companies qualifies as a stakeholder.

Iqbal and Mirakhor (2004) raised several concerns about stakeholder's model and governance in Islamic economic system. They posited that stakeholder model of CG finds strong foundation in the Islamic economic. By drawing from Divine Law of sharia, they discovered that Islamic concept of property rights and Islamic law of contract from both explicit and implicit contracts are the basis for stakeholder theory of CG. This causes them to further propose that all stakeholders ought to be included into decision making activities of the firm's. Whereas the objectives of the firm are to preserve the interests of all stakeholders not only those of just shareholders. A critical review of this paper reveals that the concepts of stakeholder theory and CG are well articulated with convincing arguments and used by two prominent scholars by emphasize on the rules of behaviour or Islamic norms. Hence, according to them, these lead to recognize the role of stakeholders in decision making of a firm. However, far too little attention has been paid to show how to ensure that property rights are protected in Islamic economic system. The discussion of stakeholder theory and CG has not been able to explain a conclusive argument on socio-economic grounds and formal analysis of the economics of stakeholder model in Islamic economic system.

Critically examines, Chapra (2004) commented the work of Iqbal and Mirakhor (2004) on stakeholder model of governance in Islamic economic system. According to him, the paper has valuable contribution to ascertain and justify the stakeholder theory which has been rooted from Islamic principles. Nonetheless, he pointed out the loopholes in that paper especially the lack of evidence to show how to ascertain that property rights are guaranteed in an Islamic economic system. Chapra critically viewed that Islamic norms of behavior do not automatically internalized to protect stakeholders' rights. The existence of moral values or Islamic norms of behavior on stakeholders' rights, albeit its prominent, will not be adequate enough. As a consequence, according to Chapra, it's necessary to have an effective socio-economic mechanism based on incentives and deterrents to protect the stakeholders' rights.

Dusuki (2012) has proposed that the pyramid of maslahah as a viable tool to devise a decision-making framework and managing conflicts arising from diverse stakeholder groups in Islamic financial institutions (IFIs). In addition, the findings are consistent with findings of past studies by Iqbal and Mirakhor (2004), which showed that stakeholder theory in Islamic perspectives provide a strong basis pertaining who can be deemed as a stakeholders and what are the rights and responsibilities. The uniqueness of this study exists in the fact that the application of the pyramid of maslahah in stakeholder management. According to him, the principles of maslahah can be used as a framework for decision-making processes and general guidelines to resolve conflicts arise among various stakeholder groups. For instance, managers of the firms ought to protect the basic needs of their employees by a way of providing sufficient and convenient prayer rooms and guarantying the safety of their employees. This

example reflects the protection of religion and life which is constituted as essential or fundamental responsibilities (daruriyyat) to be fulfilled by IFIs.

Bhatti and Bhatti (2012) carried out comprehensive study of CG in Islamic finance. They discuss the concept, framework, and structure of Islamic CG (ICG) and analyze whether its viable in current corporate structure. According to them, the ICG frameworks are in harmony with OECD principles of governance. However, unlike Anglo-model of governance which is based on the spirit of self-interest, the ICG model is built upon ethics and morals to realize the maqasid al-shari'ah (objectives of shariah). Moreover, the authors also posit that the ICG model tends to support the stakeholder theory. The critical review of this paper reveals that although they have been extensively discussing the concept and framework of ICG, there has been limited efforts to show how this model can be used properly in Islamic financial system.

Needless to say, there is also a trade-off existed in the context of shariah governance framework. According to Akhtar (2006), CG from shariah perspective stemming from two core dimensions: (1) faith-based that govern of the business in harmony with shariah principles, and (2) profit motive that recognize business activities and wealth maximization. However, the agency structures in Islamic banks perhaps may raise a conflict between the need to comply with shariah principles and maximization of shareholders' wealth (Safieddine, 2009). Agency theory explains the separation of management and ownership of the company, which raise an agency cost (Jensen and Meckling, 1976).

Hassan, Joseph, and Bashir (2003) reported that the major shareholders for Islamic banks are government, government agencies, giant financial institutions, and big individual investors. They raised several concerns on big individual investors form the board of directors (BOD). Accordingly, they indicated that equity holders can be regarded as insiders to the bank, whilst investment depositors (mudarabah and musharakah account holders) are considered as outsiders to the bank. Therefore, the existence of these two groups raise the conflict between insiders (BOD) and outsiders (investment depositors) due to the occurrence of asymmetric information (Hassan et al, 2003).

In addition to Hassan et al (2003), Safieddine (2009) argued that Islamic banks are facing the trade-off between shariah compliance and mechanism protecting investors right. The managers of Islamic banks are required to balance the interests between maximize shareholders value of their investment, and comply with shariah compliance principles (Akhtar, 2006). Subsequently, based on the contract stipulated between the banks and investment depositors, the managers are able to share in profits but not in losses and prohibit depositors to interfere the management. As a consequence, the depositors are separated from their control right in the management of their funds (Safieddine, 2009).

4 Dimensions of Corporate Governance in Islamic Banks

Despite the proliferation of research on CG in Islamic banks, the majority have strongly emphasizes in investigating CG practices in particular applications and settings (Al-Beshtawi, Zraqat, & Al –Hiyasat, 2014; Al-Malkawi et al., 2014; Archer, Karim, & Al-Deehani, 1998; Bhatti & Bhatti, 2009; Bukhari, Awan, & Ahmed, 2013; Mizushima, 2013; Wilson, 2009). These studies oftentimes have different interpretations on the CG concept from Islamic point of view. As a matter of fact, there is little agreement in the use of CG principles or dimensions from Islamic perspective. Accordingly, albeit the literature is reasonably broad however lacks of consistency and strong underpinning principles. Therefore, the aims of this paper is to present the synthesis of literature on CG from Islamic perspective and identifying the broad dimensions that have been employed in the study of CG from Islamic banking and finance.

In doing so, the keyword "corporate governance", "Islamic banks", and "Islamic perspective" were entered into the major research database such as Science Direct, Emerald Insight, Scopus Elsevier, Wiley-Blackwell, Springer, and Taylor & Francis. This first process provides considerable articles in the form of journal articles, conference papers, reports, and thesis. A further step was undertaken to remove articles from database that use the keywords of corporate governance, Islamic banks, and Islamic perspective yet did not precisely address the issues of corporate governance per se. In sum, 57 articles were included in this study. The review employed articles published between 1990 and 2016. The starting point in 1990 was selected since the seminal paper such as Cadbury Report was released.

To form a deeper understanding of CG from Islamic perspective, the characteristics/dimensions of each article were reviewed through manual read by author and calculated the frequency using NVivo 11 software. Hence, if a dimension of CG was considered by ten authors, accordingly, this dimension will then have a frequency of ten. These bulk list of dimensions were listed in a descending order.   Figure 1

below exhibits the frequency with which dimensions of corporate governance in Islamic banking and finance have been identified in the analysis.

In most cases, the concept of CG from Islamic perspective is defined by these dimensions. For instance, the report released by ISRA & Thomson Reuters (2016) identified corporate governance concepts related to Islamic banks, namely:

1) Sharia scholars qualifications
2) Synergies between scholars and practitioners
3) Standardization
4) Accountability
5) Responsibility
6) Transparency
7) Trustworthiness (Amanah)
8) Independence
9) Competency
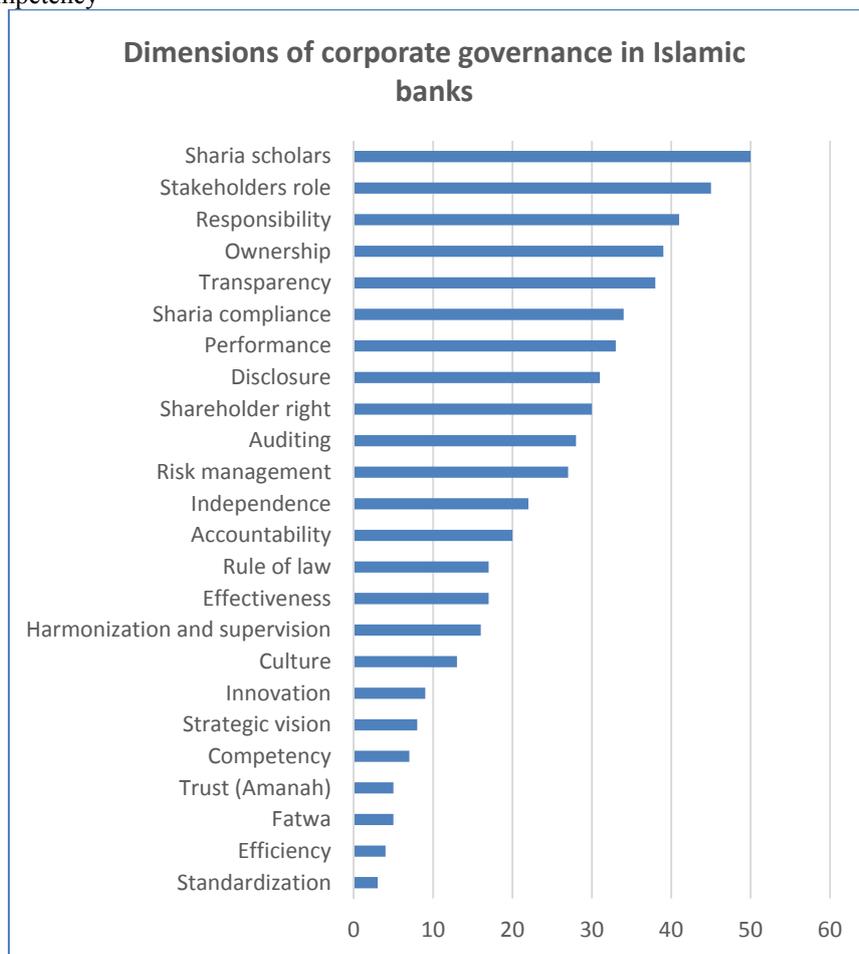
Figure 1   Identified Dimensions of Corporate Governance in Islamic Banking and Finance

It was not surprising to find that different researchers have different characteristics of corporate governance because of their differences in the definition of governance per se. Say for example, Choudhury and Haque (2006) have identified the characteristics of governance in Islamic corporations are *shuratic* process, sharia rules, effectiveness, accountability social responsibility. Whereas Abu-Tapanjeh (2009) states that Islamic principles of corporate governance are identified from shareholders right, equitable, stakeholders' role, disclosure, transparency, and responsibility. Conversely, Zain, Zulkarnain, and Hassan (2015) included accountability, sharia compliance, performance, and consultation as a proxy for sharia governance in their study.

In sum, there are 24 identified dimensions of corporate governance from the analysis. Most of these dimensions also recognized in corporate governance from conventional literature. Moreover, the most

frequently dimensions of governance from Islamic perspective can be named as follows: (1) sharia scholars, (2) stakeholders role, (3) responsibility, (4) ownership, (5) transparency, and (6) sharia compliance. Each of these frequent dimensions was mentioned in more than 30 articles respectively. In addition, two-third of all dimensions investigated in the corporate governance literature pertinent to the context of Islamic banking and finance being examined by author. Table 4 below shows the citation references for each identified dimensions of corporate governance in Islamic banking and finance

Table 4   Identified Dimensions of Corporate Governance in Islamic Banking and Finance.

Dimension	Citation References
Sharia scholars	Abdel-Baki & Leone Sciabolazza, 2014; Abdullah, Percy, & Stewart, 2015; Abu, Jasin, Abdul Razak, & Sharif, 2014; Abu-Tapanjeh, 2009; Ahmad & Omar, 2016; Ahmed, 2014; Akhtar, 2006; Al-Beshtawi et al., 2014; Al-Malkawi et al., 2014; Alnasser & Muhammed, 2012; Al-Sadah, 2007; Archer et al., 1998; Bakar, 2011; Bhatti & Bhatti, 2009; Bukair & Abdul Rahman, 2015; Bukhari et al., 2013; M. Umer Chapra & Ahmed, 2002; Choudhury & Hoque, 2006; Dalwai et al., 2015; Darmadi, 2013; Ghayad, 2008; Ginena, 2014; Grassa, 2013, 2016; Hamza, 2013; Haniffa & Hudaib, 2013; Hasan, 2009, 2012; Hashim, Mahadi, & Amran, 2015; N. A. Ismail & Razak, 2014; ISRA & Thomson Reuters, 2016; Lewis, 2005; Mizushima, 2013; Mollah & Zaman, 2015; Muneeza, 2014; Nathan & Ribière, 2007; Rosly, 2010; Safieddine, 2009; Shafii, Ali, & Kasim, 2014; Shahzad Bukhari, Awan, & Ahmed, 2013; Shaw, 2015; Srairi, 2015; Ullah, 2014; Wijethunga & Ekanayake, 2015; Wilson, 2009; Zain, Zulkarnain, & Hassan (2015)
Stakeholders role	Abdel-Baki & Leone Sciabolazza, 2014; Abdullah et al., 2015; Abu et al., 2014; Abu-Tapanjeh, 2009; Ahmad & Omar, 2016; Ahmed, 2014; Akhtar, 2006; Al-Beshtawi et al., 2014; Al-Malkawi et al., 2014; Alnasser & Muhammed, 2012; Al-Sadah, 2007; Archer et al., 1998; Bakar, 2011; Bhatti & Bhatti, 2009; Bukair & Abdul Rahman, 2015; Bukhari et al., 2013; M. Umer Chapra & Ahmed, 2002; Muhammad Umer Chapra, 2004; Dalwai et al., 2015; Darmadi, 2013; Dusuki, 2012; Ghayad, 2008; Ginena, 2014; Grassa, 2013, 2016; Hamza, 2013; Haniffa & Hudaib, 2013; Hasan, 2009, 2012; Hashim et al., 2015; Iqbal & Mirakhor, 2004; N. A. Ismail & Razak, 2014; ISRA & Thomson Reuters, 2016; Kasim, Ibrahim, & Sulaiman, 2009; Mizushima, 2013; Nathan & Ribière, 2007; Shafii et al., 2014; Shahzad Bukhari et al., 2013; Shaw, 2015; Srairi, 2015; Ullah, 2014; Zain et al (2015)
Responsibility	Abdel-Baki & Leone Sciabolazza, 2014; Abdullah et al., 2015; Abu et al., 2014; Abu-Tapanjeh, 2009; Ahmed, 2014; Akhtar, 2006; Al-Beshtawi et al., 2014; Al-Malkawi et al., 2014; Alnasser & Muhammed, 2012; Al-Sadah, 2007; Archer et al., 1998; Bakar, 2011; Bhatti & Bhatti, 2009; Bouzenita, 2012; Bukair & Abdul Rahman, 2015; M. Umer Chapra & Ahmed, 2002; Choudhury & Hoque, 2006; Darmadi, 2013; Dusuki, 2012; Ghayad, 2008; Ginena, 2014; Grassa, 2013; Hamza, 2013; Haniffa & Hudaib, 2013; Hasan, 2009, 2012; ISRA & Thomson Reuters, 2016; Kasim et al., 2009; Lewis, 2005; Mizushima, 2013; Muneeza, 2014; Nathan & Ribière, 2007; Rosly, 2010; Safieddine, 2009; Shafii et al., 2014; Srairi, 2015; Wijethunga & Ekanayake, 2015; Wilson, 2009; Zain et al., (2015)
Ownership	Abdallah, Hassan, & McClelland, 2015; Abdel-Baki & Leone Sciabolazza, 2014; Abdullah et al., 2015; Abu-Tapanjeh, 2009; Ahmad & Omar, 2016; Ahmed, 2014; Akhtar, 2006; Al-Beshtawi et al., 2014; Al-Malkawi et al., 2014; Alnasser & Muhammed, 2012; Al-Sadah, 2007; Archer et al., 1998; Bakar, 2011; Ben Slama Zouari & Boulila Taktak, 2014; Bukair & Abdul Rahman, 2015; Bukhari et al., 2013; M. Umer Chapra & Ahmed, 2002; Dalwai et al., 2015; Dusuki, 2012; Ghayad, 2008; Grassa, 2013, 2016; Hamza, 2013; Hasan, 2012; Hashim et al., 2015; Kasim et al., 2009; Lewis, 2005; Mizushima, 2013; Mollah & Zaman, 2015; Nathan & Ribière, 2007; Shahzad Bukhari et al., 2013; Shaw, 2015; Srairi, 2015; Ullah, 2014; Wijethunga & Ekanayake, 2015; Zain et al (2015)
Transparency	Abdallah et al., 2015; Abdel-Baki & Leone Sciabolazza, 2014; Abdullah et al., 2015; Abu et al., 2014; Abu-Tapanjeh, 2009; Ahmad & Omar, 2016; Akhtar, 2006; Al-Beshtawi et al., 2014; Al-Malkawi et al., 2014; Al-Sadah, 2007; Archer et al., 1998; Archer & Rifaat, 2013; Bakar, 2011; Ben Slama Zouari & Boulila Taktak, 2014; Bhatti & Bhatti, 2009; Bukair & Abdul Rahman, 2015; M. Umer Chapra & Ahmed, 2002; Muhammad Umer Chapra, 2004; Choudhury & Hoque, 2006; Dalwai et al., 2015; Darmadi, 2013; Dusuki, 2012; Ghayad, 2008; Hashim et al., 2015; N. A. Ismail & Razak, 2014; Mizushima, 2013; Nathan & Ribière, 2007; Safieddine, 2009; Shahzad Bukhari et al., 2013; Shaw, 2015; Srairi (2015)
Sharia compliance	Abdel-Baki & Leone Sciabolazza (2014); Abdullah et al., 2015; Abu et al., 2014; Abu-Tapanjeh, 2009; Ahmed, 2014; Akhtar, 2006; Al-Beshtawi et al., 2014; Al-Malkawi et al., 2014; Alnasser & Muhammed, 2012; Al-Sadah, 2007; Bakar, 2011; Bukhari et al.,

	2013; M. Umer Chapra & Ahmed, 2002; Dalwai et al., 2015; Darmadi, 2013; Ginena, 2014; Grassa, 2013; Hamza, 2013; Hashim et al., 2015; N. A. Ismail & Razak, 2014; ISRA & Thomson Reuters, 2016; Kasim et al., 2009; Lewis, 2005; Mizushima, 2013; Nathan & Ribière, 2007; Safieddine, 2009; Shafii et al., 2014; Shahzad Bukhari et al., 2013; Shaw, 2015; Srairi, 2015; Ullah, 2014; Wijethunga & Ekanayake, 2015; Wilson, 2009; Zain et al (2015)
Performance	Abdallah et al., 2015; Abdel-Baki & Leone Sciabolazza, 2014; Abdullah et al., 2015; Abu-Tapanjeh, 2009; Ahmad & Omar, 2016; Al-Malkawi et al., 2014; Alnasser & Muhammed, 2012; Al-Sadah, 2007; Archer et al., 1998; Bakar, 2011; Ben Slama Zouari & Boulila Taktak, 2014; Bukair & Abdul Rahman, 2015; Bukair & Rahman, 2015; Bukhari et al., 2013; M. Umer Chapra & Ahmed, 2002; Choudhury & Hoque, 2006; Dalwai et al., 2015; Darmadi, 2013; Dusuki, 2012; Ghayad, 2008; Grassa & Matoussi, 2013; Grassa, 2016; Hasan, 2012; Iqbal & Mirakhor, 2004; ISRA & Thomson Reuters, 2016; Lewis, 2005; Mollah & Zaman, 2015; Rosly, 2010; Safieddine, 2009; Srairi, 2015; Ullah, (2014)
Disclosure	Abdallah et al (2015); Abdel-Baki & Leone Sciabolazza (2014); Abdullah et al (2015); Abu et al (2014); Abu-Tapanjeh (2009); Ahmad & Omar (2016); Akhtar (2006); Al-Beshtawi et al (2014); Al-Malkawi et al (2014); Alnasser & Muhammed (2012); Al-Sadah (2007); Archer et al (1998); Archer & Rifaat (2013); Bakar (2011); Bhatti & Bhatti (2009); Bukair & Abdul Rahman (2015); Bukhari et al (2013); M. Umer Chapra & Ahmed (2002); Dalwai et al (2015); Ginena (2014); Haniffa & Hudaib (2013); Hashim et al (2015); ISRA & Thomson Reuters (2016); Mizushima (2013); Mollah & Zaman (2015); Safieddine (2009); Shahzad Bukhari et al (2013); Srairi (2015)
Shareholder right	Abu-Tapanjeh (2009); Ahmad & Omar (2016); Ahmed (2014); Akhtar (2006); Al-Malkawi et al (2014); Alnasser & Muhammed (2012); Al-Sadah (2007); Archer et al (1998); Archer & Rifaat (2013); Bakar (2011); Ben Slama Zouari & Boulila Taktak (2014); Bhatti & Bhatti, (2009); Bukhari et al (2013); Muhammad Umer Chapra (2004); Darmadi (2013); Dusuki (2012); Ghayad (2008); Grassa (2013, 2016); Hasan (2009, 2012); Hashim et al (2015); Iqbal & Mirakhor (2004); ISRA & Thomson Reuters (2016); Lewis (2005); Mollah & Zaman (2015); Nathan & Ribière (2007); Rosly, (2010); Wijethunga & Ekanayake (2015)
Auditing	Abdullah et al (2015); Abu-Tapanjeh (2009); Ahmad & Omar (2016); Al-Beshtawi et al (2014); Al-Malkawi et al (2014); Al-Sadah (2007); Archer et al (1998); Archer & Rifaat (2013); Bakar (2011); Bukair & Abdul Rahman (2015); M. Umer Chapra & Ahmed (2002); Ginena (2014); Haniffa & Hudaib (2013); N. A. Ismail & Razak (2014); ISRA & Thomson Reuters (2016); Kasim et al (2009); Lewis (2005); Mizushima (2013); Muneeza (2014); Nathan & Ribière (2007); Rosly (2010); Safieddine (2009); Shafii et al (2014); Srairi (2015); Ullah (2014); Wijethunga & Ekanayake (2015)
Risk management	Abdallah, Hassan, & McClelland (2015); Abdel-Baki & Leone Sciabolazza (2014); Abdullah, Percy, & Stewart (2015); Ahmed (2014); Akhtar (2006); Al-Malkawi, Pillai, & Bhatti (2014); Al-Sadah (2007); Archer, Karim, & Al-Deehani (1998); Archer & Rifaat (2013); Bukair & Rahman (2015); Chapra & Habib (2002); Dalwai, Basiruddin, & Abdul Rasid (2015); Darmadi (2013); Ginena (2014); Grassa (2013); Hamza (2013); Ismail & Razak (2014); ISRA & Thomson Reuters (2016); Mizushima (2013); Rosly (2010); Safieddine (2009); Srairi (2015); Wijethunga & Ekanayake, (2015)
Independence	Al-Beshtawi, Zraqat, & Al –Hiyasat (2014); Alnasser & Muhammed (2012); Al-Sadah (2007); Bakar (2011); Chapra & Habib (2002); Dalwai et al. (2015); Darmadi (2013); Grassa (2013); Hamza (2013); Hashim, Mahadi, & Amran (2015); ISRA & Thomson Reuters (2016); Kasim, Ibrahim, & Sulaiman (2009); Mizushima (2013); Mollah & Zaman (2015); Nathan & Ribière (2007); Safieddine (2009); Srairi (2015); Wilson (2009)
Accountability	Abu-Tapanjeh (2009); Ahmad & Omar (2016); Alnasser & Muhammed (2012); Al-Sadah (2007); Bakar (2011); Bhatti & Bhatti (2009); Bukair & Abdul Rahman (2015); Chapra & Habib (2002); Darmadi (2013); Dusuki (2012); Haniffa & Hudaib (2013); Hasan (2009); Iqbal & Mirakhor (2004); ISRA & Thomson Reuters (2016); Kasim, Ibrahim, & Sulaiman (2009); Lewis (2005); Mizushima (2013); Mollah & Zaman, (2015)
Effectiveness	Alam Choudhury & Ziaul Hoque (2006); Al-Beshtawi, Zraqat, & Al –Hiyasat (2014); Al-Malkawi, Pillai, & Bhatti (2014); Alnasser & Muhammed (2012); Al-Sadah (2007); Bukair & Abdul Rahman (2015); Bukhari, Awan, & Ahmed (2013); Chapra & Habib

	(2002); Hamza (2013); Mizushima (2013); Mollah & Zaman (2015); Noor Azian Ismail & Shaikh Hamzah Abdul Razak (2014); Safieddine (2009); Shahzad Bukhari, Awan, & Ahmed (2013); Wilson (2009)
Rule of law	Abdullah, Percy, & Stewart (2015); Abu-Tapanjeh (2009); Ahmad & Omar (2016); Ahmed (2014); Alnasser & Muhammed (2012); Bakar (2011); Bhatti & Bhatti (2009); Darmadi (2013); Ghayad (2008); Grassa (2013); ISRA & Thomson Reuters (2016); Lewis (2005); Muneeza (2014); Rosly (2010); Wijethunga & Ekanayake (2015); Wilson (2009)
Harmonization	Abdullah et al (2015); Akhtar (2006); Alnasser & Muhammed (2012); Al-Sadah (2007); Archer, Karim, & Al-Deehani (1998); Bukair & Abdul Rahman (2015); Chapra & Habib (2002); Ghayad (2008); Ginena (2014); Grassa (2013); Hamza (2013); ISRA & Thomson Reuters (2016); Lewis (2005); Mollah & Zaman (2015); Safieddine (2009); Ullah (2014)
Culture	Abdallah, Hassan, & McClelland (2015); Ahmed (2014); Bakar (2011); Bukair & Abdul Rahman (2015); Bukhari, Awan, & Ahmed (2013); Chapra & Habib (2002); Darmadi (2013); Grassa & Matoussi (2013); Haniffa & Hudaib (2013); Hashim, Mahadi, & Amran (2015); Mizushima (2013); Nathan & Ribière (2007); Shahzad Bukhari, Awan, & Ahmed (2013)
Innovation	Abu, Jasin, Abdul Razak, & Sharif (2014); Abu-Tapanjeh (2009); Ahmed (2014); Akhtar (2006); Ghayad (2008); Hasan (2012); ISRA & Thomson Reuters (2016); Nathan & Ribière (2007); Rosly (2010)
Strategic vision	Abu-Tapanjeh (2009); Bakar (2011); Grassa (2013); Hasan (2009); Hashim, Mahadi, & Amran (2015); Mizushima (2013); Nathan & Ribière (2007)
Competency	Alnasser & Muhammed (2012); Bakar (2011); ISRA & Thomson Reuters (2016); Mizushima (2013); Mollah & Zaman (2015); Shafii, Ali, & Kasim (2014); Wilson, (2009)
Fatwa	Alnasser & Muhammed (2012); Ginena (2014); Grassa (2013); Hamza, (2013); ISRA & Thomson Reuters (2016)
Trust (Amanah)	Abu-Tapanjeh (2009); Archer & Rifaat (2013); Hasan, (2012); Iqbal & Mirakhor (2004); Nathan & Ribière (2007)
Efficiency	Ahmed (2014); Al-Beshtawi, Zraqat, & Al –Hiyasat (2014); Bakar (2011); Chapra & Habib (2002)
Standardization	Akhtar (2006); Hamza (2013); ISRA & Thomson Reuters (2016)

5 Conclusions and the Way Forward

This paper has provided the critical analysis and synthesis of the plethora governance literature in Islamic banks. A review of bulk 57 published articles from the Islamic banking literature identified 24 dimension of CG that has been employed in this study. Out of these dimension, the six most frequently used as corporate governance dimensions in Islamic banks are: sharia scholars, stakeholders' role, responsibility, ownership, transparency, and sharia compliance. More importantly, the evidence of this review confirm that despite the proliferation of literature in CG there is ambiguous in defining the CG and its dimensions from Islamic perspective.

The aims of the paper were to investigate and provide the various dimension of CG in Islamic banking and finance literature. Importantly, the contribution of this study is obvious as this has not previously been undertaken in the field of Islamic banking and finance. The evidence of this paper enables us to understand why the CG concept in Islamic banks is so disparate. Accordingly, this paper provides a basis to other researchers for replicating and testing these identified dimensions in further research.   Due to the scope and limitations of this paper, future research can address the issues more detail by the way of exploring the theoretical constructs of CG concept in Islamic banks, and investigate the dimensions that constitute CG for Islamic banks.

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Linking Business Strategy with Organizational Innovation

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Abstract: Recently, the emerging competitions in the business environment compel organizations for developing dynamic business strategies to be innovative for competitive advantage. Few organizations are using defender, prospector, analyzer and reactor business strategy for the competitive advantages. However, limited empirical evidences are available to show the linkage of these business strategies with organizational innovation, either open or closed innovation. This paper examines the influence of the business strategies on organizational innovation. For this purpose, we used a quantitative research design and collected data from 250 employees of SEMs in Malaysia through a self-administrated questionnaire. The results indicated that the defender and prospector business strategies are not linked with open innovation while reactor business strategy is not linked with closed innovation. While analyzer and reactor business strategies are positively influencing the open innovation in the organization and the defender, prospector and analyzer strategies are positively influencing towards close innovation.
Key words: Organizational strategy; Innovation; SMEs; Malaysia

1 Introduction

Strategy is an ongoing process which determines where organisation will lead, not just a briefing or an idea. There have been several engaged platforms, including opportunities and possibilities, which are discussed as strategy. In literature, Miles and Snow's *strategy types* impacted and opened many debates in management literature. Scholars and consultants and leaders had been directly influenced by these ideas. Four different strategic types have been defined in 'The Miles and Snow typology': Defenders, Prospectors, Analyzers and Reactors. The Defender, Prospector and Analyser strategy types are reflected to display different, yet steady conduct, the way to evaluate circumstances, scope of domains, innovativeness and solving problems. While, Reactors strategy find it difficult to find solutions of problems. Reactor strategy type is usually deliberated unfeasible and not encouraged. There have been numerous studies on strategy and its relationship with innovation. (Williamson, 2003; Kim and Mauborgne, 2005). Interestingly and realistically, innovation is generally considered the backbone and life blood of organizational survival and growth. Product, process, and executive innovations are flagships in corporate efforts to improve efficiency and compete in the world. Innovation has generally been characterized as open and close innovation. There have been many researchers in the association and linkage between strategies and innovation. Tasmin and Woods (2007) proposed substantial linkages between knowledge management strategy and firm's innovation capability among large manufacturers in Malaysia. However, there is a clear shortage of empirical evidences about the relationship. The present literature presents the relationship between four strategy types and open plus close innovation types statistically and analytically. Our approach is to provide an analytical frame of different forms of strategies and its linage with open and close innovations and the associated advantages and disadvantages for each type. This paper is focused in determining the relationship of four strategies with innovation types. It is important as to strategic innovation has always been a hall mark for the management literature and grasped interest of the researchers and organizations.

2 Literature Review

Strategy is top management level planning and implementation to achieve desired goals for the organisation under particular existing constraints and risks. These include opportunities and possibilities which have been widely discussed as strategy. Based on literature, strategy is just not ideas but the implementation of thinking process. According to Pugh and Bourgeois (2011), strategy is just not the result but a process. In last four decades, many frameworks of strategy have been developed since Five Forces (Porter, 1979; Oster, 1999), the Profit Zone (Slywotzky and Morrison, 2002), Blue Ocean Strategy (Kim and Mauborgne, 2005), the Resource-Based View (Collis and Montgomery, 2008), strategy as Options (Williamson, 1999, Beinhocker 1999), Effectual Reasoning (Sarasvathy, 2008), and the BCG or McKinsey matrices (Bourgeois, 1997).

Strategy, learning and discovery have improved the current positioning. It is only after much homework and intellectual sweat that the inventions and potential blue oceans sparked by strategic intuition come to the fore. This leads to strategic invention and innovation (Pugh and Bourgeois, 2011). Scholars and consultants have relied heavily on Miles and Snow's insights in developing practical tools and prescriptions for managers. And some managers have read and been directly influenced by their book (Hambrick, 2003). Since its development in 1978, the Miles and Snow typology of corporate-level strategies has formed the basis of many studies. Indeed, articles published in leading management and strategy journals confirm the continuing relevance of the typology. A primary reason for the popularity of the Miles and Snow typology is that it offers a simple and miserly characterization of the strategic stance of organizations (Hambrick and Crozier, 1985).

2.1 Organizational strategy types

Whilst numerous empirical studies have been conducted to validate the existence and characteristics of the Miles and Snow strategy types in different domains, in this study researchers will focus on strategies' relationship with innovation.   The Miles and Snow typology defines four distinct strategic types: Defenders, Prospectors, Analysers and Reactors. The Defender, Prospector and Analyser strategy types are considered to exhibit distinct, yet consistent and repetitive behavior in terms of the way they analyse their environment (Parnell and Hershey, 2005), their breadth of product/market domains (Snow and Hrebiniak, 1980), their innovativeness (Parnell and Hershey, 2005) and their use of technology for solving problems (Miles et al., 1978). By contrast, Reactors lack a consistent strategic approach to solving problems. As a result, the Reactor strategy type is generally considered unviable (Conant et al., 1990) and is frequently omitted from studies (Shortell and Zajac, 1990). Because Reactors may vary their behaviour at different times to exhibit the characteristics of a Defender, Analyser or Prospector type, they are also difficult to characterize at a single point in time using objective approaches. During the period of time since its publication, the Miles and Snow typology has been debated and supported by many researchers (e.g. Hawes and Crittenden, 1984; McDaniel and Kolari, 1987; Snow and Hrebiniak, 1980; Zahra and Pearce, 1990). These studies and debates have contributed significantly to the body of knowledge on these strategic types. Studies have found support for either some or all of the strategy types across a number of domains (Atkins, 1994; Hambrick, 1983; Parnell and Wright, 1993; Smith et al., 1986, 1989; Snow and Hrebiniak, 1980; Subramanian et al., 1993; Tan, 1997; Weisenfeld-Schenk, 1994; Zajac and Shortell, 1989). Tasmin et al. (2016) reported that furniture manufacturers in Southern Peninsular Malaysia were practicing the strategy of mostly the analyser and prospector approaches.

Defenders: Narrow product market defines defenders' organizations, where the CEO has the expertise in his short domain. Opportunities are not looked for outside the organizational domain. Here the focus mainly remains on quality for operational efficiency (Miles & Snow, 1978).

Prospectors: These organizations always look for new domains and markets. Their thirst for new opportunities though increase their breadth, and competitors have to remain on toes, but it effects the organizational efficiency though always having potential for business (Miles & Snow, 1978).

Analysers: These organizations work in both stable and changing environments, in stable circumstances, the organization is formal and focused on processes and routine tasks, having operational efficiency for market edge. But in the changing environment, the top management looks for new markets like prospectors to have an eye on environment for opportunities and adopting by competitors (Miles & Snow, 1978).

Reactors: These organizations react only when they must react to take corrective actions in their organizations. These organizations do not adjust according to demands of time but only react when they are forced (Miles & Snow, 1978).

2.2 Organizational innovation

Innovation is widely considered the life line of organizational survival and growth. Innovations are now a centerpiece in the ongoing corporate efforts to improve productivity and compete globally (Zahra, 1993). To create value from innovation, executives must make two interrelated decisions (Kotabe, 1990). The first is to select the types of innovations that are compatible with their firms' goals. The second is to decide whether their companies should rely exclusively on internal or external sources for their innovation or to imitate their rivals (von Hippel, 1988).

Recognizing, investigating and developing openings are among shared attributes of organizations which effectively evolve business processes for timely creation of value.   There have been many examples of strategizing and innovation, as mentioned in literature, be it high quality modern agriculture products internationalization and production, or acquisitions and merging in technological firms. The

same applies to even bakery industry as described in literature, the company Polarbröd, a bread producer from Northern Sweden, has managed to think outside the box to identify new business opportunities and increased its sales and profitability, becoming the third largest producer of bread in Sweden, in an otherwise shrinking industry. Polarbröd identified opportunities, made mistakes but still got internationalization through innovation and experience Dahlander and Gann (2010). As evident from above examples, organizations use their resources in a balanced way for strategic growth, which usually comprises business model revision or development.

These strategies enable the design of business model. As recent literature on business models had pointed out that business models need to change over time, it was still unclear which strategies and activities would be necessary to achieve such change. According to Dahlander and Gann (2010), if a strategy is good in one context may be otherwise in other contexts. Companies which manage to successfully adapt and renew their business models over time typically display all of these strategizing actions and capabilities in pronounced form. These are not only interlinked, they are complementarities, meaning that their combined use facilitates even more sustained value creation. From a theoretical point of view, each type of innovation has significantly different characteristics:

2.3 Open innovation

A number of papers draw on the openness construct to depict and explain different aspects of the innovation process. Open innovation has been one of the most debated topics in management research in the last decade (Chesbrough, 2003; Christensen *et al.*, 2005; Gassmann, 2006; Vanhaverbeke, 2006; West and Gallagher, 2006). The open innovation model corresponds to companies that are really able to manage a wide set of technological relationships, that impact the whole innovation funnel and involves a wide set of different partners. The extant literature presents the concept of openness in quite different ways; Laursen and Salter (2006a) equate openness with the number of external sources of innovation, whereas Henkel (2006) focuses on openness as revealing ideas previously hidden inside organizations. Our approach is to provide an analytical frame of different forms of openness and the associated advantages and disadvantages for each type.

It is an emerging innovation management paradigm comprised of two dimensions:

1)Inbound Open Innovation, which is the practice of establishing relationships with external organizations or individuals with the purpose of accessing their technical and scientific competences for improving internal innovation performance and

2)Outbound Open Innovation, which is the practice of establishing relationships with external organizations with the purpose of commercially exploiting technological knowledge. (Davide C, Vittorio C and Fedricco F, 2010)

Open innovation is described by a high tension towards technological leadership and internationalization of activities, even R&D; technology and represent critical success factors and require excellent and diversified competencies; R&D and innovation activities have a very high level of risk, both technical and commercial and the level of R&D spending is quite high (as a percentage of sales). This allows to manage and control innovation networks as a whole, from the definition of objectives and risks, through partners' analysis and selection, to the definition of each organization's specific role and contractual form of collaboration, the detailed planning of activities and the measurement of actual results. Obviously, designing and implementing such a complex organizational process requires advanced managerial competencies (Dodgson *et al.*, 2005).

2.4 Close innovation

The closed innovators' model corresponds to external sources of knowledge only for a specific, single phase of the innovation funnel and typically in dyadic collaborations, to invest in their internal R&D effort and believe that keeping the innovation process closed allows them to avoid significant costs and risks. In other words, they perceive the openness and the relationships to be too difficult and costly compared to the potential benefits (Laursen and Salter, 2006). The idea is that all the resources (people, money, competencies) and managerial ability should be focused internally to develop innovation.

Therefore, these firms develop most technologies in-house. Technological leadership is expected to be mainly the result of an internal effort instead of being the result of an innovation network. The R&D risk is not too high and there is little need to share it with other parties. It can be managed by the company itself, by using sophisticated managerial tools and techniques. Subsequently, technical alliances are occasional involving a few allies having long-term relationships and restricted threat of rift.

2.5 Hypotheses development

Integration of the business strategy with organizational innovation strategy is central to the

competitive advantage. Organizations are consistently looking for new mechanisms of the integration of the both. There have been many researchers focusing on the relationship of strategy and innovation, as few have been mentioned in below Table 1. Zahira and Covin (1994) mentioned the financial implication of the integration of the organizational strategy with its innovation practice. Williamson (2003) focused on the strategic intent and the organizational innovation. Kim and Mauborgne (2005) related blue ocean strategy with organizational innovation. More recently, Evans *et al.* (2009) linked strategic thinking with organizational innovation. Nuntamanop *et al.* (2013) presented a new model for linking the business strategy and organizational innovation. However, none of these studies focused on the relationship of different types of the business strategy with both open and close innovation (Zahira and Covin, 1994; Gimenez, 2010; Joseph, 2001; Sundbo, 1996). Geminiez (2000) have also discussed in details the limitations and roles of each strategy type in different scenarios, especially focusing SME's. To create value from innovation, executives must make two interrelated decisions (Kotabe, 1990). The first is to select the types of innovations that are compatible with their firms' goals. The second is to decide whether their companies should rely exclusively on internal or external sources for their innovation or to imitate their rivals (von Hippel, 1988).

Table 1   Studies on Business Strategy and Organizational Innovation

Authors	Framework	Constructs
Zahira and Covin (1994)	The financial implications of fit between competitive strategy and innovation types and sources	Strategy and innovation
Fernando A.P. Gimenez (2000)	Coherent strategy for innovation	Miles and Snow Model with innovation in SME's
Williamson (2003)	Strategy innovation	Strategic intent, innovation
Kim and Mauborgne (2005)	Blue ocean strategy	BOS and innovation
Beown (2005)	The evolving role of strategic management development	Strategic formulation, innovation
Evans *et al.* (2009)	Strategic thinking about disruptive technology	Strategic thinking and innovation
Nuntamanop *et al.* (2013)	A new model of strategic thinking competency	Strategy and innovation

This paper focuses more on relationship between strategy types and appropriate innovation types. Following hypotheses have been developed, after through study of literature from Snow & Miles' four strategy types of Defender, Prospector, Analyser and Prospector, and innovation types.

H1: Defender business strategy has a positive influence on the open innovation
H2: Prospector business strategy has a positive influence on the open innovation.
H3: Analyzer business strategy has a positive influence on the open innovation.
H4: Reactor business strategy has a positive influence on the open innovation.
H5: Defender business strategy has a positive influence on the close innovation.
H6: Prospector business strategy has a positive influence on the close innovation.
H7: Analyzer business strategy has a positive influence on the close innovation.
H8: Reactor business strategy has a positive influence on the close innovation.

This results in how a firm will focus those innovations which are dependable with its strategy. This study is based on the basic concept of strategic management. Strategic management is a set of decisions and actions that result in the formulation and implementation of plans designed to achieve an organization's objectives (Pearce and Robinson, 2000), and relates to innovation.

We hope that this paper will inspire researchers to build on the concept and theorize in a way that helps explain which conventional strategy is more relevant to which innovation type

3 Methodology
3.1 Sample
The data for this research paper was collected from the Small and Medium Enterprises two hundred and fifty employees in Malaysia. Organization was the unit of analysis in this research. Demographic analysis is highlighted in the following sections using frequency tests of the respondents. 55.6% of the respondents belong to the 30 to 40 years age group. Respondents of the age category of 26-30 years are followed as 35.2%, remaining 19% are from other groups. Gender wise investigation represent that 58.3% were male respondents, representing male dominant SME in Malaysia. Master's level education (22.5%)

and high secondary certificate were 18.8% while most of the respondents were graduates (47.8%).

3.2 Measures

Market orientation scale of Narver and Slater's (1990) was adopted as measurement scale; market orientation as single construct based on five items was used in this study. 5 point Likert scale was used to measure all items, ranging from '*strongly disagree' to 'strongly* agree'. Sisodiya (2008) scale was used to measure inbound open innovation. Five items were used to measure the construct based on 5 point Likert scale ranging from strongly disagree to strongly agree. The scale of Lichtenthaler (2009), of five items was used to measure the outbound innovation.

This study adopts 26 items of Segev's (1978) instrument to measure firm's strategy. According to the description of four types of Miles and Snow's strategy, nine items were developed to evaluate defender type of strategy, 6 items for prospector, five and four items were used to measure analyzer and reactor strategy respectively.

4 Data Analysis and Results

4.1 Measurement model

As a required step in testing the conceptual models, the suitability of the computed variables must be assessed. Confirmatory factor analysis (CFA) was conducted by using AMOS 18. The results of the CFA indicated that all of the values are within the acceptable ranges as shown in Table 2. The factor structure of each model fits the data and all fit indices met the respective criteria with χ^2=Chi-square; DF= Degree of Freedom; CMIN= Minimum Chi-square; GFI= Goodness of fit index; RMR= Root Mean Square Residual; RMSEA= Root Mean Square Error of Approximation; NFI= Normed Fit Index; TLI= Tucker Lewis Index; CFI = Comparative Fit Index and AGFI= Adjusted Goodness of Fit Index. The criteria for eliminating the items were set on the basis of the factor loadings and the residual values of each item. The factor loadings >.50 was selected to retain the items.

Table 2   Confirmatory Factor Analysis (CFA) Tabulated Construct Results

	CR	AVE	Open Innovation	Defender	Prospector	Analyzed	Reactor	Close Innovation
Open Innovation	0.897	0.685	**0.828**					
Defender	0.911	0.673	0.521	**0.820**				
Prospector	0.867	0.522	0.620	0.516	**0.722**			
Analyzed	0.839	0.512	0.672	0.791	0.598	**0.716**		
Reactor	0.884	0.605	0.603	0.715	0.514	0.590	**0.778**	
Close Innovation	0.862	0.624	-0.290	-0.028	-0.096	-0.139	-0.158	**0.790**

Figure 1 showed the results of measurement model. At the first stage, all latent constructs were correlated to test the measurement model fitness of all constructs. The model showed a good fit as the values to CMIN/DF=1.40, df = 808, χ^2= 1130.476, GFI= .918, RMR= .058, RMSEA=.057, TLI=.896, AGFI=.848, CFI=.915. These values indicated a good model fit for the measurement validation through CFA.

Convergent validity is the construct indicators that reflect a large amount of the mutual proportion of variance among factors. It determines the amount of correlation among the measures of the same concept (Amran, 2006, Arbuckle, 2011; Hair *et al.*, 2010). Convergent validity deals with construct loadings, average variance extracted (AVE) and construct reliabilities. Average variance extracted is the sum of square of standardized factor loadings to represent how much variation in each item is explained by latent. The average variance extracted is the average percentage of variation explained by the measurement items in a construct. The standard value of AVE is .50 or greater. Table 2 shows the average variance extraction of each construct and results showed that all the constructs have more than .50 of average variance extraction, that shows all the constructs have sufficient amount of convergent validity. Range of Average Variation Extractions are 0.512 - 0.685.

The threshold value of the construct reliability is .70 or above (Amran, 2006; Cooper and Schindler, 2011). Table 2 shows that all the constructs have adequate reliability of all constructs ranges from .817 to .911. Therefore, the current study does not violate the convergent validity of the constructs. Discriminant validity referred to the extent to which an instrument contains a construct that was truly distinct from all others. Discriminant validity is the degree to which similar constructs have distinct

values. In this type of validity, the responses are measured without cross loading in terms of latent constructs (Arbuckle, 2011; Hair *et al.,* 2010).   Discriminant validity is violated when the correlation among exogenous constructs is more than 0.85 (Cooper and Schindler, 2011). In discriminant validity the value of the square root of average variance extraction should exceed than the value of inter-construct correlations. Table 2 shows the inter-construct correlations. Results indicate that all the constructs have adequate discriminant validity as the square root of average variance extracted is greater than the inter-construct correlation of each variable and also the values of inter construct are less than .85. It means results provide sufficient evidence of discriminant validity of the constructs.
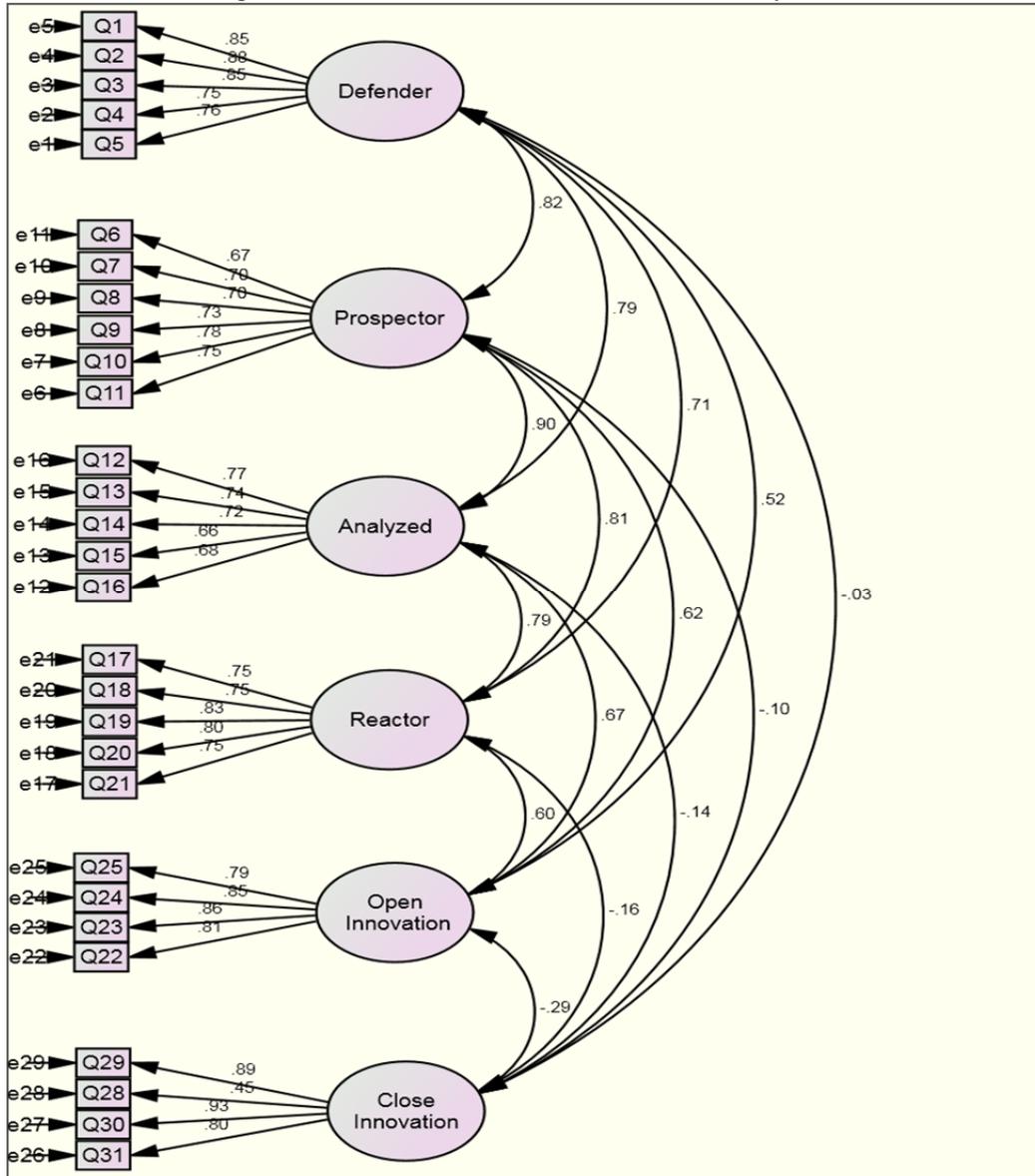
Figure 1   Measurement Model

4.2 Hypotheses testing

The proposed structural model consists of 8 hypotheses, as indicated in Figure 2. Structural model composed of basic six constructs which are namely defender, prospector, analyzed and reactor business strategy, open innovation and closed innovation.
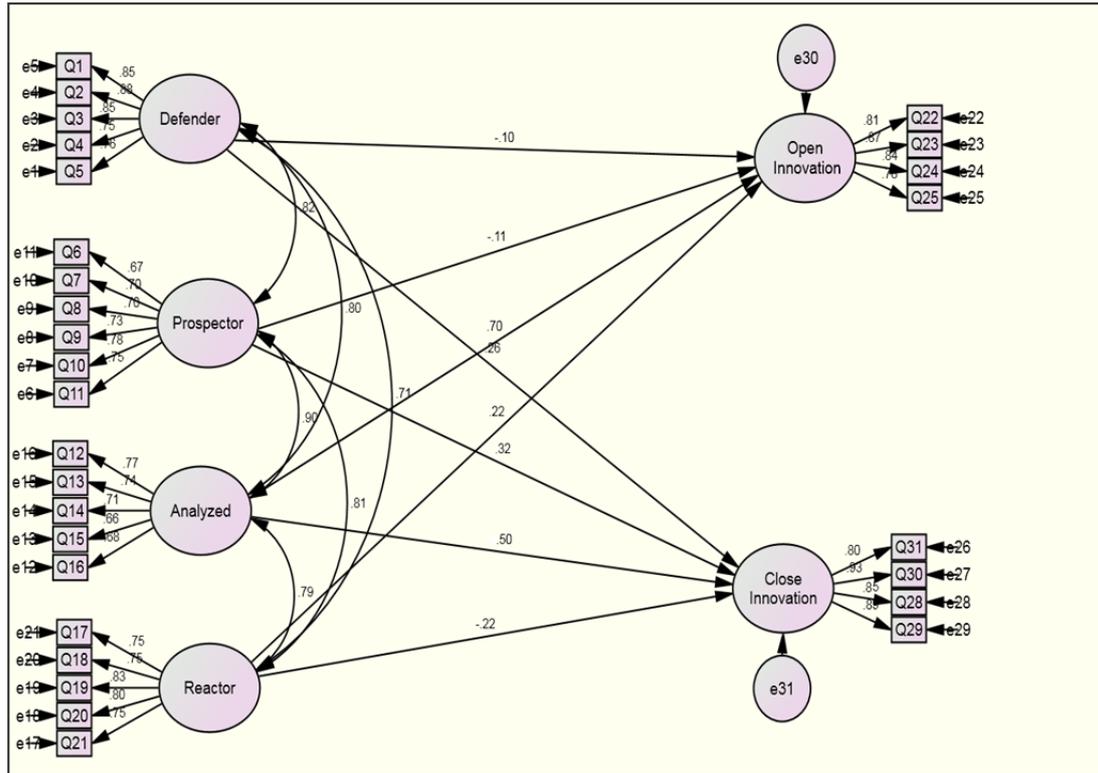
Figure 2   Structural Model of the Six Constructs

First hypothesis of the study states that H1: Defender business strategy has a positive influence on the open innovation.   So the standardized path coefficient of this was -0.10 and unstandardized path coefficient was -.113 with p value above than 0.05. Thus, this provides enough evidences to reject research hypothesis H1. Thus, this study found no relationship between defender business strategy and open innovation. Second hypothesis of the study states that H2: Prospector business strategy has a positive influence on the open innovation.   So the standardized path coefficient of this was -0.11 and unstandardized path coefficient was -.120 with p value above than 0.05. Thus, this provides enough evidences to reject research hypothesis H2. Thus, this study found no relationship between prospector business strategy and open innovation.

Third hypothesis of the study states that H3: Analyzer business strategy has a positive influence on the open innovation.   So, the standardized path coefficient of this was .70 and unstandardized path coefficient was .910 with p value less than 0.05. Thus, this provides enough evidences to accept research hypothesis H3. Thus, this study found positive relationship between analyzed business strategy and open innovation. Fourth hypothesis of the study states that H4: Reactor business strategy has a positive influence on the open innovation.   So, the standardized path coefficient of this was .21 and unstandardized path coefficient was .243 with p value less than 0.05. Thus, provides enough evidences to accept research hypothesis H4. Thus, this study found positive relationship between reactor business strategy and open innovation.

Fifth hypothesis of the study states that H5: Defender business strategy has a positive influence on the close innovation.   So, the standardized path coefficient of this was .26 and unstandardized path coefficient was .321 with p value above than 0.05. Thus, this provides enough evidences to accept research hypothesis H5. Thus, this study found positive relationship between defender business strategy and close innovation. Sixth hypothesis of the study states that H6: Prospector business strategy has a positive influence on the close innovation.   So, the standardized path coefficient of this was .32 and unstandardized path coefficient was .356 with p value above than 0.05. Thus, provides enough evidences to accept research hypothesis H6. Thus, the current study found positive relationship between prospector business strategy and close innovation.

Seventh hypothesis of the study states that H7: Analyzer business strategy has a positive influence on the close innovation.   So, the standardized path coefficient of this was .50 and unstandardized path

coefficient was .684 with p value less than 0.05. Thus, this provides enough evidences to accept research hypothesis H7. Thus, this study found positive relationship between analyzed business strategy and close innovation. Eighth hypothesis of the study states that H8: Reactor business strategy has a positive influence on the close innovation. So, the standardized path coefficient of this was -.22 and unstandardized path coefficient was -.262 with p value above than 0.05. Thus, this provides enough evidences to reject research hypothesis H8. Thus, this study found no relationship between reactor business strategy and close innovation. Table 3 below shows the results of the path analyses between the innovation and the strategy

Table 3   Path Analyses of the Business Strategies and the Innovations

Path			Estimate	S.E.	C.R.	P	Label
Open_ Innovation	<---	Defender	-.113	.113	-.999	.318	Not significant
Open_ Innovation	<---	Prospector	-.120	.205	-.584	.559	Not significant
Open_ Innovation	<---	Analyzed	.910	.246	3.697	0.00	Significant
Open_ Innovation	<---	Reactor	.243	.114	2.132	.033	Significant
Close Innovation	<---	Defender	.321	.146	2.202	.028	Significant
Close Innovation	<---	Prospector	.356	.026	13.59	0.00	Significant
Close Innovation	<---	Analyzed	.684	.300	2.283	.022	Significant
Close Innovation	<---	Reactor	-.262	.146	-1.787	.074	Not significant

Regression Weights: (Group number 1 - Default model)

5 Discussion and Conclusion

Researcher aims to examine the relationship of business strategy with organizational innovation strategy. For this, we proposed eight hypotheses related to the business strategies (i.e. defender, analyzer, prospector and reactor) and its relationship with organizational innovation, either closed or open innovation. Our results suggested that the defender business strategy focus on the passive approach and strives to work with the current status of the organization. Thus, it is more likely that the organizations having defender business strategy will resist organizational innovation importing from the outside of the organizational boundaries. However, defender business strategy is more linked with the closed innovation performance of the organization. Similarly, this is the case of the prospector business strategy. The organization having prospector business strategy are more focused to enhance their business and mostly focused on the new opportunities to promote their business activities. These organizations are ready for in-house innovation and rely on their capabilities. Thus, prospector business strategy is closely linked with closed innovation strategy. Meanwhile, analyser business strategy focuses on the market information and closely analyse the dynamic situation of the business environment and have the ability to cope any situation and turbulence. Thus, analyser business strategy is positively related with both open and close innovation. Finally, the reactor business strategy is a passive business strategy and it contemplates on the changes in markets environments. Mostly, it is impossible for this type of the organization to meet the competitive dynamic business challenges, through closed innovation. In addition, organizations having high levels of reactor business strategy are positively linked with open innovation.

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Research on the Customer Centered Marketing Evaluation, Management and Control System

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Abstract: Customer centered marketing evaluation, management and control is the focus of marketing management. This paper pointed out the necessity and importance of the customer centered marketing evaluation, management and control system to the marketing work, respectively from the angles of deep customer demand survey, customer satisfaction evaluation, marketing behavior review and customer relationship management, explored the composition and operation mechanism of the marketing evaluation management and control system.

Key words: Customer; Marketing; Evaluation; Management and control

1 Introduction

Marketing management is the process of collecting relevant information, researching customer demands, constantly mining customer internal demands and then meet customer demands. Under the condition of new economic norm and the continuous adjustment of the industry, it is especially important to fully judge the situation, constantly improve the level of recognition, seriously look up deficiency and diagnose problems, and correspondingly optimize the layout of marketing strategy and sales strategy. As for industries at the critical moment of industry turnaround and transformation, enterprises should be with more strong sense of crisis, further enhance the management and control strengths and utilize more scientific and effective management tools. Marketing assessment management system is mainly to evaluate the effect of enterprise marketing tools, technology and method in the practical application process, and in the process of analyzing enterprise marketing ability, improve the enterprises marketing ability and efficiency(Neng he Wang 2012;Mathews et al.,2016).In the domestic and foreign research, the research of the marketing evaluation management and control system mainly includes two aspects: the design of marketing evaluation index system(Kontis et al.,2015)and the marketing evaluation method. Many researches concerning to the design of marketing evaluation index system(Martin,2016), but it lacks of correspondingly indicators and quantitative models (Zhixin Du, Kang Qi, 2013; Han Mei, He Yue,2015), and exists strong subjective indicators. (lvshi Guo, 2011). The methods of marketing assessment mainly include the customer lifetime value method (CLV) and the return on investment evaluation method (ROI). Customer centered CLV focuses on the customer's cognition and satisfaction, which is related to the long-term development and benefit of the enterprise, but this approach ignores the problem of investment in marketing costs; In contrast, ROI evaluation method can avoid this problem, but it is easy to sacrifice some high costs investment projects which will bring long-term development to the enterprise (Zhang Li, Zheng Ling, 2012).

Therefore, when selecting evaluation method, the enterprise should assist with other evaluation models, and improve the assessment process by means of technology in order to realize the balance between intangible benefits and long-term development, and the combination of short-term assessment with long-term monitoring of the enterprise (Shen Guanglong etc, 2006). In retrospect, Scholars at home and abroad generally recognize the importance of adhering to the customer as the center in the management and control system of marketing evaluation system, but as how to build the customer centric marketing evaluation and control system, it has not been effectively resolved. For this reason, this article attempts to rely on the market information big data analysis, take the form of a more scientific market information analysis to construct the marketing evaluation, management and control system to seek innovative marketing model and system.

2 The Customer-Centered Deep Customer Demands Survey

In order to improve the efficiency of marketing management, enterprise needs to adhere to taking customer as the center, carry out the market information collection and explore the deep customer demands from the perspective of management control and evaluation. Specifically, aimed at the review, analysis and evaluation of marketing behavior, systematically collect, do statistics, collate and analyze the market and customer big data, Multi-angle analyze the marketing team's marketing efficiency. It will

be helpful to continuously strengthen the internal effective and perfect communication between the marketing team and the production department, continuously provide quality value-added services to the production department. Through leading the frontline sales team from "the customer as the center" marketing ideas to collect market and customer information, supervise and regularly provide Market Research Report, the market information can be retained and accumulated, and can be the basis for the construction of marketing assessment control system. The comparisons between the customer centered and the enterprise centered are shown in Table 1:

Table 1   Customer Centered Deep Customer Demand Survey

customer demand	Customer-centered performance	Enterprise-centered performance	Thoughts to establish the marketing evaluation, management and control system
Customer Solution	The problems existing in the customer actual purchase and use; Customer demand for the purchasing way, pre-sale and after-sale service.	Potential problems considered in the design of an enterprise; various needs subjectively considered	Coordination between demand side and supply side
Customer Cost	Customers should / hope to pay how much cost	Pricing from the perspective of enterprise product cost	Pareto optimal on Pursue of the consumer surplus and producer surplus
Communication	Strengthen communication with customers	Need to carry out what kind of sales promotion activities	The transformation from One-way communication to two-way communication
Convenience	To allow customers more convenient to buy and use	Enterprise self-owned distribution channels and network	Sales network optimization

Evaluating on the cognition and development situation of the "Customer centered" marketing concept is the process to examine whether the marketing concept has transformed from the enterprise centered to the customer centered. Deepen the use of "customer centered" 4C marketing ideas, centering around the "demands solution, customer cost, two-way communication, purchase convenience", conduct marketing activities, to further promote the scientific analysis of market situation and ensure that marketing activities is reliable and effective.

3 Customer Centered Customer Satisfaction Evaluation

Customer centered customer satisfaction timely evaluation and dynamic evaluation is an important basis and link of the construction of marketing management and control system. To explore the performance, reason and essence of customer satisfaction level can help enterprises shoot the arrow at the target in the construction of marketing evaluation, management and control system, and carry out targeted improvement work. Whether the work to maintain the existing market and open up new markets and so on is effective, must be based on customer satisfaction as the premise. Around the center of the customer, customer satisfaction that the Marketing evaluation management and control system try to ensured is not only set up the customer complaints department, Smile service or behave kindly, but also need to develop higher customer service standards based on the status quo of customer satisfaction. This extra value and service is not only a set of rules or actions, but the attitude of the entire company, and it is an important part of corporate culture. Customer centered marketing evaluation, management and control is also a kind of philosophy thought of enterprise management, that is, to create value for customers, or to say, to create the customer value. Customer centered customer satisfaction evaluation must follow the following steps:

3.1 The customer satisfaction index

To establish a set of scientific customer satisfaction degree evaluation index, the first to do is to study the structure of customer demand, and evaluate from several aspects of the demand structure. The basic structure of customer requirements is shown in the first phase of Figure 1:
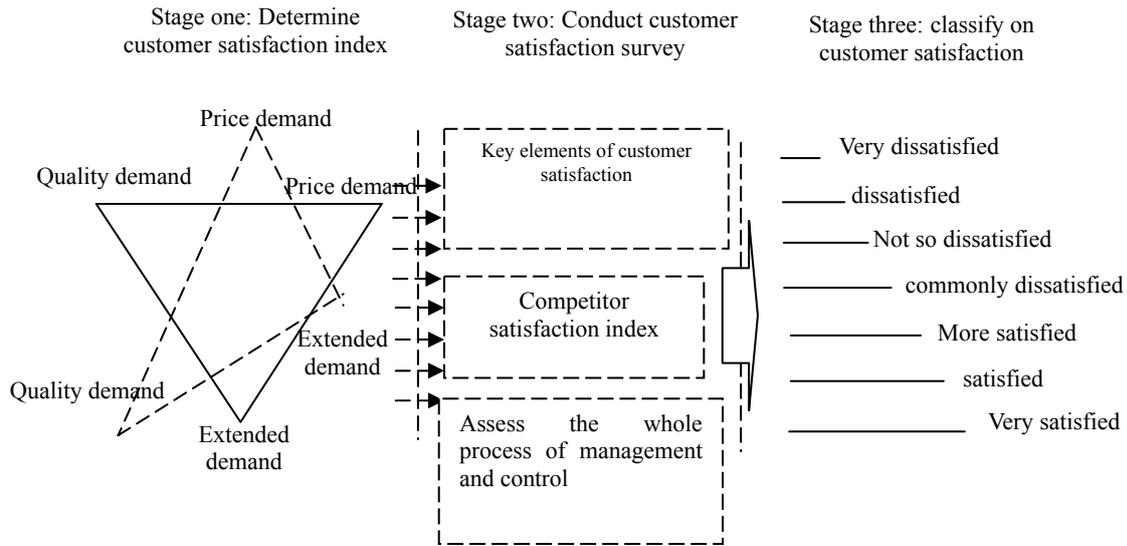
Figure 1   Three Stages of Customer Satisfaction Evaluation

The quality requirements in Figure 1, in addition to the basic performance indicators, there are aesthetic, economic natures, etc; Epitaxial demand includes service needs, psychological and cultural needs, etc.; Price demand includes price level, price to quality ratio, price elasticity and so on. In the provision of products or services, all the 3 basic customers' needs should be considered.

But different consumer groups have different demand intensity for these demands. At the same time, there is a level of satisfaction after consumption. When the customer demand intensity is high, slightly inadequate will lead them to be dissatisfied or very dissatisfied, When the customer demand intensity is low, it needs only a low level of satisfaction. Therefore, the triangles in Figure 2 will show different shapes. In the construction of marketing evaluation management and control system, we should determine the main demand structure according to different customer needs to meet different levels of customer requirements and satisfy customers.

3.2 Customer satisfaction survey

To evaluate the degree of customer satisfaction, it is necessary to establish a set of product related project which is capable of reflect the degree of customer satisfaction to the product. As the customer has different intensity requirement for the product demand structure, and the product is made up of many parts and each part with many attributes, if a part or attribute of the product does not meet the requirements of the customer, they will make a negative evaluation and feel discontent. Therefore, the enterprise should, according to the customer demand structure and the characteristics of products, select the subjects that not only can fully reflect the status of customer satisfaction but also can be representative of the subject as the evaluation index of customer satisfaction. Fully refers to the evaluation of the subject's setting should include both the core subject of the product, and the intangible and the extension of the product subject. Otherwise, not only we are unable to fully understand the degree of customer satisfaction, but also it is not conducive to enhance the level of customer satisfaction. In addition, due to large number of factors that can affect customer satisfaction or dissatisfaction, it is impossible to treat all the factors as measurement indicators, so, enterprise should choose main factors that is representative as the evaluation subjects.

Customer satisfaction survey is shown in the second stage of Figure 1, one content of the customer satisfaction survey is the key elements to determine the cause of customer satisfaction, that is to judge whether the customer management can effective improve and bring customers a unique consumption experience. For example, customers are more interested in what products or services, and whether the satisfaction analysis is reliable or reasonable.

The second content of customer satisfaction survey is the index to evaluate the satisfaction of the company and the main competitors. Reasonable and effective customer satisfaction survey and analysis is a very important factor to effectively strengthen the comprehensive competitiveness. The evaluation of the satisfaction index of the company and the main competitors, can make the satisfaction index be better in place to achieve the standard.

The third content of customer satisfaction survey is the whole process of control survey. In the process of customer satisfaction survey, more diversified consideration should be given to the overall management and control system, and control in advance, control in-process, and Ex post control, should be effectively enhanced to a practical and effective level. This is very important for customer satisfaction survey to issue a special data report, which can effectively improve the overall customer satisfaction evaluation.

3.3 Customer satisfaction degree

Customer satisfaction is a kind of psychological state as well as self-experience. The psychological state bust be defined, otherwise, it is hard to evaluate the customer satisfaction, and then is also hard for the marketing assessment management and control to achieve its results. Psychologists believe that the emotional experience can be divided into several levels according to their cascades, therefore, the customer satisfaction degree can accordingly be divided into seven steps. As shown in the third stage of Figure 1, it specific includes:

1) Very dissatisfied: indignation, anger, complaints, anti propaganda

Very dissatisfied state is referred to as customers, after the consumption of a certain product or service, are indignant, angry from embarrassment, angry intolerable. Customer not only attempted to find opportunity complaints but also use every opportunity to carry out anti propaganda to abreact the unhappy of heart.

2) Dissatisfied: anger, annoyance

Dissatisfactory state refers to the atmosphere or trouble state produced after customers' consumption of a certain product or service. In this state, customer can reluctantly or barely endured and hope that through a certain way to compensate, at the appropriate time, will also carry out anti propaganda, remind his friend and relatives not to buy the product.

3) Not so satisfied: complain, regret

Not so satisfied refers to the complaint, regret state after customers' consumption of a certain product or service. In this state, customers though are dissatisfied, but also can reluctantly accept.

4) Commonly dissatisfied: no significant positive or negative emotions

Commonly dissatisfied state refers to a state in which a customer has no apparent emotion in the process of consuming a certain product or service. That is, without saying good or bad, just able to pass.

5) More satisfied: favor, affirmation, praise

The more satisfactory state refers to the favor, affirmation and praise state that customers formed in the consumption of a commodity or service. In this state, customers are fairly satisfied with the heart, but to the higher requirement are far worse, and to the worse is comforting.

6) Satisfied: satisfaction, praise and pleasure

Satisfied state is the satisfaction, praise and happy state that customers formed in the consumption of a commodity or service. In this state, customers not only to their own choice to be sure, but also willing to recommend to friends and relatives, while their expectation is basically consistent with reality, there is no a clear regret.

7) Very satisfied: excited, fulfilled, grateful

Very satisfied state refers to the excited, fulfilled and grateful state that customers formed after the consumption of a commodity. In this state, customer expectations not only fully meet without any regrets, but may also greatly exceeded their own expectations. At this time the customer is not only proud of their choice, but also possible to use every opportunity to recommend and publicize the product to relatives, hope others buy the product.

To sum up, in order to establish an effective customer satisfaction evaluation system, we can first start from the intensive study of customer demand structure of three demand elements "quality, extension, price", At the same time, according to the characteristics of the product, we can choose some representative subjects that can fully reflect the status of customer satisfaction to investigate. We must ensure that the customer satisfaction survey content is comprehensive, correspondingly and targeted, and ensure the control of the whole process of investigation, so that the investigation is effectively. The second is to further grasp and understand the seven steps of customer satisfaction, to achieve fairly knowing of the score, to grasp the customer satisfaction status all the way and adjust the marketing strategy timely and properly.

4 The Review of Customer Centered Marketing Behavior and the Customer Relationship Management

To construct the Marketing evaluation management and control system needs to continuously collect and accumulate market, sales and customer related information and regularly carry out marketing review and analysis, to restore the market conditions within the selected time period and assess the impact of the current marketing work on the current performance and the later performance, so that to ensure that the company's development direction is consistent with the market changes, and to be able to continuous improve the marketing level of the company.

Based on above, the Marketing evaluation management and control system can help the company timely formulate and revise the regional market management and fractionize customer management and company management to make it not only consistent with the company's strategy, but also in line with the objective situation of the market. The Marketing evaluation management and control system is helpful to the marketing team to accumulate experiences having real data support and enhance the sensitivity of the team to the market environment change as well as provide a solid analysis basis and an evaluation tool for the post marketing work. A retrospective view of customer centered marketing behavior as well as its performance are shown in table 2:

Table 2   A Retrospective Perspective and Performance of Customer Centered Marketing Behavior

Analysis and evaluation perspective	Analysis and evaluation behavior	Analysis and evaluation content
Market area	Quantitative analysis of marketing behavior	Product sales radius and customer structure optimization.
distribution channel	Quantitative marketing performance	Sales volume and market share. Sales price of different products.
Sales branch	Quantify the implementation of the overall marketing strategy and marketing performance	Sales volume, sales price, inventory, etc. product mix. Number of customers.

The above data acquisition, analysis and evaluation can help enterprises more clearly control the sub companies in the regional markets and sales channels on the marketing performance, and Make each branch can carry on the horizontal comparison so that each branch can make horizontal (with other branches) and longitudinal (With competitors in the market area and in the sales channels) compared. Thus, it is possible to find out the advantages and disadvantages of each branch and further optimize the marketing strategy. For the coincident market area of different branches, this type of analysis can be used to find out which companies have what competitive advantage and also play an important role for the future to confirm the market area of each branch and to prevent disorderly competition between regions.

Customer relationship management is an important way and means for marketing evaluation, management and control, but to highlight the customer as the center, it is necessary to collect customer data as much as possible and optimize the customer portfolio, through customer visits and daily behavior information recording to administrate the sales team and sales behavior. Customer centered customer relationship management assist the marketing evaluation, management and control system to promote the performance of marketing management and customer service, the specific classification management as shown in table 3:

Table 3   The Customer Centered Customer Relationship Management

working types of customer relationship management	working content of customer relationship management	points of marketing evaluation, Management and control
Customer positioning and sales behavior management	In daily work, optimize the work behavior Customer portfolio analysis, management Tracking sales behavior and sales intensity	Customer selection and sales behavior tracking
Action plan management	Management area and Key customer action plan Follow up customer action plan	Marketing plan monitoring
Customer visit	Preparation before visiting Customer visit report	Customer communication detail management
Management layer support	Support the work by tracking the sales representative of the daily work. support the inter regional, inter firm joint visit	Cross region, cross sector coordination

In the difficult situation of the current and future period, establishing the marketing behavior management system and using auxiliary information tool to diagnose problems, scientifically formulating the marketing strategy, optimizing the marketing management process, and more systematically and comprehensively managing the sales behavior and teams will further provide the basis and protection for the cement industry development to against the contrarian trend.

5 Conclusions

With today's marketing work more and more sophisticated, more and more networking and personalizing, as well as the competition more and more fierce and homogenizing, the customer centered marketing evaluation management and control has become the focus of marketing efforts. Carrying out the customer centered deep customer demand survey and only by doing it, can ensure that the premise of the marketing evaluation management and control work with a rational basis. "Multi angle, multi dimension" Conducting the marketing analysis and the evaluation Review, acquisition and recording the accurate multi-dimensional data, and strive analysis preciseness and assessment justice, only by doing above, can ensure the arrow of the marketing evaluation, management and control work shoot at the target. Focusing on the customer centered marketing behavior review and the customer relationship management, only so can ensure that marketing evaluation, management and control work to be implemented.

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Challenges of Malaysian Small Medium Enterprises in Expanding into Overseas Global Market

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Abstract: Small Medium Enterprises (SMEs) in Malaysia play an important role in the country's economic development. The aim of this study to discuss the challenges of SMEs in expanding into overseas global market due to international expansion. The focus of this paper is the challenges of SMEs in expanding into overseas global market. The current trend of economic growth, globalization, ICT technology and the rapid industrial development has made Malaysia as one of the most open economies in the world.
Key words: SME (Small Medium Enterprise); Internalization; Challenges of SME; Tangible and intangible factors of SME's; Types of SME's exports

1 Introduction

The increasing development of globalization in the international business environments is very crucial in today's business economy. Induced by globalization, it is highly expanding concentrate on the internationalization of small firms. In spite of the fact that SMEs is the biggest source of development and creation of employment, and are not much noticeable or presence in global market with respect to their commitment and local advancement. There is a lack of research on small and medium enterprises and export improvement in developed nations. Standardization plays an imperative part in today's market and business, particularly when the organization tries to enter the global business sector to compete and experience internationalization.

As more companies enter the global business environment, there is expanded rivalry. Expanding rivalry brings about a decrease in the capacity of small and medium firms to manage their improvement ways (Todd, et al, 2007). Additionally, incorporate that trade liberalization expands the limit of good producers and retailers to enter the market, hence SMEs find it quite hard to survive or even keep up their present business position in their particular markets. (Singh, et al, 2010)

1.1 Definition of SME

The definition of SME in one country might be different from another and each country might have its own specifications of it. The definition that is used mostly with the quantity of employees and the amount of total net asset, investment level and sales also been used in some countries (Adam, I. O., et al, 2015). Another article also demonstrates that SME covers an extensive variety of meanings and values, which could be different based on their approved statistics (Olang'o, et al, 2014). Small firms are the foundation of basically all economies around the world. (Wattanapruttipaisan, 2003; McDougall, et al, 2003)

Although there is no universally agreed meaning of SME, a percentage of the regularly used criteria are the count of the employees, estimation of total assets, turnover, estimation of the size of capital and sales (Olang'o, et al, 2014). However, other researchers, recognizes that among all the different definitions, the quantity of employees and workers have been used the most in definitions, but still with that, there are different definitions from high and low number of employees (Adam, I. O., et al, 2015). The majority of them define SMEs with employees less than 250. Definitions based on size differ significantly, as per what is normal in other countries, for instance, for more than 20 years, Canada has marked SME organizations as firms with not more than 100 workers manufacturing sectors and bellow 50 in the service field. Medium-sized organizations are frequently depicted as having 100 to 500 employees (Fedorowicz, 2002).

1.2 SMEs and internationalization

Internationalization is characterized as the activities that pass through the national boundaries; it is

planned to add values in associations. These days, internationalization influences all organizations, big and small. Progressively, SMEs are faced with global rivalry and compelled to play a critical part in worldwide markets. (Al-Hyari,et al,2012)

Small companies are turning out to be highly global, contributed somewhere around twenty to twenty five percent of global activity of manufacturers (Al-Hyari, et al,2012). To globalize, small firms usually experience significant challenges, the challenges are difficult and both could be internal to a specific company or radiating to the bigger market environment that SMEs perform, including the challenges involved in trade policy (Fliess,et al,2006). Still exporters could face overwhelming difficulties that reduce their capacity to realize such development chances. However, To become successful in the foreign markets is not that simple such as, social contrasts, savage rivalry, and expanding motion in the business sector (Ates,et al,2013; Li,et al,2004). Smaller and younger industries could be especially helpless to exporting challenges, as asset requirements and hierarchical restrictions expand their powerlessness (Neupert, et al,2006).

Universal trade is vital, specifically for improving nations, as it could increase employment and imports (Dusoye,2013). Export activities expand productivity, enhance trade adjusts, and help to manage the issues of destitution and unemployment (Evangelos L. Psomas, et al,2010). However Success in trading in small organizations depends widely on foreign market intelligence. In this way gathering of related data ought to be a need in supporting SME's development and exports, it doesn't convey that different elements, for example, the education level and capital accessibility must not be counted (Ghauri ,et al,2003). Internal business situation has been progressively influenced by global financial elements, and the capacity for smaller companies to disconnect from outside rivalries have reduced, particularly for a company which work in worldwide businesses (Al-Hyari,et al,2012).

2 Challenges of SMEs

SMEs play an important role in economic activity through employment, innovation and development (Turner R, et al,2012). Small organizations are without a doubt critical to keep up solid financial development; nonetheless, the way to maintain their execution in the long run is a major problem. Feasible and reliable high is portrayed performance by performance management practices (Ates,et al,2013）.

The applied suggestion expresses that boundaries caused the business activities to be more troublesome abroad in comparing to residential market exercises. In that admiration, evacuation or minimization of those boundaries could help to a higher export rate and performance, a very admirable objective of governments (Al-Hyari,et al,2012) .

SMEs is habitually stood with significant challenges. Contrasted with bigger organization, SMEs benefit less regularly from economies of scale, and less have access to a wider asset base. As a result of the typically low value proportion of SMEs, they are moderately powerless against external events contrasted with bigger organizations. That this represents not only bigger companies face many risks as well as SMEs, whose survival is all the more effortlessly debilitated due to their little arrangement of – both budgetary and non-money related – assets (Muhammad Khalique, et al,2011). It gets to be significant to research the challenges and constraints that are able to help the SMEs to address these issues in order for SMEs to participate in economics improvements and the development (Zaroug Osman Bilal,2015).

2.1 Management challenges

We should not question the significance of ventures in SMEs, yet the management group in general and the project management group in particular does just a bit to give SMEs direction on overseeing activities. Researchers have examined variables, adding to the performance of SMEs yet work has concentrated essentially on the commitment of the management group (Turner, R.,et al,2012). Risk management may help SME supervisors to recognize critical dangers that could imperil the achievement or presence of the organization so as to proficiently adapt to them. Misconstruing or neglecting to perceive the risks can – in the most pessimistic scenario – have appalling outcomes, going from client's misfortune to harming liability, environmental damage and conceivably, even insolvency. Notwithstanding, numerous SMEs don't – or not sufficiently – apply risk management rehearses, generally because that they can't stand to rededicate assets because of their requirements (Craig C. Julian,2012; Mohd Zulkifli Muhammad,2010).

A brief audit of the literature demonstrates that there are a few studies centered upon senior corporate management visions, projections, future management visions, future desires, potential

opportunities and threats connected with the new business environments (Coskun,2002).

2.2 Marketing challenges

Marketing issues and execution of marketing choices are not selective to big organizations settings. Small and developing firms face marketing issues for their basic survival and development. Insufficient experimental proof is available, then again, on the part of marketing in the advancement of small enterprise research. Given this deficiency of literature, it is hard to survey rapidly the relative impact of marketing on the improvement of small enterprise research (SER). While there has been used of hypothesis and experimental exploration from the marketing discipline, there has been no predictable example of its use (Romano, et al,1995).

Research has demonstrated that planning is an issue for small enterprise management, which has a tendency to be responsive in style. Since few firms do not have the specialists and authorities available in bigger ventures the directors of the business need to have common knowledge (Fuller ,1994).

The researchers have perceived the studying on marketing as a tricky process for more than 20 years (Simpson,et al,2006). Research on SME's marketing and their exercises have been generally restricted to clarifications of specific sorts of conduct that found in SMEs. Characterized export marketing issues as "those gaps, which need to be filled before the competitive producer becomes a successful exporter ". Internal export challenges are characteristic for the company and normally are related with not enough campany assets for marketing expert, for instance, issues relating to meet import quality models, and setting up the suitable plan and picture for the export market (Ghauri ,et al,2003).

Issues identified with the poor association departments of export and company's absence of equipped employee to manage the exports, the powerlessness of poor finance trade deficient data about foreign markets. Albeit truly segmented, they organize interior problems that impact export activities of manufacturing companies in developing countries, entering foreign markets (Ghauri ,et al,2003).

External export issues are identified with the business, the export market and the macro environment. Macro environment challenges are components beyond the association's control, for example, the absence of fitting trade institutions, unfavorable trade rates, unlucky deficiency of an empowering national export strategy, and global agreements (Ghauri, et al,2003).

The management structure in SMEs regularly implies that practically there is no marketing planning and numerous of small sized companies' failures outcome from insufficiencies in marketing. Researchers have discovered this responsive style, even among exporters where it may be expected there would be a more systematic approach to marketing (Fuller ,1994).

3 An Example

SMEs play important roles toward export around the world (Fletcher D, 2004). SMEs also represent the newest sector in economies for respective country especially in Asia. This small business at the early stages will face challenging factors within their competition to achieve their business goals (Kent E. Neupe,2006). SMEs need to meet export requirements at early stages with limited resources in different organizational structure increase their confidence level in the global market environment (Katsikeas,et al,1994; Leonidou,1995; Lönnqvist, 2004).

Furthermore, various researchers found that problem faced by SMEs is financing problem, rules or regulation of the host country, lack of experience and foreign market contact (Bell, et al,2001; Bones,2007). According to related researches, [SMEs doing export also facing issues on resources and organizational skills, language barriers, and demographic issues(Fletcher,2004). Furthermore, the problem also found that challenges on the global market are foreign market opportunities, policies, regulation and start-up cost (Leonidou,1995).

Another major study, classified internal and external challenge factors involve in global market industries (Leonidou,1995; Li, H.-H., JK.,et al,2004). Internal barriers can be categorized into formational, functional and marketing, while external barriers such are procedures, government deregulation and business environment (Neupert, et al,2006). Related research mentioned that problem to find middle man or third party, product acceptance, and financing were important factors faced by SMEs exporters. Other researches, indicated that lack of training, knowledge, lack of infrastructure, failure workforce, lack of ISO implementation and experience (Angelogiannopoulos, et al,2007).

According to some scholars, define many reasons to initiatives SMEs to meet their competitor in the global market are (Dr. Jan Fedorowicz,2002):
● Suitable website for SMEs to get direction from government program and information
● A comprehensive inventory of market and business information

● Mentor mentee services either free or at subsidized rates.
● Improve skill building, especially developing in the international trading system.
● Assistance with trade shows and exhibitions
● Tax incentive from government to encourage SMEs in the global market
● Incentive for SMEs to be a major international logistics hub

SMEs that involved in the higher export transaction involved acquired higher export profitability and export marketing strategies (Neupert, K. E., Baughn,et al,2006; Salvo, et al,2008). Furthermore, (O'Cass, et al,2003) business in global market strategy did not have any relationship within export performance and supported by recent argument (Abdul Adis, et al,2010), clarified that there were no related between global marketing strategy

4 Importance of Intangible Factors Towards SMEs Success

Various authors, scholars and experts clarified (Bones,2007), Four (4) key forces management in SMEs role today are intangibility such as globalization, digitalization, innovation and organizational restructured. Furthermore, other researchers also, clarified that increase in knowledge-based economy, such as intellectual property, reputation, human capital and customer relationships (Jarvis, et al,2006). Others, classified that more than 90% of SMEs in service sector generate income from the intangible assets. Furthermore, SMEs can be successful improved targeting the intangible assets such as customer's tribes, brands, and intellectual property (Brooking,2010).

Table 1   Classification of Common Success Factor (Lonnqvist, 2004) Success Factor

	Financial	**Non-Financial**
TANGIBLE / **SUCCESS Factor**	Economic Growth Liquidity Product/Service Costs Profitability Capital adequacy	Delivery time Quality Products Production Volume Productivity Stock turn time Service volume
INTANGIBLE	Brand value Goodwill Value of immaterial properties	Competencies Customer satisfaction Customer retention Innovation Motivation Personal satisfaction

Table 1, Classified critical success factors based on not only on financial and non-financial but also tangible and intangible challenged for performance planning and management. The two upper boxes aspect of tangible assets and lower boxes are difficult to be measured which are intangible assets (Lönnqvist,2004).

This research will make in-depth studies the areas of leadership, innovation, image and reputation, entrepreneurial competencies, and organizational culture as they consider critical success factors for SMEs. A major factor has been identified SMEs need to remain in business and need to have self-confidence to become a large firm both domestic and global. Therefore, researchers need to find how important SMEs growth can be successfully overcome the barriers and rewarded (Li,et al,2004).

5 SMEs' Exporting in Developing Countries

Growing in SMEs business in global market competition forces government to meet market oriented policies within the domestic and foreign market. Growing technologies in business operation can reduce cost of information and time capabilities in global economy (Mohd Zulkifli Muhammad,2010). Therefore, because of these factors a new small business was not only growing in domestic industries, but their global market activities such as trade, technology and investment.

SMEs involved their business in the global market, particularly meets challenges within SME supplier's connection within larger Multi National Enterprise in local markets. In this situation SMEs faced higher barrier requirement in international operation compared to larger firms because of capabilities. Others clarified that importance of strategic alliances by SMEs (Gomes-Casseres,1997) However, much of the research, clarified that (1) when small business uses alliances to do foreign business operation, (2) how and when to use alliances and (3) alliances competitive performance.

Many analysts, classified SMEs into three capabilities and challenges (McMahon, et al,2001). Firstly, capabilities to meet international competitors, second able to accept globalization pressure and thirdly they need to be protected by government from globalization effect. According to related research, SMEs can be described able to facing international market competition. However, SMEs needs to be knowledgeable to compete successfully in international markets and other researchers, clarified that the barriers, mostly due to differences in rules and regulation, socio-cultural and procedural differences (Hassan, et al,2011). Barriers to globalization hinder the entrepreneur's ability to overcome problems, develop and able to meet international operation in the global market (Leonidou,1995). Furthermore, others (Shoham, et al,1995), identified the primary barriers in global market include business attention, government policy, foreign rules and procedures. It is also defined that challenges in international markets include difficulty in collecting payment from foreign customers, and high cost of global market transaction. It is also will affect cash flow problems for exporters (O'Cass, et al,2003; Da Silva, et al,2000).

The high cost in global markets such as insurance, market research and distribution cost. Therefore, due to this issue will result in higher production costs in the market and the SMEs will increase the price of the product. As a result, increase in product price will make the product less demanded in the foreign (Da Silva, et al,2000). SMEs need to be creative in a foreign market exporter such as to build a good relationship (Kotabe, et al,1992). Therefore, without this assistance some SMEs found that it is difficult to market their product, especially host country governments protect their domestic industries. Thus, government policy can act as a barrier to success in the global market (Lages,2000).

Fluctuations in currency can create losses due to currency is devalued. Therefore the price of exports will increase in the target market and reduced demand (Karunaratna,1997). As a result, SMEs needs to find out how to overcome pricing and promotional policies according to the environment. SMEs need to adapt products to meet foreign customer's demands (O'Cass, et al,2003). As a result, adjusting pricing in the global market are important decisions in their business practice and will affect SMEs company profit. If the SMEs did not meet the price level according to the host country and their agreement venture could be terminated (O'Cass, et al,2003).

Promotional strategy also needs to organize by the SMEs because it is required from the target market (Cavusgil, et al,1994). As a result, it gives local competition inspire with the foreign competitors that able to meet local market requirement.   It is important that knowledge of local markets by SMEs in foreign market will stimulate the firm to develop products according to demographic requirement. However, whether to accept and adapt the SMEs product demand based on localized strategy and benefit to the local market (O'Cass, et al,2003).

6 Types of SME's Exporting

Up to the middle of 1990s the firms reviewed based on export and administration studies were frequently divided into exporting companies and non-exporting companies are highly vs. limitedly exporting firms. During the past 10 years the world has increasingly concern toward the firms, which involved their operation to the oversea countries, or sales straighter rather than the firms, which grow and get powerful first to the home country then involve in oversea market and sales. These companies have been named fully differentiated in different studies: born global Madsen inter- national new ventures (INVs), global beginners (Knight, et al,1996; Oviatt, et al,2005), or high technology beginners (Jolly, et al,1992). In the lately, the term born again international companies have also suggested, to explain long-established companies which, used to concentrate on their domestic markets, but abruptly opt for fast internationalization (Bell, et al,2008).

The most important reasons for development of these new kinds of firms are (Knight,et al,1996; Madsen, et al, 1997; Rialp, et al, 2005): (1) the great significance duty of niche markets, (2) the develops in procedure of technology, (3) the improvement in communication of technology, (4) the intrinsic, improvement of small firms, (5) the definition of internationalization that have become more available to all companies and higher backing tasks for the higher international connections and collaboration, and (6) the higher amounts and usage of international networks.

Looking at the definitions used in different Articles that concentrated on born global, many reviews have obviously shown that there are a lot of differences. According to an analysis of 55 studies which dealing with global startups, have discovered that two criteria were more often used in these descriptions: (1) the time frame from creation to beginning of exports/oversea activities and (2) the portion of exports into that time frame. Lowest used criteria were the time of establishing of the firm, the quantity of

export target countries, and even more limitedly the kind of target countries (Dominguinhos P,2004)

Focusing on the time frame, some comparatively few studies used a time frame of one or two years from the creation to the beginning of export. Some relatively other studies used a period of three years, but in most of the studies a period time frame of six years has also been used, obviously influenced importantly, by the precursor studies (Oviatt, et al,2005). In few studies only the reference ''in the first years' is at work. Thinking the role of exports, some studies do not impose any exact share, in some studies 5, 15, or 25%, respectively has been used as the lower portion in exports. In regards to the foundation, some studies have concentrated on companies founded in 1978 or more recently, or in some studies in 1990 or more recently, but most of the studies do not place any borders due to witnesses from the existence of global startups before the mid 1970s. In some studies, the lowest demand of at least three countries of exports has been used; in some studies, even higher, harder demanding reservation like exports or functions in two continents, but merely behind a rather long time since the foundation. Furthermore, significant specifications of the operation should be that the oversea sales should be continuous and important for the company (mainly increasing role) (Dominguinhos P, 2004). As the prior discussion it shows there are big differences in the description used for bearing global. These variations can have a high influence on the outcome of connected manners, strategies, and export efficiency

According to the description and descriptions introduced above, we have agreed on two varies categorization to the present study: (1) a weaker categorization and (2) a narrower categorization. In the weaker classification the firms only, separated into two subgroups according to the time frame and the being of exports: no exports vs. exports within three years from the foundation, without any extra terms. The sub- groups are named as truly traditional exporters and born global.

In the second categorization three terms were focused (1) the period and the being of exports: no exports vs. exports within three years from the foundation, (2) the share of exports in three years: if the exports portion had overtaken the 25% limit of the whole sales during the agreed period of time, and (3) the ongoing and significant/ large role of exports: if the share of external sales had attained the 50% limit of the whole sales. The sub-groups are named as traditional exporters and truly born global. These cutouts of 25%, according to the previous studies that on the truth if the global sales attain to that area the firm must take the international operation very strict and the globalization is not far-flung after that.

For more info, the necessity of minimum 50% share of oversea sales was chosen to show the ongoing growth and significant role of overseas sales. Without this kind of additional terms, e.g., a company which has started its overseas sales within three years from the foundation (share of total sales may even go over the 25%), possibly according to an unwanted inquiry, but which stops majorly or whole the exports over the three years, would be categorized as a born international.

The name born global shows operation in various countries or that located on different continents. Because these terms were not put, as it has also been the case in a lot of previous studies even though the condition is used, it was decided that the term ''born international'' will be used in this article to describe most real the nature of these SMEs.

As argued before there are clear existence evidences that born international companies history is much durable previous 1990s. In fact, e.g. in the research (Aspelund, et al,2005) the oldest born global firm in their sample was founded already in 1884. However, their number was obviously increased during 1990s (Moen, et al,2002). In their analyst, most of the French and Norwegian global companies, which founded in 1990s, can be categorized as born internationals. The outcome in Denmark also shows the same status. As well as there are a lot of born global firms outside hi-technology sectors too, for example, in the user goods and the service departments (Knight, et al,1996). This looks to be the case, especially in lower developed countries with small domestic markets. Hence, it was decided not to put any restrictions for born global firms, according to the time period of foundation, or series of industry.

Many specifications are considered to describe the born global companies (Knight,et al,1996); (a) concern on highly specialized international market niche, (b) developing their export/oversea activities quickly into many markets, (c) entering to their lead markets more faster compare the traditional companies, (d) processing very quickly the steps of globalization (e) they may use leap-frogging in their activity tactics development, and (f) they use more solidarity and alliances in compare of traditional companies. Many authors discuss that the being of this type of firms is concerned on hi-technology sectors, but there are witnesses that these kinds of firms are not limited merely to hi-technology sectors (Madsen, et al,1997). Based on a recent investigation, the share of oversea sales of Danish born global was, on average 71%, whereas the relative share in US-based born global was 47%. For a latest study modeling the aspects affected the speed of globalization (Oviatt, et al,2005).

7 Export Barriers

Obligation to export market is a base of the export marketing traits in a company. The manager's audit and operation in oversea market drive of SMEs in order to get and reach higher globalization traits experiences (Reuber, et al,1999). Export direction is total trend, ideas, and conception of a company's management, which indicate the company's practices for export operations. The aim is to higher the export level of Small Medium Enterprises and based on this view the top management behaviors and sustainability is more efficient in export approach (Cavusgil, et al,1994; Solberg,2002). Companies must start oversea by geographical and cultural, which are more similar markets for beginning (Johanson, J,et al,1990).

Based on the meaning of this strategy the high vagueness of the globalization causes the companies to start the procedure with overseas markets, which are physically, and lettered alike to the native market firms. So, few additional practices of resources are needed to defeat the export obstacles. Despite of this gradual strategy, there are still extra export obstacles recognizably at every level of the globalization process, from the beginning stages until the latest committed stages. (ACS ET AL, 1997) Globalization traits have caught the attention of many researchers on having the negative role in the export barriers perception in small and medium enterprises (Katsikeas, et al,1994; Katsikeas, et al,1995).

The perceptual formation export obstacles have researched, particularly based on country's growth rate and organizational influence (Lages,2000). Which some other researches are mostly general in nature. Furthermore, other researchers (Morgan,1997), found three export obstacles categories of as approach barriers, activities obstacles, and information obstacles. Others, classified five aspects regarding the significance of obstacles in exports include on thinking entanglement in paper productions exporting. Cluster opinion that there are five driving forces in the significance of export barriers included on thinking entanglement in paper production exporting. These aspects were measured in regards to the global trade literature, and named as public export procedures, approximate market distance, and lower of export obligation, outside economic limitation and competitive rivalry. Export obstacles generally as internal and external. The internal obstacles are relevant with organizational resource capability and a company's approach to export trade (Leonidou,1995). Outside obstacle root from the home and host surroundings in the company acts and searched export obstacles in an analogical research among normally and outspread exporters (Katsikeas, et al,1995).

Significant groups of export obstacles based on finite magnanimity, unidentified chance, and absence of needful resources, unreal dread and administrative immovability in meaning of managerial standpoint. Bureaucracy, that is one of the elements of unofficial export obstacle, can further weigh an outside obstacle. The conception of export obstacles seemed to be different based on company sizes and cluster too. To support others propose that, however company measure can be interdependent in some barriers realized by managers, it could be defeated by including exporting tasks by devious manners (Mittelstaedt, J. D., et al,2003).

Many analysts, categorized export obstacles based on company size groups. Prepares an experimental evaluation of non-exporter realization, which prevents the beginning of export tasks with presumption, which these obstacles will influence, their further efficiency (Katsikeas, et al,1995). Furthermore, they propose that for analytical targets, interior obstacle can be broken down additional within actions, informational, and marketing; during the outside obstacles are divided into procedures, government, activity, and environmental. Export obstacles are classified into five wide areas: pecuniary, managerial, according to the market (comprising both local and global markets), industry particulars and company particulars (Shaw, et al,2004). Export obstacles are presumed to be the most significant obstacle, according to the market. The psychological obstacles are indicated to be the most important obstacles in export activity (Hornby, et al,2002).

Results demonstrate that there are a lot of divers in manager perceptual of export obstacles among the companies from every country, lending belief to divers export task levels. Study the penury influences of unofficial export obstacles e.g. transportation expenses, heavy custom operations, expensive rules and bribery. In poor countries, these unofficial obstacles, practice as export expenses which mutilate the efficacious assign of resources, they are decreasing salaries, lowering agronomical revenue, and increment destitution. Likewise, after controlling for self chooses prejudice and for driving force which may influence both export operations and Internet connection, companies with technology availability exported higher compare to alike companies. Internet availability influences organization and service companies to a like degree. Furthermore, researchers discover that Australian exporters using the Internet realized export obstacles to be more down in comparing to a sameness category of

exporters (Hornby, et al,2002).

8 Conclusions

SMEs in expanding into overseas global market made its challenges for entrepreneurs meet their standard and requirement from export nation countries. The impact of globalization, recession, ICT knowledge and business documentation should aspire SMEs becoming more competed within global competitors. Although this study does not reflect the empirical study of SMEs in Malaysia. To compete in today's global market, SMEs will need access to learn and willing to accept new advance ideas. For example, advanced technology has affected the ways in which global market documentation is prepared and shipped. As a conclusion, in this study given and overview of challenges and factors of Malaysia's SMEs in a global market environment. Furthermore, the Malaysian government has recognized the important of SMEs for the economy and has implemented policies, action plan and programs to support SMEs in these difficult circumstances.

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Employee Empowerment, Trust, and Innovative Behavior: Testing a Path Model

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Abstract: The motive behind this paper was mainly to uncover the trust mechanism in the field of employee empowerment and innovative behavior. It was hypothesized that structural empowerment and psychological empowerment will influence innovative behavior. Empowerment was also hypothesized to influence trust. We also posited that trust will act a mediator. Data came from 410 respondents employed in the manufacturing, banking, cement, telecommunication sector in Pakistan. Regression analysis proved our hypothesis. In the end, suggestions and recommendations have been given.
Key words: Empowerment; Trust; Innovative behavior

1 Introduction

Innovation is at the core of organizational success (Thornhill, 2006) and this role has been empirically evidenced also (Martins & Terblanche, 2003). The organizations rely on their best human capital in order to produce innovations. These are the employee who offer creative ideas which the organizations materialize into innovations and turn into their competitive edge (Patterson, Kerrin, & Gatto-Roissard, 2009). Given the importance of innovative behavior for organizations, understanding the mechanisms involved in innovative behavior is an important area of study. Strictly speaking, in the recent turbulent economic times, gaining innovative edge is also imperative to survival of an organization.

Innovative behavior is intentionally introducing new ideas, services, products, processes, and/or procedures in the workplace by an employee. These may be limited to an employee's own unit, may relate to a group or an organization as a whole (West & Farr, 1990). Innovative behavior is also "opportunity exploration, idea generation, idea promotion, and the implementation of ideas" (Scott & Bruce, 1994). Innovative employees look for opportunities to give novel solutions to. They propagate their ideas effectively. They build support for the implementation of those ideas. The conclude with idea implementation which also includes ideas testing, modification of the outcomes, and finally the commercialization (Dörner, 2012). According to Åmo (2006), innovativeness also includes modification of routines, simplification of work, service improvement, or giving new offers to customers. The innovative workers engage in any one or many of earlier mentioned activities at a time (Scott & Bruce, 1994). Yuan (2012) recalls that element of "newness" in all the descriptions of innovation does not necessarily entail that the idea has to be new for the world as a whole. Innovativeness implies anything that is novel for a particular context of the organization or individual. Moreover, innovativeness ranges from radical innovations to incremental (Axtell et al., 2000), from administrative to technological (Van de Ven, 1986), and from soft to hard.

Though, empowerment has already been found to relate with innovativeness, yet mediating mechanisms in this realm remain to chart out. In this study, we test a path model involving organizational trust as mediator. Moreover, the studies from a developing context are also lacking in the literature. We use the data from manufacturing sector of Pakistan.

2 Literature Review and Hypotheses
2.1 Empowerment and innovative behavior

Power refers to the "ability to get things done, to mobilize resources, to obtain, and use whatever a person needs to achieve the goals of the organization" (Kanter, 1993). The level of control which employees can exerciser over their work is linked with their performance. Power in formal connotation, means the decision making discretion. Alternatively, informal power is related with support and communication in the workplace (Kanter, 1993).

Employee empowerment is mostly view from two perspectives: structural, and psychological. Employees have structurally empowerment if they can approach information, support, resources, and

chances for learning and growth (Laschinger, Finegan, Shamian, & Wilk, 2004). Access to information occurs when employees have knowledge, both formal and informal, for the effective performance of their jobs. Likewise, they should also have technical knowledge and expertise and an understanding of decision and policies of organization. Access to support means receiving performance feedback from fellows, either superiors or subordinates, in the organization. Access to resources involves employees' ability to monetary resources, and implements required to complete their task (Kanter, 1993). The focus of structural empowerment is employee's actual interpretation of the work conditions (Laschinger et al., 2004). Psychological empowerment pertains to employees' psychological state of being empowered and having a feeling of control over their job (Spreitzer, 1995). In order to make psychological empowerment comprehend-able, Spreitzer (1995) cracks it into four dimensions: "meaning, competence, self-determination, and impact". Meaning refers to the correspondence between beliefs, values, behaviors, and requirement of job of an employee. Competence is confidence over one's abilities to do the job. Self-determination entails a state of mind that one has control over one's work. Impact is the feeling that one able to influence organizational outcomes. A difference to be noted between the two perspectives is that the former is the perception about the conditions empowering the employees in the workplace, whereas, the latter is the psychological reaction to such conditions (Laschinger et al., 2004).

Empowered employees offer novel ideas which otherwise are impossible. Empowerment facilitates employees to engage in "trial-and-error", a vital requirement in the process of innovation (Ramamoorthy, Flood, Slattery, & Sardessai, 2005). Empowerment allows experimentation and unconventional techniques which land into innovations and inspire original ideas (De Spiegelaere, Gyes, & Hootegem, 2014). Roberg (2007) shows that empowerment is related innovative behavior. Hence, we hypothesize that:

H1: Structural empowerment influences innovative behavior positively.

H2: Psychological empowerment influences innovative behavior positively.

2.2 Empowerment and trust

According to Mayer, Davis, and Schoorman (1995), trust occurs when party A is willingly vulnerable to the actions of party B while expecting that party B will perform an act important to the party A, regardless of party A's ability to control the action of party B. Party A would be trustor, whereas party B would be trustee in such situation. In essence, the trustor takes the risk to pose confidence over the trustee, and the trustor is vulnerable in such a way that he/she may lose something (Schoorman, Mayer, & Davis, 2007) in this interpersonal transaction (Bhattacharya, Devinney, & Pillutla, 1998). In organizations, employees do their tasks on the trust of supervisor (Bhattacharya et al., 1998). Trust may be either vertical or lateral. Vertical trust denotes employees' trust on their supervisor. Lateral trust entails trust between peer at a similar hierarchy in organization (Stull & Aram, 2010).

According to Laschinger and Finegan (2004), structural empowerment predicts trust in management. The environment which provides structural conditions to managers is responded by employees through increased trust in their manager. Laschinger, Finegan, and Shamian (2001) also held that structural empowerment develops a sense of psychological empowerment among employees which in turn builds trust of employees over their supervisor and organization. Moye, Henkin, and Egley (2005) found that empowered employees will function to eradicate mistrust between supervisor and employees. Moye and Henkin (2006) advise the way manager can improve trust among subordinates. They argue that when manager decrease dependence on control and monitoring mechanisms, employees feel empowered. They signal employees about the trusting behavior of bosses. Hence, empowerment and trust may be thought the relate positively.

H3: Structural empowerment influences trust positively.

H4: Psychological empowerment influences trust positively.

2.3 Trust and innovative behavior

Carmeli and Spreitzer (2009) have empirically connected trust with innovative behavior. They argue that trust creates a psychological contract between employer and employee. Psychological contract augments relationships with organizational peers. This relational connectivity affects thriving among individuals. The connectivity in turn, enhances employee innovative behaviors in the workplace.

Clegg, Unsworth, Epitropaki, and Parker (2002) has explained the role of trust in terms of; trust that heard and trust that benefit, in the process of innovation. They explicate that employees' trust that their organization will listen to their suggestions will have positive effect on idea implementation aspect of innovative behavior. In other words, the more the employees have belief that their suggestions are taken considerately, they will argue for the application of their ideas. Alternatively, the "trust that benefit" will operates at personal level. It is linked with the perception of outcomes and rewards. The more the employee have trust that their effort will bring rewards, the more they will engage in innovative behavior (Clegg et al., 2002).

Lastly, we also hunch that trust will intervene the connection between employee empowerment and innovative behavior. Empowerment develops a psychological feeling among employees that their organization rests trust upon them. One such feeling is developed; employees more likely go beyond the roles described for them. They engage in such behaviors which uniquely advantage their organization. Off such behaviors, innovative behavior is also a common behavior. Hence, we hypothesize that

H5: Trust will positively influence innovative behavior

H6: Trust will mediate the influence of structural empowerment of employees on innovative behavior.

H7: Trust will mediate the influence of psychological empowerment of employees on innovative behavior.

3 Methodology

3.1 Participants and procedures

The sample for this study was drawn from the manufacturing sector of Pakistan. In order to enhance the representation, we used a multistage sampling with a unique criterion at each stage. At the first stage, all the companies having an employee strength of at least 300 were selected from all provinces. Next, we randomly choose the companies in such a way that at least 5 companies are selected in each industry, that is, manufacturing, banking, textile, cement, and fertilizer.

We sent the questionnaire to at least 50 employees in every companies selected in each industry. Questionnaires were sent both by postage and using google forms. By both ways, 645 questionnaires were circulated across all the companies. The number of returned responses were 410, with response rate of 63 percent. After sorting the questionnaires for usability, 8 were discarded for lack of information. Hence the total usable sample was 402 responses. The sample comprised of 57% male and 43% female respondents. The average age was 29 years.

3.2 Measures

Innovative behavior was measured using the instrument of De Jong and Den Hartog (2010). It was measured on a behavioral frequency scale (1=rarely, 6=often).

Empowerment was measured across two dimensions: structural empowerment, psychological empowerment. The instrument on Conditions for Work Effectiveness Questionnaire – II (Laschinger, Finegan, Shamian, & Wilk, 2001) was used for structural empowerment. The factors of structural empowerment were access to opportunity, information, support and resources. For psychological empowerment, we used the scale by Spreitzer (1995). It was operationally defined in terms of meaning, competence, self-determination, and impact.

Trust was measured with the help of scale by Mayer and Gavin (2005). The scale consists of 10-items on 5-point Likert scale.

3.3 Control variables

Gender: the effect of gender was also controlled for spuriousness of inference. However, in this era, we may no longer assume any differences between males and females because now females have improved access to opportunities.

Age: was used age as control variable. It is generally observed that people usually tend to be more innovative at younger age because they are enthusiastic and have fresh ideas.

Education: was also used as a control variable.

4 Data Analysis

4.1 Descriptive results

The table below (see Table 1) shows presents a summary of descriptive statistics. All the correlations were significant ($p<.001$). For assessing convergent validity, average variance extracted (AVE) were calculated. All values were above 0.5. The constructs also had discriminant validity since maximum shared variance (squared correlations) were below AVE (Fornell & Larcker, 1981).

Table 1   Descriptive Results

Constructs	Mean	SD	AVE	1	2	3	4
IB	3.413	1.703	0.710	(0.251)			
SE	3.761	1.613	0.753	0.413	(0.321)		
PE	2.343	1.530	0.792	0.501	0.567	(0.321)	
TRUST	3.127	1.731	0.776	0.492	0.478	.541	(0.292)

IB=Innovative Behavior, SE=Structural Empowerment, PE=Psychological Empowerment, AVE= Average variance extracted

4.2 Confirmatory factor analysis

The hypothesized measurement model was test using AMOS. In the first run, the model fit values showed that model was fit (χ^2/df=2.981, CFI=0.971, TLI=0.987 RMSEA=0.31). A second model was also test to check if there were any method biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) whether there exist any alternative explanations of proposed measurement model. In this model, all the variables were loaded on a single factor. The model fit (χ^2/df=4.981, CFI=0.671, TLI=0.787 RMSEA=0.87) was out of the suggested threshold (Hu & Bentler, 1999).

4.3 Hypotheses testing

We ran linear regression for testing hypotheses testing. It must be noted that we ran separate regression models for structural and psychological empowerment. Baron and Kenny (1986) procedure was used to examine the inter-mediation model. The table below (see Table 2) reports the result of hypotheses. H1 states the structural empowerment has positive influence on innovative behavior. The results of regression analysis provide the support ($\beta = 0.405$, p<0.001). Similarly, in H2, psychological empowerment proved a positive predictor of innovative behavior as hypothesized ($\beta = 0.517$, p<0.001). Next, we regressed trust structural empowerment and psychological empowerment respectively. The results were same as posited ($\beta = 0.393$ p<0.001; $\beta = 0.418$, p<0.001). This also proved the second condition of mediation tested to be true. Third, we ran the model with trust as independent variable and innovative behavior as dependent variable. The hypothesis proved as proposed ($\beta = 0.402$, p<0.001). This also fulfilled the third condition of mediation. In the fourth and last step, we regressed the trust on structural empowerment, then trust on psychological empowerment and innovative behavior respectively. The results proved that fully mediated the effect of both structural empowerment and psychological empowerment separately on innovative behavior (see Table 2).

Table 2   Regression Results

Steps	Constructs	Standardized beta	Standard error	Adjusted R²
		Step 1		
Outcome	Innovative behavior			
Predictor	Structural empowerment	.405***	.031	.367
	Psychological empowerment	.517***	.027	.436
		Step 2		
Outcome	Trust			
Predictor	Structural empowerment	.393***	.034	.410
	Psychological empowerment	.418***	.045	.481
		Step 3		
Outcome	Innovative Behavior			
Predictor	Trust	.402***	.071	.383
		Step 4		
Outcome	Innovative Behavior			
Mediator	Trust	.306***/.351***	.082/.051	
Predictor	Structural Empowerment	.385***	.074	.513
	Psychological Empowerment	.485***	.041	.590

Note: results have been reported after controlling for Age, gender, qualification, and tenure. ***p<.001

5 Discussion and Conclusion

The results coincide with our underlying theoretical frameworks. This paper adds to literature by uncovering the trust mechanism in field of empowerment and innovative behavior. We advise the managers to be mindful of the fact of that employee empowerment is necessary for both trust and innovative behavior.

However, we remind that the cross-sectional studies lack the establishment of causality. Since, we also use cross-sectional data which may be a limitation for this study.

Further studies should be conducted with longitudinal design. Mixed methods may also bring in-depth conclusions. Across the occupation studies should also be conducted.

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The Influence of Mixed Ownership Reform to State-Owned Enterprises' Operating Performance

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Abstract: In July 2014, the first batch of four policies reform pilots was carried out in China, which marked a new round of mixed ownership reform on state-owned enterprises officially in full swing. In this background, firstly, this paper built a conceptual model which shows how the mixed ownership reform influences state-owned enterprises' corporate governance, and then further influences their operating performance. Based on this model, through empirical analysis, the results showed that, there are positive effects in different dimensions.
Key words: Mixed ownership; Reform of state-owned enterprises; Corporate governance; Operating performance

1 Introduction

The exploration and practice of China's mixed ownership reform has experienced a long process, until the end of 2013, as The 18th Plenary Session passed Decisions of Several Important Problems on Comprehensively Deepening Reform and the publication of 2014 Government Work Report, the prelude of Actively accelerate the development of the mixed ownership economy formally opened. Then the first batch of *four policies reform pilots* marked a new round of mixed ownership reform on state-owned enterprises officially in full swing. This round of mixed ownership reform aims at exploring the combination forms and routes of state ownership and market economy, in order to achieve the magnification and competitiveness promotion of state-owned capital. In this background, this paper tries to explore the specific influence of reform policies to state-owned enterprises' operating performance.

So far, empirical researches on the correlation of corporate governance and corporate performance has been relatively mature, recently policy researches about the mixed ownership reform of state-owned enterprises also have sprung up; but what is the specific influence of this new round of mixed ownership reform to state-owned enterprises operating performance is a worthy topic. The mixed ownership economy refers to an economic form, which integrates different ownership capital such as state-owned capital, collective capital, private capital. Decisions of Several Important Problems on Comprehensively Deepening Reform raised it to the height of China's basic economic system.

1.1 Foreign research review

Foreign mixed ownership reform models are as follows: "Temasek" model of Singapore, "hosting bureau" mode of Germany, "the introduction of the private system, relax market regulation" mode of The United States, "asymptotic private" model of Japan, "equity transformation" and "Mechanism reform" binary model of other western European countries.

Researches about the influences of corporate governance to enterprise performance: (1) Equity structure: Overly dispersed ownership structure makes a multitude of small shareholders have no enough incentive to supervise the operator (Grossman&Hart,1980). (2) The board of directors' characteristics: many scholars used Tobin Q to measure enterprise performance, and found a variety of relationship between the board characteristics and corporate performance. (3) Senior management incentive: Most scholars believe that there is significant positive correlation between the incentives of senior management and corporate performance (Mehran H,1995)

1.2 Domestic research review

In terms of mixed ownership reform: domestic scholars generally agree that the core of reform is property rights system reform and corporate governance. In the aspect of equity structure, traditional model of dominant state-owned capital should be abandoned (Wenkui Zhang,2006), equity diversification and diversity should be actively promoted (Xing Jing, Yangqing Ye,2014).

Influence factors to state-owned enterprises performance: reviewing the existing literature, researches directly on the Influence of mixed ownership reform to state-owned enterprises' operating performance are sparse. In view of corporate governance is the core of mixed ownership reform, researches about the influences of corporate governance to enterprise performance have a strong reference. Operational efficiency and performance of enterprises whose state-owned property right is relatively higher is lower (Yifan Hu ,2006). Corporate governance has a positive effect on return on

equity, while has a negative effect on price / book value ratio.

The selection of enterprise performance evaluation index has presented a trend from single indicators to multiple comprehensive ones (Donghui Shi,2004).

2 The Conceptual Model of the Influence of Mixed Ownership Reform to State-owned Enterprises' Operating Performance

Based on the above, combined with the understanding of relevant policies, the conceptual model is established in the following train of thought (as shown in Figure 1). The overall train of thought: the mixed ownership reform influences state-owned enterprises' corporate governance, and then further influences their operating performance. In particular, according to the first batch of *four policies reform pilots* of China's central state-owned enterprises, the government implements the pilots from four aspects: restructuring of state-owned capital investment company pilot; developing mixed ownership economy pilot; the board of directors exercising senior management personnel selection, performance evaluation and salary management pilot; dispatching the discipline inspection group to state-owned central enterprises pilot. And then it could be speculated that, the four pilots will probably influence corresponding aspects of corporate governance successively. The changes that mixed ownership reforms bring to corporate governance will probably influence state-owned enterprises' operating performance at market and finance levels.
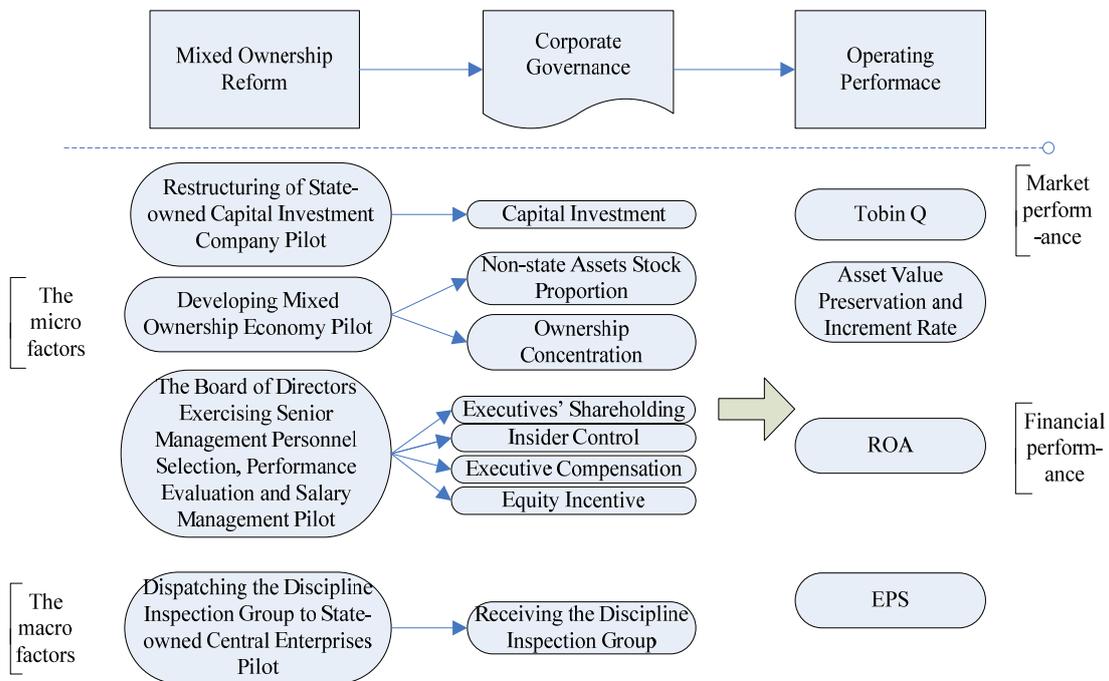
Figure 1   The Conceptual Model of the Influence of Mixed Ownership Reform to State-Owned Enterprises' Operating Performance

3 Empirical Research

3.1 Sample selection and data sources

The 22 listed companies of the 6 state-owned central enterprises under the first batch of *four policies reform pilot*s are chosen as research objects, the research samples are their relevant data disclosed from 2009 to the first half of 2015, each time node is half a year, there are totally 286 samples. Data is from the CMSAR database, annual and half annals report of the listed companies.

3.2 Research assumptions

Based on the above, the research assumptions are as Table 1.

Table 1   Research Assumptions

Assumptions	Influence Factors of Corporate Governance	Correlation relationship	Operating Performance Evaluation Index
1	Capital Investment	significant positive	Tobin Q
2	Non-state Assets Stock Proportion	significant positive	
3	Ownership Concentration	significant negative	Asset Value Preservation and Increment Rate
4	Executives Shareholding	significant positive	
5	Insider Control	significant negative	ROA
6	Executive Compensation	significant positive	
7	Equity Incentive	significant positive	
8	Receiving the Discipline Inspection Group	significant positive	EPS

3.3 Empirical research model

Tobin Q, Asset Value Preservation and Increment Rate, ROA and EPS are chosen as dependent variables, respectively represented by $Y_1 \sim Y_4$; capital investment, non-state assets stock proportion, ownership concentration, executives' shareholding, executive compensation, insider control, equity incentive, receiving the discipline inspection group are chosen as independent variables, respectively represented by $X_1 \sim X_8$; asset size is chosen as control variable, represented by Size. Accordingly, the empirical model of the influence of mixed ownership reform to state-owned enterprises' operating performance is as follows:

$$Y_i = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 + a_6 X_6 + a_7 X_7 + a_8 X_8 + a_9 Size + \varepsilon_i \quad (1)$$

(i=1,2,3,4; ε_i is random disturbance.)

3.4 Descriptive statistical analysis

Through the data processing of SPSS 19.0, the variables' descriptive statistical analysis is shown in Table 2.

Table 2   Descriptive Statistical Analysis

Variable	Variable Name	N	Min	Max	Average	Standard Deviation
Y_1	Tobin Q	286	0.1	8.75	1.5681	1.31136
Y_2	Asset Value Preservation and Increment Rate	286	-0.56	5.01	1.133	0.45768
Y_4	ROA	286	-11.88	18.34	3.5474	4.7927
Y_5	EPS	286	-0.86	2.41	0.3488	0.47168
X_1	Capital Investment	286	0	5.83	3.512	1.52022
X_2	Non-state Assets Stock Proportion	286	0.2	0.97	0.5187	0.13536
X_3	Ownership Concentration	286	0.02	0.5	0.2199	0.09881
X_4	Executives Shareholding	286	0	65.92	3.2112	12.30401
X_5	Insider Control	286	0	5	1.4301	1.10199
X_6	Executive Compensation	286	1.59	2.88	2.3494	0.2351
X_7	Equity Incentive	286	0	9.95	0.0348	0.58836
X_8	Receiving the Discipline Inspection group	286	0	1	0.3287	0.47055
Size	Total Assets	286	4.88	7.28	5.7394	0.58505
N		286				

3.5 Regression analysis

Based on the empirical research model, using SPSS 19.0, the regression results are summarized in Table 3.

Table 3 Multiple Linear Regression Results Summary Table

Dependent Variable		Y_1		Y_2		Y_3		Y_4	
Adjusted R Square		0.429		0.03		0.109		0.165	
Durbin-Watson		1.386		2.04		2.135		2.036	
ANOVA(b)		F	Sig.	F	Sig.	F	Sig.	F	Sig.
		24.826	.000(a)	1.995	.040(a)	4.872	.000(a)	7.248	.000(a)
Coefficients(a)		t	Sig.	t	Sig.	t	Sig.	t	Sig.
	(Constant)	13.553	0	2.402	0.017	1.504	0.134	-2.56	0.011
	X_1	6.153	0	0.558	0.577	3.796	0	3.086	0.002
	X_2	1.373	0.171	0.391	0.696	0.299	0.765	2.998	0.003
	X_3	2.079	0.039	0.226	0.821	-0.144	0.886	-0.391	0.696
	X_4	1.1	0.272	3.141	0.002	-0.008	0.993	0.648	0.517
	X_5	-1.078	0.282	-1.359	0.175	-3.191	0.002	0.008	0.994
	X_6	-1.631	0.104	1.002	0.317	3.229	0.001	3.149	0.002
	X_7	-0.43	0.667	-1.257	0.21	0.117	0.907	0.015	0.988
	X_8	2.521	0.012	0.079	0.937	-0.099	0.921	2.182	0.03
	Size	-12.344	0	-0.671	0.503	-3.911	0	-0.858	0.392

After using SPSS backward selection method to remove the independent variables whose regression results are not significant, using AR (1) first-order autoregressive model to modify the formulas that have residual autocorrelation in the DW test through Eviews6.0, the final regression model and regression results summary are in Table 4.

Table 4 Modified Regression Model and Results Summary

Dependent Variable		Y_1			Y_2			Y_3			Y_4		
Adjusted R Square		0.468			0.041			0.124			0.173		
Durbin-Watson		1.835			2.039			2.128			2.036		
ANOVA(b)		F		Sig.	F		Sig.	F		Sig.	F		Sig.
		50.917		0.000	7.052		.001(a)	11.123		.000(a)	15.926		.000(a)
Coefficients(a)		Unstandardized Coefficients	t	Sig.	Unstandardized Coefficients	t	Sig.	Unstandardized Coefficients	t	Sig.	Unstandardized Coefficients	t	Sig.
	(Constant)	11.146	16.707	0.000	1.170	26.289	0.000	6.392	1.608	0.109	-1.245	-4.715	0.000
	X_1	0.332	6.443	0.000	-	-	-	1.103	3.981	0.000	0.065	3.334	0.001
	X_2	-	-	-	-	-	-	-	-	-	0.607	2.918	0.004
	X_3	1.922	2.960	0.030	-	-	-	-	-	-	-	-	-
	X_4	-	-	-	0.007	3.208	0.001	-	-	-	-	-	-
	X_5	-	-	-	-0.041	-1.711	0.088	-0.990	-3.464	0.001	-	-	-
	X_6	-	-	-	-	-	-	4.882	3.566	0.000	0.430	3.396	0.001
	X_7	-	-	-	-	-	-	-	-	-	-	-	-
	X_8	0.322	2.608	0.010	-	-	-	-	-	-	0.119	2.141	0.033
	Size	-2.021	-14.608	0.000	-	-	-	-2.922	-4.291	0.000	-	-	-
	$Y_{i(1)}$	0.205	4.595	0.000	-	-	-	-	-	-	-	-	-

Modified regression models are respectively as formula (2) ~ (5):

$$Y_1 = 11.146 + 0.333X_1 + 1.922X_3 + 0.322X_8 - 2.021\text{Size} + 0.2045Y_{(1)} \qquad (2)$$

$$Y_2 = 1.170 + 0.007X_4 - 0.41X_5 \qquad (3)$$

$$Y_3 = 6.392 + 1.103X_1 - 0.990X_5 + 4.882X_6 - 2.922\text{Size} \qquad (4)$$

$$Y_4 = -1.245 + 0.065X_1 + 0.607X_2 + 0.430X_6 + 0.119X_8 \qquad (5)$$

4 Conclusions

In conclusion, most chosen influence indicators of mixed ownership reform, on the whole in different dimensions, have significant correlation relationship with state-owned enterprises' operating performance. It proves that, to some extent, mixed ownership reform has positive influence to improving state-owned enterprises' performance.

While the correlation between ownership concentration(X_3) and operating performance does not agree with the initial assumption, in addition almost no piloted state-owned enterprise has begun to adopt equity incentive, which requires further study.

Acknowledgements

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Analysis on Job Satisfaction and Turnover Intention of Core Staff in Micro and Small-Sized Sci-Tech Enterprises in Wuhan

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Abstract: The paper takes the core staff of Wuhan science and technology small and micro enterprises as the research object，and constructs the 11 dimensions of job satisfaction. Combined with descriptive statistical analysis, it analyzes the relationship between job satisfaction and employee turnover. The findings indicate that core talents of technology-based micro enterprises in Wuhan have certain turnover intentions. Their turnover intentions have a moderate negative correlation with job satisfaction. Core employees of technology-based micro enterprises are correspondingly pleased with colleagues, subordinate relationship and work condition, but they show relatively low satisfaction with salary, opportunities of training and promotion.

Key words: Micro and small-sized sic-tech enterprises; Job satisfaction; Turnover intention; Correlation

1 Introduction

The research and development employees account for a major proportion of the micro and small-sized sci-tech enterprises and master certain core technology. Such enterprises have played unimportant part in both the transformation of technological achievements and the accomplishment of innovation-driven development in China. These enterprises are developing rapidly in the fierce market competition with the help of their new products and technology. The talents who have a command of the new technology are keys to the survival, transformation and development of the enterprises, and are also an important factor that influences the enterprises' rapid growth. Therefore, how to avoid brain drain has become significant for their human resources management. As the important theme of human resources management, the job satisfaction has been studied as a dependent variable or an outcome variable. Studies have found that job satisfaction can influence the employees' performance, the rate of absenteeism, turnover rate, and physical and mental health. If the employees' turnover intention and its influence factors are known in time, measures can be taken to reduce the actual turnover behavior. Through the CNKI database retrieval, it shows a lot of research on the relationship between job satisfaction and turnover intention of Chinese and foreign literature. Wu Jingshan (2010) from the perspective of population characteristics studies factors influencing enterprise's R&D staff job satisfaction, she found that gender, age, annual income is of R&D personnel job satisfaction have significant effect, post to job satisfaction no significant effect. Tan Xiaohong (2013) thinks the factors that affect the job satisfaction of R&D personnel are salary, growth and development, work environment, work achievement, work itself, social support and so on. Wang Xueli (2014) believes that the reasons for the loss of R&D personnel include corporate factors, personal factors, social factors. Li Xianyin (2016) believes R&D of the distribution of equity, interpersonal justice and turnover intention are significantly related in the high-tech enterprises. However, the academic circles have not been related to the relationship between job satisfaction and turnover intention for Micro and Small-sized Sci-tech Enterprises.

In order to keep the talents and provide theoretical guidance for the talents management practice, this article takes the core talents of the micro and small-sized sci-tech enterprises as research subjects, investigates their job satisfaction and turnover intention and analyzes the correlation between these two aspects.

2 Research Samples and Scales

2.1 Research samples

The research subjects are the core staff of the micro and small-sized sci-tech enterprises, specifically referring to employees who have relatively high education background, master the professional knowledge and skills and play an important role in the enterprises' survival and development. This research is designed to investigate the enterprises in the micro and small-sized enterprises park of science and technology in Wuhan, involving 300 core employees from electronic information industry, software R&D service industry, industrial automation, industrial design, modern

services, precision machinery manufacturing industry and environmental protection industry. 300 questionnaires in total have been given out and 265 effective questionnaires have been obtained. The retrieval rate reaches 88.33%.

2.2 Research scales

This study employed the MSQ (Minnesota Satisfaction Questionnaire) that is revised by domestic researchers, with 5-point Likert scale to measure the subjects' satisfaction. One point means being the least satisfied and five means being the most satisfied. The higher the point is, the higher the job satisfaction is. The turnover intention scale in this study modified on the basis of the scale of Griffeth, Hom, Mobley and etc., includes two questions in total with 6-point Likert scale to measure the possibility for subjects to accept a new job. One point means being the least likely and six mean being the most likely. The higher the point is, the higher the turnover intention is.

3 The Reliability and Validity Analysis of Research Scales
3.1 The reliability of scales

By analyzing the research data of job satisfaction scale and turnover intention scale, it is concluded that the coefficient of job satisfaction scale is 0.932 and the coefficient of turnover intention scale is 0.814. The reliability of these two scales are both more than 0.70, which shows that the used questionnaire has good reliability and can be accepted.

The job satisfaction scale includes eleven dimensions that are the operators, the superior, further study, colleagues, development of achievement, promotion, administrative units, subordinates, working environment, social approval, and treatment (Valentine S, Greller M M, Richtermeyer S B ,2006). Except that the reliability coefficient of subordinates is 0.684, the others' reliability is all greater than 0.72, which indicates that the reliability coefficient of job satisfaction scale is high in every dimension.

3.2 The validity of scales

These extracted eleven factors of job satisfaction scale are consistent with those of the original design, and overall satisfaction presents high positive relativity with its eleven factors. The operators, the superior, further study, colleagues, development of achievement, promotion, administrative units, subordinates, working environment, social approval, and treatment of the eleven dimensions and overall satisfaction with the Pearson correlation coefficient was 0.762, 0.746, 0.707, 0.577, 0.825, 0.822, 0.716, 0.703 and 0.688, 0.790, 0.812. So it can be seen that the scale of job satisfaction has a good structural validity.

4 Analysis of the Core Staff' Job Satisfaction
4.1 Satisfactory aspects

Table 1 Descriptive Statistical Analysis of Job Satisfaction and Turnover Intention

	Average value	Standard deviation	Sample size
The operators	4.1070	0.42753	265
The superior	3.9281	0.48564	265
Further study	3.7485	0.63008	265
Development of achievement	3.8754	0.51758	265
Promotion	3.7083	0.62747	265
Administrative units	3.9561	0.45145	265
Subordinates	3.8977	0.47788	265
Working environment	3.9496	0.59140	265
Social approval	3.8246	0.58700	265
Treatment	3.7573	0.62130	265
Colleagues	4.1645	0.56720	265
Overall satisfaction	3.9016	0.40316	265
Turnover intention	3.4912	1.24086	265

From the data in Table 1 can be seen, the core talent for business operators and colleagues satisfaction average of more than 4 points, which shows that the core talent of the two satisfaction is

relatively high.

The dimension of the operators involves their own leadership, plans for the future, the importance and guarantee of employees' benefits as well as their communication with employees. Through the analysis, it can be found that the investigated core talents agree with the enterprise operators in terms of their management ideas, operating modes and communication with leaders, which reflects that the operators attach great importance to employees' benefits, which is recognized by core talents.

Meanwhile, this dimension involves the accessibility between colleagues, how they get along with each other, opportunity to make friends and cooperation spirit. It shows that the core employees have a friendly and harmonious relationship with each other. Such jobs meet their needs of social communication, which also indicates the harmonious and friendly interpersonal environment in the micro and small-sized sci-tech enterprises.

4.2 Satisfactory average aspects

From the data in Table 1 can be seen, the superior, administrative units, subordinate, work environment, development of achievement, social approval that several factors satisfaction level is not too high, the average value between score 3 and the score 4, namely, between general satisfaction and satisfaction.

Superiors, administrative units, subordinates and other factors are the social environment where the core talents work. These environmental factors include superiors' leadership and their communication ability, the interaction between external units and administrative departments, the leadership of one's own, and the ability to direct subordinates etc. (Allen D G, Shore L M, Griffeth R W ,2003). The reasons of the low satisfaction are as following: 1.the enterprises have no thorough communication channels, well-coordinated mechanism, smooth information delivery and harmonious relationship, and contradictions can't be resolved in time. 2. Insufficient contact with external enterprises and administrative department causes the obstruction of information and ill-informed connection. 3. core talents feel a loss of enthusiasm and creativity, because their leadership has not been exerted.

Work environment includes lighting, ventilating, equipment, traffic, operating funds, and the comfort of environment. The research findings show that the working condition in technology-based micro enterprises requires further improvement. It is obvious that good work environment can help enhance work efficiency and keep the core talents.

The other two dimensions----development of achievements and social approval mean the opportunity of developing abilities, a sense of personal achievements, social prestige and status. The study shows those core talents are not satisfied with their achieved personal value in working due to the very limited development space and opportunities, which leads to low job achievement.

4.3 Unsatisfactory aspects

Core talents in the three aspects of the average which include further study, promotion and treatment of the satisfaction row in the final. This shows that the incentive factors of small and micro enterprises of science and technology is insufficient.

On-job training involves the opportunities offered to core talents, the degrees of training and the training atmosphere etc. The research finds that core talents in technology-based micro enterprises hold a sense of crisis that no training brings no job. However, the enterprises don't provide them with enough training opportunities, which suggests micro enterprises have not attached great importance to training of the core talents and don't support them in terms of time and financial due to their inner problems in finance, management and system, thus the training atmosphere is unsatisfactory.

Promotion includes the policy, opportunity and the fairness of career advancement. In technology-based micro enterprises, core talents don't get full recognition and attention on promotion from their superiors. Due to imperfect promotion system, unfairness and injustice exist. Having no chance of promotion, core talents can't find an outlet to show their knowledge, skills and values, which limits their advancement and causes low social recognition.

Benefits include salary, welfare and stability of occupation. The data in chart 1 shows that if the order is put from high to low, the recognition of the core staff for their treatment in technology-based micro enterprises ranks low in job satisfaction dimensions among the 11 ranks, namely last but two, which indicates that there is a gap between core staff's expectation and reality, so they are dissatisfied. This reflects that enterprise managers, lacking of modern salary administration concept, have not established scientific salary system. Besides, it also shows that technology-based micro enterprises which start business on their own venture capital mostly are in the initial and growth stage, so it is difficult for them to meet the salary requirements of the core staff. Enterprises are willing to keep talents, but may not be able to provide stable positions and content material rewards for them, thus affecting

their core roles to create value.

5 The Core Staff Correlation Analysis Between Turnover Intention and Job Satisfaction

5.1 Turnover intention of core staff

According to the Table 1, the average of turnover intention of respondents is between 3-4, which suggests that their turnover intention is "hard to say" or "slightly likely to go". It shows that the core talents of science and technology small and micro enterprises have a certain turnover intention. The standard deviation of turnover intention is more than 1.2, which is much larger than the average standard deviation of job satisfaction. It shows that the core talent's turnover intention is more obvious individual differences comparing with the job satisfaction. And the influence factors of turnover intention are more complex.

5.2 Correlation analysis between turnover intention and job satisfaction

Table 2 The Correlation Analysis of Turnover Intention and Job Satisfaction

	The operators	The superior	Further study	Development of achievement	Promotion	Administrative units	Subordinates
Turnover intention Pearson Correlation	-0.318	-0.28	-0.315	-0.393	-0.336	-0.33	-0.325
Sig.(2-tailed)	0.001	0.003	0.001	0.000	0.000	0.000	0.000
N	265	25	265	265	265	265	265
	Working environment	Social approval	Treatment	Colleagues	Turnover thought	Turnover intention	Overall satisfaction
Turnover intention Pearson Correlation	-0.326	-0.391	-0.424	-0.004	0.444	1	-0.423
Sig.(2-tailed)	0.000	0.000	0.000	0.964	0.000		0.000
N	265	265	265	265	265	265	265

Table 2 shows the relationship between turnover intention and job satisfaction and their various dimensions. From the point of view of statistical data, the correlation between turnover intention and job satisfaction is medium-negative, which suggests that core staff are usually confident and self-reliant in a more dominant position in the workplace; their relationship with colleagues is not likely to affect their choice to turnover. This finding fully prove that technology-based micro enterprises should pay attention to employee satisfaction survey in order to keep core staff.

6 Conclusions

The findings indicate that core talents of technology-based micro enterprises in Wuhan have certain turnover intentions. Their turnover intentions have a moderate negative correlation with job satisfaction. The operators, the supervisors, administrative units, subordinates, working environment, further study, moved rise, development and achievement, treatment etc. factors are associated with turnover intention, and is negatively related to the role. But there is no correlation with their relationship with colleagues. Investigated core talents feel generally satisfied with most aspects of their enterprises. The satisfaction degrees from low to high are colleagues, the operators, administrative units, working environment, the superior, subordinates, development of achievement, social approval, treatment, further study, promotion. Core employees of technology-based micro enterprises are correspondingly pleased with colleagues, subordinate relationship and work condition, which suggests these enterprises enjoy good organizational atmosphere, harmonious interpersonal relationship and satisfying work condition. However, core talents show relatively low satisfaction with salary, opportunities of training and promotion, which reflects their desires for personal growth have not been satisfied and enterprises' incentive mechanism remains to be improved.

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Market Research and Suggestion of O2O Business Model to ZHOU HEIYA

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Abstract: O2O (Online To Offline) is a new e-commerce business model, emerging in recent years. The momentum of O2O business model development is very rapid, which has attracted a lot of financial support from venture capital institutions, and caused the extensive concern inside and outside the industry. It is very important to analyze the operation mechanism of O2O business model and research marketing route for O2O enterprise. This paper used exploratory case study of HUBEI "ZHOU HEI YA" Food Co., Ltd and took 550 consumers of pot-roast in Wuhan as a research sample. It suggested that ZHOU HEIYA should further enhance the consumers' recognition of O2O business model through strengthening interaction between online and offline; make full use of Wechat, mirco-blog and other online marketing channels; guide consumers to pay by online order system, in order to realize sound integration and interaction between online and offline. Finally, it predicted that the future of O2O business model will be a multi-level，multi-dimensional complex ecological system to keep the diversity and depth of development．
Key words: O2O business model; Physical store; Market survey; Interaction

1 Introduction

The rapid development of technology promotes the combination of traditional industries and the Internet，creating a new mobile international business model—Online To Offline(hereinafter referred to as the "O2O") business model. O2O business model combines the advantages of online shopping and offline shopping，has become a marketing innovation paradigm. With the continuous development of electronic information technology, electronic commerce presents the trend of rapid growth in China from 2009, online retail sales grow nearly 10 times from 2009 to 2014. However, by the end of 2014, online retail sales accounted for 10.6% of the total amount, means that nearly ninety percent of the business off the e-commerce, means that e-commerce is facing both opportunities and challenges, so that the research of business model that online and offline combined becomes extremely urgent; O2O model arises at the historic moment(WangShaSha,2015).

O2O business model is considered as a general commercial model where the customers book their merchandises and services online, then enjoy their services offline, which combines the offline business opportunities with Internet, turning the internet into a front stage of offline trade (Dongmin Kim, Izak Benbasat ,2009). The O2O business model has showing the increasing tendency currently, and it has been widely applied in fast-moving consumer goods (hereinafter referred to as the "FMCG") field, such as restaurants、entertainment、tourism and so on. Since Alex Rampel (2010) put forward the concept of O2O business model, it has arisen a universal and ardent discussion. John Doerr (2011) put forward the concept of "SO+ LO+ MO" firstly, which meant "Social+ Localization+ Mobile". The business O2O model has been divided into square model, mall model and agency model by LuYiqing, LiChen (2013). CuiJian (2014) belive that the current understanding of O2O business model has not limited to the initial concept of "Online To Offline". With the continuous development of commercial model, people's understanding of the O2O business model is also more abundant, such as "Offline to Online". O2O business model is a new style to promote the interaction between online and offline in consumption (Hangjung Zo, K. Ramamurthy ,2009).

Through the analysis of the above literature, we find that both domestic and overseas research play a fundamental role in enriching the O2O business model theory. But the concrete research on practice of O2O business model is rare. Thus, based on the data of Chinese FMCG industry, this paper used the new theory of marketing channel to put forward suggestions for construction of HUBEI "ZHOU HEI YA" Food Co., Ltd. (hereinafter referred to as the "ZHOU HEI YA") O2O business model.

2 Case Selection and Research Design
2.1 Case selection and introduction

In this research, we chose the typical case of Chinese FMCG industry to carry out exploratory research and summarize the O2O business model of the case subject. The case is selected to meet the following three conditions: firstly, the enterprise have a good brand reputation, high market share and advanced marketing channels in contrast to competitors in Chinese pot-roast industry. Secondly, the enterprise's traditional channel is mature. Thirdly, the enterprise has a new attempt and achieved some achievement in the O2O business model innovation. All of the above are shown in Table1.

Table 1   Introduction of "ZHOU HEI YA"

Company Name	HUBEI ZHOU HEI YA FOOD CO.,LTD		
Founding time	1996	Location of Formation	Wuhan
Registered capital	156 million yuan	Sales Revenue	2400 million yuan (2014)
Brand Concept	More entertainment More happier	Sales Network	600
Main Channel	Self-support Stores Business to Consumer	Output	50000ton/year

2.2 Research design
2.2.1 Research method
1) Literature research method
    In order to prevent the one-sidedness, this study used a variety of channels to gather information, including the use of monographs, journals, statistical yearbook and a certain amount of foreign literature to obtain indirect theoretical knowledge (Chen Jun, Sally Dibb,2010).
2) Questionnaire survey method
    Taking 550 consumers of pot-roast products market in Wuhan as the research sample, this paper wants to obtain recognitions, advices and suggestions of consumers to "ZHOU HEI YA" O2O business model through questionnaire and interview. The questionnaire contains 13 items, including 12 closed items and 1 open item.
2.2.2 Hypothesis
    H1：Consumers' recognition to O2O business model of "ZHOU HEI YA" is low.
    H2：Consumers tend to purchase products of "ZHOU HEI YA" in physical stores.
    H3: The integration degree is low and the interaction degree is weak between online and offline of "ZHOU HEI YA".
2.2.3 Sample definition
    The available sample is 543 eventually with effective rate of 98.72%, which meets the demand of marketing research basically. All of the above are shown in Table2.

Table 2   The Sample's Composition

	Category	Number	Proportion
Gender	Male	213	39.3%
	Female	327	60.2%
	Invalid	3	0.5%
Age	18-26	445	82%
	Above 27	98	18%
Occupation	Student	331	61%
	Freelancer	71	13%
	Office worker	141	26%

3 Survey Results Analysis
    The basic descriptive statistics analysis, correlation analysis and multiple response analysis were finished by using EXCEL and SPSS software.
    1) Male interviewee account for39% and female percentage is 61%, including 213 males and 327 females.
    2) The age of interviewee is mainly concentrated in 18~26, accounted for 82% of the total sample and the ratio of over 27-years-old is 18%. It revealed that the target market of "ZHOU HEI YA" is concentrated in younger groups. The number of students accounted for 61% of the total sample, freelancer and office workers accounted for 13% and 26% of the total sample respectively.
    3) The 168 interviewees understand O2O business model, accounting for 31% of the sample. However, 367 interviewees have no idea about the O2O business model, achieving 69% sample share,

which shows most consumers may have not pay attention to this new consumption model. Therefore, the O2O consumption model enjoys bright market prospect.

4) The physical stores are offline terminals, thus important nodes and strong points of O2O business model. Bad service attitude, inconvenient payment, cumbersome system of membership card and etc are all the main problems. The percentage of interviewees complaining about waiting for a long time for the dissatisfied service is 38.5%, so it is necessary to improve physical store's related services and promote the customers' shopping experience.

5) Consumers prefer traditional physical store shopping among three consuming models of the physical stores, Business to Consumer (hereinafter referred to as the "B2C") and O2O. The proportion of Consumers choosing O2O business model is 12.6% and that of interviewees selecting B2C business model is 13.2%.

6) The main channel of information receiving concentrate in physical stores, with the ratio of 53.4%. A half of information pushing is through online channels, including Wechat and Micro-blog, with the share of Wechat reaching to 19%.

4 Conclusions

This study found that consumers' recognitions and participations to O2O business model are low, especially female consumers. There is no significant correlation between age and recognition of O2O business model. There is a significant correlation among gender、age、occupation and recognition of O2O business model. The experience of O2O and occupation don't exist significant correlation (Blanca Hernández, Julio Jiménez, M. José Martin,2011).

1) "ZHOU HEI YA" should further enhance consumers' awareness of O2O business model., it is very important to future marketing activities.

2) According to the survey results, there is no fixed consumers group and are not concentrated in one age level or a professional category. It shows that "ZHOU HEI YA" should have a good guidance of consumers in different age and occupation in the field of O2O business model.

3) Customers still prefer to the traditional consumption models of "cash + merchandise" in physical stores. "ZHOU HEI YA" should further guide the customers' consumptive habits to make capital and information freely flowing on the Internet.

4) "ZHOU HEI YA" should establish its own CRM (Customer-Relationship-Management) system, in order to fully collect and analyze the big data. The service training on staff and the consumers' experience should be further strengthened to play a strong role of terminals in the O2O business model.

5) "ZHOU HEI YA" accumulates strong competitiveness on its reasonable structure and extensive layout of physical stores, which benefits to promote online marketing and payment and realize the interaction of online and offline. Therefore, the enterprise should further optimize promotion activities, increase information pushing channels, strengthen online news pushing, and provide customized information based on big data to accurate marketing, achieving virtuous and closed cycle of "drainage - conversion - consumption –response" for customers.

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Study on Tunneling Behavior of Substantial Shareholder and Its Regulation

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Abstract: In China it is common that the substantial shareholders tunnel the company to gain private benefits through connected transactions, dividend policy. These acts infringe the interests of minority shareholders, harm the healthy development of the capital market. After analyzing the data of the stock market, the paper draws the conclusion trough researching the relationship between the tunneling behavior of the substantial shareholders and external supervision that the relevant departments shall intensify supervision to curb the tunneling behavior.
Key words: The tunneling behavior; Connected transactions; Governance structure; Government monitoring

1 Introduction

Although our capital market has developed for many years, its legal supervision environment has been improved, it is a common phenomenon that the substantial shareholders of the listed companies tunnel the company and infringe minority shareholders' interests by connected transactions, dividend policy, capital occupying, reducing the holding and put it into cash and other methods. After the reform the shareholder structure, a series of regulatory measures involved in insider trading, connected transactions, information disclosure and other aspects have been introduced, which in a certain extent, protect the interests of minority shareholders. But at the same time, the substantial shareholders occupy the interests of the company also become subtler, which makes it more difficult for minority shareholders to find their tunneling behavior to make the wrong decision. Therefore, it is necessary to make in-depth study of tunneling behavior of the substantial shareholders.

Tunneling, also known as the "tunnel effect", is the activities of the substantial shareholders of the company gain the control benefits using control to occupy the interests of the company, which causes great harm to the capital market. Therefore, it becomes the focus of research at home and abroad. Abroad, Johnson, La porta and Shleifer (2000) put forward the concept of tunneling for the first time. It is pointed out that the concentrated ownership structure will lead to tunneling, controlling shareholders will transfer resources from the listed companies for its exclusive use through concealed way. Morck etal (1988) study concluded, when the substantial shareholders' equity gradually increases, it will gain private benefit through control. But when the control reaches a certain level, its concern is the interests of the company and will reduce occupying the interests of the listed companies. Wurgler (2000) study points out that tunneling behavior of the substantial shareholders will reduce the efficiency of the allocation of capital market and cause adverse effect on the investment and financing environment. At home, Li Zengquan, Sun Zheng, Wang Zhiwei (2004) study finds that the substantial shareholders increase their holdings, its occupation of the listing company's funds also increases, while holding to a certain proportion, the occupation of the listing company's funds reduces. Gao Lei and He Shaohua and Huang Zhizhong (2006) think that the concentrated ownership exacerbates tunneling of the substantial shareholders, while the equity structure of checks and balances has no impact on tunneling of shareholders. Wu Yuhui, Wu Shinong (2011) study think that when there exists interests conflict between management and shareholders, the substantial shareholders and minority shareholders at the same time, the higher the level of protection of minority shareholders, the lower the tendency of tunneling of the substantial shareholders. In the tunneling way, Liu Feng, He Jiangang (2004) study find that if the controlling shareholders have a higher shareholding ratio, they tend to take the connected transactions, high dividend to realize private benefit, while if the controlling shareholders don't have a high shareholding ratio, they take the capital occupying, related-party guarantee and other means to tunnel. With the deepening of these studies, theoretical support is provided for our country to regulate the capital market and protect the interests of minority investors.

2 The Meaning and Characteristics of Tunneling Behavior

"The substantial shareholders" means the largest shareholder in the company. There still exists difference in its meaning and that of the controlling shareholders. The controlling shareholders are shareholders who hold shares high enough to affect the company's major decisions and daily operation. Thus, the substantial shareholders are not necessarily the controlling shareholders.

"Tunneling" is also called "tunneling behavior", "benefit transfer", refers to the behavior of the substantial shareholders to occupy the interests of minority shareholders. The substantial shareholders use illegal means to occupy the interests of minority shareholders. They often take illegal means to cover up, pass false information to the capital market to affect minority shareholders to make correct judgment, at the same time, it also hinders the healthy development of the capital market. Tunneling behavior often has the following characteristics:

1) Tunneling is a kind of interest transfer behavior, which often happens at the cost of occupation of the interests of the other party or other more parties.

2) It is often the substantial shareholders of the company who implement the tunneling behavior, because the substantial shareholders often have higher shares, with advantage of information right, control and other. They can use connected transactions, related-party guarantee, capital occupation and other means to transfer interests so as to gain private benefits.

3) The tunneling behavior is hidden. To protect the interests of minority shareholders and investors, maintain the healthy development of the capital market, the supervision department formulate laws and regulations and the corresponding measures. However, tunneling behavior is on its contrary. In order to avoid supervision and punishment, the tunneling behavior of the substantial shareholders is often subtler.

3 Tunneling Way of the Substantial Shareholders

Domestic and foreign study find that the substantial shareholders use control, information right and other advantages to carry out tunneling behavior. They often have the following forms:

Use connected transactions to transfer profits. The substantial shareholders have the advantage of control. They usually take buying low and selling high with associated enterprises and trading activities, illegal guarantee, capital occupying, paying salary to executives and other mean to transfer profit between the substantial shareholders and companies freely, so as to seek their own interests. The connected transactions have various forms and concealment, therefore, it has become the most convenient and common means for the substantial shareholders to tunnel.

Use false statement of earnings management. Taking the advantage of information right in the company, the substantial shareholders shall not make decisions according to false statements. While due to the inferior position of information, minority shareholders can only make decisions based on the statements of earnings management. This unequal information provides the possibility for the substantial shareholders to occupy the interests of minority shareholders.

Use dividend policy to make a profit. Under the situation of controlled shifting resources, the substantial shareholders will take non benign cash dividend policy, to plunder the interests of minority shareholders for their own profit.

4 Analysis of the Relationship Between the Tunneling Behavior and External Supervision

In the study of the relationship between governance structure and corporate value, La porta (2002) et. al.   propose the LLSV model, pointing out that when separate control of the substantial shareholders and cash flow right, tunneling behavior may occur. But the model ignores the opportunity cost of tunneling behavior, namely the substantial shareholders may get the benefits not by tunneling but putting resources in the company. When private benefits from tunneling behavior is greater than the opportunity cost, the substantial shareholders have the motivation to tunnel. The opportunity cost is often due to the supervision to the capital market of the government departments. Under the assumption of the opportunity cost, the following models can be established to analyze and the parameters are set as follows:

a: cash flow right of the substantial shareholders to the company, $a>0$;

S: the proportion of the substantial shareholders to occupy the company's cash, $0<S<1$;

I: the amount of cash that the company has at the beginning;

R: return on investment invested in the company, $1+R>0$;

$C\,(K,\,S)$: the cost function of expropriation, that is, when the substantial shareholders occupy S

ratio of funds, the cost required to pay. In it K stands for the protection degree of protection of shareholders;

The cash received by the substantial shareholders of occupying S proportion of the company's funds is $SI-C$ (K, S);

r: the return on reinvestment of the substantial shareholders, $1+r>0$;

b: the cash flow rights of the substantial shareholders' reinvestment.

Earnings of reinvestment of resources transferred by the substantial shareholders by tunneling behavior is $[SI-C$（K, S）$I]$ （$1+r$）b, when the substantial shareholders don't tunnel and leave the resources in the company, earnings are SI（$1+r$）a, so, only when $[SI-C$（K, S）$I]$ （$1+r$）$b>SI$（$1+R$）a, tunneling behavior occurs.

We can get the following after arranging the formula: $1-C$（K, S）$/S>$（$1+R$）$a/$（$1+r$）b

The left end of the formula indicates the supervision of the government department. Among them, C $(K, S) / S$ is the proportion of the cost of tunneling of the substantial shareholders, $1-C$ $(K, S) / S$ is income ratio from tunneling of the substantial shareholders; and the right end of the formula indicates the company's characteristics. If the right end of is fixed, namely, the company characteristics are constant. The smaller C $(K, S) / S$, the bigger $1-C$ $(K, S) / S$. It shows that the lower the cost of tunneling behavior of the substantial shareholders, the greater the tunneling behavior motivation.

To analyze combining with the case of Hualun Group tunneled Sichuan Jinding Group Co., Ltd. After becoming the largest shareholder of Sichuan Jinding Group Co., Ltd., Hualun Group withdraw cash from the original company's cement industry for investment in the real estate and other business, eventually because of poor management and led to capital chain rupture. We can analyze the strength of investor protection needed to restrain the substantial shareholders to put all of the funds into the investment in real estate projects, assuming that the expected return rate of the actual controller of the investment in Jinding Group Co., Ltd. is R, the expected return rate of the actual controller reinvest in projects is r, the cash flow rights of the actual controller in Sichuan Jinding Group Co., Ltd. is a, the cash flow rights of the actual controller to reinvest project is b.

According to the website data disclosure of China Financial Consulting Co., Ltd., after finishing we can obtain gross profit margin, total asset return, net asset yield and other data of the building materials industry, the real estate industry in 2009 as shown in Table 1.

Table 1   Profitability of the Building Materials Industry and the Real Estate Industry in 2009

Profitability	Industry	Numerical Value
Gross Margin	Building Materials Industry	0.1776
	Real Estate Industry	0.3551
Return on Total Assets	Building Materials Industry	0.0581
	Real Estate Industry	0.0626
Return on Net Assets	Building Materials Industry	0.1014
	Real Estate Industry	0.1045

Then according to the 2009 annual report of Sichuan Jinding Group Co., Ltd., we can get the data of the control and cash flow rights of the actual controller of the company as shown in Table 2.

Table 2   The Control and Cash Flow Rights of the Actual Controller of Sichuan Jinding Group Co., Ltd. in 2009

Sichuan Jinding Group Co., Ltd.			Hualun Group			Cash Flow Ratio of Weight
Control （$V1$）	Cash Flow Right （$C1$）	Relative Ratio （$V1/C1$）	Control （$V2$）	Cash Flow Right （$C2$）	Relative Ratio （$V2/C2$）	
17.33%	8.84%	1.9608	51.00%	51.00%	1	1.9608

After determining the two factors of the cash flow rights and the expected rate of return, according to the tunneling model of the substantial shareholders calculated as shown, we can calculate the investor protection efforts needed to achieve by the law to constrain the behavior of the actual controller to tunnel the listed companies, as shown in table 3.

Table 3   The Investor Protection Efforts Needed to Limit the Substantial Shareholders to Put All the Funds to Invest in Real Estate Projects

Profitability Index	R	r	a	b	1-C（K, S）/S	C（K, S）/S
Gross Margin	0.1776	0.3531	8.84%	51.00%	15.43%	84.57%
Return on Total Assets	0.5881	0.0626	8.84%	51.00%	17.65%	82.35%
Return on Net Assets	0.1014	0.1045	8.84%	51.00%	17.68%	82.32%

Calculation results show, the investor protection efforts needed to constrain the tunneling behavior of the actual controllers is over 82%, namely, if investors occupies resources of RMB100 yuan, he should pay the cost of over 82 yuan. Such protection in China's securities market should be very high. After Hualun Group tunneled Sichuan Jinding Group Co., Ltd.was disclosed in 2009, the China Securities Regulatory Commission gave warning to Sichuan Jinding and imposed RMB 30 million in fines. Only from the point of view of the amount of the fine, if is much lower than benefits obtained from the tunneling the listed company, so it is not enough to achieve the regulatory effect.

5 Conclusions

Through the above functions, we can draw a conclusion, the supervision of the government will influence of tunneling behavior. To reduce the tunneling motivation, we must plus greatly the cost of tunneling, namely to strengthen the supervision and punishment. The conclusion matches the status of the China's capital market. Although the legal environment of China's capital market has been improved, but due to the relatively light penalties, compared with the benefits gained from tunneling the company, the cost of tunneling behavior of the substantial shareholders is much less, so the substantial shareholders of many listed companies would prefer to run the risk of being punished to tunnel the listed company for personal gain.

In order to promote the healthy development of the capital market and protect the interests of minority investors, the relevant departments should should strengthen the supervision and punishment, including increased administrative penalties for the securities regulatory departments, support civil litigation of minority investors and increase the criminal responsibility that the substantial shareholders should bear and other. So the regulatory measures can truly have a deterrent effect on the tunneling behavior of the substantial shareholders, raising their cost of tunneling, to decrease the tunneling behavior motivation.

Of course, to thoroughly check the tunneling of the substantial shareholders, it is far from enough solely relying on the external supervision mechanism, the company internal needs to improve its governance structure, establish the effective internal control mechanism, forming the monitoring system of independent directors, strengthen external information disclosure and other measures. Only within the company, external personnel and departments and make concerted efforts to adopt a variety of measures, to curb the tunneling of the substantial shareholders and to protect the interests of minority investors, can we promote the healthy development of the capital market.

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Development of Analytical Framework for SME's Competitiveness Based on Competency Approach

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Abstract: The purpose of this paper is to provide a theoretical rationale for investigating the relationship between entrepreneurial characteristics and the SME's performance at the firm level through adopting the concept of competitiveness incorporated with entrepreneurial competencies. The model distinguishes between two dimensions of competitiveness, assets and process and six areas of competencies of an entrepreneur with the in creating competitiveness scope and capabilities of the firm. A major contribution of the theoretical framework is the organization of the existing theories and findings in entrepreneurial characteristics, and future theoretical development and empirical studies of SME competitiveness can be made based on this framework.
Key words: SMEs; Competitiveness; Entrepreneurial competencies; Competency approach

1 Introduction

The Small and Medium enterprises (SMEs) have given much attention in the recent entrepreneurship researches due to their vital contributions in the global economy. The role of SMEs is very important specially in all developing countries where SMEs assist economic growth; improve income distribution, productivity, efficiency and economic structure during the economic downturn (Abdullah & Manan, 2011). The review by Rasmussen et al., 2011and Man, Lau, & Snape, 2008 has pointed out the use of sound theoretical frameworks in further investigating the relationships between a SME's competitiveness and its antecedents. The purpose of this paper is to develop a conceptual model linking the characteristics of SMEs' entrepreneur and firm performances based on the concept of competitiveness and the competency approach. The use of the concept of competitiveness therefore provides with a rationale for investigating the long term performance of SMEs. Following a review of the literature on SME competitiveness, three key aspects affecting an SME's competitiveness have been identified, including the internal firm factors, external environment and the influence of the entrepreneur. These factors in turn impact the performance of the firm. In particular, the influence of the entrepreneur is addressed by the competency approach from a process or behavioral perspective. Entrepreneurial competencies are considered a higher level characteristic encompassing personality traits, skills and knowledge and therefore can be seen as the total ability of the entrepreneur to perform his/her role successfully. This paper will conceptualize analytical framework to investigate the relationship of entrepreneurial competencies and firm level competitiveness of SMEs. In the proposed analytical framework, SME competitiveness dimensions are based on the world competitiveness formula introduced by Institute of Management Development and World Economic Forum in 1993.

2 SME Competitiveness

2.1 Competitiveness as a concept

Concept of competitiveness is applied in various level of studies including individual firm level, microeconomic level for industry and macroeconomic level for the national economies (Nelson, 2012). A review by Waheeduzzaman and Ryans (2006) also pointed out that the competitiveness concept involves different disciplines, such as comparative advantage, price competitiveness, the strategy and management perspective as well as the historical and sociocultural perspectives. Competitiveness can also be treated as a dependent, independent, or intermediary variable, depending on the perspectives from which we approach the issue (Mulatu, 2016). Competitiveness is a multidimensional concept, in simple terms, it is the ability to compete. It has become the name of the game today to describe economic strength of a country or industry or firm with respect to its competitors in the global market economy in which goods, services, people, skills and ideas move freely across geographical borders (Murths, 2008). Whatever the level of focus, competitiveness is ultimately concerned with the long term performance of the subject related to its competitors, which is the result of being competitive.

2.2 Models of competitiveness

There has been inadequate research on such practical importance of these competitiveness related frameworks and models. Porter (1998) defined competitiveness as implementation of value creating

strategy by a firm which cannot simultaneously implemented by competitor and particular strategy cannot be easily duplicated. Moving away from the traditional Ricardo idea of comparative advantage, Porter's diamond model aims to explain the competitive advantages of the nations. The competitive position of a nation depends on the factor endowments, demand conditions, the support of related industries, and the firms' strategy, structure and rivalry, argues Porter. Over years there have been many new developments in the field of competition. According to the Mulatu (2016), there is a two dimensional approach; one is at the level of analysis (nation, industry and firm) and the other is the types of used variables. In the ''world competitiveness formula'', ''competitiveness'' is a combination of assets, which are inherited or created, as well as processes, which transform assets into economic results. When using the term competitiveness, we need to consider not only the resulting performance or the potential or asset to generate this performance, but also the process for doing so.

Out of these possible approaches, this paper is focused on the firm level analytical framework. The Porter's view is not the only way to examine the competitiveness of the businesses (Ambastha & Momaya, 2004) besides traditional theories such as the Structure Conduct Performance (SPC) and the competency theories which provides a useful alternative to Porter's argument. The competency theories include the Resource Based Theory(RBT), the Dynamic Capabilities Theory (DCT) and the Knowledge Based Theory (KBT). A common characteristic of these theories that they give a decisive importance "to the firm's internal rather than to its external conditions for understanding its competitive market position" (Ambastha & Momaya, 2004). It is proposed to use the framework of assets, process and performances as proposed by Ambastha and Momaya (2004) and tested empirical data by Patlan-perez and Lara in 2012. Man et al. (2002) suggests three key factors for competitiveness of small and medium firms that have direct influence on the firm's performance: 1) internal factors, 2) environmental factors and 3) the influence of the entrepreneur. According to Man et al., (2002); in this paper we consider the dimensions related to the influence of the entrepreneur on competitiveness. According to the Patlan-perez and Lara, (2012); assets and processes have a direct positive relationship with competitive performance of the firm based on which dimensions analytical framework is developed.

Table 1 Dimensions and Constructs

Dimensions	Constructs
Assest	Financial, Operational, Human Resources, Technological, Image & reputation
Process	Strategic Management Processes (Competencies, Competitive strategy, Flexibility, Adaptability) Human Resources Process (Design and deploy talents) Technological Processes (Innovation, Systems, IT) Operational Processes (Manufacturing, Design, Quality) Marketing Processes (Marketing, Managing relationships, Persuading power)

Source: Ambastha & Momaya (2004) and   Patlan-Perez & Lara (2012)

3 Entrepreneurial Competencies
3.1 Influence of the entrepreneur

More importantly, for an SME, the process of achieving competitiveness is strongly influenced by the key players, highlighted as entrepreneurship factors in the framework. Even in the literature emphasizing the internal or external sources of competitiveness, these entrepreneurial factors are also stressed. For example, according Man et al. (2002), ''basic role played by the owner/manager'' is one of the major determinants of SME competitiveness because of the concentration of decision-making power in the owner/manager in an SME environment, consequently affecting the firm's overall strategy. This emphasis on the human factor is the key distinctive competence of small firms is the experience, knowledge, and skills of the owners and workers. Two of the critical success factors highlighted in the study of Mitchelmore and Rowley, (2010), are the ''experience'' and ''goal orientation'' of the small business owners. Mitchelmore and Rowley, (2010), also suggested that the ''total competitiveness'' is positively influenced by a founder who can pay attention to the detailed operations of the business when the business is small. In sum, all of these studies imply the influential role of the entrepreneur particularly in affecting the performance of the firm.

3.2 Entrepreneurial competencies

Entrepreneurial competencies are considered a higher level characteristics encompassing personality traits, skills and knowledge. Therefore, it can be seen as the total ability of the entrepreneur

to perform a role successfully. Entrepreneurial competencies are related with the performance of the firm and its competitiveness (Man et al., 2002), growth and success of business (Colombo & Grilli, 2005). The competencies are learnable; therefore, it is crucial to recognize the importance of competencies. Colombo & Grilli (2005) referred entrepreneurial competencies to the underlying characteristics such as traits, self-images, specific knowledge, motives, social roles and skills that lead to venture birth, survival its growth whereas Man et al. (2002) defined them as the entrepreneur's ability to successfully perform a job role. Thus, there is a general consensus that the competencies of entrepreneurs are possessed by those individuals who start and further develop their businesses. The small and medium businesses require skills and entrepreneurial competencies that are very much different than from larger organizations.

3.3 Competencies and SME success

The competencies of entrepreneurs make a business more successful and may lead towards its sustainable competitive advantage as well. Entrepreneurial competencies are related with the performance of the firm and its competitiveness (Man et al., 2002), growth and success of business (Colombo & Grilli, 2005). According to Mitchelmore and Rowley, (2010); the literature emphasizes different approaches to reveal the impact of competencies on performance. For instance, the entrepreneurs seek for better opportunities for their ventures and management competencies of entrepreneurs are related to formulate venture strategy that better fit with their businesses. Man et al. (2002) indicated ten areas of competencies of entrepreneurs which are innovative, learning, opportunity, analytical, human, relationship & commitment, strategic, operational and personal competencies.   In terms of a causal relationship, behavior is closer to performance than other entrepreneurial characteristics, such as personality traits, intentions or motivations (Colombo & Grilli, 2005). According to Ambastha and Momaya (2004), competencies are seen as behavioral and observable but only partly intra psychic characteristics of an entrepreneur. Consequently, competencies are changeable and learnable, allowing intervention in terms of the selection and teaching of entrepreneurship. These natures allow entrepreneurial competencies to indicate the controllability characteristic of competitiveness

According to Mitchelmore and Rowley (2010), the literature emphasizes different approaches to reveal the impact of competencies on competitiveness. For instance, the entrepreneurs seek for better opportunities for their ventures and management competencies of entrepreneurs are related to formulate venture strategy that better fit with their businesses. Ambastha and Momaya (2004) referred competency to the quality of entrepreneur's action that contributes to venture outcomes. Colombo & Grilli (2005), clustered the entrepreneur's competencies identified through the literature according to three basic roles such as technical skills, entrepreneurial skills and managerial role. They found that entrepreneur's competencies were related with venture performance. We have examined previous empirical studies in entrepreneurial competencies in an attempt to categorize all of the identified competencies into relevant activities or behavior in an SME context. Consequently, six competency areas are grouped together as opportunity competencies, relationship competencies, conceptual competencies, organizing competencies, strategic competencies and commitment competencies which are the independent variables in proposed analytical framework.

4 Analytical Framework

As per the framework, the characteristics of entrepreneurial competencies can be investigated from a process perspective, reflecting the actual behavior of the entrepreneur. These aspects are fit into the long term orientated, dynamic and controllable natures of SME competitiveness. They can be considered as higher level characteristics, representing the ability of the entrepreneur to perform a job role successfully and encompassing personality traits, skills and knowledge.   Formwork is designed answer the primary question of how competencies impacting competiveness by creating competitive scope and firm capabilities. The construct of competitive scope represents the perceived breadth for the firm to act. Previous studies have highlighted several measures to capture this construct, including technological sophistication, market heterogeneity, dynamism, market attractiveness, product/industry life cycle, environmental munificence, perceived opportunity, market demand, and competitive concentration (Colombo & Grilli, 2005; Ahmad, 2007, and Mitchelmore and Rowley, 2010). According to the Patlan-perez and Lara, (2012); business assets and processes have a direct positive relationship on competitive performance of the firm. According to the Mulatu, (2016), competitiveness can also be treated as a dependent, independent, or intermediary variable, depending on the perspectives from which

we approach the issue. Firm level competitiveness will be treated as dependent variable in this framework and asset competitiveness and process competitiveness will be the two major dimensions which will contribute to the overall firm level competitiveness. There are four measures have been identified to measure dimension of asset competiveness as; Financial Assets, Technological Assets, HR Capabilities, Image and Reputation as well as four measures to assess the competitiveness of the processes as Strategic Management Processes, Human Resources Process, Technological & Operational Processes and Marketing Processes.
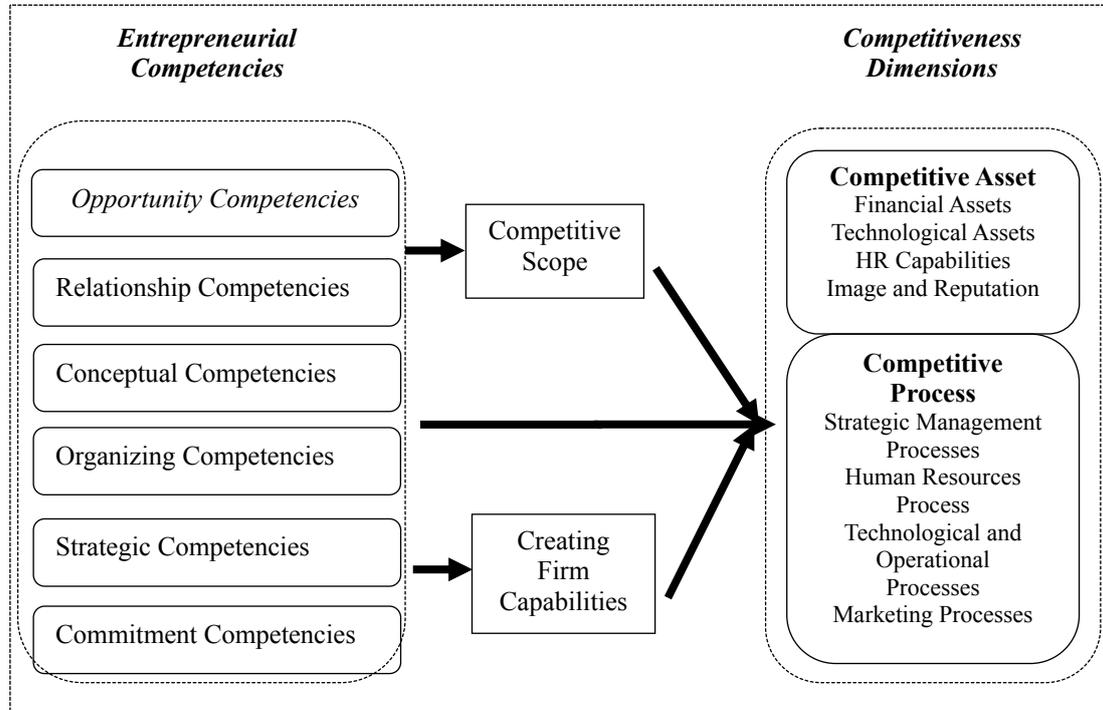
Figure 2   Conceptual Model (Source: Author Compiled,2016)

To investigate the relationship between entrepreneurial characteristics and SME's long term performance, the concept of competitiveness has adopted and incorporated with entrepreneurial competencies to provide a theoretical rationale. The model distinguishes between two dimensions of competitiveness, assets and process, and six areas of competencies of an entrepreneur with the scopes of creating competitiveness scope and capabilities of the firm. The use of the competency approach in particular provides us with a means of studying entrepreneurial characteristics as a kind of variable, which is less operationalized yet higher level and closer to performance. This should provide us with a more significant relationship than by using easily operationalized but lower level variables such as the entrepreneur's educational background, age, and experience.

As the theoretical framework focuses on the role of the entrepreneur in firm competitiveness, this will give better results with firms which are smaller in size and have a dominating entrepreneur, who is most likely to be the founder of the business. It is less readily applicable to SMEs without a dominating or founding entrepreneur, or to larger firms. This condition will have some limitations on the generalizability of the framework. However, upon modification, it can also be applied to the study of the strategic business unit for larger corporations. Another important factor of this framework is that an entrepreneur needs a balance between various competencies. Overemphasis on a few competency areas will not ensure the firm's long-term performance, which could be seen as a result of the moderating or interactive relationships of competencies and descendants of competencies. To illustrate, the lack of organizing competencies hinders the development of organizational capabilities, which in turn limits the use of strategic and commitment competencies

5 Conclusions

A major contribution of this theoretical framework is the organization of the existing theories and findings in entrepreneurial characteristics and firm performance around three entrepreneurial tasks, so

that further theoretical development and empirical studies can be made based on this framework. For instance, in terms of theoretical considerations, as it focuses on the central role of the entrepreneurial competencies in entrepreneurial tasks, it highlights the importance of the role of the entrepreneur in determining the firm's performance. Another implication from the framework is that an entrepreneur needs a balance between various competencies. Overemphasis on a few competency areas cannot ensure the firm's long term performance, which can be seen as a result of the moderating or interactive relationships of competencies and descendants of competencies. To illustrate, the lack of organizing competencies hinders the development of organizational capabilities, which in turn limits the use of strategic and commitment competencies

The model also calls for several related directions for empirical studies. First of all, while we have distinguished between six competency areas and other major constructs, we still need to identify which individual competencies lie in each area, as well as the appropriate variables within each construct. Further empirical studies in the form of qualitative methods are appropriate for investigating the competency areas in detail. It would also be of great value to carry out interindustry or cross-cultural comparisons of different competency areas, and look at how they affect other constructs of SME competitiveness.

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Non-Governmental Organizations' Responses to Street Children in China: A Case Study of Kunming City

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Abstract: In China, street children are a large group and the number is growing. In response to this issue, the government takes on the main responsibility of rescuing them from street life and reuniting them with their families. However, the needs of street children are diverse, and an innovative way of helping them is needed. Non-governmental organizations, which aim to help vulnerable groups of people, have gradually been taking more action to help street children in China. Through a case study of a non-governmental organization called 'Sweet Home Center' in Kunming, this paper aims to explore the non-governmental organization's responses to the problem of street children. The data are collected through in-depth interviews with nine street children and two workers at the Center. Findings indicate that the Center has a formalized service procedure of helping street children, as well as providing needs-oriented services to the street children.
Key words: Non-governmental organizations; Response; Street children; Case study

1 Introduction

The problem of children living on the street has already emerged as a common social phenomenon around the world and has elicited public concern. In China, the number of urban street children is growing: from an estimated 150,000 in 2000, in nearly a decade, the number increased to nearly a million. The recent national sample survey reveals the number of children living on the street has increased to 1 to 1.5 million (Ju, Zhang, & Chen, 2008).

In response to the problem of street children, Chinese government has taken action to solve this problem. A series of laws and regulations have been issued to protect children's rights, such as the Law of the People's Republic of China on the Protection of Minors, and a new policy towards street children implemented in 2003, transferring from a traditional compulsory repatriation system to a new social assistance system (Xue, 2009). Welfare services and organizational systems to protect and rescue street children groups are also established in China, called Protection and Education Centers (PECs), with the goal of protecting and educating street children and ultimately returning them to their own families and there were 130 PECs in China (Jiang, 2006). With the development of the problem of street children, the PEC system has received many criticisms. It is a working model in an administrative system from top to bottom and the service providers are in the role of the administrative authority for serving street children (Bi, 2008). PEC is described as having good hardware with cold management, a prison with no freedom (Lam & Cheng, 2008).

Non-governmental organizations have been gradually taking on responsibility for serving this needy population. Different from institutionalized rescue services provided by the government, non-governmental organizations provide community-based rescue services for street children, which means providing open, decentralized relief for children, based on their needs, in a community (Jiang, 2011). In Kunming, street children are easily found and the problems of street children are obvious. According to statistics from the Ministry of Affairs, Department of Yunnan Province, there are more than 20,000 children living on the street, and every year the government rescues, on average, more than 10,000 children from the streets of Kunming City. There is one non-governmental organization called 'Sweet Home Community Children Relief Service Center' (Sweet Home Center), which has been funded since 2004 with the goal of reaching out to all kinds of street children in Kunming and providing temporary shelter, counseling services, and family reunification to those who are willing.

In the current study, we are aiming to study how non-governmental organizations react to the social problem of street children. Taking Sweet Home Center as a case study, we want to explore how the Center is helping street children and what kinds of services are provided by the Center.

2 Methodology

This study explores the services of non-governmental organizations through a case study, which is helpful for a researcher to gain both a holistic and an in-depth understanding of the research in focus

(Baxter & Jack, 2008). The Sweet Home Center provides open and voluntary relief for all street children. There are no isolation mechanisms, such as an iron gate or a fence to restrain the street children, thus they have access to the services at the Center at any time, and they also can leave at any time. Reuniting the street children with their families is one goal, but not the only goal. Its ultimate goal is to re-integrate street children into society. There are two service sites visited during my fieldwork, one is the Outreach Site located in the urban area without sheltering services, and the other is the Children Village with sheltering, which is located in the rural area in Kunming. The Center also recruits couples to become the 'parents' of 'Semi-families', which are designed to operate as a real family. Usually, there are four to six adolescents in one Semi-family. The couples of the family act as parents of the family/house and the street children in the family treat each other as siblings.

The researcher spent six months staying in the Center and explored the responses of the Center in 2012. In the beginning, the researcher spent most of the time talking to and interviewing the workers, as well as reading some existing documents and files of the Center, to find out the history, background, and goals of the Center, and the profile of the service recipients. In the second stage, the workers invited the researcher to interact with all street children in the Center. Then, the researcher spent time building trust with all street children through playing with them, listening to their stories, etc. When sufficient trust had been built, the researcher invited a street child to attend an in-depth interview which aimed to find out about the lives of street children in the Center. Nine street children were recruited in the research. Interview questions were asked: How did you get access to the Center? What services did the worker of the Center provide to you? How do you feel? What have you experienced in the Center?

To make the results clear and easy to present, the researcher adopted coding to differentiate both samples. The coding is unique, denoted by one capital letter (C represents street children, W means a worker from the Center), and one Arabic number (which alters the sequence according to the time of the interview). Interviews were audio-taped on an electronic recorder for later transcription. Verbatim transcripts were typed out according to the interview recordings. The data were then coded according to themes and were analyzed for thematic strands emerging from what the respondents said.

3 Findings

Street children faced many difficulties in staying alive on their own over time on the street and sought help from all kinds of social resources; one of them is the Sweet Home Center. Findings indicate that the Center has a formalized service procedure in helping street children (See Figure 1).
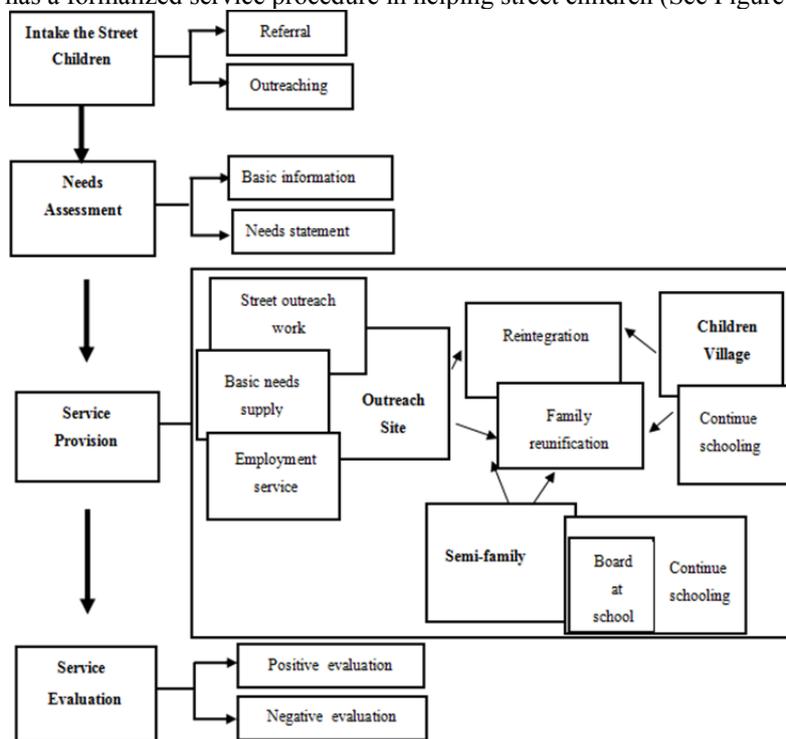
Figure 1   Service Procedure and Scope of the Sweet Home Center

3.1 Intake of street children

There are different ways for this group of children to leave life on the street and get access to the Center. The workers go to the streets themselves and put a lot of effort into outreach in order to help children get out of life on the street. Street children also seek or encounter other social resources, such as friends, police or others who help them to find a better alternative. All these social resources help this group of children get access to the Center. Of the nine respondents, C1, C4 and C5 met the youth outreach workers and were introduced to the shelter. Respondents C2, C8 and C9 were referred by their peers. The rest, respondents C3, C6 and C7, were referred by other sources, such as journalists.

Referred by law enforcement officials and other people. Local law enforcement officials were aware of the Center, and some of them preferred sending the street children there. Respondent C3 gave a typical example of his experience of being referred to the Center by the police: "I encountered the police near the railway station, and they asked me about my situation and family information. I was so afraid they would call my parents and that I would have to return home, so I lied to them saying I did not have parents. I thought they would let me go; however, they called the Center providing shelters to the street children, and a member of staff came to pick me up." The Center was also known in the community, and three respondents were referred by other people, such as journalists, scavengers, and others. For example, C6 recalled her experiences, saying: "I was sitting by the sidewalk, and one couple saw me. The man asked me if I wanted to go to school. They wanted to support me in taking me to school. The woman said there was a Center to help orphans and asked me whether I would like to go to the Center. I agreed. So later they sent me here." The street children know that if a child has parents, irrespective of their experiences, the authorities would send them back to parents. The Center was another community alternative and a buffer. Building a community reputation to mobilize all possible resources, such as police and media, is necessary to generate referrals of street children to the Center.

Outreach and building trust. Workers conduct outreach work on the street to identify possible street children and invite them to accept services. Trust is the first element that affects whether or not this group of children accept the services or not. Children do not trust outreach workers easily in the beginning, because of the self-protection mechanisms they have established. Certain techniques were helpful for the workers to build trust with the street children. Some street children went to the Center because outreach workers approached them and persuaded them to go to the Center for services related to getting a formal job. Respondent C4 gave a typical example of his experience of trusting the workers: "It was in November 2009 when I was distributing flyers on the street - two workers from the Center approached me and asked me whether I wanted to go the Center so they could help me to find a formal job. They told me that the job was washing cars, and I could be paid a certain amount of money each month. I wanted to have a try, so I came with them, assuming that the Center owned a car wash business of its own." Usually, friends were more easily trusted by the children, because they were familiar and trust had already had been built. Some children trusted the workers and agreed to accept services from their friends' suggestions. Respondent C1 gave a typical example of his experience: "That day I was wandering around the pedestrian street. There was a young woman who approached me and she said she was a worker for helping children, she asked me to go with her. I didn't trust her in the beginning, thinking she was a kidnapper. So I walked away. Later I knew from another child that she really was helping. So the second time I met her, I trusted her and came to the Center." Outreach to children instead of waiting for the children to approach the Center is helpful. There is a positive assessment of the community response from this group of street children, it helps other street children who live on the street become more likely to trust the workers and accept the services. Therefore, the community image has become a source of supporting information to the Center, especially when considering the effect of the street children's social networking.

3.2 Needs assessment

The newcomers, whether they were found by the outreach staff or referred by their peers or by law enforcement officials, initially stayed at the Outreach Site. They were first asked to take a bath. Then, one worker from the office invited the children to fill out a form, including basic information about name, age, education, hometown, family background, and family contact information. After entering the Center, a short time was given to all new entrants to adjust to the environment, as well as to getting along with peers and staff. During this adjustment period, all children were introduced by the worker to the rules of the Center and that their performance would be evaluated. The Center provides basic services, including three meals a day, a bed, daily recreation activities, and informal education. They also assign one staff member to follow up with each newcomer, providing counseling and case management. Behavior management is also a service. Through building trust between the children and

the staff member, the children are encouraged to indicate their willingness to discuss their developmental needs, to see if they want to attend school, return home, or find a job.

For most street children, the Center is a temporary place for transition. Respondent C7 provides a typical example of this situation: "The Center was a transitional place. Children were sent back home if the staff member had contacted their parents. If we do not want to go home, we could stay in the Center and learn something. In my mind the Center was a temporary place. I just wanted to give it a try."

3.3 Service provision

Those who do not want to return home or attend school, and who are not ready to work, are sent to the Children Village when the workers believe that they are ready, i.e., that their behavior and emotional status are stable. After a period of time, the Center arranges for contact, visits and mediation with the children's families, for those who want to return home. In most cases, however, the children do not want to return home. However, as the Center is not authorized to be a temporary guardian for the children, and they could not take on any legal liabilities for the street children's behavior, the Center has to contact the children's families and let them know that they are taking care of the children and try to mediate between the parents and their children. The workers of the Center successfully contacted four children's parents during the time period of this study, and they attempted to mediate between the parent-child relationships before reuniting them at their home. As introduced by the manager of the Center, W2: "The Center respects the diverse needs of the street children and provides them with more options. Its ultimate goal is to reunite street children with society". Thus, apart from providing basic life necessities, and reuniting street children with their homes, the Center also provides unique services for young adolescents, including setting up the semi-family care mode and developing independent living skills training services. The Center provides training to street children who neither want to return home nor to attend school under the semi-family care mode, but who hope to work in other firms (in our case, C4 and C6), helping them to seek jobs and to communicate with their managers.

The Semi-family is designed and operated as a real family. As introduced by W1 of the Center, there were three semi-families at the time of this study in 2012. She elaborated: "It is a unique care mode for those runaway young adolescents who do not have any intention of returning home but who want to attend school with the help of the Center. The Center recruits a middle-aged couple to become the 'parents' of a semi-family. The Center assigns street children who match certain criteria to join the semi-family. Usually, the Center conducts an assessment of children who want to join the Semi-family by observing their behavior and their emotional performance in their daily lives in the Center for two or three months, and by visiting their birth family and getting consent from their parents to the arrangement. Those who match the criteria - that is, those who are permitted by their parents and who are stable in their behavior and emotional state (such as not fighting with others, not leaving the Center without staff permission, etc.) - can join the semi-family. The children attend school in the daytime and return to the Semi-family at night. The Center provides financial support for their tuition fees and daily living expenses. The responsible staff member for each Semi-family visit the family once a week or twice a month, talking to both parents and to the young adolescents and conducting a follow-up assessment." Two of the research informants examined in this study have been part of a semi-family, C2 and C9. C2 treasured the education chances and studied hard. He completed his studies while living in the Semi-family and found a job with the help of the worker from the Center.

3.4 Service evaluation

At the time of interview, the respondents' positive experiences in the Center were reported; the help received, such as food, sleeping places, safe environment, outdoor activities, informal education, attending school, counseling, family mediation, assistance to seek jobs, etc. All these helped them stay in the Center and they expressed positive feelings about the Center; for example, C3 said, "The shelter is better than my home. I like to stay here. I can watch TV and play basketball." C4 added, "In the Center, the staff always organize outdoor activities for us, such as visiting a museum. Once they also took us to Lijiang City for camping. I really liked these kinds of activities." C9 said: "Here I can eat, I can sleep well and also some workers worry about me if I am still outside … Anyway, the Center is better than my home. If my (step-)father can change to be like the first time I saw him, but now it's impossible he can change. He will not stop beating me if I go back home. So I will not go back home."

The positive comments of the children indicated the overall services of the Center were effective in the areas of supportive services for the children, specifically health and schooling. However, the Center needs to do more. The limitations of the Center were reflected in the street children's negative comments toward the services, focusing on the following complaints: often changing the locations of the office and the shelter sites, making it difficult for children to find them (C4); strict regulations and rules and

limited freedom (C2); being bored in the daily routine (C1); being bullied by other children (C3); fighting with other children (C9), and feeling maltreated by the staff (C4), etc. Here are some examples the children recalled. C1 said, "Sometimes I feel no freedom here, so I just go out to the street for a walk, to see the outside world." C2 added, "The staff of the Center always ask too many things when I want to ask for leave and go out of the Center for something. I felt that they wanted to control me, so I don't like to tell them."

4 Conclusions

The findings indicate several important hints for future practice: outreach to children instead of waiting for the children to approach the Center is a more effective way to help street children. The Center makes efforts to build a community reputation – this is important and will help the general public refer the street children. From the street children's perspective, the Center is positively evaluated in providing shelter and food, but negatively evaluated as it lacks further incentives to motivate them to stay or lacks developmental assistance for them. Overall, the non-governmental organizations responses to street children is a large step forward in children's services in China. Different from the government's work, the non-governmental organization does not directly send them to back to their home but, through outreach work, assessment, basic services provision, and case management, provides services for street children which are more effective and successful. More community-based non-governmental organizations are needed in China and more professional development of these organizations are also needed to put them on the agenda.

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Study on the Impact of Ownership Structure on Earning Management

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Abstract: We attempt to explore the impact of ownership structure on earnings management, specifically, institutional investor ownership and managerial ownership within the China background. We utilize the Modified Jones model for non-financial Chinese firms listed in the Shenzhen and Shanghai stock exchange market, and try to examine this relationship for the entire research period (2005-2013). Our empirical results provide evidence that during the whole research period there is a significantly negative relationship between institutional investor ownership and earnings management in state owned enterprises (SOEs) and non-state owned enterprises (non-SOEs). Moreover, this study has provided further suggestions, specifically that the Chinese government should speed up SOEs' ownership reforms in order to enhance the function of constraints in corporate governance.
Key words: Earnings management; Ownership structure; SOEs, Non-SOEs; Managerial ownership

1 Introduction

Through the economic reforms in China between the 1980s and the 21st century, the country's economy has grown from 10% of the size of the USA's economy to over 2/3rds currently, thus attracting investment interest from all across the world (Allen et al. 2010). Firth et al. (2007) mention that China implemented an opening policy and transitional market economy in order to improve governance effectiveness of state owned enterprises (SOEs) and raise capital from domestic and foreign investors (Farh, et al, 2004). Li and Xia (2008) stated that it is commonly accepted that the governance function of SOEs is weaker than for non-SOEs in Chin. Although there is a rising number of SOEs reforming to non-SOEs, the former still take a dominant position in the market, and state ownership stands in a decisively controlling role. Moreover, in SOEs the government takes over all operational activities, including the appointment of senior managers. At the present time, interest towards determinants of earnings management has accentuated with the lower quality of accounting information, thereby influence decision-making of investors (Fernandez and Garcia, 2007). Agency theory is concerned with the fact that separation of ownership and operation in organisations might stimulate managers to adopt behaviours which serve their own self-interests (Arnold & Lange, 2004). To mitigate such opportunistic behaviour, corporate governance deems ownership structure mechanisms as essential devices in monitoring, disciplining and influencing managerial opportunism (Mallin, 2007). A number of different arguments have been made regarding how a company requires a suitable ownership structure, involving monitoring and governance functions with an effect on earnings management. (Beasley, 1996; Arya et al.1998; Klein, 2002). Overall, previous studies have put forward the idea that ownership structure can affect earnings management in firms. Therefore, the primary purpose of this research is to find the impact of shareholding structures on managing earnings in the Chinese stock market and to address whether ownership structure provides incentives to reduce earnings management behaviors both in SOEs and non-SOEs.

2 Data and Methodology

Agency theory predicts that ownership structure monitoring mechanisms can effectively align the interests of managers with those of the shareholders. Previous studies on the topic have suggested that ownership structure is one of the most important factors impacting corporate earnings management (Chung et al. 2002; Dechow et al.1996). Prior research supports these predictions in developed markets. However, in emerging markets, institutional settings such as ownership structure and regulatory oversight bodies differ across the world. Thus, the feasibility and sustainability of agency theory predictions are varied as well. Furthermore, there is little research difference between SOEs and non-SOEs, for example in China where most of listed companies are reformed from state-owned enterprises, whereas the corporate governance role of ownership structure is different for the two types.

With the unique institutional background of China and because investor protection is weak and the capital market is still evolving, there are significant differences between state-owned companies and non-state-owned companies. Therefore, this study addresses these issues and investigates the effectiveness of ownership structure monitoring mechanisms in mitigating earnings management in China and provides a comparison between SOEs and non-SOEs.

In accordance with the agency theory, separation of shareholdings and operations causes a conflict between the benefits of shareholders and managerial interest (Jensen & Meckling, 1976). Therefore, it is important that the decisions of managers should be monitored in order to protect the interests of the shareholders, which can also enhance the reliability and completeness of financial reporting (Iturriage & Hoffmann, 2005). The primary purpose of this research is to find the impact of shareholding structures on managing earnings in the Chinese stock market. The objectives of this study are to address whether ownership structure provides incentives to reduce earnings management behaviors both in SOEs and non-SOEs. Previous research by Jian and Wong (2004), Yang et al. (2008), and Liu and Lu (2007) compare several models and examine the effective of the Modified Jones model in China. Thus, the writers use the Modified Jones model for calculating discretionary accruals and multiple linear regressions utilizing data from China's stock market over a period from 2005 to 2013.

2.1 Sample selection

This study examined A-share firms listed on the Shanghai and Shenzhen stock market from 2005 to 2013. The reason for choosing this specific period is because 2007 is when Chinese accounting standards started to introduce IFRS convergence. Then, in order to control for potential industry effects, this study further introduces industry dummy variables and classifies 1109 sample firms into 14 categories in line with CSMAR industry code A. Since the main aim of this study is to compare how the effect of ownership structure differs between SOEs and NON-SOEs. Finally, sampling selection obtained 9963 observations during the period of 2005 -2013, including 6576 on SOEs and 3387 on NON-SOEs.

Table 1   Distribution of Final Sample Firms by Year and Type

YEAR	SOE	NON-SOE	Total Samples
2005	747	360	1107
2006	739	368	1107
2007	728	379	1107
2008	730	377	1107
2009	731	376	1107
2010	733	374	1107
2011	724	383	1107
2012	722	385	1107
2013	722	385	1107
Total	6576	3387	9963

Notes: SOEs are state owned enterprises, while NON-SOEs are non-state owned enterprises. In line with the Chinese market factors reviewed earlier, this table shows that there are mainly firms controlled by the government in the Chinese stock market.

2.2 Measuring of earnings management

The Jones model (1991) is the most popular model used in studies of accounting accruals, and is the most widely used model in earning management research and established significant market effects (Liu & Lu 2007, Jaggii & Leung 2007). Total accruals are used to measure earnings management, and can be categorised firstly into uncontrollable accruals (non-discretionary accruals, represented by NDA). Jones argues that uncontrolled accrued profit is the function of the company's operating income and fixed assets. Namely, there is a linear relationship between a company's operating income change and fixed assets, while NDA is calculated through regression analysis.

Firstly, total accruals (TA) are defined as the difference between net income before extraordinary items (NI) and cash flow from operating activities (CFO): TA=NI-CFO.

Then, following ordinary least squares (OLS) regressions to estimate the coefficients $\alpha 1$,$\alpha 2$,$\alpha 3$ for

the sample period from 2005 to 2013, the regression equation is as follows:

$$TA_{it}/A_{it} - 1 = \alpha_{1t}[1/A_{it} - 1] + \alpha_{2t}[(\triangle REV_{it} - \triangle REC_{it})/A_{it} - 1] + \alpha_{3t}[PPE_{it}/A_{it} - 1] + \varepsilon_{it} \quad (1)$$

Where: TA stands for total accruals, NDA means the non-discretionary accruals, ΔREVit are the changes in operating revenues, ΔRECit is the change in net receivables, PPE is gross property, plants and equipment, t and t-1 are time, i is the firm. A_{it}-1 is prior year total assets that are used to scaled variables in order to control for heteroscedasticity.

Following the calculation of non-discretionary accruals (NDA) as total accruals less discretionary accruals (DA), using TA_{it} the regression equation and TA=IN-CFO to estimate the coefficient values, αα1tα2t are inserted into the NDA_{it} equation to find NDA.

$$NDA_{it}/A_{it} - 1 = \alpha_{1t}[1/A_{it} - 1] + \alpha_{2t}[(\triangle REV_{it} - \triangle REC_{it})/A_{it} - 1] + \alpha_{3t}[PPE_{it}/A_{it} - 1] \quad (2)$$

Finally, DA is equal to total accruals less NDA, producing the equation below:

$$DA_{it} = TA_{it}/A_{it} - 1 - \alpha t[1/A_{it} - 1] + \alpha_{1t}[(\triangle REV_{it} - \triangle REC_{it})/A_{it} - 1] + \alpha_{2t}[PPE_{it}/A_{it} - 1] \quad (3)$$

Where, DA_{it} is the discretionary accruals, A is the total accruals, NDA is the non-discretionary accruals, ΔREV_{it} is the changes in operating revenues, ΔREC_{it} is the change in net receivables, PPE is gross property, plants and equipment, t and t-1 are time, i is the firm. A_{it}-1 represents the previous year's total accruals, which are used to scaled variables in order to control for heterosexuality.

3 Empirical Results and Discussions
3.1 Descriptive statistics
As can be known from the descriptive statistics (as shown on table 2), the averages of DA during 2005 to 2013 are very close. Specifically, the DA of the state-owned firms are slightly larger than those of non-state firms. Thus, it can be concluded that the amount of earnings management in state-owned companies is slightly larger than what is present in non-state-owned companies. Additionally, standard deviation of DA is relatively small in most cases, indicating that fluctuations of DA are not frequent or significant. Overall, there is no obvious trend, and DA have minor decrease volatility.

Table 2 Descriptive Statistics of Discretionary Accruals

Year	SOE				NON-SOE			
	Mean	Min	Max	Sd	Mean	Min	Max	Sd
2005	0.2583	0.0010	0.5989	0.0981	0.2328	0.0022	0.5285	0.0778
2006	0.2628	0.0031	1.1917	0.1271	0.2268	0.0133	0.6244	0.0844
2007	0.2548	0.0032	1.3829	0.1100	0.2319	0.0072	4.3047	0.2330
2008	0.2488	0.0052	1.1816	0.1101	0.2201	0.0002	0.9550	0.0894
2009	0.2503	0.0114	3.9222	0.1756	0.2183	0.0058	3.3847	0.1833
2010	0.2391	0.0021	1.9896	0.1284	0.2184	0.0018	4.3294	0.2384
2011	0.2372	0.0032	3.0822	0.1652	0.2136	0.0157	2.8100	0.1913
2012	0.2260	0.0033	1.5271	0.1213	0.2200	0.0021	2.6849	0.2365
2013	0.2273	0.0011	1.6517	0.1188	0.2047	0.0056	1.3465	0.1112
OBS	6576	6576	6576	6576	3387	3387	3387	3387

3.2 Correlation matrix
The data correlations for non-SOEs show that managerial ownership is negatively correlated with DA, meaning that earnings management are less frequent in firms with greater managerial ownership. In addition, institutional investor ownership and size present a positive correlation with discretionary accruals in SOEs. However, the research further shows that institution investor ownership is negatively correlated with discretionary accruals both in SOEs and NON-SOEs after the adoption of IFRS in 2007(as shown on table 2and table 3). Also, there is a significantly positive correlation between SIZE and DA, which shows that large firms tend to undertake earnings management behaviour both in SOEs and NON-SOEs. All in all, the highest correlation coefficient is 0.37673, and so the overall results show that there is a weak correlation among the variables, indicating that the variables do not have multi

co-linearity problems (Tabachnick & Fidell, 2001).

Table 3   Correlation of Variables from 2007 to 2013 in Soes

	DA	MAN	INST	SIZE
DA	1			
MAN	-0.0289 (0.7027)	1		
INST	-0.0796 (0.0000)	0.00949 (0.0034)	1	
SIZE	0.01780 (0.0000)	-0.01823 (0.0022)	0.30255 (0.0000)	1

Table 4   Correlation of Variables from 2007 to 2013 in NON-SOEs

	DA	MAN	INST	SIZE
DA	1			
MAN	-0.01121(0.0653)	1		
INST	-0.05803(0.0000)	-0.07939(0.0009)	1	
SIZE	0.017980(0.0000)	0.070801(0.0001)	0.37673(0.0000)	1

3.3 Regression results

From above data, it is clear that there are statistically adverse effects for institutional investor ownership when it comes to earnings management, for both SOEs and non-SOEs. This negative relationship conforms to past research conducted by Iturriaga and Hoffman (2005) and Ali, Salleh and Hassan (2008). Earnings management may be fundamentally diminished by companies with higher institutional ownership. Thus, increments in institutional ownership will diminish discretionary accounting accruals and institutional investors could efficiently supervise a company's earnings management behaviours both in private and state owned Chinese firms.

The results show that, following IFRS adoption, institutional investor ownership becomes negatively associated with earning management in SOEs, whilst there is still no association relationship between earning management and managerial ownership in SOEs. The results also find that before IFRS was adopted in non-SOEs, institutional investor ownership and managerial ownership both have a significantly negative effect on earnings management. However, after introducing IFRS into Chinese accounting standards, the results show that there is a negative, but not significant, association relationship between managerial ownership and earnings management. The possible reason for this is that IFRS adoption reduces the effect of ownership structure on earning management behaviors. Institutional investor ownership remains unaltered in its impact on earnings management in non-SOEs.

3.4 Summary of the regressions results

In short, it can be concluded that the findings of the regression show a negative but significant relationship at the 1% confidence level between the level of the value of discretionary accruals and institutional investor ownership for SOEs and non-SOEs between the years 2005-2013. However, at 10% significance level this relationship becomes significant, and is in line with earlier results established by Warfield et al. (1995) who noted a negative correlation between manager ownership and incidents of earnings management. Furthermore, the findings of regression also show that the IFRS adoption in 2007 had a negative significant effect on institutional investor ownership. This puts forward the idea that the level of discretionary accruals is expected to be lower in times of IFRS adoption, for both SOEs and non-SOEs.

4 Conclusions

This study measures earnings management through the modified Jones models of Dechow et al. (1995). As a result, empirical models are constructed in which the estimated earnings management measures represent the dependent variables. Independent variables in the empirical model ownership structure include institutional ownership and managerial ownership. These models are tested using the population of all firms listed on the A-shares of the Shenzhen and Shanghai Stock Exchange. Moreover, in order to examine the effect of IFRS adoption in China, data from 2005 to 2013 was used.

The results reveal that institutional investors appear effective in constraining accruals manipulations. From this, this study offers a different view of the agency theory literature, which focuses more on earnings management in general, and emerging market in particular. It highlights challenges to the applicability of the agency theory in emerging markets where corporate governance

mechanisms are supposed to mitigate the practice of earnings management. Moreover, when it comes to non-SOEs, the findings present that the adoption of IFRS has significantly affected the level of earnings management in the presence of ownership structure. Additionally, the results provide evidence that the level of institutional investor ownership in times of IFRS adoption changes a positive effect into a negative association relationship with earnings management in SOEs. This result means that IFRS adoption in the state-owned company achieves an effective inhibition of earnings management, and especially helps improve the governance effect of the institutional investors in the case of state-owned enterprises.

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A Study on the Influencing Factors of Income Disparity among the Elderly in China

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Abstract: China has stepped into the aging society since the beginning of the 21th century. With the population of the elderly on the increase, the aging quickening trend, supporting for the elderly has become the focus of the concern of the whole society. Income of the elderly, the economic source to sustain their daily life, plays an irreplaceable role in satisfying the demand of the elderly, while there are large gaps among different groups. Based on the baseline data of Chinese Health and Retirement Longitudinal Survey (CHARLS) (2011), this essay analyses the income level of the nationwide elderly and studies the determinants of income differences, and finds that apart from urban-rural disparity, the income level is also variable to gender, occupational background and educational background etc.
Key words: The elderly; China; Income disparity; Influencing factors

1 Introduction

China has been facing increasing pressure on the aging population in recent years, especially since it entered the aging society: the large population base of the elderly and the high speed of increasement. Statistics of China Research Center on Aging in 2014 shows that till the end of 2013, the number of people above 60 in China is 202,430,000, accounting for 14.9% of the total population; and the number of people above 65 is 131,610,000, accounting for 9.7% of the total population. As is forecasted by China National Committee on Aging, the number may exceed 400,000,000 when it comes to 2030, which aggregates the worries of scholars on China's greying (Hu Hongshu, Lu Yuanping, 2012). Aging of population with the national conditions of being at the primary stage of socialism, the country is facing the problem of "aging comes before getting wealthy", making the aging problem more prominent.

In nature supporting problem is an economic issue, and the core is income guarantee of the elderly, which is directly related to the quality of life of the elderly (Song Jian, 2006; Wei Pu, 2012). Though the endowment insurance system is increasingly improved, expanding coverage and providing better treatment gradually etc., and the government has issued relevant policies and regulations to guarantee the interests of the elderly, in reality, we may still perceive intuitively that a general income disparity exists among the elderly. Furthermore, among various aging problems, poverty and income disparity is the most basic and common one. Before most elderly people achieve common prosperity in material life, generally the level of income plays a determinant role in their living conditions, life satisfaction and quality of life (Wei Pu, 2012).

A certain gap between the rich and the poor is inevitable in market economy, but the gap in our country is much too large, which is close to 0.5 in the measurement of Gini coefficient (Li et all, 2013); income inequality deteriorates health conditions of the elderly, increases the probability of unhealthy elderly, thus affects their well-being (Hu Hongshu, Lu Yuanping, 2012). Therefore, increasing the income of the elderly and improving the fairness of income are beneficial to relieving or eliminating the concern of elderly over future economic conditions, improving their well-being and guaranteeing they could go through the last years of their life healthily with dignity.

2 Literature Review

Significant differences exist in income of the elderly. Based on the statistics of "one-time sampling survey on urban and rural aging population in China" (2000) published by China Research Center on Aging, to study on income disparity of the elderly in China, Wu Xiaolan (2008) makes analysis by using quinquepartite method, and finds out that significant income disparity exists among the elderly, more than half of the total income belong to 20% of the elderly who gain highest income (Wu Xiaolan, 2008; Liang Hong, 2011), indicating distinct imbalance of   income among the elderly.

First, take urban-rural disparity as start point to study income disparity of the elderly. In the past, we have followed the strategic policy of "lay stress on city not countryside, on industry not agriculture" in social economic development, shaping typical urban-rural dualistic social structure characteristics,

resulting in the different social economic development level of the city and countryside; and endowment security system construction shows distinct urban-rural dualistic structure characteristics (Wei Pu, 2006). Wei Pu (2006) makes a thorough study on urban-rural disparity based on income level and constitution of income sources, and finds out the urban-rural income disparity of the elderly is large; income levels of the elderly in rural areas is far lower than those in city or town; and the independence and stability of income of the elderly in rural areas is far lower than those in city or town (Wei Pu, 2012).

Second, take gender disparity as start point to study income disparity of the elderly. From two dimensions, namely absence of necessary legislation to ensure equality of men and women in doing household chores and the present retirement system in which it is stipulated that female shall retire from work five or ten years earlier than male, Cai Lin (2007) explores the causes for the general inferior position of income level of female elderly to that of male elderly. Both in city and countryside, the income level of female elderly is obviously lower than male elderly; female elderly's self-supporting ability and independence in economic life are far weaker than male elderly, and the degree of their economic dependence on other family members is much higher than male elderly of the same region (Zhu Xuhong, 2011; Wei Pu, 2012).

Third, take occupational background as start point to study income disparity of the elderly. Generally, income level of the elderly will decrease to some extent after they retire or lose ability to work; therefore savings are important supplementary guarantee in their later life. Disparity also exists among different stratums of society on the index of savings: those enjoy high level of income used to be cadres, the ratio of people with savings among science, education, culture and health occupation is higher than the ratio of those among workers and commercial services occupation, while the ratio of those among peasants is the lowest (Li Ruojian, 2007). In "Analysis on Income Disparity Status of the Elderly in Guangzhou", Liang Hong (2011) stresses the impact of urban-rural difference and occupational background on income disparity of the elderly, and suggests taking them as reference for policy making on solving the problem of economic support to the elderly. Occupational background plays an important role in living conditions and selection of supporting mode in the elderly, and the study further proves that different occupational backgrounds result in income disparity among the elderly.

Fourth, take educational background as start point to study income disparity of the elderly. No matter in city or countryside, the more education one attains, the higher is his/her income (Wu Xiaolan, 2008; Qian Xuefei, 2011). Wei Pu (2012) further points out that the elderly with higher educational background enjoy higher level of income, as well as independence and stability. The largest income disparity exists among three educational levels: primary school, junior middle school and high school. The income disparity between illiterate people and primary school graduates, high school graduates and university or above graduates is not large.

3 Study Design
3.1 Definitions
3.1.1 The elderly
As per international provisions, people above the age of 65 are defined as the elderly; in China, those above the age of 60 are the elderly, therefore, the subject of this essay is people above 60 years old.
3.1.2 Income of the elderly
The income of the elderly studied in this essay is shown as self-evaluated living standard of the elderly, which is divided into five levels: very high, above the middle, at the middle, below the middle and quite low; "1" represents very high, meaning the best income status, and "5" represents quite low, indicating the worst income status.
3.1.3 Occupational background
Since there is quite big difference in retirement system between city and countryside, this paper defines one's occupational background as his/her occupation before retirement or before 60 years old, more specifically, in city area, it refers to as the elderly's occupation before retirement, and in rural arears, it mainly refers to the last occupation the elderly undertakes before he/she gets 60.
3.1.4 Educational background
This paper takes the highest diploma one gets as his/her educational background, which is divided into 11 categories: 1) didn't attain formal education (illiterate); 2) didn't finish primary school, but capable of reading and writing; 3) went to old-style private school; 4) graduated from primary school; 5)

graduated from junior middle school; 6) graduated from high school; 7) graduated from technical secondary school (including secondary normal education and vocational high school); 8) graduated from junior college; 9) graduated with bachelor's degree; 10) graduated with master's degree; and 11) graduated with doctor's degree.

3.2 Data

The analysis of this study is based on the baseline data of China Health and Retirement Longitudinal Survey (CHARLS) in 2011. The respondents of CHARLS are middle-aged and elderly people above age 45, and the survey content is mainly family and personal status of them, which provides information about middle-aged and elderly people's health, employment and family relations status under the background of aging of population in China from a multi-disciplinary perspective. 17,000 respondents from about 10,000 families of 450 village/neighborhood committees of 150 counties are involved; the sample is relatively highly representative, which is significant to nationwide study. Data is collected through multi-stage sampling, and PPS sampling is conducted at county/district and village/neighborhood sampling stage.

Since the respondents of CHARSL are people above 45 and the subjects of this study are elderly people, therefore samples at and below 59 are eliminated. After selection, 10,539 samples data are acquired, ages of samples distribute between 60 and 105 years old, among which elderly of 60 to 69 account for 62.36% of the sample size; elderly of 70 to 79 account for 26.87% of the sample size; and elderly at and above 80 account for 10.77% of the sample size (Hu Shiyong, Nan Shunxia, 2016). The gender ratio of the sample is 0.9857, male taking up 49.64%, and female 50.36%. Rural elderly account for 75.47% and urban elderly 24.53%. The education level of the sample is: 1) didn't attain formal education (illiterate), those make up 34.91% of the sample; 2) didn't finish primary school, but capable of reading and writing, 19.65%; 3) went to old-style private school, 0.80%; 4) graduated from primary school, 22.61%; 5) graduated from junior middle school, 13.96%; 6) graduated from high school, 3.39%; 7) graduated from technical secondary school (including secondary normal education and vocational high school), 2.67%; 8)graduated from junior college, 1.22%; 9) graduated with bachelor's degree, 0.75%; 10) graduated with master's degree, 0.03%; and 11) graduated with doctor's degree, none. Self-evaluated income is divided into five levels, "very high" occupies 0.23%, "above the middle" 3.09%, "at the middle" 58.23%, "below the middle" 30.53%, and "quite low" 12.93%.

4 Results

As is compared in urban and rural areas, the income level of rural elderly is 3.586, and the urban elderly 3.439, generally the income level of rural elderly is lower than that of urban elderly.

Table 1   The Interaction between Each Variable and Income

Each Variable	Number of obs	Prob > F	R-squared	Adj R-squared	Root MSE
lUrban-rural Difference	6028	0.0000	0.0065	0.0063	.777327
Gender Difference	9665	0.2084	0.0002	0.0001	.76382
Background Difference	1492	0.0000	0.0312	0.0306	.68018
Educational Background	9664	0.0000	0.0135	0.0314	.75847

Under the condition of significance level being 5%, urban-rural difference shows effect of significance level to income disparity of the elderly (P=0.00). Under the condition of significance level being 5%, gender difference shows no effect of significance level to income disparity of the elderly (P=0.208).Under the condition of significance level being 5%, work unit difference shows effect of significance level to income disparity of the elderly (P=0.000).Under the condition of significance level being 5%, education difference shows effect of significance level to income disparity of the elderly (P=0.000).In a word, urban-rural difference、work unit difference and education difference have an impact on income. The person who has the higher level of occupation background and education with urban hukou has a higher income.

As is compared in urban and rural areas, the income level of rural elderly is 3.586, and the urban elderly 3.439, generally the income level of rural elderly is lower than that of urban elderly.

Table 2   Urban-rural Difference in Income Disparity among the Elderly

Rate Your Standard Of living	Area Type Taken Down by EWER		Total
	1 Rural	2 Urben	
1 Very high	9	6	15
2 Relatively high	127	62	189
3 Average	2333	778	3111
4 Relatively poor	1425	454	1879
5 Poor	711	123	834
Total	4605	1423	6028

Table 3   Gender Difference in Income Disparity among the Elderly

Rate Your Standard Of living	Gender		Total
	Male	Female	
1 Very high	10	12	22
2 Relatively high	164	135	299
3 Average	2506	2639	5114
4 Relatively poor	1536	1414	2950
5 Poor	563	687	1250
Total	4779	4886	9665

As is compared in gender, the average income level of male elderly is 3.518, female elderly 3.538, the income level of female elderly is relatively lower. Under the condition of significance level being 5%, gender difference shows no effect of significance level to income disparity of the elderly (P=0.208)

Table 4   Occupational Background Difference in Income Disparity among the Elderly

Rate Your Standard Of living	Gove rnme nt	institu	NGO	Firm	Invidual firm	Invidual farmer	Indidual household	other	total
1 Very high	1	1	1	1	0	0	0	0	4
2 Relatively high	25	26	2	20	1	0	0	1	75
3 Average	103	227	5	478	29	3	3	17	865
4 Relatively poor	39	92	5	267	32	6	3	10	454
5 Poor	8	17	1	48	12	3	2	3	94
Total	176	363	14	814	74	12	6	31	1492

As far as occupational background is concerned, the income level of elderly who retired from government sectors is 3.159, public institutions 3.269, non-profit organizations 3.214, enterprises 3.418, individual household 3.743, peasant household 4.000, household 3.875, others 3.483. Through comparison it is observed that the income status of elderly who retired from government sectors is highest, and that of peasant household is lowest. Under the condition of significance level being 5%, work unit difference shows no effect of significance level to income disparity of the elderly (P=0.000).

Table 5   Educational Background Distribution in Income Disparity among the Elderly

Rate Your Standard Of living	No form	Did not finish primary	Sishu	Eleme ntary	Middle	High	vacational	Associate	Bachelor	Master	Doct oral	Total
Very high	11	4	0	4	2	1	0	0	0	0	0	22
Relatively high	95	31	3	63	49	13	19	15	10	0	0	298
Average	1663	1031	47	1181	752	173	174	79	44	2	0	5146
Relatively poor	974	600	16	707	444	106	59	29	13	1	0	2949
Poor	581	262	6	253	106	28	9	0	4	0	0	1249
Total	3324	1928	72	2208	1353	321	261	123	71	3	0	9664

As far as educational background is concerned, the income level of elderly who didn't attain formal education is 3.607, those who didn't finish primary school 3.562, those who went to old-style private

school 3.347, those who graduated from primary school 3.517, those who graduated from junior middle school 3.445, those who graduated from high school 3.457, those who graduated from technical secondary school 3.222, those who graduated from junior college 3.113, those who graduated with bachelor's degree 3.154, those who graduated with master's degree 3.333. Generally, the higher is the educational level, the higher is the income level of the elderly. For each higher level of educational background, the income level increases 0.046.

5 Conclusions

Based on the analysis on baseline data of CHARLS2011, this paper explores the factors that influence income level of the elderly, and makes a concrete analysis on the influence of urban-rural difference, gender difference, occupational background and educational background to income level of the elderly.

The result is in consistence with previous ones (Dong Fang, 2014; Wei Pu 2006&2012; Wu Xiaolan, 2008; Liang Hong, 2011): urban-rural difference has greater impact on income level of the elderly; income level of rural elderly is low generally; compared with in the city, social assistance to rural elderly with low income from the government is far from enough. Urban-rural household registration system and the unbalance of urban-rural economic development result in the significant difference in urban and rural elderly's income. To narrow urban-rural income disparity, first we should take rural areas as the focal point, improve income level of rural residents, and pay close attention to those live in rural areas with agricultural registered permanent residence, since this group of people gain low level of income and are prone to poverty. In addition, the ratio of fiscal transfer payment should be improved, to tackle the problem of insufficiency of rural social endowment insurance funds, improve the welfare level, make changes to the urban-rural dual-division situation, and promote free and proper flow of labor force.

Most previous studies indicate that gender difference show significant influence to income level of the elderly, the come level of male elderly is much higher than that of female elderly (Wei Pu, 2012; Qian Xuhong, 2011; Cai Lin, 2007); while this paper shows that gender difference has no significant impact on income level of the elderly, which is quite unexpected.

Previous studies have found that occupational background has significant impact on income level of the elderly (Liang Hong, 2011; Li Ruojian, 2007), and it is further proved in this study that different backgrounds result in income disparity among the elderly. As the symbol of an elderly's social status at middle age, occupational background has great impact on income of the elderly, which means the higher is one's occupational status before he/she retires, the higher is his/her income level at old age.

Most studies show educational background has significant impact on income level of the elderly (Qian Xuefei, 2011; Wei Pu, 2012; Dong Fang, 2014; Wu Xiaolan, 2008): the higher is one's educational background, the higher is his/her income level, and the higher is the independence and stability of his/her income.

As the population of the elderly is continuously on the increase, and the aging of population is more and more serious, besides institutional supply from the national level, we shall also take initiative to make use of the main guarantee function of family, individual and the market, to establish a multi-pillar elderly security system, realize the combination of social supporting and family supporting for the elderly, make the two ways complement each other and promote development of each other; we should make sure social supporting for the elderly develops with economic development while consolidating and strengthening the beneficial traditional family supporting way, so as to ensure the elderly enjoy effective guarantee in later life, their income level actually improved, stability of their income secured, and their quality of life improved continuously; we should prevent poverty in old age, narrow income disparity, and realize social equity.

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An Empirical Research on the Relationship Between Sports Industry and Three Industries in China

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Abstract: The study carries out an empirical analysis on the relationship between sports industry and three industries in China by adopting econometric methods including correlation test, ADF test, cointegration test and Granger causality test. The study confirms the presence of cointegration, implying the long-run equilibrium relationship between the development of sports industry and three industries in China. Granger causality test confirmed the existence of bidirectional causality between the development of sports industry and tertiary industry in China. The major implication of the study is to clarify the status of sports industry in the national economy and to correctly understand the coordinated development between sports industry and three industries in China.
Key words: Sports industry; Three industries; Cointegration; Granger causality

1 Introduction

Since the 1980s, the sports industry has been emerging as a new industry worldwide. In the developed market economy countries, the sports industry has already begun to play an important role in the national economy. In America, the sports industry has ranked among the top ten pillar industries of its economy, the value-added of which accounts for about 3% of GDP. In 2014, the value-added of China's sports industry only account for 0.64% of GDP, but the development potential of China's sports industry is huge. In October 2014, the State Council of China issued the "Opinions on accelerating the development of sports industry and promoting sports consumption," which clearly puts forward that sports industry should be promoted to become China's new economic growth point and an important strength to promote economic structural transformation and upgrading.

Some scholars have studied the relationship between sports industry and economic growth. Molitor (1996) predicted that the leisure-oriented businesses would be the major driving force of the American economy. Meek (1997) put forward that since national output is measured by Gross Domestic Product (GDP), the output of the national sports industry should be measured by Gross Domestic Sports Product (GDSP). Michael and Pachianathan (2011) attempted at estimating the economic value of the sport industry in the United States in 2005 with a view of verifying the optimistic forecasts of the growth of the sport industry. Preuss (2004) analyzed some important economic aspects of holding the Olympic Games, such as tourism, exports, investments, revenues and expenditures of the Organizing Committee, and economic legacies. Fedderson and Manennig (2013) analyzed the economic impact of a mega-sporting event and found significant positive employment effects exclusively during the Olympic Games. Ren and Xia (2016) established the assessment indicator system of Chinese sports industry and proved a long-term equilibrium relationship between China's sports industry competitiveness and the level of economic development. Although extensive research has generally documented a positive relationship between sports industry and economic growth, the relationship between sports industry and three industries has received less attention. Sports industry is considered as an industry with long industrial chain and strong industrial relevance. Therefore, it is imperative to examine the linkage between sports industry and three industries, namely, primary industry, secondary industry and tertiary industry. Based on time series data from 2006-2014, this paper explores the interactive relationship between Chinese sports industry and three industries by adopting econometric methods including correlation test, ADF test, cointegration test and Granger causality test. This research is of great significance to clarify the status of sports industry in the national economy and correctly understand the coordinated development between sports industry and three industries in China.

2 Data and Methodology

GDP is defined as the market value of goods and services produced by labor and property within a country (Michael and Pachianathan, 2011). The value-added approach calculates the GDP through the subtraction of intermediate inputs from total sales at each stage in the production process. Sports

industry is a collection of economic activities which aims to provide sports services and products for the public (Chinese association of Sport industry, 2011). In accordance with the principles of economic computation, value-added approach was selected to measure the development of the sports industry in China. Data from 2006-2014 were taken from the "Statistical bulletin on sports and related industries" published by China's General Administration of Sport. Value-added approach was also selected to measure the development of primary industry, secondary industry, and tertiary industry in China. Data from 2006-2014 were taken from national statistical yearbook of China. All the series were transformed into natural log-form to eliminate the heteroscedasticity problem of time series. The variables are denoted as lnS, lnPI, lnSI, lnTI for natural log-form of the value-added series of sports industry, primary industry, secondary industry and tertiary industry respectively. The analytical techniques used in the study are described below.

2.1 Augumented Dickey-Fuller (ADF) unit root test
Many economic and financial time series exhibit trending behavior or non-stationarity in the mean. The task of the unit root test is to test whether a time series variable is stationary and possesses a unit root. The null hypothesis is generally defined as the presence of a unit root. A commonly used test is the Augmented Dickey–Fuller test (ADF test). The ADF test is utilized to check the order of integration by using the model (1):

$$\Delta y_t = \alpha + \delta T + \beta_1 y_{t-1} + \sum_{i=1}^{l} \beta_1 \Delta y_{t-1} + \varepsilon_t \tag{1}$$

where, $\Delta y_t = y_t - y_{t-1}$, ε_t is pure white noise term, α is the constant-term, T is the time trend effect, and l is the optimal lag value which is selected on the basis of Schwartz information criterion(SIC). The null hypothesis is that β_1, the coefficient of y_{t-1} is zero. A non-rejection of the null hypothesis suggests that the time series under consideration is non-stationary (Gujarati, 2010).

2.2 Cointegration test
    Cointegration test can be divided into two types: cointegration test based on regression coefficient and cointegration test based on regression residuals. This study adopted the latter method, which aims to test the regression residuals for stationarity. Regression equations are established between the sports industry variable and the three industries variables respectively by using ordinary least squares (OLS) estimation:

$$\ln PI = \alpha_1 + \beta_1 \ln S + \varepsilon_1 \tag{2}$$
$$\ln SI = \alpha_2 + \beta_2 \ln S + \varepsilon_2 \tag{3}$$
$$\ln TI = \alpha_3 + \beta_3 \ln S + \varepsilon_3 \tag{4}$$

    where, lnPI, lnSI, lnTI are the log-form of the value-added series of primary industry, secondary industry and tertiary industry; α_1, α_2 and α_3 are the constant-term, β_1, β_2 and β_3 are the estimated coefficient, $\varepsilon_1, \varepsilon_2$ and ε_3 are the error term.

2.3 Granger causality test
    The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. A time series X is said to Granger-cause Y if it can be shown, usually through a series of t-tests and F-tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y. Granger causality is performed by the following regression equation:

$$Y_t = \sum_{i=1}^{m} \alpha_i X_{t-i} + \sum_{j=1}^{m} \beta_j Y_{t-j} + \mu_t \tag{5}$$
$$X_t = \sum_{i=1}^{m} \lambda_i X_{t-i} + \sum_{j=1}^{m} \delta_j Y_{t-j} + v_t \tag{6}$$

    where, assume the random error μ_t is not related to v_t. The null hypothesis of Granger causality test is "X does not Granger Cause Y" or "Y does not Granger Cause X". In each case, a rejection of the null hypothesis will imply that there is Granger causality between the variables (Gujarati, 2010).

3 Results and Discussion
3.1 Correlation analysis results
    The correlation analysis was conducted between value-added of sports industry and three industries in China by using SPSS 19.0. Table 1 shows that the sports industry series and three industries series are highly correlated ($P < 0.01$). There may be mutual promotion between sports industry and three industries because of their significant correlation. Judging from the correlation coefficient, the sports industry has the highest correlation coefficient with tertiary industry, which shows that the relationship between sports industry development and the tertiary industry growth is the most closely related.

Table 1   Correlations Matrix of the Study Variables

variables	sports industry	primary industry	secondary industry	tertiary industry
sports industry				
primary industry	.995**			
secondary industry	.990**	.998**		
tertiary industry	1.000**	.996**	.991**	

Note. ****.** significant at $P < 0.01$ (two-tailed test)

3.2 Unit root test results

The results of the Augumented Dickey-Fuller (ADF) unit root test applied at level, first difference and second difference to the logarithmically transformed value-added are given in Table 2. The empirical evidence suggests that the series of lnS, lnPI, lnSI, lnTI have unit root problem at their level and 1st difference form. Thus, it is concluded that all the series are non-stationary at their level and 1st difference forms. The data became stationary after 2nd difference as absolute values of the ADF statistics are now greater than the 5 percent critical values of the test statistics. With the proof that all the series are non-stationary and integrated of the order I (2), then test for cointegration can be used to model the long-run relations.

Table 2   ADF Unit Root Test Results (including intercept and trend as exogenous)

variables	(c、t、k)	t-Statistic	Test critical values	Prob./%	remarks
lnS	(c、t、2)	3.691949	-3.877714	10	non-stationary
ΔlnS	(c、t、0)	-2.346296	-6.292057	10	non-stationary
Δ^2lnS	(c、t、1)	-18.69370	-8.235570	1	stationary
lnPI	(c、t、0)	-1.625025	-3.590496	10	non-stationary
ΔlnPI	(c、t、1)	-2.665414	-3.877714	10	non-stationary
Δ^2lnPI	(c、t、1)	-126.1954	-8.235570	1	stationary
lnSI	(c、t、2)	1.402134	-3.877714	10	non-stationary
ΔlnSI	(c、t、1)	-2.386618	-3.877714	10	non-stationary
Δ^2lnSI	(c、t、1)	-11.36265	-8.235570	1	stationary
lnTI	(c、t、2)	1.532879	-3.877714	10	non-stationary
ΔlnTI	(c、t、1)	-3.648632	-3.877714	10	non-stationary
Δ^2lnTI	(c、0、1)	-4.186479	-3.694851	5	stationary

Note. c denotes intercept ;t denotes trend; k denotes lag length , which is determined by SIC minimum; "ln" denotes added-value in logarithmic form; Δ denotes 1st difference; Δ^2 denotes 2nd difference.

3.3 Cointegration test results

Cointegration test was carried out to test the variables by using Eview 6.0，yield：

$$\ln PI = 0.657184 \ln S + 5.534301 \tag{7}$$
$$t \quad (40.38299) \quad (44.25755)$$
$$p \quad (0.0000) \quad (0.0000)$$
$$R^2 = 0.995726 \quad D.W. = 2.222898$$
$$\ln SI = 0.700725 \ln S + 6.733980 \tag{8}$$
$$t \quad (31.95528) \quad (39.96521)$$
$$p \quad (0.0000) \quad (0.0000)$$
$$R^2 = 0.993192 \quad D.W. = 1.525815$$
$$\ln TI = 0.848961 \ln S + 5.574419 \tag{9}$$
$$t \quad (111.3143) \quad (95.12139)$$
$$p \quad (0.0000) \quad (0.0000)$$
$$R^2 = 0.999435 \quad D.W. = 1.609138$$

From the said equation (7-9), R^2 is close to 1 and the coefficients are statistically significant (P< 0.01). The fit of the model is adequate. And then run out stationarity test on the estimated residual series. Table 3 presents the results of residual unit root test. The results indicate that the null hypothesis is rejected, that is, the residual series are stationary. According to the principle of cointegration, it can be

concluded that there is a cointegration relationship between the development of sports industry and three industries. 1% increase of Chinese sports industry will promote the primary industry, the secondary industry and the tertiary industry increases by 0.6572%，0.7007% and 0.8490% respectively, which implies the development of sports industry exerts greater influence on tertiary industry than primary industry and secondary industry.

Table 3   ADF Unit Root Test Results for Residual ε_t

variables	(c、t、k)	t-Statistic	Test critical values	Prob./%	remarks
ε_1	（0、0、1）	-3.140178	-2.937216	1	stationary
ε_2	（0、0、0）	-2.094211	-2.886101	1	stationary
ε_3	（0、0、0）	-2.187386	-2.886101	1	stationary

Note. c represents intercept; t represents trend; k represents lag length, which is determined by SIC minimum

3.4 Granger causality test

Based on correlation analysis and cointegration test, there's a more significant relationship between sports industry and tertiary industry. Thus, Granger Causality test was conducted between lnS and lnTI. Table 4 presents the results of Granger causality test.

Table 4   Granger Causality Test Results

Null Hypothesis	Lags	F-Statistic	Prob.	Granger cause	Direction
lnS does not Granger Cause lnTI	2	12.1834	0.0759	Yes	Bidirectional
lnTI does not Granger Cause lnS	2	67.1429	0.0147	Yes	

The results indicate that there exists bidirectional causality between the development of sports industry and tertiary industry in China. The sports industry granger causes the tertiary industry which in turn provides the feedback to the former as well. Sports industry can effectively stimulate the development of related industries such as cultural industry, tourism industry, financial and insurance industry which belong to the tertiary industry, thus promoting the optimization of industrial structure. At the same time, the upgrading of industrial structure can promote people's demand for sports consumption, thus promoting the development of sports industry.

4 Conclusions

The objectives of this study were to examine how the development of sports industry relates to the three industries in China. To achieve the objective, this paper carries out empirical analysis on time series data of the sports industry and three industries in China during 2006-2014 by employing econometric methods. Conclusion can be drawn as follows:

1) Chinese sports industry is closely related to three industries, which indicates that the sports industry, with its long industrial chain and strong industrial relevance, play an important role in stimulating the national economy development. The relationship between sports industry development and the tertiary industry growth is the most closely related.

2) The results of cointegration test have indicated that there is a cointegration relationship between Chinese sports industry and the three industries, which suggests the existence of a long-term equilibrium association across them. The development of sports industry exerts greater influence on tertiary industry than primary industry and secondary industry. In the long run, 1% increase of Chinese sports industry will promote the tertiary industry increases by 0.8490%. Sports industry is supposed to be the leading role of the development of tertiary industry even the national economy, which will be the remarkable feature of the next phase of Chinese economic development.

3) Granger Causality tests have indicated that there's a bidirectional Granger causality between the development of sports industry and tertiary industry in China, which implies the mutual promotion between sports industry and tertiary industry. During the period of economic restructuring and vigorously developing the tertiary industry, the sports industry should be supported as strategic pillar industry of national economy. It is, therefore, suggested that the sports industry should constitute an important force promoting the optimization of industrial structure, transformation of the economic development mode and sustainable development of economy and society.

Acknowledgement

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A Research on the Relationship Between Corporate Culture and Management Performance Based on a Fuzzy Evaluation Model

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Abstract: This paper has made a research on the relationship between corporate culture and management performance based on a fuzzy evaluation model. Corporate culture includes five dimensions, such as entrepreneurship, corporate values, business philosophy, business environment and corporate culture network. Management performance includes task performance and peripheral performance. The conclusion is that corporate culture has a greater impact on task performance, while it has a deeper great impact on peripheral performance. In comparison, corporate culture has a more significant impact on peripheral performance.

Key words: Corporate culture; Management performance; Task performance; Peripheral performance

1 Introduction

The corporate culture concerns with the rise and fall of the corporate. Once established, it will exert a huge influence on the management performance.The success model of every corporate differs but the failure of some corporates in essence results from the failure of the corporate culture.At present, the research on the corporate culture has attracted great attention of the academic and theoretical circle.Corporate culture as a modern corporate management theory supported by the approach、 the function and the power of the culture relies on the infusion of the corporate value in every aspects, every level and all processes of the corporate management to promote the development of the comprehensive quality, level of management and the economic benefit(Chen Guangjin ,2009).The spirit of the entrepreneurs, the value of the corporate, the philosophy of the corporate, the corporate environment and cultural network in some way influence the operation and the development of the corporate, which also influence the task performance and peripheral performance. The paper on the basis of the extension of Fuzzy Evaluation Model analyzes the influence of the five dimension of the corporate culture on the task performance and peripheral performance.

2 Brief Review of Related Researches

2.1 Research on the corporate culture and corporate performance

Via the survey method,Denison has found that there is an obvious correlation between the culture characteristics and performance of the corporate(Denision D.R,Mishra A.K ,1995). Besanko and some other people have put forward three approaches for the corporate culture to create value: first, to optimize the information processing of the corporate;second, to reduce the cost for security; third, to enhance the activity of corporate members(Besanko D.，Dranove D. & Shanley M ,1996). Zhang Yirong analyzes the influence of the corporate culture on corporate performance from the perspective of transaction cost(Zhang Yirong ,2004).Ni Zhen and Wu Zhixia elaborated on the connection between the corporate culture and corporate performance from the perspective of stakeholders(Ni Zhen,Wu Zhixia, 2006）. Li Ning and Yang Huixin believe that the effects of the corporate culture are reflected through its influence on the activities of corporate members and further the performance and made an argument analysis on the relationship between corporate culture and corporate performance via the use of the Game Theory(Li Ning, Yang Huixin, 2006）.

2.2 Research on the corporate culture and performance management

Yu Shizhong points out that the mutual relationship of corporate culture and performance management: (1)corporate culture is the basis of the performance management which is the foothold of the corporate culture. (2)the enforceability and operability in the real practice should be fully taken into consideration in building the corporate culture and the operation of the corporate culture should be highly connected with the development direction of the corporate set by the corporate culture, which would lay a solid foundation for the strategic goal of the corporate culture. (3)Both are highly dependent. The corporate culture has been put into practice via the performance management and the later upgrades its operation approach via the former(Yu Shizhong, 2007).Li Bin has pointed out in the paper *The Research on Performance Management Based on the Corporate Culture* that the corporate culture plays

the leading,connective,intangible standard and inner-and-outer coordinated role in performance management and the latter actively secures the corporate culture(Li Bin ,2007).

2.3 Research on the corporate culture andperformance management

Compared with the researches on the relationship between corporate culture and management performance, research fruits of corporate culture and performance management are less. Kotter and Heskett have selected corporates from 22 different fields and carried out the research on the connection between individual culture and management performance and pointed out that the cultural influence is more than any other factors(John P. Kotter, James L. Heskett, 1997).In the paper *the example research on the private corporate culture building and its relation with the management performance*, Jiang Tainting carried out the research on the relation between the corporate culture and management performance and on the basis of the task performance and peripheral performance, he made the innovative research on the management performance and put forward the relation between corporate culture and innovation performance(Jiang Tianying, 2004).

All in all, scholars home and abroad have carried out researches on the relationship between corporate culture and corporate performance from different aspects, but researches on the corporate culture and performance management are insufficient which is the turning point of the research of this paper.The paper based on the vogue comprehensive evaluation model, elaborates on the effects of five elements of the corporate culture including the entrepreneurs spirit, values,management philosophy, corporate environment and culture networking on the management performance (task performance and peripheral performance).

3 Research Method and Research Tool

3.1 Research method

It is impossible to quantify the research on the relationship between the corporate culture and management performance and thus the fuzzy comprehensive evaluation model is adopted in the paper.

The application processes of the fuzzy comprehensive evaluation model are as follow(ShaoChunyan, Liu Xuesheng, 2007):

1)Make sure of the establish evaluate factors.According to the characteristics of the first grade factor in the evaluation index system，evaluate factors are made as $U = \{u_1,\ u_2,\ u_3,\boxed{\omega},\ u_n\}$.

2)Determine the evaluate factors. Suppose the establish evaluate factors are $V = \{v_1,\ v_2,\ v_3,\boxed{\omega},\ v_n\}$

3)Set the singlefactorevaluationmatrix R from U to V. To make evaluation of the single factors towards every single factor $u_i\ (i \leq n)$ .However there m kinds of evaluation catogories(comments), the evaluation results towards every single uiand the vogue vectors are written as $R = \{r_{i1},\ r_{i2},\ r_{i3},\boxed{\omega},\ r_{im}\}$ $((i=1,2,\boxed{\omega},\ n), R_i \in U\ (V)$ .The above evaluation results are suitable for the normalization and all components sum up to 1 in another word that for every i, there is $r_{i1}+r_{i2}+\boxed{\omega}r_{im}=1$ .The evaluation of all single factors consist the vogue relationship from U to V $R : R = (r_{ij})_{nm}$ i.e. B set.

4)Set the indicator weight.Weight is the amount every measurement accounts in measurement system according to its importance.The influence of every single factor on the judged matter differs.Given every single factor u_i a weight a_i , the weight-distributed set A will be regarded as a fuzzy set on establish evaluate factors U, and therefore recorded as $A = \{a_1,\ a_2,\boxed{\omega},\ a_n\}$

It is requested to satisfy the normalization condition: $\sum_{i=1}^{n} a_i =1$ ， and mean while $0\langle a_i \langle 1$

5)Make the judgement.The judgement results can be made through the index weight vector multiplying the single factor evaluation matrix R: $B = A \times \boxed{\Re} = \{b_1,\ b_2,\boxed{\omega},\ b_m\}$.
$A = \{a_1,\ a_2,\boxed{\omega},\ a_n\}$。Satisfy the assimilation：$\sum_{i=1}^{n} a_i =1$ ， and meanwhile $0\langle a_i \langle 1$。

6)Get the judgement.Assimilate the B set,i.e the sum of all components in B divides every single

factor in B set.

3.2 Research tool

3.2.1 Corporate culture

American managerialist William Ouchi pointed out in his work *Z theory——How American Company Deal with Japanese Challenges,* published in 1981that the main factor that Japanese corporate succeed is their unique corporate culture（Liu Xinhong, 2008）. The corporate culture is the certain cultural concept, value normalization, moral norm, ceremonial customs, traditional customs and the related production concepts etc. Corporates rely on the culture to organize all sorts of power and units the power under one guiding thoughts and economic philosophy (Lv Jun,2009).

Scholars home and abroad uphold different views on the components of the corporate culture. Professor Quinn and Professor Cameron developed OCAI on the basis of view of competition value and divides the corporate culture into four main types including patriarchalclan，vigor, market and level(Cameron K.S.，Quinn R.E.,1998). The TMCT (Theoretical Model of Culture Traits) set up by Professor Denision divides the culture characters into four types, including the flexibility, mission, compatibility and engagement. OCP scale put forward by Professor Chatman includes innovative, stability, respect for the members, result-oriented, details focus, initiative and team-oriented. Chinese scholars have also carried out the research on the elements of the corporate culture, and all in all interpersonal harmony, innovation-orientation, entrepreneur spirit and member development have been added. Because the paper focuses on the research on the relationship between the corporate culture and performance management and there is a close connection between the performance management and high-level managers,therefore the elements this paper selects are entrepreneur spirit,corporate value,economic philosophy,corporate environment and corporate network.

3.2.2 Performance management

Motowidlo and Scotter (1994) have divided the performance management into task performance and periphery management. The measurement of the task performance is the real work related to the detailed work content. But the periphery performance focuses on the interpersonal improvement and work input less connected with the core task of the organization and more directly connected with the long-term development of the corporate. Most scholars conclude the periphery as two aspects: interpersonal development and work devotion. Interpersonal development is a kind of action to secure the interpersonal relationship in the organization and help others get sufficient working performance. It has been shown in the research that interpersonal improvement is a part of periphery performance, and the working contribution is another part of the task management. Therefore, in defining the performance, task management should include task proficiency and the work efficiency. Periphery should include interpersonal skills, good working relationship and the motive to help others finish the work.

The paper having drawn the conclusion from Motowidlo and Scotter, divides the performance management into task performance and periphery performance and tried to analyze which kind of performance the corporate culture has a better influence on.

3.2.3Evaluation of estimate

Ten experts are invited to give their ideas about how much effect on the task performance and contextual performance from such five factors as entrepreneurial spirit, enterprise values, enterprise operation philosophy, enterprise environment, enterprise culture network. The results are show in the Figure1.

Figure 1　The Entrepreneurs' Evaluation Statistical Table

	effect on the task performance (number of experts)					effect on the contextual performance (number of experts)				
	Huge influence	Much influence	Some influence	little influence	No influence	Huge influence	Much influence	Some influence	Little influence	No influence
entrepreneurial spirit	2	5	2	1	0	5	3	1	1	0
enterprise values	1	6	1	2	0	6	2	0	2	0
enterprise operation philosophy	3	5	1	0	1	5	3	1	0	1
enterprise environment	2	5	3	0	0	6	2	2	0	0
enterprise culture network	2	4	2	1	1	4	3	1	1	1

4 Results and Analysis

There are three basic elements of the fuzzy evaluation model including the evaluation on the factor set, evaluation set and single factor.On the basis of the three elements,the paper has extended the fuzzy evaluation model. First, the paper analyzes the influence of the corporate culture on task performance;second,it analyzes the influence on the periphery performance and finally it determines which kind of performance it has the most influence via the use of the maximum membership principle.

4.1 The research on the relationship between corporate culture and task

Performance：

1) Determine the establish evaluate factors U.According to five elements of the judgement indicator system, the establish evaluate factors are determined as $U = \{u_1, \ u_2, \ u_3, \ u_4, \ u_5\}$, i.e $U=$ {entrepreneur spirit, corporate value, corporate operation philosophy, corporate environment and corporate culture networking}

2) Determine the evaluation set V. Suppose the evaluation characteristic of the corporate culture on task performance is huge,more, a little,not very much and no,and then the set V is defined as $V = \{v_1, \ v_2, \ v_3, \ v_4, \ v_5\}$,i.e V={huge, more, a little, not very much and no}

3) Set the single factor evaluation matrix R from U to V. As it shows in the Fig1, the expert team(10 people) made the fuzzy evaluation. Fuzzy vector $R_1 = \{0.2, 0.5, 0.2, 0.1, 0\}$ means that according to the entrepreneur spirit, there are two experts believe that it has huge influence. five much influence, two some influence, one a little influence and none of scholars think it has influence.Also,fuzzy vector $R_2 = \{0.1, 0.6, 0.1, 0.2, 0\}$, $R_3 = \{0.3, 0.5, 0.1, 0, 0.1\}$, $R_4 = \{0.2, 0.5, 0.3, 0, 0\}$, $R_5 = \{0.2, 0.4, 0.2, 0.1, 0.1\}$,i.e. the single factor judgement matrix is：

$$R = \left(r_{ij} \right)_{nm} = \begin{bmatrix} 0.2 & 0.5 & 0.2 & 0.1 & 0 \\ 0.1 & 0.6 & 0.1 & 0.2 & 0 \\ 0.3 & 0.5 & 0.1 & 0 & 0.1 \\ 0.2 & 0.5 & 0.3 & 0 & 0 \\ 0.2 & 0.4 & 0.2 & 0.1 & 0.1 \end{bmatrix}$$

4) Determine the indicator weight .According to the influence of the corporate culture on task performance, the entrepreneur spirit, corporate value, corporate operation philosophy, corporate environment, corporate culture network are given the weight 0.2，0.25，0.2，0.15 and 0.2 relatively, i.e $A = \{a_1, \ a_2, \ a_3, \ a_4, \ a_5\} = \{0.2, 0.25, 0.2, 0.15, 0.2\}$

5) Calculate the comprehensive evaluation result. The evaluation result is, i.e

$$B = A \times \boxed{R} = \left(0.2, 0.25, 0.2, 0.15, 0.2\right) \times \begin{bmatrix} 0.2 & 0.5 & 0.2 & 0.1 & 0 \\ 0.1 & 0.6 & 0.1 & 0.2 & 0 \\ 0.3 & 0.5 & 0.1 & 0 & 0.1 \\ 0.2 & 0.5 & 0.3 & 0 & 0 \\ 0.2 & 0.4 & 0.2 & 0.1 & 0.1 \end{bmatrix} = \left(0.195, 0.505, 0.17, 0.09, 0.04\right)$$

It can be shown that 19.5% of   experts think it has a huge influence, 50.5% think a much huge influence, 17% think only a little influence and 9% think only little influence and 4% think no influence.

6) Draw the conclusion. Vectors of B set sum up to 1 which satisfies the assimilation condition.According to the maximum membership principle, the maximum number 0.505 in the set B corresponding to the "most influence" should be the comprehensive evaluation conclusion of the corporate culture to the task performance,i.e the corporate culture has the most influence on the task performance.

4.2 Researches on the relationship between the corporate culture and periphery

Performance：

1) Determine the establish evaluate factors U. The paper selects the same part of the corporate culture for comparison, i.e U={entrepreneur spirit,corporate value, corporate operation philosophy, corporate environment and corporate culture networking}

2) Determine the evaluation set V. Suppose the evaluation characteristic of the corporate culture on task performance is huge,more, a little,not very much and no, and then the set V is defined as $V = \{v_1, \ v_2, \ v_3, \ v_4, \ v_5\}$,i.e V={huge, more, a little, not very much and no}

3) Set the single factor evaluation matrix R from U to V. As it shows in the Fig1, the expert team(10 people) made the fuzzy evaluation. $R_1 = \{0.5, 0.3, 0.1, 0.1, 0\}$ means that according to the enterpreneur spirit,there are two experts believe that it has huge influence.five much influence,two some influence,two a little influence and none of scholars think it has influence.Also, fuzzy vector $R_2 = \{0.6, 0.2, 0, 0.2, 0\}$, $R_3 = \{0.5, 0.3, 0.1, 0, 0.1\}$, $R_4 = \{0.6, 0.2, 0.2, 0, 0\}$, $R_5 = \{0.4, 0.3, 0.1, 0.1, 0.1\}$, i.e. the single factor judgement matrix is:

$$R = \left(r_{ij}\right)_{nm} = \begin{bmatrix} 0.5 & 0.3 & 0.1 & 0.1 & 0 \\ 0.6 & 0.2 & 0 & 0.2 & 0 \\ 0.5 & 0.3 & 0.1 & 0 & 0.1 \\ 0.6 & 0.2 & 0.2 & 0 & 0 \\ 0.4 & 0.3 & 0.1 & 0.1 & 0.1 \end{bmatrix}$$

4) Determine the indicator weight .According to the influence of the corporate culture on task performance, the entrepreneur spirit, corporate value, corporate operation philosophy, corporate environment, corporate culture network are given the weight 0.35，0.2，0.1，0.15 and 0.2 relatively, i.e $A = \{a_1,\ a_2,\ a_3,\ a_4,\ a_5\} = \{0.35, 0.2, 0.1, 0.15, 0.2\}$

5) Calculate the comprehensive evaluation result. The evaluation result is, i.e

$$B = A \times \boxed{R} = (0.35, 0.2, 0.1, 0.15, 0.2) \times \begin{bmatrix} 0.5 & 0.3 & 0.1 & 0.1 & 0 \\ 0.6 & 0.2 & 0 & 0.2 & 0 \\ 0.5 & 0.3 & 0.1 & 0 & 0.1 \\ 0.6 & 0.2 & 0.2 & 0 & 0 \\ 0.4 & 0.3 & 0.1 & 0.1 & 0.1 \end{bmatrix} = (0.515, 0.265, 0.095, 0.095, 0.03)$$

It can be shown that 51.5% of experts think it has a huge influence, 26.5% think a much huge influence, 9.5% think only a little influence and 9.5% think only little influence and 3% think no influence.

6) Draw the conclusion. Vectors of B set sum up to 1 which satisfies the assimilation condition. According to the maximum membership principle, the maximum number 0.505 in the set B corresponding to the "most influence" should be the comprehensive evaluation conclusion of the corporate culture to the task performance, i.e the corporate culture has the most influence on the periphery performance.

5 Conclusions

It can be demonstrated above that 50.5% of experts think that the corporate culture has much influence on the task performance, 51.5%experts think the corporate culture has a huge influence on the periphery performance. According to the maximum membership principle and through the comparison of both:the corporate culture has a more obvious influence on the periphery performance. It is also shown that in building the corporate culture system, corporates should understand the system plays the active role in improving the impersonal relationship, enhancing the teamwork spirit and periphery spirit. Therefore the corporate should attach great importance to the entrepreneur spirit, corporate value, corporate philosophy, corporate environment and corporate culture network.

The innovative point of this paper is that it carries out the example research of the relationship between corporate culture and management performance via the use of the fuzzy evaluation model. And it breaks the limitation of related researches and makes the comparison on the influence of the corporate culture on the management performance and recognizes that the corporate culture has a more notable influence on the periphery performance.

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Research on the Relationship of Young Employees' Extroversion and Achievement Motivation: The Moderating Effect of Perceptions of Organizational Politics

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Abstract: This paper establishes a model to interpret the relationship between extroversion and achievement motivation in young workers, empirically analyzes the impact mechanism of extroversion on achievement motivation, and introduces perceptions of organizational politics to moderate the relationship. Through the questionnaire survey of 189 employees, regression analysis is used to test the hypotheses. The results show that extroversion could predict achievement motivation well in young employees of organization; salary and promotion and colleague relationship in perceptions of organizational politics moderate the relation of extroversion and achievement motivation of avoiding failure. Suggestions on employee recruitment and containment of organizational political behavior in research are proposed.

Key words: Extroversion; Achievement motivation; Perceptions of organizational politics

1 Introduction

Personality is a kind of special and persistent individual psychological behavior patterns, and is one of the favorable indicators to predict individual subjective feelings. Tomas (2004) believes extroversion in the big five personality model refers to self-confidence and vigor of higher level in favor of social behavior, which means that the individual is more optimistic, positive, loving communication. And achievement motivation is a desire to overcome obstacles, display their talents, strive to complete a task as soon as possible in some specific areas. Atkinson's achievement motivation theory is that individual's achievement motivation has two tendencies, achievement motivation of pursuing success and avoiding failure. Throughout the related research, research on extroversion predicting positive emotion is still the mainstream, but research on individual achievement motivation is lesser. The achievement motivation research mainly focuses on its incentive effect for individuals, such as achievement motivation on subjective well-being, innovation ability (Yang Jie, 2010) and work performance. Part of the study involves the impact of achievement motivation on job burnout, turnover intention and other factors. Extroversion and achievement motivation are two important fields in psychology research, whether extroversion personality traits can predict individual's achievement motivation needs to be verified.

Currently, many workplaces like a political arena, where individuals may damage the interests of others for their own interests, or they can not properly hand it and suffer the consequences. Employees' perceptions of organizational politics (pop) of high degree will affect the formation of their achievement motivation? Most research takes pop as antecedent variable, such as pop on employee job satisfaction, affective commitment, job burnout (Zhang Juncheng, 2013), work performance (Miller, 2008), voluntary turnover, organizational citizenship behavior. And antecedent variable of weakening or strengthening pop, such as the frequency of using political behavior, group performance, moderate negative impacts of pop. This paper intends to introduce pop to explore the mechanism of extroversion effect on achievement motivation.

The research object about achievement motivation focus on college students, seldom involve young workers (young workers in this paper refer to someone who graduate from college for a short time and have fewer work experience in their 20s or 30s). This article takes young workers as the research object, explores the impact mechanism of extroversion on achievement motivation, investigates the moderating role of pop, provides useful suggestions for staff management and organizational culture construction.

2 Theoretical Review and Research Hypothesis

2.1 Effects of extroversion on achievement motivation

Each individual has own goals, but want to achieve their goals, achievement motivation varies from person to person. Individual achievement motivation has obvious individual difference under different personality traits. Individuals with extroversion are more likely to experience positive emotions, high level of confidence in the pursuit of success, have strong desire to obtain success and rarely make

avoiding failure behavior. Because of these positive qualities early research mostly focuses on the relationship between extroversion and positive emotion. He Yuanyuan's research shows individuals with extroversion experience more positive emotion in daily life, some people increase the opportunity to experience positive emotion by obtaining success. Gan Lu (2006) thinks extroversion and social oriented achievement motivation have a relatively high positive correlation. Liu Jinhong (2008) thinks extroversion has a significant correlation with achievement motivation. Two kinds of intention to pursue success and avoid failure exist simultaneously and act on the inner psychology of the individual, but they drive the opposite mental function, the size of the achievement motivation mainly depends on the result of the conflict. Individuals who have a strong tendency to pursue success are more confident and tend to have a higher subjective probability of success. Above all, this study will take extroversion as one of the factors of achievement motivation, study the relationship between them. Based on the above theoretical basis, this study put forward the following hypotheses:

H1: extroversion and achievement motivation of young employees have the correlation

H1a: extroversion on the motivation of pursuing success has a positive predictive effect

H1b: extroversion on the motivation of avoiding failure has a negative predictive effect

2.2 The moderating effect of perceptions of organizational politics

The perception of organizational politics is the subjective feeling and evaluation of the political degree of work environment for staffs. The response of individual is often based on their own subjective perception of reality, different members also have different subjective pop. However, most researchers hold a negative attitude for the emergence of organizational politics, believe it will have a negative impact on employee attitudes and behavior (Chang, 2009). If employees perceive organization with politics, which means that he lacks confidence in the pay system (Rosen, 2006), believe reward decision is based on power basis, nepotism and other factors, not their hard work's results. Once employees lose confidence in the organizational environment, believe their work will not exchange the desired results (Chang, 2012), employees' motivation of pursuing success is likely to weaken. When employee has higher pop, which means he subjectively think self-interest suffer possible loss because of self-interest behavior or unfair internal decision, whether to continue to pursue what they believe to be more meaningful things is in doubt. Even for individual with higher extraversion it is difficult to form a higher achievement motivation, their own subjective feelings and evaluation about pop may reduce the desire of realizing their own value, so the impact of extroversion on achievement motivation further reduce. Ma Chao discuss the dimensions of pop, the dimensions include self-interested behavior, salary and promotion, colleague relationship, and it is verified. Above all, pop may play a role in between extroversion and achievement motivation. Based on the above theoretical basis, this study put forward the following hypotheses:

H2: perceptions of organizational politics have a negative moderating effect on the relationship of extroversion and achievement motivation, the stronger of perceptions of organizational politics employees feel, the smaller the impact of extroversion on achievement motivation is

H2a: employee's perceptions of self-interested behavior in organization has a moderating effect

H2b: employee's perceptions of salary and promotion in organization has a moderating effect

H2c: employee's perceptions of colleague relationship in organization has a moderating effect

Above all, this study mainly analyzes the impact mechanism of extroversion on achievement motivation among young employees, and introduces perceptions of organizational politics to moderate the relationship. The conceptual model shows in Figure 1.
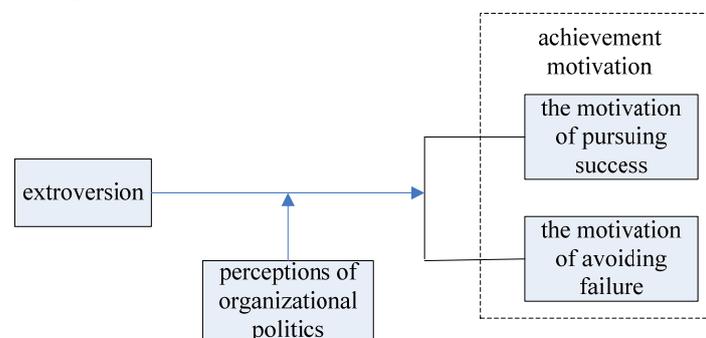
Figure 1   Mechanism Model of Extroversion on Achievement Motivation among Young Employees

3 Research Methods

3.1 Research object and data collection

This study conducted a questionnaire survey in Shanghai, Beijing, Guangzhou, Shenzhen, Wuhan, Hangzhou, Changsha and other cities. A total of 200 questionnaires were issued, 189 questionnaires were returned, 169 questionnaires were valid. The effective rate is 89.4%. Investigation object's features are as follows: the proportion of women (63.3%) is bigger than men (36.7%); survey is mainly for young workers, under the age of 25 account for 60.9%, 25-30 years old account for 35.5%; years of working focus on 1-5 years (65.7%); main duties are ordinary staff (78.7%) and low-level managers (17.8%); 71.6% receive undergraduate education, 17.8% is college degree.

3.2 Measuring tool

Extroversion's measurement uses the big five inventory revised by Zhang Jianxin. The dimension of extroversion contains 12 items, "yes" and "no" answer the question, "yes" for 1 point and "No" for 0 point. The higher the score is, the higher the degree of extroversion is. The internal consistency reliability of extraversion scale is 0.792. Extraversion scale's KMO value is 0.783, the validity is good.

Achievement motivation's measurement uses the scale revised by Ye Renmin in 1988. The scale's items are about the motivation of pursuing success (Ms) and the motivation of avoiding failure(Maf). The scale uses a 4-point score, the situation entirely consistent with ownself gets 4 points, the situation completely inconsistent with ownself gets 1 point. The total score is Ms minus Maf. The higher the score is, the stronger achievement motivation is. The internal consistency reliability of Ms is 0.781and Maf is 0.831. Achievement motivation scale's KMO value is 0.797, the validity is good.

Measurement of perceptions of organizational politics uses the scale developed by Ma Chao et al. in 2006. The scale contains three dimensions, self-interested behavior, salary and promotion, colleague relationship. The scale uses a 6-point score, the situation entirely consistent with ownself gets 6 points, the situation completely inconsistent with ownself gets 1 point. The internal consistency reliability of self-interested behavior is 0.748, salary and promotion is 0.8and relationship between colleagues is 0.791. Perceptions of organizational politics scale's KMO value is 0.809, the validity is good.

4 Data Analysis

4.1 Descriptive statistical analysis and correlation analysis of the study variables

Table 1　Descriptive Statistical Analysis and Correlation Analysis of the Study Variables(N=169)

Study variable	Mean	SD	1	2	3	4
Extroversion	0.68	0.239	1			
The motivation of pursuing success	2.74	0.473	0.125	1		
The motivation of avoiding failure	2.49	0.494	-0.204**	-0.244**	1	
Pop	9.66	2.218	-0.089	-0.035	0.265**	1

Note: * represents $p<0.05$, * * represents $p<0.01$(Two-Tailed)

Descriptive statistical results of study variables are shown in the table 1. Correlation analysis results of variables show that extroversion is positively related to motivation of pursuing success, has significantly negative correlation with motivation of avoiding failure, and is negatively related to pop; the motivation of pursuing success has significantly negative correlation with motivation of avoiding failure, is negatively related to pop; motivation of avoiding failure has significantly positive correlation with pop. These results provide a necessary precondition for the subsequent statistical analysis.

4.2 Regression analysis

4.2.1 Regression analysis of extroversion on achievement motivation

Firstly, in order to test the impact of extroversion on the motivation of pursuing success, the paper takes the motivation of pursuing success as dependent variable, on the basis of the control of demographic variables, adding extroversion into independent variable to do regression analysis. Results are shown in Table 2. In the model 1(a), the regression equation is significant, F value is 2.638($P = 0.025$). R^2 value is 0.075, suggesting that demographic variables can explain 7.5% variation of the motivation of pursuing success. On the basis of benchmark model, model 2 (a) adds extroversion into independent variable, F value is 2.449 ($P = 0.027$), the regression equation is significant, R^2 value in model 2 (a) increases 0.008, indicating that extroversion can explain 0.8% variation and it has a positive impact, but very weak ($\beta = 0.092$). The above description shows extroversion has a positive predictive role for the motivation of pursuing success, but not significantly, H1a is not verified.

Then, with regard to the motivation of avoiding failure, steps are shown above. In the model 1(b), the regression equation is significant, F value is 4.053($P = 0.002$). R^2 value is 0.111, suggesting that

demographic variables can explain 11.1% variation. On the basis of benchmark model, model 2(b) adds extroversion into independent variable, F value is 4.645(p=0.000), the regression equation is significant, R^2 value in model 2(b) increases 0.036, indicating that extroversion can explain 3.6% variation and it has a significantly negative impact (β=-0.193, P=0.010). The above description shows extroversion has a significantly negative predictive role for the motivation of avoiding failure, H1b is verified.

Table 2   Regression Analysis Results of Extroversion on Achievement Motivation

	The motivation of pursuing success		The motivation of avoiding failure		Achievement motivation	
	Model1(a)	Model 2(a)	Model 1(b)	Model 2(b)	Model 1(c)	Model 2(c)
Sex	-0.111	-0.114	0.190*	0.197**	-0.192*	-0.198**
Age	-0.016	-0.011	-0.019	-0.030	0.002	0.012
Education	-0.072	-0.064	-0.144	-0.160*	0.049	0.064
Working year	0.128	0.124	0.024	0.034	0.064	0.055
Position	0.145	0.133	-0.242**	-0.218**	0.247**	0.224**
Extroversion		0.092		-0.193**		0.182*
R^2	0.075	0.083	0.111	0.147	0.120	0.152
F	2.638*	2.449*	4.053**	4.645***	4.438***	4.844***
ΔR^2		0.008		0.036		0.032
ΔF		1.464		6.873**		6.170*

Lastly, as for achievement motivation, steps are shown above. In the model 1(c), the regression equation is significant, F value is 4.438(P=0.001), R^2 value is 0.12, suggesting that demographic variables can explain 12% variation. On the basis of benchmark model, model 2(c) adds extroversion into independent variable, F value is 4.844(p=0.000), the regression equation is significant, R^2 value in model 2(c) increases 0.032, indicating that extroversion can explain 3.2% variation and it has a significantly positive impact (β=0.182, P=0.014). The above description shows extroversion has a significantly positive predictive role for achievement motivation, H1 is verified.

4.2.2 The moderating effect of perceptions of organizational politics on the relationship between extroversion and achievement motivation

In order to test the moderating effect of pop on the relationship between extroversion and achievement motivation, the paper adds interaction variable of extraversion and pop, using stepwise regression method to carry on regression analysis. Partial results are shown in Table 3. When the motivation of avoiding failure is considered as dependent variable, interaction terms of extroversion and salary and promotion (β=-0.171*) and extroversion and relationship between colleagues (β=-0.201**) are significant. Model 6(b) with respect to Model 5(b) has been significantly improved (ΔF=5.300*), F value is 4.244(p=0.000), regression equation is significant, R^2 value increases 0.027. Model 8(b) is also significantly improved (ΔF=7.401**), F value is 5.508(p=0.000), regression equation is significant, R^2 value increases 0.036. The above description shows the moderating effect of pop (salary and promotion, colleague relationship) on the relationship between extroversion and motivation of avoiding failure is negative and significant. H2 is partly verified.

Table 3   The Moderating Effect of Perceptions of Organizational Politics on the Relationship Between Extroversion and the Motivation of Pursuing Success and Avoiding Failure

	The motivation of pursuing success			The motivation of avoiding failure		
	Model 4(a)	Model 6(a)	Model8(a)	Model 4(b)	Model 6(b)	Model8(b)
Extroversion	0.103	0.094	0.094	-0.174*	-0.188*	-0.213**
Self-interested behavior	0.097			0.317***		
Extroversion * Sb	-0.035			0.074		
Salary and promotion		-0.133			0.047	
Extroversion * Sp		-0.106			-0.171*	
Colleague relationship			0.011			0.175*
Extroversion * Cr			-0.009			-0.201**
R^2	0.093	0.114	0.083	0.250	0.175	0.216
F	2.056*	2.562*	1.818	6.665***	4.244***	5.508***
ΔR^2	0.001	0.010	0	0.005	0.027	0.036
ΔF	0.209	1.875	0.013	1.097	5.300*	7.401**

5 Conclusions

5.1 Research conclusion and discussion

The statistical analysis results reveal that young employee' extroversion has a significant effect on achievement motivation. Individuals with high extraversion to pursue success motivation is not significant, but avoid failure motivation is significant. Individuals with obvious extroversion personality have stable emotion, tend to be lively, easy to accept new things, conducive to the formation of individual-oriented high achievement motivation level, motivation of pursuing success is greater than motivation of avoiding failure, choose challenging tasks, exert their achievement potential. When extroversion is taken as antecedent variable, which predicts positive emotion in the mainstream, this study takes achievement motivation as dependent variable, enriching related research.

Meanwhile, the study also confirms pop has a certain moderating effect on the relationship between extroversion and achievement motivation. And the results show salary and promotion and colleague relationship moderate the relation of extroversion and motivation of avoiding failure. When pop is in a higher degree, the effect of extroversion on the motivation of avoiding failure decreases, reflecting pop has brought some side effects. However, the overall moderating effect is not obvious. Young employees' work experience may be not rich enough compared with old employees, feelings about pop are not profound, they have smaller reaction, thus the effect on their achievement motivation is also smaller.

5.2 Recommendations for management practices

According to the research results, we put forward the following specific recommendations to the organization's management practices. Firstly, extroversion on achievement motivation has positive prediction, which enlightens human resource managers in the selection of younger workers pay attention to individuals with obvious extroversion personality except for the case of the post with special requirements, so it is easy to stimulate employee's motivation and make full use of it, enabling employees to not only display their talents and realize their own value, but also improve work performance. Secondly, study results show that pop has a certain moderating effect, confirm pop has certain negative effects on the formation of achievement motivation, so we should curb the occurrence and contagion of organizational political behavior. Managers can guide employees' behaviors properly in cultural construction, actively monitor self-interested behaviors, establish an open, just and fair salary promotion system and the scientific and reasonable evaluation and incentive mechanism. Organization also should actively improve internal communication, timely answer feedback problems, improve organizational behavior's transparency, wash away the living space of self-interested behavior, form a good working atmosphere, which can reduce professional belief deviation behavior.

5.3 Research limitations and future research directions

Because of the emphasis of this study and objective condition of the empirical study, the research has some limitations. Firstly, in terms of research method, this study adopts a cross-sectional study, survey data are obtained in the same time period and the number of samples is not enough to fully reveal the impact mechanism of extroversion on achievement motivation. Secondly, the source of study sample is wide, whether the moderating effect is restricted by industry, organization nature, job post and other factors should be considered in the future research. Thirdly, the article only tests the moderating effect of pop, and it does not explore possible mediating or moderating effects of other variables. Therefore, future research should expand the sampling range, improve the representativeness of sample, conduct a follow-up study, and also need to study other factors of achievement motivation in order to provide a more accurate explanation for the problem, as well as valuable insight for management practices.

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A Study on the Interaction among Learners' Affective, Personality Variables and Their Recasting

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Abstract: Based on the relevant theories of Cognitive Psychology and Second Language Acquisition, the current study explores the interaction between individual learners' affective and personality variables and three types of recasts by means of questionnaires, task-based dialogues and stimulated recall. The results show no clear-cut relationship of affective variables to feedback types, whereas some correlations between personality and feedback types are found. Field dependent and extroverted learners choose recasts; field independent and introverted learners like the combination of recasts and metalinguistic clues; the combination of recasts and explicit correction is not preferred.
Key words: Recast; Affective variables; Personality variables; Interaction

1 Introduction

Recast, proposed by Lyster and Ranta (1997), is a reformulation of students' expression, which does not explicitly point out students' mistakes, but the form of feedback to provide students with the correct input, and hope that the students are able to compare their wrong input with the teacher's right input in order to realize their mistakes. Since its inception, recast has drawn much attention in applied linguistics due to the great theoretical significance and the wide practical value as well. In the previous five years, many foreign researchers (e.g., Rassaei Ehsan & Moinzadeh Ahmad, 2011; Jaemyung Goo, 2012; Ehsan Rassaei, 2013; Ana Llinares & Roy Lyster, 2014) have conducted empirical studies to explore the relative efficacy of recasts over other types of feedback on the learning of the English and examine the relationship between the effects of recasts and explicit corrections on the second language development and learners' perceptions of corrective feedback. At the same time, the researches on recast in China go from the descriptive study to introduce the controversy over the corrective nature of recast and the factors influencing the role that recasts play in the second language development (Li Zaihui, 2011; Liu Xiaoyu, 2012; Zhao Wei & Wang Junju, 2013; Li Danmei & Zou Degang, 2014), to the experimental study on whether learners' differential perceptions of recasts will result in different learning (Zhang Shanshan & Li Guohong, 2012). However, no researches were concerned with the interaction between individual learners' affective and personality variables and recasts. Therefore, in accordance with the characteristics of Chinese learners, the current study intends to conduct theoretical discussion and empirical research on the relationship between the three recast types and the four cognitive models, combined with the cognitive mechanisms and psychological factors.

2 Experiment Design

2.1 Focus

The experiment focused on the interaction between individual learners' affective and personality variables and three types of recasts, namely, recasts, combination of recasts and metalinguistic clues, combination of recasts and explicit correction.

2.2 Subjects

The subjects were 48 first-year English majors in a university, including 8 boys and 40 girls. None of the subjects knew the purpose of this study in advance.

2.3 Procedure

The experiment was composed of questionnaires, task-based dialogues and stimulated recall.

All the subjects were engaged in the questionnaires on motivation and attitude, field dependence /independence, extroversion/introversion. The results from the four questionnaires divided the subjects into 12 groups participating in the task-based dialogues the next day.

The 145-minute task-based dialogues took into consideration the four factors contributing to the expected recasts by Han (2002). Firstly, the experiment was concerned with object clause; secondly, the subjects had some ideas of object clause, but failed to arrange a correct clause order, indicating the developmental readiness; thirdly, the teacher-student interaction occurred in the task-based dialogues where the reporter acted by each student interviewed the singer acted by the teacher in the way the

object clause was applied. For example, "Could you tell me where you were born?"; "I'd like to know how you become interested in singing."; "I wonder when you will sing songs in a foreign country."; "Many of your fans want to know why you will try to play a role in a movie."; Fourthly, the teacher was preoccupied with the students' errors in the object clause, and offered the relevant corrective feedback. Based on the theory proposed by Gass and Mackey (2000), all the subjects were engaged in the stimulated recall three days later. The teacher urged the students to recall their experiences concerning the task-based dialogues.

3 Data Analysis and Discussion
3.1 Results from questionnaires
In order to assess the subjects' affective factors, the results from motivation and attitude questionnaires are shown in Table 1 and Table 2.

Table 1   The Results from Questionnaire on Motivation (n=48)

Items	Number of students	Percentage (%)
1. be more at ease with native speakers	43	89.58
2. understand western culture better	39	81.25
3. have an academic exchange with foreigners	38	79.17
4. make me a more knowledgeable person	39	81.25
5. be useful in getting a good job	46	95.83
6. receive more respect from other people	33	68.75
7. be helpful in going abroad	40	83.33

Among the seven items, the first three belonged to integrative motivation. The average number of students who chose the first three items was 40. The rest items could be called instrumental motivation, which were selected by 39.5 students. So, nearly no significant difference existed in terms of choice between these two kinds of motivation, thus a majority of students were highly-motivated.

Table 2   The Results from Questionnaire on Attitude (n=48)

Items	Number of students	Percentage (%)
1. I really enjoy leaning English.	43	89.58
3. I plan to learn as much English as possible.	40	83.33
5. They are a very sociable, warm-hearted and creative people.	38	79.17
6. I would like to know more native speakers of English.	39	81.25
13. My English has been improved by the application of what I learned into practice.	36	75
16. I get a sense of satisfaction from feeling more confident in situations that I found difficult before.	38	79.17

Attitude analyses fell into three categories. As for the attitude towards learning English, 43 (89.58%) of the 48 subjects really enjoyed learning English, while 40 (83.33%) students planned to learn as much English as possible. Considering the attitude towards people in English-speaking countries, 38 (79.17%) of the 48 subjects regarded native speakers of English as a very sociable, warm-hearted and creative people, and 39 (81.25%) students intended to know more about them. With respect to the attitude towards success in learning English, 36 (75%) subjects liked to find out improvements by seeing if they could apply what they had learned in real-life situations. In addition, 38 (79.17%) students got a sense of satisfaction as they could feel more confident in situations that they had found difficult before. The questionnaire results suggest that the subjects in this study had, overall, a positive view of the target language and of the people in English-speaking countries.

Meanwhile, all the subjects responded to the questionnaires on field dependence /independence and extroversion /introversion to explore the personality types of the students. The results are shown in Table 3.

Table 3　The Results from Questionnaires on Field Dependence /Independence and Extroversion /Introversion (n=48)

Items	Number of students	Percentage (%)
field dependence	32	66.67
field independence	16	33.33
extroversion	33	68.75
introversion	15	31.25

All the subjects completed the questionnaires, and meanwhile they identified their personality types in the light of tally criteria printed on the questionnaires. There were 32 (66.67%) field-dependent learners and 16 (33.33%) field-independent learners. Moreover, 33 (68.75%) subjects were extroverts, while 15(31.25%) subjects belonged to introverts.

The overall results from the four questionnaires are shown in Table 4.

Table 4 The Results from Questionnaires (n=48)

Items	Number of students	Percentage (%)
high motivation	40	83.33
low motivation	8	16.67
positive attitude	39	81.25
negative attitude	9	18.75
field dependence	32	66.67
field independence	16	33.33
extroversion	33	68.75
introversion	15	31.25

According to the results from the questionnaires, the subjects were classified into four types: 27 field-dependent and extroverted students with high motivation and positive attitude; 12 field-independent and introverted students with high motivation and positive attitude; 6 field-dependent and extroverted students with low motivation and negative attitude; 3 field-independent and introverted students with low motivation and negative attitude.

3.2 Results from task-based dialogues

The experiment was designed by 3×4 variables. The feedback types fell into three categories: recasts (A1), combination of recasts and metalinguistic clues (A2), combination of recasts and explicit correction (A3).The students were classified into four types: field-dependent and extroverted students with high motivation and positive attitude (B1); field-independent and introverted students with high motivation and positive attitude (B2); field-dependent and extroverted students with low motivation and negative attitude (B3); field-independent and introverted students with low motivation and negative attitude (B4). Then the twelve groups were formed to complete the task-based dialogues in turn.

The current study referred to the classifications by Lyster (1998) and Braidi (2002) and classified learner uptake into the following four types.

The first type was a successful uptake. The student offered the feedback and brought the recast into their words. For example,

Student: Could you tell me where were you born?

Teacher: (A1) Could you tell me where you were born?

(A2) Could you tell me where you were born? We can't say "were you", because the object clause should be made in a normal order.

(A3) Could you tell me where you were born? It is wrong to use "were you", and it should be "you were".

Student: Could you tell me where you were born?

The second type was an unsuccessful uptake. The student offered the feedback, but failed to bring the recast into their words. For example,

Student: I'd like to know how do you become interested in singing.

Teacher: (A1) I'd like to know how you become interested in singing.

(A2) I'd like to know how you become interested in singing. We can't say "do you", because the

object clause should be made in a normal order.

(A3) I'd like to know how you become interested in singing. It is wrong to use "do you", and it should be "you become".

Student: how you become interested in singing.

The third type was zero uptake. The student avoided offering the feedback. For example,

Student: I wonder when will you sing songs in a foreign country.

Teacher: (A1) I wonder when you will sing songs in a foreign country.

(A2) I wonder when you will sing songs in a foreign country. We can't say "will you", because the object clause should be made in a normal order.

(A3) I wonder when you will sing songs in a foreign country. It is wrong to use "will you", and it should be "you will".

Student: Which country?

The fourth type was a confirmation. The student offered the feedback by approving of the recast. For example,

Student: Many of your fans want to know why will you try to play a role in a movie.

Teacher: (A1) Many of your fans want to know why you will try to play a role in a movie.

(A2) Many of your fans want to know why you will try to play a role in a movie. We can't say "will you", because the object clause should be made in a normal order.

(A3) Many of your fans want to know why you will try to play a role in a movie. It is wrong to use "will you", and it should be "you will".

Student: OK.

Except the third type, the rest proved that the student had already been on the uptake. In the real task-based dialogues, the students had eight uptakes of the three types of recasts, on the average. The results are shown in Table 5, Table 6, and Table 7.

Table 5   Learner Uptake of Recasts (A1)

	B1 (9 subjects)	B2 (4 subjects)	B3 (2 subjects)	B4 (1 subject)
successful uptake	61（84.72%）	6（18.75%）	9（56.25%）	0（0%）
unsuccessful uptake	5（6.94%）	4（12.5%）	3（18.75%）	1（12.5%）
zero uptake	0（0%）	18（56.25%）	1（6.25%）	6（75%）
Confirmation	6（8.34%）	4（12.5%）	3（18.75%）	1（12.5%）
Total	72（100%）	32（100%）	16（100%）	8（100%）

Table 6   Learner Uptake of Combination of Recasts and Metalinguistic Clues (A2)

	B1 (9 subjects)	B2 (4 subjects)	B3 (2 subjects)	B4 (1 subject)
successful uptake	6（8.33%）	17（53.125%）	1（6.25%）	3（37.5%）
unsuccessful uptake	7（9.72%）	6（18.75%）	2（12.5%）	2（25%）
zero uptake	50（69.45%）	2（6.25%）	11（68.75%）	1（12.5%）
Confirmation	9 （12.5%）	7（21.875%）	2 （12.5%）	2（25%）
Total	72（100%）	32（100%）	16（100%）	8（100%）

Table 7   Learner Uptake of Combination of Recasts and Explicit Correction (A3)

	B1 (9 subjects)	B2 (4 subjects)	B3 (2 subjects)	B4 (1 subject)
successful uptake	0（0%）	0（0%）	0（0%）	0（0%）
unsuccessful uptake	4（5.56%）	3（9.375%）	1（6.25%）	1（12.5%）
zero uptake	65（90.27%）	27（84.375%）	13（81.25%）	6（75%）
Confirmation	3（4.17%）	2（6.25%）	2（12.5%）	1（12.5%）
Total	72（100%）	32（100%）	16（100%）	8（100%）

The results indicated that field dependent and extroverted learners (B1, B3) chose recasts (A1); field independent and introverted learners (B2, B4) liked the combination of recasts and metalinguistic

clues (A2); the combination of recasts and explicit correction (A3) was not preferred.

3.3 Results from stimulated recall

Concerning the subjects' perception and uptake of various recasts given by the teacher, the stimulated recall was decoded into four types: perception + uptake; perception + no uptake; no perception + uptake; no perception + no uptake. The results are shown in Table 8.

Table 8   The Results from Stimulated Recall

	B1			B2			B3			B4		
	A1	A2	A3	A1	A2	A3	A1	A2	A3	A1	A2	A3
perception + uptake	7 78%	2 22%	1 11%	0 0%	3 75%	1 25%	1 50%	0 0%	0 0%	0 0%	1 100%	0 0%
perception +no uptake	0 0%	6 67%	8 89%	1 25%	0 0%	3 75%	0 0%	1 50%	2 100%	0 0%	0 0%	1 100%
no perception + uptake	2 22%	1 11%	0 0%	1 25%	1 25%	0 0%	1 50%	0 0%	0 0%	0 0%	0 0%	0 0%
no perception + no uptake	0 0%	0 0%	0 0%	2 50%	0 0%	0 0%	0 0%	1 50%	0 0%	1 100%	0 0%	0 0%
total	9 100%	9 100%	9 100%	4 100%	4 100%	4 100%	2 100%	2 100%	2 100%	1 100%	1 100%	1 100%

The first type (perception + uptake) was regarded as the best interaction between the learner's type and the recast type. Table 8 informed that field dependent and extroverted learners (B1, B3) chose recasts (A1); field independent and introverted learners (B2, B4) liked the combination of recasts and metalinguistic clues (A2); the combination of recasts and explicit correction (A3) was not preferred. The results from stimulated recall were in agreement with those from task-based dialogues.

3.4 Discussion

The results can be justified by Noticing Hypothesis and Scaffolding theory.

Firstly, the teacher's output of the recast type gives rise to the learners' noticing about the target grammatical form. That is to say, in producing the target language vocally or sub vocally, learners may notice a gap between what they want to say and what they can say, leading them to recognize what they do not know, or know only partially. Under these circumstances, the recasts (A1) may prompt learners to consciously recognize some of their linguistic problems, in particular, the field dependent and extroverted learners (B1, B3). They are more inclined to empathy, more capable of knowing the teacher's intention, thus choosing the recasts (A1). In contrast, the recasts (A1) fail to achieve the noticing function for field independent and introverted learners (B2, B4). They are less sociable, resulting in their unrecognition of the teacher's intention. Yet, their thinking and analytical skills contribute to the preference for the combination of recasts and metalinguistic clues (A2) since metalinguistic clues offer the opportunity for them to modify the output.

Secondly, scaffolding theory denotes a person who helps students to accomplish what they cannot do by themselves. In the task-based dialogues, the teacher provides three types of recasts that were considered as scaffoldings. Comparatively, the combination of recasts and explicit correction (A3) is not preferred, mainly because the explicit correction of the learners' errors may harm self-esteem and self-confidence and fail to offer the effective cognition scaffolding.

4 Conclusions

Recast bears the corrective nature to second language acquisition and pedagogy. The current study explores the interaction between individual learners' affective and personality variables and three types of recasts. The results show no clear-cut relationship of affective variables to feedback types, whereas some correlations between personality and feedback types are found. Field dependent and extroverted learners choose recasts; field independent and introverted learners like the combination of recasts and metalinguistic clues; the combination of recasts and explicit correction is not preferred. The results are justified by Noticing Hypothesis and Scaffolding theory. Needless to say, the present study is far from perfect because of some objective and subjective limitations. Recast calls for the further study on the various speakers of English and different language forms.

Acknowledgement

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Investigations on Strategies for Products and Services of Mobile Phone Companies in Congo Brazzaville

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Abstract: The notion of competition is taken with great interest and enthusiasm by mobile phone companies in Congo-Brazzaville. It requires such economic operators a minimum of vigilance, causing them to be more efficient on the market.3 major companies discuss the Mp[1] market, thus seeking the largest market share. This study therefore examines the roles of corporate strategies in the sale of products and services offered by the companies which are AIRTEL and MTN Congo and its impact on their competitive positions. Thus, according to our investigation, 95% of the products and services of these mobile phone companies are sold through strategies of innovation of products and services. A literature search about operators and the ARPCE[2] has been conducted to determine the impact of these strategies on subscribers, market shares and turnover of the companies in the period 2014-2015. The results of the analysis have been recorded in the excel software.
Key words: Investigations; Products; Services; Mobile phone

1 Introduction

Since the deregulation of the telecommunications market of 1997 (Act No. 14/97 of 26 May 1997), Congo-Brazzaville faces a variety of company in the mobile telephony market. Several companies have emerged giving birth to an unprecedented and accentuated competition thus changing the market information, promoting new deeper competitive practices. We are witnessing a high and permanent research of new innovation strategies to differentiate themselves from the competition for the sole purpose of maintaining some customers and conquering others. A business orientation is two-folded: firstly, the implementation of a product or service and then its commercialization. Thus, the sales performance of each of these mobile phone companies in Congo-Brazzaville passes necessarily through the implementation of marketing strategies and innovation of products and services. It is then, that the mobile telephony market has become after some time the scene of fierce competition between different operators. This pushes so all mobile players to:

1) Innovate and create competitive advantages;
2) Identify the resources needed to achieve the objectives set;
3) Interested in a service offering reliable and cost-effective than the competition;
4) Evaluate its position relative to that of others;
5) Anticipate the evolutions of the competition, the market and regulation;
6) Maintain its activity in a competitive environment and opportunities;
7) Lower especially tariffs and expanding their networks.

Strategies differ from a company to the other, and differ from one operator to another. Mobile is one of the sectors which likely scored with a great shot the telecommunications industry in Congo-Brazzaville. The birth of several products and operators has not only boosted this sector but has also expanded its competitive environment. That is why, faced with competition and the permanent pursuit of market share gain, a company must develop methods and compelling marketing strategies to hope to maintain its position on the market and increase its turnover.

2 Objectives

It is in this perspective that this study has for objectives to:

1)Explain products and services strategies implemented by the Congolese of TM enterprises;
2)Measure the impact of these strategies on the competitive position of enterprises on the market of TM in Congo.

3 Problematic

Two major issues will constitute the backbone of our work:

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[1] Mobile Phone
[2]Agence de régulation des postes et des communications électroniques

1)What are the products and services these companies offer they market Mp in Congo Brazzaville and their methods used to effectively achieve their goals?

2)What is the impact of these methods on the competitive position of these companies on the Congolese of Mp market?

4 Hypothesis

From the above two questions of the problematic fundamentally mentioned, we have following two assumptions:

●Phones modem and of promotion offers on the cost of call and message transmission may be products and services of the companies of Mp in Congo Brazzaville.

●Innovation of products, services and pricing strategies can explain the sale of products and services of Congolese companies on the Mp market.

Trade performance is sufficiently observed on the mobile telephony market in the Congo through a perpetual pace of strategic innovations renew and plays on the competitive positioning of operators of Mp in the Congo. And, according to our survey on the field; to better sell and remain competitive, Congolese mobile phone companies use business strategies. Therefore, our literature will focus on business competition strategies and on the field of the Mp.

5 Literature Review

The strategy is linked to the notion of performance i.e., the degree to which objectives are being met in an organization (GAMVOULA G, 2007). This performance translates into customer loyalty and customer satisfaction. It must therefore be able to resume all calls to all applications and satisfy till the end. It is also about a product positioning, the client should not return angry, he should be happy. It is keeping him and building his confidence. This performance is linked to the quality and quantity of the service to clients (Jaeger C, 2002). But the work of Nwamen F, (2006) adds that the performance can be managed in a functional perspective (sales and marketing, accounting and Finance, Production and human resources management) or process (management of the supply chain, innovation and communication). We quote Onge St S. and Magna M. L. (1994) who also quoted Lynch and Cross (1991) in these terms: "on a business vision, the performance allows the leader to explain the link between the company and its daily operation". In this perspective, each function of the firm should therefore positively enhance the value provided by its activity. Thus, the competition very often affects sale. Thus, to obtain a benefit at the time of globalization there should be good marketing strategies or communication.

● **Strategies in the company and towards competition**

For Igor ANSOFF (1989), the strategy is not only borrowed from military or reserved this field only terminology, but applies to all competitive situations in which two or several companies are in the rivalry on a same field of activity. The strategy in this case is a necessity in any competitive universe. But in recent years, the term strategy into the everyday vocabulary of business leaders and strategic planning is now part of the functioning of large companies. HIAM. A and SCHWE. C (1994) also define strategy as the main lines of the action plan, the general pattern that helps the company achieve its goals. Thus, according to Demeure C (1997), the strategy is a set of decisions taken in advance by a business for a period of time to achieve its general objectives in a competitive world, economic, social etc. This is to say that actual strategic issues arising from the creation or the orientation of the new opportunities the need for strategy intervenes and allows business leaders to anticipate the satisfaction of customers. J.M LAUGINIE and his staff will focus on marketing strategy in the enterprise. This marketing strategy depends on the company's general policy and is concerned that of the coherence of the various policies (product, price, distribution, and communication) which compose it. Currently, the marketing strategy is a very extensive decision-making universe. Thus, P.L. DUBOIS and A. JOLIBERT (1980), confirm this hypothesis more clearly stating that the marketing strategy must focus on how the company works towards its competition. The need for a company that applies the policy marketing in the long term, is to use the information on all of the company for the implementation of this marketing strategy at the level of the organization or the strategic areas, hence the need for communications policy in the business.

Nowadays, the strategy remains to business leaders, the only way of remedies to deal with threats that may arise at every moment from the rapid and continuous changes posed environmentally. Igor ANSOFF (1989) adds that these changes can be caused by a situation of markets, technological

discoveries in and out of the company, or the sudden arrival and mass competitors. In these circumstances neither established traditions nor experience sufficient to deal with the opportunities and threats in absence of the strategy. Where, Don Stenay Junior MadgilNGOMAH includes this concept grassroots communication in any business strategy to minimize risks. He in his dissertation: "communication strategies to the Congolese of lottery (COGELO) management", assesses the place of communication and marketing in the activities of the COGELO in the CONGO. It shows with fitness that to promote its image, its activities to target populations and local authorities or to ensure the success and sustainability of business leaders of premiums on board, define the objectives of the company, identify the strategic axes and efficiently use all the potential for communication to achieve the objectives.

● **Strategies in Mp**

Mobile grows exponentially today resulting in a competition that obliges companies to be competitive on the market (Lerzan A, Alexander B, PelinAksoy, Bart L, Timothy L. K, 2012). This competitiveness therefore through a management system promotes the production of the company. Thus, (Le temps Décide Amour Prestige NGOMAH, 2012) shows that the sector of telephony knows an unprecedented development in Congo Brazzaville. This therefore imposes another system of management of the companies, who wish to prosper and make a place of choice in the current context of globalization of trade. It emphasizes a little more beyond the elements enabling the business to a place of choice are part of marketing and communication strategies. These two tools are surely the key to socio-economic development of any business. However, the dynamics of a market cannot be understood in its fullness without taking account of the environmental conditions that characterize it. The reason for this is that both firms already in place that potential entrants, the economic environment is an important source of strategic inspiration (Madala B, 2005). The author in this work shows that since the opening of the market in the Republic of the Congo, offering phone service is provided by four operators operating in all three different systems grouped into two types of networks: the wired and mobile networks. Telecommunications offers several services to businesses as well as consumers and asking today adequate tools of communication (image, voice, messaging etc.) (Olivier B, Giuseppe N, 2001). And the success and failure of the mobile phone companies therefore depend on the choice of strategies they undertake (Christine J, 2002). So speaking mobile phone and its development that entails competition (Rohit S, 2009) shows the phone as being one of the components of the range of the NICTs in the same way as internet and television and is a mixed object, because it is not only a tool for communication, but also and above all, an object of production manufactured, sold, consumed, maintained. It analyzes the circuits for the import of mobile phones and accessories, distribution of prepaid recharge cards and 'credit' and their sale. It addresses the issue of interactions that are played between different actors between themselves and between them and the population, market and Bamako road traffic users. In this same order of idea, the experience is that mobile phone today requires new techniques on the market, among current preferred techniques, is part the side innovation products and services. Companies in this sector must adopt innovation strategies to seize the competition. Analyzing mobile telecommunication Abdelillah Hamdouch, attests that the innovations of mobile telecommunications services are far from being marginal or correspond to simple artificial differentiation tools. As in many other areas of service in fast-growing (online services and electronic commerce on the internet, air transport, retail and specialty distribution, Audiovisual Council and recreation), they are now a 'must' and a central strategic axis for the firms. Because these are services and not industrial goods, innovate in the delivery (content and design of the service) and in close relationship to the customer involved in the realization of this benefit, is not only a variable to compete; It is, basically, the key variable on which depends competition.

6 Problem Statement

Beyond all notions of business strategy that different authors have mentioned, now builds on the performance and competition elements: customer relationship management. That is, after and before the sale of a product or service, a client file tracking must be established. This leads therefore to study potential or customer purchasing behavior to retain it. This notion is called jurisdiction of the HRM[1], for choice and the quality of the staff who will pilot this management of RCM[2] service. In the TM, we remember that elements such as marketing, communication are strengths for modern businesses, the

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[1]Human Resources Management
[2]Customer Relationship Management

success of the activities and the good position before all eventualities of the market. Thus, next to the strategies of the offer and other innovations on products and services (promotion of calls, messages, novelty phones...) we could insist on the quality of networks and high-speed Internet services from telephones (case of quality problems of network of companies of MP in Africa, particularly Congo Brazzaville).

7 Research Methodology

To complete this research work, we have to use documentary analysis methodology, which consist in finding with the operators and of the ARPCE documents on the characterization of MP market, to all current market statistics. We have also conducted informal and formal (no questionnaire) interviews with officials of the different operators of MP to obtain information regarding their products and services, as well as their service innovation strategies and their impact on their competitive positions. We have all resorted to comments about facts which have allowed us to see how customers would have more than one network and would benefit from the affordable market offerings. The internet tool also was a great remedy, because it allowed us to have on the site of the ARPCE and those of the operators of the new offers of products and services, as well as developments in the sector of the MP.

8 Results

This methodological approach allowed us to detect the strategies of the offer of products and services on the field; to know the Congolese market of the MP which currently consists of operators Mtn, Airtel and azur; after the effective takeover of the company Warid by Airtel, at the beginning of the fourth quarter 2014. • These three operators total more than 4.5 million subscribers in the third quarter of 2015 (T3-15)[1] and generated a total revenue of 69.3 billion CFA (turnover), whose nearly 55.8 billion on outbound traffic. • All operators generated in T3-15 traffic voice of 1, 1 million minutes in both directions (outbound and inbound); While the volume of SMS is 1.18 billion. Mobile phone outgoing weighted rates settled in T3-15, 63 F/min for voice, against 3 F[2] for SMS.

9 Companies Congolese Mp

There are currently three (3) mobile phone companies in the Congo after the effective takeover of the company WARID by AIRTEL. Among these companies, we can mention: the company MTN Congo; AIRTEL Congo and AZUR Congo. These three companies are lighthouses on the mobile telephony market Congolese firms. However, we present the number of companies having exercised market MP in the Congo.

Table 1   Evolution of the Congolese of MP Market

Companies	Date of creation or operating
ONPT	1964 June 25
Cyrus	1997
Celtel	1999 December 15th
Libertis Telecom	2000 may 19
Sotelco	2003febuary
MTN International	december 9
Warid Telecom Congo	2008january
Zain Congo	2008 August 1 rd
Airtel Congo	2010 April 24
Azur Congo	2011july 7

Source author: This chart traces the names and dates of formation of the national and private companies having exploited sector of MP in Congo Brazzaville, since its independence to the present day. However, Celtel had been bought by zain and zain by Airtel. Libertis was acquired by Mtn and the national company sotelco has been replaced by Azur.

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[1]Third (3rd) Trimester 2015: method of data calculation for ARPCE and operators. T=trimester

[2]CFA franc appellation means franc of the African financial community for the UEMOA member countries, and Franc of financial cooperation in Central Africa for the members of CEMAC countries. 1FCFA=550$ (Dollars)

10 Strategic Analysis of These Companies of MP in the Congo and Impact on Their Competitive Position.

The request represents the amount of a product that consumers are willing to buy at a price (in microeconomics). With respect to mobile phone, it comes to focusing on the behaviors and attitudes of consumers to mobile telephony services. Thus the area of Mp in the Congo the characteristics of supply and demand are factors that understanding competition that prevails. This allows understanding the strategies put in place by each operator. But we will talk about the characteristics of different offerings.

10.1 Companies and strategies of their offerings

Multiple strategies are used on the Mp market by these three companies, to get the largest share of the market, increase the number of subscribers and possibly face competition. The offer means the "volume of goods and services available to the market in order to be sold. These products or services are traded on the market for a price. Strategies for providing services of mobile operators are therefore based on the essential variables of offer of products, services and prices. For more information on the implementation of these strategies by the Congolese of Mp operators, we will discuss respectively the case of AZUR, AIRTEL and MTN.

10.2 Companyazur and his strategy of the offer of goods and services

The company offers a prepaid to these customers, which allows you to pass and receive calls from the purchase of a SIM card to its agencies and distributors. The prepaid package consists of a SIM card, priced non-promotion of 500 FCFA with 500 CFA FRANCS communication credit offered. Post services paid azure: to satisfy its professional clientele, Azur offers flexible and adapted to the needs of users, their allowing communication costs. These offers are: azurcorpo, commercially for post paid subscribers willing to pay at the end of the month and with a minimum of 10 lines guarantees access to this offer. Then there are azure flexi more which is a flat-rate offer for post paid subscribers eager to control their consumption. With each of these offers, customers benefit in addition to a broad range of services with value added such as: Voice mail and missed call notification, National and international text messages, Call waiting, Detailed invoice, Web, International Roaming

GFU offers either group farm user; enable the members of a society to communicate at unbeatable prices all competition. Regarding corpo more, a company having endorsed guidelines can from the same number: capping its consumption in national or international without slot, call at rates other internal lines of business (GFU), call account prepaid from the same SIM, benefit from all of the prepaid services.

Azure also provides services in the form of accounts:

A master account: this account allows the user to recharge his account from standard "refills" of azure. The user has access to all prepaid services, only from this account and allows access 24/24 for calls not GFU, electronic charging is possible or by prepaid cards, followed by consumption, consultation of balances and accessibility also 100% prepaid (recharge me, call me, transfer of credit, etc.);

GFU account: this account is dedicated to calls that the user issue within his company. Every month, the numbers are credited on the basis of the letter of request that companies send to Azur. This translates so access 24/24, to recharge balances and consumer consultation and finally unauthorized access unauthorized prepaid services, preferential tariff, except for calls to the closed loop of users.
In addition, there is also another called account: (closed) capped company account. This account offers only the ability to issue national and a time slot can be configured on this account. His schedule is similar to prepaid. It is structured as follows:

Accessibility parameterized according to the customer (slot), unauthorized charge, consultation of the balance and consumption, accessibility unauthorized prepaid services, similar to Corporate first fee schedule, capped consumption, call on the national restrictions

A company account (unlimited): this account to call in national as in international, without any constraint. Similar to that of the prepaid fee schedule and this account provides: time range not configurable, unauthorized charge, consultation of the balance and consumption, Accessibility unauthorized prepaid services, similar to corporate first fee schedule, no ceiling

With regard to the flexi service more and more, it allows any postpaid user to use the postpaid offers 50, 100, 150 or 200 azur. The only prerequisites to ensure that users are qualified for this type of offering; they shall be post paid subscribers. This subscription includes offers of services like azurCorpo 50, 100, 150 and 200; it respectively gives customers the benefits of communication at the national and the international. Take for example Azur 50 corpo which applies as follows: 50-minute national call to a

Subscriber Azur to other azure, 50 minutes of calls to other operators, 50 minutes to the international then 50 sms from national to the international. This is valid for 30 days, anytime and even on other operators of the competition. Thus, this example applies in the same way with the suite of offerings mentioned. This strategy is winning, because it allows the company to build trust with its customers and keep coming them. And the monthly charges for these services during the subscription are divided as follows: 15.000FCFA for Azurcorpo 50, 25,000 fr azure corpo 100, 40,000 azurcorpo 150 and 50.000fr for azurcorpo 200. On the other hand, other services apply after consumption. We have inter alia national calls from azure to Azure: 60FCFA per minute (per-second billing). National calls to other operators: 75FCFA per minute (per-second billing). International calls: 75FCFA per minute (per-second billing). National SMS: 20FCFA per unit. International SMS: 50FCFA by SMS.There are also prepaid rates, azur offers calls to azur 1, 25f/SEC as well as to other operators. Calls to the international on 12 countries to 1f, other distributed calls in zone 1, 2, 3. Called at 1.25, 1.5, 2-3f/second. SMS to Azure 20f, 40E to other operators and 75 abroad. Azur recharge cards are varied. To meet multiple needs, Azur has various recharge cards: 5.00f, 1.000f, 2.000f, 5.000f, 10.000f and 40.000f.

10.3 Company Airtel and its strategy

● Offer products

Regarding products, AIRTEL offers different brands phones namely: Black Berry, Nokia, ZTE, Samsung, LG, Sony Erikson, and Sagem... These devices have several options ranging from the composition of ringtones, games, infrared, FM Radio, mp3 player, Bluetoof, in the integrated Web browser. The extent of the range of AIRTEL is very displayed. This range puts on types, series or the versions depending on the effect of mode. AIRTEL is thus aimed at a segment of different market attracting customers to taste and to need diverse; AIRTEL uses a line extension policy. The range of these products, only ZTE is promoted and is sold at a low price. The ZTE brand is accompanied by a logo of type AIRTEL enabling identification and differentiation over competitor's products. There's also a touch Tablet and phone smartphone African brand product of the VMK Company Airtel offers to its customers. AIRTEL opts for the multiple brand strategy.

The card SIM of AIRTEL was sold to 500 FRS with 400frs of credits included. The renewal of the SIM card in case of loss is done at customer service AIRTEL for a fee of 1000FCFA (500 FRS for renewal) and 500frs of credits. AIRTEL also makes available to consumers to the cards of seven kinds at varying rates. Prepaid cards are mobile telephony subscription offers, without being constrained to all minimum subscriptions over time. Calls are already paid in advance and the balance available decreases as and as communication is done. Offered by AIRTEL recharge cards are cards at the price of 200, 500, 1,000, 2,500, 5,000, and 10,000 to 45.000FCFA.

● Offres des services

Services offered by AIRTEL Congo are two types of clients: individual (men of affairs, traders, civil servants, students and students, artisans and housewives) and large enterprises. Individuals, in addition to basic (calls, text message, voicemail...) services, AIRTEL offers to individuals the Airtel money service that gives users the ability to transfer money using a phone and service is for you (Cpt) which allows the AIRTEL subscriber to send credit to another subscriber of the same network. It is also possible to the AIRTEL subscriber to use electronic recharge (Sap Sap) without using a card to cater her communication credit account. The AIRTEL Subscriber can access the Internet wirelessly from his phone, if it is compatible. This is done also via a computer using a PC card or a USB modem. In addition, AIRTEL has Roaming agreements with 72 countries in the world including 48 in Africa. AIRTEL has thus created unique network, the first network without borders in the world. Indeed, the unique network enables Airtel subscribers to use their phones everywhere where the AIRTEL network operates. This service allows all AIRTEL customers to use their phones across borders without having to pay Roaming fees or additional costs when they receive calls. Roaming services calls are set at the local rates and the cost of an SMS (domestic and international) to 149 FRS.

Business, the company offers prepaid service. The prepaid service is a service charged before consumption. On behalf of business customers of AIRTEL, it is still called top up offer payphone. This service is available to business customers through 45000frs. This allowed the emergence of telephone booths in abundance in most localities where AIRTEL is established. Top up is automatic reloading of the AIRTEL customer's account every first of the month. This quite flexible method also allows, in case of need to add communication credit. The offer is done without subscription fees. The daily life of the Congolese found somewhat simplified and enhanced through this service.

And finally postpaid. These are services which billing occurs after consumption. The postpaid offer consists of the following services: Eco, Business and First. Through the Eco service, in AIRTEL allows companies to access the Internet by phone (Wap), to acquire closed groups of users thus allowing company employees to communicate cheaply. Acquire the Eco service, requires a deposit of guarantee of 200.000F. Monthly subscription to the Eco service fees are set at 17835FCFA as in 2004.

Through the Business service, AIRTEL gives access to fixed rates of monthly subscription with discounts up to 30%. The company may also benefit from rates to fixed and mobile of the Democratic Republic of the Congo (RDC) networks. To acquire the Business service, it must also be a payable deposit of guarantee of 200.000FCFA and 5250FCFA at the beginning of each month.

With First, AIRTEL offers business subscribes to multiple subscriptions, to benefit from the preferential tariffs for local calls, and rates to all mobile and fixed the DRC's networks. The acquisition of this service requires a monthly consumption above or equal to 45000F. For calls, pricing is done in the minute following destinations. In 2005, there was the emergence of Eco, Business, First and Roaming services. Eco service is taxed between 125 FRS and 650frs, the Business service between 140frs and 650frs, and the First service between 120frs and 650frs. It turns out if pricing is identical to the international level, there is the Eco service is the least expensive follow-up of First and Business. SMS are taxed at the level of Eco, Business and First services to 83 FRS regardless of the time.

It appears that AIRTEL applied a strategy to lower tariffs to the level of transactions between AIRTEL subscribers. On the other hand, for operations to other networks, the drop in rates is not as important. AIRTEL is the loyalty of its customer base to maintain its position with its competitors.

10.4 Company MTN Congo and its strategy

●Offer products

MTN offers various branded phones: phone smartphone and touchpad African VMK company. Motorola ZTE, HUAWEI, at affordable prices. This strategy aims to put at the disposal of the consumer smart phones and others, with simple functions at low prices. This proved be an effective way to sell SIM and thus increase the number of subscribers. Indeed, the promotion prices proposed MTN are within the reach of all social strata. These prices remain low enough with regard to the income of the poor. It should be noted that the MTN SIM card is sold to 600 FRS with 500 FRS of credits included. The subscription is free. It is same for the renewal of the SIM loss thereof.

The company also has a range of very varied cards exclusively for prepaid subscribers. These cards allow the account in appropriations for communication. MTN Congo is currently available to consumer's six types of cards at the price of: 500, 1000, 2000, 15000 and 40000 FCFA.

●Offer of services

The company started on two categories of clients, one hand individuals of the other companies. Personal services, MTN Congo policy is to offer through its values: Can do, Leadership, innovation, Relationship and integrity, quality of services varied such as Mtn money involving the transfer of money through a phone. Thus MTN offers apart from services (calls, messaging etc.), services like Call Me, Libota, Flexibility, i-charging, Internet, MTN area. Call me, is a service that allows a MTN subscriber to be reminded by another when there is no credit by sending a free SMS. The LIBOTA service for its part allows subscribers to call their parents or friends at a lower cost. Any customer has the right to four numbers libota MTN. The registration number is charged at 500 FRS. For the mobile internet, subscriber's call 123 for activation and for 3 kilobytes, they pay 0.1 FCFA. 1 kilobyte is 1000 characters (including spaces and punctuation). As for Flexibility, it is a prepaid account-shaped and sub account. It enables the Subscriber to control consumption in terms of calls. This service is much more reserved to companies and, to lesser extent, individuals.

The "i-charging" is, meanwhile, an international transfer service of credit like service "Me2U". It allows a subscriber to transfer since, from the France or the Belgium for example, communication credit has a person to the Congo.

Finally, MTN zone, it is a mode of per-second billing. With this service, the second is invoiced at 0, 12frs, the Subscriber will always benefit reductions ranging from 10 to 95%. In a simpler way, we can say that MTN Zone is a service that enables the Subscriber to be charged according to the reduction or the percentage of geographic location. MTN Zone is reserved for subscribers of tariff plans for prepaid services namely Classik'Optima, Gold Allo and Allo first.

In fact, all subscribers consuming not similarly, differentiation with respect to pricing was made following their monthly consumption. It speaks of tariff plans. Classik'Optima is the tariff plan which is entitled any customer prepaid just after taking his subscription. The call is charged at 150frs per minute

toward the MTN numbers, other networks and international. The Subscriber is subject as long as it consumes less 40.000 FRS month. Access to Allo Gold is acquired when a customer consumes from 40.000frs credit in the interval of one month. Once in Gold, the Subscriber is granted a reduction on its calls to MTN. To keep himself in Gold, the Subscriber must reach the threshold of 40.000 FRS after a month, otherwise it is automatically downgraded on Classik' Optima.

However, to access Alo first, the Subscriber must consume a minimum of 100.000 FRS for Classik'Optima and 60.000frs if it is Allo gold. The principle of a month remains valid and the Subscriber is billed in increments of 15 seconds. On Allo first, the period of validity extends over two months renewable provided that they reach the threshold no later than the day of the anniversary date. The evolution of tariffs of prepaid services of MTN (calls, SMS) database (ex Libertis) shows that in 2004 Libertis used four tariff plans: Classic Allo, Allo Optima, Allo Gold and Allo first. In Allo Optima, the pricing was in hourly increments. While in Allo classic, Gold Allo and Allo first Libertis applied per-minute pricing.

Thus, calls between subscribers Libertis in optimum Allo were fixed 200 FRS in peak hours and 120 FRS in off-peak hours. In Gold and Allo first these calls were taxed at 120 FRS the minute however they were attached to 200 FRS in Allo classic. Calls between Libertis and other networks are fixed in 230 FRS the minute in Allo classic, 200 FRS in Allo Gold and 150frsAllo first. In optimum Allo these calls were taxed to 260 FRS in peak hours and 200 FRS in off-peak hours. Calls to the international level are set at 1000 FRS in Allo classic, 800 FRS in Allo Gold and 650F Allo first. These calls are taxed in Allo Optima 1200 FRS in peak hours and 800 FRS off-peak tariffs.

The cost of an SMS is fixed at 40 FRS at the national level and 250 FRS outdoors in Allo classic, Gold Allo and Allo first. In optimum Allo, Libertis keeps the same pricing, except for SMS to other national networks (intra) taxed at 80 FRS.Between 2005 and 2007, MTN maintains the 2004 classic Allo, Allo Optima and Allo Gold call rates. While in Allo Optima pricing does more in hourly increments as in 2004. Thus the rates for calls between subscribers MTN to other networks and international are 200frs, 230frs and 1000frs respectively. During this period, MTN drop by half (50%) the cost of an SMS between subscribers (20frs) and to the international (125frs). It should be noted that SMS to other national networks are maintained to 40frs while 100frs are attached to other MTN networks. MTN maintains tariffs of calls between its subscribers. In 2008, MTN will merge the optimum classic Allo and Allo-tariff plans into one so-called Classik'optima. In addition, MTN maintains tariffs of calls between its subscribers and in 2007 Gold Allo and Allo first. In AlloClassiK' optimum, they are attached to 150frs a decrease of 25%. The level of calls to other networks there is a decrease in the rates of all of the terms of pricing. These rates are respectively set at 150frs in Alloclassik'optima and Allo gold either with decreases of 34.47% and 25% while Allo first attached to 145frs or a 3.33% decrease. Calls to the international pricing are identical to all tariff plans. It is set to 150frs a decrease of 85% in classik'optima, 81.25% in Allo Gold and 76.92% Allo first. The cost of SMS this year corresponds to those in 2007.It shows that in 2004, Libertis used a strategy of abandonment. This strategy was aimed at a gradual withdrawal from the market and not allowed him to review its tariffs downward. With the arrival of MTN in late 2005, there a diversification and innovations in the services on offer. In 2008, there was a decrease of tariffs fairly important; MTN is implementing its strategies for loyalty of its customers. They also attract other subscribers. With regard to the services of the companies, MTN also offers post services paid to companies. Currently the paid post services offered are five in number. It includes from: first Corporate, expert Corporate, flat Corporate and Corporate fleet and Procontrole.First corporate is the offering of the paid post database. Corporate first aims for its part companies that want access to 15 lines. The flat Corporate service is offered to companies that want their employees to be able to call at the same rates at the national level. Corporate fleet is the only post service paid for directing calls made to a group of customers or employees. The target companies of more than 9 lines. For companies wanting to grant monthly amount of consumer fixed to their employees and willing to cap their consumption an originally defined threshold, MTN offers them the Procontrole service.

Access to existing paid post services varies depending on conditions of subscription IE: monthly subscription, national surety, international deposit. It is the international surety which is most expensive followed by the national surety then monthly subscription. Apart from services corporate fleet and Procontrole, the billing is the same for the national security and the international bail set respectively at 30.000 FRS and 500.000 FRS. However the monthly subscription at the first Corporate, expert Corporate, flat Corporate and Corporate fleet services are fixed respectively at 35.000frs, 30.000frs, 45.000frs and 25. 000frs.For Corporate fleet, the national guarantor is 30.000 FRS by line and the

international guarantee is non-existent. Particular service Procontrole access requires monitoring of the following conditions: the warrants at least a line paid post, the detention of one or more lines in a prepaid solution, demand monthly charging of a credit from 15.000frs and the payment in advance of the amount of recharge.

Analysis of the fee schedule of post services paid by Libertis in 2004 shows that calls to the paid post service were taxed by slots at the same price. Billing ranged from 120frs to 800frs depending on the destination. Schedule of post payes15 first Corporate, expert Corporate, Corporate flat and corporate services fleet of MTN watch billing has remained the same for calls between subscribers MTN, to other national networks for the first corporate services and expert Corporate. For the flat corporate services and corporate fleet these rates increased to 150 FRS compared to 2004. There is a decrease in the rates of international calls which are currently fixed at 350 FRS. The rates of SMS at the level of the paid post services match those practiced at the level of the services prepaid since 2005.

A specificity of billing is made at the level of the Procontrole service. MTN uses for this service a billing system based on the value of the credit to Cap. Thus MTN takes into account three versions: Procontrole 1 (hourly rates) and Procontrole 2 which billing occurs through minute then Procontrole 3 for invoicing per second.

For business customers, MTN offers a prepaid service for the opening of a telephone booth from 44000frs. The call to MTN subscribers is taxed at 27, 5frs and 35frs to other national networks for 15 seconds. These calls are taxed at 50frs to individuals. From the foregoing, it appears that MTN has a tendency to practice a strategy to lower tariffs for all its services. By implementing these strategies, MTN wants in fact to retain its customers and attract other subscribers.

11 Impact of These Strategies on Their Competitive Position

It should be noted that this study analyses strategies for the supply of the products and services of 3 operators and their impact on the market of MP in the Congo. Thus, the impact of these strategies identify itself on the following market indicators: the number of subscribers that record these operators on the market, their turnover and market share. To this end, the expected results of the period 2014-2015 give us the following:

11.1 Subscribers of the MP

In the third quarter of 2015, the Congolese market registered more than 4.5 million subscribers spread between the three operators at during that period in the Republic of the Congo. The number of subscribers between T3-14 and T3 - 15 decreased by 2.5%. Compared to the T2-15, the number of subscribers to the T3-15 decreased by 1.6%. The Mpmarket is composed of 99.2% of prepaid subscribers versus 0.8% postpaid subscribers. The mobile telephony market penetration rate was 98.6% in the third quarter of 2015, compared with 100.9% in the second quarter of 2015. (Table 2)

Table 2   Subscribers of the MP and Penetration Rate

	T3-14	T4-14	T1-15	T2-15	T3-15
Total subscribers(000)	4633	4595	4503	4590	4515
Prepaid subscribers	4601	4560	4468	4555	4481
Postpaid subscribers	31	35	35	35	35

Sources: Operators and ARPCE

11.2 Subscribers by operator

T3-14-T3 - 15, the operator MTN subscribers increased by 12.4%, and those of Airtel's 44.1%. Furthermore, the Azur operator subscribers increased by 2, 0%. (Table 3)

Table 3   Distribution Subscribers by Operator

Subscribers by operator(000)	T3-14	T4-14	T1-15	T2-15	T3-15
MTN	1972	2012	2038	2128	2216
Airtel	1348	2220	2117	2113	1943
Azur	350	363	347	349	357

Source: Operators and author

11.3 Market share in volume of Operators

MTN and Airtel have respectively 49.1% and 43.0% of market share in the third quarter of 2015. Azur, with 357 000 subscribers, farm market with 7.9% of market share, as shown in figure 1 below.
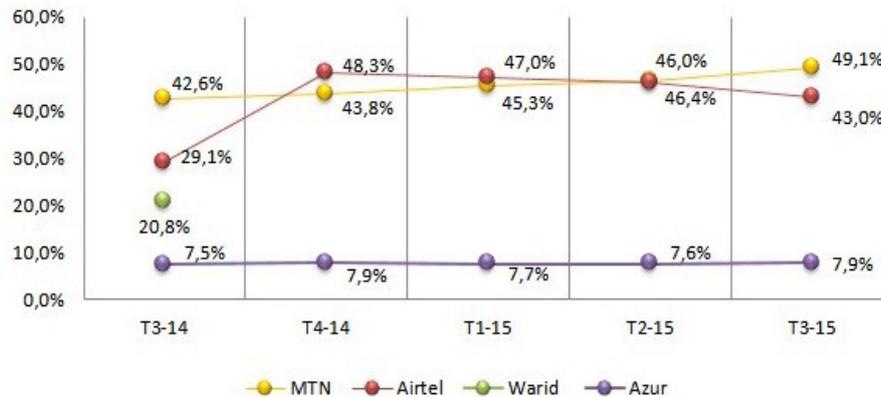
Figure 1 Presentation of Data of Market Share in a Figure
Sources: Operators, ARPCE and Author

12 Conclusions

This study explained in a first step the role played by strategies and their impacts in the Mp enterprises in Congo. On the other hand, it recounted how the Congolese mobile phone market of is characterized and analyzed the part of the business, the competitive battle or market even sales strategies. After analysing strategies used in the Mp market, we can therefore assert that each operator practices a watch known as informative and technological, to counter the total domination of its competitors. This is why we see a similarity on bids put in place by Azur, Airtel and Mtn operators. The strategy here aims at innovation offers, in order to differentiate itself from its competitors. Observation made, it is that the mobile market is approaching a level of saturation. 95% of the population aged 15 years and more is equipped with mobile, out of a population estimated at 3.900.000 habitants56. 37% of mobile users have more than one line. This trend is justified by the multiplication of stakeholders and the competitive intensity on the market, searching for rates (essentially for the net off calls) and failure in terms of network coverage. Therefore, Congolese phone companies (Azur, Airtel, Mtn) try to enforce different policies for best performance as the competitive stakes are so huge oblige them to work to improve each time their reputation, conquer and retain their customers. So, it has to be mentioned that this sector of the MP, still enjoys a balanced economic health.

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The Impact of Transformational Leadership, Organizational Learning, and Knowledge Management on Organizational Innovation

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Abstract: Organizations are facing volatile environments compounded with strife competition, faster technological change, and globalization. This study aims at finding the potential predictors of organizational innovations. Stratified random sampling was used to collect data from 273 usable responses from 500 respondents. Empirical study shows that transformational leadership (TL), organizational learning (OL), and knowledge management (KM) significantly predict organizational innovation (OI). Contributions, limitations, and future research directions are also explained in the end.
Key words: Organizational innovation; Organizational performance; Knowledge management; Organizational learning; Transformational leadership

1 Introduction

Organizations are facing volatile environments compounded with acute competition, faster technological change, diverse workforce, explicit and tacit knowledge arrival, and globalization. The secret of successful organizations is to have distinctive resources which are rare, unique, inimitable, and valuable. These resources are unique technology, better work procedures, skilled human resource, better equipment, venture capital etc. To expedite innovation and continuous improvement or even expediting the corporate bottom-line, organizations need to foster those antecedents which are already inbuilt into it (Noruzy, Dalfard, Azhdari et al., 2013). OL seems to be a great source of greater competitive advantage in this knowledge economy. KM is a precursor to the organizational learning to be adopted for improving organizational sustainable performance. OL and KM instigate an organization to be innovative and profitable firm in the long run (Liao, Chang, Hu et al., 2012; Liao and Wu, 2009). A company's excellence is linked with the utilization of its knowledge capabilities, i.e. the knowledge of the organization and its employees. KM, an important element of OL, is a life blood of an organization that contributes to the OI. OI is a premium benefit to outweigh its counterpart. Innovation is the successful implementation of noble and useful creative ideas (Amabile, 1996). KM is a pre-requisite for creating, sharing, and storing creative ideas, and on the other hand, effective leadership plays a significant role to have a supportive climate for exposing knowledge and OL into OI. TL is presumed to be more effective form of leaderships to transcend employees drive into the innovative and long-term successful initiatives. Whereas literature exhibited that leadership plays a significant role to transform OL and KM into OI and also revitalize the OP (Noruzy et al., 2013), this study intends to figure out how TL, OL, KM, and OI directly influence OP rather than TL, KM, and OL affect OP through OI.

2 Conceptual Model and Hypotheses Development

2.1 Transformational leadership and its significance

TL creates positive change among followers. It is defined as the charismatic ability of the leader which elevates the followers' dedication and motivation and aligns them with the mission and vision of the team and the organization (Bass, 1991). TL contributes to the development of a learning organization. Besides, TL also influences a team performance who is involved in knowledge creation, sharing and implementation. Bass and Riggio (2006) reported that TL enhances creative effort in an organization and also contributes to the innovative goal. This TL is supportive to unconventional and out of the box things and work-process that fosters innovation and improve organizational performance. Empirical studies exhibited the effect of TL on OL (Abbasi and Zamani-Miandashti, 2013), KM (Birasnav, 2014; Bryant, 2003; Han, Seo, Yoon et al., 2016), OI (Chang, 2016; Tajasom, Hung, Nikbin et al., Hyun, 2015), and OP (Noruzy et al., 2013). The hypotheses of these relationships are:

H_1: Transformational leadership positively influences organizational learning
H_2: Transformational leadership positively influences knowledge management

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H$_3$: Transformational leadership positively influences organizational innovation

H$_4$: Transformational leadership positively influences organizational performance

2.2 Organizational learning and its effects

Kane and Alavi (2007, p.796) said that 'OL as the dynamic process of creating new knowledge and transferring it to where it is needed and used, resulting in the creation of new knowledge for later transfer and use.' OL is also concerned with KM and the difference lies in the way of treating knowledge. Unlike OL, KM is a static process of storing, creating, and transferring knowledge in the organization. There is a considerable debate on their relationship of who is the cause is and who is the effect (Noruzy et al., 2013; Shieh, 2011). The relative competitive position of an organization depends on how far innovative the organization is (Montes, Moreno, and Morales, 2005). Noruzy et al. (2013) reported that OL significantly affects OI and OP. The hypotheses of these relationships are:

H$_5$: Organizational learning positively influences knowledge management

H$_6$: Organizational learning positively influences organizational innovation

H$_7$: Organizational learning positively influences organizational performance

2.3 Knowledge management and its influence

Knowledge and human capital act like antecedents to the organizational innovation and performance (Sánchez, Marín, and Morales, 2015). In this information and knowledge economy, KM is essential to keep the organization updated and stay it out of competitors' reach. According to Nassuora (2011), knowledge management (KM) is all managerial activities which helps employee create new knowledge and share this knowledge to other employee for improve organizational and individual performance in an organization. Darroch (2005) found that a firm that can manage KM better is likely to be innovative and perform better. Plethora of research found that KM contributes to innovation effort and thus help ameliorate organizational performance (Darroch, 2005; Noruzy et al., 2013). The following hypotheses have been developed considering the above literature?

H$_8$: Knowledge management positively influences organizational innovation

H$_9$: Knowledge management positively influences organizational performance

2.4 Organizational innovation and organizational performance

Organizational innovation is the implementation of a new way to recruit personnel, allocate resources and structure tasks, authority and rewards. It comprises innovations in organizational structure and in the management of people (Damanpour, 1987). Continuously improving performance is the ultimate goal of an organization and the word 'continuous' senses nothing if there is no innovative effort. OI helps an organization to improve its performance. Empirical studies conducted by Huang, Wu, Lu et al. (2016) examined the impact of innovation of outcomes of the organization and found that OI affects OP significantly. Thus the following hypothesis is proposed for this study:

H$_{10}$: Organizational innovation positively influences organizational performance

Supervisor supports, fair treatments from organization, and supportive organizational climate, preconditions to the perceived organizational supports (POSs) can create superior moral obligations to organizational performance by employees. Therefore, organization needs TL and fair climate to mould the KM and OL for fostering innovative performance leading to innovative organization in the long run. Like resource based views, knowledge based views exhibit that knowledge and organizational learning turns out to be the predictors of sustainable organizational performance. A conceptual model (figure 1) has been developed to exhibit relationships among TL, OL, KM, OI, and OP as follows:
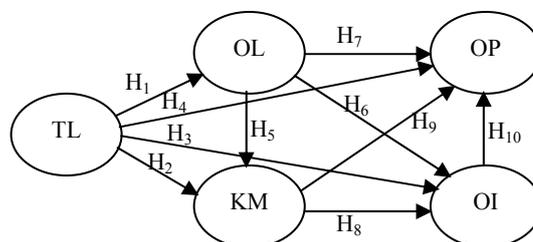
Figure 1   Hypothetical Model of OI

3 Research Methods and Survey Instrument

Using stratified random sampling, 300 responses from 500 questionnaires were collected. In screening tests, 47 responses were dropped to abate the common method bias, missing data, outliers, and data normality problems. Of the responses (273), 83 per cent were from male and 17 per cent were from

female. Respondents were serving different organizations at different levels, i.e., top level (6%), mid-level (68%), and lower level (26%). They have been serving their organizations for more than one year (25%), five years (51%), fifteen years (20%), and twenty years (4%). Survey shows that respondents were representing readymade garments (35%), finance (24%), telecommunication (20%), and others organizations (21%). Education profile shows that they completed bachelor, master and others by 14 per cent, 77 per cent, and 9 per cent respectively. Researchers adopted five (5) different instruments and used 5-point Likert scale to administer the survey. These five instruments are Transformational leadership (Podsakoff, MacKenzie, and Bommer, 1996), organizational learning (García-Morales, Lloréns-Montes, and Verdú-Jover, 2008), knowledge management (Gold, Malhotra, and Segars, 2001), organizational innovation (Miller and Friesen, 1983), and organizational performance (Cho, Ozment, and Sink, 2008). SmartPLS 2, and SPSS 20 software packages were used for generating the results.

3.1 Reliability and validity of the instrument

Table 1 reports the convergent validity and it shows that the factor loadings (all > 0.50), average variance extracted (AVE> 0.50) and composite reliability (>0.919) are within the rule of thumb. Discriminant validity analysis reports that the result within the cut off value, that is, the square root of the average variance extracted (AVE) of each construct is higher than the construct's highest correlation with any other construct in this study. Therefore, both validity and reliability analyses suggest that these constructs are valid and reliable for further advance (Hair Jr., Hult, Ringle et al., 2014).

Table 1　Convergent Validity and Descriminant Validity Tests

	AVE	Composite Reliability	R^2	Cronbachs Alpha	Communality		KM	OI	OL	OP	TL
TL	0.713	0.925	0	0.899	0.8440	KM	**0.849**				
KM	0.720	0.912	0.608	0.870	0.8487	OI	0.821	**0.855**			
OL	0.679	0.894	0.729	0.843	0.8241	OL	0.827	0.837	**0.824**		
OI	0.732	0.891	0.798	0.816	0.8553	OP	0.831	0.849	0.819	**0.853**	
OP	0.728	0.915	0.807	0.875	0.8531	TL	0.780	0.829	0.777	0.828	**0.844**

4 Findings and Discussion

Figure 2 (in next page) shows the path diagram in the structural equation model. It shows standardized coefficient (β), percentage of variance explained (R^2), and items' loading in the path model relationships. Hair Jr et al. (2014) reported that path coefficients with standardized values above 0.20 up to a sample size of 1000 are usually significant. Analysis along with bootstrapping results (**figure 1**) shows that standardized coefficients (βs) of TL→KM is 0.345 *(t-value=3.466; p<.00)*, TL→OL is 0.777 *(t-value=16.968; p<.00)*, TL→OI is 0.364 *(t-value=3.780; p<.00)*, TL→OP is 0.273 *(t-value=2.408; p<.02)*, OL→KM is 0.559 *(t-value=5.907; p<.00)*, OL→OI is 0.348 *(t-value=3.539; p<.00)*, OL→OP is 0.169 *(t-value=1.53; p<0.127)*, KM→OI is 0.25 *(t-value=2.703; p<.007)*, KM→OP is 0.255 *(t-value=2.439; p<.015)*, OI→OP is 0.272 *(t-value=2.439; p<.02)*. Therefore, all path relationships (excepting OL→OP) were found significant. Furthermore, TL, KM, OL, and ON altogether explains 81% *(R^2)* variance in OP, TL, OL, and KM altogether explains 798% *(R^2)* variance in IN, TL and OL together explains KM by 73.2% *(R^2)* and TL alone explains OL by 60.4% *(R^2)*.

These findings are also found consistent with the previous empirical findings that TL predicts OL (H$_1$) (Abbasi and Zamani-Miandashti, 2013; García-Morales et al., 2008), KM (H$_2$) (Birasnav, 2014; Bryant, 2003; Han et al., 2016), OI ((H$_3$) (Afsar, F. Badir, and Bin Saeed, 2014; Chang, 2016; Tajasom et al., 2015), and OP (H$_4$) (Abbasi and Zamani-Miandashti, 2013; Noruzy et al., 2013) respectively. OL is also found consistent with previous findings that it effects KM (H$_5$) (Liao and Wu, 2009; Noruzy et al., 2013; Shieh, 2011), OI (H$_6$) and OP (H$_7$) (Liao and Wu, 2009; Noruzy et al., 2013; Shieh, 2011) respectively. Previous studies supported that KM influences OI (H$_8$) (Al-Hakim and Hassan, 2016; Noruzy et al., 2013) and OP (H$_9$) (Darroch, 2005; Noruzy et al., 2013). Finally OI is found affecting OP (H$_{10}$) like other previous empirical research (Huang et al., 2016; Walker, Chen and Aravind, 2015). TL sheds light on OL and KM of an organization and paves the path for OI and excels OP. TL facilitates OL by creating team, giving timely directions, and guiding the

processes of change. TL is essential for creation, transforming, and transferring of knowledge. Furthermore, TL revitalizes OI and OP by integrating OL and KM with employees' mindset towards organizational mission and vision.
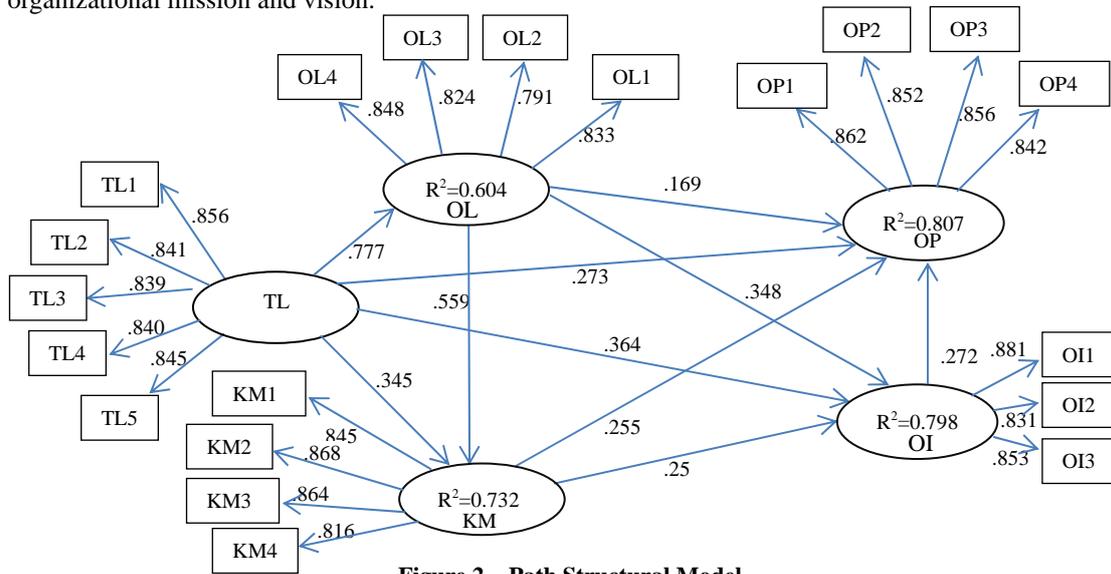
Figure 2   Path Structural Model

5 Conclusions, Implications, and Future Research Prospects

This study aims at finding the predictor variables of OI and OP in Bangladesh at different organizational units. Result shows that TL, OL, and KM significantly affect OI at different levels. Besides, TL, KM, and IN are also found to be significant predictors of OP. This result has some theoretical, academic and practical significance. Unlike many other studies, this study shows that OL is not significantly affecting OP which is a new direction of further research. Studies on KM and OL are relatively new; however, this study shows that they affect OI significantly. Therefore, professionals and practitioners require committing more resources on the proper KM and OL. Academics and researchers can do more research on KM practices, KM systems, and OL for further development. One of the limitations of this study is the sample size which is limited to generalize the universe. In addition, moderation effect of demographic factors and mediating effects of above considered variables mentioned in the structured model are clearly absent. Future studies suggested chalking out the mediating effect and moderating effect of third variables on the relationships between leadership and organizational innovation.

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An Empirical Research on Customer Participation and Its Impacts on Customer Value

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Abstract: Customers participation is considered a new source of competitive advantage, but there are comparatively fewer studies which have considered the value outcomes of participation from the customers' perspective. In this study, the personal training industry is taken as an example to explore the effects of customer participation on customer perceived value and customer behavioral intentions. The Survey results suggest that customer participation and customer value are significantly positively correlated, in which, personal interaction has the most influential effect. But interestingly, utilitarian value perceived by customer was not found to be associated with customers' positive WOM, repurchasing and referral, whereas social value and hedonic value do have a significant effect. Finally, implications for managers are considered.

Key words: Customer participation; Customer value; Behavioral intentions; Service

1 Introduction

Nowadays growth and value creation have become the dominant themes for managers (Prahalad and Ramaswamy,2004). Companies are searching for new and better ways to create value and differentiate their service offerings in order to attract and keep customers, as well as make a profit. Customer participation is considered as a new source of value creation.

Characteristics of service often require customers to be actively involved in helping to creation the service value, either by serving themselves or by cooperating and often working collaboratively with service personnel (Claycomb,2001). Customer participation in service delivery, referred to as customer co-creation (Prahalad and Ramaswamy,2004; Witell et al.,2011), yields benefit for both service providers and customers. Through customer participation, service provider can generate some economic value. The service provider can increase productivity, decrease costs, facilitate service development and innovation activities (Lovelock and Young,1979; Mils et al.,1983; Mustak,2013). Participative customers can obtain personalized service, and then lower price sensitivity (Hsieh and Yen,2004), perceive the brand image more favorably (Woisetschläger et al.,2008). Participation leads to higher customer satisfaction and enhance customer loyalty (Ennew and Binks,1999; Chan et al.,2010; Cermak et al.,1994).

Recent studies have indicated the promise of studying the impact of customer participation on sellers' value outcome. Comparatively fewer studies have considered the value outcomes of participation from the customers' perspective (Mustak et al.,2013). The customers' perspective and their value outcomes deserve more research. In this study, based on the existing research, the personal training industry with a high degree of customer participation is taken as an example, to explore the relationship among customer participation, customer value and customer behavioral intentions.

2 Theoretical Background and Research Model

2.1 Customer participation

Customer participation refers to a customer's activities or provisions of tangible or intangible resources related to the development or creation of offering (Mustak et al., 2013). Customer participation is a multi-dimentional construct. Silpakit and Fisk (1985) argue that customer participation includes customers' mental effort, physical and emotional effort. According to the role of customer playing in the service delivery, Bettencourt (1997) developed three types of customer's voluntary performance: loyalty, information sharing and co-production. Ennew and Binks (1999) suggest that customer participation has three broad dimensions: information sharing, responsible behavior and personal interaction. Although some scholars have attempted to classify customer participation into different dimensions. But by comparison, we can find these dimensions have a lot of similarities in meaning. So three different dimensions of participation are proposed including information sharing, co-production and personal interaction in this study.

2.2 Customer value

Creation and offering customer value have become the new source of competitive advantage. Most authors agree that customer value involves some kind of trade-off between benefits and sacrifices(Zeithaml,1998). Customer value research has devoted significant effort to developing typologies of value. For example, Sheth et al. (1991) identify five types of value: functional, social, emotional, epistemic and conditional. Chandon, Wansink and Laurent (2000) further expand the content of customer utilitarian / hedonic value. The utilitarian value is divided into saving, higher quality and convenience, the hedonic value is divided into the chance of value expression, entertainment and exploration. Gursoy, Spangenberg and Rutherfor (2006) classify value into two types in their study about festival activities and proposed hedonic dimension is more important. Sweeney and Soutar (2001) propose four distinct value dimensions that are termed emotional, social, functional value (quality/performance and price/value for money). Summarizing the different views about customer value, we also conceptualize value as a multi-dimensional construct, including utilitarian value, hedonic value and social value.

2.3 Customer behavioral intentions

Behavioral intention refers to "a person"s subjective probability that he will perform some behavior (González et al., 2007), is a predictor of future behavior. Bloemer et al. (1999) break up behavioral intention to WOM, purchase intention, price sensitivity and complaint behavior. The concept of behavioral intention proposed by Yang and Peterson (2004) refers to the intention to repurchase and recommend. In this study, we agree that customer behavioral intention consists of positive word of mouth (WOM), repurchase intentions and the intention to recommend the product to others.

2.4 Customer participation and customer value

Customer participative behavior should yield benefits. Customers who are more willing to share information and develop closer personal contacts might be expected to benefit in terms of a higher quality of service provision, because the provider will be more knowledgeable about their needs and expectations (Ennew and Binks, 1999). So participation is associated with improved perceived quality and greater perceived value by customer. Customer can also accrue economic value through participation, as they benefit form cost reduction and discounts when participating in the creation of offering. In addition to make service process more efficient and effective, customer participation can yield the emotional or spiritual pleasure (Firat, Dholakia and Venkatesh, 1995). Prahalad and Ramaswamy (2004) argue that value is co-created at multiple points of interaction. Basis of value is co-creation experience. Social value is derived from the product's ability to enhance social self-concept (Sweeney and Soutar,2001). The communication and interaction between customers and employees or among customers can enhance the sociability experience, will be of great help to customer experience friendship, build good personal image, meet the inherent spiritual demand. Participative behavior will bring a sense of pleasure, curiosity, rigorousness and fulfillment to customers (Ennew and Binks,1999; Cermark et al.,1994). Therefore, we offer the following hypothesis:

H1：Customer participation -(a) information sharing(IS), (b) Co-production(CO), (c) personal interaction(PI)- will be positively associated with utilitarian value(UV).

H2：Customer participation - (a) information sharing(IS), (b) Co-production(CO), (c) personal interaction(PI)- will be positively associated with hedonic value(HV).

H3：Customer participation - (a)information sharing(IS), (b) Co-production(CO), (c) personal interaction(PI)- will be positively associated with Social value(SV).

2.5 Customer value and customer behavioral intention

Zeithaml (1998) argues that it is hard that high quality directly urges consumers' purchasing behavior, the mediator of customer perceived value is the relevant factor that influence consumer behavior. Couchen Wu, San-san Hsing (2006) argue that the more value perceived by customer, the greater influential to customer subsequent conduct. Therefore it is hypothesized that:
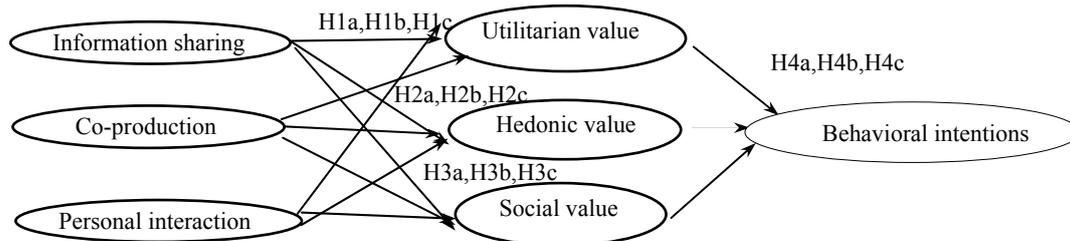
Figure 1   Research Model

　　H4: Customers value - (a)Utilitarian value(UV), (b) Hedonic value(HV), (c) Social value (SV) - will be positively associated with customer behavioral intentions(CBI).

3 Methodology

3.1 Sample and data collection

　　Our study took the training industry as research context, the object of study were people who had the personal train experience. A web-based questionnaire survey was used to collect data. Online questionnaire survey was generated and released. At the same time, we send the link of survey website to friends and invite them to participate in the survey.

　　We collected 382 usable responses for data analysis. Female accounted for 50.52%, Male accounted for 49.48. Most respondents in this study were the undergraduate college students. The most participated training is the driving school, which includes 139 people, accounting for 36.39%. The next larger ones are the qualification training including 79 people and accounting for 20.68%, and the foreign language training including 73 people and accounting for 19.11%, and so on.

3.2 Study measures

　　Reference to previous study, three dimensions of customer participation were assessed by measures designed to identify information sharing, co-production and personal interaction.This study proposed to examine customer value were measured from different dimensions: utilitarian value, hedonic value and social value. Three items (repurchasing intention, positive WOM and referral) were used to measure customer behavioral intentions. All measure items of our study were drawn from previous study and made some modifications according to the characteristics of the training industry. Table 1 provides the definition and measures of all constructs. All measures used in the present study were assessed on seven-point Likert scales, ranging from strongly disagree (1) to strongly agree (7).

Table 1　Operational Definition and Measurement of Constructs

Construct	Operation definition	Items	Source
Information sharing (IS)	share information between the two parties in order to ensure that they are provided with a service that meets their particular needs	IS1-IS5	Ennew & Binks (1999)；Cermak,File & Prince (1994)；Jia Wei(2010)
Co-production (CO	discretionary customer behaviors indicating respect for the provision of quality service delivery	CP1-CP6	
personal interaction (PI)	personal interaction between customers and the staff delivering the service	PI1-PI5	
Utilitarian value (UV)	the utility derived from expected performance, perceived quality, costs, convenience	UV1-UV7	Sweeney & Soutar (2001)
Hedonic value (HV)	the utility derived from the feelings and　affective state, e.g. Joyful, fantasy etc.	HV1-HV5	
Social value (SV)	the utility derived from the enhancement of social self-concept	SV1-SV9	
Customer Behavioral intentions (CBI)	customer's subjective probability that he will perform some behavior	CBI1-CBI3	Groth (2001)

3.3 Reliability and validity test

　　We tested the reliability and validity of the measurement model by Spss17.0 and Amos 17.0. The Cronbach's α of the variables are higher than 0.7, indicating a high scale reliability.

Table 2　Cronbach's α of Construct

Variable	Customer participation			Customer value			Behavioral intentions
Dimension	IS	CO	PI	UV	HV	SV	
Cronbach's α	0.720	0.728	0.822	0.909	0.912	0.907	0.808

　　A confirmatory factor analysis on the measurement model was conducted to check for the construct validity. The measurement model fit the data well ($\chi 2$/df=2.52, RMSEA=0.067, RMR=0.06, CFI=0.921, GFI=0.934, AGFI=0.87).

3.4 Data Analysis

　　Statistical Regression analysis was conducted to test the study hypotheses. Table3 and Table4 provided the results from the regression analysis.

H1 predicted that the three dimensions of Customer participation will be positively association with customer utilitarian value. The regression results indicated very support for this hypothesis. Information sharing (H1a: β=0.201, p<0.001). Co-production (H1b: β=0.203, p<0.001), personal interaction (H1c: β= 0.479, p<0.001) were all found to be positively associated with the customer utilitarian value. Similarly, H2 which predicted association between customer participation and hedonic value and H3 which predicted association between customer participation and Social value were also supported (H2a: β=0.282, p<0.001; H2b: β=0.181, p<0.001; H2c: β=0.423, p<0.001; H3a: β=0.163, p<0.001; H3b: β=0.166, p<0.01; H3c: β=0.492, p<0.001).

Table 3   Regression Results-Impact of Customer Participation

Variables	Utilitarian value	Hedonic value	Social value
	β	β	β
Information sharing	0.201***	0.282***	0.163***
Co-production	0.203***	0.181***	0.166**
Personal interaction	0.479***	0.423***	0.492***
R-squared	0.636	0.630	0.561
Adj. R-squared	0.633	0.627	0.557
F	220.105***	214.468***	160.844***

***p<.001; **p<.01; *p<.05

H4 predicted positive association between the three dimensions of customer value and customer behavioral intentions. The regression results indicated that this held true for hedonic value (H4b: β=0.314, p<0.001) and social value (H4c: β=0.530, p<0.001), but utilitarian value(H4a) was not found to be associated with customer behavioral intentions (not entered into the regression equation of explaining behavioral intentions).

Table 4   Regression Results -Impact of Customer Value

Variables	Customer behavioral intentions
	β
Social value	0.530***
Hedonic value	0.314***
R-squared	0.653
Adj. R-squared	0.651
F	356.577***

***p<.001; **p<.01; *p<.05

4 Conclusions
4.1 Study results
In the personal training industry environment, the hypotheses have been tested. As predicted, customer participation (information sharing, co-production and personal interaction) were all found to positively influence customer perceived value. Among them, personal interaction had the most influential effect on customer perceived value. The findings that were contrary to expectation related to the impact of customer perceived value on customer behavioral intentions. The study found the more the social and hedonic value perceived by customer, the more favorable behavioral intention (positive WOM, repurchasing and referral) and vice versa.

Social value had the most significant impact on customer behavioral intentions, hedonic value took the second place. But surprisingly, utilitarian value was not found to be associated with behavioral intentions. The reason of such a result was perhaps partly because of the samples, most of our samples are college students who received lower level training. Comparing with training result, these students value the training experience and social contact much more.

4.2 Managerial implications
The research model and study findings hold several important implications for managerial practice. Firstly, enterprises should encourage and expand the various forms of customer participation. The research results show that three dimensions of customer participation, such as information sharing, personal interaction and co-production, all have a significant positive impact on utilitarian value,

hedonic value, and social value. Among them, personal interaction has the maximum impact on customer value, because it involves in the emotional investment from both sides, and the higher level the interaction has, the deeper the emotional investment becomes. In addition, by the timely communication and human interaction, the customer can also cause social bonds, which providing themselves with an important psychological benefit. Therefore, service companies should take effective measures to encourage customer participation and expand the ways for customer participation, and at the end improve customer participation. Particularly it is important to provide customers with convenient and efficient participation channels for keeping the communication and exchanges with customers, in which the communication between customers and employees and the interaction between customers are included.

The second implication relates to the findings regarding the potential impact of customer value. For businesses, products and services not only should meet the most basic practical requirements of customers, but also should pay more attention to the psychological feelings which the customer has during the service process. In the service process, to make the customer feel happy and have the spirit of enjoyment, let the service become a new and interesting experience, which is reflected in the hedonic value. The social value mainly lies in the influence from the society and other consumers on him / her in the service process with customer participation. This make him/her improve his/her position through the service, and be admitted by more people.

4.3 Limitations and future research

Relevant conclusions of this study are only drawn by the survey data, and the studied industry is limited to the personal training industry. Therefore, whether the results of this study can be applied to other industries and other situations as well needs to be further verified. In addition, most respondents in this study were the undergraduate college students, so the training involved was mostly in middle and low-level training programs, which also affected the universality of the conclusions.

The focus of the study was to examine impact of customer participation on the perceived value and customer behavioral intentions. However, other factors should be considered, for instance, whether there are some factors moderating the relationship between customer participation and customer perceived value. Future research should address the limitations of this study.

Acknowledgement

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A Research on Management Innovation of State-Owned Enterprises under the New Situation of Comprehensively Strengthening the Discipline of the Communist Party of China

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Abstract: This paper using methods of literature research, qualitative analysis, interdisciplinary research, according to the report of domestic scholars about the Chinese enterprise management innovation in recent years, proposes that the State-owned enterprise how to act, maintain development and open-minded thinking way under new situation of Comprehensively Strengthening the Discipline of the Communist Party of China. It is considered that state-owned enterprises need to adapt to changes in internal and external environment as soon as possible, search a new way of management and innovation, comprehensively understand the characteristics of the management innovation in order to build a theoretical system of preliminary construction for state-owned enterprise management innovation. This paper concludes that the state-owned enterprise management innovation will be based on integration of strengthening the Party's construction, institutional innovation and culture innovation, which provide related subjects especially Chinese management theoretical research for a reference.

Key words: State-owned enterprise innovation management; New situation of comprehensively strengthening the discipline of the communist party of china; The necessity of management innovation; Basic way

1 Introduction

The strategic management expert from Unite State proposed that, as the result of internal and external environment with resource adaptation and integration, the management innovation in overcoming the organizational inertia and rigidity, eradicating the deep operation problem of organization, enhancing organizational performance and other aspects has an irreplaceable role. It is an important way for enterprises to have sustainable competitive advantages(Gary Hamel.2009). State-owned enterprises as the first main part of socialist market economy, the initiative to adapt to China's New Normal and carry forward management innovation has become the most important issue that needs to be solved urgently. For enterprise management innovation research, because related research of early domestic academia was mainly staying on the summary of experience or general information of innovation rather than a deep theoretical research, so the theoretical research of Chinese enterprise management innovation mainly came from abroad. Dr. Lin Haifen from Dalian University of Technology summarized the foreign related research as process research, effectiveness research, impact research, spread research, influence factors and other interrelated perspectives (Lin Haifen.2012), which laid the important theoretical foundation for Chinese management innovation. Compare to most researches based on the previous studies in a particular context of organization abroad, this paper according to the new situation in China and the emergency of the Chinese enterprise to carry out the innovation management research, discusses the necessary of innovation management for the state-owned enterprise under the new Situation of Comprehensively Strengthening the Discipline of the Communist Party of China, and research the basic way and characteristic of enterprise management innovation.

2 The Necessity of Management Innovation of State-owned Enterprise under New Situation of Comprehensively Strengthening the Discipline of the Communist Party of China

2.1 The necessity of implementing about comprehensively strengthening the discipline of the communist party of china

The responsibility system of strengthening the construction of the Party's working style should be strictly implemented by the leadership of the Party committees and leading cadres in the Party in order to build a clean and honest government. Especially for state-owned enterprises, according to the request of Comprehensively Strengthening the Discipline of the Communist Party of China, constantly push

forward the construction of a clean and honest government, establish and improve the honest working mechanism, from top to down strengthen implementation of responsibility system, perfect examination of responsibility and accountability, strengthen supervision and management, innovative working methods, improve the risk prevention mechanism, deepen the internal control system construction, promote the Party to build a clean and honest government, promote enterprise stable, healthy and sustainable development. Secretary of the Party committee of the state-owned enterprise should be the first responsibility for construction of a clean and honest administration and anti-corruption work, who need to set an example to the other, from the top to control the below, layer upon layer transmit pressure. Enterprise should insist to combine the construction of a clean and honest government with every key work together, combine responsibility appraisal of a clean and honest administration with assessment of cadres, give full play to the functions of commission for discipline inspection, improve the work efficiency through construction of a clean and honest administration.

2.2 The necessity of management innovation for state-owned enterprises

The new situation of Comprehensively Strengthening the Discipline of the Communist Party of China makes the external environment of the stated-owned enterprise change, and the external environment of enterprise influences the internal environment deeply. So the enterprise must continuously improve internal factors to adapt to the external environment, and generate non-replaceable effects for enterprise developing, Therefore, the changing internal environment require state-owned enterprises to take the initiative of management innovation actively. At present, state-owned enterprises not only face the new situation of Comprehensively Strengthening the Discipline of the Communist Party of China, but also face intensive competitions in the market which presents new characteristics. Firstly, with the sustained openness of market, it's formed a unity of the worldwide market, each of industries have some large competitive enterprise with top obvious advantage, which are the pilot and vane to others. Secondly, cutting-edge ideas, innovative technology, advanced management appeared continuously which were different from the traditional enterprise, have highly competitive and dynamic, promoting the competition between enterprises more serious. Thirdly, the competition between enterprises in the international market always involves the interests between countries, so it might be transferred as the interest or the power between countries and regions. the government behavior will further intervene into the enterprise competition, making the enterprise competition situation more complicated. Therefore, as an important part of the national economy, state-owned enterprises should take initiative to adapt to the new characteristic of changing market actively, make the management innovation of enterprise development as the first important work.

3 The General Information of the Basic Method for State-owned Enterprise Management Innovation

3.1 Strictly strengthen the management in accordance with the law

To Strengthening the Discipline of the Enterprise strictly must rely on the rule of law on the overall architecture of strict process management, make management and operation scientification, achieve the maximum benefit of the enterprise under the tight legal system, make enterprise share bonus through legal system in market economy; strengthen the system construction and propaganda construction of enterprise, improve and perfect system, standard, revise according to the new situation, new requirement and new regulations regularly. Further increase the impact of the Commission for Discipline Inspection, through function of the Commission for Discipline Inspection for people, the supervision of the matter, the audit of the financial, The Trinity embedded each link of enterprise production and marketing chain, to achieve the whole process monitoring and supervision. Intensify the propaganda, making employees know and use to defend their rights and interests of law or system; Enterprise leaders must take the leadership in this system, play a positive example for employees, give full play to the role of corporate counsel.

3.2 Strengthen the idea of management innovation

Innovation is a creative thinking activity, is the soul and guideline to promote the enterprise management. State-owned enterprises have to strengthen this concept of Comprehensively Strengthening the Discipline of the Communist Party of China, resolutely resist the abuse of power, abusing power for personal gain and other issues. to hold, construct, tighten the Party constitution, Party rules, and Party discipline, have overall situation inside, make the state-owned enterprises better and stronger unswervingly: Strengthen the detailed management idea, use this idea in the whole process of the management, realize the transition from experience management, extensive management to

scientific management and detailed management, further to subdivide position responsibility, subdivide target, subdivide system process, creating the enterprise culture of constantly perfecting. Strengthen the consciousness of innovation, implementation of the national idea that innovation promotes development, build strong innovation atmosphere, share management innovation experience, popularize excellent management achievements and application experience, promote transformation of management innovation achievements and application.

3.3 Stand out management institutional innovation

Institutional innovation provides a guarantee to strengthen enterprise management and promote enterprise innovation. State-owned enterprises have to give full play to the role of case study method, mainly through the combination of three methods of extensive collection of second-hand cases, study and research the field case, second-hand data and field investigation to obtain other business management system innovation cases, comprehensive understanding and using the innovation of management system and relevant experience for reference. In order to innovate management system according to the Comprehensively Strengthening the Discipline of the Communist Party of China under the new situation and the future development of enterprise needs, institutionalize and standardize the thinking innovation, technological innovation, organizational innovation and other kinds of activities, improve performance incentive constraint mechanism, fully arouse the enthusiasm of the staff; innovate decision-making mechanism, allow employees to develop their own interests, encourage employees to innovation, import excellence performance management model, create a more favorable environment for the enterprise and staff; Innovation mechanism encourages talents in science and technology innovation activities, changes the model of incentive for material, pays attention to the synchronization of the improvement of employees' EQ and IQ, Actively create a harmonious and warm working environment, makes the staff take the initiative to consider the development of the enterprise, arouses the enthusiasm of science and technology talents.

3.4 Optimize the process management

Optimize the process management is to emphasis operation, innovation, the problem solution and pushing forward the construction of the quality management system and realize enterprise process management. State-owned enterprises should take process management as the core implementation of process reengineering, break departmental boundaries functions, establish a process oriented management system, stable core business processes, realize the key point, cross-sectoral, cross-functional process interface management, comprehensively improve the process efficiency; Stated -owned enterprises should accelerate the deep integration of information and management, enhance the information construction of office automation, human resources management, statistical analysis, financial management, performance appraisal work etc. Stated-owned enterprise should set up the business process management platform to strengthen the core management processes and business process stable and online monitoring, realize the application can check, management can view, process can control, performance can evaluate, ensure accurate and efficient information transmission; Stated-owned enterprise should reduce costs through reasonable management innovation, improve quality, increase enterprise's interests, improve enterprise management level, enhance the market competitiveness of the enterprise, adapt the new situation and the change of economic market.

4 The Characteristics of the State-Owned Enterprise Management Innovation

4.1 Ecological

The state-owned enterprise's ecology refers to looking for the key points of enterprise management innovation, and the evaluation of management innovation achievements should be taken according to enterprise's whole ecosystem. At the macro level, the enterprise's ecosystem is a complex system, elements in this system connect and interact each other, and vary when the internal and external environment changed. The enterprise's ecology provides a possibility for management innovation, meanwhile give a suitable opportunity for the enterprise to adapt to new situation of Comprehensively Strengthening the Discipline of the Communist Party of China.

4.2 Integrality

The extent of management innovation in state-owned enterprises are different, each department or staff can be considered as the subject of innovation management. People-oriented, that relying on staff to solve the problem, has been considered as an innovation of modern management. Fundamentally, enterprise innovation management involves each employee, their intuitive feelings and opinion suggestion are the best voice for management innovation. Therefore, every employee can and should

become the main subject of innovation management, they form a strong overall management innovation integrality, and lay a solid foundation for the enterprise reform and development.

4.3 Transformative

Transformative means the management innovation usually refers to the adjustment of the relationship between rights and interests inside the enterprise, thus, many management innovation, especially the deep management innovation, is essentially a profound management reform. State-owned enterprises which seek survival and development in the new era must break the old development pattern and the old mindset, take the enterprise's reform and innovation in a large environment, have an initiative to adapt to the changed situation. The leadership of enterprise can't simply use the profit for enterprise's developing goals, but should stand at the higher level thinking the direction of enterprise development, make the revitalization of national industry as the historical responsibility for state-owned enterprises.

5 Conclusions

Innovation is the root and motivation of enterprise's survival and development. This paper has made some considerations under the new situation of Comprehensively Strengthening the Discipline of the Communist Party of China, that state-owned enterprises should seize opportunities and adapt to the change of internal and external environment as soon as possible. Through the management innovation the state-owned enterprises should play the Party's construction as an important role in enterprise management, cultivate and implement advanced enterprise culture, establish and perfect the advanced management system, achieve optimal allocation of resources, comprehensively improve the enterprise's capability and competitiveness in all aspects. In this research we found the complexity of the management innovation, the culture with Chinese characteristics and the embeddedness of Comprehensively Strengthening the Discipline of the Communist Party of China, which make the research on Chinese enterprise management innovation become a continuous task. Further studies need to increase the exploratory case studies, and use other methods to research the problem of the implementation management innovation, high-level leadership issues, the comparison problem of domestic and foreign research issues.

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A Research on Linking Marketing Capabilities to Marketing Strategy: Implications for Firm Performance

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Abstract: The current paper is aimed to explore the importance of marketing capabilities in formulating global marketing strategy by reviewing the existing literature. A research model is proposed after critical analysis of different studies conducted in the same sphere. The important dimensions of marketing capabilities including market sensing, customer engagement and partner linking have been defined as contributing elements of firms' competitive advantage. Therefore, current paper proposed positive relationship between strong marketing capabilities and competitive advantage. The main reason to scrutinize competitive advantage is that it helps companies to formulate marketing strategy. Pursuing thoughtful global marketing strategy is the key element of firms' success in international market. This paper contributes to the marketing innovation literature as it analyzes marketing capabilities in relation to competitive advantage. Therefore, expected outcomes of the paper are to provide useful suggestions for marketers and scholars in terms of formulating global marketing strategy.
Key words: Market sensing; Customer engagement; Partner linking; Global marketing strategy; International performance

1 Introduction

For the last three decades, the role of marketing has been extensively studied by marketing scholars to shed more light in its contribution to form a global strategy. Precisely, during the 20th century, most of the companies witnessed decreasing number of international trade barriers which led to increasing trade levels among many nations. In this regard, firms started utilizing global strategies as a means of gaining competitive advantage (Teece, 2007). It is worth to mention that due to the intense impact of globalization most of the countries are still becoming richer whereas the consecutive force of globalization made most countries to stay without any progress. The same principle can be applied in order to understand the position of many companies in different industries. That is to say, some companies possess a strong competitive advantage over the other companies in certain industries (Yim et al., 2008). Therefore, there is strong need for most companies to understand the importance of factors which contribute to the formulation of successful global strategies in local as well as in international market. Additionally, the creation of strong global strategy requires from firms good understanding of industry environment, the essence of internal and external forces, the influence of competitive rivalry, bargaining power of suppliers and buyers, the nature of changing technology and much more (Porter, 1985). It has been stated that well-designed global strategy helps firms to achieve competitive advantage. Therefore, understanding the market environment and exploiting new marketing opportunities has been discussed as the main important requirements of the firm that can determine their successful operations in the market (Du & Kamakura, 2012). Therefore, this paper aims to explain the increasing importance of marketing capabilities and how marketing capabilities can help firms to build strong global marketing strategy which is considered as a critical success factor of their expansion in international markets. Based on the review of the previous literature in the area of marketing and global strategy formulation, this paper builds conceptual framework which helps firms to understand the underlying importance of marketing capabilities including market sensing, customer engagement, partner linking and how these capabilities can contribute to the global strategy formulation through moderating role of international experience and international entrepreneurship.

2 Literature Review

Most of the marketing professionals and business practitioners have been analyzing the significant importance of marketing capabilities (Lockrey, 2015; Morgan, 2009, Mariadoss, 2015). The reason for increasing attention towards studying the characteristics of marketing skills is that they are directly

related to formulating strong marketing strategies of companies (Sok, 2013, Morgan, 2005, Du, 2012). Formulating right marketing strategies is found to be crucial in maximizing the chances of success of firms as they continuously develop and maintain their strong positions in the foreign market (Teece, 2007). It is believed that marketing capabilities help firms to create strong competitive advantages for the firms which are not easily copied by their competitors. Achieving strong competitive advantage requires the usage of different generic strategies proposed by Porter (1995). These strategies include cost leadership, differentiation, and focus. Formulation and successful implementation of these strategies require from firms strong capabilities in marketing. Scholars debated for a long period of time over different skills which constitute strong marketing capabilities. As a result of long discussions and debates between the main scholars of marketing, a certain type of capabilities was proposed such as market sensing, customer engagement, and partner linking (Du & Kamakura, 2012). Marketing capabilities allow firms to establish and formulate timely and efficient reactions towards changes in market environment. Ongoing changes in market environment involve changes in customer preferences, exploitation of new marketing opportunities and creation and usage of new technologies that will result in the creation of new product and service. Therefore, most marketers strongly argue that marketing capabilities are the essential assets of any company that aims for successful positioning of their products in the foreign market.

As it was stated in the previous literature, market sensing is regarded as one of the important elements marketing capability. The relative importance of market sensing becomes even significant when companies are provided with the right type of information at the right time at the right amount. In this regard, market sensing enables firms to formulate their strong strategies which are more likely to allow them to exploit new market opportunities (Teece, 2007). Customer engagement is another crucial element of contributing to the effective formulation of marketing capabilities. From the marketing perspective, firms producing their products and services according to the needs and wants of customers are more likely to win in the long term (Ghazi, 2015). Despite this widespread phenomenon, many businesses nowadays aim to increase the number of their existing customers as well as attracting new ones (Morgan, 2005). Therefore, customer engagement is gaining popularity in the field of marketing capability. Previous studies defined marketing capabilities as the integrative process which allows the firm to produce a product to meet consumer demand by using their tangible and intangible resources (Du & Kamakura, 2012) Marketing capabilities are also reported to create better value for customers through effective usage of market sensing. This integrated process is the example which shows those main elements of marketing capabilities including customer engagement and market sensing that interrelated with each other. Most of the previous studies suggested showed the positive link among companies' partnership capability and marketing capability (Weick, 2005, Miller, 1988). Studies conducted by (Day, 1994, Mu, 2012, Park, 2010) stated that having strong marketing capabilities are essential in achieving competitive advantage. Companies with strong competitive advantage are believed to achieve success in the long term through their operation both in local as well as international market. In general, it can be concluded from the review of previous literature, companies with strong marketing capabilities are more likely to achieve success compared to those without capabilities.

The following propositions are deduced from the critical literature review:

Proposition 1 – Marketing capabilities consisting of market sensing, partner linking and customer engagement lead to competitive advantage of firms on global markets

Proposition 2 – Competitive advantage is a mediating variable linking marketing capabilities and firm performance
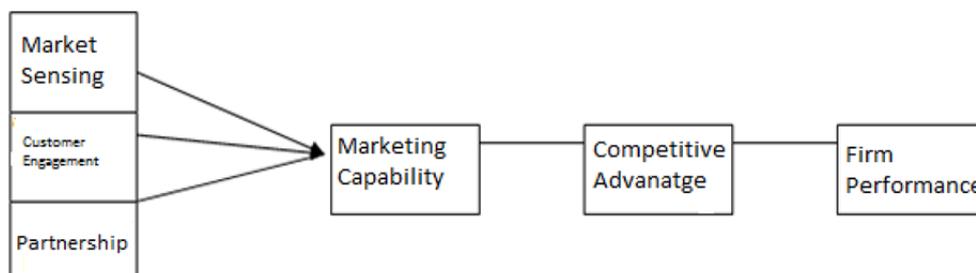
Figure 1   Proposed Research Model (Relationship of Marketing Capabilities With Marketing Strategy to Achieve Firm Success)

3 Recommendations and Implications

The current proposed model has been formulated based on the review of the previous literature and can be well suited to be applied in the case of the companies that are aiming at cultivating their marketing capabilities. For companies, which are trying to become global, such as many of Chinese producers, adding value to the existing product through marketing efforts presents a challenge. Despite the fact that marketing capabilities of many businesses operating in China are quite strong, they do not translate well to success on global markets. The marketing drawbacks of Chinese firms reflect in the inferior results and unfavorable reputation. Such companies can use the current framework and focus specifically on the variables of market sensing, customer engagement and partner linking on a global level. The conceptual framework proposed in this model is not targeted to explain all the important variables that can connect marketing department activities to operations of business. Considering the specific nature of marketing operations and their relation to global strategy formulation, it would be very challenging to propose such model. However, proposed framework gives the underlying characteristics of marketing which will help the firm to achieve success in international market operation. Therefore, our model proposes some significant implications for business managers and marketers. Proposed conceptual framework is useful in understanding the importance of market sensing capability, customer engagement capability and partner linking capability and their relative importance in formulating the global strategy of the firm. For example, customer engagement capability and market sensing capability can be developed by producing and offering an innovative product to the market which will help to create customer value, which is the cornerstone of achieving competitive advantage. Moreover, this study shows the critical role of international experience in moderating the role between market sensing and global strategy formulation, emphasizing the possession of international experience and how it can be beneficial in achieving market sensing capability. Moreover, the critical role of international entrepreneurship has been controlled for partner linking capability and strategy formulation.

Despite the significance of the proposed framework, this model has some limitations. For instance, the relative importance of marketing capabilities such as human resources and financial resources of the firm should be considered to a certain extent to understand their influence on firm performance. Moreover, specific marketing capabilities including brand management, marketing communications management, and channel management should be studied well enough to produce some empirical evidence to support the formulation of global strategy. As a suggestion for future research, it can be mentioned that other important characteristics maintaining the sustainability of marketing capability should be studied in relation to global marketing strategy.

4 Conclusions

The development of a conceptual framework to explain the influence of marketing capabilities to form global marketing strategy is crucial for both marketing scholars and international business people. Pursuing right global strategy in the international market helps firms to achieve competitive advantage which is critical to their success. A comprehensive review of the previous literature implies that there is no single study that can explain the importance of marketing capabilities to formulate the right global strategy that will help the firm to achieve global strategy. Therefore, this study developed a conceptual framework which explains the relative importance of marketing capabilities including market sensing, customer engagement, and partner linking and their role to formulate a global marketing strategy that will help the firms to pursue their operations internationally in foreign markets. Some useful implications and recommendations are expected to be derived from the results of the study. Therefore, business practitioners and marketing professionals are advised to pay more attention in strengthening the role of marketing capabilities.

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A Review of Enterprise Top Management Team and Organizational Innovation

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Abstract: Research on top management team (TMT) began in the "upper Eehelons Theory" which was proposed by Hambrick and Mason. The "upper Eehelons Theory" is based on the opinion that TMT provides the impetus for the organization innovation and the strategic decision. The relationship between TNT and innovations has been highly concerned by the scholars. By reviewing literature, this paper summarizes the relationship between TMT and innovations into three aspects: 1) the direct relationship between the TMT characteristic and innovations; 2) the direct relationship between the TMT operation and innovations; 3) the intermediary effect and adjustment variable effect between TMT and innovations. On the basis of the review, this paper analyzes the limitations of existing research, and discusses the direction of future research.
Key words: Top management team; The characteristics of TMT; The team operating; Innovation

1 Introduction

In the 21st century, innovation is the key factor of enterprise survival and the key means to maintain the sustainable competitive advantage. The innovation is a high risk investment. The enterprise whether makes innovations or not depends on the TMT's values, characteristic and the organization innovation. The research about TMT began when the *Upper Echelons Theory* was proposed by Hambrick and Mason in 1984. The *Upper Echelons Theory* has two chief viewpoints: (1) organization outcomes include strategic choices and performance depends on the value of top manager(TM); (2) the demographic characteristics such as TM's ages, tenures in the organization, educational background, social and economic status are the explicit variable. Hambrick and Mason's Upper Echelons Theory has been further broadened and deepened by many scholars. Ultimately come to this conclusion that TNT can be defined as top managers, including CEOs, general managers, vise-general managers and senior managers, who work on corporate strategic decision-making and are responsible for enterprise's business activities and economic benefits. Reviewing literature for more than 20 years, the relationship between the TMT and the innovation is divided into two stages: the first stage mainly studys the TMT's demographic characteristics and heterogeneity's impact on strategic choices and organization performance; the second stage is further, the research extended to TMT's operation and its situational variables.

However, in this field, the review of the research is relatively blank, so that there is a lack of effective integration of the existing literature. Based on literature review, this paper summarizes the research on the relationship of the TMT and innovations from three aspects, the direct relationship between the TMT characteristic and innovations, the direct relationship between the TMT operating and innovation and the mesmeric effect, the mediating effect and moderating effect.

2 The Direct Effect of the TMT Characteristics on Innovation

There are two main aspects of the research on the characteristics and innovation of the TMT. One is the research on demographic characteristics (ages, tenures, education level, education specialty, career backgrounds), psychological features, social characteristics; another is the research on influence the TMT's heterogeneity and diversity of the characteristic have on innovations.

2.1 Demographic characteristics and innovation

The discrete distribution of the TMT's demographic characteristics of has a great influence on organizational innovation (Yan Jiang&Tiqing Zhang, 2008). Most researches indicate that there is a negative correlation between ages, tenures and innovations. (Barker & Mueller, 2002; Yanling Kang, 2011; West & Anderson,1996; Carmen& Ana,2010). Tenures will bring organizations tangible or intangible risks and restrict the information process. The long-tenure top managers who attain the existing achievement through years of efforts would choose simulation strategies conforming to present situation of industry development rather than innovating. (Finkelstein & Hambrick, 1990) But there is a positive correlation between education levels, career backgrounds and innovations. The top

managements who are more educated own more knowledge reserve and greater cognitive competence which can improve their competence of absorbing knowledge and solving complex problems; the education level also has influence on the risk perception and bearing that the highly-educated TMs accept reform and bear risk more easily, (Hui Lei & Peng Liu ,2013) thus are more willing to innovate (Schoenecker & Daelloibach, &McCarthy)；In 2009, Fang Wen and Yuming Hu empirically studied China's listed companies between 1999 and 2006, finding there is a positive correlation between the whole TMT's education levels and research input. In 1991, Thomas found enterprises which support the innovation strategies about market and product are mostly leaded by TMs who have the background of R&D function; the more technology-oriented TMs who pay more attention to the strength of R&D, the more beneficial to organization innovations. The research made by Barker and Mueller also indicated that the CEOs from production, engineering or R&D department care more about technology development and product innovation.

2.2 Psychological features of the TMT and innovations

Based on their cognitive, TMTs consider many factors when deciding whether to invest in innovation. Partial researches have confirmed that the TMT members' personality, cognitive styles and other psychological characteristics, has an important impact on innovation. In 2011, dividing the TMT cognitive styles into analysis and creative two types, Shenglin Shi, Qi Chen and Jing Zhang found they have significant influence respectively on process innovation and product innovation. In 2009, people like Qisheng Shi studied the TMT's shared mental model from its sharing accuracy and breadth, and thought that the cognitive and sharing between members can effectively affect the efficiency and process of decision making.

2.3 Social characteristics and innovation of TMT

TMT's social characteristics mainly refer to TMT's social networks and social capitals. TMT members' social network is a powerful tool for enterprise's resource dependence. TMT gets different information resources through the integration of internal and external social networks, which is conducive to the whole organization strategy (Keegan, 1984), effectively improve strategic flexibility (Shuming Zhao, 2013), then affect innovation.

TMT's social network is divided into two types: internal social network to promote team members' experience diversity and the enterprise's effective decision making and innovation (BURKE,1998) and external social network to obtain external resources, enhance the enterprise competitiveness and innovation performance (Bing Ren, Liqun Wei 14, 2011).For team network how to access and exchange resource, the structuralism network theory emphasizes social relationship or connection configuration brings available resources to individuals or teams. Min geng based on the network analysis method of social center view to explore the relationship between TMT social network structural characteristics, team cohesion and decision quality. People like Qianwen Li and Shuming Zhao (2012) found that the TMT social network affects enterprise performance through internal innovation, risk investment, strategic update and other internal entrepreneurial mechanism. In addition, the HR practice of constructing TMT social network significantly improving the enterprise performance (Collins and Clark, 2003) is significantly positively related to the TMT's social network which is the channel for TMT to obtain and promote the accumulation of social capital. TMT's social capital is constituted together by external relationship which gets the interests of economic, resources, information and control and internal relationship contributing to the full-effective cooperation. (Weimin Chen within the team, 2007) Fuping Ma and Yanping Li (2011) studied from three dimensions: political social capital, business social capital and public social capital, indicating that TMT social capital is conducive to obtain innovation resources and then promote technological innovation.

2.4 The TMT heterogeneity and innovation

Team heterogeneity is difference which can broaden the team's vision in the decision-making process, bring organization diverse information resources and may also contribute to the gap between the members and aggravate conflicts.

Some empirical studies confirmed that TMT age heterogeneity, tenure heterogeneity, career background heterogeneity, education level heterogeneity has significantly positive influence on innovation. The TMT's characteristics heterogeneity which means the diversity of information resources and ideas in the information decision-making process, prompts the TMT to be more creative and innovative. The TMT's education background heterogeneity plays a negative regulatory role between political connections and entrepreneurial enterprise's innovation capability (P Zhang, Z Huang, X Gao,2014); and the greater the difference in tenure, the more inclined the enterprise is to competition and product innovation (Srivastava &Lee, 2005). Zahra and Wiklund (2010) found the positive

correlation between TMT's awareness of the market, the functioning heterogeneous and product innovation; Lyon and Ferrier (2002) thought that TMT with high heterogeneity can make better tactics or strategic innovation compared to teams with homogeneity. However, not all scholars agree that team heterogeneity promotes organization innovation. Minming Xie (2011) found age heterogeneity is negatively related to innovation performance; selecting technology-based SMEs as objects, Huajing Li and Yuli Zhang proposed negative correlation existing between TMT functional management experience heterogeneity and enterprise innovation. Third studies suggest that heterogeneity is nothing to do with innovation. Selecting 100 manufacturing firms as samples, the result was TMT's ages, tenures, and education backgrounds have no impact on strategic change. (Wiersema & Bantel, 1992)

3 The Direct Effect of TMT's Operation on Innovation

West & Anderson (1996) built a TMT innovation output model showing that innovation support, task orientation, decision-making participation and other team operation effect organization innovation differently. Researchers from process perspective think TMT operation mainly including team conflict, communication, task oriented, decision-making, behavior, behavior integration, incentives and other acts, and team members' interaction, as team characteristics do, will affect team's innovation decision-making. This paper summarizes the direct effects of the TMT's operation on innovation from the three aspects: team conflict, compensation incentive and behavior integration.

3.1 The conflict of TMT and innovation

TMT conflict is defined as an interdependent interaction between TMT members and the resulting competition and cooperation relationship between core team members in strategy making and implementing level, and also the opposite or inconsistent interaction process caused by factors existing between members such as goals, cognition and feelings which are incompatible and difficult to coordinate. (Chen Yun, 2007) Different perspectives can divide TMT conflict into different types: cognitive and affective conflict, according to a condition precedent; destructive conflict and constructive conflict, according to effects of conflict. Conflict which is inevitable in the TMT's decision-making process is considered to be the prevailing condition for effective decision making. However, conflict is a double-edged sword. Sometimes it can find defect, improve decision quality and promote understanding of decision theory; and under some circumstances it will delay the decision making process, destroy team members' satisfaction and hinder their interaction.

There are many reasons for the conflict in TMT, such as group norms, team values and effectiveness of team interaction. Carmen and Ana (2005) consider the heterogeneity of TMT characteristics that causes cognitive conflict which promotes team innovation and emotional conflict which inhibits team innovation to be the main factor. And the latest research shows that, unless there is an appropriate mechanism to manage the conflict between the top management team, the high correlation between the dimensions of conflict will cover the potential benefits of task conflict, is not conducive to team innovation(C Camelo-Ordaz,J García-Cruz,E Sousa-Ginel,2016).So TMT's problem is to encourage cognitive conflict and restrain emotional conflict in decision making. Different types of conflict have different impact on innovation, and the key is to carry out effective conflict management(Chen et al，2005).Guoquan Chen and Chunghong Liu suggested that only cooperative conflict management can promote high-quality constructive conflict which makes high-energy teams which guide more creative organizations. Simth, Olian, Sims, O'Bannon and Scully（1994）found high frequency of team communication can reduce conflict, solve and consider different opinions, which contributes to team decision-making and enterprise performance improvement.

3.2 TMT's compensation incentive and innovation

Now mostly enterprises separate ownership from managerial, and incentives of which affect the direction of TMs' decision making and innovation can effectively change TM's behavior. Lerner and Wulf (2007) found a significant positive correlation between TMs' long-term incentive contract and the technological innovation output by analyzing the panel data of 300 Usa Inc between 1987 and 1998. Yu Zhiliang and Zhang (2009) took China's listed companies as research objects to study the relationship between TMT incentives and enterprises' innovation, finding the positive correlation between annual salary and enterprise independent innovation. People like Yuan Gu (2013) measured TMs' incentive mechanism from two aspects: compensation and share proportion, knowing that different incentive methods have different effects on enterprises' innovative input, on which TMs' shareholding ratio have greater influence. Ning Xu and Xiangyi Xu (2013) redefined and remeasured TMs' incentive effect in the framework of innovation economics and they found that the influence of equity incentive, incentive

compensation and control power incentive on technological innovation has 3D interaction effect. Barros and Lazzarini (2012) found that promotion incentives can do more to promote organization innovation than compensation incentive, and the two forms a complementary relationship that promotion incentive works with the support of compensation incentive.

3.3 The TMT'S behavior integration and innovation

The TMT's behavior integration is a new trend of team process researches. TMT behavior integration's essence is to achieve the effect that "two heads are better than one" and contribute to the harmony without uniformity of team members' information sharing, decision-making and resource. Hambrick (1994) firstly put forward the concept of TMT behavior integration and come it down to: the quantity and quality of information exchange(including the richness, timeliness, and accuracy), cooperation and collective decision-making. Based on Hambrick's study, Simsek (2005) expand the research of TMT behavior integration, and developed the scale to measure three dimensions of behavior integration. Then the foreign formed two types of empirical research paradigm represented by people like Siemsek whose researches attached importance to the consistent behavior of integration and cared more about the content of the "harmony" in the team operation while people like Li whose researches attached importance to the inconsistent behavior of integration and cared more about the act of the" different opinions "in the team operation. China's scholars named Zhenhua yao and HaifaSun (2009) divided behavior integration into three dimensions: decision-making participation, open communication and team cooperation, considering the dialectical process of "harmony without uniformity" and "difference but harmony" is essence of TMT behavior integration. TMT behavior integration helps TMs integrate knowledge and insight, and contributes to enterprises' decision making of developing new products, and improvement of product innovation strength (Li&Zhang2002). Lubatkin (2006) thought TMT behavior integration is the key factor for enterprises to succeed in dual innovation, and improving the level of which can promote innovative behavior, contribute to carry out exploratory innovation and using innovation, and then enhance innovation capability (Anna Ding and Jingjiang Liu 2012). Ling Shang's (2011) study also confirmed that the higher the level of TMT behavior integration is the more conducive to entrepreneurial enterprises to carry out dual innovation can be.

4 Mediating Effects and Moderating Effects

4.1 Internal mediating effects

TMT's innovation strategy decision-making is not only affected by TMT's composition, but also factors such as the team process or team members' interrelation. Some scholars believed TMT's characteristics diversity may lead to conflict within the team or the internal heterogeneity (Amason and Mooney, 1999; Li and Hambrick, 2005), and then effect innovation. Some others believed team members' interaction is an intermediate variable between TMT's composition and organization performance (Jackson, 1992; Etal. Knight, 1999; Olson and Parayitam Olson, 2006). So TMT's research changes from the direct effect to the mediating effect.

TMT characteristics affect innovation by effecting team operation. As intermediary variables, the team process mainly includes task orientation, decision-making participation, conflict management, strategic identity and so on. West and Anderson (1996) built a framework of TMT characteristics, team operation and innovation, explore the relationship between TMT heterogeneity and organization innovation, and indicate that task orientation and decision-making participation are the intermediary variables. Heterogeneity can not only enrich the team view, but also lead to team conflict, which is not conducive to innovation. Task orientation and decision-making participation contributes to team members' full exchange of different views and information, changing team conflict into a constructive debate and improving the level of organizational innovation. Some scholars pay more attention to the mediating role of conflict and consistency. Chen et al (2005) found that cooperative conflict management is the most effective way, which can produce high-quality constructive conflict and contribute to organization innovative. People like Chen Lu constructed a theoretical framework of the relationship between social capital, team conflict and the effect of decision making, which is mediated by cognitive conflict and affective conflict. Taking science and technology enterprises as samples, Carmen and Ana found that only in the mediation of strategic identity can TMT's functional diversity promote innovation.

Some scholars carry out exploratory researches, regarding social capital, social networks and other team characteristics as intermediary variables. People like Bing Re (2011) proved that the organization obtain the resources needed to promote enterprises' innovation through the management of external

social networks between enterprises.

Some scholars pay attention to the mediation between the TMT operation and innovation. Et al Wu (2002) studies the relationship between the TMT's management style and organization innovation, finding that TMT with a focus on empowerment and consensus management style is easy to promote organization learning, and thus promotes technological innovation. People like Lu Chen (2013) found that psychological empowerment plays a mediation role between paternalistic leadership and creativity. Abraham et al (2009) discussed the influence of TMT members on decision-making effectiveness and draw a conclusion that decision-making participation contributes to decision-making effectiveness which plays a partial mediation role between TMT decision-making participation and organization performance. Guoquan Chen, Dean Tjosvold and Chunhong Liu believe that the two kinds of leadership styles, the human-orientation and the production-orientation, play a mediation role between team cooperation and innovation, which can help team members gain two basic elements of creativity: firstly, strategies to complete a series of tasks; secondly, strengthening team members' coordination to achieve strategic objectives. The choice TMT leaders make from the two kinds does affect the effectiveness of leadership and innovation.

4.2 The external situational effect

Upper Eehelons Theory agrees that the TMT operation and TMT members' performance are different in different situations, thus the impact on innovation is different. So there are scholars studying the relationship between TMT and innovation in allusion to different management situations.

Functional synergies, strategic consensus, team behavior integration, product novelty and other moderator variables are well studied. Regarding functional synergies as moderator variables, Seigyoung and Mengue (2005)studied the relationship between TMT heterogeneity and organization innovation and knew the relationship used to have no correlation between TMT's education level heterogeneity, tenure heterogeneity and organization innovation turns into a significantly positive correlation at a quite high level of functional coordination, which shows the addition of contextual factors can reflect the positive role of the TMT heterogeneity on organization innovation. Fu Ping Ma and Xiaochuan Guo (2010) found that the method of TMT conflict management plays a moderation role between TMT heterogeneity and technological innovation performance, and cooperative conflict processing mode has a positive moderating effect while competitive conflict processing mode has a negative moderating effect. In the same year, people like Fuping Ma (2010) found the heterogeneity of tenure, education level and professional, career background has a more significantly positive effect on technological innovation performance under the quite high behavior integration, because the behavior integration is more conducive to share and utilize the decision-making information. Selecting 174 new ventures in high potential as research objects, Amason and Shrader (2006) found that the TMT heterogeneity (including education level, professional heterogeneity and functional heterogeneity) is negatively related to entrepreneurial performance under the condition of high product, but the negative correlation disappears in the case of the new degree of the product novelty. With 97 innovative firms in Spain selected as objects, Carmen et al (2010) discussed the moderation effect of strategic consensus between TMT and innovation performance, and the study shows that the relationship between TMT functional diversity , tenure diversity and innovation performance is a significant negative correlation, but the relationship between the diversity function and innovation performance changes from a negative correlation to a positive correlation when under the moderation of strategic consensus. Yong et al[1](2011) built a theoretical model between TMT and strategic reforms and discussed the moderating role of salary inequality and resource abundance. The results show that the relationship between TMT's tenure heterogeneity, the education background heterogeneity and strategic reform is significantly positively related but weakens when salary inequality existing. While the relationship between age heterogeneity and strategic changing is a significant negative correlation but weakens when wage inequality existing. Li (2013) considered organization innovation studies the relationship between the TMT diversity and organization flexibility from an information processing view, and results showed that the social capital of the TMT plays a moderating role, and when it is in high level, the relationship between TMT diversity and multiple organization innovation is a significantly positive correlation. Because TMT with diversity promotes the information exchange and the knowledge accumulation within the team through a high level of social capital, and then realizes dual innovation.

It is worth noting that environment, culture, industry and other external factors are also scholars' focus of attention. Seigyoung and Mengue (2005) found that the direct effect of TMT's career background heterogeneity and innovation strategy is negatively related, and the negative impact is large when it is in the high dynamic complexity of the environment, while the negative correlation becomes

positive when it is in the high dynamic complexity of the environment and functional synergies. The company's ownership form and industrial environment plays a moderating role between TMT characteristics and enterprise strategic positioning, and the TMT heterogeneity promotes the enterprise's strategic direction, of which the effect is more significant if the environment is stable and especially when the enterprises are state-owned. Johnson and Rasheed (2008) found the TMT's demographic characteristics have no effect on the differentiation strategy in a controlled environment, while the TMT's age, tenure and differentiation strategy form a significant negative correlation in the unregulated environment. Based on the perspective of literature review, Ning Xu (2013) argued that industry characteristics, corporate equity structure, corporate profitability and other contextual factors play a moderating role in studying the relationship between TMT incentive and technology innovation.

5 Conclusions

Through the analysis and review of the literature, we can see that scholars have made abundant research results on the relationship between TMT and innovation. The framework of the existing research is roughly shown in Figure 1. There are three aspects of the main research contents: firstly, the direct relationship between TMT characteristics and innovation; secondly, the direct relationship between TMT operation and innovation; thirdly, the focus on the mediating effect and moderating effect between TMT and innovation.
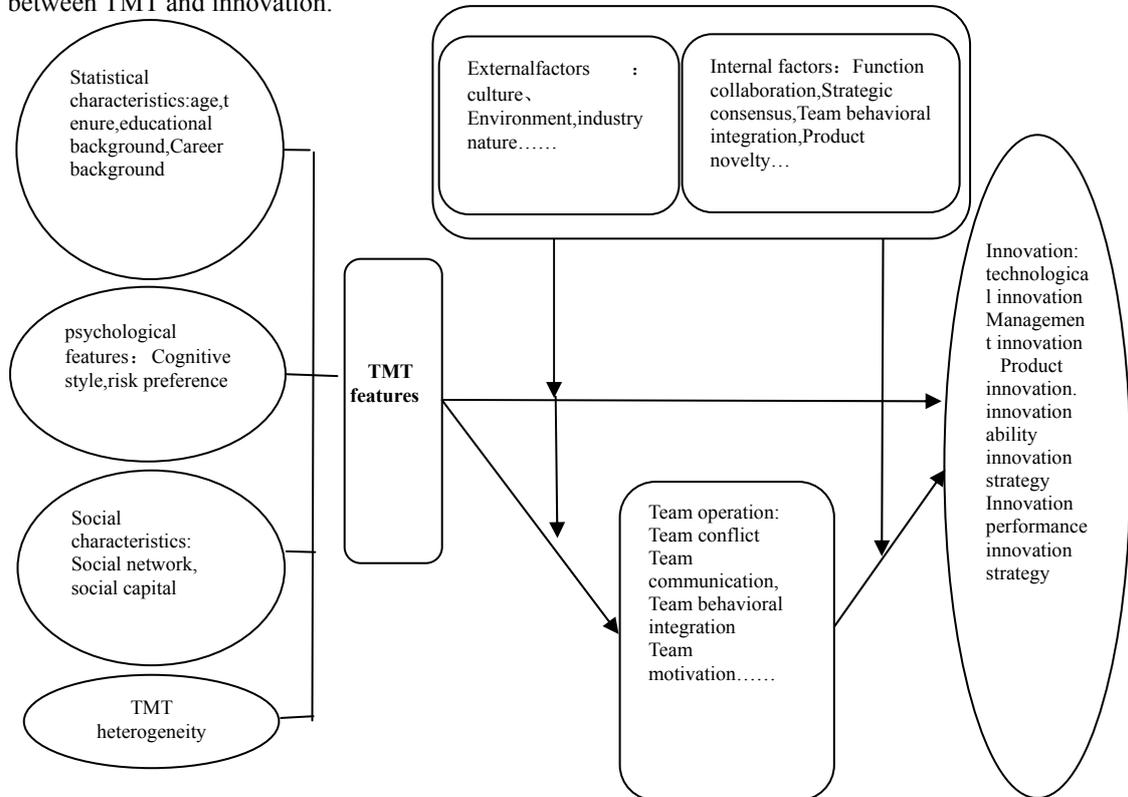
Figure 1   The Executive Team and Innovative Research Framework

Academia has confirmed that the TMT characteristics and operation have an impact on innovation, but there is no consensus it is positive or negative. So as a branch of the TMT theory tree, the researches on relationship between TMT and innovation still continue growing. For future research, we propose the following recommendations:

1) Expanding the scope of the TMT characteristics

Upper Eehelons Theory regards TMT's demographic characteristics as measurable indicators of values, the cognitive basis and so on, follow-up studies mostly select demographic characteristics, diversity or heterogeneity as dependent variables, and a few literatures relate to TMT's psychological characteristics which are difficult to measure such as psychological motivation, risk perception, cognitive style and so on, or social features such as social capitals and social networks, etc. Future researches can pay more attention to the TMT's psychological characteristics and social characteristics,

such as the TMT's risk preference of perception, cognitive difference, psychological contract and so on, because innovation is a kind of risk investment, different ability of risk perception, cognitive differences and others will all affect innovation.

    2) Researches in different situations

    Among existing empirical researches, many of the results are not consistent, and even some are completely contrary, maybe because of differentiation in samples selecting, calculation errors or other factors in the technical level, and maybe it did not consider the impact of situational factors. From the contingency theory perspective, the influence of TMT characteristics on innovation is likely to be different in different internal and external situation. Future researches can consider the moderating effects of environmental factors, cultural factors, organization factors, and so on.

    3) Strengthening researches on the impact mechanism of the TMT operation

    The existing researches study more about the correlation between the TMT and organization output, and the researches on the internal team operation is still lack of systematization, and there is no clear distinction on the impact mechanism of team operation. The influence mechanism of TMT operation has two modes which have different explaining process and level on the impact of innovation, one is the TMT operation directly affects innovation as the antecedent variables, another is that TMT operation is a mediating or moderating variable between TMT characteristics and innovation. Future researches should consider how does the TMT operation affect innovation when leading it in.

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The Interpretation and Orientation of Inducing the Enterprise Institution Innovation: Based on the Vision of Emergency Governance

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Abstract: Emergency governance dominated and exercised by the business managers, is a typical form of business management governance practices. From the perspective of institutional-ism, emergency governance not only has the rationality for business managers to dominate mandatory supply within institution demand, but also has the necessity for the authorization to respect the staff's wishes to enhance the inevitability of public governance structure under the background of humane system. However, there are some drawbacks of the corporate governance practices based on emergency governance. It could strengthen the centralize management of infrequent events, and the closed, forced institution innovation may increase the cost of implementation, reduce the efficiency, and shorten the life cycle of the system. Only with an open mind, detailed implementation mechanisms, and multiple power sources, can we extend the vitality of enterprise system, and minimize the ills of institution innovation based on the emergency governance.
Key Words: Event management; Institution innovation; Emergency governance; Enterprise management system

1 Introduction

There are four main kinds of enterprise system innovation: organization innovation, property system innovation, corporate culture innovation and enterprise management innovation (Fang Shijiao, 2002). To sum up, domestic research on enterprise management innovation focuses on the following areas: the definition of management innovation connotation, the main content of management innovation, the case studies on management innovation, the features of management innovation, and the dynamic mechanism of management innovation, etc (Wang Yong ,2012). Since 2000, case studies and simple theoretical analysis have become the two main ways to conduct practical research on enterprise management innovation (The Report on Management Innovation of Chinese Enterprises,2007). Compared with theoretical research, practical research focuses more on the main points of management or revealing laws of management and operation within the competition and cooperation. Wang Yihua and others researched the strategic reorganization of Dong Feng Motor Corporation and transnational corporations (Citroen, Honda Motor Co., Ltd.) Their findings have directed guidance and inspiration on enterprise management innovation.

Emergency governance is a kind of common governance model in process of actual business management. Analyzing its causes, operating mechanism and influences has both theoretical significances in system innovation and practical significance in implementation of system innovation. However, from the perspective of institutional-ism to observe the phenomenon can only explain merely focus of this issue. This article does not follow the single theoretical category of the so-called Political Science Institutional-ism, Sociological Institutional-ism, Economic Institutional-ism or Rational Choice Institutional-ism (He Junzhi, 2007). It is based on a macro view, harnessing the theory of institutional-ism, and analyzing it with the background of the innovation case of emergency governance. And we will discuss its internal mechanism, and then put it into the frame of emergency governance to explain and predict, finally to give the suggestions.

2 From the Emergency Treatment to the Normalized Management

In The Comet Factory's workshop, a machine operator spilled a large amount of liquid on the floor around the machine. The director let the operator clean the liquid, but the operator refused, claiming that the job specifications did not include the cleaning clause. Then, the director called a temporary worker to do the job, but he also refused, for his service specification not including this type of work, and he thought it's the handyman's duty. The director threatened the cleaning man by firing him, because he is assigned to do the chores at the workshop. The temporary worker reluctantly agreed, but immediately

after the work, he complained to the company about this.

After getting the complaint, the staff checked these three kinds of workers' service specifications: the machine operator, the temporary worker and the handyman. The service specification of the machine operator says, machine operator is responsible for keeping the lathe clean to make it available, but doesn't refer to the cleaning job. The service specification of the temporary worker says, they are responsible for helping the machine operators in many ways such as getting the materials and tools, and should be on service every time when called, but the cleaning job is still not mentioned. The service specifications of handyman do claim that he should do some kinds of cleaning job, but his working time is after the regular workers.

So, if you are the HR manager who is responsible for dealing this complaint, what would you do?

From the perspective of the sensitivity of management and enterprise governance, the managers should realize the inner problem of the enterprise: the loss of sense of ownership and the "none of my business" thought really does harm to the teamwork and cooperation. It is emergent to boost the sense of management, which is to build the sense of ownership and the awareness of teamwork. First we should make a discussion on "who is responsible for the cleaning job". Then, let all staff generally realize the importance of teamwork and the sense of ownership during the discussion and debate so that it can internalize into every worker's mind. Besides, under the threatening situation, the cleaning man could still finish the job which is out of his service. The manager should praise him publicly with a bunch of material rewards, for his great attitude and the way he dealt this problem, and set positive examples for the managers. By dealing this kind of emergency, we should be all prepared for cultivating and innovating the formal institutions and so on.

In this case, we could find that it is not a new topic of the process about emergency governance, including the occurrence, management and inducing enterprise system innovation. It has its background of the enterprise institutions. Besides, the similar cases in dealing with emergencies is not just event governance for an enterprise, it has become a tendency. Although this has not become a kind of institution, it is still the manager-oriented governance, so it should be called as the emergency governance method.

3 The Institutional-ism Explanation of Emergency Governance

Emergency governance is not like the ordinary governance; it is different from the ordinary style which depends on institutions. Emergency governance is manager-oriented, it is a dynamic formal institution arrangement, we could explain its necessity and rationality in the view of institutional-ism.

3.1 The choice which satisfies the arrangement of efficiency

The innovation of enterprise's institution system which under the emergency governance is mostly originated from the spirit of the managers and staff. Then it could be seen from the system and the whole enterprise. The possibilities of innovation and the progress of arrangement lie in the staff, and they can boost the innovation in some aspects. These managers, who promote the institution transition and innovation, put forward the idea and they are responsible for discussion, compromising and solving the problem. They play very important role in applying the spirit of innovation to implement enterprise resource optimization. However, this kind of option is limited by the entrepreneur tenure. To achieve the goal, the managers must do well in the system design to emphasize the ability of assigning resources in a short period of time. So this would cause the obvious short-term and dynamic character of institution transition or innovation. The new successor would replace it when it is out of effect. So that, only by establishing the institution system and emphasizing the same topic, could it keep the effect of this system. So emergency governance is sure to be a routine option.

3.2 The choice which is a strong institution migration powered by single engine

The engine of emergency governance could come from the enterprise system itself, or from the demand of staff or the inspiration of emergency, even from both ways. But just consider the emergency governance, it is more like manager-leadership. The "careless, laziness, indolence" phenomenon is the performance about the lack of internal motivation mechanism. Before realizing the institution transition and innovation based on emergency governance, the enterprise itself has formed a stability state, which could be called as the institutional inertia. If the manager wants to break the pattern, the only way is relying on the internal power of management to do away with the path dependence and behavioral inertia of old system, when the enterprise lacks openness, competition of external institutions and sufficient constraints of corporate forces.

3.3 The choice which could realize the equilibrium of institutions

The institution transition of enterprise is a balance of demanding and supplying. The demand of institutions could come from the enterprise itself, such as some sectors competing for the precious resources. It could also come from the outside of the enterprise, such as higher level of service, better investment environment, etc. Emergency governance behavior, under the guidance of dynamic goal, is an implementation mode of intermittent balance. Although this kind of transition is compulsory, it is shown as a passive, adaptive way. It relies not only on a sensitive manager to realize management value propositions with entrepreneurship, but also the inspiration of conflicts or pressure. However, the manager will change along with the term of service, and the conflicts always come and go with different topics in the logic of occurrence, development and regression, so, "every emergency governance provides an opportunity for the next similar action - when the seriousness of the problem accumulates to a certain extent, the next dynamic governance act will come (Tang Xianxing,2009)."Thus, such kind of system equilibrium can only be dynamic and adaptive.

4 The Underlying Demerits of System Innovation about the Emergency Governance

The reason why enterprises want to conduct institution transition is to get the "potential profit" of the system, namely is to maximize the utility. However, it doesn't mean that all the transition or innovation could improve the efficiency and boost the utility. There are also some underlying demerits of system innovation about the emergency governance.

4.1 The institutional friction may add the cost of institutions

When it comes to the transition or innovation of institutions, it also means that it is based on the specialized environment. The existence of institutions is to improve the efficiency of coordination and depress the transaction cost and the risk of the internal and external complexity the enterprise may face. But if we don't get rid of the old institutions totally, the set of old and new institutions may cause the multiple influences to the staff behaviors, so that they cannot follow the speed of the transition of institutions and it may cause the conflict. Especially emergency governance may cause a series of behaviors which may let all the institutions lose its control, so it won't be efficient anymore. "Improper system transformation can lead to bias of institutional change supply (Coase,1992)." The institutional friction arises. Besides, the arrangement of emergency governance actually denies the procedure of trials and tribulation. So the underlying risk is, as the model of imitating, if the institution itself has some problems, then the cost would be a great burden when it spreads into the enterprise.

4.2 The received innovation of institution may shorten the life cycle of the system

Discontinuous innovation is one of the ways to realize the intermittent balance. But whether it could be balanced depends on the life cycle of this system，because the realization needs some stabilization to keep the productivity. As a kind of pragmatic governance, emergency governance has its inevitable shortsighted character. It usually refers to the problem concerning the operation of the enterprise, or the problem may exist. The need could come from the manager's mind, or the staff's need. The lack of demand expressing could let some institutions be put on ice before it really works. This kind of renovation also lacks of leadership and accommodation, because it ignores the concern of society or the environment, and it makes reaction only when the enterprise has problems. So, facing to the complicated problems, this kind of institution should be strategic, and aims at periodic goals. With the changes of problems or demands, the institution itself surely won't last long.

4.3 The sealed institution innovation may depress the efficacy

Many institutions in enterprises designed are obviously sealed, which means its design is originated in the enterprise itself. The option has its repellency naturally on the value, content and implementation of the institution. The information of system implementation is from bottom to top and in one-dimensional. Also it could cause the negative accommodation to the environment. To sum up, it does not last long and is does harm to the self-renovation.

The emergency governance always comes with the resources support by great power. After the dynamic storm, the mobilization of resources depresses, so its efficacy also depresses. In addition, emergency governance is not a stable expectation, its complement is also hard to ensure. Not only could it not reflect on the manager's thoughts, but also could not satisfy the demand of staff.

5 Emergency Governance is not Accidental Any More

The emergency governance is trying to boost the efficacy of system management. So in order to avoid these incidents, we should ensure it with institutions. As Huntington put it, "the institutionalization is a

process of the organization and procedures to obtain the values and stability (Walter Dimateo ,2008)."which switch the "moral behavior" into "reality behavior". It means switching how to conduct certain behavior to conduct certain behavior simply. An act institutionalized process is also an act by an institution of the Statute of "moral behavior" to "the fact that the behavior" of the process, from how to implement an act should be converted to a simple implementation of an act process. The result is not to deny the manager, but try to improve the structure and consequence of emergency governance. When it is truly the norm of governance, the nature of its instability will disappear.

5.1 Open the institution system to avoid the functional disorder

An advanced perspective is so much better than a received way to design the institution. It could also boost the leadership of the institution and avoid functional disorder. Only an open institution could allow the manager to make some advanced reaction by innovation. In the reality aspect, the internal openness is easy to be repelled by authorities. Only when the institution is approved by all the staff, could it be conducted by itself and internalized into a kind of behavior. Meanwhile, human based institution arrangement could make the managers take the responsibility and accomplish equivalence of rights and responsibilities. By arranging some motivating mechanism, it could boost the multiple institution innovations. To achieve this goal, we must realize the release of entrepreneurs' power by emphasizing the responsibility and assessing every part of the management. In addition, the evaluation and measurement of the management institution must be the combination of inner and outside of the enterprise. This could make the managers avoid the functional disorder. So right now, boosting the manager's ability and concerning the behavior of the emergency, is a mechanism which could realize the equilibrium and avoid functional disorder.

5.2 Detail implementation mechanisms to extend efficacy

The system implementation mechanism is an operable specific method that makes system can work effectively. Mechanism is the middle variety which connects the system expectations and system results (John Campbell ,2010). We cannot expect that the system can work automatically and reach expected in a functionalism attitude. It needs supports and transformation of mechanism to achieve, including system transformation mechanism, system spread mechanism, system update mechanism and system evaluation mechanism etc. System is a kind of content advocated. After coming out, it becomes a fact, which has the standard meanings of normative and symbol. However, realizing the value effectively cannot only rely on system text itself, but need the supports of detailed mechanism design and managements' technological means. Especially, system arrangement is a lengthways multi-level and transverse multi-apartment system aggregation. There are detailed requirements for every level and apartment, which promises the operability of it. At the same time, emergency governing, to some extent, is mainly about releasing the potential abilities of the system we already had. Before the institution innovation, we already had many systems and specific implementation measure, strategy and so on. Therefore, detailing implementation mechanism and intensifying the space and time scales of the executing efficacy system now is one of the ways to reducing dynamic system circulation as well.

5.3 Rely on multiple power sources to accelerate system updating itself

The changes and innovations of system are the results of entrepreneurs, enterprise managers and employee cooperation and interaction with others. Even if under mandatory system changes, system efficacy working effectively still needs other subjects to work together. The environment that the system facing is fickle, if the incentive source is only, the adaptive capacity of system is limited in front of the complicated needs of system. On the one hand, power sources are limited, entrepreneurs cannot be omniscient. On the other hand, continual provide efficiency of power sources is facing challenge. The attentions or responsibilities of entrepreneurs cannot be only; they cannot put all power to keep the emergency governing system going. Keeping the vitality of system needs unceasingly sources updating, which relies on the sources provide of the diversified subjects (Zhou Yuhua 2010). Polybasic subjects keep motivating, especially with the participation of the enterprise managers, prevent the formation of system inertia, achieve updating itself, correct the malfunction of the system, realize system repairing, and avoid punctuated by the replacement of the expiration of the enterprise senior management, to realize the institutional change or reform. This kind of self-update system is a normal system set, and the requirements and reflections in enterprise life.

6 Conclusions

Enterprise institution Innovation, based on emergency governance, has its inevitability and reasonability of enterprise management practice. And from the point of achieving the goal of enterprise,

it seems like an inevitable periodic option. The practice of enterprise's reformation and achieving enterprise's goals needs a process spreading from a single responsibility-building entrepreneur himself to a group of enterprise managers and employees. Dynamic process is a mechanism choice of motivating the awareness of responsibility, which can be regarded as a necessary stage of emergency-governance enterprises. But we cannot ignore its underlying demerits and refuse to improve it.

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Strategic Research on Auto Racing Industry in China

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Abstract: The auto racing industry is accompanied by the development of the automobile industry, which is one of the signs of the developed automobile industry. The pulling effect of the auto racing industry to the automobile industry is the wings that help automobile industry takes off. China is treated as the world's largest car market, the development of whose car auto industry has close relations with the development of automobile industry. They are interdependent and closely connected. A complete auto racing industry chain is conducive to the promotion of economic development in different regions, the promotion of the automobile industry development and the establishment of the city brand image. However, there is a large gap in the auto racing industry between China and the developed countries. This paper introduces the present situations of domestic and foreign auto racing industry, analyzes the gap and the deficiencies between China's auto racing industry and other developed countries, and puts forward the relevant countermeasures, in order to promote the development of China's auto racing industry.
Key words: Auto racing industry; Situation analysis; Deficiency; Strategies

1 Introduction

The auto racing refers to the related industrial chains, including the racing car's research and development, manufacturing, modification, event organization, racing drivers training, racing venue operations, and the car derivative products (auto racing forum, media, tourism, apparel, information systems, big data, racing car supplies, etc). According to statistics from China Automobile Industry Association, China's annual total car production was 24.5033 million in 2015 and the total car sales was 24.5976 million, which ranked first for seven consecutive years in the world (Liu Chunxiao, 2016). On May 8th, 2015, the Chinese government proposed the strategic plan of "2025 China manufacturing", which aims to improve China's international competitiveness as well as the transformation and upgrading of the manufacturing industry. Whether the independent brand car can occupy a space in the world is one of the important signs to measure the global competitiveness of the manufacturing industry. The auto racing industry is accompanied by the development of the automobile industry, which is one of the signs of the developed automobile industry; they are interdependent and closely connected. The auto racing industry has also played a significant role in boosting the automotive industry. The racing car market will also boost in China as the world's largest car market. The auto racing industry, which brings together top technology and manufacturing process of the car movement, is not only a sports culture movement and an economy phenomenon, but also a social cultural phenomenon. The auto racing sports not only provides a competitive platform for people to drive, but also entertains people. It has become an important topic in the development of the auto racing industry to study how to integrate advantages of the automotive industry with the capital advantage, the industry resources of the car market and the sports culture, enhance the upgrading of China's auto racing industry, guide the Chinese auto racing to rapidly and healthily develop in a civilian, popular and entertained manner.

2 Analysis of Current Situations and the Deficiencies of the Auto Racing

According to the forecast of foreign media data, the global racing car market will reach $5.6 billion in 2020. At present, F1, WEC, WTCC and other events are held respectively at home, focusing on mentioning the national fitness promotion to the national strategic objectives, emphasizing to create a contest performance items with the consumption characteristics according to *13th Five-Year Plan for the Development of Sports* proposed by China General Administration of Sport. By now, the racing sports have a history of more than 100 years, while China has merely 20 years of history. With the development of China's automobile industry and the improvement of people's living standard, auto racing is no longer far away from people. After several years of development, the domestic auto racing industry has developed to a certain scale. However, in the world-class events, China still lags behind the world racing teams, and the auto racing industry does not match the huge consumption ability in China. Along with the development of the automobile industry and the increasing number of people in the

higher and the more abundant pursuit of the car cultural products, it is an inevitable trend of the gradually emerging auto racing sports. At present, China's auto racing industry is stepping into the stage of rapid development, with racing venues established respectively in Shanghai, Beijing, Chengdu, Zhuhai, Changchun, Shenzhen, etc. In 1996, the first China international speedway was founded in line with the International Automobile Federation Formula One Standards International Speedway — Zhuhai International Speedway. In 2004, Shanghai International Speedway was completed with the racing field, commercial Expo area, culture and entertainment etc. China has formed a certain scale of racing sports culture company, which has begun to take shape in these aspects of the racing event organization, racing media, racing event, racing car online business, racing car theme park, racing car travel, racing car outdoor camping by using the Internet and big data, which have a large number of consumers to participate in. Nevertheless, there are still a lot of deficiencies in the auto racing industry, such as how to copy the operation mode of auto racing and existing domestic racing business from developed countries to China and how to shorten the gap with racing teams of developed countries.

2.1 Higher threshold of auto racing

Taking F1 as an example, the racing cars themselves are expensive, the costs of taking part in F1 auto racing are more expensive and the cost of mechanical engineer is amazing. The length, width and road environment of F1 car racing site requirements are extremely strict. F1 track in Shanghai Audi international car park costs 2 billion 600 million Yuan. So for most people, the auto racing is far away from them. Owing to limited auto racing space, ordinary people can hardly experience it and have little knowledge about it. It is impossible to narrow the gap between the mass and the auto racing, not alone spreading the auto racing culture in a personal way.

2.2 Less auto racing talents and complex career planning

As the auto racing industry involves a long chain, it needs various aspects of talents, such as the automotive R & D talents, senior technicians, automotive marketing talents, including the most popular racers, track referees, car maintenance personnel, service personnel, etc. These demands are presented in the less of personnel in quantity and quality. Taking the racer as an example, "the racing car population" is very important for the automobile movement, and the racers in the developed automobile industry countries generally begin to take part in karting at about 4~5 years old and then gradually promote to the entry-level racing car, so the developed countries has a relatively mature and perfect training system. This enables wide participation, get more training and competition opportunities lay a solid foundation for building up the talent pool. However, it is impossible to reserve auto racing talents aged from 4~5 years old in China. The current situation of China's racing industry has restricted the career choice of racing drivers, so the majority of operators and drivers choose the types of auto racing sports from the commercial interests.

2.3 Lower science and technology abilities in independent research

The development of global automobile industry has a rather fierce competition. There is a large gap between China's auto industry and the developed countries. China's auto parts are the weakness of China's auto industry, which is limited in the independent development. According to incomplete statistics, 90% of Chinese parts enterprises are in lower level. the advanced foreign manufacturers monopolies the core field of technology components, such as automotive electronics, engine EFI system, turbocharger, transmission solenoid valve and drive shaft. In the engine management system (including the EFI), ABS and other core components, the proportion of foreign-funded enterprises was as high as 95% and more than 90%. Investigation shows that currently R & D investment in China's auto parts enterprises accounts for only 1.4% of sales revenue, much less than the average of 5% in multinational companies (Zhang Xiaohu, 2015). Domestic auto enterprises are lack of investments in independent research and development, and key and core technology and high-end technology, which are relatively weaker than that in the more developed countries in the innovation ability. As for the materials of the racing car, high-tech car seat, IT system of racing cars, and auto racing power system, including the balance of friction, the hybrid and aerodynamics, domestic brand auto racing industry needs to catch up with the auto racing R & D technology of developed countries.

2.4 Weak racing car cultural atmosphere

Auto racing sports are also called a "money-burning" movement. On the one hand, in the case that people with low overall living standards do not have cars, the possibility of vehicle movements involved is low; on the other hand, as racing car industry is associated with the automobile industry, the industrial civilization in China is less developed, so there is less attention for auto racing; the regional motorsport development is not balanced, some underdeveloped areas rarely carry out such races. Most Chinese people' understanding of auto racing still remains in the impression of some negative images, such as"

wealth". In China, CCTV-5 as the only one national free sports channel, but it does not live auto racing sports out of the broadcast copyright costs or the conflicts with other sports events. Competitive automobile manufacturers lack the knowledge on the auto racing industry, such as unawareness of the problem in the auto racing industrialization, no overall understanding of auto racing industry from the aspect of property, culture and market. People are not concerned about the auto racing industry, or they just race a car for the car, but they do not make the development of auto racing industry together with that of automobile industry.

3 Strategies for the Development of Auto Racing Industry in China

3.1 Playing the role of chinese government

The core role of the government is not only reflected in the capital and land but also in the policy supports, management and coordination. As a developing country, the Chinese auto racing is just in the trial stage, the government can guide the financing rather than investment, formulate relevant preferential policies, build financing platform for the auto racing industry, implement macroeconomic control, create a low-cost and high-efficiency investment and financing environment for the auto racing industry, use domestic car as leading racing models, and increasingly popularize auto racing sports. In addition, since it requires a lot of lands to build the racing field, the government, the society and the racing organizations should select the site cautiously, plan reasonably, and make good use of it. Before the selection of new tracks, the risk evaluation and the feasibility reports should be accomplished. The government should plan the development of Chinese auto racing industry cluster scientifically, make all the members in the cluster produce enormous cluster effect by the common development, increase the competitive strength of industry cluster rapidly, and gradually cultivate the core competitiveness of the Chinese auto racing industry.

3.2 Establishing auto racing training system

Based on the features of the talents of auto racing industry, it is essential to establish and promote the training system of multi-level racing talents. The training of auto racing talents can enable people to make full use of the cooperation of the schools and enterprises, utilize disciplinary advantages from domestic and foreign universities, carry out a wide range of international cooperation and exchanges in automotive-related professions, jointly train talents in the car design and manufacturing, competition management, auto racing, the referee, car maintenance, event services and other fields. It also needs to make full use of the cooperation with colleges and universities, use FSAW motorsport as the starting point, and promote the cultivation of talents and development of automobile independent core technology, so as to bring automobile talents and advanced technology to the enterprise. To develop the research, manufacturing and service industry chain with FSAE motorsport as the center, the relevant authorities can make good use of commercial operation, fully develop the business value of the FSAE sports car and make enterprises willing to participate in FSAE racing, and thus promote China's FSAE racing to develop in a sustained and healthy way. Besides, the relevant authorities should also make full use of clubs in colleges and universities, create unique campus auto racing culture atmosphere with motorsport as a link and develop professional racing clubs and comprehensive clubs for members and students. The study of theoretical knowledge and practice of auto racing will enrich the relevant knowledge in auto racing and enable to accumulate some experience for guiding students to join the enterprise. Meanwhile, the youth should be guided to join the racing business. The entertaining way is adopted to cultivate interests since they are still children. In this way, more people will love this business and pass it on. To cultivate various racing cultures and interests on auto racing will be an important part of the industrial development. The training plan can be developed at the early age and economic and training supports should be given.

3.3 Perfecting market operation mechanism of auto racing industry

It is necessary to learn the successful management and development experience from foreign auto racing clubs, and constantly improve and standardize the club management, and improve the healthy and sustainable development of motor racing. Furthermore, the industry shall learn from advanced foreign experience and follow the market rules, and then find the mechanism in China's development of the auto racing. In addition, the industry shall make use of industry associations, provide services, reflect the demands, regulate behaviors and build a platform; make full use of the social auto racing organizations and market operation to promote the development of China's auto racing industry. At the same time, it is essential to take full advantage of all kinds of non-profit sports organizations to reduce the risk of the event and keep the event in a safe environment; attract famous industrial funds and investments from

listed companies and integrate the capital market to expand the auto racing industry resources. Finally, the industry shall focus on developing the potential locations for auto racing sports and strive to achieve the strategic layout of the auto racing market.

3.4 Cultivating auto racing culture

The auto racing sports in China is in the initial stage, it is vital to combine Chinese tradition and wisdom and learn from the advanced experience from other countries and regions. The media with responsibilities of auto racing culture transmission should also give up pursuing only the profit; but instead, it shall present more exciting racing events and programs to the audience. The more people are interested in the event, the more they are willing to transmit it to the public. The Internet information technology and data should be used to dig the potential value of the auto racing market. Moreover, it shall cultivate this industry as a unique one, evaluating the culture and finding the main factors of why Chinese auto racing industry is very important. To publicize auto racing industry, China can also make full use of the sport column of television, radio and magazine and websites and videos to introduce the relevant history and culture; vigorously promote sports that are easy to carry out, such as car leisure travel, camping cars, car entertainment show, recreation experience, theme amusement, auto racing exhibition, museum, theme park to reduce barriers to entry.

3.5 Improving independent R&D ability of domestic brands cars

With the emergence of a large number of domestic brands, domestic brand cars and especially independent brand cars shall be encouraged to participate in the auto racing sports, so as to form a positive interaction with automobile industry. The auto racing industry must base on the development level of Chinese automobile industry and use domestic cars as models to gradually increase the popularity of auto racing sports. Meanwhile, more investments should be made in positive independent researches and development, in order to improve the independent innovation ability and narrow the gap of investment in research and development between the developed countries and China. Racing cars are special in that the system is upgraded, the engine, derailleur, electrical system, luxury decoration, body weight are all designed for racing, and even the steering wheel, door handle and car seat are different. Meanwhile, IT system is not only the key factor in the success of the auto racing sports, but also a driving factor in the innovation of the auto racing. In order to meet the needs of the market development and competition, only continuous innovation in product and market can China adapt to the change of market demand. With the development of the automobile and auto racing industry, there will be more and more auto racing enterprises and relevant supporting services enterprises. Constantly acquiring new knowledge and technology will promote the spreading of the technology and knowledge within the auto racing industry. Improving the design skills is conducive to enhancing the innovation ability and competition ability. Besides, China should give full play to the role of auto racing industry associations and provide effective platform for basic research, in order to make enterprises better carry out basic researches and enhance the innovation capacity and competitive edge of China's auto racing industry.

3.6 Integrating auto racing industry and other industries

In the horizontal level, innovation should be taken as the driving force to integrate the auto racing industry with the automobile industry and stimulate the industrial transformation and upgrading; in the vertical level, the tourism industry should be integrated with the auto racing industry to develop the tourism resources, the surrounding industries, customer resources, festival activities and derivative products, and improve the attractiveness of auto racing industry. A large number of enterprises with both auto racing industries and tourism development functions should be cultivated by relying on the developed tourism market. According to the rules of industry development, China may form the value chain, service chain and supply chain with the integration of auto racing industry and tourism, adapt to the intensive, intelligent and ecological development trend of international metropolis, effectively integrate layout of the auto racing industry and the tourism functional area. Combined with training and education industry is the way to carry out the training of motor racing driver's license, maintenance training, management of auto racing field, etc. Finally, China may involve the cultural creative industries to develop a large number of auto racing industry products, including automotive Museum, automotive Science Museum (R&D), transportation education theme pavilion, film, animation, games and visual art, so as to promote the development of the auto racing industry.

4 Conclusions and Prospects

This paper analyzes the status of China's auto racing industry, deeply explores its shortcomings, learns successful experience from developed countries, and puts forward relevant countermeasures and

suggestions from the perspective of governmental policy supports, auto racing culture, training system of industry talents, operation system, the enhancing of the local auto brands and its competitiveness, and integration with other industries and so on. The auto racing industry is both an opportunity and a challenge for China. Therefore, China should seize the opportunity, make breakthroughs in the key technology of domestic cars, promote the sustainable development of China's automobile industry, and enhance the international competitiveness. In the future, further researches should be done on the post-service market, the industry cluster, talent management, event management, leading roles of the auto racing industry in the development of regional economy and its evaluation system.

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Theorizing a Boundary Condition of the Relationship Between Human Resource Management Practices and Turnover Intention: A Proposed Model

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Abstract: Following a comprehensive review of the extant literature on human resource management (HRM) and organizational behaviour, this paper proposes a conceptual model that highlights the role of contextual factor in affecting HRM practices-turnover intention relationships. More specifically, we propose that perceived organisational politics may play a moderating role between HRM practices and employees' turnover intention. Propositions and directions for future research on employees' turnover decisions are also offered.
Key words: HRM practices; Organisational politics; Turnover intention; Social exchange theory; Proposed model

1 Introduction

Employee turnover has become a major concern for academics and practitioners alike (Deery, Nath, & Walsh, 2013; Korunka, Hoonakker, & Carayon, 2008; Popoola, Nnadozie, & Moses, 2013). To understand the underlying causes of employee turnover, researchers have suggested several factors from a number of theoretical perspectives. To date, some of the factors that have been advanced include, ethical climate (Mulki, Jaramillo, & Locander, 2008), job satisfaction (Kuo, Lin, & Li, 2014), quality of work life (Surienty, Ramayah, Lo, & Tarmizi, 2014), work related stress (Jones, Chonko, Rangarajan, & Roberts, 2007; Yun, Hwang, & Lynch, 2015), work group (Kruzich, Mienko, & Courtney, 2014), work-family conflict (Nohe & Sonntag, 2014), perceived external prestige (Ciftcioglu, 2010), job embeddedness (Mitchell, Holtom, Lee, Sablynski, & Erez, 2001; Yang, Ma, & Hu, 2011),   leadership styles, (Peachey, Burton, & Wells, 2014), and organizational justice, among others (DeConinck & Stilwell, 2004).

Additionally, research suggests that HRM practices, which is characterized by promotion, compensation, and evaluation practices, among others play an important role in understanding employees' turnover decision (e.g., Ahmad & Schroeder, 2003; Demo, Neiva, Nunes, & Rozzett, 2012; Fey & Björkman, 2001; Huselid, 1995; Ngo, Turban, Lau, & Lui, 1998; Pfeffer, 1998; Thang & Quang, 2005). Despite such accumulating research evidence supporting the link between HRM practices and employee's turnover intention, little is known regarding the conditions that determine when and how HRM practices affect individual attitudes' and behaviours (Joarder, Sharif, & Ahmmed, 2011). Hence, this gap in the literature suggests that more studies are needed to understand the role of moderating variables on the link between HRM practices and employee's turnover intention. The purpose of this paper was to propose a model on whether perceived organisational politics play a moderating role on the relationship between human resource management practices and turnover intention.

2 Literature Review

2.1 Human resource management practices and turnover intentions

Human resource management Practices refer to "all practices (e.g. annual performance appraisals), specific policies (e.g. equal opportunities), tools (e.g. employee surveys) or techniques (e.g. management by objectives) that contribute to managing human resources in an organisation" (Petersitzke, 2009, p. 1). Literature suggests that HRM Practices is a multi-dimensional construct consisting of several dimensions, ranging from two dimensions (e.g., Baughn, Ward, & Buchanan, 2004) to eight dimensions, or even more (e.g., Beechler, Najjar, Stucker, & Bird, 1996; Gavino, Wayne, & Erdogan, 2012; Theriou & Chatzoglou, 2009). Previous studies have found mixed results in the relation between HRM practices and employees' turnover intention. For example, with two samples comprising of department store salespeople and insurance agents, respectively, Allen, Shore, and Griffeth (2003) examined the role of supportive HRM practices (participation in decision making, fairness of rewards,

and growth opportunities) in explaining turnover intention. Using structural equation modeling, they found that HRM practices were negatively correlated with voluntary turnover in both samples of employees. In the same vein, Paré and Tremblay (2007) showed that high-involvement human resources practices were found to be significant determinant of Information Technology Professionals' turnover intention. Chew and Chan (2008) reported a significant and negative relationship between HRM practices (i.e., remuneration, recognition, training and career development) and intention to stay among 457 employees across nine Australian organizations.

In a sample of 412 employees in Netherlands, Boon, Den Hartog, Boselie, and Paauwe (2011) linked employee perceptions of a broad set of HRM practices, such as training and development, performance appraisal, and employment security with employee outcomes. They found significant and negative relationship between HRM practices and intention to leave. Relatedly, with a sample of 457 employees working in various sectors in Malaysia, Juhdi, Pa'wan, and Hansaram (2013) tested whether HRM practices (career management, performance appraisal, and compensation) have any significant influence on turnover intention. While performance appraisal and compensation were found to be significantly related to turnover intention, however, multiple regression analyses indicated that career management does not have any significant effect on turnover intention. In a cross-sectional study, Watty-Benjamin and Udechukwu (2014) examined whether HRM practices were related to intentions to leave among Virgin Island's public sector employees. Unexpectedly, the results of multiple regression analysis indicated that HRM practices were not significant predictors of turnover intention. To replicate previous findings, we advanced the following proposition:

Proposition 1: Human resource management practices are negatively related to employees' turnover intention.

2.2 Perceived organisational politics as a moderator

As noted in the preceding section, previous studies examining the relationship between HRM practices and employees' turnover intention have reported mixed findings. These inconsistencies suggest the need for moderator variables to affect HRM practices - turnover intention relationships. Hence, we suggest perceived organisational politics as a moderating variable worthy of incorporation into our proposed model. Perceived organisational politics represent "an individual's subjective evaluation about the extent to which the work environment is characterized by co-workers and supervisors who demonstrate self-serving behaviour" (Ferris, Harrell-Cook, & Dulebohn, 2000, p. 90). Several studies have examined the effect of organisational politics on employees' turnover intention. Vigoda (2000) examined the relationship between perception of organizational politics and work outcomes in a survey of 303 public sector employees in Israel. The study established a significant and positive relationship between perception of organizational politics and intention of exit. In a similar vein, Huang, Chuang and Lin (2003) found that perceived organizational politics was inversely related to turnover intention. Organizational politics has also been shown to relate negatively to turnover intention (Harris, Andrews, & Kacmar, 2007). A recent meta-analytic study by Bedi and Schat (2013) has confirmed a significant and negative relationship between perceived organizational politics and turnover intention.

While extant research has demonstrated negative relationship between perceived organizational politics and employees' turnover intention, very few studies have theorized the boundary condition of the relationship between HRM practices and employees' turnover intention. We suggest that perceived organisational politics might play a moderating role between HRM practices and employees' turnover intention. Social exchange theory (Blau, 1964) provides the theoretical basis for identifying the boundary condition that determine when and how HRM practices affect employees' turnover intention. Social exchange theory (1964) posits that perception of high levels of organizational politics may attenuate the effects of HRM practices on employees' turnover intention. For example, perceptions of HRM practices are distinguishing factors in decreasing employees' turnover intention when the level of perceived organizational politics is low. In contrast, when individuals perceive high levels of organizational politics, HRM practices may be less important in decreasing employees' turnover intention (Hochwarter, Witt, & Kacmar, 2000).

Furthermore, while we suggest perceived organizational politics as a boundary condition that determine when and how HRM practices affect employees' turnover intention, one cannot rule out the possibility that HRM practices may play a moderating role between perceived organizational politics and employees' turnover intention. Thus, it is possible that perceptions of organizational politics are more likely to predict turnover intention for individuals who perceive unfavourable HRM practices as compared to those who perceive such practices to be favourable. Based on the aforementioned theoretical and empirical contributions, the following proposition is advanced:

　　　　Proposition 2: Perceived organisational politics moderate the relationship between HRM practices and employees' turnover intention. This relationship is stronger (i.e., more negative) when individuals perceive low levels of organizational politics than when the level of organizational politics is high.

　　　　Based on theory and extant research (Allen et al., 2003; Blau, 1964; Boon et al., 2011; Harris et al., 2007; Huang et al., 2003; Juhdi et al., 2013; Paré & Tremblay, 2007), a conceptual model (Figure 1) has been developed. The proposed conceptual model depicts the role of perceived organizational politics in affecting HRM practices-turnover intention relationships.
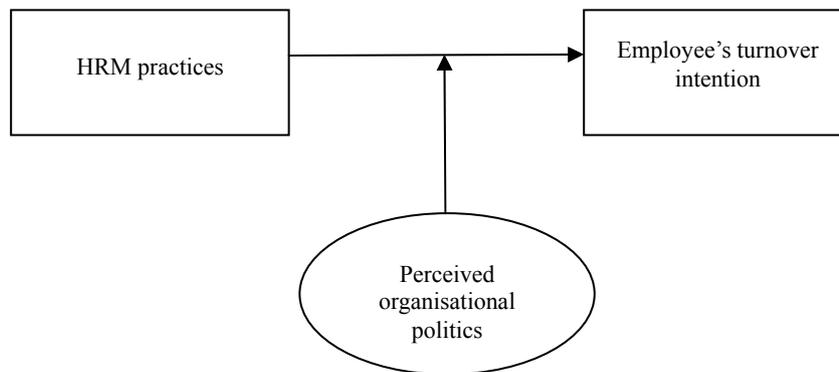
Figure 1　Conceptual Model

3 Conclusions and Directions for Future Research

　　　　The main objective of this paper was to propose a conceptual model that highlights the potential moderating role of perceived organisational politics on the relationships between HRM practices and employees' turnover intention. While extant research has examined the direct effect of HRM practices on employees' turnover intention, the findings from these studies were conflicting and inconclusive. To address this gap in the literature, the present paper suggests the need to identify a moderator variable. Thus, the overall contribution of this paper lies in the identification and incorporation of perceived organisational politics as a moderating variable between HRM practices and employees' turnover intention.

　　　　The proposed conceptual model (Figure 1) suggests some avenues for possible future research agenda. First, research could propose and test theoretical mechanisms for the postulated effects of HRM practices on employees' turnover intention. On second thought, research could develop and test a mediated moderation model in which perceived organisational politics reflect the moderator and its role may be mediated by other psychological variable (Hayes, 2013; Muller, Judd, & Yzerbyt, 2005). Finally, future research could consider the effects of HRM practices on employees' turnover intention across cultures. For example, Future studies could examine whether the effect of HRM practices on employees' turnover intention is stronger in cultures that are characterized by collectivism rather than individualistic.

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Research on the Upgrading Path of Government Management Mechanism Through Public Participation in Network Environment

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Abstract: With unique advantages, the Internet has rapidly developed and popularized through the globe, which is not only profoundly changing the lives of ordinary people, but also gradually changing the management of government. This paper analyzes the opportunities and challenges of the government management because of the people participation in the network environment, proposes the path of mechanism innovation of government management based on popular participation in the network environment: to enhance the openness of government network to strengthen the positive network interaction with the public; to strengthen government network response mechanisms based on concerning the network hotspot of public participation; to continuously improve the response mechanism to copy emergencies; to improve the capacity of standardize network order; to accelerate the transformation of the concept of social management of government departments; to strengthen administrative accountability system of government management.
Key words: Network media; Public participation; Government management; Innovation

1 Introduction

With the rapid development of information technology, the network has gradually penetrated into all aspects of social life. It not only affects people's lifestyles, but also government agencies can form open public space for public participation through websites, forums and other forms of interactive network. The network provides a platform for government administration. The public participation in the network environment is treated as a new way to increase government management science level and improve the public satisfaction, at the same time it plays an important role in promoting democratic decision-making process of government administration. Puluoge (1998) stated that internet joins people together who never participate in any group and is the web of social relations. David Miller (2002) believed that Internet is such a great political invention that no clear central authority can single-handedly magnificent structure. Currently, the studies on the public participation the network environments are mostly in the view of government to explore how the government can enhance its management mechanism through the public network participation.

2 The Opportunities of Government Management Innovation Brought by the Public Network Participation

2.1 The public network participation can help to transform the ways of government govern

Because Internet has changed the channels of information access, the information acquisition and transmission has become quick and convenient. The government makes use of network media instead of the traditional "face to face" government service, whereas the development of public network participation make some traditional functions of the government weaken. Some people and organizations work together by network participation to solve many affairs which manage and control by the government in traditional society, and makes government management more scientific and democratic, which will improve administrative agencies more efficiency and accelerate the construction speed from "management-oriented government" to "service-oriented government". It is foundation of government management innovation that how to establish the focus of the government management and timely complete to transfer "omnipotent government" to "limited government". Therefore, the government management needs to meet the needs of economic and social development and adjusts the management range from "service-oriented government," to "control government".

2.2 The public network participation will help to improve scientific and democracy in the course of government decision-making

Administrative decision refers to that the government makes analysis, judgments, choices and decision of state official affairs for executing administrative functions. (Wang Aihong ,2004) The information is the foundation of scientific administrative decision-making, but due to the limitations of

various factors, the information is not complete and truly enters the system of government, which impacts scientific and administrative of decision-making. The development of the Internet makes information diversifying, the traditional government makes decisions behind closed doors, and rarely seek public comments or suggestions. In today's information era, the government initiatives will publish to the Internet to seek public opinions before the decision making, the public can make use a variety of network channels to issue and express their views and opinions on public affairs and feedback to the Internet, which makes up for the lack of government information gathering, and the government will amend and improve timely and effectively the decisions by feeding back information through public network, which promotes the democratization level of executive decision to achieve the public participation in the management.

2.3 The public network participation will promote the transparency of government management process

From the general point of view of the government information disclosure, the transparent government refers to that the activities and results of the country's legislative, administrative, judicial making and decision documents, data and information should be in accordance with the provisions and procedures of the law, have an obligation to open to the public and society within a certain range (Yang Jianguo,2010). The transparent government is not the individual behavior of the government, but bi-directional behaviors between the government and citizens. In order to be truly transparent, the public must be participation in these processes. The public can keep abreast of government-related information through the network media, grasp the latest government dynamic to better understand the views and attitudes of government officials to policy, express their requirements to public management activities and timely feedback on satisfaction with government services. The government also breaks the traditional letters and other ways, makes use of the Internet to quickly respond to the demands of the public interest, which improves the government's administrative efficiency and transparency, achieves the information exchange between the government and the public, so enhance social service capabilities of the government management.

2.4 The public network participation will help to improve the ability of government management staff

As the number of Internet users is increasing, the requirements of governments and staff at all levels are also rising, they should learn to deal with the network, maintaining the good image of the government, which is the important source of government authority and legitimate, is the foundation of political consensus and political stability of society; is a key factor of the implementation of government policies and policy effects; is the indispensable support forces of economic development and improves the moral standards of society and social construction of spiritual civilization force. Since the network monitoring is fewer restrictions and the network's entrance threshold is low, the Internet network can reduce the space of "black-box operation", which makes government officials not easily deviate from the policy in the course of implementing public policy and adhere to the correct concept of governance which causes more equitable and orderly adjustment in the distribution of benefits (Zhong Dongsheng,2011). To a certain extent, it makes up for the lack of effective control of public power and helps to improve the government's credibility.

3 The Challenges of Government Management Innovation Brought by the Public Network Participation

3.1 The public network participation impacts on government authority

Network media is interactive propagation of "many to many". The public can participate by issuing, comments, reproduced and copy, etc., so they all-round involve in the course of government management. Because the network has the advantage of openness, freedom of expression, every people can become a reporter to spread his opinions of new social events or his individual experience, and provide more information. At the same time, because the network has virtual and anonymity, some criminals on the Internet can spread rumors, which seriously impacts on social stability and economic development and brings the government a serious challenge. Therefore, the network media has two sides: on the one hand, the network can effectively maintain a good image of the government and the government's authority; on the other hand, the network will bring some impact to the government network image. The spreading content of network has diversity, which requires the government network construction should make great progresses in accordance with the times. The checks in the traditional sense make little use for the network, because the news once in a network just like ink drop into water

quickly spread, cannot be completely blocked or blocked, which this feature determines that the image of the government crisis in the event of negative news will be widely spread quickly on the Internet to damage the government's image, and the tarnished image in a short time is difficult to repair.

3.2 The public network participation requires enhance the interaction of government management

While the government holds a lot of information, most government websites have been set up contained very little information and the content is just a provision from the paper moved to the network, such as the settings, functions and leadership information of institutional departments, the list of staff, policies and regulations. Although some government websites set up relatively complete, they more emphasis on their static presentation features of the web page, the online information update is not timely, the feedback of public issues is not in place, only to answer and reply, so the disjointing between online and offline is quite serious. Even after the event of a crisis, some government's departments may take delete network posts and seal website stations and other means to suppress the people's speech. Once the government conceals the truth, it is not conducive to resolve the matter, but makes the mistrust between the public and the government, which reduces the government's credibility and makes these events beyond the control. There are some government's websites make use of the online survey, but most of survey questions are a mere formality and lack of the depth investigation, therefore, the close relationship between public life and government's websites should be improved.

3.3 The public network participation influences the social mainstream ideology

Nowadays, with the devolvement of economic globalization, the increasing of international exchanges and increasingly developed communication technology, various cultural ideologies collide with each other. Some of the western countries tend to use the network to delivery their own ideology and values to all corners of the world in order to strengthen cultural aggression. The culture is a concentrated expression of the nation full of wisdom and civilization and maintains a state and national spiritual bond. There are distinct features between foreign countries and China, such as cultural customs, public's behaviors and values. The entry of foreign culture make the Chinese know a lot of western social philosophy, but these ideas are not always consistent with our traditional value system, which inevitable penetrates into the native culture and impacts of the public's way of thinking. These ideas may make the public to form inappropriate values, which brings adverse impact on the government management.

4 The Innovation of Government Management Mechanism in Respective of Public Network Participation
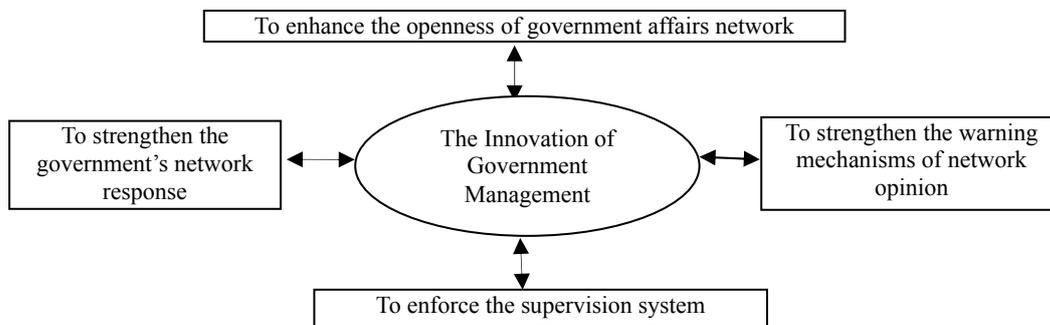
Figure 1   The Innovation of Government Management Mechanism in Network Environment

4.1 To enhance positive network interaction with the public by strengthening the openness of government affairs network

In some extend, the Internet between the government and the public play an important interactive role, the publically discussions gradually condense into a social force, which will improve the ability of public to participate in politics. The local officials use the network language to interact, understand public opinion through the network platform, which helps them to rational treat and accept the views of the masses and livelihood of hot spots. For events and issues of great concern to the public, the government officials should actively respond in order to reach the real two-way communication. Because of the unbalanced social development, there are a number of relatively backward areas of economic and cultural level in China, where information infrastructure is not complete, relevant social

information cannot be communicated in a timely manner to result in that the corresponding social problems cannot be solved effectively. Therefore, the government in future network construction should increase fund and technology investment in central and western areas, fully make use of the network platform to promote the nation's line, principles and policies to minimize the impact of asymmetric information brought to government, keep abreast of the needs of different public in the region so that the public can better supervise the government and limit the scope of the exercise of government power and the government's ability centralized control in order to lay a solid foundation of the future "national politics".(Bai Ranran ,2010)

4.2 To strengthen the network response mechanisms of the government by focusing on network hotspot of popular participation

The government portal websites are the government's face. From the relations between the government and public, the understanding speed and breadth of public policy for the public through the network is much larger than tradition governmental documents. The public know the government decision-making by the government website without paper copies, which make the understanding very low cost and the public is more willing to accept. First, as the main platform for public in politics, the government portal websites let each ordinary public to express opinions as possible as freedom and can be heard by other people to the concern their interest demands of different groups. Second, the network interaction can make normalization of the public network political participation. The governments at all levels will know the network politics as a routine, regularly communicate with the public in Internet. Finally, the governments set up the special management agency of mass political participation to improve information collection, screening, sorting and reporting, strengthen the government websites to enhance their influence in guiding public opinions, timely and accurately release authoritative news and clarify false news. (Jiang Shengyao,2012) The network development of government management depends largely on the quality structure of the officials and strengthens the online service to interpret national policies and explain social hot topics so as to make public work more quickly and appreciate the service-oriented government to bring their own benefits.

4.3 To strengthen warning mechanisms by improve the ability to copy emergencies and guideline the network order

Because the development of network government can make more uncertainties, the government will face more interest demands of pluralistic communities and coordinate more and more conflicts between different groups, which increase the difficulty of the government administration. It is necessary to be aware rationally of two sides of public network politics participation. The authenticity and objectivity of network public opinion should be known, and the opacity and deceptive also be found. In particular, many network "navy" in the online statement may make chaos, spread rumors and malicious speculation in the Internet world to seriously affect the social stability. When the network information deviate from the public's wills, it is necessary to network monitoring effectively. First of all, the network media should improve the self-management capacity and strengthen the moral and ethical standards. Secondly, it is necessary to guide the public to analyze information to determine the authenticity, improve their ability to resist false information and treat seriously the spreaders of bad information. In order to protect public's privacy and legitimate rights and interests, the relative network should implement the real-name register system to help to improve the authenticity of network information, at the same time, the Internet laws and regulations should be improved through legislation in order to inhibit effectively the negative effects of online speeches and maintain the legitimacy of the network order.

4.4 To enhance uncorrupted government building by enforce the supervision to network

The content focused by public in the network is rich and varied, including social events, social problems, social conflicts, of which the most important is the integrity of leading cadres. For a long time, our public strong depends on the government. The public usually think that the government should help public solve problems, as long as there is one thing the government did not do well, the public will think it is the government's dereliction of duty. The Internet has given the public the right way to express dissatisfaction with the government. Faced with corruption of government officials, the original supervisory system under government control lacks the regulatory effectiveness. The public take advantage of network to monitor the officials and build a new social atmosphere. At the same time, because the public can supervise government officials through the network, the executive power of the government and the efficiency of the regulation will be increased, so that the social forces will format which is any organization or individual cannot be ignored, so that government offices will be sunlight, transparent and truly.

4.5 To accelerate the transformation of government social management concept

The primary condition of strengthening social management innovation is to accelerate the transformation of social management philosophy; especially the government organs should actively change ideas from diet management and human management to legal management in order to be fair and impartial public administration. The government managers should make the society manage from an ordinary working to developing into a true serve work for the public. The government's way should be changed from the traditional single system management to integrate social resources and social forces by means of the development of social organizations and citizen force to increase community participation in social management; and then make benign supervision of the society, public opinion to prevent crises and control the problem from the start so as to avoid the adverse impact on the stability of the society. The traditional management means of rigid target, hard requirements and ways become real diversified applications and macro-control of legal, moral, economic, technical and other means to deal with the full range of issues. Only by accelerating the transformation of the concept of social management and promote social management innovation, can avoid wasting of social resources and overlapping administrative management and blind spots, which help to comply scientific governance in all aspects of current society.

4.6 To improve the administrative supervision accountability system of government management

At present, with the development of laws, the system of administrative accountability and the normal of the public network participation will be more strengthened. It requires supervision system and various supervision measures to improve and implement, so the relevant functions departments can administrate according to laws to promote the formation of law departments and government. The key of administrative accountability system under public network political participation is to strengthen the administrative supervision of the government's ability to authority and improve the fairness and credibility of the government's execution by means of law enforcement tools. First, the decisions of social management innovation should be based on relevant laws and regulations to implement the law responsibility system, and the managers should actively listen to the public opinions and assume the responsibility of the social management and correct the error. Second, the administrative supervision and accountability system need change and innovation in accordance with existing social conditions because the traditional management means cannot completely solve the practical problems occurring in contemporary society, at the same time, need to educate the government officials to change traditions views. In short, from the perspective of social management innovation system to strengthen the administrative supervision accountability, it requires to clear and specific responsibilities of each administration and to refine the implementation requirements and the management range. By means of combining executive management with social accountability, it is like to strengthen the feasibility and effectiveness of the administrative supervision accountability and social management, which is more conducive to the development of political participation under the network environment.

5 Conclusions

Because of the development and increasingly perfect of the network technology, more and more public participate in the government management through the network, which not only provides the opportunities to improve the decision's democratization and transparency, but also faces the challenges of authoritative, interactivity and social mainstream consciousness. Faced with these opportunities and challenges, the government needs to strengthen the network openness, improve political participation and enthusiasm of the public while building an uncorrupted government and better supervision. To strengthen early warning systems and network monitoring will prevent endless disinformation to disturb social order and adopt reasonable response of public's real proposals.

Acknowledgement

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Performance Measurement in Halal Industry: An Initial Proposed Concept Based on Maqasid Shariah

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Abstract: Halal industry is one of the most growing industries in the world. Halal industry refers to the industry which is in line with Islamic principles and requirements. The emergence of this industry aims to fulfill the need of Islamic compliance products and services. Surprisingly, the industry has been growing in both muslim and non-muslim countries. Assesing the performance of the industry would be notable to ensure that it obtains its objectives. The proper performance measurement should highlight both business perspective and religious aspects. This is a conceptual paper aiming to propose an initial performance measurement concept based on Islamic objectives (Maqashid Al-Shariah). Referring to some previous studies, this paper proposed twelve ratios as performance proxies for halal industry.
Key words: Performance; Maqasid; Halal industry; Measurement; Firm

1 Introduction

The development of Islamic compliant industries has been increasing significantly nowadays. Starting from financial industry, the interest in Islamic economy is getting broad into other industries including food industry, pharmaceutical, and tourism industry. The terminology of "halal industries" defines the industries which comply with Islamic law and requirements. Halal industries are not only aimed for Muslim, but also for the non-Muslims (Laldin and Furqani, 2013). Halal does not only concern on the product itself, but it encompasses many aspects. It has already become a new paradigm in a business where it concerns more on sustainability, not merely a religious ritual (Shariff, et al, 2014).

Performance of halal industry should be measured using appropriate method focusing on business perspective and religious perspective as well. Economic condition always changes and all firms must adapt with the changing environment, including "halal" firms. The "halal" firms refer to the firms which do not only produce halal product and service, but also does not violate Islamic law in all aspects, especially its financial aspect. Islam assists the firms to adapt with the changes which urges creativity, dynamism, and flexibility (T. Al-mubarak and N. M. Osmani, 2010). The adaptation should be aimed to reach the objectives of life in Islam called as Maqasid Al-Shariah (Ascarya, et al, 2014). Maqasid Al-Shariah depicts the the holistic view of Islam as a guidance of life for the individual and society (Dusuki and Abozaid, 2007), including business entities (Abdullah, 2012). In recent years, the discussions on the objectives of maqasid al-shariah has been increasing significantly in Islamic finance.

The term of Maqasid comes from arabic word means a principle, purpose, objective, intent, or goal (Kasri and Ahmed, 2015). Combined with the term "al shariah", Abdul Aziz and Mohamad (2013) defines it as "..the goals and objectives for the legislation of the rules of Islam or simply The Objectives of the Islamic Law.." (Abdul Aziz and Mohamad, 2013). Dusuki and Bouheraoua (2011) explained two most prominent definition of maqasid al-shariah, which are from Abu Hamid al-Ghazali and Al-Satibi (Dusuki and Bouheraoua, 2011). According to Al-Ghazali, maqasid al-shariah is defined as a concern with safeguarding faith (dien), lives (nafs), intellect ('aql), posterity (nasl), and wealth (maal). And, Al-Satibi defines maqasid al-shariah as "..The primary goal of the sharīah is to free man from the grip of his own whims and fancies, so that he may be the servant of Allah by choice, just as he is one without it..".

The development of *maqasid* can be divided into three phases (Kasri, 2016). First phase is the formation period where the foundation of *maqasid* was built by the jurists. Second phase is the major development period. In this phase, many scholars paid more their attention to develop the fundamental of *maqasid* theory. Kasri (2015) stated that the last phase as "the extention period" where its theory was developed to compromise with the complexities of life.

Imam Al-Ghazali divided maqasid al-shariah into five important elements, which are (Ascarya,et al, 2014):
a.   Safeguarding the faith
b.   Safeguarding the life
c.   Safeguarding the intellect
d.   Safeguarding the lineage

e.   Safeguarding the wealth

Al-Satibi is the most prominent scholar in developing the theory of maqasid where he could combine the theory of ushl fiqh and maqasid al-shariah (Ismail, 2014). Al-Satibi classified maqasid al-shariah into two categories, which are shariah objectives and human objectives(Ascarya,et al, 2014; Ismail, 2014). Shariah objectives consist of three parts, such as necessities, complements, and embelishments.

Other prominent scholar on maqasid al-shariah theory is Abu Zahra. He classified the objectives of maqasid into three broad objectives, such as:

a.   Educating the individual
b.   Establishing justice
c.   Promoting Welfare

A number of previous studies use these objectives to develop the performance indicators. Mohammed, Razak, & Taib (2008) tries to generate Abu Zahra's theory into more measurable indicators (Mohammed, et al, 2008). Their framework was developed to measure the performance of Islamic bank. Since then, their model has been used by many researchers to measure Islamic bank's performance in many countries.

This conceptual paper attempts to develop Islamic performance measurement concept for shariah compliant firms by adopting Mohammed, Razak, and Taib's framework. It will propose new approach in performance measurement which is applicable for non-banking institutions as part of halal industry. The remainder of this paper is divided into four sections. Firstly, the paper discusses on the *maqasid* and performance in ideal condition and the practice. The following section discusses the current performance measurement in halal industry which is followed by the authors' proposed concept of performance measurement. The last section concludes the overall discussion.

2 Maqashid and Performance Measurement: Ideal Versus Reality

In general, the firm performance is measured using financial indicators or market value if it is listed in the capital market. The firms which are implementing the Islamic economic system is also measured in the same way. Financial indicators become the main benchmark to evaluate the firm performance. Nevertheless, the financial indicators alone are not sufficient to measure firm performance.

Since the last decade, the awareness on "religious" performance has been increasing significantly. Many researchers attempt to use *maqasid al-shariah* framework to develop firm performance measurement. This measurement aims to evaluate the level of firm performance in upholding Islamic values and objectives. Unfortunately, most of the past studies focus on how to measure the performance in Islamic banking sector. The most referred research in this area is a research that was done by Mohamed, Razak, and Taib in 2008. Mohammed *et al* proposed the performance measurement using Abu Zahra's theory on maqasid (Mohammed, et al, 2008).

Table 1   Framework on Islamic Banking Performance Measurement

Objectives	Dimension	Elements	Performance Ratios
Educating Individual	Advancement Of Knowledge	Education grant	Education grant/total income
		Research	Research expense/total expense
	Instilling new skills and improvements	training	Training Expense/total expense
	Creating Awareness of Islamic banking	Publicity	Publicity expense/total expense
Establishing Justice	Fair dealings	Fair Returns	profit/ total income
	Affordable products and services	Affordable price	Bad debt/ total investment services
	Elimination of injustices	Interest free product	Interest free income/ total income
Maslahah	Profitability	Profit ratios	Net profit/ total asset
	Redistribution of income & wealth	personal income	Zakah/ Net Income
	Investment in vital real sector	Investment ratios in real sector	Investment deposit/total deposit

Source: Mohammed *et al* (2008)

　　The work of Mohammed et al (2008) was adopted by numerous researchers to measure the performance of Islamic banks, microcredits, baitul maal wa tamwil, social performance, and soundness of the islamic banks (Jazil and Syahruddin, 2013; Antonio, 2012; Asutay,2015; Abdillah, 2013; Syahputra,2011). Instead of to measure organization or business entities, the other frameworks that explore the maqasid al shariah are dominantly used to measure the individual performance or to measure non-performance aspect, such as biothechnology, education system, financing model, and corporate social responsibility (Md Dali, 2016; Arafah, et al, 2016; Budiman, 2015; Dikko and A. Abdul Ghani, 2015; Sulayman, 2014; ohd Saifuddeen, 2014).

　　It is crucial to the understand maqasid al-shariah in business organization, especially firms producing halal products and services. It should be underlined that halal industry disseminates a new paradigm for the stakeholders where maximum profit is not the sole objective in business. It must also be followed by the initiatives ensuring spiritual achievements.

3 Performance Measurement in Halal Industry

　　Having a great understanding and implementation on halal concept is the duty for every muslims (Wilson and Liu, 2010). There should be appropriate paradigm when we define "halal industry". Islam does not only consider the end-product, but also considers the process.　We should define "halal industry" as the industry which is fully managed in shariah framework, including how they finance their operation. Halal also can be defined as non-haram product and services. There are two types of haram (Ali, Hussain, 2013). First, haram li dzatihi means haram in its essence. Halal industry is prohibited to produce non-halal products or services. Second, haram li ghayrihi means prohibition due to external factors. This also can refer to how a firm obtains its sources in producing the products or services. In this matter, this is including on how the firm finances itself. Halal industry as part of Islamic economic system should be free from usury, speculation and excessive uncertainty in its operation (Ascarya, et al, 2014). Therefore, the firms in "halal industry" must be the firms which do not only produce non-haram products or services but also free from usury, speculation, and uncertainty. It is called as "shariah compliant" firms.

　　As a business organization, shariah compliant firms are expected to promote Islamic values in their operation. Performance measurement for shariah compliant firms have not been developed yet. Generally, performance measurement of the firms in halal industries are measured by common performance measurement, which focus on financial aspects. Financial ratios (ROA, ROE, P/S ratio, etc) are commonly used to measure the performance. For shariah compliant firms, there is an urge to developed the performance measurement which does not only use financial ratios, but also considers a new paradigm where it encompasses economic, environmental, and social indicators (Antonio, 2012).

4 Proposing Performance Measurement in Halal Industry

　　It is an urge to have appropriate measurement which indicate the performance of shariah compliant firms. The measurement will serve as a benchmark which indicates the level of firm persistency sustaining Islamic values. It is important for the firm to have a performance measurement which is developed from Islamic principles approach. The measurement below proposed by adopting previous the Performance Measurement based on Maqasid al-Shariah (PMMS) model in Islamic banking.

　　The first objective of maqasid al-shariah is educating individual which refers to the firm's effort to improve the quality of human resources by maintaining their knowledge and educating their stakeholders. There are three dimensions in this objective, which are advancement of knowledge, skill improvement, and creating awareness of shariah comply firms. To measure these dimensions, there are four pecuniary indicators. Education and external research grant and internal research activities measure the advancement of knowledge dimension. The advancement of knowledge indicators shows the level of firm interest in internal and external human resources quality. Employee training indicator explains the skill improvement dimension. It represents the firm concern on the quality of their employees individually. Awareness of shariah compliant firm will be measured by publicity activities. This indicator shows the firm effort to educate the stakeholders regarding firm's objective and products or services.

　　Second part of the index is to reach the objective of establishing justice. Justice in this paper refers to justice in term of economy. To measure this objective, there are two dimensions which are measured using three indicators. The dimensions are "fulfill the obligation" and "elimination of negative element". The "fulfill the obligation" dimension is measured using the contribution to the government and the

contribution to the employee. The "low non-halal income" indicator indicates firm's effort to eliminate the negative element.

Table 2   Proposed Performance Measurement

Objectives	Dimension for Non-Banking "Shariah Comply" Firms	Elements	Performance Ratios	Reference
Educating Individual	Advancement of Knowledge	Education and research grant	Scholarship + research grant/ Total Expenses	Author's reccomendation
		research	R & D Expense/Total Expenses	(Mohammed & Taib, 2009; Antonio, Sanrego, & Taufiq, 2012)
	skills improvement	Training	Training Expense/Total Expenses	(Mostafa & Taib, 2009; Antonio, Sanrego, & Taufiq, 2012)
	Awareness of Shariah comply firms	Publicity	Publicity Expense/Total expenses	(Mostafa & Taib, 2009; Antonio, Sanrego, & Taufiq, 2012)
Establishing Justice	Fulfill the obligation	Contribution to the government	Income Tax/Operational Income	(Ascarya, Sukmana, Rahmawati, & Anwar, 2014)
		Contribution to the employee	(Personnel Expense + Tantiem + Pension Expense)/Total Expenses	(Ascarya, Sukmana, Rahmawati, & Anwar, 2014)
	Elimination of Negative element	Low non-halal income	Non-halal income / Total Income	Author's reccomendation
Maslahah	Financial return	Profitability	Net Income/Total Assets	(Mostafa & Taib, 2009; Antonio, Sanrego, & Taufiq, 2012)
	Social Return	Personal distribution	Zakah/Net Income	(Mostafa & Taib, 2009; Antonio, Sanrego, & Taufiq, 2012)
		Internal welfare	Avg. employee remun-Avg. directors remun|/Personnel Expenses	(Ascarya, Sukmana, Rahmawati, & Anwar, 2014)
		Community Support	(Total Education Expenses + CSR fund)/Total Expenses	(Ascarya, Sukmana, Rahmawati, & Anwar, 2014) modified by author
	Mutual Trust	Investment to other party	(Investment in Subsidiaries + associates) / Total investment	Author's reccomendation

The last part of the index will measure the level of maslaha (welfare). The three dimensions are financial return, social return, and mutual trust. Financial return will be measured using profitability. As business entity, the firm should earn maximum profit to sustain in the competitive market (Ibrahim, 2014). It also shows the firm's effort to achieve the objective of its shareholders.   Social return will be measured using personal distribution, internal welfare, and community support. Social element indicates the firm's concern on the relationship to surrounding communities. Lastly, the mutual trust dimension will be measured using investment to other party indicator. This indicator represents the firm's trust in the ability of its stakeholders which are the subsidiaries and associates companies. In maqasid al-shariah, investment activities also play an important role (Barom, 2013). It also shows to the public the firm's participation in real sector economy which has direct impact to the wider community.

5 Conclusions

This significance of this conceptual paper is that it proposes a new performance measurement for shariah compliant firms in halal industry. This measurement aims to assist halal industry stakeholders in

evaluating the achievement of Islamic objectives in each firm. Maqasid al-shariah framework is useful to provide a guidance consisting of economic and social perspectives. Referring to numerous studies conducted in maqasid al-shariah field, this study comes up with twelve proposed measurements for non-banking industries.

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Measuring the Impact of Business Strategy in Management of Change: A Study on Causes of Psychological Contract Violation

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Abstract: The aspect of employees' performance in an organization is pivotal. Identifying critical reasons for employees' absenteeism, resignation, theft, negative word of mouth and lack of motivation is the first level of strategy to overcome challenges. The most important asset of an organization is its employees. Diverting more focus on customers might blur the organization to identify the key areas that leads to ultimate customer satisfaction. Hence, the satisfaction initially derives from employees and thereafter transferred to customers gain and loyalty. This comes in line with intense competition in the era of technology. As many organizations are competing with each other and want to become the most preferred choice for customers. Moreover, cost of operating a business has also in a rise. The objective of every firm is to increase profit and reduce cost. Organization has opted for change management in order to overcome environmental challenges in sustaining their growth. But organizations are now facing internal challenges that focus on employees' behaviour as psychological contract are deemed to be violated by the changes. These challenges need to be addressed in order to sustain internal growth and integration, as a new game plan need to be installed to overcome challenges in change management and maintain growth.

Key words: Psychological contract violation; Employees'satisfaction; Customers'satisfaction; Communication; Leadership; Change management; Challenges

1   Introduction

In this new era of globalization, organizations have no choice but to adapt and make necessary changes in order to survive. Organizations especially multinational companies have been struggling to survive due to increased global competitors, advancement of new technological implications, rapid growth and economic downturns. Consequently, organizations have to adapt and make necessary changes and likely, employees will have to go through big changes and may have significant impacts on their psychological contract.

Organization change defined as one of the very important problem confronting organizations and has little doubt in a fast-moving and unanticipated world in organization change (Burnes, 2004). Organization change can occur based on transformational, restructuring, merger and acquisition to improve the organization's performance and effectiveness. Moreover, organizational change can also have a negative impact on individuals' perceptions of the psychological contract and this caused the psychological contract violation. Nowadays, psychological contract has been accepted as a part of the norm in Human Resources practitioners (CIPD, 2016). Psychological contract violation is defined as the realization of each organization's failure to meet its responsibility to manage ones feelings of anger, distress, injustice and mistrust (Arshad & Sparrow, 2010). The psychological contract is the foundation of the employer and employee relationship as well as it comprised belief about reciprocal obligation between these organization and employees. Psychological contract violation may occur when the organization failed to fulfil the expectations of an individual's psychological contract.

Employers and staffs have set up a systematized relationships defined constrained by such documents as terms of employment, organizational human resources policies as well as contracts (McCoy& Elwood, n.d.). Psychological contract concept has achieved noticeable attention in important texts which linked to organizational psychology, organizational behaviour as well as human resource management discourse (Akhtar& Long, 2015). Due to the difficulty of handling organization and staff relationship in existing large companies, this had progressively become more essential consideration of construct. The psychological contract appears when staffs trust on their employer which had made promises to their commitments consequently for future advantages (Akhtar& Long, 2015). Yet, these expectations commitments and perceptions of promises amongst staff as well as employer are depended on exchange relationship. However, the organisational change could cause psychological contract violation. In the era of competitive businesses, organizations expect more towards their employees whether early recruits or seniors. Early recruits also experience psychological contract violation if they

already experience impactful breaches in the psychological contract. It gets worse when the early recruits perceived the breach as a significant breach in their psychological contract such as lack or no career development, additional training and education were not provided, no support from the organization, broken impactful promises and withholding promises.

Psychological contract can be described as an unwritten assumption between organization and employees as well as it is about the content of the social exchange between both of the parties. However, these unwritten assumptions are not necessarily to share since most of the time organization and employees hold the different assumption endangers the psychological contract. In other words, the concept of the psychological contract focuses on the role of the employees' emotions and attitudes as well since both of these elements drive the employee performance and behaviour toward the work. Based on previous research, there are two types of psychological contracts, transactional and relational. Transactional contracts describe the area of monetizable exchange in which employees receives competitive wage rates, commissions, allowances and any sort of monetary promises. Relational contracts on the other hand is open-indeed, less specific terms of agreement that establish and relatively maintain relationship, such as career development and career opportunities. Both, transactional and relational referred to implicit promises that subject to change over time. Since it is termed as promises, employers are perceived to be obligated in fulfilling them generally.

The atmosphere in the organization changes can be an inadvertent effect of the change process and these might cause a violation of the psychological contract. For example, an organization with a relaxed working atmosphere could be one of the selling points since this may no longer be the case when come to the organization implementation phase. Furthermore, employees might feel insure about their career and future since employees starts wondering about more expectations that will be violated. The implementation process of organization changes such as communication, support or participation might lead to some consequences for the psychological contract. Other than that, the way that the organization agree with the change process need to concern on who should be involved in the planning of the change, what information should be provided and which support need to be given for the change. Those factors considered as the potential violations of psychological contract.

Employers are also victims of psychological contract violation based on disruptions caused by affected employees. Theft, employees exit and refusal to carry out duties are some of the major impact on employers (Nadin & Williams, 2012). The nature of psychological contracts and organisational attachments for both permanent employees and forced temporary workers is complex. Permanent employees generally continue to exhibit relational forms of attachment to the organisation. These, they believe, are reciprocated by the organisation. Reactions from forced temporary workers are more varied. After a period of denial, some develop a more calculative approach to their interactions so as to focus only on temporary payment of wages and not in long term growth or loyalty as the temporary workers appear to recognise that their future direction is no longer a concern of the organisation. However, forced temporary workers experience violations of psychological contract.

Therefore, the purpose of the paper is to find out how and why the organizational change cause to psychological contract violation and ways to overcome these organizational challenges.

2   Psychological Contract Violation

There are two types of psychological contract, transactional contracts and relational contracts. Transactional contracts focus on short term, narrow, specific and limited promises and obligations. Individuals focus primarily on extrinsic outcomes such as pay. Contingent workers have transactional psychological contract. Whereas, relational contracts focus on long term, general and evolving, extensive and broad promises and obligations. Relational contract implies a mutual commitment on the part of both parties. Extrinsic outcomes are still important but there are also intrinsic factors involved.

Consequences of broken contract leads to poor motivation and performance, negative moods and emotions, job dissatisfaction and the intention to quit. The larger the perceived violation of the psychological contract, the more intense the potential negative reactions.

There are several notions that related to psychological violation such as technology, communication, downsizing, organisational structure and recognition on performance, job security, lack of support, rewards and pay system, frequency, type and impact, lack of information, fear of losing power, lack of leadership intervention and top-down change.

2.1 Technology
The changes in every organizational setting had the objectives included working smarter and

streamline, cost reduction, increase efficiency, faster turnaround times. For example, the upgraded technology is introduced to the organisation to increase the speed of doing things. Organisations needed latest technologies to adapt the market requirements in order to grow in fast moving environment today. The evolving technologies would violate the psychological contract due to the lack of adaptation. This is because employees are worked in their conform zone and used to their method of doing things, thereby unwillingness to learn new skills and know-how. However, they are forced to learn and to accept the changes announced because they want to achieve organisation's expectation and to avoid replacement by new comers. Besides that, the machinery would replace human capital due to cost savings in long term and increase productivity. When employees feel threatened and scared of losing the job, the psychological contract is violated.

Organizational change can be defined as the adaptation of an organization when the environment is changing such as the introduction of new technologies (Marshall, 2010). Therefore, when the organization is introducing new technologies into the system, it can cause violation to employees' psychological contract. The change in technology may need to increase the contribution of employees to their organization such as learning with new technology and increase the working hours. For example, the employees working in their comfort zone, but when the organization introducing new technology into their system and the employees had to learn to work with the new system and this does not expect from the employees so the psychological contract violated. Besides employees see change is difficult, they will feel threatened and this can cause the psychological contract violation.

Organization change defined as an introduction of new technology of the comfortable of an organization when the surrounding is changing. In addition, the employee led to psychological contract violation when there is an introduction of new technology in the organization. In addition, the introduction of new technology lead to psychological contract violation because the employee had to learn the new technology from the beginning but some of the employee never expect to learn new things and they expect to stay at comfort zone. Thus, this behavior leads to psychological contract violation and they feel like menace due to their perception that change is difficult (Dick & Nadin, 2011).

When an organization is experiencing change such as new technological implementation, they need high expertise to handle the implementation. Some organization do not prefer to invest and train their own employees, instead, they hire other expertise to handle the implementation. This act will severely affect its own employees because some of them will be demoted or terminated due to the change. Therefore, affected employees will face psychological contract violation.

2.2 Communication

The cause of misunderstanding the psychological contract is lack of communication yet the influence of understanding their psychological contract is an actual communication. Thus, leader communication skill is the forceful impacts among the organization (Senior & Swailes, 2010). The organizational outcomes which are employees' performance, job satisfaction, motivation, attendance and loyalty to the organization influence by leader communication. For example, performance appraisal as an effective tool for manager evaluate employee job performance such as provide feedback and communicate to the employee how to improve their performance (Addae, Parboteeah & Davis, 2006). Therefore, it is based on the result of performance appraisal to distribute task to the employee, pay level of the employee and promotions.

Furthermore, the performance appraisal can cause psychological contract violation because the employees fear of change of salary, increase workload and no promotion which has huge impact on the performance. This is derived from lack of two-way communication. Employees who are not given the opportunity to evaluate themselves and express their contribution to the organization and their intended career growth would experience psychological contract violation and the sense of bias will be perceived. In addition, employers who do not make clear communication to the condition of their firm, reasons for change and justifying the proposed change plan would be the contributor for the violation.

Psychological contracts had emphasized that "they are based on perceived promises, where a promise is defined as any communication of future intent". This intent can be conveyed by different ways such as written document, oral conversation and organizational practice and policy. Psychological contract can be formed before a prospective employee even joins an organization. Managers will share information about the organization during recruitment and they should provide a realistic preview during interview process to inform both the advantages and disadvantages of a particular job and working in a particular organization. Employees will notice the aspects of given from and taken to the organization. If there are unpleasantly surprised on any aspects of their job, the psychological contract will violate. For example, they are not supposed to work in weekends but their

superior scheduled for Saturday, it undermines trust and lead to psychological contract breached.

An effective communication can affect the employees to understand their psychological contract and lack of communication can cause to misunderstanding of the term of the contract. One of the powerful influences in the organization is the leader communication skill. Leader communication can affect the organizational outcomes, such as job satisfaction, employees' performance, motivation, attendance and loyalty to the organization. For example, manager evaluated employees' job performance by using performance appraisal. The performance appraisal can be a useful tool for communication with the employees, such as provide the feedback of their job performance and how they can improve. However, manager will make the changes decision based on the information from the performance appraisals, such as how to assign tasks to individual employees, how to set pay levels and deciding whom to promote. Yet, most of the employees dislike the performance appraisal, it is because the employees fear of changes in their salaries and promotions and these changes can cause psychological contract violation.

In addition, distrust between managers and their subordinates may occur when there is a lack of communication. When there is organisational change such as the merger, a communication is needed to outline the employees' requirements and expectations to reduce the uncertainty they faced by confirming the non-sustainability and synergy of retained staff with new culture. When management implemented the changes without informing the effect of the change to the employees, employees are oblivious to the cost of success. Yet, when employees realised the changes themselves, they will not trust their managers because employees do not like the sudden change or the change affects their comfort zone. Therefore, when the managers choose not to tell the truth, it may lead to distrust.

A company ought to make sure that they have effective channels of communication. Open communication is one of the main key to a successful development of equal beneficial psychological contracts. Hones and clear discussion will enable the understanding of organizational culture, expectations, compensation, benefits and employee development. The employee's credibility and trust will be increased if the firm gives satisfactory justification and clarification to the employees, then psychological contract violation will not occur.

2.3 Downsizing

Downsizing could lead to psychology contract violation. When the organization making change by downsizing the workforce, those employees who remain in the organization would feel insecure with their job. This change has been moved from relational psychological contract to transitional psychological contract.

Organisations have initiated downsizing or restructuring to improve operational efficiencies and reduce costs (Graetz, 2000). However, downsizing violated the remaining employees' psychological contract by eliminating job security from the employment relationship. Furthermore, the organizational changes create the state of turbulence and uncertainty which make it difficult for organizations to fulfil all of the obligations that they make to employees.

With the existing insecurity and ambiguity, those survivors with a high negative affectivity characteristic will focus more on the negative impacts of layoffs. In turn, the perceived violation of the psychological contract will influence the survivors to behave in the potential negative reactions such as poor motivation and performance, job dissatisfaction and high turnover.

3 Conclusions

Employers concern to limit the damage and disruption caused by psychological contract violation to operate their business with smoothly and instil a credible image as a good employer in the eyes of all of their employees. Employees' dissatisfaction from this violation could affect customer relationship and company's image if the problem wasn't dealt with swiftly and effectively. Dealing with this problem on a case to case basis will only consume more time and energy. Moreover, other areas of violation would probe out because once case could be solved. Hence, employers proactively involve other employees in dealing with the incident and simultaneously making explicit norms so as to reaffirm the state of authority. Psychological contract violation not only brings dissatisfaction to employees, however, it also impacts employers' credibility as it affects company's image. Hence, this leads to the end result of company's performance and profitability.

A strategic business strategy is required to overcome all these challenges. Hence, the ultimate goal is to provide value. This value is not only directed to customers, but employees and the organization as whole. Value is derived by quality that is generated from product, services, people, processes, and the

environment. And the objective of every organization is to produce superior value for customers (Goetsch & Davis, 2014). Inadequate Human Resource development is an important part of quality driven organization. This inadequacy would lead to lack of planning, leadership, resources and finally results to lack of customer focus. Therefore effective and strategic human resource planning is essential.

In today's advanced technology environment, business processes can be designed and implemented to employ business solutions. Moreover, it can improve business relationships with enhanced communication approach. Hence, the key concept of Business Process Management (BPM) is the convergence of technologies with process management theories (Chang, 2016).

Failure, change and chaos are all around us. It is the choice of the organization to avoid, ignore or take initiative to redefine it. Employees dissatisfaction is limitless, however, take the necessary measures and steps to overcome, goes a long way and the results are usually positive. Hence, new forms of awareness and understanding are necessary when change is too fast and incontrollable violation which could also be viral based on sharing and exposure. Moreover, new skills and abilities are also necessary when the crisis is towards focusing on sensitive or emotional issues. Therefore, sensitive analysis, creative thinking and contingency plans are equally important as decisive decision making and clear, detailed communication. There is no fix set of procedure to solve sensitive crisis. As such, crisis management strategy is essential and this need relevant training and supports (Booth, 2015).

Strategic planning is difficult as it demands time, attention and capabilities. However, without proper planning it would result it will worsen the performance of an organization. Despite the importance, very often organization do not implement it properly, this also leads to negative result. Planning and implementation are interrelated. It cannot be separated for better results. Successful strategic outcomes are best achieved when those responsible of executing the planned approach, are also part of planning and formulating the plan (Hrebiniak, 2013).

Any strategic plan should be measurable to evaluate. This comes in the line of Activity-based Costing (ABC). The ability to utilize the resources and generate competitive advantage requires good knowledge of costing Jeston & Nelis, 2014).

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Preliminary Safety Climate: A Case at Pulp and Paper Industry in East Coast Malaysia

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Abstract: The purpose of this study is to identify the level of safety climate in Pulp and Paper Industries. In addition, the relationship between safety climate and investigated the accident rate in this study. According to Zohar (1980), safety climate perceptions are shared between employees on performance and commitment of management in terms of procedures, practices and security policies. Researchers believe that the level of safety climate has a relationship with the accident rate. Therefore, this study was undertaken to identify the level of safety climate in Pulp and Paper Industries. The study was conducted using questionnaires where the questionnaire was distributed to 100 respondents consisting of managers, executives, engineers, clerical and technicians in the organization. To support the result findings, Statistical Package for Social Science (SPSS), version 16.0 was used to analyze the result. The result was shown that, climate use a high level of safety. Safety climate was practicing in the organization with the value at 3.86. Thus it shows that, workers in Pulp and Paper Industries have a good awareness, have a positive attitude and behavior on issues related to safety practice. The result was supported that safety climate has relationship with the accident rate among workers at Pulp and Paper Industry.
Key words: Pulp and paper; Safety climate; Positive attitude; Safety

1 Introduction

Nowadays, safe practices are concerning by the organization in order to reduce and practice the best of safety practices. Thus to ensure safety climate practices this study will explore the level of the of safety climate at Pulp and Paper Industry. Safety climate is important to practice by the organization especially to reduce the rate of accidents at workplace. Employees should always be in a safe working condition that provided by employer. Thus, this study is aiming to investigate.

Furthermore, employer shall to ensure the employee a safe work environment and healthy. Not so survivor lives but also company property can be saved. Therefore, researchers thought it was necessary to study the safety climate. The relationship on safety climate and the level of accident rates at Pulp and Paper Industries.

2 Safety Concern in Malaysian

Department of Occupational Safety and Health (DOSH) in Malaysia is government body are in charge on safety awareness on working environment for employees and employers in the workplace (Hughes and Ferret, 2010). According Yusof (2008), enhanced security can be seen with the enforcement of the Occupational Health and Safety Act of 1994. Act 1994 created is intended to overcome the disadvantages of Machine Ordinance 1953.

Based of Occupational Health and Safety Act 1994 was intended to foster and promote safety and health awareness among workers and employers. In addition, it also creates security measures and effective health organizations. This is done through self-regulation schemes tailored to industry or related organizations.

DOSH 2014, The Act contains fifteen and sixty-seven parts of that section is a step in the enablement of overlapping laws existing safety and health such as the Factories and Machinery Act 1967. The provisions of the Occupational Safety and Health Act 1994 is complementary to the provisions of existing laws and if there is no conflict of Occupational Safety and Health Act 1994 shall prevail. Under the Occupational Safety and Health Act 1994, Section 15, the general duties of employers and self-employed persons to their employees.

In Malaysia, the concern for workplace safety started from the enforcement of the Factory and Machinery Act (FMA) in 1967. The FMA 1967 was enacted to protect employees in factory, quarry mining and construction sectors. By operating under this act, industries were more concerned about the physical aspects of safety, such as equipment safety and injuries practices in the workplace. (Bakar, 2006), the accident investigation report revealed that the building of this manufacturing plant was not

constructed according to the standard specification. (Shaluf et al, 2002). The incident has also triggered many parties to think about soft issues in safety matters and many industries have started to realize that the traditional approach which focused on technical aspects of safety suffers from major limitations and is inadequate in managing safety-related matters within organizations.

2.1 Case study pulp and paper industry east coast

Pulp and Paper Industry East Coast was established in 1996. Throughout the history of newspaper publishing in Malaysia and Singapore the supply of newsprint has been wholly dependent on availability and dictated by the global demand of larger countries. Thus, Pulp and Paper Industry East Coast was established to meet local demands and provide world-class, premium grade newsprint primarily for newspaper publishers in Malaysia, Singapore and the region. Pulp and Paper Industry East Coast vision is to be a competitive newsprint provider in terms of cost, efficiencies, quality and service thus creating prime value for their stakeholders.

Pulp and Paper Industry East Coast produces newsprint from old newspapers (ONP), old magazines (OMG) and telephone directories. The mill site is located in East Coast Malaysia. There are total 67 hectares of mill areas and the build-up areas is 15 hectares. The plant finished construction and first ran in year 1999. Pulp and Paper Industry East Coast was co-owned by private company from Malaysian. There was total investment of RM 2 billion in this company.

Pulp and Paper Industry East Coast was the largest and the only local supplier of newsprint which holds 70% of local newsprint market. Pulp and Paper Industry East Coast also become the largest collector of old newspaper and old magazines in Malaysia.

Pulp and Paper Industry East Coast used deinking-bleaching techniques to produce superior pulp without use of chlorine. The mill produces 270000 tons per year of mixed waste and 280000 tons per year of newsprint. Pulp and Paper Industry East Coast receives and treats up to 19000 m3/day of water from the Sg. Pahang. The pipe is connected 10km away from the mill to the Sg. Pahang. All the effluent would be treated and return to the river.

The technology of paper machine and stock preparation is from Voith Germany and the raw water and effluent treatment plant is supported by Ahlstormaquaflow, Finland. All the electrical and automation system is from ABB. Pulp and Paper Industry East Coast is a 100% recycling Newsprint Mill and has achieve EMS ISO 14001. All the waste produced from the plant has to be treated properly before disposed and scheduled waste disposal policy has strictly applied to all worker and plant operation. This is to ensure the environment safety and reduce hazardous chemical release to the environment.

However, all the practicing well in the company, they are still a few recorded injury. Thus, it shown there is the quantities arise to avoid this serious happen. It is become there are weak relationship.

2.2 Safety climate

Zohar (1980), safety climate is a summary of the perception by employees share about their work environment. Furthermore, the Zohar (2000) stated that their perception about the organization's security policy, procedures as a practice also known as climate security. Based on descriptions by scholars and trigger the security climate, the researchers found that safety climate is a key pillar to the safety and health at work. Based on the safety and health policies and procedures in the workplace easier for employees to understand and work with the right workers also will feel they are in safe working condition. Byrom and Corbridge (1997) assert that the security climate is sharing the perception of workers and the implementation of safety management within the organization. In the field of worker safety climate can share your thoughts and opinions with employers to ensure that workplaces and work activities they are in a safe condition.

According to Clarke (2006), there are three key factors in climate security. First is the manager of safety. The second is the employee's responsibility to safety. The third is the conflict between production and safety. Climate security can not predict accidents in the industry. Employees are responsible for safe work and the conflict between production and safety are significant to unsafe behavior. However, communication failures will cause the difficulty of predicting the results of safety Table 1.0 is the survey of all related construct as proposed by Clarke (2006)

Indicator, Siti Fatimah Bahari (2011), said that safety training affects the safety climate or cultural improvement. Security training is a powerful mechanism that shows a positive impact on the climate at the workplace. Thus, organizations need to give priority to safety training as it can influence the individual behavior towards safe work practices. However, safety training and safety climate showed a negative correlation with accident rates (Siti Fatimah, 2011). Therefore it is important for the organization to improve the safety performance. It is believing that safety training is the crucial element

in avoiding any accident at workplace.

Table 1　Correlation Between Safety Training and Safety Climate

Factors	Time 1			Time 2		
	Mgt Action	Mgt Attitude	Safety Priority	Mgt Action	Mgt Attitude	Safety Priority
Knowledge and Skill Transfer	0.745**	0.777**	-0.227**	0.824**	0.876**	-0.562**
Safe Work Practices	0.703**	0.722**	-0.227**	0.568**	0.411**	-0.548**
Safety and Risk Understanding	0.656**	0.718**	-0.170**	0.062	0.135**	-0.141**

Correlations between Safety Training Impacts and Safety Climate Factors in Time 1 and Time 2

** Correlation is significant at the 0.01 level
Note: Mgt refers to Management

Source: Siti Fatimah Bahari (2011)

According to Michael (2002), management recognizes that employee attitudes and perceptions can help to change behaviour. The finding shown that training sessions and education can influence the attitudes and perceptions. There are six practices in the safety program was used bt previous study. There is commitment from management, rewards, communication feedback, selection, training and participation (Alison G. Vredenburgh, 2000).

In addition, Cheyne et. al (2002), also mentioned in this study that have six dimensions of safety climate, consist of security management, personal involvement, communication, individual responsibility, safety standards and goals in the work environment.

Jong Bae Back *et al* (2007), studied on safety climate on one Korean manufacturing plants, the result indicate manager and workers showed generally high level of safety climate awareness. Due to explore the length of employment was tha a significant contributing factor to the level of safety climate. Managers' commitment to comply safety rules, procedures and effective safety education and training are recommended

Then, problem faced by management firm this study is significant and important to conduct. Because of the gap identify and the researchers feel that safety climate is very important to study because safety is a major factor in the manufacturing industry. Therefore, the organization needs to take a serious concern to avoid any kind of untoward accidents occur. It involves physical lives of workers and employees in the organization.

3 Methodology

The methodology also means science or discipline methods used when conducting certain studies to achieve certain goals. Research is defined as the act of researching, examining, carefully and careful research (Tengku Iskandar, 1996). Methods for collecting data and get the right information, researchers use appropriate research methodology. This study focused on quantitative methods of content analysis. Therefore the research methodology chapter, the researcher uses elements of discussion in this chapter include study design, study population, research instruments, pilot study, data collection and data analysis.

Table 2　Construct Development

Construct	Number of Question	Scores
Safety Management	15	
Personnel Involvement	5	
Communication	5	Occupational Safety Health Act 1994
Responsibility of Individual	2	
Safety standards and goals	3	

3.1 Safety management (15 questions)

In this study, a total of 15 questions about safety management by the Pulp and Paper Industries. Occupational Safety and Health Act 1994 states that any employer, whether public, private and statutory authority necessary to protect as far as practicable the health, safety and welfare of the

people working for them. It relates in particular to aspects of the preparation and maintenance of plant and systems of work that are safe. Where the safety aspects cannot be underestimated by employers, rather it should focus on the safety of workers. If the number of accidents can be reduced, thus saving the cost can be reduced as well.

3.2 Personal involvement (5 questions)

In the Pulp and Paper Industries, a safe workplace is priority for the staff. Therefore, every worker should have the responsibility, attitudes and willingness to work safely in order to ensure their health and safety is assured. Personal involvement by employees is necessary to ensure that the work they do is safe from any hazards and prevent accidents. According Satapah (1995), the Occupational Safety Health Act 1994 provides for the responsibility of employee with employers in dealing with injuries.

3.3 Communication (5 questions)

Communication is essential to convey information. Communications jobs, safety and health through communication vertically and horizontally is to avoid accidents and occupational diseases so that the production process can be done safely.

3.4 Responsibility of individuals (2 questions)

Section 25 AKKP 1994, the obligation to state employees not to interfere with or misuse anything provided or done in the interest of safety, health and welfare of worker.

3.5 Safety standards and goals (3 questions)

According to section 16, Safety and Health Act 1994 (Act 514), the employer must provide a safe working environment and healthy for all workers and individual under its area of control in accordance with the provisions of law relating to occupational safety and health during, industry codes of practice, standards and other requirements relevant.

4 Result and Discussion

Table 3   Reliability Statistics -Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.891	.891	30

Table 3 is realibility statistic – cronbach alpha. According DeVellis (2003), Cronbach Alpha, which reached 0.7 points and above is calculated reliability. Overall instrument has a value of reliability (Cronbach's alpha) high ($\alpha = 0891$). This shows the appropriate instruments used to assess safety climate. According Nunally and Bernstein (1994), the value of 0.80 and above is sufficient for the new instrument built or first used while George & Mallery (2003). Thus, for this study the indicator is reality to test the study.

Table 4   Summary Result Safety Climate

No	Constructs	Mean	Percentage
1	Safety management (15 questions)	3.96	13.20
2	Personnel Involvement (5 question)	3.85	12.83
3	Communication (5 question)	3.77	12.56
4	Personnel Involvement (2 questions)	3.87	12.90
5	Safety Standard and Goals (3 questions)	3.86	12.86
	Total Mean	3.86	

Table 4 is the summary result safety climate. The result safety management is indicating that have a mean of 3.96. This is because safety is a matter for the management of important in ensuring safety in the workplace. With the good management and effective, accidents can be avoided. The management of the company's management began in the Pulp and Paper Industry East Coast to subordinates. They have generated policy and safety policy in the workplace. Whereas communication and 12:56 min acquires 3.77 percent for all policy and police have been prepared by management. The important issue regards

communication to be carried out from top management to subordinates. Min and the percentage was the lowest when compared with 5 of the above.

5 Conclusions

Based on the mean score of 3.86 indicates that safety climate is a highest score that practicing in Pulp and Paper Industries. Results from the analysis shown the safety management reached the highest mean score of 3.96. The mean score is high due to the company Pulp and paper Industries very concerned about the safety aspects and always encourage employees to work in a safe environment. In accordance with the slogan "Safety Begins with Me", workers need to think first before action is taken. Communication while achieving the lowest mean score of 3.77 because of a lack of information on safety aspects presented by the management to the employees. Safety climate is an important factor influencing the rate of accidents in organization. Workers are an important asset of any organization. Hence, integrated cooperation between employer, employees, government and non-governmental crucial need to ensure the occupational, safety and health at work are safe at work and guaranteed safely. Occupational, safety and health strategy is important not only to ensure the health of workers and the salvation maintained and preserved but also contributes to increased productivity, product quality, employee motivation, job satisfaction and can improve quality of life of an individual and society. In OSHA 1994, section 15. General duties of employer and self-employed persons to their employees. It shall be the duty of every employer and every self-employed person to ensure, so far as practicable, the safety, health and welfare at work of all his employees. This awareness is also supported safety culture and can help reduce the rate of accident at work.

Acknowledgement

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Roots of Diversity in the Academics Institutions: How HR Manager Can Encounter the Challenges of Workplace Diversity

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Abstract: Purpose-The purpose of this paper is to look at the way higher-education institutions' respond to the challenges of an increasingly diverse students pressure and the degree at which the organizational culture welcome and value diversity, thus allowing the university to benefit from talented people with diverse backgrounds. Most of the researcher only linked the human resource management with global business activities. The author also tried to identify those issues which are facing by the HR workforce due to learning (Academics) globalization in various educational organizations. The study found that diversity management is now more than legal and moral importance for sustainable development of the organization. This paper will highlight on how an HR manager can meet the challenges of workplace diversity. Findings- It is a fact that the globalization in every field became now unwanted challenge, especially in global educational sectors. Due to a large number of student's migration for long and short time to the search of batter education worldwide, it increased a lot of challenges to the institution especially interim of human resources. These challenges can be converted into the opportunities if depute trained human resource to handle these global assignments wisely.
Key words: Cultural dimensions; Diversity; Environment; Human resource management diversification; Globalization; Academics; Organizational culture; Diverse workplace challenges

1 Introduction

Globalization of firm's operations or an increased level of firm's involvement in exchanging goods and services, information, personnel across national boundaries create puzzling for its human resource management (Rugman and Verbeke 2004). Due to cultural variances, the way of communication is also changed. One of the biggest challenges is language (Marschan-Piekkari, Welch et al. 1999). Poor culture-fit has often been mentioned as one reason why Merger and Acquisition have not produced the outcomes as organizations hope for (Cartwright and Schoenberg 2006). Academic institutions are also affected by the rapid changes of culture result of globalization.　Booming economic activities turn the world business scenario and it increased the level of exchange of goods and services, information, finance and personnel across national borders (Rugman & Verbeke, 2004). Significant changes in the global society and in the markets lead to growing workforce diversity. The globalization process force organization all over the world to deal with more international customers and suppliers (Cox and Blake 1991);(Milliken and Martins 1996). Rapid globalization is one of the most challenging factors in this changing world. Many researchers only linked this globalization with only business sectors. There is the various dimension of the modern globalization. Different observers identify different type of globalization, for example, globalization in the area of the economy, technology and cultural (Brown and Lauder 1996). Although this diversity is a strength(Ramiya, Maraist et al. 2000). Due to this, the demographic diversity is also rising in higher educational organizations. Students and staffs are an exchange and cross-border recruitment is increasing (Schapper* and Mayson 2004). According to the (Cheong Cheng 2004), there should be multiple globalization including technological globalization, economic globalization, social globalization, political globalization cultural globalization and learning globalization. The learning (academic) organizations are now globally inviting the students to enroll in their respective universities to increase their ranking among worldwide universities. As a result, the management of the universities deals two issues, first to deal the international students at host universities and at the same time to deal with the organization of origin countries of these international students. After the Bologna Declaration many Asian and African countries students starting moving around the world in search of quality higher education through scholarship and self-support basis. There are many challenging faces by these organizations. Inevitably, how educational institutions should be responsive to the trend and challenges of the globalization has become the major concern in policy –making in this era (Brown and Lauder 1996). The main obstacle faced by the policy maker is to an amalgamation of a local and global way of learning (Yin Cheong Cheng, 2004). In short in this modern era when learning environment is very rapidly globalized. There is also increased of traveling of students around the world going to different countries in searching for relevant and competitive

education. A new global scenario has emerged by students because sojourn in foreign countries by extending their period of stay not for settlement permanently as traditional immigrants would (Gavela, Hernández et al. 1994). There mobility so extensive and high that the composition of the student bodies in universities all over the world has changed (Hartwell, Johnson et al. 2011), marked largely by increasing the number of international students. This is the biggest issue faced by the university management. To gain success of their international students programs, universities thus need an adequate intercultural understanding, manifested in an action of their staff and students. The staffs need to be properly trained and well aware the cross culture sense. The thing is that due to this trend the organizational environment totally changed. Now it is more important to manage HR strategically as a new source of competitive advantages in the global marketplace has been emphasized (Stroh and Caligiuri 1998). The academies in developed and transition countries will face new challenges divert from the increasingly diverse work environment because of increasing number of students moving from underdeveloped countries to developed or transition countries. In order to attract, integrate, motivate, and develop the full potential of academic diversity, European universities must become more international oriented and have an organizational culture that truly values and creatively manage such human diversity (Metcalte, of Hull Business School et al. 2007). The Diversity still remains under-researched in European higher education. To examine these issues, this conceptual paper is designed to highlight some core issue which directly affect the organization and indirectly affect human resource performance.

2 Literature Review
2.1 Sources of diversity in academic organization

The meaning of diversity within the organization is not limited to those attributes which are observed but also include invisible characteristics such as the difference in educational background, creativity, comprehension, learning style and problem-solving ability (Nafukho, Wawire et al. 2011). Multiple categories of diversity within the workplace may influence the individual, group and organizational performance and processes (Van Knippenberg and Schippers 2007). As we know that there are lot of sources of diversity, but in an academic environment following are the main source of diversity:

2.1.1 Studentship, exchange student's projects and international internship schemes.

In order to promote the mutual understanding, cooperation and exchanges in various fields between various countries, the various governments have set up a series of scholarships programs to sponsor international students, teachers, and scholars to study and conduct research in various countries. This policy of various countries also leads to globalization in the educational institutions. Student's interest in global education has been growing steadily over the past several years. From 2005 to 2011, the number of the students throughout the world pursuing higher education outside of their home countries few from 3 million to 4.3 million students, and the number of students outside countries in 2025 projected to reach 8 million (Farrugia 2014)

2.1.2 Granted the services of international faculty.

The source of diversity is due to hiring a teacher from foreign countries in the educational institutions. In this modern globalization every field of life are directly and indirectly facing the impacts of diversity. As we have already mentioned in this research paper that now educational services also act as export industries, to increase the revenue of educational institutions by inviting students all over the world. But due various reasons, like technical skills, educational skills and on the basis of professional background these educational institutions also invite or hiring the foreign teacher to benefitted the foreign students in their educational institution or to attract more international students. Current all over the world many countries are focusing on standardizing their education system, especially the education provided to their children must be up to the marked. For this reforms, only teachers can help (Garet, Porter et al. 2001). Thus, the success of ambitious education and high-quality education has a very positive link with the teachers (Cuban 1991). These reasons increase the tendency of teacher's migration globally. Now the supply of teachers increased internationally to fill the vacancies. And in this way many overseas teachers are employed to fulfill these vacancies (Barlin and Hallgarten 2002).

2.1.3 International conferences.

To enhance the revenue of various international educational institutions it conducts academicals conferences in various countries to provide a platform where the researchers share their research findings. It also leads to increase the diversity in the organization. The aim of these multidisciplinary

international conferences is to bring together theoretical perspective that helps advance our understanding how the global research qualitative or quantitative empirical contribution to their local and global articulations. These conferences seek globally to delve into the shifting relationship between established and emerging art market through a series of paper presentation and keynote sessions as well as a panel discussion with global experts.

2.1.4 Cross-border investment by educational institutions.

   In this modern globalization, the scenario of business changed. There has been rising interest in the business of global education. Most of the international educational institution attracting international students to increase their revenue (Cantwell 2015). This is the main reason due to this approach the educational institutions are turned into global educational institutions. Many countries including china (McCafferty 2013) have currently announced plans to attract more international students to increase the revenue of their educational institutions. If we evaluate this system of education where the educational institutions inviting the foreign students is some sort of export business. The reason is that if one industry exports their product the balance of payment will positive due to increasing in foreign exchange currency. Same in the educational business because they are selling their services to the foreign students (Ziguras 2011). That's why this kind of business also become the reason to bring diversity into the educational institution

2.1.5 Technology

   Modern innovation is one of the biggest reasons to turn educational institution towards diverse organizations. Modern teaching techniques, accessing academicals database, various lab and material science equipment and online courses and other training converts the organization into the diverse organization.

   These sources of globalization changed the organizational environment from local oriented to global oriented. In short that now the stockholders and now globalized. In the modern era, most of the universities are linked with global stakeholders. This is not surprising that they are challenged. It means that if one university accepting the cross-border students then it automatically keeps in touch with the parent and the other related cross-border agencies. Another side for an effective management is some universities inviting cross-border faculty as well as professionals. No one can imagine that the university which is dealing globally with all aspects then the university's organizational environment will automatically change. The question is that how the organization will manage their Human resource in term of faculty and support staff effectively to deal the matters of cross-border stockholders in the changing environment. Many organizations need to change and facilitate diversity within structure due to increasing challenges of diversity (Van Ewijk 2011).

2.2 What are the challenging factors for the human resource management

2.2.1 Introduction

   The role of the human resource manager is developing with the transform in a competitive market environment and the understanding that Human Resource Management must play a more strategic role in the success of an organization. An organization that does not put their emphasis on attracting and retaining talents may find themselves in dire consequences as their competitors may outplaying them on the strategic employment of their human resources. With the increase in completion, locally and globally, an organization must become adaptable, resilient, agile and customer-focused to succeed. And within in this changing environment, the HR professional has to develop to become a strategic partner and a change mentor within the organization. As we discussed above that due there are many sources which create diversity in the workplace. Due to these dimensions of the workplace also changes. These dimensions include but are not limited to age, ethnicity, ancestry, gender, physical abilities/qualities, race, sexual orientation, educational background, geographical locations, marital status, religious beliefs, working experience and professional approaches (Ely and Thomas 2001).

2.2.2 Challenges of workforce diversity.

   The future success of any organizations depends on the ability to manage a diverse body of talent that can bring ideas, perspectives and views to their work. The challenge and problems faced of workplace diversity can be turned into a strategic organizational asset if an organization is able to capitalize on this melting jar of diverse talents. With the mixture of the talents of diverse culture backgrounds, gender, ages, and lifestyles, an organization can respond to business opportunities more rapidly and creatively, especial in global arena (Cox and Beale 1997). This is especially true for those academic organizations who have invited a large number of students and faculty from all over the world. Thus, the Human resource manager needs to be minding full and may employee 'think global, Act local' approach in most circumstances. Furthermore, the HR professional must assure the local professional

that these foreign talents are not a threat to their career advancement (Miyake, Friedman et al. 2000). In many ways, the effectiveness of workplace diversity management depends on a skillful balancing act of the HR manager. One of the main reasons of ineffective workplace diversity management is predisposition to pigeonhole employees, placing them in different silo based on their diversity profile (Thomas 1992)

2.3 How human resource manager can meet the challenges.

2.3.1 Style of management at diverse workplace.

In order to effectively manage workplace diversity, Human Resource manager need to change from an ethnocentric view ("our way is the best way") to a culturally relative perspective (' let's take the best of a variety of ways") (Nkomo and Cox 1999). This shift in philosophy has to be ingrained in the managerial framework of the Human Resource Manager in his/her planning, organizing, leading and controlling of organizational resources (Thomas 1992). A suggested by Tomas (1992) and Cox (1999), there are several best practices that an HR Manager can adopt in ensuring effective management of workplace diversity in order to attain organizational goals. They are as follows:

2.3.2 Training and mentoring program

This is the one of the best ways to handle the workplace diversity issues is through initiation a diversity mentoring program. This could entail involving different departmental managers in a mentoring program to coach and provide feedback to employees who are different from them. In order to make this program more effectively, it is wise to provide practical training to the employees or through an expert in this field. The main purpose of this diversity mentoring program seeks to encourage members to move beyond their own cultural frame of references to recognize and take full advantages of the productively potential inherent in a diverse population. Training is the one of the main strategies by which the organization readies the management to handle the require tasks. Basically, training is same like war equipment which is necessary for the battlefield. Training is most important especially to handle the global tasks. Without training, the organizational cannot achieve their strategically objectives. Training is one of the most important strategies for the organizations to help employees gain proper knowledge and skills to meet the environmental challenges (Goldstein and Gilliam 1990). Basically training capable the individual to use their cognitive skills in the strategically way with motivating attitude and behavior. Training enhances the motivational level of the employee. (Colquitt, LePine et al. 2000) argued that because the effects of motivational variables on learning are stronger than that of cognitive ability.

2.3.3 Organizing talent strategically

Now many organizations realized the benefits of diversity at the workplace. Due to an expansion of market toward globally, now it is necessary to induce diverse workforce as well. To induce global talents in the local organization basically, strengthen the organizations to cater global issues related to organizations. So the thing is that the Human Resource manager must manage diverse talent strategically for the organization. The researcher found talent management implementation particularly in public sector management especially alignment with well –embedded diversity and equality policies and their perceptions of fair treatment in the workplace (Bleijenbergh, Peters et al. 2010). Most researchers argue that greater competitive advantages are achieved when all the available talent in a workforce is fully utilized (Bleijenbergh, Peters et al. 2010).

2.3.4 Leading the team effectively

Human resource manager needs to advocate a diverse workforce by making diversity evident at all organizational levels. Otherwise, some employees will quickly conclude that there is no future in the company. As the HR manager, it is pertinent to show respect for diversity issues and promote clear responses to them in the organization. The Manger also must show a high level of commitment and be able to resolve issues of workplace diversity in an ethical and responsible manner. Previous research has shown that the diversity is related to both task and relationship conflict in groups but the modern research rejected and according to their finding effective leadership reduced these negative effects to zero   Many another researcher (Jackson, Joshi et al. 2003) and (Martins, Milliken et al. 2003) in a view that the affecting the relationship between c   conflict among diverse teams and outcomes id leadership. Especially the team leaders tend to have greater authority than other team members (Edmondson 2003) while effective leaders are expected to have more knowledge, skills and abilities in the area of people management (Bell and Kozlowski 2002). For these reasons, the team members are likely to look to the leader to guide the group successfully when they become untidy in potentially critical conflict. That way the effect of conflict in diverse group partially depends upon the parties but particularly the group leader (Ayoko and Härtel 2006).

2.3.5 Managing diverse workforce through improves communication.

Day by day increasing in globalization, diversity has become more challenge for those organizations which are involving with diverse workforce. Many researchers' finding explains the various ways hoe to handle this issue. Anyhow some researcher finding says that the way of communication from upward to downward must be effective to manage diverse team members (Sadri and Tran 2002). In short the role of the HR manager must parallel the needs of the changing organization. Successful organization are becoming more adaptable, resilient, quick to change directions, and customer-centered. Within this environment, the HR professional must learn how to manage effectively through planning, organizing, leading and controlling the human resources and be knowledgeable of emerging trends in training and employment development.

3 Conclusions

The international and multicultural environment in which universities have to operate these days requires the management of an increasingly diverse workforce. In order to benefit from the potential of such diverse workforce, it is important to ensure that the entire individual is making full use of their skills, knowledge and work experiences. In that sense, an inclusive culture that values diversity and encourages the free debate of ideas would be a major asset. This study also reflects the personal experiences of a researcher. The researcher has done more than one year work as volunteer supporter to the international student office. The basic area of researcher working was to settle the new students came from various countries of Asia, Africa, and Europe to China for their higher education. I found some areas which must be more focus on the employees training before giving responsibility to deal with diverse students. The organizations must change the ethnocentrism thinking of the employees while dealing with foreign students. Most of the educational organization failed to deal with the diverse environment due to providing equal opportunities for all individual in management support staff regardless of their talents, skill and ability which is not fit to deal diverse base assignment. In other words, the academic institution must develop such kind of organizational culture which must be fit for all diverse elements in that organization.

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Research on Steering Governance of Governments

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Abstract: During the Third Plenary Session of the 18th Central Committee of the Communist Party of China, the modernization of the national governance system and government abilities were firstly proposed. Based on the introduction the "steering theory" and combined with the political system, special national conditions and social development of China, this paper pointed out that "steering" is still necessary for government governance with Chinese characteristics. Moreover, in accordance with the "Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform" adopted at the Third Plenary Session of the 18th Central Committee of the CPC, this paper discussed how to steer.

Key words: Governance; Government; Steering; Paddling

1 Introduction

The "governance" theory originated from Western countries. In 1980s, economic regression appeared in Western countries and provoked a serious social crisis. Therefore, people began to reflect on drawbacks of the existing management model. In the academic circle, governance theories were proposed originally for compensating for limitations of Keynesian-ism and Neo-conservatism. Meanwhile, a rise in research on social capital and new public management, and scholars' post-modern reflection have provided rich academic resources and good academic atmosphere to research on governance theories. Western scholars have applied the governance theory to various fields, and developed the governance theory as a sociological research method. This also caters to the situation of the social development at that time. When the world entered the post industrial era, the western welfare state generally appeared management crisis. The government is unable to cope with the demand of the society and the public loses confidence in the government. Western countries began to administrative reform. The concept of "multi center", "response", "interactive", "transparency", "rule of law" and "effective" concept are included in the governance theory, which provides a feasible way for the reform. At present, western scholars have formed a systematic and comprehensive theoretical system for the study of governance, and have achieved fruitful results.

Chinese scholars made a later start in research of government theories and mostly began from the translation of Western classical literature, so they have not developed governance theories with Chinese characteristics. In mid and late 1990s, domestic scholars began to pay attention to the theory of governance from the perspective of government management. The governance theory and the background factors of the governance theory are also highly valued by researchers. "Government", as a term, had not really entered into people's social life and aroused much attention, until the Third Plenary Session of the 18th Central Committee of the CPC. According to the Third Plenary Session of the 18th Central Committee of the CPC, the overall goal of comprehensively deepening the reform is to "improve and develop the socialist system with Chinese characteristics and promote modernization of the national governance system and governance capabilities". This was the first time when the CPC put forward the notion of "national governance system" and "governance capacity". Prior to this, the CPC usually used the term "management". A change from the use of "management" to "governance" reflects the CPC's new concept of administration and started a reform of a transformation from management to governance in China.

2 The Rising of "Governance" Theory

"Governance" is to control, guide and manipulate someone or something. At present, the most authoritative definition to "government" was given by the Commission on Global Governance in its report "Our Global Neighborhood" in 1995. The Commission on Global Governance: The Report of the Commission on Global Governance" defined governance as "the sum of various approaches adopted by public or private individuals and institutions to manage their common affairs (Commission on Global Governance, 1995)". It refers to a time-continuing process to reconcile conflicting or different interests and take joint action. Governance has the following 3 features. Governance is a process of continuous interaction; realization of governance goals mainly relies on reconciliation instead of control; subjects of

governance include both public and private sectors.

The term "social management" first appeared in the "Specification for the Program for the State Council Institutional Reform" in 1998. After that, the term "social management" had been frequently used in party and government documents. In the "Decision of the Central Committee of the CPC on Some Major Issues Concerning Comprehensively Deepening the Reform" adopted at the Third Plenary Session of the 18th Central Committee of the CPC, central leading groups proposed that the overall objective of comprehensively deepening the reform is to improve and develop socialism and promote the modernization of the national governance system and capacity. The notion of "governance" was put forward at the Third Plenary Session of the 18th Central Committee of the CPC. This indicates that modernized governance is different from traditional management modes, because it exhibits a new political analytical framework. China can learn from, but should not copy Western governance theories. China should achieve governance in line with socialism with Chinese characteristics, on the basis of considering special political systems, special national conditions and the social development status in China.

3 Government "Steering" Governance
3.1 The "steering" idea
"Steering" does not mean that the government ruling goes back to the original mode of management. In fact, the "steering" idea originated in the West. At the end of the 20th century, on the basis of profoundly pondering over government management crises in welfare states, Western countries initiated a new public management reform. The reform was launched to achieve a status change of governments from "paddling" to "steering". The main principle of the reform is to "steer" instead of to "paddle". "Steering" refers to the role of governments to guide directions, set macroscopic goals, design programs and fulfill functions of macro-control, instead of acting like "paddling" to do things all by governments themselves and launch specific operation and control.

Jessop believed that governance also bears risk of failure, because various subjects of governance are hard to reach a common goal in negotiations. Therefore, Jessop proposed the notion of "meta-governance". "Meta-governance" is intended to make macroscopic planning, reorganization and integration of governance subjects such as states, markets and social organizations, in order to achieve relative balance between various governance mechanisms and cooperation-based joint governance of various governance subjects. Governments which play a role in meta-governance and governments which fulfill steering functions have the same responsibility. This means that governments should play a good role in institutional design, planning and development, so that the whole social system can achieve continuous improvement and development through proper institutional arrangement (He Ziying, 2010).
3.2 Reasons of government "steering"
The government role in governance and the government relation with market and civil society have long been a hot topic in theoretical research and debates. Western "governance" theories emphasize that governance should have various subjects and centers, and advocate that governments should have an equal status to market and civil society. However, government "governance" with Chinese characteristics is inevitably different from governance in Western countries. Government "steering" governance is determined by factors in many aspects.

Firstly, civil society in China is still immature. Its immaturity is reflected mainly by following aspects. Firstly, the civic awareness of Chinese people is quite weak. Chinese citizens show poor legal awareness, lack consciousness of rights and have a low sense of responsibility for safeguarding public affairs and the public order. Secondly, civil organizations generally lack independence. In recent years, civil organizations have constantly increased in number in China, but most of them are small and weak in power, so many civil organizations still rely on government funding and show great dependence on governments (Zhang Weihua, 1997). Thirdly, civil social organizations are unjust. There are various interest groups in the civil society, and different interest groups usually provoke conflicts and frictions, because each of them strives to maximize its own interests. Lastly, China has not developed a set of perfect laws and regulations to oversee and guarantee the healthy and orderly development of civil organizations. Therefore, government "steering" governance is still required to cultivate and develop the Chinese civil society (Li Shenzhi, 1997).

Secondly, the basic political system in China is quite special. China has a political party system different from Western countries. Western countries generally pursue the multi-party system. To be specific, two or more countries have the right to have control over government offices. However, China

adopts a political system of multiparty cooperation and political consultation under the leadership of the Communist Party of China. Communist Party of China, as the sole ruling party, is the core of leadership in revolution and modernization construction of China.

As explicitly stated in the keynote report delivered at the 18th CPC National Congress, "we should pay more attention to improve the party's leadership and ruling styles and ensure that the party can lead people to govern the country effectively". "Governance without state" runs contrary to the basic political system of China, and does not match the basic conditions of China at the current stage. Governance with Chinese characteristics can never change the leadership of the CPC. Adhering to the leadership of the CPC, the Chinese government should gather various democratic parties together, develop a high degree of political identity, promote optimal allocation of political resources, mobilize the enthusiasm of all parties, guide and organize the continuous modernization of society, and promote the development of multiple subjects within a centralized political framework.

Thirdly, China faces complex situations in the transition period. At present, China is in a period of rapid social transformation, which results in an increase in social instability factors and frequent occurrence of social problems and conflicts. Faced with huge pressures arising from unreasonable social stratification and structural changes in the population and family, new challenges from reforms in the information-based and network society, continuously-increasing mass disturbance and highly competitive international environment, no organization or individual has the ability to handle them.

The ultimate goal of governance is to achieve "good governance". The stability of social politics is an important indictor to measure whether a government achieves good governance. Yu Keping highlighted "stability" among several factors listed for good governance. A stable social environment is required to achieve good governance. As Deng Xiaoping said, "stability is overriding". A stable and orderly environment is essential to cultivate civil society and develop market and social organizations. However, a powerful core of leadership is a precondition for guaranteeing a stable and orderly environment.

4 Government "Steering" in "Decision" of the 18th Central Committee of the CPC

As stipulated in the "Decision" of the 18th Central Committee of the CPC, "to make innovation in social government, we must focus on fundamental interests of the broadest masses, strive for a maximum increase in harmonious factors, enhance the social development vitality, improve skills of social governance, comprehensively promote the construction of A safe China, safeguard national security and ensure that people in peace and contentment and society develops in peace and order." At a practical level, the "Decision" confirms the dominance of the CPC in governance, reflects the idea of government "steering" governance, and guide directions for specific practices of governments.

Firstly, the Chinese government should adhere to systematic steering governance. As stipulated in the "Decision", "the party shall adhere to systematic governance, strengthen leadership by party committees, play a leading role, encourage and support participation of various social parties, and achieve sound interactions of government governance with social self-improvement and residents' self-government. A precondition for pursuing systematic governance is to guarantee and strength the leadership by the party. Under the leadership of the party, the Chinese government should give full play to its leading function, encourage different parties to participate in governance, play a steering role in coordinating various parties, and create a stable and orderly governance environment. Meanwhile, it should also monitor movements of "paddlers", build a comprehensive and effective evaluation mechanism, combine various kinds of administrative bodies, and implement the CPC's policies and guidelines in governance practices. Lastly, the government should also listen attentively to demands to the people, and solve livelihood issues.

Secondly, the Chinese government should adhere to a proper separation between steering and paddling. The "Decision" stipulates that "China shall properly handle the relationship between the government and society, accelerate a separation of politics from society, and promote social organizations to specify their rights and responsibilities, achieve self-governance according to law, and fulfill their functions." That is to say, requirements are put forward for law-based administrative capacities of governments, to achieve a transformation in government functions. To achieve a proper separation between steering and paddling, governments should launch systematic planning in governance, clearly determine the steering part and paddling part, make scientific positioning of government functions and return more rights to markets and social organizations, so that governments

can be more concentrated on decision-making and their decision-making can be more scientific and democratic. In addition, governments should not completely shake off their "paddling" functions in some fields. Due to imperfect laws and regulations, immature civil society and the incomplete community service system, government participation is still needed in many aspects.

Thirdly, the Chinese government should strive for more steering and less paddling. The "Decision" stresses that social governance is to encourage and support active participation of various parties in society, integrate various resources of social governance, create conditions for public participation, effectively mobilize the masses and develop a situation that all people participate in social governance. To achieve this, the government is required to launch more steering and less paddling. That is to say, the government should invest more efforts to develop policies instead of implementing policies. It should ease governance over microscopic things. To be specific, it can transfer some public services-providing or issue-solving power to social organizations and provide institutional specifications and resource support to the social organizations. In this way, the government assigns paddling tasks to the high-efficiency market, so that the government can be more concentrated on steering work. Therefore, China should build a governance model with the government as the leadership and profit-making enterprises, non-profit organizations or non-governmental organizations and the masses as participants.

5 Conclusions

Government "steering" governance with Chinese characteristics should conform to political attributes, social systems and social values of China. "Steering" governance is to govern against China-specific issues and solve practical difficulties exclusively for China. According to the report delivered at the 18th Party Congress, governance with Chinese governance is expected to achieve an overall planning of economic construction, political construction, cultural construction, social construction and ecological civilization construction, comprehensively build a moderately prosperous society, and achieve social modernization. However, Marx and Engel did not give an answer to the question how to achieve the overall planning. China should not completely follow Western governance theories. In a complex and ever-changing social environment, the Chinese government should fulfill functions of steering, launch overall planning and make practices in line with the Party's policies and guidelines. In a complex and ever-changing social environment, the Chinese government should fulfill functions of steering, launch overall planning and make practices in line with the Party's policies and guidelines; achieve a transformation in government functions, governments should launch systematic planning in governance; develop civic education, cultivate civil society and provide the ability of citizens to participate in governance(Joes S. Migdal,2001); encourage and support participation of various social spartie, create conditions for public participation, develop a situation that all people participate in social governance.

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A Study and Practice of Art Based on Nanotechnology

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Abstract: Since the 21st century, with the fast development, Nano Science and Technology not only promoted the development of many related industries, but also provided more creative sources for environmental art design. This paper, firstly, analyzes and summarizes the characteristics and principles of nano-art inside the microstructure from electron microscope image based on an aesthetic point of view; Secondly, from two aspects of scientific and artistic inspiration, or/and each other on the design concepts as well as the interoperability methods of science language and art design, it reveals the way of fusion of nanotechnology and environmental art; Finally, the authors explore the design methods by the application of nanotechnology   in environmental art design for an exhibition space design practice.
Key words: Nanotechnology; Environmental design; The pathway of fusion; The method of design

1 Introduction

In the 21st century, the revolution of nanotechnology sweeps the world, gradually exerting a great influence on human life and improving its quality day by day. Subsequently, this program gives a birth to nano-art. Artists are inspired by numerous nanotechnology achievements, creating a series of devices, photography, and related graphic designs. Until now the definition of "Nano Art" is unclear, the public usually regards "using nanotechnology to create art work in nano-scale". According to the definition strictly, the art work in this paper does not mean real nano art work, we expect to explore the possibility of nanotechnology's concepts and nano-structures to environmental design. Its aim is to expand nano art, which shows designers' understanding to the nano world.

Artistic characteristic of microscopic structure

Image builds symbol, the symbol builds information. Current society is flooded by media and image, the visual era results in a tendency, which cultural symbols tends to be the image. Environment is an integral part of human life, utilization of image to environment cannot be ignored. Illustrative science not only makes abstruse scientific theory as simple as possible so that the general public can understand, but also allow the architect to find inspiration from the field of science. Nano-/or micro-structure can only be seen by advanced scientific equipment and nanotechnology, nano-lithography and electronic scanning microscope technology are great instruments to visualize them. The nano images show the aesthetic law, which may provide a source of inspiration and a basis or concept for environmental design in the future. After careful study on the nano images, following aesthetic characteristics can be seen in them.

1.1 Array

Repetition and order

The figure 1 shows the microscopic images made by using the photolithography technique on integrated circuit boards. The fundamental of photolithography technique is based on using particles beam (electron beam or ion beam) to carve the pattern on the objects, which can produce these nano-scale graphics. These patterns amplified by the electron microscope show the beautiful and well-ordered linear arrays, which can further assemble to form a two-dimensional (2-D) plane pattern, giving balanced visual experience and providing aesthetic qualities of rhythm, repeat and order. This sort of patterns can be used to facade decorative design, architectural skin design, spatial layout, landscape planning, interior design and so on. These patterns can also be modified by artistic method, such as conversion, extraction, deconstruction, restructure to create other kinds of environmental design.
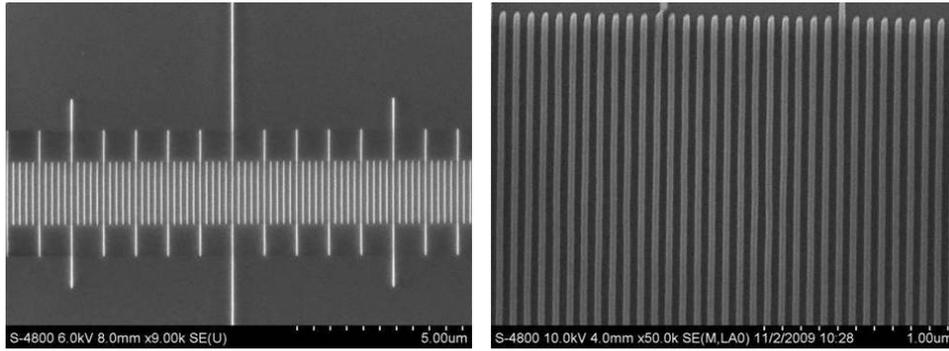
Figure 1   A Small Part of Integrated Circuit Board

1.2 Aggregation

Change and level. Nano-scale materials are able to form special structures during the chemical reaction, which can be recorded and controlled by electron microscopy and nanochemistry, respectively. This 3-D micro-structure shows irregular or random shape (figure 2). This 3-D micro-structure has the characteristics of complexity, softening, mobility, dynamic, light weight and non-linear process, which are strongly connected with modern architectural forms. Due to new science's integrity and complexity, designers begin to pursue non-linear and non-rational in architectures. This kind of micro-structures' diverse changes, flexible unit organization give designers inspiration on internal space and external morphology. Designers not only directly imitate the microscopic structures but also can extend or integrate these micro-structures, to create new architectural forms, seeking new developments and infinite possibilities of architectural forms.

Figure 2   Mesoporous Silica, Spindle-like Nanoparticles, Dendrimer-like Mesoporous Silica

1.3 Similarity

Contrast and unity. By adopting different technology, driven from experimental or themself, materials may get self-assembly to form the much ordered or uniform regular patterns in the micro-scale or nano-scale (figure 3). More particularly, although the size of each structure is varied, the characteristic of each element is unified. For instance, the linear-based image shows obviously a linear random hash, containing the cone element, represents the same characteristics of the tapered hash. The image naturally illustrates the shape of point, line, surface, which are similar with basic element in art field. These images are widely used in architecture, landscape, indoor environmental design through a variety of design techniques.
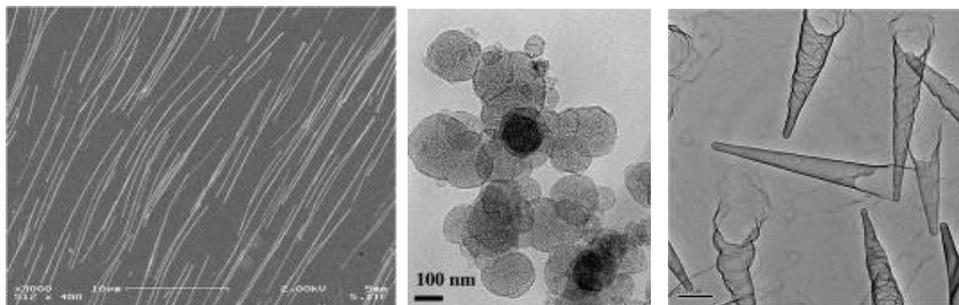
Figure 3   ZNO Nanorods, Mesoporous Silica Beads, Cone Shaped Nanoparticles

2 The Combination of Nanotechnology and Environmental Design
2.1 Mutual inspiration in concept of art design and scientific research

Science and art make progress together when they inspire each other mutually. Architect R Buckminster Fuller created a grid dome structure with high structural stability and light weight, which has been widely used in space covering large construction projects, such as the Montreal Expo Hall in 1967 (Figure 4). The scientist was inspired by the building structure, after testing, also proved the existence of C60 molecules, named "fullerene" (Figure 5). The new discovery of fullerenes exactly confirms that art inspires science in terms of the concept as it reveals the homology of Arts and Sciences. Moreover, the landscape planning of Zhongguancun Life Science Park (Figure 6) is designed by Yu Kongjian. Based on living cells, designer imitates the cells' structure and running mechanism to create more organic and ecological community. In-depth understanding of the living cells provokes designer to create the new landscape framework. It is an excellent example which is inspired by scientific research. Concept of science or art, as an indicator of essential attribute, objectively reflects human's recognition to science and art respectively. The mutual inspiration between science and art not only confirms the same attributes of them, but also enables them to be more systematical and complete.

Figure 4   U.S. Exhibition Hall of Montreal1966 Expo   **Figure 5   C60 Molecule Model Structure**   **Figure 6   Zhongguancun Life and Science Park Plans**

2.2 The mutual utilization of technological language and design language

Science continues creating new technologies, which gives artists more imagination and expressiveness. For example, recently the rapid development of computer-aided architectural design (CAAD) has freed the designers completely from the drawing so that they entirely concentrate on the design itself. These advanced analysis technologies can dramatically improve the quality of architectural design. "Virtual building" design approaches become the mainstream of CAAD which can liberate the creativity and imagination of the architect, changing the way of thinking. In return, the language of art gives scientific imagination, helps shaping the physical world through law of beautiful. The China National Aquatics Center "Water Cube" (Figure 7) is built by the shape of water molecules as architectural surface, giving the building ice-like appearance. This architectural skin clearly demonstrates a unique visual effect on the contrary. Membrane structures, as well as high-tech structures, illustrate their utility value in architecture by using artistic language. It is apparent that design and art become more rational when using technological language, while science gets closer to human instinct and is easily acceptable when immersing in design and art.

Figure 7   China National Aquatics Center

3 Exploring the Application Method of Nanotechnology to the Field of Environmental Design

3.1 The reproduction of nanotechnology

Reproduction is a means of art. The reproduction art depicts a specific objective image or social life that an artist knows in his work. As an art form, environmental art cannot be separated from the means of reproduction to reflect the basic reality. The ways of achieving nanotechnology reproduction are i) Simulating nanotechnology concept: Making a deep understanding of a nanotechnology concept and selecting the appropriate design approach to simulate this technical concept. ii) Simulating nanotechnology methods: Being familiar with a nanotechnology operation, experiments and selecting the appropriate design to express in the form of this technical approach. iii) Simulating nanotechnology achievements: many nano products can give inspiration to artists, making them rethink to create new art work. Those three approaches cover concepts, methods and achievements of nanotechnology, helping reflect the various aspects of nanotechnology.

[Molecular sieve] The design of nanotechnology hall (Figure 8) is a good example for the reproduction of nanoscience research achievements. In the microscopic world, the nanoparticles can spontaneously grow into nano-structures which get together and form a unique morphology. The hall is inspired from the microscopic structure, using the molecular sieve structures as the basic elements of artistic processing. By transforming and assembling the outline of molecular sieves, the rudiment of this hall gradually reveals. Molecular sieves (Figure 9) have a unique highly ordered porous nanostructure, which can be used for screening different sizes of molecules and widely used in many industrial fields such as petrochemical engineering, electronics, metallurgy with a good catalysis and separation effect. The molecular sieves, zeolites as a cracking catalyst for petroleum chemical industry to produce gasoline, have created huge profits for human being. The method of architectural design also applies in Nanoscale Science and Quantum Information Centre (NSQI) Building in University of Bristol, UK (Figure 10), which is used fullerene structure as the top of the building atrium.

**Figure 8   Design of "Molecular sieve"   Figure 9   The Model of   Figure 10   NSQI Building
Exhibition Hall   Mesoporous Structure   in UK**
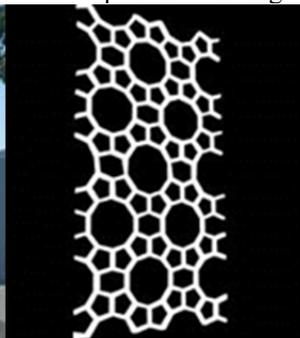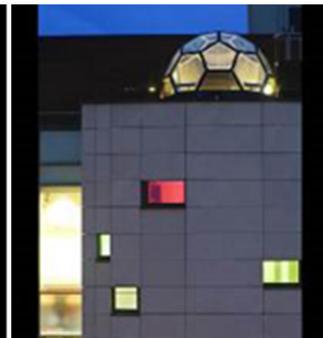
3.2 The performance of nano-science

Compared with reproduction, performance emphasizes more on self-expression of feelings and subjective emotion. It does not express the reality of life, but the spiritual reality. The ways to achieve performances of the nanotechnology involve in: A) Expressing artistically theoretical research on nanotechnology. It is related to understanding nanotechnology theory deeply and then selecting the proper artistic method to express this theory. And at the same time, we should lay to emphasize on pursuing the design creativity and innovation. B) Interoperating the method of nanotechnology. The designers should be familiar with its experimental method, operational procedure and re-interpret the experimental method or operational processes by appropriate art processing. C) Re-creating the nanotechnology. Achievements are widely used in many aspects of human life, which are probably well known by the masses. Converting nanotechnology achievements to art work is a good way to make people get to know about nanotechnology.

[Crystal-growth] Design of the nanotechnology hall (Figure 11) is the performance of nano-growth which confirms to the growth of nanowire typical patterns, the gas-liquid-solid (VLS) growth model. This VLS growth model proposed in 1964 has played an extensive guiding role on the future growth research of nanowires and their arrays. The VLS growth mechanism for the preparation of different and various nanomaterials are basically the same, the gas phase molecules can be deposited into liquid

catalyst phase, and integrated into the solid phase transition for the growth of nanowires. In simple terms, the gaseous state of a metal compound is mixed with a kind of liquid catalysts, when the conditions achieve a certain degree of saturation, the chemical decomposition reaction begins, the solid phase is grown along a direction from the catalytic sites of nanowires, which is VLS, the basic process of the growth mechanism. Understanding of scientific concepts and principles inspired the architectural design thinking. Designers use the concept of the nanowires' growth in building design. In the process of transformation, artistic interpretation of scientific concepts, scientific concepts and architectural design language can be inspired each other. The fusion between article thinking and scientific concepts ultimately forms into a nanotechnology connotation exhibition design.

Figure 11   The Design of "Crystal-growth" Exhibition Hall

3.3 The fusion of reproduction and performance

As two design art techniques, reproduction and performance cannot exist independently. They can be combined to achieve mutual tolerance and harmonious coexistence. The inspiration of Macro-nanotubes (Figure 12) is based on the understanding of nanostructures. Nano-Science & Technology is an interdisciplinary area combine science with technology. It researches the structure, characteristics and interactions of atoms and molecules on a scale of 0.1 to 100 nm. This concept of nanotechnology is widely recognized as Nanotechnology, which manipulation and process technology of atoms and molecules on the nanometer scale.

[Macro-nanotubes] The nano exhibition hall (Figure 12) design strives to a removable assembly building, which inspired by the operation of the science workers for microscopic particles in the laboratory. The entire hall is composed of 19 wall panels and 12 components that are built up by nanomaterials. One of these materials is the aerogel filler plates. The most important feature of this aerogel material is ultra-light with excellent noise and temperature insulation performance. This hall is calculated about 54 kg which can be moved by vehicle and easily installed and disassembled. The outline of the building is the hexagon array, which is a reproduction of the carbon nanotube structure (Figure 13). On the other hand, the function of building detachably assembled focuses on the performance of nanotechnology essence, which is particle manipulation processing. The concept of the two parts has achieved the harmony of the design ideas and practical function. [Macro-nanotubes] the nanotechnology hall design is combined with renewable and artistic expression, making this design both spirit and form, while demonstrating the concept of nanotechnology achievements.

Figure 12   The Design of "Macro-nanotubes" Exhibition Hall
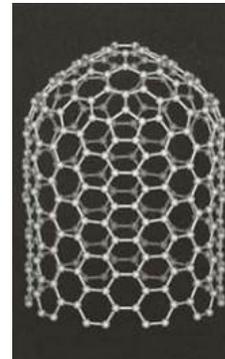
Figure 13   The Model of Carbon Cage Structure

These above three design practices try to demonstrate that applying the nanoscience to the environmental design through the technology of manipulating nanoparticles is feasible. Besides, this art form of environmental designs clearly helps to show the concept, technology and outcome of Nano-Science & Technology. The conceptual and methodological inspiration and borrowing could promote the development of discourse system, the symbolic forms and the thinking mode of environmental design and nanoscience. It will also promote innovation and progress of the arts and sciences.

4 Conclusions

The development of nanoscience and nanotechnology has opened the door for the creation of art and design thoughts. Design as a bridge links the public view and nanotechnology. This paper analyzes the principle of nano-/micro-structure aesthetics in several aspects of arrays, aggregation and similarity. In addition, it also explores the pathways of the integration between nanotechnology and environmental art in two aspects: mutual inspiration of design concept, reciprocal uses of technical and artistic language. Finally, the exhibition design, for example, can be revealed by the application of nanotechnology in environmental design. Although the related research and exploration are very preliminary, the attempt at this stage can be easily recognized that the microscopic world provides the environmental design with unlimited imagination. Nanotechnology would have much broaden applications in environmental design.

Finding inspiration from traditional culture is a remembrance and perception of history; looking for inspiration from the field of high-tech is a yearning for the future. With human life gradually approaching into the nanometer era, the exploration and the pursuit to nanotechnology will have more profound impact on our life.

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Perceived Organizational Politics and Employee Turnover Intention: A Longitudinal Study in Nigeria

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Abstract: Although prior research has demonstrated that perceived organisational politics were positively related to employee turnover intention, however, little is known about possible causal explanations for the relationship between the two variables. To address this gap, a longitudinal design was employed to examine the relationship between perceived organisational politics and employee turnover intention with data collected over a two-year time period. Specifically, one hundred and seventy five Registered Nurses from government hospitals in Nigeria completed measures of perceived organisational politics and employee turnover intention at 2 times 16 months apart. There was empirical evidence, based on results of longitudinal regression analyses to support either the hypothesis that perceived organisational politics increases employee turnover intention or the hypothesis that employee turnover intention lead to organisational politics. However, employee turnover intention and perceived organisational politics were found to change instantaneously. Implications of the results are discussed.
Key words: Longitudinal design; Organisational politics; Turnover intention

1 Introduction

Employee turnover is prevalence and has become a major concern of every organization. For example, In the United States of America (U.S.A.), about 7.7% of the full time faculty members from various universities and colleges had left their posts for other institutions in 1997/1998 academic session. Of these faculty members, only 29% were retirees, while the remaining 71% have left their institutions for variety of reasons (Sanderson, Phua, & Herda, 2000). The survey further showed that more than 40% of the faculty members in the USA have made of their minds to change careers (Sanderson et al., 2000). In a similar survey, Waswa and Katana (2008) reported that in Kenya, qualified faculty members from various Kenyan public universities have quitted their job for a secured and better paying jobs abroad. Munzali and Obaje (2008) also reported that about 64% of the required number of teaching staff from various universities in Nigeria have left for western industrialized countries, such as USA, United Kingdom (UK), Southern Africa and Middle East countries, including Kuwait, Saudi Arabia and Oman, among others.

Records have also shown that about 500 employees from various organisations in Nigeria continue to leave annually, to western economies such as United States, Europe, Canada and other African countries for better condition of service (Bassi, 2004). A recent estimates have shown that that in the year 2012, more than 20,000 professionals, including medical personnel, teaching staff from various universities and colleges leave African continent annually to look for a greener pastures in Western countries such as United States, Canada, Germany and United kingdom, among others (Agency Reporter, 2012). Meanwhile, several studies have indicated that employee turnover is detrimental to both individuals and organisations (Glebbeek & Bax, 2004; Hellman, 1997). For instance, co-worker turnover, may be a "shock" to the remaining employees, which results in work disruption and also significantly reduce their job embeddedness, thereby triggering thoughts of quitting in them (Holtom, Mitchell, Lee, & Eberly, 2008). It is also estimated that employee turnover has a financial costs to organisations due to the separation costs; replacement costs of departed employees and training costs of new employees (Cascio, 2000; McKinney, Bartlett, & Mulvaney, 2007).

Given its prevalence and detrimental effects to both individuals and organisations, researchers have examined perceived organisational politics as an underlying factor explaining employee turnover. Perceived organisational politics "involves an individual's attribution of behaviours of self-serving intent and is defined as an individual's subjective evaluation about the extent to which the work environment is characterized by co-workers and supervisors who demonstrate such self-serving behavior" (Ferris, Harrell-Cook, & Dulebohn, 2000, p. 90). Specifically, Huang et al. (2003) showed that perceptions of organizational politics are significantly and positively related to turnover intentions

among 612 Tax employees from Taiwan Ministry of Finance. Likewise, in a study conducted among 198 full-time hospital employees in United States, Byrne (2005) found that employees who experience high levels of organizational politics at work are more likely to consider quitting their jobs. Recent evidences (e.g., Abbas, Raja, Darr, & Bouckenooghe, 2012; Bedi & Schat, 2013; Chinomona & Chinomona, 2013) also suggest that high levels of organizational politics are significantly and positively related to turnover intentions.

While the aforementioned empirical studies have contributed to theory and concept development, most of them employed a cross-sectional research design, which does not allow researchers to detect changes in the characteristics of the sample studied. However, notable exception is the work of Karatepe (2012). The present study is significantly different from Karatepe (2012), which mainly focused on full-time frontline hotel employees in Cameroon, while our concern in this study was to focus on Registered Nurses working in public hospital in Nigeria. Specifically, the purpose of this study was to employ a longitudinal research design in order to examine the influence of perceived organizational support on turnover intention among Registered Nurses working in public hospital located in Kaduna metropolis in Nigeria.

2 Methodology
2.1 Participants and procedure
Participants in this study were Registered Nurses employed by a large government hospital located in Kaduna metropolis, Nigeria. We collected the data in a two-wave panel study (Time 1 in September 2014) and the second wave of the study was sixteen months later (Time 2 in January 2016). One hundred and ninety four participants completed a survey at the second wave of the study. After deletion of multivariate outliers, the final sample included 185 Registered Nurses. On the other hand, 185 Registered Nurses participated in the second wave as well.

2.2 Measures
2.2.1 Perceived organisational politics
To measure employees' perception of   organisational politics construct,   we adapted seven items from perceived organizational politics scale developed by Kacmar and Ferris (1991). Sample items in this scale are: 1) "Employees in my hospital attempt to build themselves up by tearing others down", and 2) "Agreeing with powerful others is the best alternative in my hospital". Participants were asked to respond to questions in this scale using a 5-point Likert scale ranged from 1 (strongly disagree) to 5 (strongly agreed).

2.2.2 Turnover intention
We adapted three items to measure turnover intentions from prior research (e.g., Aryee & Yue Wah, 2001; Lam, Chen, & Takeuchi, 2009).   Items in this scale are: 1) "There any likelihood that you would resign from the hospital?", and 2) "There is likelihood that you would not continue to be a staff of the hospital during your tenure of employment with your present hospital?". Participants were asked to respond to questions in the turnover intentions scale using a 5-point Likert scale ranged from 1 (strongly disagree) to 5 (strongly agreed).

3 Results
Table 1 presents the means and standard deviations of the variables employed in this study. The mean for perceived organisational Politics at Time 1 was found to be 4.362 with a standard deviation of 0.347. Relatedly, mean and standard deviation for perceived organisational Politics at Time 2 4.362 were 4.455 and 0.526, respectively. Regarding the turnover intention at Time 1, we found a mean and standard deviation of 3.463 and 0.914, respectively. On the other hand, the mean for turnover intention at Time 2 was found to be 3.400 with a standard deviation of 0.912. In terms of correlations, perceived organisational Politics at Time 1 was positively related to turnover Intention 2 ($r = 0.394$, $p < 0.01$), perceived organisational Politics at Time 2 was positively related to turnover Intention 1 ($r = 0.65$, $p < 0.01$). Perceived organisational Politics at Time 1 was positively related to Turnover Intention 1 ($r = 0.263$, $p < 0.01$), perceived organisational Politics at Time 2 was positively related to turnover Intention 2 ($r = 0.571$, $p < 0.01$).

Furthermore, following (Tekleab, Takeuchi, & Taylor, 2005), we used lagged hierarchical multiple regression to analyse the longitudinal data towards hypotheses testing. Specifically, we computed two block-wise multiple regression analyses with the turnover intention at Time 2 and perceived organisational politics at Time 2 as the dependent variables. In the first block, we regressed the turnover

intention 2 on perceived organisational politics 1. We then we regressed the perceived organisational politics 2 on turnover at Time 1 in the second block. Accordingly, in order to ascertain the longitudinal effects of perceived organisational politics on turnover intention, the incremental R^2 for the first block of regression analysis was examined. The results of the lagged hierarchical multiple regression analyses are reported in Table 2.

Table 1　Means, Standard Deviations and Correlations of Study Variables.

	Mean	SD	1	2	3	4
1. Organisational Politics 1	4.362	0.347	1			
2. Organisational Politics 2	4.455	0.526	.605**	1		
3. Turnover Intention 1	3.463	0.914	.021	.263**	1	
4. Turnover Intention 2	3.400	0.912	.394**	.437**	.571**	1

Note: *$p < 0.05$. **$p < 0.01$ (two tailed).

Table 2　Results of the Lagged Hierarchical Multiple Regression Analyses

Predictors	Block 1	Block 2
Intercept	-2.93*** (0.64)	-0.01(0.39)
Organisational politics - Time 1	0.38***(0.14)	0.60***(0.08)
Turnover Intention - Time 1	0.56***(0.05)	0.25***(0.03)
R^2	0.47	0.43
Adj. R^2	0.47	0.42
$\triangle R^2$	0.32	0.36

Note:　*$p < 0.05$. **$p < 0.01$; ***$p < 0.001$ (two tailed). The values in brackets are standard `errors (SE) for corresponding estimates
Dependent Variables: Turnover intention at Time 2 (Block 1); Perceived Organisational Politics at Time 2 (Block 2).

As shown in Table 2, the first block accounted for a significant proportion of the Time 1 perceived organisational politics ($\triangle R^2 = 0.32$, $p < 0.001$). In the same vein, according to our expectation, Turnover Intention at Time 1 was related to higher levels of Perceived Organisational Politics at Time 2 ($\triangle R^2 = 0.36$, $p < 0.001$). Accordingly, the findings supported both Hypothesis and Hypothesis 2.

4 Discussion and Conclusion

The goal of the present study was to examine the relationship between perceived organisational politics and turnover intention.　We examined longitudinal data from Registered Nurses employed by a large government hospital located in Kaduna metropolis, Nigeria in a two-wave self-administered survey 16 months apart. A longitudinal model was tested using a Lagged Hierarchical Multiple Regressions. The results largely supported our hypotheses that there would be reciprocal effect of perceived organisational politics on turnover intention.　These results underline our postulation that the relation between perceived organisational politics and turnover intention is complex and reciprocal. This suggests that there is no simple one-directional effect of perceived organisational politics on turnover intention. Whereas perceived organisational politics influence turnover intention, employee turnover can also influence the perception of organisational politics in the work environment.

Despite its contributions, the present study, there few of its several limitations that should be discussed. First, the findings of the present study should be regarded as descriptive and preliminary given the low variance explained in the dependent variables. As reported earlier, our research model was able to explain 47% of the total variance in turnover intention at Time 2 (Block 1) and 43% of the total variance in perceived organisational politics at Time 2 (Block 2), which means there are other variables that could significantly explain the variance in dependent variables. In other words, the remaining 53% and 57% of the variance in in perceived organisational politics at Time 2 (Block 2) and perceived organisational politics at Time 2 (Block 2), respectively could be explained by other factors not incorporated in our longitudinal model. Thus, future research is needed to consider other possible factors that could help in minimizing tendency of turnover intention and organisational politics.　For example, future research might examine the longitudinal effect of perceived organisational justice or organisational support on turnover intention.

Second, although perceived organisational politics and turnover intention were measured at the same point in time, as well as even at different points in time, however, we cannot interpret with confidence the causal effects of one variable on another. Hence, only an experimental research design can demonstrate causal effect of perceived organisational politics on turnover intention. This represents one of the limitations of longitudinal research design. Therefore, it has become imperative for future research to replicate the findings of the present study using a well-design experiment.

The final limitation that the data did not allow us to dependably distinguish between those Registered Nurses who have really changed their jobs voluntarily, and those who changed jobs involuntarily. It is likely that some of the Registered Nurses who involuntarily changed jobs may not have reflected such when answering the questionnaires, since there was no provision for that in the questionnaires that have been administered. Hence, this suggests an avenue for future research. Specifically, replication of the present study is needed by incorporating the questionnaires those Registered Nurses who have really changed their jobs voluntarily, and those who changed jobs involuntarily so as to understand the underlying reasons why the left.

In conclusion, the present study is one of the first empirical studies that provide comprehensive examination of the longitudinal effect of perceived organisational politics on turnover intention among Registered Nurses employed by a large government hospital located in Kaduna metropolis, Nigeria. This particular study showed provided empirical evidence based on results of longitudinal regression analyses to support either the hypothesis that perceived organisational politics increases employee turnover intention or the hypothesis that employee turnover intention lead to organisational politics. Finally, although the present study extends recent work on turnover intention, there is a need for further extension of the effect of perceived organisational politics on turnover intention using a well-design experiment.

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Skilling Entrepreneurs on Innovations: A Key for Improving Competitiveness of Leather Products and Footwear Industry of Sri Lanka

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Abstract: This research paper explores the relationship among skills of entrepreneurs of leather products and footwear industry in Sri Lanka and entrepreneurs' involvement of innovations in product, process, raw material and market in the industry. Further, the survey investigates firms' competitiveness and innovativeness in the industry. Database of firms in the industry available in Sri Lanka Industrial Development Board was used to administer an expert reviewed and piloted questionnaire among the population of firms. Personal interviews and a mail survey were undertaken which jointly brought above-average response rate of completed questionnaires used for analysis. The research has found that there is a strong link between skills of entrepreneurs and their involvement in innovations. Research has found that entrepreneur focus on product innovations rather than process, raw material and market innovations due to their low level of general education and the main mode of acquiring skills remains on-the-job-training. Usage of technology has been found to be lower level which has a negative effect on innovations. However, the entrepreneurs have a positive attitude towards innovations the relevant agencies can capitalize-on for expansion of the industry and increase competitiveness. The research unearths an intelligent view that in an efficiency-driven economy, what matters is productivity where skilling of entrepreneurs will yield enormous results for harnessing the potential of this ever growing industry.
Key words: Innovations; Technology; Competitiveness; Innovativeness; Skills

1 Introduction

Small and medium scale enterprises (SMEs) play a crucial role in Sri Lanka economy by providing employment and income in order to push the economy forward (Thilakarathna & Jayasekera, 2013). Though there is large number of large scale and micro size firms operate in the economy of Sri Lanka, the main focus is on the SMEs of leather products and footwear industry in Sri Lanka for the purpose of this research paper.

This paper explores the levels of skills of entrepreneurs of the industry and the innovations in product, process, raw material and market as a whole. Economists mainly discuss about product and process innovations in enterprises (Fried, 2005) however, this particular research paper focused additional two innovation areas i.e raw material and new market as it particularly appropriate to leather products and footwear industry sector and the SME sector of Sri Lanka in general. On this backdrop, the research focused the level of new products, processes, raw material and market innovations which the entrepreneurs uncovered in their firms over the past 2 years (2015 and 2014).   The paper inquires how the entrepreneurs view about innovations in a context where firms in contemporary business world increasingly recognize skills as one of the key determinants towards innovations which ultimately lead to business competitiveness (Smith, Courvisanos, Tuck, & McEachern, 2012).

1.1 Definitions of key terms

SMEs in general, are defined in variety of ways by various countries in terms of
1) Number of persons employed
2) Amount of capital invested
3) Amount of turnover of the business

In Sri Lanka, Department of Small Industries of Sri Lanka defines SMEs as enterprises with fewer than 50 people and capital investment of less than Rs. 5 million.   The Export Development Board of Sri Lanka defines SMEs as enterprises with less than Rs. 8 million investments and less than Rs. 50 million annual turnovers. The World Bank defines SMEs as enterprises that employ less than 99 people (Thilakarathna & Jayasekera, 2013).   Webster Dictionary defines the term "skills" as an ability that has been acquired by training.   Entrepreneurs' skills is   much complex proposition where it is defined as the ability of entrepreneurs to identify the industry trends and new technologies as well as acquire and exploit this knowledge and information for further improve the enterprise performances (Curtin, 2011).

The concept of innovation has been defined as the creative application of knowledge to increase the set of techniques and products commercially available in the economy (Smith et al., 2012). An enterprise is defined as an economic entity created by the entrepreneur, which may develop into a small or large business in time to come (Henry, Hill, & Leitch, 2005). The terms "firms" and "enterprises" are used interchangeably to denote small and medium scale companies operate in the leather products and footwear industry for the purpose of this research paper.

1.2 How skills and innovations apply to SMEs

SMEs are a crucial set of entities in an economy which contribute heavily for Gross Domestic Product (GDP) of a country. In Sri Lanka, SME sector contribution to GDP has increased to 52% in 2011 from 40% in 2010 (Thilakarathna & Jayasekera, 2013). The leather products and footwear industry in Sri Lanka, which is highly labor intensive, has a significant potential for being a key contributor to the economy of the Country with a value addition in the range of 40% - 50% (Gurusinghe, 2012). With this level of value addition, it is extremely vital the entrepreneurs demonstrate innovative skills in order to improve firm competitiveness. The ability of an enterprise to innovate depends on quality of its human resources and level of technology being used (Smith et al., 2012).

2 Research Problem

The research was undertaken to find an answer to following research problem:

"Does entrepreneurs' skill matter for enterprise innovations in leather products and footwear industry of Sri Lanka".

Enterprise innovation is referred to as product, process, raw material or new market innovations. In some enterprises innovations take place and entrepreneurs have ensured measures for innovations. However, in most other enterprises no innovations made and only the status-quo is maintained thus making enterprises inefficient, unproductive and monotonous thus leading to stagnation in doing business.   So, what is matter? What prevent them not doing innovations?

2.1 Research objectives

The research expects to achieve following objectives on completion of the research:

1) To explain current level of skills of entrepreneurs and the type of skills they look for in order to make innovations

2) To describe the current level of technology that the entrepreneurs use including the use of information and communication technology tools and the machines they use for production purposes

3) To elaborate link between innovation and competencies, industry experience, location, and financing

4) To describe the entrepreneurs' involvement on innovations, innovation target markets and status of enterprise competitiveness

5) To unearth and describe the constraints for innovations in the industry

2.2 Policy implications for implementation

The researcher will put forward responses for above research objectives with policy implications to address the issues for implementation by relevant agencies.

3 Literature Review and Theoretical Background

Enterprises care about innovations for improvement of productivity and capture new markets while being in competitive in the industry (Stanwick, 2011). What is really meat by innovation? It is much more about new product, processes and services development than research and development (Stanwick, 2011). If an entrepreneur intends to be competitive, he/she has to offer something different or do something differently which requires innovation (Caskey, 2015). Caskey (2015) further explains that use of different distribution channels and markets also make enterprises competitive in the market. What is inferred here is finding of different markets is also part of innovations.   Beal (2000) discussed about different ways of being different where he stresses innovation differentiation and market differentiation as a strategy to be competitive in the market. As cited in Hatak, Kautonen, Fink, & Kansikas, (2016) Greve, Camps & Marque emphasized the need of product innovations for firms to be competitive in a globalized business world. Industries experience threats of new entrants and in order to face such threats product differentiation has been identified as a strategy (Porter, 1997). Parry et al. as cited in (Löfsten, 2014) explains that product innovation is the first stage of product-life-cycle management where determinants of product costs are identified and set determining the future success of the firm. Product innovation processes are different to work processes innovations where the former is strategically

important to firms (Löfsten, 2014). As explained in Sundarraj (2016) product innovation processes are different to work processes innovations where the former is strategically important to firms. In the western cultures, it has been found that there is positive relationship between innovations and enterprise performance (Hatak et al., 2016). There may be different results in developing countries similar to Sri Lanka as management and financing are differ from that of western world. As cited in Sandberg, Hurmerinta, & Zettinig (2013) Drucker and Schumpeter had argued that in order for firms to be sustainable and society and economies to be vibrant entrepreneurship and innovativeness are considered to be crucial. As cited in Sandberg et al. (2013) Beugelsdijk, Hisrich&Peters, Trott, Woo et al. unanimous on entrepreneurs' contribution for wealth creation, firm and economic competiveness through innovations is enormous. Entrepreneurs, though doing innovations challengeable, find way out to engage in product and process innovations despite numerous issues (Sandberg et al., 2013). Scholars analyze firms' ethical behaviors and performances are positively relates where such climate paves the way for various innovations (Moon & Choi, 2014). Innovations take place within enterprises as a response to competitions' behavior (Porter, 1985). Damanpour, Hirst et al. as cited in (Moon & Choi, 2014) have explained distinctive competences or skills of employees and entrepreneurs determine product and process innovations. The view of Zhang &Bartol as cited in Wojtczuk-Turek & Turek (2015) innovativeness is significant for creating competitiveness in modern organizations has been commonly approved. As discussed by Dan (2015)[1] the world recognize the fact that innovations pave the way for business competitiveness while entrepreneurs have to be in the forefront of discourses on innovations to meet people's needs fully. Also, it has a great risk of failure of products that the enterprises innovate though there are successes (Stanwick, 2011). The scholars Yeh et al. Gonza ´lez& Palacios, Freeman, Hart, Urban & Hauser as cited in Graner & Mißler-Behr (2013)   new product innovation is one of the most important determinants of sustained company performance and therefore represents a key challenge for firms to give attention to. Scholars give attention to numerous individual and organizational predictors which can later become a foundation for creative activities of an enterprise where competence of individuals is a key (Wojtczuk-Turek & Turek, 2015). It has been recognized the fact that giving the managers and employees more freedom, a sense of ownership and self-determination is essential for enterprise sustainability and dynamism in innovations (Muthusamy & Dass, 2014). Innovations help achieve enterprises greater efficiency, effectiveness, financial and firm performance (Toner, 2011). Bouwman et al., Den Hertog, Forfas as cited in Janssen et al. (2014) were of the view that businesses run in severe competition and use multitude of strategies to increase market share targeting increased profit margin where innovations considered to be a key. It is argued that there is no single kind of skills that foster innovation but rather there are a variety of skills that are required for innovation (Stanwick, 2011). The OECD (Organization for Economic Cooperation and Development) has been working in the sphere of innovations and they have put forward strategies for innovation among member countries. Empowering people to innovate and importance of unleashing the innovation potential in firms were given priority among OECD member states (Stanwick J. and Beddie F., 2011). Scholars are of the view that some entrepreneurship skills can be taught in order for them to be effective in doing businesses irrespective of the size of the firm (Henry et al., 2005). The responsibility of the entrepreneur is to revolutionize the production processes by innovation or invention of new products or processes (Dana, 2001). Scholars suggest to use competency based training (CBT) as an adult training mode for training of entrepreneurs in whatever the required areas which enables successful performance in enterprises (Hackett, 2001). Though Porter (1985) viewed that innovations take place as a result of competitors' behaviors, Hamel and Prahalad, Barney and Barney et al., as cited in Janssen et al. (2014) reiterate enterprise resources, skills and competence as key for product, process and new market innovations. The scholars Christensen and Raynor as cited in Janssen et al., (2014) argue that strategies that focus on cost-cutting due to financing limitations leave enterprises not engaging new innovations on product and processes and demoralize progressive discourses on ideas and concepts related to innovations.

  Sri Lanka has been experiencing a growing informal sector over the years and as in 2014, a high 59.5% of labor force is engaged in employment in informal sector (Department of Census and Statistics, 2014[2]). Out of this, 47.5% of labor force is in non-agricultural sector in which the leather products and

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[1] Dan, Z[I]. Retrieved on 14th March 2015 from http://english.cntv.cn/ 2015/03/13/ ARTI 1426234682359564.html, 2015
[2] Department of Census and Statistics is the Sri Lanka Government agency responsible for collection, analysis and dissemination of national statistics.   It can be accessed via www.statistics.gov.lk

footwear sector falls in (Department of Census and Statistics, 2014). Skills training for informal sector is found to be very minimal that create issues in improving efficiency of those employed in the informal industries (Dundar, Millot, Savchenko, Aturupane, & Piyasiri, 2014). Gunatilaka as cited in (Dundar et al., 2014) was of the view that most informal sector employees have fewer skills than formal sector workers. Howell et al., Kelley and Lee as cited in Sergeeva (2016) put forward the view that innovative persons has more of specific personality traits than that of skills that they learned in their working life. Owners or Chief Executives of firms are regarded as leaders who show the path for innovations, take risks and identify and promote ideas on innovations (Sergeeva, 2016). Research has found that the need of integration of human factors and technological factors in order to give birth to useful innovations (Smith et al., 2012). In recent decades, enterprise size is also considered a factor for innovations where small firms are more able and enthusiastic in doing things differently and in quality and thus found as a preferable organization form to be successful in business activities (Muthusamy & Dass, 2014). Wiggins and Ruefli as cited in Breznik & D. Hisrich (2014) put forward the view that enterprise life cycle has been shrinking where their period of being competitive is diminishing. Research has found that having collaborations with Tertiary and Technical and Vocational Education Institutions, innovative capacities can be translated to real innovations (Andrew Smith, Jerry Courvisanos, Jacqueline Tuck, 2011). In order to achieve higher productivity of human resource of an enterprise it is necessary to improve capacities of human resources which determine the competitiveness of enterprise (Huggins & Izushi, 2015). Porter as cited in Huggins & Izushi (2015) presented four factors for competitiveness of a nation where he stressed "factor conditions" meaning the availability and quality of human resources of an industry. Research has found that entrepreneurs' cognitive style, innovative intentions, and subsequent behaviors can potentially be useful in guiding workforce staffing and training efforts for enhancing productive innovation in organizations (Ettlie, Groves, Vance, & Hess, 2014). Products like footwear is produced in volumes of thousands and usually use not-so-complex technology in enterprises mainly in low-labor-cost countries (Caskey, 2015). As labor cost is low, the entrepreneurs may invest money for training in innovations at training institutions. As cited in Breznik & D. Hisrich (2014) Prahalad's and Hamel's have emphasized enterprises must give attention to the knowledge, skills and technologies that include the set of resources of an enterprise. Their main premise was that when a firm creates new products, these should be oriented to the firm's strategic resources, mainly capabilities (Breznik & D. Hisrich, 2014). Entrepreneurs acquire skills through on the job and apprenticeships in the industry (Dana, 2001). This mode of training lacks mostly the theoretical aspects which are an essential part of innovations. Informal methods of learning still in existence in developing countries (Dana, 2001). Designs play a key role in innovations which entrepreneurs decide in numerous ways. They use existing designs, designs by themselves, and buyers' designs etc. The scholars discuss generation of designs by user communities which will eventually reach production and successful in the market (Caskey, 2015). When it comes to quality of skills training, scholars argue that quality of the education and training of the workforce is the single most important characteristic in determining economic competitiveness of a country (Ball, 2009). Learning has to take place throughout of life of people which includes education and training, the processes of both formal and informal learning: skills, knowledge, understanding, experience, attitude, values etc. (Ball, 2009). In Sri Lanka, competency based training (CBT) is in operation in training centres over the past decade based on competency standards and national curricula. Competencies are descriptions of essential skills, knowledge and attitudes required for effective performance in a work situation (Hackett, 2001). For the purpose of innovation, enterprises do not need higher level skills but a fair understanding of the entrepreneurship, industry trends and markets and customers remain the key (Stanwick, 2011). Scholars argue that lack of focus for innovation may lead to failure in business. Also, to many innovation ideas can cloud the thinking of entrepreneurs that end up in collapse of business (Vaduvescu, 2016). Literature shows that radical innovations though it is riskier is one of the key long term competitive advantages (Verganti, 2016). As people do not buy products but meanings, innovations driven by designs will be sustainable for many enterprises (Verganti, 2016). Given the level of globalization and other reasons, entrepreneurs having innovation skills is critical in 21st century (Asad, 2016).

Each person, regardless of ability, style or orientation can and should be more innovative all the time acquiring innovation skills continuously while making improvements in what they do in value chain of the business (Asad, 2016). Economically, innovation skills take a strong place and is a mainstay of industry and economic development and crucial for success of enterprises and most importantly enhance well being of mankind (Ali, 2014).

3.1 Limitations, reliability and validity

The scope of this research was leather products and footwear industry firms that employ 2 – 250 workers that usually regarded as SME firms by definition. The revenue criteria of the definition could not be met as respondents usually do not disclose facts that may lead to controversies. Therefore, the research considered only the number of employees of the firm in deciding whether it falls in SME definition. As per the definition of the World Bank (less than 99 employees as SMEs) a majority of respondents (92%) have employed less than 35 employees. Micro enterprises and large-scale enterprises were excluded from the survey.

When it comes to reliability and validity, the scholars have defined the terms reliability as the degree to which the measure of a construct is consistent or dependable whereas the validity refers to the extent to which a measure adequately represents the underlying construct that it is supposed to measure (Bhattacherjee, 2012). The questionnaire used to measure the dependent and independent variables was developed in consultation of industry experts and training experts in the industry. It was piloted among 10 entrepreneurs and was updated thereafter. The views of training experts of the Leather Products Development Centre[1] of the IDB, Sri Lanka, were sought and included in the questionnaire. Literature related to skills and innovations were also considered in developing the questionnaire.

3.2 Approach/Design/Methodology

The Leather Products and Footwear Industry is dispersed in all administrative Districts of Sri Lanka with a high concentration in the Western Province which is the main business hub of the country. The Industrial Development Board (IDB) of Sri Lanka[2] maintains a database of almost all SMEs in the country including all SMEs of the leather products and footwear industry. Therefore, the researcher sought assistance of the IDB in obtaining contact information of leather products and footwear firms in Sri Lanka.   Accordingly, the IDB submitted a list of 290 SMEs in the industry with owners' names and postal addresses.

As the research explores the relationship between entrepreneurs' skills and firm innovations, the survey research method was used. The questionnaire with 18 relevant questions was administered during February and March of 2016 among the entrepreneurs in the industry. Depending on the availability of resources, 55 firms were personally interviewed by the researcher and then the questionnaire was sent to the remaining firms all over the country by post mail. Altogether, 185 questionnaires were gathered in both personal interviews and postal survey with a response rate of 63.8%. Personal face-to-face interviews were held to increase accuracy and quality of data being collected for reaching reliable conclusions. The data gathered accordingly have been fed to the SPSS database and analyzed for presentation. When it comes to literature, it has been found that very little amount of literature is available related to leather products and footwear industry of Sri Lanka and no research done in the industry related to the topic being investigated. However, available literature was reviewed in descriptive manner to understand the problem and unearthed available body of knowledge that leads to understand research gaps in relation to the topic being investigated.

4 Results

The research had surveyed entire population of 290 firms and 185 completed questionnaires were collected for analysis. When we look at the dispersion of firms we can observe that 35% of firms are located in Western Province which is the main trade and economic zone of Sri Lanka. Southern province records second largest concentration of 13% of firms. The two provinces together recorded 61% of responses of the survey. The size of the firm was queried and accordingly, the responses show 50% of firms employ 6-15 workers showing that majority of firms in the industry are small firms. 92% of them have less than 35 workers. When it comes to product category, the responses show that 61% of firms produce only slippers which is the dominant category followed by leather shoes category with 16% representation. 12% produce both slippers and shoes and 13% produce bags only and remaining 7% produce other leather goods. It was found that 63% of firms have been operating in the industry for 15 years which shows their long term experience in the industry. The survey showed that only 3% sell their products to overseas market and thus vast majority of 97% of firms sell the products in the local market. Out of this number, majority of firms sell to main distributors which hinder getting customer feedback on satisfaction of the product quality.   Only 1% of firms sell products in their own shops. The question related to sources of capital received multiple responses where 89% of firms use own money and 37%

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[1] The LPDC which operates under the purview of the IDB is the training arm related to the industry
[2] The IDB is the statutory body established by an Act of Parliament to develop and assist SMEs in Sri Lanka.

have been able to obtain whatever the loans from banks. Only 10% opt for capital from local money lenders and relatives. A question was raised related to designs based on which firms produce their products. It was identified that 65% of firms rely on designs already available in the industry. The results show that 33% of firms produce products based on designs developed by their own firms. Only 3% of firms rely on designs from overseas as only 3% of firms sell their products to overseas market.

The research expected to identify current level of skills of entrepreneurs and the type of skills they look for in order to make innovations and thus the survey asked entrepreneurs about their general education achievements in order to gauge their basic education and literacy and numeracy skills. The Table 1 depicted below show that 64% of the respondents had education up to GCE (O/L) which is the basic competitive national level school education standard.   28% of them had GCE (A/L) which is the next higher national level standard. Only 6% of entrepreneurs had bachelor's level degree qualifications.

Table 1　General Education

Achievement	Frequency	Percent	Cumulative%
Up to O/L	119	64.3	65.0
Up to A/L	51	27.6	92.9
Degree	11	5.9	98.9
Post graduate	2	1.1	100.0
Total	183	98.9	
Missing	2	1.1	

Key: GCE – General Certificate of Education, O/L-Ordinary Level, A/L-Advanced Level

The entrepreneurs' way of acquiring skills was queried and, as specified in Table 2 below, 34% indicated that they have followed a formal training course at a training institute.   The dominant way of acquiring skills was on-the-job-training which represented 57% of respondents.   Only 6% have followed business/management course and 2.2% of entrepreneurs have received training in overseas. In this question, multiple responses have been received.

Table 2　Skills/Training Programs Completed

Program	No.	%
Followed a industry specific course at a training centre	63	34
Undergone apprenticeship training in industry organized by NAITA	18	9.7
On the job training	105	57
Followed business/ enterprise management course	11	5.9
Received foreign training	4	2.2

Source: Derived table from survey data

The entrepreneurs' skills requirements were queried and, not surprisingly, majority of 70% of respondents wanted design skills followed by entrepreneurship (62%) and production skills (61%) as shown in Table 3 below. ICT skills were also a requirement of 53% of respondents.   This question received multiple responses.

Table 3　Perceived Skills needs to Improve Current Performance

Nature of skills	No.	%	Nature of skills	No.	%
Entrepreneurship skills	116	62	Communication skills	88	47
Design skills	131	70	ICT skills	98	53
Production skills	114	61	Any other skills (specify)	5	3

Source: Derived table from survey data

As discussed in the literature, use of technology is regarded as a key indicator of entrepreneurs' tendency for innovations.   The survey expected to identify the current level of technology that the entrepreneurs use including the use of information and communication technology tools.   The finding of the relevant question was that majority of entrepreneurs do not use or occasionally use internet, email, websites and social media in day-to-day business activities as shown in Table 4 below.

Table 4   Frequency of Use of ICT Facilities

ICT facility	Frequency of use									
	Not at all (1)	%	Occasional (2)	%	No idea (3)	%	Often (4)	%	Very often(5)	%
Internet	28	15	110	60	8	4	21	11	12	7
Email	30	16	97	52	14	8	26	14	13	7
Website	59	29	84	45	13	7	15	8	9	5
Social media (facebook, tweeter)	108	58	29	16	12	7	12	7	15	8

Source: Derived table from survey data

The question on ICT usage had a Likert scale where the respondents were asked to indicate how often they use them in a scale of "Not at all (1)", "Occasional (2)", "No idea (3)", "Often (4)" and "Very often (5)". The mean values in each of ICT facility in descriptive statistics as shown in Table 5 below are consistent with the result shown in Table 4 above thus showing entrepreneurs use them occasionally or do not use at all.

Table 5   Descriptive Statistics - Frequency of Use of ICT Facilities

ICT facility	N	Mean	Std. Deviation
Internet	179	2.3240	1.08412
Email	180	2.4167	1.14274
Website	176	2.3920	4.13345
Social media	176	1.8466	1.30681
Valid N (listwise)	173		

Source: Survey data

As found in the survey, majority of firms use second hand (reconditioned) machines which indicates that the industry has been using old or outdated technology for production of footwear and leather products as shown in Table 6 below. The corresponding Table 7 below shows that 64% of entrepreneurs do not expect to buy new machines in near future. This shows their willingness to apply new technology in production process remains at low level.

Table 6   Nature of Machines Being Used

Condition	Age of machines	No.	%
	Old less than 5 years	40	22
Use second hand machines	Older than 5-10 years	64	35
	Older than 10 years	57	31
	Old less than 1 year	12	6.5
Use brand new machines	Older 1-5 years	16	9
	Older 5-10 years	7	4

Source: Derived table from survey data

Table 7   Expect to Buy New Machines

Expectation	Frequency	Percent
Yes	63	34.1
No	119	64.3
Total	182	98.4
Missing	3	1.6
	185	100.0

Source: Survey data

As per the analysis, new product innovation remains dominant over process, raw material and new market innovations in this industry as shown in Table 8 below. When we compare general education levels with product innovation, it was found that 78 respondents out of 127 who involved in product innovations had GCE O/L and, interestingly, it was found that higher the general education lower the

involvement in product innovation. When it comes to training courses, 66 have received On-the-job-training, 46 have followed training courses and 17 have followed NAITA apprenticeship out of 127 who have involved in new product innovations. Those who have followed management courses and those who have gone abroad for training had very minimal involvement for product innovations. In relation to the industry experience by number of years in the industry with new product innovations, it was found that 100 of respondents with 6-20 years had involved in new product innovations. With regard to relationship between firm location and product innovation, it was found that firms in Colombo, Kalutara, Kandy and Kurunegala districts have involved in new product innovations. When it comes to financing, it was found that those entrepreneurs who use "own money" have higher involvement (116 respondents) in new product innovations.

A question was raised regarding the entrepreneurs' involvement of product, process, raw material and market innovations over the past 2 years. Interestingly, the results show that 68% have involved in product innovations but very low percentage involved in process and raw material innovations. 18% of entrepreneurs have involved in new market innovations. More than 80% did not involve in process, raw material or new market innovations over the past 2 years. Table 8 brings the findings as shown below.

Table 8   Entrepreneurs' Involvement of Innovations in Last 2 Years

Type of innovation	Yes	%	No	%
New product innovation	127	68	55	30
New process innovation	17	9	165	89
New raw material innovation	15	8	165	89
New market innovation	34	18	148	80

Source: Derived table from survey data

As the majority of entrepreneurs involved in product innovations, their target market was mainly ladies and gents followed by school children with percentages of 55%, 27% and 18% respectively. 6.5% of entrepreneurs target kids in new product innovations. Table 9 includes the findings.

Table 9   Target Market of the New Product Development

Target market	No.	%	Target market	No.	%
School Children	33	18	Gents	50	27
Ladies	101	55	Kids (less than 5 years old)	12	6.5

Source: Derived table from survey data

As indicated in Table 8, 68% of firms have involved in product innovations and in comparison of that result, the Table 10 shows that nearly 50% of entrepreneurs were of the opinion that their turnover of the new product developed has been increased and also nearly 50% of entrepreneurs indicated that their overall sales have been increased after the innovation of new product.

Table 10   Company Performance as a Result of Innovations

Variable	Strongly agree(1)	%	Agree(2)	%	No idea(3)	%	Disagree (4)	%	Strongly disagree (5)	%
Turnover of the new product increased	31	17	91	49	4	2	2	1	1	0.5
Overall sales of the company increased	29	16	91	49	3	1.6	6	3	1	0.5
Number of employees of the company increased	20	11	61	33	2	1.1	16	9	2	1.1

Source: Derived table from survey data

The question related to company performance had a Likert scale where the respondents were asked to indicate the impact for company performance as a result of any of the above innovations in a scale of "Strongly agree (1)", "Agree (2)", "No idea (3), "Disagree (4)", and "Strongly disagree (5)". The mean values in each of the variables in descriptive statistics as shown in Table 11 below are consistent with the result of Table 10 above thus showing an improvement of company performance as a result of new product innovation.

Table 11　Descriptive Statistics - Company Performance as a Result of Innovations

Variable	N	Mean	Std. Deviation
Increased sales in new product	129	1.8450	.61808
Increased total sales	130	2.0692	2.12839
Increased number of employees	101	2.1980	1.00020
Valid N (listwise)	99		

Source: Survey data

In relation to level of company innovativeness, a question was raised as to whether the firms have ability to do research on innovation, product/process innovation, innovations speedily, and whether the firms have increased their capability on innovations. Table 12 depicted below indicates the results and accordingly, entrepreneurs have reasonably good research capability, new product/process innovation capability despite they have problems in doing them speedily. However, they have improved themselves in foregoing areas over the years.

Table 12　Level of Company Innovativeness

Variable	Strongly agree (1)	%	Agree (2)	%	No idea (3)	%	Disagree (4)	%	Strongly disagree (5)	%	Responses	%
Our company has ability to do research on innovations	17	9	24	13	2	1.1	5	2.7	4	2.2	52	28
Our company has ability to develop new product /process	23	12	43	23	3	1.6	5	2.7	0	0	74	40
Our company can do new product development speedily	18	10	11	6	4	2.2	8	4.3	4	2.2	45	24
Our company has improved ourselves in new product development	25	13	77	42	1	0.5	7	4	2	1.1	112	60

Source: Derived table from survey data

The above question had a Likert scale where the respondents were asked to indicate their views on a scale of "Strongly agree (1)", "Agree (2)", "No idea (3), "Disagree (4)", and "Strongly disagree (5)". The mean values in each of the variables in descriptive statistics as shown in Table 13 below are consistent with the result of foregoing Table 10 thus showing reasonably good company innovativeness.

Table 13　Descriptive Statistics - Level of Company Innovativeness

Variable	N	Mean	Std. Deviation
Research capability	52	2.1346	1.20504
has ability to develop new product /process	74	1.8649	.78206
can do new product development speedily	45	2.3111	1.39516
has improved ourselves in new product development	112	1.9643	.80459
Valid N (listwise)	39		

In relation to entrepreneurs' future plans on innovations, the respondents were given a Likert scale of "Strongly agree (1)", "Agree (2)", "No idea (3), "Disagree (4)", and "Strongly disagree (5)" for 5 statements which illustrate their future plans.　The mean values in each of the statement in descriptive statistics as given in Table 14 show that they are positive in increasing the production of new product, consolidation of sales in other parts of the country and, finding new buyers for the new product. Descriptive statistics show that the entrepreneurs are not that positive in entering to export market and setting up of a new plant for the new product.

Table 14　Descriptive Statistics – Future Plans on Innovations

Future plan	N	Mean	Std. Deviation
I will increase production of the new product by two fold	115	1.7304	.77597
I will go to other parts of the country to introduce new product	125	1.7520	.70317
I will find a new buyer for the new product	78	1.6795	.71157
I will export the new product	39	2.3333	1.26352
I will setup a new plant for the new product	40	2.3500	1.33109
Valid N (listwise)	36		

Source: Survey data

Entrepreneurs who did not do any innovations were asked to give the reasons and accordingly, the prominent reason they have cited as indicated in Table 15 below was their unwillingness to take risk by engaging innovations.

Table 15   Reasons for no Launch of Innovations

Reason	No.	%	Reason	No.	%
No idea	6	3.2	No sufficient finance	14	8
Not like to take risk	32	17	No facilities in the company	9	5
Fellow company failed in such a work	11	6	No necessary skills	6	3

Source: Derived table from survey data

It has been found that only 27% is willing to engage in innovations in next 6 months and majority of 69% are unwilling to engage in innovations in near future as shown in Table 16. This is consistent with finding of "not like to take risk" as shown in foregoing Table 15.

Table 16   Whether the Firms do New Product in Next 6 Months

Decision	Frequency	Percent	Cumulative Percent
Yes	51	27.6	28.5
No	128	69.2	100.0
Total	179	96.8	
Missing	6	3.2	
	185	100.0	

Source: Survey data

5 Conclusions

5.1 Discussion with policy implications

This research explores for an answer to the research problem "Does entrepreneurs' skills matter for enterprise innovations in leather products and footwear industry of Sri Lanka" as set out at the beginning of the paper. While searching for an answer to the research problem, it was expected to identify current level of skills and type of skills the entrepreneurs look for in order to make innovations. As vast majority of entrepreneurs had at least lowest standard of CGE O/L at school, they have literacy and numeracy skills in order to acquire job-specific or industry-specific skills in training institutions. The entrepreneurs involved in new product innovations but not significant involvement in process, raw material and new market innovations as per the findings. Highly educated entrepreneurs' involvement in innovations is found to be minimal. Innovations related to process and raw material may need more of scientific knowledge which the current set of entrepreneurs may not have as their general education is at low level. Also, it was found that entrepreneurs' main method of acquiring skills was on-the-job-training (OJT) mode. OJT usually allows people acquire job-specific and hands-on skills but not deep knowledge related to product development. Therefore, it is important to organize Continuous Professional Development (CPD) programs which bring new developments, research findings, new technology and customer trends into discussion. Competency standards and curricula have to be developed and implemented by the relevant government agencies related to these training areas. As the National Vocational Qualifications (NVQ) system is in place in Sri Lanka as the national skills certification system with 7 levels from certificate level up to degree level, courses on technology and innovations can be developed targeting the industry entrepreneurs. In the areas of skills needs as perceived by entrepreneurs, the responses match with current level of competencies and would help resolving current skills gaps of entrepreneurs. In the order of preference, they have mentioned, the need of design skills, entrepreneurship skills, production skills, ICT skills and communication skills will enable them doing what they have been doing much better. In relation to the current level of technology being applied in the industry including the ICT being used, it can be argued that as the level of education of entrepreneurs in the industry remains low, their ability to use ICT tools i.e internet, email, websites and social media may remain low. This situation adversely affects the new developments in the industry. In this context, following policy suggestions are proposed for consideration of relevant agencies;

Policy suggestion 1: Develop and implement CPD programs on regular basis for industry entrepreneurs that bring new developments, research findings, new technology including ICT tools and customer trends into discussion.

Policy suggestion 2: Develop competency standards and curricula for training programs in the

skills areas mentioned by the entrepreneurs and award National Vocational Qualifications (NVQ) enabling them doing higher level courses at diploma and degree levels while ensuring upward mobility in the NVQ framework.

In the area of current technology being applied in terms of machines, equipment and tools in the industry, it has been found that the entrepreneurs' willingness to apply new machines with new technology remains low.   This may be because much of the entrepreneurs use own money as source of capital. Use of Banks as source of capital is not that popular among entrepreneurs which adversely affect the growth of this industry. As found in the survey, the industry is dispersed all over the country however; there is a higher presence in Colombo, Kalutara, Galle, Kandy and Kurunegala which are districts where much of commercial and industry activities are taking place. Financial services available in these areas are higher than that of other districts. Therefore, following policy suggestions are proposed in order to overcome the issues related to technology being used and to promote innovations in the industry.

Policy suggestion 3: Develop and implement industry specific funding scheme to help entrepreneurs to increase access for finance to buy new machines, equipment and tools which bring new technology in to the production process.

As majority of entrepreneurs have targeted ladies in new product innovations followed by gents and school children, design related courses can give much attention to designing of lady's footwear and leather products.   Because the entrepreneurs have targeted ladies in new product innovations, the firms have been able to increase revenue and turn over. This makes sense as country's population is predominantly represented by females as per population statistics of the Government of Sri Lanka. As per the findings of the survey, the industry has a space for research and development in innovations. This is something the relevant government bodies have to take into consideration. If there is a promotion from the government front, only new things happen as entrepreneurs always focus on doing day-to-day businesses. On this backdrop, following policy suggestion can be proposed;

Policy suggestion 4: Establish and launch leather products research unit attached to Leather Products Development Centre of the IDB of Sri Lanka.

Few of researchers and data collecting staff with ICT facilities would be required for giving effect to the foregoing policy suggestion.   This unit can be linked to new product, process and raw material related innovations that can be done in collaboration with the industry.

As revealed in the survey, the entrepreneurs are interested in increasing the production of new product, consolidation of sales in other parts of the country and, finding new buyers for the new product.   This is an area to capitalize-on with some kind of promotion from the government and financing agencies like Banks etc. Since the entrepreneurs are positive in expansion of new products to other parts of the country, loans with low interest rates may be useful to support the expansion. A public-private-partnership between entrepreneurs, the IDB and the financial agencies like Banks can bring the results to improve the current status of the industry. Hence, following policy suggestion is proposed;

Policy suggestion 5: Establish public-private-partnership between interested entrepreneurs, the IDB and the Banking agencies in promotion of new innovations to other parts of the country.

Those who have not involved in innovations have cited "not like to take risk" as the reason for no engagement in innovations. This attitude can be corrected through CPD programs suggested in the beginning of the discussion.

The discussion was mainly built around enhancing the capacity of entrepreneurs by means of skilling them in entrepreneurship, designing technology, communications and awareness building focusing on the future prospects of the industry. The research problem raised at the beginning "Does entrepreneurs' skills matter for enterprise innovations in leather products and footwear industry of Sri Lanka" has sufficiently been investigated through the research. The research findings and subsequent discussion proved that entrepreneurs' skills matter in new product, process, raw material and new market innovations in the industry. Therefore, skilling them is vital to revitalize the industry through innovations. This vision can be reached by working in collaboration of government agencies and private sector according to a well set implementation plan.

5.2 Concluding remarks

Innovations improve competitiveness of firms irrespective of what they produce and what scale they produce. Leather products and footwear industry of Sri Lanka has fairly a long history however; their contribution to the national economy is relatively less despite the large number of people that this industry employs. This shows a productivity problem pull the industry back which needs urgent attention. This research has found out that there is a link between entrepreneurs' skills and their

innovativeness which finally lead to innovations in the industry. Sri Lanka economy is now in the efficiency-driven stage of development where productivity of factors of production including human capital matter in greater extent. New product, process, and raw material innovations are critical in improving productivity. In this regard, knowledge of entrepreneurs matters. If productivity improves only profitability improves. An industry cannot move forward or cannot be able to compete in the local or overseas market unless it does things differently as per the aspirations of its customer base. Research has a crucial role in this regard followed by innovations where the proactive leaders identify customer needs before competitors do. Visionary leaders do it even before the customers identify that they have a requirement which not yet fulfilled.

The leather products and footwear industry is in the SME sector which plays a key role in providing employment and income to local young people of the country. The industry has a country-wide presence in different representation which shows a huge potential for expansion if it given due attention by relevant agencies. There are responsible agencies who can make difference for betterment of the industry. As proposed in the foregoing section, work in collaboration between training providers, regulatory bodies and SME sector agencies is crucial in this regard. The Leather Products Development Centre of the IDB is an institute which can be developed as a flag-ship centre that do research and innovations and show path for entrepreneurs in addition to training of youngsters who join industry as a way of livelihood. Development of skills standards and curricula is a responsibility of Tertiary and Vocational Education Commission[1] with which the training agencies and industry have to work in collaboration in order to develop skills related documents. The SME sector of Sri Lanka, as they are fully focused on the day-today activities may find it difficult to attend whatever the capacity building initiatives organized by relevant agencies. The government agencies shall not be discouraged or demoralized at the beginning because of the aforesaid issue and shall move forward and show results and then many would rally around the initiatives.

The Government Treasury and the donors may focus on the policy implications proposed in this paper and consider allocating resources to improve an industry which has a huge potential for expansion. Local investments and foreign direct investments can do miracles as the market of the industry has been ever growing.

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Strategic Evaluation of Key Factors Defining Tourism Destination Competitiveness: A Comparison Study Between Singapore and Sri Lanka

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Abstract: In world tourism there is a noticeable difference of destination competitiveness between developed and developing countries. The purpose of this study is to find the underlying reasons for such difference through a comparative study between Singapore and Sri Lanka. A survey instrument was used to examine 15 factors defining the tourism destination competitiveness and a total of 136 responses (70 from Singapore and 66 from Sri Lanka). The mean values were used in a model based on internal and relational capabilities to strategically evaluate the 15 factors to identify the strengths, weaknesses and competitive opportunities of the two countries. The results not only explained the competitive reality of the two destinations, but also provided strategic guidelines to both the countries to achieve greater destination competitiveness. Further, the model of strategic evaluation of tourism destination, originally tested in Spain was extended for applicability in different destinations and circumstances.
Key words: Developed and developing countries; Tourism destination competitiveness; Comparative study; Model of strategic evaluation of tourism destination

1 Introduction

While tourism generates a significant amount of foreign exchange earnings that also contribute to the economic growth of developed countries, such ingredient of growth has not been effectively harnessed by most of the developing nations. The world travel and tourism destination rankings of 2015 highlight this fact with developed countries occupying most of the top positions including the top 10 while developing nations are behind in the ranking list of 141 countries (TTCR, 2015).

This leads to the question 'why many developing countries with bio diversity, strong culture, historical artifacts and abundance of natural resources are lagging behind in destination competitiveness?', especially in comparison to developed nations which sometimes have limited natural or inherited resources. The answer to this question exposes the fact that unlike many commercial products, in tourism a destination delivers an "experience" to its visitors and the inherited resources only will no longer create that experience; instead, a destination's competitiveness will be determined by how the inherited resources are effectively integrated through efficient management of the tourism supply chain (Fernando & Long, 2012).

Rodriguez-Diaz & Espino-Rodriguez (2008) successfully used a model of strategic evaluation based on internal and relational capabilities to study the factors defining the tourism competitiveness of Gran Canaria in Spain; The two scholars further said, *'Moreover, future research should validate the model in other destinations and circumstances'* (p. 379).

The study tested this model of strategic evaluation of tourism destination in a developed and a developing country - Singapore and Sri Lanka respectively. In travel and tourism destination rankings, Singapore is 11th while Sri Lanka occupies the 63rd position; Regionally, Singapore is number one and Sri Lanka is number six out of a total of 15 south-east and southern Asian countries (TTCR, 2015). The objective of the study is to explain the different competitive positions of Singapore and Sri Lanka in tourism by identifying the country strengths and weaknesses in terms of factors defining tourism destination competitiveness.

By testing the validity of the model in two destinations with contrasting economies, the study contributes to expand the existing theoretical knowledge. On the other hand, the findings help the tourism authorities of the two countries to identify the factors that need special focus and attention to make their destinations more competitive, which can guide the shaping of their tourism strategies.

The introduction is followed by literature review in section 2 and research methodology in section 3. Data analysis, results and findings are presented in section 4, while section 5 is the conclusion. Section 6 discusses study limitations and directions for future research.

2　Literature Review

2.1 Tourism destination competitiveness

The competitiveness of a destination depends on its ability to offer goods and services to outperform other destinations (Dwyer & Kim, 2003). In tourism industry, according to Dupeyras & MacCallum (2013, p 14),

"Tourism competitiveness for a destination is about the ability of the place to optimize its attractiveness for residents and non-residents, to deliver quality, innovative, and attractive (e.g. providing good value for money) tourism services to consumers and to gain market shares on the domestic and global market places, while ensuring that the available resources supporting tourism are used efficiently and in a sustainable way".

2.2 Tourism supply chain management

The importance of supply chain management in tourism destination competitiveness is evident from the above definition, as the objective of supply chain management is to maximize profits by increasing competitiveness through reduced costs and increased service levels (Crompton, 2009). In general, a supply chain includes all parties who will work together directly or indirectly to ensure customer demand level satisfaction (Chopra & Meindl, 2013) and supply chain management combines a number of business functions such as logistics, purchasing, operations and distribution (Johnsen, Howard & Miemczyk, 2014). In tourism, it involves combining and integrating different sectors, firms and stakeholders which includes tourism enterprises like hotels, restaurants, tour operators and transporters, supporting industries in entertainment, sports and shopping as well as both public and private sector destination management organizations (Fernando & Long, 2012). Therefore, the tourism supply chain management can be described as the ability to efficiently integrate all such sectors and functions to satisfy the tourist needs by meeting their service levels at reduced costs, leading to maximized profits through increased market share.

2.3 Destination competitiveness and tourism supply chain management

In tourism, the competition is not between companies but by supply chains (Christopher 2005) and if the tourism supply chain functions more efficiently and effectively with higher volume of business, the tourism destination will be more competitive (Rodriguez-Diaz & Espino-Rodriguez, 2008). So the tourism destination competitiveness can also be viewed as how a destination uses its available resources in an innovative way using tourism supply chain management.

2.4 Destination competitive models

Based on this understanding, over the last two decades, many scholars have worked on several destination competitive models on different settings (Khin, Daengbuppha &Nonsiri, 2014), with almost all the models centered around tourism supply chain with due consideration for other factors which include economic, social and political forces.

Hassan (2000) suggested a destination competitive model comprising of comparative advantage, demand condition, industry structure and environment commitment indicators, examining the relationships among stakeholders. Heath (2002) established a model emphasizing people as key success drivers and communication and information as vital linkages. Dwyer & Kim's (2003) integrated model consists of six key elements – inherited resources, created resources, supporting resources, situational conditions, destination management and demand conditions. Demand condition here means traveler motivation comprising tourists' perception, awareness and destination image, in contrast to Hassan (2000), where demand condition is the ability of destination to respond to changing nature of market demand. Fernando & Long (2012) further developed the Dwyer and Kim (2003) model and proposed a new conceptual model by including innovation perspective and focus.

The model developed by Ritchie & Crouch (2003), known as Calgary model is based on a destination's comparative advantage through inherited resources and its competitive advantage through created resources; this model links 36 attributes covering core resources and attractors, supporting resources and factors, qualifying and amplifying determinant, destination management, destination policy, planning and development as well as macro and micro environmental forces.

The Travel and Tourism Competitive Index (TTCI) developed and used by World Economic Forum since 2007 is the latest development in this endeavor; Today, the TTCI for global country ranking is based on four broad sub-indexes; enabling environment, policy and enabling conditions, infrastructure and natural and cultural resources; these sub-indexes consists of several pillars which are made up of different variables or attributes (TTCR, 2015).

Rodriguez-Diaz & Espino-Rodriguez(2008) successfully tested a model of strategic evaluation of tourism destination with factors defining the competitiveness of Spanish tourism destination Gran Canaria; this model in Table 1 is based on internal and relational capabilities and represents a double entry matrix

referring to internal and relational strategic value; the model evaluates key factors defining tourism destination competitiveness with tourism supply chain in the focal point combining other areas like geographical, social and socio-cultural conditions, public administration, policy and infrastructure, outsourcing operations, target market segment as well as other stakeholders of the marketing destination.

Table 1   Model of Strategic Evaluation of Tourism Destination adopted from Rodriguez-Diaz & Espino-Rodriguez (2008)

Relational		Internal strategic value		
/Internal		Low	Medium	High
Relational strategic value	Type I Low	C(Weaknesses) Factors not generating internal and relational capabilities	Potential factors to generate internal capabilities	High internal value factors that do not produce any synergies in the rest of destination
	Type II Medium	Potential relationships to generate relational capabilities	B (Competitive Opportunities) Potential factors of core competence	Factors with high internal value that produce a limited synergy effect
	Type III High	Relationships not exploited to develop core competence	High potential to develop core competence but factors are not considered important	A (Strengths) Factors generating internal and relational capabilities; core competence

3   Research Methodology

The study utilized quantitative methods, since it involves testing of an existing model for evaluating key factors defining tourism destination competitiveness.

3.1 Research context

The research survey was carried out in Singapore and Sri Lanka - two countries relying on tourism. In 2014, Singapore received approximately 13 million tourists, which accounted for 1.18% of the global market, while Sri Lanka - comparatively a much bigger country than Singapore had only 1.5 million tourist arrivals. In terms of average nights stayed by a tourist, the ratio of Singapore to Sri Lanka was 1 : 2.85 (Biyagamage & Jayawardena, 2013), while the average per night expenditure of a tourist in Singapore was 2.35 times the average expenditure of a tourist in Sri Lanka[1].

3.2 Measures

To finalize the factors defining the tourism destination competitiveness of Singapore and Sri Lanka, in depth interviews were conducted with two experts having wider knowledge and experience of the Asian tourism industry. The experts were asked to review the factors used for the destination competitiveness of Gran Canaria (Rodriguez-Diaz & Espino-Rodriguez, 2008) and suggest any omissions and/or additions with reference to the context of Singapore and Sri Lanka. Based on experts' opinion, all 14 factors used in the original model were retained and one new factor - tourism supply chain innovations (TSC innovations) was added, making it a total of 15 factors.

3.3 Data collection tool and methods

The data collection tool was a structured questionnaire and the same questions used to determine the internal and relational value for tourism destination competitiveness of Gran Canaria (Rodriguez-Diaz & Espino-Rodriguez, 2008). were employed for this study. The 15 factors identified in section 3.2 were evaluated in each of the six close ended questions using a 7-point Likert-type scale, with 1 as the lowest score and 7 as the highest score. The first four questions examined the internal strategic value (ISV) based on importance, non-substitutability, benefits and contribution for improved competitiveness while the last two questions examined the relational strategic value (RSV) based on integration and sustainability.

The data collection was carried out in Singapore and Sri Lanka during the period January 2016 and May 2016 and purposive sampling method was used to select survey respondents based on their importance to and representation of the tourism industry of the two countries. Out of a total of 200 questionnaires distributed (100 in each country), only 136 were returned - 70 from Singapore and 66 from Sri Lanka and the sector representation of the survey respondents are given in Table 2.

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[1]   Data Atlas (2011-2015), Knoema[I]. Retrieved on 27th May 2016 from Knoema Website: https://knoema.com

Table 2   Sector Representation of the Questionnaire Respondents

Sector / Country	Hotels & Accommodation	Airlines	Travel Agents & Tour Operators	Tourism Ministry / Board	Complementary Offers
Singapore	27	7	17	8	11
Sri Lanka	24	8	16	6	12

3.4 Validity and reliability

Validity is the accuracy of measures or the extent which truthfully represents a concept (Zikmund, Babin, Carr, & Griffin, 2010) and by using literature review and expert opinion for identifying the 15 factors used in the study for defining the tourism destination competitiveness of Singapore and Sri Lanka, the authors have ensured the face validity of the data.

Reliability represents the internal consistency or the extent to which the sample patterns of responses to items are consistent or repeatable across items (Helms, 2006) and Cronbach's alpha reliability coefficient was used as the measure to test the reliability, with usual reliability range between 0 and 1 and higher values of Cronbach's alpha meaning good internal consistency of the items in the scale (Gliem & Gliem, 2003).

The Cronbach's alpha values of ISV and RSV for all 15 factors related to Singapore and Sri Lanka are higher than 0.70 as shown in Table 3, indicating reliability and internal consistency is within the acceptable range (Bryman & Bell, 2007).

Table 3   Cronbach's Alpha Values of   ISV and RSV for the Destination Competitiveness Factors

o	Factors Defining Destination Competitiveness	Singapore Cronbach's α of ISV	Singapore Cronbach's α of RSV	Sri Lanka Cronbach's α of ISV	Sri Lanka Cronbach's α of RSV
	Geographical	0.792	0.812	0.819	0.818
	Environmental	0.809	0.816	0.725	0.833
	Socio-cultural	0.794	0.834	0.716	0.834
	Policy	0.751	0.832	0.798	0.818
	Public administration	0.803	0.799	0.826	0.822
	Public infrastructure	0.800	0.831	0.754	0.834
	Service companies (outsourcing)	0.740	0.807	0.795	0.835
	Customer segments	0.819	0.817	0.828	0.832
	Customer performance	0.755	0.835	0.785	0.803
0	Airline companies	0.767	0.770	0.816	0.809
1	Travel agents and tour operators	0.810	0.839	0.788	0.771
2	Hotels and non-hotel accommodation	0.738	0.830	0.768	0.827
3	Complementary offers	0.788	0.825	0.793	0.833
4	Direct sales	0.793	0.832	0.777	0.811
5	TSC innovations	0.810	0.816	0.821	0.819

4 Data Analysis, Results and Findings

To facilitate the use of the strategic evaluation model, the average values for the 15 factors were calculated under each of the 6 questions from the collected data. Then the internal strategic value (ISV) for each factor was determined by calculating the relevant mean value of question numbers 1 to 4, which addressed the factors in terms of importance(Q1), non-substitutability(Q2), benefits(Q3) and contribution for improved competitiveness(Q4). Similarly, relational strategic value (RSV) for each factor was determined by calculating the mean from question numbers 5 and 6, covering integration(Q5) and sustainability(Q6).

SPSS 22 was used for data analysis and Table 4 and Table 5 display the results of mean values and standard deviations (SD) related to each of the 15 factors with reference to Singapore and Sri Lanka respectively.

Table 4   Mean & SD values of ISV and RSV for the Destination Competitiveness Factors in Singapore

No	Factors Defining Destination Competitiveness	Q1	Q2	Q3	Q4	Q5	Q6	ISV Mean	ISV SD	RSV Mean	RSV SD
1	Geographical	3.27	3.43	3.60	3.91	5.26	5.66	3.55	0.48	5.46	0.28
2	Environmental	5.40	5.39	5.46	5.77	5.40	5.74	5.50	0.31	5.57	0.24
3	Socio-cultural	3.57	3.87	3.44	3.24	3.74	3.83	3.53	0.46	3.79	0.06
4	Policy	5.27	4.01	4.70	4.69	4.14	4.26	4.67	0.89	4.20	0.08
5	Public administration	5.09	5.31	4.87	5.33	4.97	5.56	5.15	0.37	5.26	0.41
6	Public infrastructure	6.04	5.54	6.00	5.96	5.34	5.47	5.89	0.40	5.41	0.09
7	Service companies (outsourcing)	4.89	3.96	4.87	5.33	4.74	4.27	4.76	1.00	4.51	0.33
8	Customer segments	4.31	4.17	4.46	4.24	4.21	4.54	4.30	0.21	4.38	0.23
9	Customer performance	5.10	4.01	4.99	4.76	4.96	5.03	4.71	0.85	4.99	0.05
10	Airline companies	5.87	5.90	5.86	5.03	5.50	4.51	5.66	0.73	5.01	0.70
11	Travel agents and tour operators	5.27	5.13	5.50	5.14	5.27	5.26	5.26	0.30	5.26	0.01
12	Hotels and non-hotel accommodation	4.77	4.37	5.09	3.71	4.49	4.34	4.49	1.02	4.41	0.10
13	Complementary offers	5.60	4.94	5.40	5.54	5.24	5.46	5.37	0.52	5.35	0.15
14	Direct sales	4.54	4.63	4.34	4.01	5.06	5.17	4.38	0.47	5.11	0.08
15	TSC innovations	5.61	5.80	5.37	5.61	5.36	5.01	5.60	0.30	5.19	0.24

Table 5   Mean & SD values of ISV and RSV for the Destination Competitiveness Factors in Sri Lanka

No	Factors Defining Destination Competitiveness	Q1	Q2	Q3	Q4	Q5	Q6	ISV Mean	ISV SD	RSV Mean	RSV SD
1	Geographical	5.60	5.66	5.56	5.37	3.51	3.20	5.55	0.21	3.36	0.22
2	Environmental	5.07	5.61	5.06	4.03	3.46	3.56	4.94	1.15	3.51	0.07
3	Socio-cultural	5.10	5.71	5.51	4.10	3.79	3.70	5.11	1.24	3.74	0.06
4	Policy	2.80	2.76	2.36	2.26	2.46	2.77	2.54	0.48	2.61	0.22
5	Public administration	2.67	2.70	2.53	2.57	2.50	2.76	2.62	0.14	2.63	0.18
6	Public infrastructure	3.24	3.17	2.41	2.30	2.51	2.60	2.78	0.86	2.56	0.06
7	Service companies (outsourcing)	3.50	3.84	3.83	4.13	2.51	2.59	3.83	0.45	2.55	0.05
8	Customer segments	2.93	2.86	2.91	3.03	2.69	2.57	2.93	0.12	2.63	0.08
9	Customer performance	4.71	4.33	4.09	4.00	3.24	2.71	4.28	0.55	2.98	0.37
10	Airline companies	2.70	3.00	2.74	2.90	2.49	2.93	2.84	0.24	2.71	0.31
11	Travel agents and tour operators	4.07	4.64	4.00	4.41	3.04	4.01	4.28	0.52	3.53	0.69
12	Hotels and non-hotel accommodation	4.91	5.40	5.09	4.40	4.01	3.83	4.95	0.72	3.92	0.13
13	Complementary offers	2.64	2.66	3.20	2.67	2.70	2.60	2.79	0.47	2.65	0.07
14	Direct sales	2.39	1.94	2.83	2.41	2.66	3.07	2.39	0.63	2.86	0.29
15	TSC innovations	2.53	2.36	2.49	2.29	2.24	2.54	2.41	0.19	2.39	0.21

With the objective of dividing the survey data into as many boxes as in the model of strategic evaluation of tourism destination, percentile calculations were used to identify the values 3 and 5 to

separate the data range of 1 to 7 into three groups. Then the calculated means of ISV and RSV for the 15 factors were used in the model to strategically evaluate their competitive positions in defining the tourism competitiveness of Singapore and Sri Lanka. (Refer Figure 1)

The strategic analysis of Figure 2 shows that Singapore is positioned on the main diagonal in strong equilibrium having seven factors in box A as strengths, six in box B as competitive opportunities and only two off the diagonal; In contrast, Sri Lanka is in imbalanced position on the diagonal with no strengths and having three factors as unexploited opportunities in box B, eight as weaknesses in box C while four are off the diagonal. Therefore, these results from the model of strategic evaluation of tourism destination provides sound explanation as to why Singapore is a top performing and high ranked tourism destination in comparison to Sri Lanka.
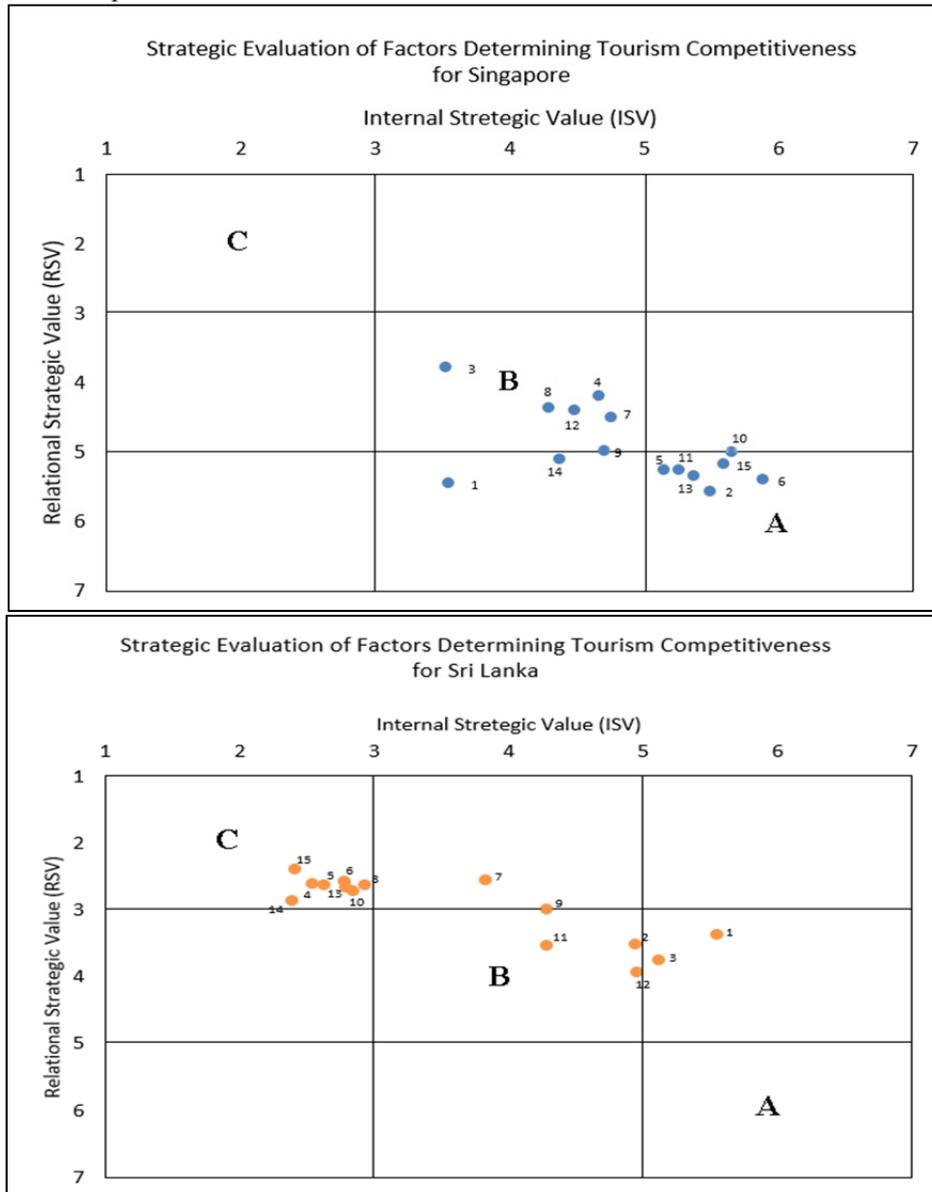
Figure 1   Strategic Evaluation of the 15 Factors Defining the Tourism Destination Competitiveness of Singapore and Sri Lanka

For further discussion and comparison, the strategic evaluation results of the 15 factors related to Singapore and Sri Lanka are summarized in Table 6.

In Table 6, the seven factors shown in box A are the core competence of destination for Singapore and the tourism authorities should continuously reinforce these strengths to ensure that they do not lose the internal and strategic value of these factors. The six factors in box B have medium strategic values

representing competitive opportunities and indicating unrealized potential. Strategically identifying the right factors in box B to pursue as strengths and developing actions to move them should be considered a priority. From the two factors outside the diagonal, direct sales could potentially be moved to a position of core competence with a focused strategy aimed at improving internal vision and generating synergies. Due to its limited natural resources, Singapore possibly may not be considering geographical factor as an internal strength, but has compensated for it with high relational value, which probably explains the off diagonal position of this factor.

Table 6   Summary of Destination Competitiveness Factor Comparison between Singapore and Sri Lanka

Description	Singapore	Sri Lanka
Factors in Box A **Strengths leading to core competence**	Environmental, Public administration, Public infrastructure, Airline companies, Travel agents and tour operators, Complementary offers, Tourism supply chain innovations **(Total of 7 Factors)**	
Factors in Box B **Competitive Opportunities**	Socio-cultural, Policy, Service companies (outsourcing), Customer segments, Customer performance, Hotels and non-hotel accommodation **(Total of 6 Factors)**	Environmental, Travel agents and tour operators, Hotels and non-hotel accommodation. **(Total of 3 Factors)**
Factors in Box C **Weaknesses**		Policy, Public administration, Public infrastructure, Customer segments, Airline companies, Complementary offers, Direct sales, Tourism supply chain innovations. **(Total of 8 Factors)**
Factors off and above the diagonal		Geographical, Socio-cultural, Service companies (outsourcing), Customer performance. **(Total of 4 Factors)**
Factors off and below the diagonal	Geographical, Direct sales **(Total of 2 Factors)**	

The lack of factors in box A indicates a relative weak position in destination competitiveness for Sri Lanka. The tourism authorities in the country should first concentrate on the three competitive opportunity factors in box B with stable plans to reposition them as core competence of the destination. Having as many as eight factors in box C as weaknesses and four others outside the diagonal suggest the need for a clear strategic direction for the tourism industry in Sri Lanka. Such direction should provide strategic actions and single out three to four factors to recalibrate as destination strengths while converting most of the remaining factors to a position of medium strategic value in box B. Identification of right factors should be done with the view that factors defining competitiveness in tourism may vary depending on the destination and targeted market segments (Enright & Newton, 2005). Further, the high IRV's of geographical and socio-cultural factors in comparison to RSV's explain the country dependency on natural and cultural resources for competitive advantage.

The comparison of RSV's show that Singapore has ten factors with high value and five with medium value while Sri Lanka has just the opposite, with five factors of medium value and ten factors of low value. This indicates a very strong comparative position of Singapore in terms of relational capabilities covering integration and sustainability of the tourism supply chain. This position of strength is evident through the competitiveness factor 'tourism supply chain innovations' - where Singapore has it as a strength in box A while for Sri Lanka it is in the weak zone of box C.

5 Conclusions

The empirical study of the factors defining the tourism destination competitiveness of Singapore and Sri Lanka shows that the model of strategic evaluation of tourism destination produces results which represent and explain the competitive reality of the two destinations. Hence the study contributes to the existing theory by extending the applicability of the model not only to a different region, but also to two different economies - one developed and the other developing.

The model also evaluated the factors based on internal and relational strategic values, which clearly identified the strengths, weaknesses and competitive opportunities for each destination which can guide the relevant tourism authorities of the two countries to take specific steps to improve their country competitive positions.

   Finally, the successful application of the model for comparative analysis of two competitor destinations with different economic conditions helps to identify the fundamental lines of action to achieve greater competitiveness in tourism, which can be of more importance and value especially for countries with emerging economies.

   The study was conducted with data collected from higher level respondents identified through purposive sampling, concentrating on strategic level factors defining the tourism destination competitiveness. This can be viewed as a limitation, since the findings may lack the operational level applicability to achieve tourism destination competitiveness.

   The future researchers can conduct a detailed study using the same model to evaluate operational attributes relevant to each of the strategic factors and by involving wider cross section of respondents representing various operational levels of the tourism industry. Alternatively, this study can be extended to combine the operational attributes related to strategic factors which were identified as areas for more focus and special attention in Singapore and Sri Lanka. It will be also interesting to see how the model functions and performs in comparison studies between two developed nations as well as two developing nations, which can lead to some new insights.

   Finally, tourism supply chain management and tourism supply chain innovations which showed a marked difference between Singapore and Sri Lanka opens up a completely new research area to explore in tourism and destination competitiveness studies.

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Radiation Effect of Independent Innovation Demonstration Area: A Case Study of East Lake Demonstration Area

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Abstract: With the rapid development of the new technology revolution and the increasing fierce competition in the globalization of science and technology, independent innovation demonstration area has been established and developed gradually. It plays an important role in promoting the transformation of regional economic development, especially the traditional industries. Firstly, this paper explains the relevant concept of demonstration area radiation effect. Then, this paper takes the East Lake demonstration area as an example for the empirical analysis, and provides some suggestions for further improving the radiation effect.
Key words: Innovation demonstration area; Radiation effect; East Lake demonstration area

1 Introduction

In the background of economic globalization, social technicalization and knowledge capitalization, the independent innovation demonstration area (hereinafter referred to as the "demonstration area") came into being. The establishment of demonstration areas for improving the system of scientific and technological innovation, speeding up the development of strategic emerging industries, promoting innovation driven development has the important radiation and leading role. After years of development, demonstration area from the "policy traction, elements of agglomeration" towards the stage of "industrial-led, innovation breakthrough", which means that it has entered the new process of second pioneering (Zhou Yuan, Wang Weicai,2003). In this process, the demonstration area continues to play a radiation role in promoting Chinese traditional industry restructuring.

There is little research on the radiation effect of foreign scholars, and the related researches mainly focus on the aspects of spillover and diffusion. Montoro (Montoro, 2011) analysis knowledge spillover effect, found that the enterprises which located in the demonstration area have higher spillover effect. Tann (Tann, 2006) first proposed the concept of cluster of hi-tech zone in the field of geography. He believes that thigh-tech zone plays an important role in the transformation of technological achievements and high-tech enterprises agglomeration. Domestic research on the radiation effect of the demonstration area is not deep enough. Wu Wei and Cao Hezhu (Wu Wei, Cao Hezhu, 2011) analyze the adiation effect of Zhongguancun from the aspects of technology and products. They think that the radiation has the characteristics of multi-level and comprehensive abroad. Li Guoping (Li Guoping, 2014) has research on the development of science and technology innovation policy. He emphasizes that the demonstration area should optimize the allocation of resources of science and technology, strengthen the demonstration leading role. So as to promote the development of the integration of science and technology innovation. Zhang Tuoyu (Zhang Tuoyu, 2015) learns the Zhongguancun's construction experience, and puts forward the suggestion of "21 park" space layout. Thus can promote the overall planning and construction of Tianjin demonstration area. Demonstration area effectively enhance the core area of radiation driven function through the way such as brand output, technology transfer, corporate diffusion and mechanism innovation.

In general, scholars have few study on demonstration radiation effect, while the domestic is in the initial exploration stage, the qualitative analytic induction needs to be improved. Therefore, this paper firstly defines the related concepts of the radiation effect of the demonstration area, and then takes the East Lake demonstration area as an example to analyze the radiation effect, and finally puts forward some suggestions for the further improvement of the radiation effect.

2 Definition and Theoretical Analysis

2.1 Concept of radiation effect

In Physics, the radiation means that when the temperature above absolute zero, all the objects in the natural world are transmitted by the electromagnetic waves and particles. Radiation effect refers to the interaction of ray with matter. Definition of economic radiation effect is taking the city as the basis of the economic development. It can drive the development of economy, culture, education, science and

technology in the surrounding area through the advantage of its strong resources. On this basis, the radiation effect of the demonstration area is defined as follows: Demonstration area can promote the development of surrounding areas through its strong policy, science and technology, human resources, industrial and other resources. Demonstration area can gather different industries which have the same functions of the enterprise value chain (such as R & D, business, etc.), and attract all kinds of service institution. At the same time, the mature service environment will attract the enterprise which have the same function to gather in this area. This is the process of demonstration area to play the radiation effect.

2.2 Reasons of the radiation effect appearing

The reasons why the demonstration area produces the radiation effect are as follows: Firstly, it has the important function of the demonstration leading. Demonstration area can promote independent innovation and high-tech industry development, and explore the high-tech industry development policy and system. These models, systems, policies can be used by other companies for reference, and have a good role model. Secondly, the market capacity is limited. The demonstration area has developed and expanded, the market capacity has reached saturation. So they need to expand to meet the needs of the development. Thirdly, cost choice. Some demonstration areas affected by the geographical location, the costs of production and operating are higher. Therefore, in order to adapt the new competitive environment, they need to transfer the lower profits links (such as production and manufacturing links) to other places.

2.3 Radiation carriers and methods

Radiation carriers mainly include science and technology business incubators, industry technology innovation alliance, the engineering technology center, public technology service platform, etc. Through these carriers, demonstration area can play the role of radiation, gather innovation resources, cluster innovation capital, attract innovative talents and improve the environment of innovation. Radiation methods include policy radiation, technology radiation, talent radiation, industrial radiation. Demonstration area has a lot of pilot policies. These policies can be applied to other areas, driving the innovation and development. High-tech enterprises can be seen everywhere in the demonstration area. They have advanced products and technologies, formed an excellent industry-university-research system. These technologies and talents can communicate and share with other areas. In addition, the transfer and extension of advantageous industries in the demonstration area can promote the adjustment of industrial structure in other regions.

2.4 Radiation patterns

The radiation patterns of the demonstration zone are mainly point radiation and line radiation. Point radiation takes the demonstration area as the center and then spread to the surrounding areas. Such as the radiation of East Lake demonstration area to Wuhan. Line radiation generally takes the railway, highways, rivers, lakes and so on as the strip source of radiation, and then pushes to the sides or upstream and downstream areas. Such as the radiation of Sunan national independent innovation demonstration area to the Yangtze River Delta city group.

Demonstration area takes the incubator, public technical service platform as the carriers, uses the advantage of policy, technology, human resources, industry resources, and drives the development of other regions through the point radiation and line radiation, but also attracts more enterprises gathered in the region. The concept model of demonstration area radiation effect is shown in figure 1.
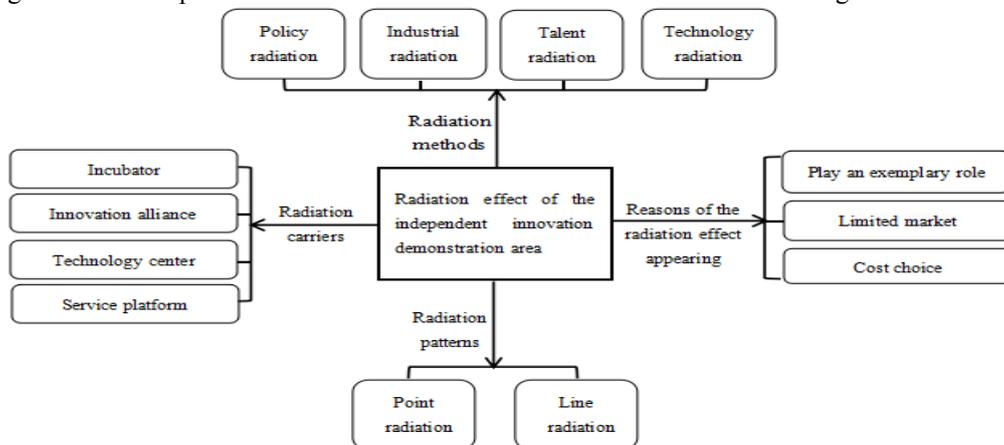
Figure 1　Concept Model of Radiation Effect in Demonstration Area

3 Radiation Effect of East Lake Demonstration Area

East Lake national independent innovation demonstration area (hereinafter referred to as the East Lake demonstration area) is approved by the State Council in December 2009. It's the second national independent innovation demonstration area after Zhongguancun. In China, it's the second largest resources concentration areas of science and technology in the high-tech zone. Photoelectric information industry is the characteristic industry of the East Lake demonstration area.

3.1 Status of radiation effect in the East Lake demonstration area

The construction of East Lake demonstration area is the reflection of building an innovative country strategy. Its purpose is to play an exemplary role to lead the transformation of economic development mode, increase our scientific and technological innovation capacity and economic efficiency. After years of development, East Lake demonstration area already has a certain radiation capacity. The radiation effect is shown in figure 2.
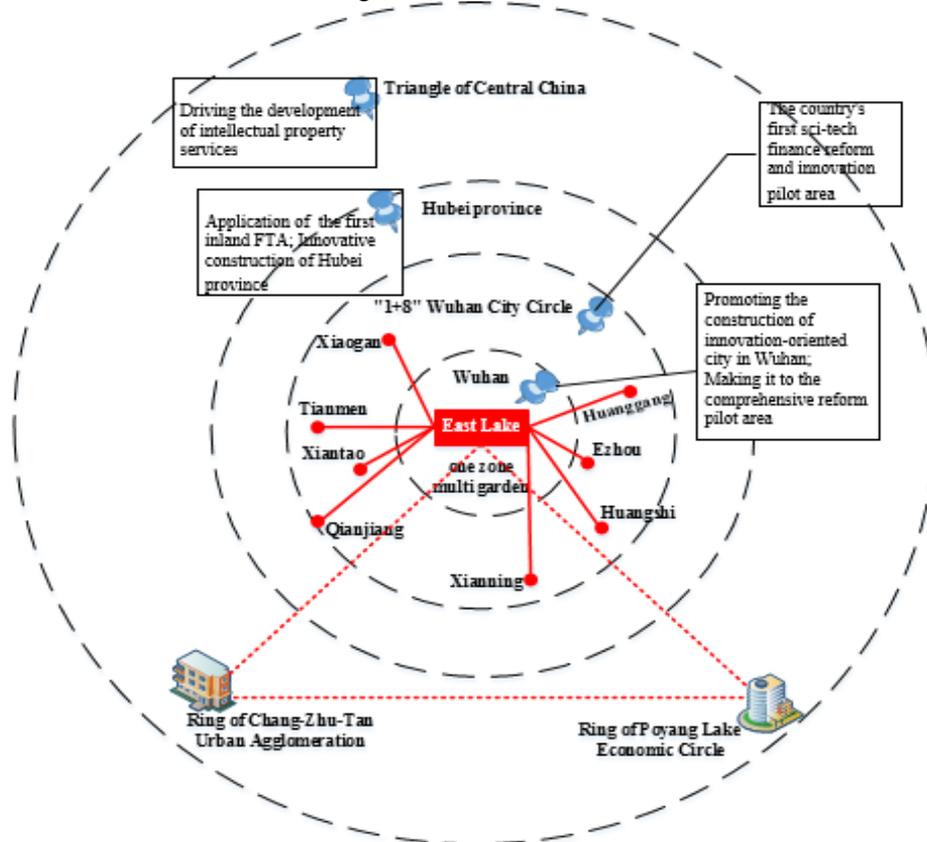
Figure 2   The Radiation Effect of East Lake Demonstration Zone

East Lake demonstration area has basically built a long-term mechanism to promote more mature and comprehensive innovation reform. It has made a number of major breakthroughs in science and technology management system, personnel training and motivation, scientific and technological achievements, intellectual property protection, financial innovation, open innovation and market fair competition. It has successfully formed a regional innovation platform with the demonstration and leading role.

1) Radiation of Wuhan. Relying on East Lake demonstration area, Wuhan carry out the pilot work of "one zone with multiple parks". It makes the various regions of Wuhan have their own "East Lake high-tech development zone". East Lake demonstration area has important demonstration, radiation and promoting effects on the establishment of the innovative city and the construction of the innovation in Wuhan.

2) Radiation of the "1+8" City Circle. Wuhan and the eight surrounding cities composed the "1 + 8" Wuhan City Circle. Among them, the "1" represents Wuhan, while the "8" represents the eight surrounding cities, such as Xianning, Huangshi, Xiantao, Tianmen, etc. The circle forms the core of economic development of hubei province, becoming the country's first experimental zone of financial

reform and science and technology innovation.

3) Radiation of Hubei province. Radiation of East Lake demonstration area to Hubei Province mainly reflected in the declaration of the free trade zone and the construction of innovative Hubei. On the one hand, Hubei Province takes the East Lake high-tech development area as the main body to apply for the first inland free trade zone. It makes the construction of high-tech area combine with the construction of free trade zone, so as to better realize the development of innovation driven. On the other hand, Hubei Province use the innovative advantages of the East Lake high-tech zone to emancipate the mind, deepen reform, promote open, strengthen the support, stand at the forefront, promote the construction of innovation.

4) Radiation of the Triangle of Central China. The Triangle of Central China is a large urban agglomeration, which takes Wuhan, Changsha, Nanchang as the center. It includes Wuhan City Circle, Ring of Chang-Zhu-Tan Urban Agglomeration and Poyang Urban Agglomeration. East Lake demonstration area has become the first national intellectual property service industry cluster development pilot area in the Triangle of Central China. And it will make a contribution to the industrial transformation and upgrading of the Triangle of Central China.

3.2 Suggestions to further improve the radiation effect of East Lake demonstration area

1) Expanding the scope of policy radiation, promoting pilot policy. East Lake demonstration area should further improve the policies of laws and regulations and the mechanisms of management. And these policies and mechanisms should be extended to more areas, thus can provide more convenient conditions and support for technological innovation.

2) Improving the ability of technical radiation, fostering more high-tech enterprises. Demonstration area should further promote the transformation of scientific and technological achievements and the construction of industry-university-research cooperation system, to achieve cross-regional sharing of intellectual property transaction and achievements, nurturing innovative technology enterprises.

3) Increasing the intensity of the personnel radiation, outputting talent intelligence. We should make full use of the East Lake demonstration area science, education, talent, innovation platform and other advantages, strengthen talent exchange, build up talent communication mechanism and realize the talent intelligence resource sharing.

4) Deeping industrial radiation level, optimizing the industrial structure. The area should be extended characteristic industry chain, strengthen industry support, optimize the industrial structure of radiation, play the role of industry radiation.

4 Conclusions

This paper defines the concept of radiation effect in demonstration area, analyzes the cause of radiation, and points out the way, carriers and patterns of radiation. Then, it takes the East Lake demonstration area as the research object, and analyzes the actual situation of the radiation effect. In the future development, the demonstration area should further expand the scope of policy radiation, improve technical radiation ability, strengthen personnel exchanges, and extend the characteristics of the industrial chain, so as to better play the role of radiation.

Through the research of this paper, we can understand the concept and mechanism of the radiation effect more clearly. It has important reference significance to improve the radiation effect of the demonstration area. The radiation effect of demonstration area is worth discussing deeply, but the study in this paper is still in the stage of qualitative research. In the following research, we will pay more attention to the study of indicator system and model framework.

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Research on the Evolution Path of Innovation and Development in East Lake Demonstration Zone

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Abstract: In recent years, as a national independent innovation demonstration zone, the East Lake Demonstration Zone's (ELDZ) economy maintains rapid growth. In the paper, the development of demonstration zone is divided into four stages incubation period, primary period, high speed development period, mature period and decline period by using Life cycle model. Then a case of ELDZ is studied, and indications from four dimensions of events, system innovation, technological innovation and integrated performance effect are compared. Finally the paper puts forward some relevant suggestions to improve the performance and capacity of innovation system. Under the construction of an innovative country and the "13th Five-Year Plan" strategy background, research on the path of innovation system development in ELDZ is of great significance.
Key words: East Lake Demonstration Zone; Life cycle model; Innovation system; 13th Five-Year Plan

1 Introduction

After 20 years of development, ELDZ with rapid growth of emerging enterprises, high-quality talent agglomeration has become rich in science and education resources, it's innovation atmosphere is strong, and mechanism of the system is relatively perfect. The construction of East Lake National Independent Innovation Demonstration Zone will become an important fulcrum of the rising strategy of central China. To improve the capability of independent innovation of the ELDZ has great potential, and it is the inevitable trend of national development. The development of ELDZ innovation system research has been the focus of research scholars, and the use of Life cycle theory in the development of the demonstration zone has never stopped.

The product Life cycle is first proposed by Professor Vernon Raymond (1966) in Harvard University, it refers to the market marketing products like a man's life, will experience formation, growth, maturity, decline of the cycle, and the cycle in different countries is not the same. The professor LE Greiner (1998) who first proposed the concept of enterprise Life cycle in 1972 in Harvard University, believed that each phase begins with a period of evolution, steady growth, and stability, and ends with a revolutionary period of organizational turmoil and change. G.Tichy (1998) put forward the four stage theory of cluster evolution which is based on the time referring to Vernon's theory of product life cycle. Maggioni (2004) used Life cycle model to show how different clusters' evolution are part of a wider picture in which technological and spatial interactions between emerging and declining clusters play a decisive role.

At present, there are few articles on the development of demonstration zones in China using the life cycle theory. Jia Xiaohui (2012) through the division of the life cycle of the industry cluster, studied the influence of the different life cycle stages on the regional innovation ability and put forward suggestions for promoting regional innovation in the Yangtze River Delta. Zhang Yi (2013), based on the life cycle theory, analyzed the characteristics of regional innovation in different stages of development, and tried to find out the roles and functions of local government in the corresponding period.

In summary, the development of the demonstration zone is a historical phenomenon in the process of regional economic development, and it's subject to the law of Life cycle.

2 Theoretical Analysis

The most important performance of the innovation system is the innovation ability, the periodicity of the demonstration zone innovation system is shown to a great extent by the periodicity of the innovation ability. Therefore, this paper makes the innovation ability as the main criteria for the demonstration zone innovation system development using life cycle model, divides the development of innovation system into five stages incubation period, primary period, high speed development period, mature period and decline period. The life cycle model of demonstration zone innovation system is proposed as shown in Figure 1.
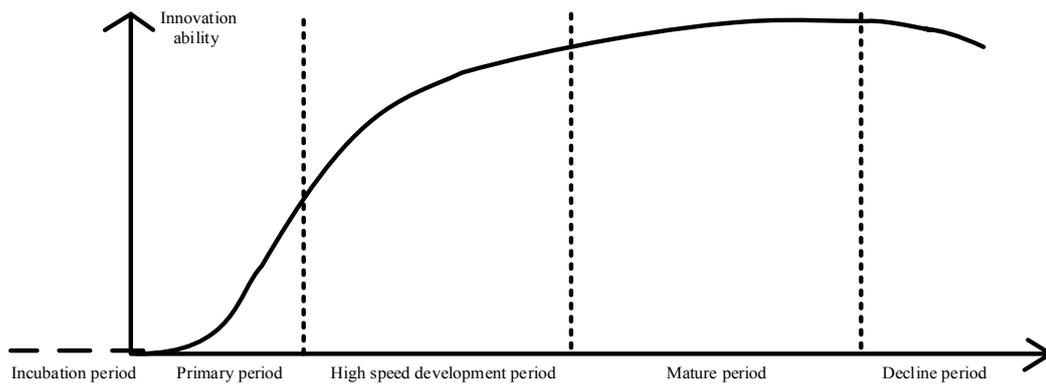
Figure 1   The Life Cycle Model of Demonstration Zone Innovation System

Incubation period is the first stage of the life cycle of the innovation system in the demonstration zone is mainly the preparation stage of the innovation system. The biggest sign of this stage is the initial formation of the industrial cluster. In Primary period, due to the initial formation of the industrial cluster, the demonstration area innovation system has been initially established, but it is just an embryonic form, in the stage of exploration and development. High speed development period is the third stages of the life cycle of the innovation system, with the development of industrial clusters and the gradual improvement of the software and hardware conditions of the demonstration zone, the innovation system in the demonstration zone has achieved rapid development, and the innovation ability has been improved by leaps and bounds. After the development of the high speed development period, the innovation system of the demonstration zone is gradually mature, and the innovation ability continues to develop. The innovation system has formed its own characteristics, and is rooted in the demonstration area. Decline period. At decline period stage, the innovation system has experienced a long period of development, began to go downhill, and innovation ability declines, the recession is a slow and long process of development.

3 Research on Innovative Development Path -- A Case of ELDZ

At present, the development of ELDZ on the axis of time can be divided into the following stages as Incubation period: the stage of creation; Primary period: formation stage of National Development Zone; High speed development period: subdivision for Optics Valley of China construction stage, independent innovation demonstration zone stage, and "13th Five-Year Plan": To establish an international comprehensive innovation and reform core area.

3.1 Origination period

ELDZ is the predecessor of East Lake technology intensive district in Wuhan of China. Between 1984 and March 1991 is the Origination period of the ELDZ. In 1984, in order to meet the challenges of global technological revolution, decision makers of Hubei Province and Wuhan city of China use the intellectual resources of East Lake technology intensive district to promote the transformation of scientific and technological achievements into productive forces, and carry out the "torch plan" to cultivate the high technology industry. In June 1987, East Lake New Technology Venture Center was established as China's first technology business incubator, created at the stage of this period, the ELDZ implemented the mode of "project started, and rolling development", followed the road of self development, self accumulation and self-improvement to develop high-tech enterprises.

3.2 Formation period of the national development zone

Nearly seven years of development, ELDZ has made some progress. In March 1991, ELDZ was approved by the State Council as a national high-tech industrial development zone. From April 1991 to 1999, East Lake high tech Zone has experienced the stage of scale development. ELDZ transformed to construct science and Technology Park and promote high-tech enterprise agglomeration. It successively built South Science Park, East Lake Science Park, Hubei software industry base, Wuhan of China International Business Park.etc. At the same time, radiation to the towns of Wuhan of China to form a district Park. At this stage, ELDZ formed a strong cultural atmosphere of innovation and entrepreneurship, created a number of entrepreneurs and nurtured a number of well-known enterprises.

3.3 Construction period of optics valley of china

From 2000 to 2009, ELDZ experienced construction period of Optics Valley of China. During this

period, ELDZ gathered key laboratories and engineering technology research centers including 33 national level's and 37 provincial level's, and 8 national enterprise technology centers, more than 500 R & D institutions. ELDZ has gradually developed into a high-tech park with distinctive features, strong strength, first-class domestic and internationally renowned. At this stage, ELDZ adhered to independent innovation, and constantly improved the ability to innovate, which walked out its own way to rely on independent innovation and development of the characteristics of high-tech industry.

3.4 Period of independent innovation demonstration zone

By the end of 2009, ELDZ is approved by the State Council as a national independent innovation demonstration zone. Since 2010, ELDZ actively carried out equity incentive and scientific and technological achievements into the reward, innovation of science and technology finance, government procurement, financial& tax policies, and supported new industry organizations to participate in the national major science and technology projects. With gathering and cultivating high level talents and promoting the construction of "two oriented society", ELDZ has made remarkable achievements. At this stage,the construction of Optics Valley innovation and entrepreneurship culture was constantly promoted, the cultural atmosphere of innovation was created, the spirit of entrepreneurship was shaped, and the connotation of Optics Valley brand deepened, that made the influence of Optics Valley brand expand.

3.5 "13th Five-Year Plan": establish an international comprehensive innovation and reform core zone

From 2016 to 2020, China has entered the "13th Five-Year Plan" stage. At this stage, ELDZ should seize the opportunity to actively participate in the international science plans and major scientific projects, and implement big data strategy. First of all, it should develop big data industry development "in 13th Five-Year Plan", make big data industry included in major scientific and technological projects, and build a common technical platform for big data and Collaborative Innovation Center.
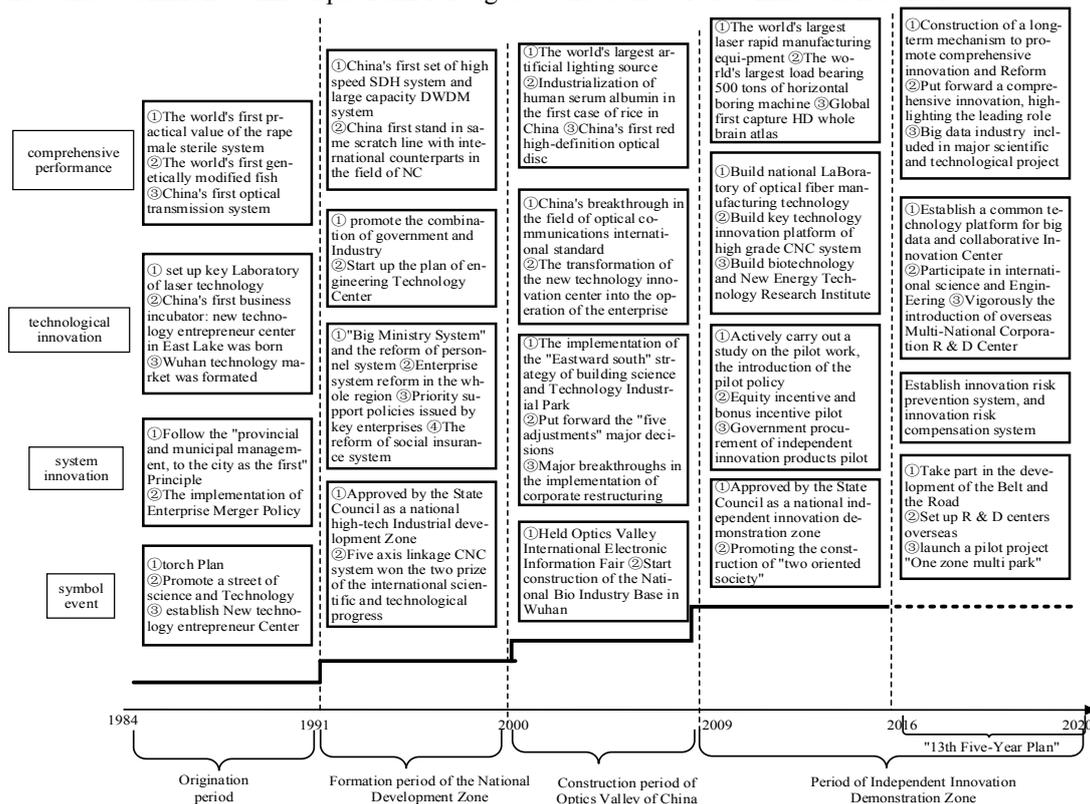
Figure 2   The Path of Innovation System Development of ELDZ

Wuhan of China is the city that won the first round of innovation and reform, in the "13th Five-Year Plan" stage, ELDZ should build an international comprehensive innovation and reform core zone. Its goal is to become the core of the comprehensive innovation and reform demonstration zone of Wuhan City and an international innovation center.

In order to make an objective, dynamic and comprehensive evaluation of the development of innovation ability of ELDZ, this paper mainly from four points: the symbol event, system innovation, technological innovation and comprehensive performance to show each period, as shown in Figure2.

4 Conclusions and Suggestions

This paper from the theory of life cycle, symbol events, system innovation, technological innovation and comprehensive performance for each stage of ELDZ were analyzed. The construction of ELDZ's innovation system is an asymptotic process, although the establishment of innovation system has already begun, but still needs to be strengthened. The promotion of innovation ability in ELDZ must give full play to the active role of government, enterprises, industry research cooperation mechanism, science and technology parks, universities and R & D institutions. According to the analysis above, this paper put forward relevant countermeasures and suggestions to upgrade the path of ELDZ's innovation system performance and innovation ability, it is necessary to strengthen the dominant position of enterprise innovation, constantly improve the innovation support system of ELDZ, and increase the support of local government. Only through breaking the constraints of reality, the life cycle of ELDZ can be extended. The suggestions are as follows:

1)Adhere to government guidance. If government can make effective and positive management of science and technology of international communication, make full use of international cooperation to obtain advanced science and technology, improve ELDZ's innovation system by allocation of resources, promote the accumulation of factors and reduce the cost, the scientific and technological innovation ability of ELDZ will be significantly improved.

2)Open up the channel between scientific and technological innovation and economic development. ELDZ should accelerate capitalization and industrialization of scientific and technological achievements, enhance the support of science and technology for economic and social development, promote enterprises as the main body to construct, establish a technical innovation system with the combination of policy and research, strengthen the use and service of intellectual property rights, and fully stimulate endogenous driving force of enterprise innovation.

3)Deepen the effective model of open innovation. ELDZ should make full use of scientific and technological achievements and high-end talents from all over the world, carry out more international cooperation and innovation with higher level; explore more open innovation policy, more flexible mode of cooperation, encourage foreign enterprises to realize industrialization in our country by introducing more innovation achievements, promote domestic technology and brand to go out. If ELDZ can make full use of global innovation resources, the innovation ability can be improved substantially.

Acknowledgment

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Empirical Research on the Efficiency of Industrial Enterprises S&T Resources in Yangtze River Economic Belt

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Abstract: Based on the analysis of technology resources, including the R&D status, R&D funding, new products, patents, technological innovation and access of industrial enterprises of different regions on Yangtze River Economic Belt in 2013, this paper finished the empirical research on the S&T resources allocation efficiency of various areas in Yangtze River Economic Belt with data envelopment analysis on the evaluation index system of input of human and investment, output of new product and S&T achievements, then the advices to optimize resources allocation efficiency were also given.
Key words: Yangtze River Economic Belt; S&T resource allocation; Data envelopment analysis

1 Introduction

S&T has become the important determinant of national competitive advantage and social development and progress in knowledge society with the increasingly fierce global competition, and the S&T resources is the material basis for S&T creation, as well the element of "First Productive Force", known as "First Resource (Zhou Jizhong ,1999). There is a comparatively large regional difference in the distribution of the S&T resource, then the gap of economic in regions will be widened. "Relying on Golden Waterway, constructing Yangtze River Economic Belt." was stated in "Government Work Report" of Premier Li Keqiang in March 2014, to stress the new plan of regional development. There are 9 provinces and 2 cities in Yangtze River Economic Belt in economically geographical sense, namely Shanghai, Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, Hunan, Chongqing, Sichuan, Yunnan and Guizhou, total area of these regions is about 2.05 million km2 and accounts for 21.35% of national acreage, the population of these regions was 580 million (2013 data) and accounted for 42.74% of national population, the GDP created by these regions was 28,468.9 billion (2014) and accounted for 44.90% of national GDP, which showed the increasing prominent in economic status and role of country.

2 Comparative Studies of S&T Resources of Industrial Enterprises in Yangtze River Economic Belt

2.1 R&D personnel

In 2013, the number of R&D personnel in Jiangsu Province and Zhejiang Province were 510,930 and 337,115 respectively, while the counterparts in Hubei Province, Anhui Province and Shanghai were more than 100,000. Comparing with the 2012, the highest growth rate of the number of R&D staff was 27.11% in Jiangxi Province, and the growth rate were more than 10% in other regions except for the Hunan Province, Yunnan Province and Shanghai (as shown in Figure1).
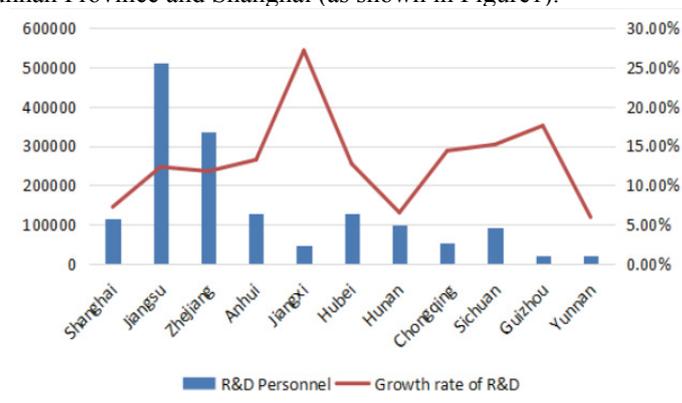
Figure 1　2013 R&D Personnel and Growth Rate of Industrial Enterprises in Yangtze River Economic Belt
Source: Statistical Yearbook 2014, China Science and Technology
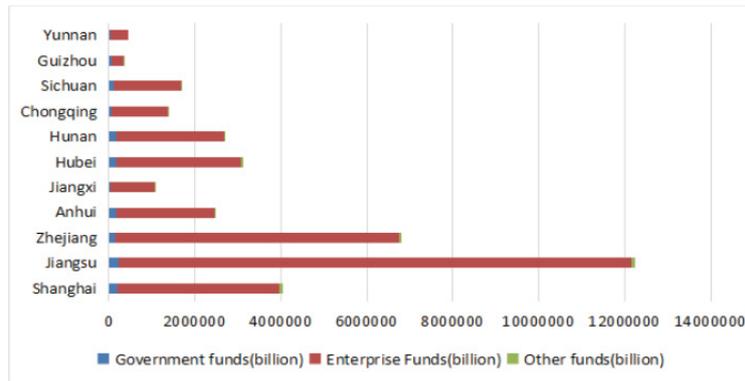
Figure 2　2013 R&D Intramural Expenditure and Growth Rate of Industrial Enterprises in Yangtze River Economic Belt
Source: Statistical Yearbook 2014, China Science and Technology

2.2 R&D intramural expenditure

In 2013, there were 123.96 billion RMB in R&D internal expenditure in Jiangsu, ranked the first of 11 regions of Yangtze River Economic Belt, which was the twice of the amount of Zhejiang, ranked second with 68.44 billion RMB. The fourth was Hubei, spent 31.18 billion RMB. There were large gaps among Guizhou and Yunnan and other areas. Besides, the main source of R&D Intramural Expenditure was the enterprise funds as shown in figure 2.

2.3 R&D projects and expenditure

In 2013, there were more than 40,000 R&D Projects in Jiangsu and Zhejiang, and more than 10,000 R&D Projects in Anhui, Shanghai and Sichuan, while the amounts for in Guizhou and Yunnan were less than 2,000 . There were 110 billion RMB R&D expenditures in Jiangsu, more than 20 billion in Shanghai, Hubei, Hunan and Anhui, and 3.18 and 3.65 billion in Guizhou and Yunnan, which were relatively backward (as shown in figure 3).

2.4 New product development projects and its sales

In 2013, there were 58,353 new product development projects in Jiangsu, ranked the first of 11 regions; followed by Zhejiang with 47,778 projects, and more than 10,000 projects in Shanghai, Anhui, Sichuan and Hubei, lack of 2000 in Guizhou and Yunnan. The sales of new product were similar with the new product development projects, the sales had broken 1 trillion RMB in Jiangsu and Zhejiang, it has to be mentioned that the sales of Jiangsu were close to 2 trillion (as shown in figure 4).
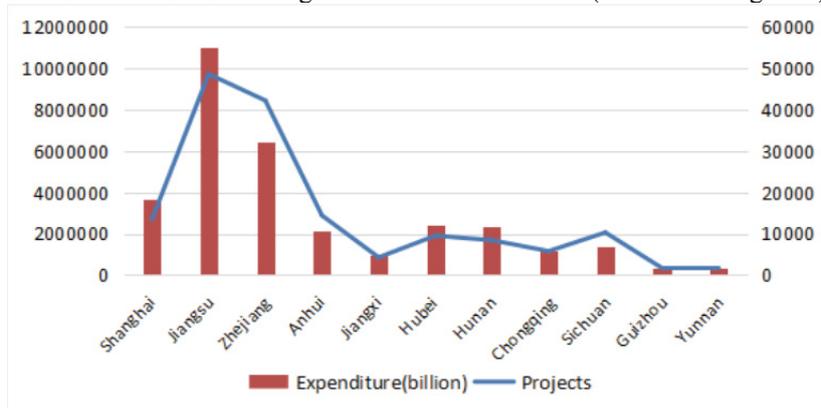
Figure 3　2013 R&D Projects and Expenditure of Industrial Enterprises in Yangtze River Economic Belt
Source: Statistical Yearbook 2014, China Science and Technology
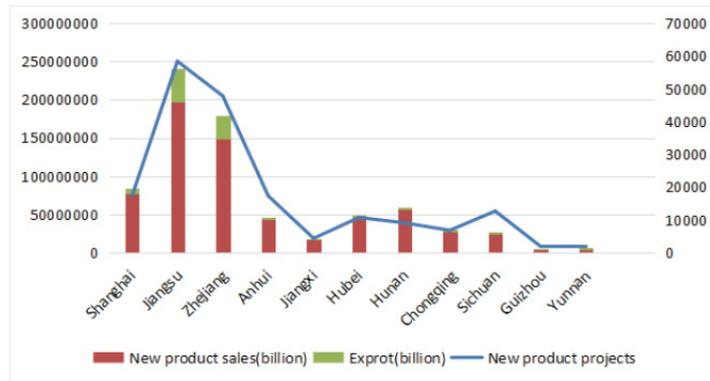
Figure 4   2013 New Product Development Projects and Its Sales of Industrial Enterprises in Yangtze River Economic Belt
Source: Statistical Yearbook 2014, China Science and Technology

2.5 Patent applications

In 2013, there were 93,518 patent applications in Jiangsu, which is the largest amount in Yangtze River Economic Belt, which and Zhejiang were ahead of others, and there were less than 5,000 patent applications in Jiangxi, Guizhou and Yunnan (as shown in figure 5).

2.6 Technology acquisition and renovation funds

In 2013, there were 7.15 billion RMB in technology acquisition funds in Shanghai, 5.25 billion in Jiangsu, more than 1 billion in Chongqing, Hubei and Zhejiang, and 18.57 million in Guizhou, which was significantly behind other regions. As to the technology renovation funds, there were 64.21 billion RMB in Jiangsu, ranked first, followed by 39.56 billion in Hunan, and excess of 10 billion in Zhejiang, Sichuan, Anhui, Shanghai and Chongqing (as shown in figure 6).
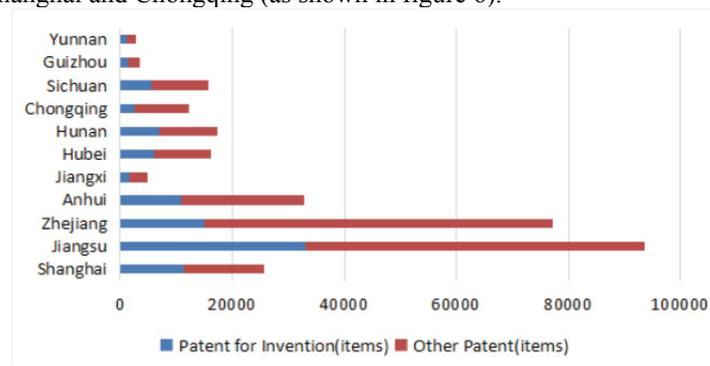
Figure 5   2013 Patent Applications of Industrial Enterprises in Yangtze River Economic Belt
Source: Statistical Yearbook 2014, China Science and Technology
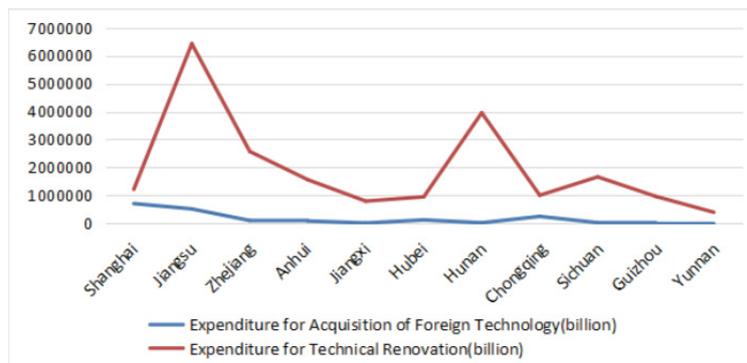
Figure 6   2013 Technology Acquisition and Renovation Funds of Industrial Enterprises in Yangtze River Economic Belt
Source: Statistical Yearbook 2014, China Science andTechnology

3 Empirical Analysis of S&T Resource Efficiency of Industrial Enterprise in Yangtze River Economic Belt

3.1 Evaluation methods

The evaluation of S&T resource efficiency of industrial enterprise in Yangtze River Economic Belt is essentially an input-output efficiency evaluation, so a number of indicators about input and output were needed to be considered, most of whose production function indicators and weights are difficult to pre-set. There are several benefits in DEA model. Firstly, it is more applicable in DEA model for the comparative analysis with similar reference system and for the analysis of multi-input, multi-output technology innovation. Secondly, the objectivity is another advantage of DEA model, which is superior to other methods without pre-setting function and weight. Finally, the simplicity in DEA model with statistical data regardless of the dimension of indicators no pre-correlation analysis of indicators. For these reasons, DEA can be regarded as the best method to evaluate the S&T resource efficiency of industrial enterprise in Yangtze River Economic Belt.

3.2 Index system of evaluation

According to scientific, consistency and comparability principles, according to the development of industrials in Yangtze River Economic Belt areas, the index system of evaluation for S&T resource efficiency of industrial enterprise was built from both inputs and outputs. The inputs in selects 3 indexes from human resources and financial resources, while the outputs selects 3 indexes from new product and S&T achievements (as shown in table 1).

Table 1   Index System of Evaluation for S&T Resource Efficiency of Industrial Enterprise in Yangtze River Economic Belt

	Category	Indexes
Inputs of S&T Resources	Human Resources	R&D Personnel
	Financial Resources	Intramural Expenditure for R&D
		Expenditure Projects Funds
Outputs of S&T Resources	New Product	Sales of New Products
	S&T Achievements	Number of S&T Projects
		Patent Applications

3.3 Evaluation

The 6 indexes of S&T resource of industrial enterprise (as shown in Tab.1) in 2009~2013 of 11 regions in Yangtze River Economic Belt Region were calculated and analyzed with Win4DEAP, the data for 5 years avoids the contingency and improves the exactness with the selected years' data. The input-oriented, variable returns to scale of DEA (1-stage) model had been selected to calculate (as shown in Tab.2), and the technical efficiency industries was also drawn in Radar Figure7.

Table 2   Win4 DEAP Software Testing Results -1

Areas（DMU）	crste	vrste	scale	
Shanghai	1.000	1.000	1.000	-
Jiangsu	0.799	1.000	0.799	drs
Zhejiang	1.000	1.000	1.000	-
Anhui	1.000	1.000	1.000	-
Jiangxi	0.752	0.856	0.879	irs
Hubei	0.818	0.823	0.993	irs
Hunan	1.000	1.000	1.000	-
Chongqing	1.000	1.000	1.000	-
Sichuan	1.000	1.000	1.000	-
Guizhou	0.833	1.000	0.833	irs
Yunnan	0.700	1.000	0.700	irs
mean	0.900	0.971	0.928	
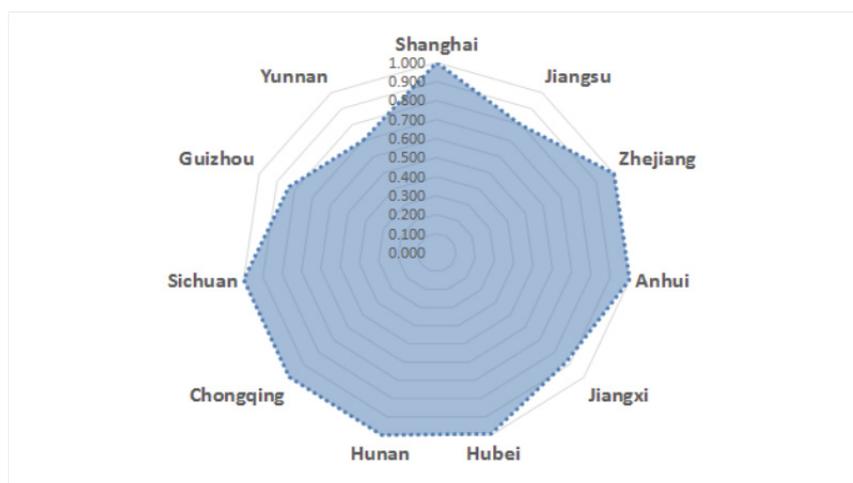
Figure 7   Radar Figure of Technical Efficiency of Industrial Enterprises in Yangtze River Economic Belt

There were following questions in the Efficiency of Industrial Enterprises in Yangtze River Economic Belt:

3.3.1 Entire developments were good, some areas needing to adjust S&T resources allocation

Technical efficiency (overall efficiency value) reflects the ability of DMU to obtain output in the case of the given investment, or to reduce inputs in the case of the given output, thereby to reflect the overall effectiveness of evaluated object. The mean of indexes of Technical Efficiency was 0.9 in 11 regions of the Yangtze River Economic Belt analysis (as shown in Tab.2), wherein, the indexes of Technical Efficiency were 1.000 with active technical efficiency and best scale in Shanghai, Zhejiang, Anhui, Hunan, Chongqing, Sichuan 6 regional; and there were 5 regional allocation efficiency were non-active but the data for those areas were above 0.7, which needed adjustment in the input and output. Overall, the allocation efficiencies of industrial enterprises in 11 regional of Yangtze River Economic Belt were good.

3.3.2 Higher level of management and more developed on S&T resources

The efficiency of DUM was decided by technical efficiency, but cannot explain the invalid reason of DMU, the further analysis on pure technical efficiency and scale efficiency of DMU were required to find out the cause of inefficient of DMU and then upgrade it. Pure technical efficiency is used to judge whether the output has reached the maximum in the given inputs, whether production could increase through optimizing the structure of investment or improving management. From Tab. 3-2, the average of index of pure technical efficiency of 11 regions of the Yangtze River Economic Belt was 0.971, which is close to 1, 9 regional's indexes were 1 and in pure technical efficiency active, except the amounts for Hubei and Jiangxi were 0.856 and 0.823 respectively.

3.3.3 Inadequate investment in S&T resources resulting in inefficiency in resource allocation in some areas

Table 3   Investment Target of DEA Operation Results

Areas	R&D Personnel（People）	Intramural Expenditure for R&D	Expenditure Projects Funds
Shanghai	116806	4047800	3672035
Jiangsu	510930	12395745	11009479
Zhejiang	337155	6843562	6421123
Anhui	127627	2477246	2161182
Jiangxi	46599	1091773	986917
Hubei	110541	2693118	2388780
Hunan	99002	2703987	2352569
Chongqing	53781	1388199	1176841
Sichuan	92424	1688902	1373596
Guizhou	20026	342541	318579
Yunnan	20323	454278	364648

Scale efficiency is the ratio of technical efficiency and pure technical efficiency, which reflects the relationship between the changes of output caused by the change of investment; the closer to 1 of scale efficiency, the more suitable of the presents scale of production, and the greater of productivity. The returns to scale of the S&T resources of input-output industrial enterprises were constant in Shanghai, Zhejiang, Anhui, Hunan, Chongqing and Sichuan; was decreasing Jiangsu, whose scale of investment was too large; were increasing in Jiangxi, Hubei, Guizhou and Yunnan, whose scale of investment were not enough. The efficiency of S&T resources could be adjusted (as shown in Tab.3).

4 Countermeasures to Improve S&T Resource Efficiency of Industrial Enterprise in Yangtze River Economic Belt

4.1 Increase investment of S&T resources, security diversification

S&T resources should be increased referring to the investment target of DEA operation results (as shown in Tab.4-1) to enhance the allocation efficiency of industrial enterprises in the Yangtze River Economic Belt because of the inadequate investment in the previous section More than 90% or even 95% regional R&D funding came from business investment, so the industrial enterprises of Yangtze River Economic Belt should increase S&T investment sources: on the one hand, industrial enterprises themselves should increase S&T investment to strengthen the core competitiveness of enterprises force of product and innovation to gain greater development potential and boost the development of Yangtze River Economic Belt; on the other hand, industrial enterprises should increase the introduction of social capital and foreign capital, and establish the multi-channel S&T funding system of government, enterprises and supplemented by social and foreign.

4.2 Optimize staffing of S&T, improve recruitment system

The talent incentive mechanism should be improved to strengthen the introduction of international talents in the economic globalization and the training of their own knowledge-based staff. Besides enterprises should increase S&T staff's funding level and improve the quality of life.

4.3 Adapt introduce technology to enterprise, promote industry

The development of S&T in Jiangsu Province was ahead of others in 11 regions of Yangtze River Economic Belt. Based on the foregoing analysis, the investment in introduction of technology expenditures were not much, but in technical reconstruction and funding were significantly higher than others. The enterprises should make the technology to combine and adapt to the characteristics and development of enterprises and regions after the introduction of technology. In order to accelerate S&T achievements in industry, companies should cooperate with universities and research institutions to strengthen the exchange of technology and personnel, to achieve mutual benefits.

4.4 Improve resources utilization, sharing among regions

The S&T resources should be shared among the various regions on Yangtze River Economic Belt to avoid wasting and internal friction, Jiangsu, Zhejiang, Shanghai and other developed areas should help Guizhou, Yunnan and other areas, to achieve the overall improvement and development. The regional governments could establish cooperation sharing platform to strengthen links among regions and implement the recombinant and cooperation among regions. In addition, the regions of Yangtze River Economic Belt should learn, exchange and cooperate with other regions of China and International in a wider range, and a higher level of cooperation can help them share S&T resources, then allocate resources more efficiently.

5 Conclusions

The countermeasures and suggestions to improve the efficiency are to increase investment of S&T resources, to security diversification, optimize staffing of S&T, to improve recruitment system, adapt introduce technology to enterprise, to promote industry, improve resources utilization, sharing among regions, were put forward based on the comparative study within six indexes such as R&D Personnel, Patent Applications, and evaluation with DEA for S&T resource efficiency of industrial enterprise in Yangtze River Economic Belt.

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The Impact of Technology Trust and Technology Anxiety on Customer Satisfaction with Self-Service Technologies

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Abstract: Despite the surprising and tremendous role of self-service technologies (SSTs) in services industries, some customers may actually feel reluctant to exploit SSTs due to their anxiety and lack of trust in technology. This research examines the influence of technology trust and technology anxiety on customer satisfaction with SSTs. Hierarchical regression analysis of 135 responses reveals that technology anxiety is one of the major factors thwart customer satisfaction with SSTs. The findings also report that technology trust has also a significant influence on customer satisfaction with SSTs. Important implications for services industries, directions for future research and limitations of the study are also presented.
Key words: Technology trust; Technology anxiety; Customer satisfaction; Self-service technologies

1 Introduction

Dynamic and competitive service industries are increasingly offering their services through technology-assisted channel. The industry is surprisingly going to be revolutionized by adapting low-touch high-tech technology enabled services or self-service technologies (SSTs). Substantial benefits are influencing them to deploy technology-assisted services. Some crucial benefits are- cost savings or reduces cost (Dabholkar, 1996, Bitner et al., 2002), increase productivity (Dabholkar, 1994, 1996, Kelly 1994, Alpar, 1992), accelerate speed of delivery, precision and customization (Berry, 1999), differentiate through technological reputation (Meuter & Bitner, 1998), increase customer satisfaction and customer loyalty (Alcock & Millard, 2006; Bitner et al. 2002), to reach new customer segments (Bitner et al. 2002).

Growing tendency of customer to interact with technology is another reason for which the firms are receiving advantages. The tendency of customer is growing since they are also enjoying plenty of benefits. For instance, cost and time savings, better control over the service consumption (Meuter & Bitner, 1998), increased perceived level of customization (Meuter & Bitner, 1998), even enjoyment in some circumstances even enjoyment (Dabholkar, 1996), efficiency, flexibility & surprise (Bitner et al. 2000) and convenience of location (Kauffman & Lally, 1994).

In spite of numerous benefits are embraced by both the service industry and customer, still customers feel uncomfortable of using SSTs (Meuter et al., 2003). Evidence also shows that customer frustration is increasing in interacting with SSTs (Parasuraman, 2000). Therefore, it is becoming increasingly difficult for services industries to ignore the understanding the degree of impact of technology anxiety and technology trust as factors of feeling discomfort or comfort with SSTs. They both should be taken into consideration in order to perfectly predict and realize the sensitivity and response of customers toward SSTs. A considerable amount of literature has been published on SSTs. But there has been a few research studies investigating consumers' feeling due to technology anxiety and technology trust.

A conceptual framework is developed for examining and understanding the influence of technology anxiety and technology trust on customer satisfaction with SSTs along with developing hypotheses and extensively amalgamating related literature on SSTs, technology anxiety, technology trust and customer satisfaction.

2 Conceptual Background and Hypothesis Development
2.1 Self-service technologies (SSTs)

Self-service technologies (SSTs) are technological interfaces that allow customer to embrace the opportunity of producing a service without depending on direct service-employee involvement (Meuter

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et al., 2000). Examples of SSTs include automated teller machines (ATMs), telephone banking, e-commerce, e-stock trading, etc.

2.2 Trust in technology and technology anxiety

Trust is intricate judgment that implies risk and uncertainty (Kenworthy and Jones, 2011). Trust, according to Fukuyama (1995) & Luhmann (1979), is also crucial for almost each and every kind of situation in which either uncertainty exists or unexpected result may arise. Trust in technology is a belief that the specific technology possesses the capability, functionality, or features to do what a person wants to do (Mayer, et al., 1995). Anxiety is feeling of discomfort due to uncertainty. Technology anxiety is the panic, apprehension and expectation customers realize when thinking to use or actually using any sort of technology (Cambre and Cook, 1985; Kay 1993). In a research of Yao & Liao (2001), they suggested that perceived risk is significantly affected by anxiety, which is strongly related to trust (Mayer et al., 1995). Therefore, technology anxiety is a considerable factor in technology trust. Strong empirical background helps us to propose the hypothesis given below:

Hypothesis 1: Customers with higher technology anxiety will have lower technology trust with SSTs

2.3 Technology trust and customer satisfaction with SSTs

Customer satisfaction with SSTs is the result of many antecedents, including trust. Generally and inherently lack of trusting belief leads to dissatisfaction in any kind of deal or transaction including the use of self-service technology. According to Balasubramanian, Konana, & Menon (2003), low satisfaction arises from the absence of trusting belief. Shunzhong (2012) suggested that customer satisfaction with SSTs is significantly and positively influenced by technology trust. Recent studies in relationship marketing, consumer behavior, information system and self-service technology indicate that higher trust is a strong predictor of higher satisfaction with technology. Therefore, the hypothesis would be:

Hypothesis 2: Customers with a higher technology trust will have higher satisfaction with SSTs

2.4 Technology anxiety and customer satisfaction with SSTs

Although it is extensively recognized that the way of doing business in the past decade has been revolutionized due to the use of SSTs (Bitner et al. 2010), in some interesting circumstances customer may be reluctant to use certain SSTs, even the benefits are noticeable and evident (Meuter et al., 2003; Parasuraman, 2000).   Customer usually exhibits anxiety related to operation of SSTs although it brings suppleness (Lin & Hsieh, 2006; Meuter et al., 2003, Yen, 2005; Zeithaml et al., 2002). Therefore, researchers tried to find the relationship between anxiety and satisfaction with technology. Butcher et al. (2001) suggest that anxiety negatively influence the customer satisfaction. Therefore, we hypothesized:

Hypothesis 3: Customers with higher technology anxiety will have lower satisfaction with SSTs

2.5 Technology anxiety, technology trust and customer satisfaction

Shunzhong (2012) found that increased technology anxiety leads to minor technology trust. Meuter et al. (2003) found that customers with high technology anxiety were less satisfied with the use of SSTs. Overall satisfaction with SSTs is significantly influenced by trust (Johnson et al.; 2008). From the mentioned relationships we could assume that:

Hypothesis 4: Technology anxiety, technology trust and customer satisfaction are correlated
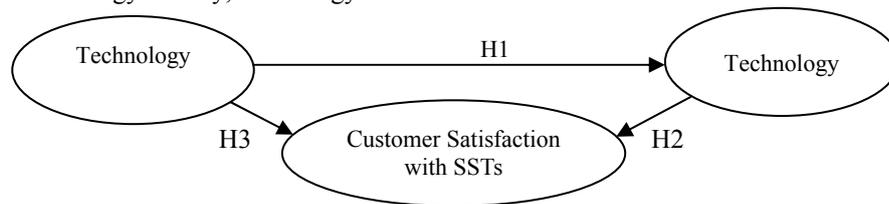
Figure 1   Conceptual Model

3 Methodology of the Study

In order to attain the objective, the study followed a thorough review in the literature on technology anxiety, technology trust and satisfaction with SSTs to identify the key issues. Survey instrument was constructed incorporating 3 constructs. The study picked up three item scale from Johnson (2007) for technology trust and three items scale for customer satisfaction from Fornell et al. (1996). To measure the technology anxiety, we adapted 3 items scale refined by Shunzhong (2012) of the original nine items scale of Meuter et al. (2003). Each indicator of the dimensions was measured using 5-point Likert scale. Using convenience sampling method, questionnaires were sent to 200 respondents in Chittagong city, Bangladesh, and 160 responses were received. After thorough checking, 135 questionnaires were found usable.

4 Findings and Result Analysis

4.1 Reliability of data

The reliability of the data was tested using most widely used and acceptable method Cronbach's alpha.　The values of Cronbach alpha for technology anxiety construct is 0.864, for technology trust construct is 0.893, and for customer satisfaction is 0.863, which are above the cutoff value 0.7 recommended by the most of the researches (Hair et al., 1998). These values of Cronbach indicate that the data collected from the respondents are reliable for the study.

4.2 Respondents' demographic characteristics

Out of 135 respondents 71.1% were male and the balance 28.9% were female. 57.8 % respondents were graduated where 42.2% were undergraduate level. 65.2% respondents fell between 25 to 34 years, 27.4% respondents were between 18 to 24 years and 7.4% were 35 and above. Majority of the respondents (66.7%) were found to be employed in service where 28.9% were students and the rest 4.4% were involved in businesses.

4.3 Findings

The results of mean and standard deviation of technology anxiety, technology trust, and customer satisfaction, and correlation among the three constructs are summarized in table 1. The mean and standard deviation were found consistent with the previous study (Shunzhong, 2012). Significant correlations were found among all the three constructs. It is also apparent from the following table that technology anxiety is negatively correlated with technology trust and customer satisfaction ($r = -0.607$, $p<0.01$ and $r = -0.613$, $p<0.01$) respectively. On the other side, positive relationship ($r = 0.555$, $p<0.01$) was identified between technology trust and customer satisfaction.

Table 1　Mean, Standard Deviations and Correlations Matrix

	Mean	STD	1	2	3
1 Technology anxiety	2.3778	1.03968	1		
2 Technology trust	3.3654	1.19206	-.607**	1	
3 Customer satisfaction	3.2988	1.22797	-.613**	.555**	1

**. Correlation is significant at the *0.01* level (2-tailed). *N =135,*

Table 2　Summary of Hierarchical Regression Analysis on Customer Satisfaction with SSTs

	Model 1			Model 2			Model 3		
	B	Std error	Sig.	B	Std error	Sig.	B	Std error	Sig.
Constant	3.681	.728	.000	5.151	.609	.000	.007	.194	.000
Age	.200	.251	.428	-.010	.203	.959	-.023	.115	.972
Education	-.208	.148	.163	-.027	.121	.827	.006	.202	.845
Occupation	-.135	.263	.610	.040	.212	.850	-.244	.193	.978
Gender	.168	.242	.489	-.068	.196	.730	-.506	.100	.208
Technology Anxiety				-.725	.085	.000	-.329	.089	.000
Technology Trust							.007	.194	.000
R2	0.023			0.376			0.436		
Adjusted R2	-0.007			0.353			0.410		
ΔR2				0.352			0.060		
F	0.776			15.56			16.51		
Sig.	0.543			0.000			0.000		

Table 2 postulates that the most significant variance in customer satisfaction was explained by the technology anxiety. It explained 35.2 per cent (R^2) of customer satisfaction with SSTs. Another important construct is technology trust. It also explained 6.0 per cent (R^2) of customer satisfaction with SSTs. Only 2.3% (R^2) variance in customer satisfaction was explained by the demographic characteristics (Age, Education, Occupation, and Gender). This shows that demographic characteristics are not significant at all. Furthermore, simple regression analysis to predict the impact of technology anxiety on technology trust has an effect of 36.8% (R^2) which is found significant at *p<0.00*. Finally, it is suggested that technology anxiety and technology trust would have been used for predicting customer satisfaction with SSTs.
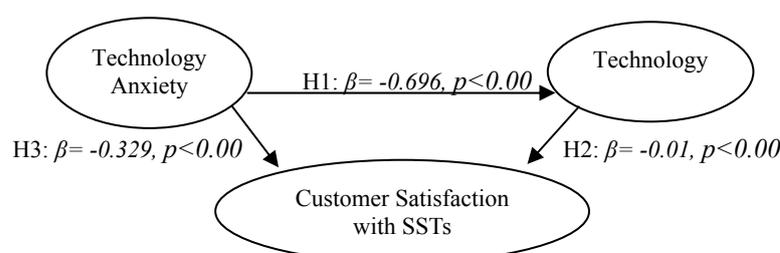
Figure 2　Estimated Model

5 Discussions and Implications

In this study we aimed at exploring the influence of technology anxiety and technology trust on customer satisfaction with SSTs. Simple linear regression analysis of the study supported the contention of the hypothesis 1 which affirmed customers with high level of technology anxiety will experience low level of technology trust with SSTs. Not capable of being bent and lack of ease to use of SSTs lead customers feel anxiety. This negative relation is also consistent with the findings of the previous research studies (Shunzhong, 2012; Hwang & Kim, 2007). The second hypothesis of the study was found to be significantly perceived by the respondents. That is Customers' trust increases when the associate factors with SSTs such as flexibility, smooth operation etc. are at desired level and hence they feel satisfied with SSTs. This relationship is consistent with earlier studies (Meuter et al., 2003; Butcher et al. 2001). The findings for hypothesis 3 is in agreement with Shunzhong's (2012) findings which showed customers with high level of technology anxiety will experience low level of satisfaction with SSTs i.e. they are negatively correlated. The results of the current study also present a support for the supposition that the three constructs are significantly correlated.

In the era of competitive world, services industries have to adopt SSTs to provide services promptly and to capture new customer in order to sustain. In doing so, the management of service industries should focus on the psychology of the customer and quality of SSTs to improve the perception of the customer about SSTs. To reduce the technology anxiety, the industries should introduce flexible and ease to use SSTs including educating the customer with SSTs. Essentially, higher technology trust with SSTs ultimately leads to better customer satisfaction. Therefore, managers should be attentive to improve the technology trust to enhance the customer satisfaction.

6 Conclusions

First limitation of the study is use of convenience sample with a small number of respondents. All respondents were from the same city is another limitation for generalizing the findings. Future study would be benefited from geographical dispersion and a large number of respondents. Despite the limitations, the paper will help the service industries' managers to strategically rethink the adoption and deployment of SSTs. Services industries should tactically introduce the SSTs so as SSTs can reduce the anxiety and increase the trust besides offering others competitive advantage in order to long run business development in the sophisticated up-to-the-minute competitive business arena.

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Combined Economic and Social Impact Assessment of Affordable Housing Investments

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Abstract: A method combining economic evaluation and social impact assessment creates information that can be applied when making decisions about a new tenement building or renovation of existing buildings. The aim of the economic evaluation is to ensure that economic aspects are adequately considered and investment is realisable from a monetary point of view. Social impact assessment reveals intangible pros and cons related to an investment or investments to be considered. This paper presents a framework that combines economic and social aspects and supports decision making related to affordable housing.
Key words: Decision-making; Investment; Affordable housing; Impact assessment; Economic; Social

1 Introduction

The aim of social or affordable housing is to ensure 'a decent home for every household at a price they [can] afford' (Scanlon, , Whitehead, Fernandez, 2014). Access to decent and affordable housing is a critical condition for economic growth and a stable society (King,2006). Thus governments and communal municipalities in different countries allocate tax revenues to support the housing of people with low income. Mechanisms to offer affordable housing vary in different countries as well as the proportion of social housing of the overall housing stock (Scanlon, Whitehead, Fernandez, 2014). In Finland the Housing Finance and Development Centre of Finland(2015) implements housing policy by providing subsidies for new construction, renovation and purchase of housing. These subsidies can be applied for by individual citizens as well as local authorities or public and other corporations that fulfil certain preconditions.

Investment decisions on affordable housing can be considered through three levels that are presented in Figure 1; macroeconomic, company management and operation processes (Forss,2013). On the top is the macroeconomic level where housing policies and allocation of tax revenues for different affordable and social housing interventions are defined. A company's strategic decisions, which follow national housing policy, are done on the company management level. Operational level decisions are for practical implementation of national policy and a company's strategy. In this paper the focus is on practical tools to support decisions on new investments, i.e., operational-level decisions.
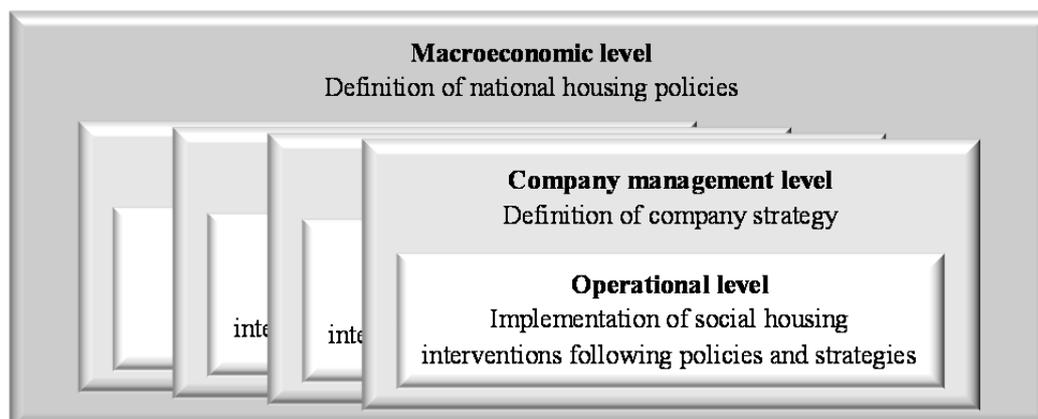
Figure 1   Decision-making Levels

When making investment decisions on new construction or renovations of affordable housing estates, economic values and affordability are typical criteria while the importance of other issues like

housing location and quality is sometimes underestimated (Mulliner,et al,2013). Economic issues create boundaries to practical-level social housing interventions, which is a clear reason for its important role in decision-making. For example, a non-profit but self-financing company that builds, owns and rents out houses, must balance costs and income to be able to continue in market. Benefits achieved by investing in affordable housing cannot only be measured by economic values. It is important to include an assessment of intangible values in investment evaluation as well. Thus, a method combining evaluation of economic and intangible values is needed.

In recent years, there has been rising interest and activity in impact investment, which are "investments made into companies, organizations and funds with the intention to generate social and environmental impact alongside a financial return" (CA, 2015). The ability to measure and demonstrate the impact of these investments has become increasingly important. In a recent review of state-of-the-art of impact assessment, the following types of impact assessment are covered (W.K,2014; Clark,et al, 2004; Hehenberger, et al,2013; Wilson,2014; Bond and Pope, 2012): Environmental Impact Assessment (EIA); Strategic Environmental Assessment(SEA); Policy Assessment; Social Impact Assessment (SIA); Health Impact Assessment (HIA); and Sustainability Assessment. EIA emerged from the National Environmental Policy Act 1970 (NEPA) in the USA. It can be considered the origin of impact assessment. EIA can be seen as a term that captures the idea of assessing proposed actions for their likely implications for all aspects of the environment, from social to biophysical, before decisions are made to commit to those actions, and the development of appropriate responses to the issues identified in that assessment (Morgan,2012). However, these methods are not directly focused on affordable housing, but rather on assessing impacts of investments towards sustaining development processes and generating a positive impact on society as a whole and especially in a less developed countries. Therefore, there is a clear need for a method focusing only on affordable housing and taking into account the specific needs of social housing financing system and housing policy in Finland.

This paper presents a conceptual model to support investment decision-making, taking into account economic and intangible aspects. The model is developed as an ongoing project and thus the results from method implementation are not yet available.

2 Research Objective and Methods

The aim of this paper is to contribute to the understanding of social and economic aspects of investment decision-making, addressing how to ensure that the most suitable investments get appropriate focus. Consequently, the paper contributes to the practical assessment on the new construction and renovation investments in affordable housing in a way that the goals of the decisions can be reached. The underlying research question of this paper is: how can the economic and social impact of affordable housing be assessed in a practical manner?

The paper is based on research carried out in the research project 'Towards risk-conscious investment decision making and value creation' partly funded by Tekes (the Finnish Funding Agency for Innovation) by the fund "New value creation". The project responds to the growing need to enhance the sustainable competitiveness of value networks. It aims to advance companies' ability to create value and to provide decision models and tools to evaluate investments and to assess uncertainty and risk.

The main research methodology is constructive research. The actual framework development is based on problem solving and solution building.

3 Case Description

The case company TVT Asunnot is a real estate company owned by city of Turku, i.e., it is a public non-profit corporation that offers affordable rental housing aiming to maintain and promote the wellbeing of individual citizens and society. TVT owns almost 11,000 homes providing a wide variety of residential options in blocks of flats, terraced houses and small private homes throughout Turku. The value of real property is over 1 billion €. In 2015 the company has yearly turnover of 75 M €; administration, maintenance and repairs add up to 48 M € and finance costs are 23 M €.

The aim of the case is to develop the company's own investment decision-making and to provide more information about investment alternatives to city authorities and other stakeholders. The developed method is aimed at supporting a selection of the suitable investment to be realised out of the 2 to 10 alternatives. To promote method utilisation in practice, a calculation tool that supports the decision-making will be created. It includes all required equations and templates and thus the user only needs to input case-specific parameter values.

4 Method for Economic and Social Impact Assessment

The method that yields information about the economic values and social impact of different investment options can be presented as a process with five main phases. In the first phase, all the investment alternatives to be compared are defined. In the second phase, monetary values for all alternatives are given and the options that are acceptable from an economic point of view are selected. In the third phase, intangible social impact generated by investment alternatives is assessed. Both economic and social impact assessments are presented in more detail in the following sections of this paper. Results of the assessments are presented by figures and tables that combine economic and social viewpoints in a way that supports the selection of the investment to be proceeded with. Case-specific values used in such an assessment are inherently uncertain since they will be realised only after the investment has been implemented. Sensitivity analysis will reveal how the ranking of alternatives will change if the results are recalculated by values deviating from original estimates.

Establishing assessment	Economic assessment	Social impact assessment	Results	Sensitivity analysis
• Definition of investment alternatives	• Basic calculation parameters, such as discount rate et al. • Investment costs • Annual costs • Annual income	• Value to owner • Socio-economic value • Regional economic value • Value to tenants • Ecological value	• Figures and tables presenting results in a form useful to compare alternatives	• Analysis of how sensitive results are for changes in evaluation and assessment parameters

Figure 2　Phases of Economic and Social Impact Assessment Method

4.1 Economic assessment

The aim of the economic assessment is to support investment decision making by providing information on economic profitability of different investment options. The case company has two main economic restrictions related to renovations and new buildings. Although the case company is a non-profit corporation, it needs to cover expenses. Public funding is used in investment financing, when terms of loans are more favourable than terms in an open financial market, but housing expenses are not directly compensated by tax money. The other restriction limits rents to a level that is about 10% lower than in the same kind of tenements in free markets. Via economic evaluation, a real estate company can assess whether the intended rent level can be achieved by the planned investment and which of the planned investments leads to the most cost-effective outcome.

The economic evaluation method applied in this case consists of five phases described below.

1) Basics of evaluation

The first phase is to define investment options to be compared and basic information related to investments. The intended area of buildings and type of the investment that can be either renovation or a new construction are examples of the basic information on buildings. Basic economic parameters used in calculations are discount rate, inflation of expenses, inflation of rent and the expected lifetime of the investment.

2) Investment cost

The second phase includes the definition of investment cost structure, the valuation of cost elements and the calculation of the total investment cost for each of the investment options. Investment costs consist of various cost elements and thus a structured approach is needed to incorporate all relevant cost items in the calculation. The numerical values for all costs items related to investment cost can typically be obtained from offers and other documents. The total investment cost is typically calculated simply by summing up different cost values.

3) Annual costs and income

To balance investment and lifetime cost with expected incomes, the next phase of the process focuses on the definition of the structure for annual costs and income related to each investment alternative. Compared to investments costs, lifetime costs and income are more challenging to valuate because the values will be realised only in future and are inherently more uncertain than investment cost. Expected annual costs in the real estate business can be estimated rather accurately utilizing data and experiences from other kinds of tenement buildings. Incomes of a tenement building consist of rent

payments, water costs and other living costs, e.g., parking, use of laundry, etc., paid by tenants. In this kind of situation when income needs to cover expenses, required income and rent per square meter can be calculated based on investment and annual costs.

4) Results

Results of economic evaluation provide information on which investment options are acceptable according to required rent per square meter. In addition, investment options can be compared by rent payments and payback times. By combining economic evaluation and intangible impact, it can be considered whether desirable intangible forms of impact are achieved by reduced rent.

5) Sensitivity analysis

Uncertainty is inherently related to basically all decision-making situations. However, this case features　fewer uncertain elements than many other cases. The simplest form of the sensitivity analysis is the what-if analysis that provides new results after the calculation values are changed. The main source of uncertainty is the utilisation rate of houses. Low utilisation rate decreases income while costs remain fixed, which causes a pressure to raise rental rates. The sensitivity analysis creates information about the lowest utilisation rate that still provides an acceptable rent level and covers costs.

4.2 Social impact assessment

The social impact assessment in this case study is made by applying multi-criteria decision-making techniques. The method used to assess the non-monetary impacts of affordable housing is derived from the work of Keeney & Raiffa (Götze,et al, 2008; Keeney and Raiffa,1993) who presented the multi-attribute utility theory (MAUT). The multi-attribute utility theory provides a tool to aggregate different aspects, which can be tangible and/or/ intangible, into one index that enhances the comparison of investments from a social standpoint. Weights needed in calculations are defined by an analytical hierarchy process (AHP) (Saaty,1980). The underlying objective is to establish relative weights for the main criteria and factors by means of pairwise comparison. Generally, the more critical a factor is, the more weight it should be given. These methods were chosen since they provide a flexible and easily understood method of analysing complicated problems, while also allowing consideration of subjective and objective factors in decision-making processes and being able to handle conflicting factors.
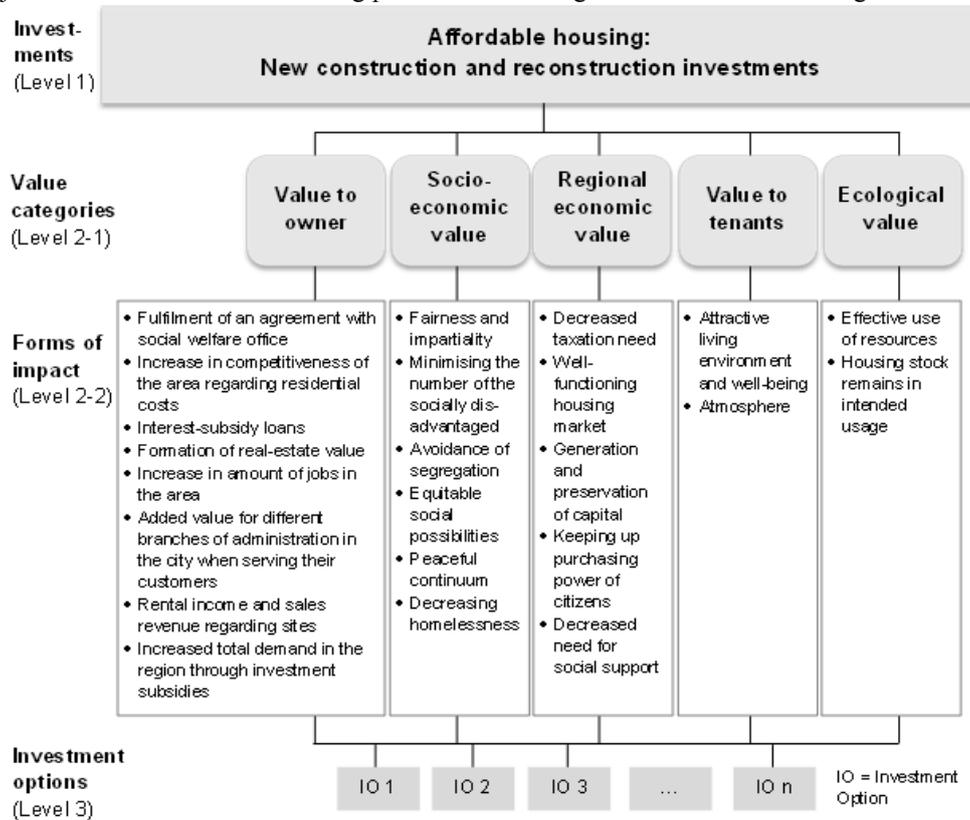
Figure 1　The Proposed Impact Structure for New Construction and Renovation Investments in Affordable Housing

In the case study, the hierarchy for categorizing the social impact of new construction and reconstruction investments was developed (Figure 3). It was created by analysing and combining the knowledge and opinions of TVT Asunnot Ltd. and the results of literature review conducted by the researchers. In addition to the top level, "new construction and reconstruction investments in affordable housing", the structure includes levels of value categories (value to owner, socio-economic value, regional economic value, value to tenants and ecological value), impacts and alternative investment options.

In the next phase of the research project, the structure described in Figure 3 will be further tested and applied by assessing the company's current investments and investment proposals.

The weighting of value categories and evaluation of various impacts is done by using expert judgment. Each value category is compared in relation to the others and the results are presented in a matrix form. After the weighting is completed, the impacts are ranked and evaluated. In order to increase the objectivity of the evaluation, the impact scoring is determined based on a fixed scoring system. The scales, i.e., the scores for various impacts are mainly modelled on a "very high (5)", "high (4)", "medium (3)", "low (2)" and "very low (1)" scale. By multiplying the weights and the impact scores, the profile for different investment options can be illustrated. The weighted score for individual investment can be calculated, and thus the order of superiority of alternative investments can be determined.

5 Conclusions

This paper presents a framework with the aim of creating information that supports affordable housing investment decisions. The framework integrates economic and social impact assessment in a way that supports multi-criteria decision-making and thus enhances the selection of the most attractive investment alternative from the tenement owner as well as from a tenant point of view. This makes the proposed method unique as often the assessment of investments focuses almost exclusively on the direct economic impacts, rather than indirect or intangible impacts. During the development, the structures for investment and annual costs and income as well as for intangible impacts of affordable housing were determined. Moreover, result indictors for both economic (required rent per square meter, payback time) and social impact assessment (weighted score) were developed. By combining economic and social impact and viewpoints of different stakeholders, the framework supports holistic assessment and increases the capability to handle multifaceted situations. It also assists in making decisions on whether desirable intangible impacts of investments can be achieved by reduced rent. Moreover, the structured assessment process will enhance the transparency of decision-making.

In the next phase of the research project, the proposed framework will be further tested with TVT Asunnot Ltd.'s current and planned investments in new tenement buildings and renovation of existing buildings. It is expected that in most cases the method can be used as such as it is developed in close co-operation between researchers who were responsible for the theoretical background and scientific knowledge on investment appraisal and impact assessment methods and experts in affordable housing who brought their domain competence on social housing and related investments to the development work. This contributes also to the adaptability and scientificity of the method. On the other hand, these future tests can reveal challenges in data collection that are crucial for the reliability of the eventual results. Economic evaluation and especially social impact assessment rely on expert judgements, i.e., on the knowledge and experiences of decision-makers and other possible stakeholders. This is because there is typically no collected data available for this kind of analysis. However, as both scientific and practical viewpoints are taken into account in the development, it can be concluded that limitations related to, e.g., data collection and the ability to ensure the fulfilment of practical requirements are considered, even while the results of empirical tests are as yet not fully available.

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Bottom up Direction on Kaizen: Production Innovation Activity for Shop Floor Engagement and Development

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Abstract: It is very important to analyze Lean production direction of Kaizen activity named Junshi. Presently, there are many variations in understanding how Toyota develops its' shop floor staff to support daily Kaizen, especially when Toyota staffs have different layers of understanding of Toyota Production System (TPS) and skills essential in applying TPS. This paper aims to clarify the Toyota's Junshi process in the context of strengthening Just In Time (JIT) and analyze both the technique and management aspects of lean small group activity by adopting the eight step of Toyota Business Practices (TBP) problem solving. Through this research, it was made clear that most attempts to imitate Toyota fail because techniques are adopted in pieces with little understanding of why they exist or what kind of organizational culture is needed to keep them alive. Junshi serves as an example of a technique which is successful only when embedded within the right organizational culture.
Key words Shop floor development; Continuous improvement; Just In Time; Toyota business practice

1 Introduction

Toyota's business success is largely and directly attributed to their unique approach to manufacturing. The Toyota production system (TPS) or more generically, "lean manufacturing" has been widely studied in the early of 1970s with quite a numbers of successful imitators. Thus, operational management researchers continue attempting to understand how TPS works. What makes Toyota's approach to manufacturing difficult to grasp is often the implicit or perspective of the analyst, not necessarily TPS itself. That is, TPS is too often examined analytically and as if it were static – despite notable examples of a contrary view (Bhasin & Burcher, 2006). For one main reason, at any given point what is called TPS is actually the state of a dynamic system that has evolved to a point and will continue to evolve. Commentators have described Toyota's approach as a set of contradictions (Osono, Shimizu, & Takeuchi, 2008). As Fujimoto sees it, the mystery is that Toyota's production system has evolved emergent qualities that cannot all be known in advance. He sees TPS problem solving as an "*evolving learning capability*" that is both "*intentional*" and "*opportunistic*" in that the company uses established routines to generate possible new production improvements and at the same time is able to seize emergent "*unintended*" or surprise improvements and then skillfully institutionalize them as well (Fujimoto, 1999) and that is Toyota Business Practice (TBP).

The scope of this work is to analyze how Toyota applies Junshi to develop shop floor worker ability to solve problems in daily activities and to support problem solving skills by management team. Correspondently, Toyota must establish an organizational culture where workers feel comfortable asking for help and learning TPS. This paper will evaluate what makes Junshi successful. One case study that illustrate some prominent characteristics of Junshi inside Toyota are included. Lastly, Junshi are discussed as they might exist "outside" Toyota. The goal of this paper, however, is not to enable copycat imitation of Quality Circle, but to offer a point of view that may be helpful for those interested in understanding TPS as a system.

2 Literature Review
2.1 Quality control circles

Shortly after World War II, the Japanese government encouraged the formation of several industry organizations to help Japan recover from the war.   The most noteworthy of these governing bodies has been the Union of Japanese Scientists and Engineers (JUSE). The union brought together leaders and experts from all of Japan's major industries so that they could share best practices.   This was exercised in the hope of revitalizing Japan's economy. Its main directive was to revitalize Japan's economy and eliminating waste by improving quality.   It wasn't until 1949 that JUSE began to host statistical quality control seminars. In 1950 JUSE invited Dr. W. Edwards Deming (Deming, 2009), a U.S. government statistical advisor to lecture to them on use of statistical quality control.

Although JUSE offered Dr. Deming the royalties for his lectures, he refused.   JUSE, inspired by

Dr. Deming's kindness, began the Deming Prize in 1951 from those same royalties.   The prize, which is a bronze medal bearing a likeness of Dr. Deming is awarded to those who have contributed to field of quality control.   The Deming Prize was originally awarded in two categories.   It is awarded to *individuals* who make a significant contribution to the theory and application of quality control and also to *firms* that obtain outstanding results in the application of quality control.

Another quality guru that also contributed to the culture and credence of JUSE was Joseph Juran (Juran, 1988).   He like, W. Edwards Deming, was also invited to give lectures to the still burgeoning JUSE and did so in 1954 and 1960.   His lectures focused more on a managing quality and how to make quality a business strategy.   His ideas greatly supported JUSE's tenet beliefs in continuous improvement and quality circles. The most influential figures in the history of JUSE have been its founder Ichiro Ishikawa and his son Kaoru Ishikawa.   In 1946 Ichiro Ishikawa (Hung, Lien, Yang, Wu, & Kuo, 2011) organized JUSE and helped many of the top Japanese executives to meet and pay attention to W. Edwards Deming.   However, it was his son Kaoru that headed JUSE during its flourishing and led the Japanese to internalize the teachings of Deming and Juran.   As a professor of engineering at Tokyo University, he developed the concept of quality circles.   A Quality circle is an approach to Total Quality Management that encourages workers to form teams to present process changes to management for implementation.   This reinforces Deming's 14th point for management, "*Quality is everybody' responsibility*" Kaoru Ishikawa spearheaded the Japanese Quality Revolution that has given JUSE the prestige it enjoys today.   Ishikawa left behind him a focus in JUSE of training others how to use Total Quality Management tools especially quality circles.

The quality circle concept has become so popular that there are now over 426,000 registered quality control circles in Japan.   These groups, some small while others quite large, permeate all of Japan's industries and play a major role in Japan's culture.   These quality control circles have helped Japan's industries thrive and often define the work and social context of many Japanese.

2.2 Toyota business practice (TBP)

The eight-step process aims to break down large problems into small problems and test various countermeasures for each small problem. The eight-step method is an agreed to use procedure for developing countermeasures that keep problems from returning. The eight-step is effective because, it links methods to results by running trials to determine countermeasures. Examples of its use and detailed descriptions of its steps can be found elsewhere (Ohno, 1988) (Liker & Hoseus, 2010).

1) *Clarify the problem*
o   Identify problems at worksite.
o   Search for problems that are related to work processes, wastage, productivity, quality, cost etc.
o   Brainstorm, Genchi Genbutsu, past records.
2) *Breakdown the problem*
o   Refer to problem statement on what data to collect (Object).
o   Check past data(if any) / Collect fresh data.
o   Analyse flowcharts(if any)/ Create flowcharts on current process (if unavailable).
o   Examine the situation over a period of time.
3) *Set the target to be achieved*
o   State where the improvement is to take place and visualize in chart or graph.
o   Make it clear what is to be done and what the objective is.
o   Express topic in terms of attacking something bad rather than improving something good.
o   Use SMART technique (Specific, Measureable, Achieveable, Realistic and Time bound).
4) *Think through to the true cause*
o   Indicate your problem statement.
o   Use Fishbone/Ishikawa/Cause & Effect Diagram.
o   Brainstorm of possible causes.
o   Do the '5 Whys'.
o   Identifying the causes of the problem.
o   Narrow the long lists of causes down to the most important ones.
o   Use facts, data, past history and personal opinions to focus on the most important cause.
o   Verify the cause whether it is true or false. Evaluate the degree of influence of each causes identified.
o   Collect data on the most important cause and present it on graph.
5) D*evelop countermeasures*
o   Suggest the countermeasures / corrective action based on the cause analysis,

- Think of creative solutions.
- Use 5W 2H to describe countermeasure.
o come-out with several alternatives solution, consider the advantages and disadvantages of each countermeasures in term of its effect, cost and practicality.
6) *Follow through on the countermeasures*
o To execute countermeasures and monitor the implementation
o Confirm the tangible and intangible results.
o Analyze result based on quality, cost, time and other benefits.
7) *Evaluate the result and the process*
o To confirm and monitor the results of countermeasures against the target.
o Compare result with target set, evaluate and study why target did not achieve.
o Confirm your achievement by checking your data.
o Evaluate success and failure.
8) *Make sure the results take hold*
o Monitor the trends of result obtained to confirm the effectiveness of countermeasure for long term.
o Where results are successful, standardize the countermeasures and establish as SOP (Standard Operating Procedure).
o Create a system in which can confirm that SOPs are followed and continue to have the desired effect (Training, Audit, Result Monitoring and etc).
o To standardize the countermeasures that are effective in eliminating root causes of problem for permanent and long term effect.
o Review the project.
- what went well.
- what did not go well.
o Record the remaining problems that were not solved and select new theme for next project.
o Review the benefits that the team has received in being part of the project.

2.3 Junshi

If lean is a discipline that develops over time, then it requires commitment and consistent leadership engagement and participation. One element in the current TPS approach that is of interest as a focus and can also make this picture of lean clear is Junshi. There have been various attempts to explain small group activities such as Jishuken (Marksberry, 2011); however, these attempts have described only Quality Circles as a rapid shop floor activity similar to the kaizen blitz model (Rodriguez & Lopez, 2012; Suárez-Barraza, 2013) with connections to supplier quality development for those situations needing urgent solutions. What is more misleading is that none of the current work discusses how lean problem solving is applied or how this activity can actually weaken shop floor worker involvement if applied incorrectly. There is also little understanding of how managers can initiate, support or lead problem-solving activities when they themselves need help in developing their understanding of TPS problem solving.

These descriptions of Junshi mislead by creating the impression of a static impression, that shop floor within Toyota have a complete understanding of TPS, one which they somehow attained instantly without needing to develop it over time (B.-H. Lee & Jo, 2007). Seen more clearly, Junshi's, like many other TPS activities, have both a learning development goal and a productivity goal: as they harness shop floor teams for problem solving needed by the production process, Junshi help managers continue to improve their ability to coach and teach TPS problem-solving to others, specifically production staffs.

What is important about this procedure is that the Junhsi team will pass much time studying and examining the current scheme to discover the smallest possible root causes for each countermeasure. This procedure can consume time and cannot be rushed, which is why Junshi can take weeks or months to complete, when performed right. Although Junshi may vary in time depending on the nature of the problem, the Junshi team may meet as needed to complete the problem-solving process. Junshi could meet continuously over a short period or spend a few hours a week over the span of several months. The form of time spent depends on the nature of the problem and what is involved in completing the problem-figuring out countermeasures. The only reliable way to know if a countermeasure was successful is by monitoring and monitoring through the current arrangement. This process can sometimes take weeks or months to complete and depending on the nature of the problem can be difficult to track. The research methodology used are based on PDCA cycle introduced by Dr. Deming which later it was developed further by Taichi Ohno. It is known as Toyota Business Practice (TBP) until today as the eight steps problem solving process.

3 Research Result
3.1 Research method
Mixed methods studies the relationships of management understanding, support and execution towards Junshi implementation.

3.1.1 Qualitative method

A qualitative research Case study/Phenomenology design was carried out on one purposively-selected Malaysian manufacturing company that has implemented lean manufacturing system deploying the Kaizen practices. Exploratory longitudinal fieldwork of research diary and field notes with key informants over a period of time using descriptive, analysis and interpretation through unstructured interviews, meetings, document and observation to develop's an insiders point of view. Using the practical approach consists of the empirical study of small group activity of hands on approach. It involves first hand research through observations, data collection and discussion groups.

1)Data collection was conducted internally within the company through observation and interview techniques with these respondents.

2)Interview was conducted with the managers in the manufacturing company so as to understand the manufacturing operations and to gather accurate information on their current kaizen system used in the facility.

3)This was followed by on-site visit to the premise. Two managers were purposively selected as respondents for the study and interviews were conducted at the respective offices. Interviews were conducted (lasting between 1.5 and 2.5 hours) using unstructured question based upon the four research propositions. In total, 2 different managers and team leader were interviewed. The four exploratory propositions;

a. Junshi as an outcome will improve business performance.

b. Junshi implementation for production's development trajectory is unique.

c. Junshi activity is dependent upon the context of the firm.

d. Junshi maximises general innovative activity.

The interviews were 5 hours of interview, notes into a series of observations and quotes.

3.1.2 Quantitative method

This type of research methods requires quantifiable data involving numerical and statistical explanations. Quantitative Research is used to quantify the problem by way of generating numerical data or data that can be transformed into usable statistics. It is used to quantify attitudes, opinions, behaviors, and other defined variables and generalize results from a larger sample population. Quantitative Research uses measurable data to formulate facts and uncover patterns in research.

3.1.3 Case Study: Junshi Project for the Inventory Reduction

The implementation of the small group activity activity namely Junshi has been executed upon several breakthrough cases in the automotive industry. Previously, there was a workers small group activity on complexity planning for automotive components using this approach. In this study, a project that explores new approach from small group activity known as 'Inventory Reduction' is presented. In the automotive industry, inventory plays a critical role in controlling and keeping optimum stock that bring high impact to manufacturing competitiveness in terms of cost effectiveness.

It aims to create an opportunity to develop own style, alongside cost reduction on the benchmarked systems. The case project in adopting using Junshi activity was conducted in an automotive OEM. The focus area was selected because of their incapability in controlling a full cycle production process. The cost improvement results were recorded after the case implementation was completed.

Process flow for performing Junshi

The general process flow for performing Junshi is explain in the follows the eight-step problem-solving process are as follows:
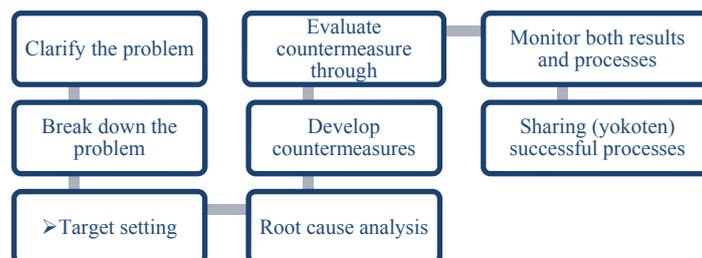
Figure 1　Process Flow of Junshi Activities

The clarification and target of stock reduction activity

Inventory plays a significant role in a manufacturing environment, one most widely use term is Just In Time (JIT) concept, as it derive as a pillar by Taichi Ohno, creator of Toyota's production system. The Just-in-Time approach attempts to reduce costs and improve workflow by carefully scheduling material to arrive where needed at the right amount and at the right time. Consequently, costs of inventories can be substantially reduced and the use of space can be maximized. In this case, this approach is targeted to lower the cost of the product. Due to space limitations, inventory is high thus the problem is surfaced.

Break down the problem example using 5W2H

What; To optimize stock reduction activities.

Where; To which focuses on Finish Good (FG), Local parts and Completely Knock Down (CKD) parts inventories.

Who; A team that specialized in the automotive material management and inventory was established and explored the stock reduction on manufacturing system.

Why; The research target of this study is to reduce the holding cost and towards having the right parts at the right quantity at a right time.

When; The duration of the case study was around 3 months to be completed at the conceptual level, and further 6 to 12 months to actually implement the concept into the production systems.

How; Junshi approach was used to explore this situation and to demonstrate how results can be achieved.

How much; The cost improvement results were recorded after the case implementation was completed.

Root cause analysis and development of countermeasure

	Root cause	Action taken
1	Customer order not stable	Bi-monthly SAP safety stock level adjustment based on requirements and daily production control
		To revise Monthly Kanban formula (eg. Safety stock level , lot size change) to reflect customer order
2	Transport not optimise	Revise production lot size for low volume model, especially models to match lorry loading
3	Line process not match to daily requirement	Monthly manpower meeting to determine manpower distribution at Production to suit the production order
4	No proper Handover from Vendor Dev. to Purchasing	Proper handover process from Vendor Development to Purchasing for new & carry-over parts
5	Delayed firm info from customer	To update Kanban using forecast figures for n+1 mth (complete on weekk 3 of n mth) for early kanban adjustment
6	Improper arrangement during phase in/out	Include standard packaging revision and order quantity for local vendors
7	Delivery frequency and quantity not revised/updated	Delivery frequency revision and safety stock to match production daily reqmt (inclusive of Milk Run, DTS-related parts, Stamping material/ coil)
8	Part pakaging size > Production Lot	Standard packaging review for CKD parts (concentrate on high volume model)
9	CKD Delivery frequency not revised to match production	Customer production plan improvement to match with CKD incoming plan
		Revise delivery frequency/timing for incoming CKD parts

Figure 2   Summary of Identified Root Causes and Countermeasures Taken

Root cause analysis looks at all three types of causes below. It involves investigating the causes of negative effects, finding hidden flaws in the system, and discovering specific actions that contributed to the problem. This often means that root cause analysis reveals more than one root cause. ou'll usually find three basic types of causes:

1) Physical – Tangible, material items failed in some way.
2) People – workers did something wrong, or did not do something that was needed. people causes typically lead to physical causes.
3) Organization – A system, process, or policy that people use to make decisions or do their work is faulty.

3.2 Result

Intangible and tangible results;
a) Increased safety for workers working at robot station.
b) Eliminate near miss accident during robot operation.
c) Safe working environment.
d) Prevent loss time (ie; worker injuries manpower planning)
e) Improved shop floor worker engagement.
f) Inventory cost reduction activity achieved.
g) Increase worker morale and support.
h) Improve material management and workflow.
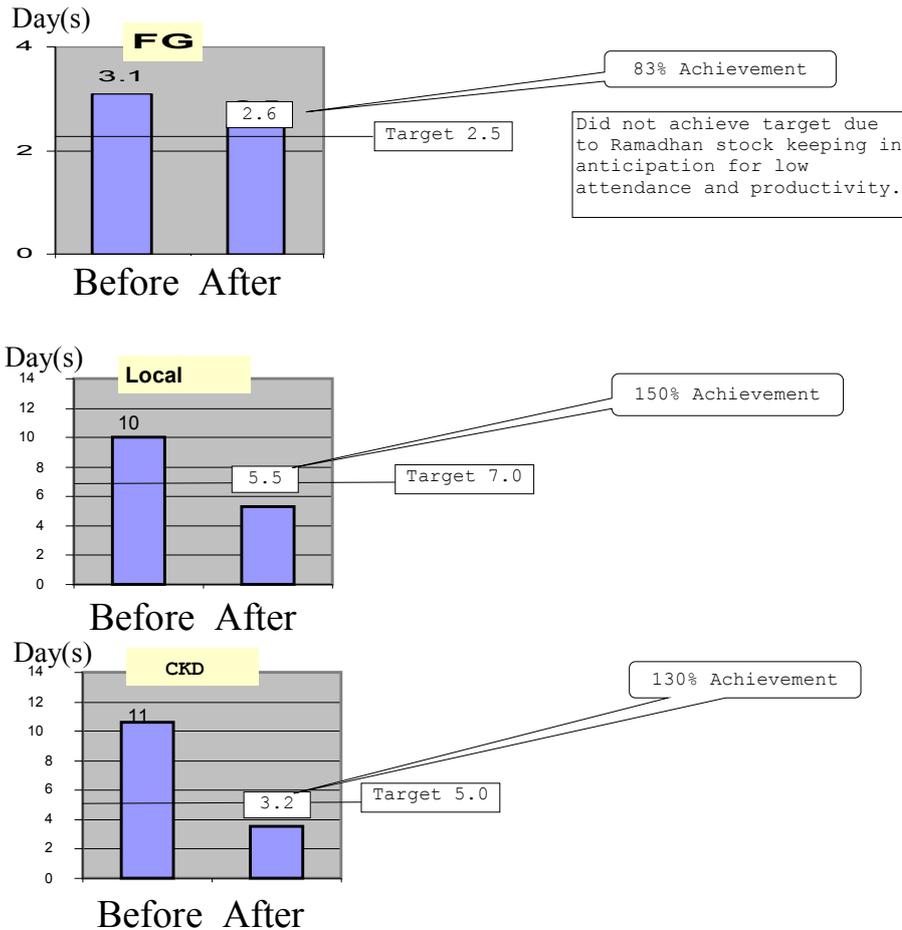
Figure 3   Summary of Tangible Results before and after at Focus Area

Observation
1)   Using a longitudinal exploratory approach better help in identifying a relationship between shopfloor engagement or contribution and problem solving skills development towards Junshi activity.
2)   Observation that was carried out at a just one point in time, known as cross-sectional that provide a snapshot of what is happening in that particular process kaizen group at that particular time. Qualitative analysis brings problems out into the open;
a)   By definition of propositions, directions and perceptions vary across individuals.
b)   Configurations of propositions, directtions, and perceptions are not static and stable but potentially subject to reflective transformation.
c)   Individual proposition may be modified to better fit lived experience and/or cope with a given situation.
3)   The pre-eminence of the lean production paradigm reflects the academic and practitioner effort that has been directed towards establishing and transferring ``best practice'' in operations.

4)   This study has offered a theoretical critique of this generic approach and the empirical evidence presented adds further support, suggesting that contingency and complexity are the dominant characteristics of any successful implementation process.

5)   In all circumstances, the umstructured interview took place as an informal conversation, with the researcher asking follow-up questions in response to statements made by the interviewees. This type of interview resulted in some irrelevant information, but also allowed evidence related to the variables of interest to emerge naturally.

6)   Sometimes structured interviews may be biased by the emotional involvement of the interviewee with the topic. Observations, however, can also be biased. Data collected during observations may be limited by the researcher's judgment of what is important enough to record.

However, the direct and indirect relationships between these factors describe the situation far more accurately than the individual factor taken into isolation

An important difference between Quality Circle and Junshi activity.

A significant different between Quality circle and Junshi activity is the team members are coming from bottom up with support and commitment from management. Therefore, the engagement of shop floor workers in problem solving activity is being recognized and highlighted by the management. Junshi can be misunderstand as "single purpose": as only a plant improvement activity [10,13–15]. In fact, Junshi has two main purposes: to solve problems in the workplace that need management attention and to correct, enrich and deepen understanding of TPS by management through first-hand on the job application of the problem-solving principles using hands-on activity and coaching. It differs from problem-solving activity conducted by management ("Quality Circle" in Toyota's language) because Junshi involves only shop floor workers to identify the problems and implement the countermeasures.
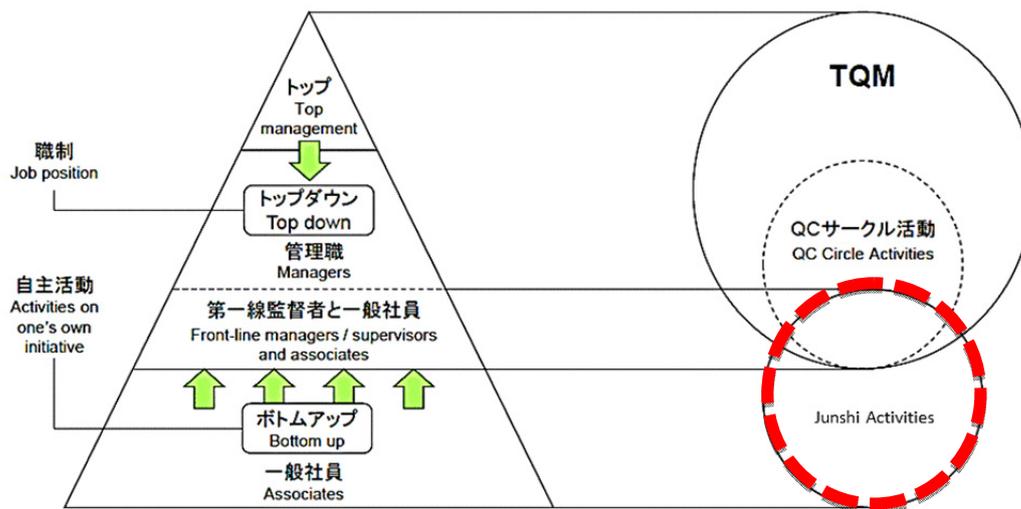
Figure 4   Scope, Structure and Direction of Junshi Activities

Significant roles and support function of management

Since in addition to their other roles, managers perform an important function in TPS as coaches and teachers for team members doing problem solving, Junshi is both a technical problem-solving activity and a management development process that helps managers learn how to be better teachers [16,17]. Junshi continually develop management's interpersonal skills so that they understand the right way to coach and support kaizen [18]. A third organizational culture function of Junshi is to communicate, maintain and reinforce the company's values, beliefs and behaviors (known as the Toyota Way) (The Toyota Business Practice (Toyota Motor Corporation, 2005)). Participation in Junshi gives management a common language and a common approach to problem solving standard across the company.

4 Conclusions

In conclusion, establishing a culture among front line managers that values identifying and solving problems among themselves and in the production workers they teach and guide is an essential step toward establishing that culture on the shop floor. Establishing this kaizen culture means shop floor

workers demonstrates their abilities in identifying and solving problems are valued by making those abilities part of their work, rather than a potentially causing of troublemaking that needs to be hidden (Fujio, 2006).

　　1) This paper expands the theoretical foundation of kaizen activity principles by studying and analysing a practical application of the concept.

　　2) As a result, the case study is opportune for presenting a relevant overview of the relevance and applicability of the research methodology. This single case study is particularly appropriate for completely new and explorative investigations.

　　3) However, the study has some weaknesses. The main one is the fact that the methodology is based on experts' judgments. To overcome this weakness, it will be necessary to widen the panel of experts and diversify them as much as possible.

　　4) Moreover, the research can be based on a wider database, including other courses of the same model factory or to test it into other companies.

　　In the larger sense, Junhsi can also be usefully seen as demonstrating that Toyota Production System or Lean Manufacturing, though it can be seen as a collection of tools and activities, is better approached as a dynamic evolving system within which those "tools" have multiple mutually reinforcing purposes in developing workers creativity whilst, eliminating the number eight muda. It could be generalize as a tool to engage and develop workers and also as amanagement recognition of such improvent activity done by shop floor as the process owner. Since this initiatives starts from workers being proactive in solving the problem at workplace, is the key to sustainable lean practices success. Celebrating the success and standardize the activity plus recognition from the management has brought Junshi to a significant level in Lean innovation and sustainability.

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Measuring Tourist Satisfaction at Taman Negara Pahang: A Preliminary Study

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Abstract: Tourist visits create tourism demand. This demand in national parks is particularly important as it generates revenues for the parks operation especially nature conservation and offers economic benefits to the local community. Satisfied tourists increase chances of repeat visits, loyalty and positive word of mouth communication with others and hence tourists may contribute to higher tourism revenues. Therefore, it is important to maintain tourist satisfaction that serves as an important indicator in sustaining tourism demand at a destination. This study has two key objectives. Firstly, it aims to measure the overall tourist satisfaction based on eight dimensions namely the quality of park, service and hospitality, natural attractions, accommodation, food, transportation and recreational activities and lastly the perceived cost. Secondly, it intends to determine the level of tourist satisfaction by nationality. This study has selected 40 tourists through convenience sampling technique for its pilot survey. The collected data were then analysed with Kruskal-Wallis Test. The results show that the tourists were generally satisfied with their overall travel experience and there is no significant difference among different nationalities on tourist satisfaction. It is concluded that the tourists may not expect high on a natural-based tourist destination, such as a national park that only allows limited development for better nature conservation. Basic services and facilities which were offered in the park are deemed sufficient and have met their expectations.
Key words: Tourist satisfaction; National park; Nationality; Kruskal-Wallis

1 Introduction

A national park is one of the most important natural-based tourist attractions that focuses on protecting natural ecosystem and biodiversity while offering educational experiences and recreational activities (Department of Wildlife and National Parks, 1987; International Union for Conservation of Nature, 2015). According to Choi, Huang & Shen (2015), Kamri & Radam (2013) and Prebensen (2002), tourists visit to national parks for relaxing, social trip, learning, nature tour and fitness purposes. Their visit creates tourism demand which then generates revenues to be used for the parks general operation and to support park conservation activities. At the same time, it also offers economic benefits to the local community. Akama & Kieti (2003), Jarvis, Stoeckl & Liu (2016) and Mohamad & Ghani (2014) revealed that satisfied tourists increase chances of repeat visits, loyalty and positive word of mouth communication with others, hence tourism revenues are likely to be higher. Therefore, a well-maintained tourist destination is important to increase tourist satisfaction that would generate continuous demand thereby supporting the local livelihoods while enhancing the park revenues. Other words, tourist satisfaction serves an important indicator in determining the sustainability of a tourist destination (Candrea & Ispas, 2009; Goh, 2008).

Numerous studies on tourist satisfaction had been carried out either in Taman Negara National Park (TNNP) or Taman Negara Pahang (TNP) (Nor' Ain, Nor Asmalina & Lim, 2010; Tan, Aziz, Khairil &

Zaiton, 2015; Teo, Chui, Rahim, Hassan, Musa & Yusof, 2010). However, the dimensions being studied are rather limited to a few specifically on the quality of services or activities provided. In general, tourist satisfaction in the national parks can be measured based on the quality of tourist facilities and services, experience of the activities tourists participated, the perceived costs and most importantly their overall experience when they come into contact with the natural settings - the resource that is fundamental to the tourism development. Therefore, this study examines the overall tourist satisfaction with their travel experience and the tourist satisfaction level among different nationalities, adapting all dimensions of tourist satisfaction derived by Pizam, Neumann & Reichel (1978).

2 Tourist Satisfaction

Satisfaction is a concept derived from social psychology and consumer behavior theory (Oliver, 1980). According to Klaus (1985 as cited in Kozak, 2001a), satisfaction refers to a post-consumption evaluation determined by the relationship between one's perceptions and product attributes. Swan & Combs (1976) found that satisfaction is measured according to the expressive (psychological) and instrumental (physical) dimensions of a product while Engledow (1977) refers satisfaction as the result of an interaction between an individual's expectation level and the actual experience of outcome. An individual is satisfied if the experience exceeds expectation or vice versa. While the studies in examining the antecedents of satisfaction had been extensively conducted since 1970s, the focus later evolved to focus on determining the gaps between expectations and perceptions (Kozak, 2001a).

Pizam et al. (1978, p. 315) defined satisfaction in the context of tourism as "the result of interaction between tourist's experience at the destination area and the expectations he had about the destination". Based on their study conducted at Cape Cod, Massachusetts, eight factors of tourist satisfaction were identified namely beach opportunities, hospitality, eating and drinking facilities, accommodation facilities, campground facilities, environment and the extent of commercialization. These factors covered both expressive and instrumental dimensions as revealed by Swan & Combs (1976). This is consistent with the study findings revealed by Akama & Kieti (2003), who reported that overall tourist satisfaction was mainly affected by tourism products and services quality in tourist destinations. Moreover, the experience encountered when tourists participated in activities and the perceived price also affect their satisfaction level (Arabatzis & Grigoroudis, 2010).

Pizam et al. (1978) reported that ease of access, traffic conditions, directional signs and information are not important once tourists are at the destination area. However, it was later shown by Akama & Kieti (2003) that bad quality of accessibility has resulted in low satisfaction level in Tsavo West National Park. Similarly, Akama & Kieti (2003), Arabatzis & Grigoroudis (2010) and Hamilton, Crompton & More (1991) also argued that signs and information are equally significant in such matter. In addition, Jarvis et al. (2016) reviewed and summarized the significance of several economic, social and environmental factors of trip satisfaction, including demographic profile (e.g. age, gender, education level, country of origin, income), trip cost, tourist facilities, climate, economic development, quality of personal safety and natural environment quality.

3 Research Methodology

Malaysia is well-known with its natural scenic beauty and wildlife diversity (Mohamad & Ghani, 2014; Mahadzirah, Abdullah & Mokhlis, 2012). TNP is chosen as case study for its nature conservation, its reputation as the largest and oldest protected area in Malaysia, and as one of the most popular eco-tourism destinations in the country. Tourists are offered with a wide range of activities including the visit to the settlement Orang Asli, wildlife and bird watching, jungle and mountain trekking, cave exploration and other outdoor activities.

It was school holiday from 12 – 20 March 2016 and the data collection was conducted from 14 – 17 March 2016 at TNP and Kuala Tahan, the entrance point. The date was chosen to ensure the equal opportunities in receiving feedback from both local and foreign tourists throughout the survey. The respondents were selected through convenience sampling technique where the researcher waited at the park main entrance and at the floating restaurants across the river which marks the park boundary from the local villages, targeting tourist who were having their meals and those waiting for transport ready to depart. According to Hertzog (2008), there is no specific sample size recommended to assess the feasibility of instrument, but depending on different aims. However, he suggested that 25 samples are the minimum number for the instrument development purpose. Johanson & Brooks (2010) stated that 30 samples are reasonable to consider enrolling in a pilot study. For this pilot study, a total of 40 responses

were collected from both local and foreign tourists who had participated in the activities and experienced the services in and around TNP.

Quantitative research method was applied in this study as suggested by Pizam, Neumann, & Reichel (1979) and Likert scale was used to measure tourist satisfaction. The questionnaire was made up of three parts: demographic profile, travel profile and tourist satisfaction. The first part of the questionnaire contained the socio-economic factors that affect trip satisfaction adopted from Jarvis et al. (2016). Second part of the questionnaire covered tourists trip profile and the participated activities (Jarvis et al., 2016; Neal, 2003) while most of the dimensions to measure tourist satisfaction in the last part were adapted mainly from by Pizam, Neumann & Reichel (1978) besides Arabatzis & Grigoroudis (2010) and Yu & Goulden (2006). In addition, relevant attributes were also added from the findings by Akama & Kieti (2003), Kozak (2001b) and Sukiman, Omar, Muhibudin, Yussof & Mohamed (2013).

Table 1 Dimensions of Tourist Satisfaction

Dependent Variable	Dimensions
Tourist satisfaction	Park
	Service & hospitality
	Natural attractions
	Accommodation
	Food
	Transportation
	Recreational activities
	Perceived cost
	Overall satisfaction

Source: Adapted from Pizam, Neumann & Reichel (1978)

The respondents were asked to rate their satisfaction based on the dimensions using the 7-point Likert scale ranging from 1 (strong disagree) to 7 (strongly agree) with a neutral position in the middle and 0 for not applicable. According to Krosnick & Presser (2010), 7-point scale is reliable and sufficient enough in most cases. All attributes were validated using internal consistency reliability measure. Subsequently, descriptive analyses including the frequency and cross tabulation analyses were performed on tourist demographic and trip profile as well as their overall satisfaction. Lastly, Kruskal-Wallis test was employed to determine whether there is any significant difference by nationality on satisfaction level.

4 Findings and Discussions
4.1 Tourist demographics and trip profile
Selective demographic details of the respondents and trip profile are summarized in Table 2. The survey shows that more than half of the tourists came from Europe. In general, the Europeans see Malaysia as a desired tourism destination because of the low foreign exchange rate and reasonable living expenses. Specifically, they visited TNP for its unspoilt natural scenery and landscape. Relatively the main motivation among the Asian tourists to TNP was to spend time with family or friends. Majority of the respondents were adults aged from 22-50. This could be due to the fact that TNP offers a wide range of active recreational activities such as night walk, mountain climbing and jungle trekking, which are more suitable for teenagers and adults although more passive activities as fishing, bird watching and wildlife observation are available for all age groups. A trip to TNP is deemed affordable because it receives tourists from all income groups.

The findings indicate that 97.5% of the tourists visited TNP for the first time. The interviews conducted with this group of tourists found that, while they were satisfied with their visit, most probably they would not be visiting TNP again because they wished to explore other places. The only tourist who came to TNP for the third time indicated that it was interesting to do bird watching in the park and this was the key motivation for the repeated visits. Relatively, Asian tourists to TNP preferred packaged tour arrangement compared to European tourists, with the independent travelers as majority. This finding is in line with the studies by LaMondia, Snell & Bhat (2010) and Pizam et al. (2004), who revealed that there is a different between nationality and choice of travel arrangement due to their different behavior and cultural background. In addition, the average length of stay in TNP was three to four days which

was considered as adequate for tourists to explore the park and participate in their desired recreational activities.

Table 2   Demographic Details and Trip Profiles

Characteristics	Samples (n=40) 100%	Asia (n=11) 27.5%	America (n=3) 7.5%	Oceania (n=3) 7.5%	Europe (n=23) 57.5%
Age					
Under 20	(4) 10	7.5	0	0	2.5
20 – 55	(31) 77.5	20	5	7.5	45
Above 55	(5) 12.5	0	2.5	0	10
Income (RM)					
Not applicable	(11) 27.5	10	0	0	17.5
10,001 – 30,000	(6) 15	2.5	0	0	12.5
30,001 – 60,000	(5) 12.5	10	0	0	2.5
60,000 – 100,000	(3) 7.5	2.5	2.5	0	2.5
More than 100,000	(15) 37.5	2.5	5	7.5	22.5
Travel purpose					
Spend time with friends/family	(12) 30	12.5	2.5	0	15
Education/Research	(4) 10	7.5	0	0	2.5
Teambuilding/ camping	(1) 2.5	2.5	0	0	0
Scenery/landscape	(11) 27.5	0	5	2.5	20
Flora/fauna	(5) 12.5	2.5	0	0	5
Culture of indigenous people	(3) 7.5	0	0	5	2.5
Bird watching	(3) 7.5	0	0	0	7.5
Honeymoon	(1) 2.5	2.5	0	0	0
Travel frequency					
First time	(39) 97.5	27.5	7.5	7.5	55
Third time	(1) 2.5	0	0	0	2.5
Travel arrangement					
Package tour	(16) 40	22.5	2.5	2.5	12.5
FIT	(24) 60	5	5	5	45
Length of stay					
Day trip	(2) 5	2.5	2.5	0	0
2 days	(6) 15	0	0	2.5	12.5
3 days	(17) 42.5	20	0	2.5	20
4 days	(11) 27.5	5	5	0	17.5
More than 4 days	(4) 10	0	0	2.5	7.5

4.2 Overall tourist satisfaction

Table 3   The 0verall Tourist Satisfaction (n=40)

Dimensions	Number of items	Cronbach Alpha	Mean	SD
Park	5	0.733	5.19	1.04
Service & hospitality	19	0.848	3.52	1.41
Natural attractions	3	0.839	5.64	1.12
Accommodation	4	0.857	4.79	1.77
Food	3	0.902	4.99	2.01
Transportation	9	0.875	3.30	1.66
Recreational activities	3	0.905	4.50	2.01
Perceived cost	9	0.841	3.08	1.54
Overall satisfaction	3	0.776	6.20	0.81

The Cronbach's alpha scores for each dimension are shown in Table 3. Tourists showed the highest satisfaction on the natural attractions followed by park, food, accommodation and recreational activities. They were slightly dissatisfied with the service and hospitality, transportation and perceived cost. However, the overall satisfaction on travel experience was relatively high. This variance is observed because there were tourists indicated "not applicable" in the questionnaire represented by "0" when they were not in contact with any park rangers or nature guides, did not use public transportation or accommodation service or they were not aware of the perceived cost for those who came by packaged tour.

Table 4 Kruskal-Wallis Test on Tourist Satisfaction among Different Nationalities

	Overall Satisfaction Level ($n=40$, 100%)				x^2	df	Sig
	Asia	America	Oceania	Europe			
					2.259	3	0.520
N	27.5	7.5	7.5	57.5			
Mean Rank	16.45	25.67	20.33	21.78			

The tourists generally indicated high overall satisfaction. The result is consistent with findings of the past studies by Nor' Ain et al. (2010), Tan et al. (2015) and Teo et al. (2010). Despite prior evidences (Kozak, 2001b; Shahrivar, 2012; Yu & Goulden, 2006) showed that nationality affects tourist satisfaction, this study reveals that there was no significant difference by nationality on the level of tourist satisfaction in TNP ($\alpha^2 = 2.259$; $df = 3$; $p > 0.05$) as shown in Table 4. This may be due the fact that all the tourists did not have high expectation on a natural-based tourist destination such as national parks that only allow for limited development in order to conserve the natural landscape as compared to a tourist destination in built environment setting. The mean rank values show that among the nationalities, American tourists showed the highest satisfaction level followed by the European tourists and Oceania tourists while Asian indicated the lowest satisfaction level of all nationalities.

5 Conclusion and Implications

This pilot study was conducted in preparation for the study in researcher's PhD. It intended to ensure correct interpretation of the questionnaire contents, reliability of the research instrument after all to access the feasibility of the full-scale survey. This study examines the overall tourist satisfaction and the tourist satisfaction level by nationality at TNP. The result reveals that the tourists were generally satisfied with the perceived costs and all the facilities and services offered in the park. There is no significant difference shown for by nationality on satisfaction level. The survey provides valuable findings to the park authority and local tourism operators to evaluate the quality of their current operations and for future planning. With continuous efforts to improve tourist facilities and service quality, and to conserve the existing natural resources and environment, TNP will attract more tourists which would enhance the revenue generation from tourism activities to ease the park operation burden and to support park nature conservation. At the same time, it also helps to secure earning and diversify the job opportunities available to the local folks directly contributing to improve their quality life.

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The Impact of Contemporary Innovation Management Trends Towards the Organization of IT Projects

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Abstract: Innovation failures when properly understood will support to improve the understanding of innovation success, which will help management improve their strategies. The objective of the research presented in this paper is to explore the efficiency in the organizing of innovative IT projects in the Sri Lankan context.Grounded Theory was used as the central methodology for this qualitative research study, where data was collected through open-ended questions based interviewing of corporate informants. An analytical tool, MAXQDA, which is a software that supports the analysis of qualitative data was used to electronically store, document and structure all interview transcripts.This research has found that the ordering of aspects of innovation management that influence the organisation of IT projects to be Reward Structure, Recruitment, Training and Development, Gamification, and Employee Empowerment; where Reward Structure had the highest code frequency per document and number of documents per code. For different innovation management methods, the ordering of the factors which influence the organisation of IT projects was further elaborated upon in this research. In the observation of 11 target organisations, it was found that there were no two identical innovation management implementations and each organisation provided a different experience.
Data sources for the interviews were limited because the preliminary review of opportunities to study innovation management in the Sri Lankan context revealed that only a selected set of organisations would be relevant to the research. This research has important uses as only a small fraction of the existing literature attempted to establish any relationships between the variables Trend and Project Organisation. In order to introduce or improve innovation management in an organisation, the budget, needs of the organisation, how to introduce the implementation and investment evaluations need to be considered.
Key words: Innovation management; IT project organisation; Grounded theory

1 Introduction

Organisations should continuously strive to innovate in order to develop new products or processes. This is considered an important factor in order to survive in the IT industry and at the same time it is considered a challenging endeavour in the practical world. From the historical overview of innovation management after World War II, innovation was considered as crucial for the economic and technological survival of nations leading to a scientific research in innovation management (Ortt & Duin, 2008).

Innovation failures when properly understood will support to improve the understanding of innovation success. When the root causes for the failures are analysed, managers can intervene to reduce the future occurrences of such failures. Some of the reasons for innovation efforts to fail have been identified as inadequate customer focus or even innovations rejected by customers, employees not engaged in strategy, a disempowering culture of blame, with ineffectual communication prevalent and tolerated, ineffective teamwork, communication and collaboration, and suppliers not engaged or fail to deliver on requirements (Balmaekers, 2014).

This paper is organized in the following way. First, it provides a critique of the existing literature and shows how it contributes to this research study. Second, it describes the research methodology used for this research and thirdly, it presents the findings of this study. Finally, it offers conclusions and possible avenues for future research.

2 Literature Review

In past research work, innovation management and its impact in several areas were studied. However, such research was lacking in how it impacts to organise IT projects. Researchers have examined innovation management from various perspectives.

2.1 Cultural

Several studies have focused on organisation's innovation culture and climate (Ahmed, 1998;

Sharifirad & Ataei, 2012). Drews et al. (2013) found out from the 14 semi-structured expert interviews carried out that IT innovation should not be limited to the management level but by establishing a culture of innovation would lead to a successful IT innovation management. Similar work in their view is presented in several studies (Ahmed, 1998; Martins & Terblanche, 2003; Schneider, Brief, & Guzzo, 1996; Steiber & Alänge, 2013). Whereas Drews et al. (2013) state that the innovation process should be formalized partially, the study by Steiber and Alänge (2013) reveal that it is not possible to have a manager in charge for innovation or formalize the innovation process as anyone could give ideas at Google.

2.2 Leadership

Numerous studies highlight the importance of support for innovation and have found that there is a positive relationship between an organization's culture on its innovation when the support for innovation is high (Ahmed, 1998; Choi et al., 2013; Sharifirad & Ataei, 2012; Stamm, 2009; Tushman et al., 2010).

Leadership is the process of influencing others towards achieving a desired outcome (Jong & Hartog, 2007). In the qualitative study carried out by Jong and Hartog (2007), they interviewed 12 managers and identified 13 leadership behaviours that included innovative role modelling, intellectual simulation, stimulating knowledge diffusion and support for innovation.

Previous research has focused on the importance of leadership for sustaining innovation in organisations (Jong & Hartog, 2007; Stamm, 2009). Whereas Steiber and Alänge (2013) have discussed the importance of selecting and developing leaders so that they could support innovative employees.

2.3 Organisational structure

An organisational structure is defined as the arrangement of responsibilities, authorities and relationships between people (Manning et al., 2006). A considerable amount of literature has been published on how an organisational structure influences innovation (Ahmed, 1998; Daugherty et al., 2011; Steiber & Alänge, 2013).

Organic structures promote innovation and mechanical structures hinder it (Ahmed, 1998; Arad et al., 1997; Martins & Terblanche, 2003). In the study on Google by Steiber and Alänge (2013), it was found that employee's innovative ideas were welcome through a bottom up process and clear goals and priorities were set from the top. In the study by Martins and Terblanche (2003), found that organisational culture has an impact on organisational structure. The values inculcated by the structure can encourage or limit novelty in organisations. Arad et al. (1997) also found that when employees are empowered to involve in decision making in problem solving, it is positively related to innovation.

2.4 Reward system

Lim and Ling (2012) defined a reward system as the package/system that contains rewards and benefits, e.g. holiday leaves, medical benefits, transport allowance and performance bonus. Several studies have revealed that organizations highlight individual based rewards in order to encourage innovation as variations in rewards can be justified based on performance and is a method to stimulate performance (Carneiro, 2008; Lawson & Samson, 2001). Amabile (1988) argues that money should not be used to bribe employees to generate novel thoughts. Ahmed (1998) discusses rewards under cultural norms that promote innovation. He also states that if rewards are not based on innovation but on task performances, employees will be cautious and hesitant.

Lawson and Samson (2001) stated that successful innovative organisations had reward systems that consisted of dual ladder systems, suggestion schemes, public recognition, and financial rewards. Whereas in the study by Steiber and Alänge (2013), it was found that the performance and incentive system was not a major factor behind Google's innovativeness. However, it served to recognize innovative employees. It was also found in the study of Google that the intrinsic motivation was identified as more vital for innovation.

2.5 Organisational learning

Whereas Steiber and Alänge's (2013) study on Google revealed that learning was vital for current products and process improvements than new innovations, Sicotte et al. (2014) found that innovation portfolio management need to build skills where learning would help them to be ahead of the competitors.

In the qualitative study by Duygulu et al. (2015), they interviewed 38 R&D official representatives consisting of R&D directors, managers and coordinators and found that learning and development is one of the major attributes of an innovative culture.

3 Research Methodology

3.1 Theoretical framework

The theoretical framework summarised in Table 1 was developed from the literature review and it lists the factors used for the study. However, from the full list of factors identified from the literature survey, some were not included in the theoretical framework. The reasons for those factors to be omitted are as follows:

The factor, employment growth is linked to innovation. Acs and Armington (2004) identified that employee growth has other factors affecting it. Therefore, measuring the contribution of innovation is difficult. The factor, growth in output is also linked to innovation. However, Fountas et al. (2002) found that it is influenced by other factors such as inflation and inflation uncertainty. Therefore, it is not suitable to be used in this study. The factor productivity will not be used as Feldstein (2008) states that it is influenced by rise in wages. Share of sales of new products was also not used because Cao and Li (2015) found that this factor is controlled by many variables such as advertising, working capital and competition. The factor firms' R&D investments was not used as Lai et al. (2015) found that it is influenced by financial autonomy, profitability degree, company size, capital structure, goodwill and patents, human resources and business resources. The factor firm size is not used because Kumar et al. (1999) found that it is influenced by other factors such as institutional factors consisting of the effectiveness of the legal system and financial market developments and also the amount of capital and the market size of the firm. Project size was also not used as Park and Papadopoulou (2012) found that it is influenced by cost and duration.

3.2 Participant recruitment

As the research design was intended to develop a theory as it emerges, theoretical sampling was used to recruit participants for the research on the basis of relevancy to the emerging theory. In this study a total of 14 participants who were relevant to the research area took part in the study. The individuals were a cross section of people directly involved in innovation - Heads of Research, Product Managers, Project Managers and Software Architects. The criteria for selecting the participants were based on their experience and knowledge in the research area.

3.3 Data Collection technique

For this qualitative research study, data was collected through open-ended questions to interview corporate informants to gather data to analyse perceptions of the participants with regard to innovation management in IT projects. The theoretical framework was used to develop the interview questions. Interviews were used to collect data as the participants' experiences can be thoroughly explored by conducting interviews. By using this approach, each organisation was assessed to see whether innovation is fostered using semi-structured expert interviews. The study included face-to-face interviews collected over a two-month period.

After a selected expert interview with a key person from one of the largest e-Health providers to see the validity of the questions, a series of semi-structured interviews was conducted. Each interview lasted approximately 45 to 60 minutes and was handwritten and later transcribed for analysis purpose. MAXQDA, a software that supports the analysis of qualitative data was used to electronically store, document and structure all interview transcripts.

Table 1   Summary of the Factors Used in the Theoretical Framework

Variables	Type	Dimensions	Measurement
Trend	IV	Cultural	Employee empowerment Gamification
		Leadership	Talent development
		Rewards	Reward structures
		Resources	Recruitment process
Project organisation	DV	Resources	Team distribution
		Leadership	Support for innovation
		Organisational structure	Type of organisational structure
		Rewards	Incentives for innovation

4 Analysis

The data gathered from the open ended interview transcripts were analysed in a qualitative manner. Qualitative content analysis and Grounded Theory approaches (Glaser & Strauss, 2009; Miles &

Huberman, 1994) were used in this research because the phenomena studied is specified in the interview questions and forms the basis for understanding why different innovation management trends and organisation of IT projects are used.

4.1 Analytical strategy for interview transcripts

The analytical strategy consisted of Grounded Theory (Glaser & Strauss, 2009; Miles & Huberman, 1994). For answering the questions: 1)what aspects of innovation management influences the organisation of IT projects and 2)for different innovation management methods what is the ordering of the factors which influence the organisation of IT projects, the following three steps were followed during the analysis (Miles & Huberman, 1994).

1) Data Reduction
2) Data Display
3) Drawing conclusions

4.1.1   Data reduction

In order to carry out the exploratory and inductive analysis of this study the 14 interviews resulting in 29 pages of interview transcripts and notes have been stored and analysed with the help of MAXQDA. In order to reduce the data, open coding (Glaser & Strauss, 2009) was followed and 59 codes that were grounded in 126 quotations were identified. In this step of the analysis a total of 291 code assignments were found and the reason for this was the multiple coding for a single quotation.

Thereafter, axial coding was used to link the codes to categories and sub categories that facilitated to reassemble the data and to form the theory. The coding scheme was refined by introducing several categories and sub categories. Next, selective coding was used to selectively add new codes and properties where required and further refine the categories and sub categories. The facility in the MAXQDA tool to add memos to the identified codes supported to structure the codes during data analysis. The creative coding feature, where a plain map is used to visually arrange the codes in MAXQDA was used to build categories from open coding.
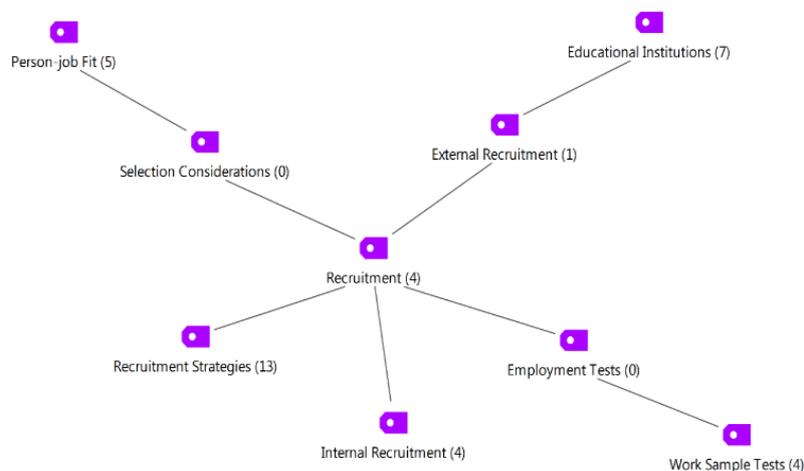
Figure 1   Code Theory Model – Recruitment

At the axial coding stage, the main categories identified initially for Recruitment were External Recruitment, Internal Recruitment and Recruitment Strategies. At the selective coding stage, the codes were then grouped and refined into 5 higher order categories and 3 subcategories as shown in Figure 1.

4.1.2   Data display and drawing conclusions

A variety of options to visualize data is presented using MAXQDA. In this stage of analysis, the responses for the research questions were reviewed. The questions were focused on the aspects of innovation management that influence the organisation of IT projects and for different innovation management methods what is the ordering of the factors which influence the organisation of IT projects. In order to protect the participants' anonymity, they were categorized according to their primary work responsibility into 3 areas and assigned with a code to represent them as shown in Table 2. The 3 main areas were Research, Engineering and Management.

Table 2　Study Participants

Codes	Description
E1	An Associate Software Architect at a prominent innovative financial technology business.
R1	Vice President - Research at a lean enterprise middleware company.
R2	Head of Research at a leading international travel solutions company.
M1	Director Advanced Services and TQM at a global technology innovation services provider.
M2	Director at a global technology innovation services provider.
M3	Manager Software Engineering at an e-Health provider.
E2	Team Lead - Client Managers at a cloud supply chain business.
E3	Head of Engineering at a leading telecommunication value added services specialist.
E4	A Technology Manager at a leading provider of software product engineering services to ISVs globally.
E5	A Software Architect at a prominent innovative financial technology business.
M4	Senior Manager Software Development at a global enterprise software company.
M5	Senior Manager of Human Resources at a leading restaurant industry solutions provider.
M6	Head and Director of Software at a global technology innovation services provider.
E6	Senior Director of Technology and Chief Software Architect at a global information technology services company.

4.2 The aspects of innovation management that influence the organisation of IT projects
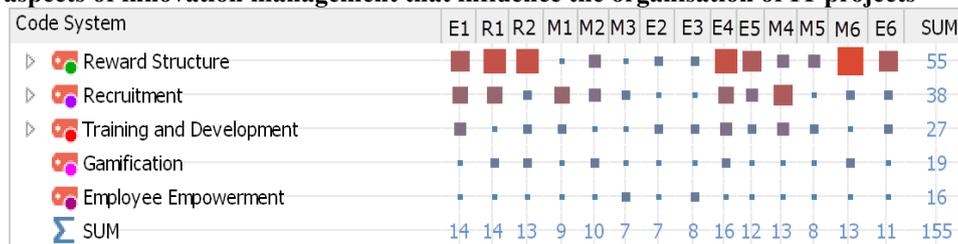
Figure 2　Code Frequency per Document – Overall
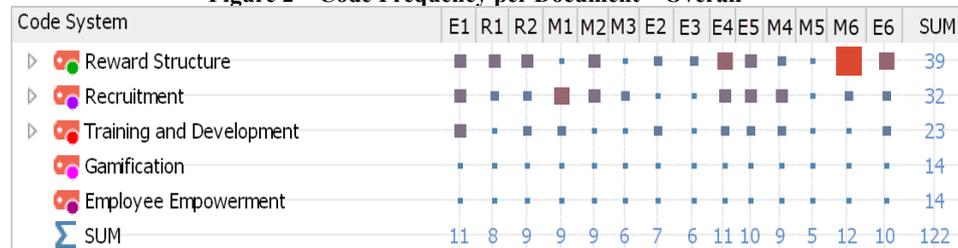
Figure 3　Number of Documents per Code – Overall

As shown in Figure 2 and Figure 3, all codes have been related to the five trends of innovation management, with the highest density resulting for Reward Structure with 55 empirical groundings derived from 12 different codes. The second highest code was for Recruitment, with 38 groundings derived from 9 different codes. Training and Development received 27 groundings. Finally, Gamification and Employee Empowerment had only 19 and 16 empirical groundings respectively.

The overall ordering of the innovation management trends based on the code frequency per document and number of documents per code were as follows:

1) Reward Structure
2) Recruitment
3) Training and Development
4) Gamification
5) Employee Empowerment

4.3 For different innovation management methods, the ordering of the factors which influence the organisation of IT projects

4.3.1　Reward structure

Incentives for innovation
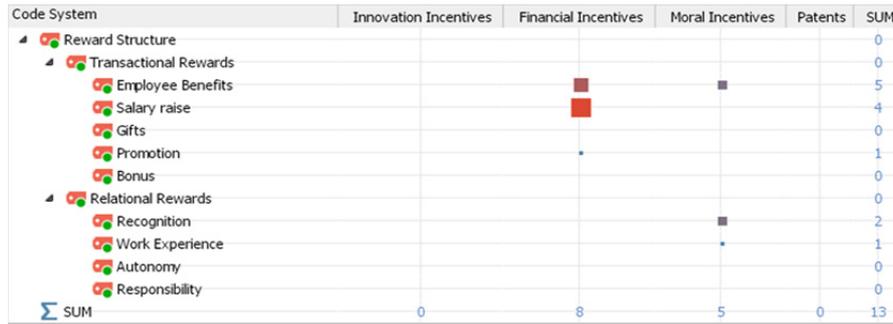
Figure 4   Total Code Relations of Co-occurrence of Codes Between Reward Structure and Innovation Incentives
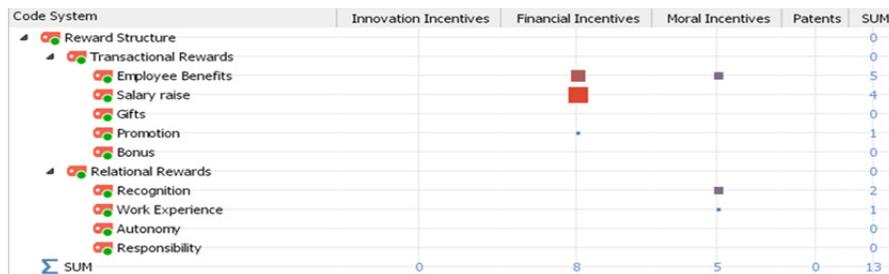
Figure 5   Number of Documents per Code Relations of Co-occurrence of Codes Between Reward Structure and Innovation Incentives
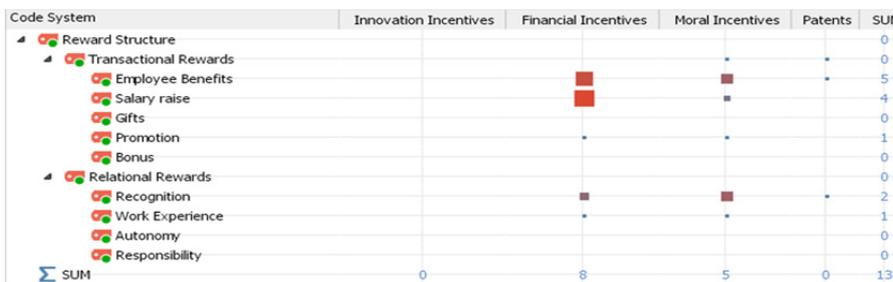
Figure 6   Total Code Relations of Near Codes Between Reward Structure and Innovation Incentives
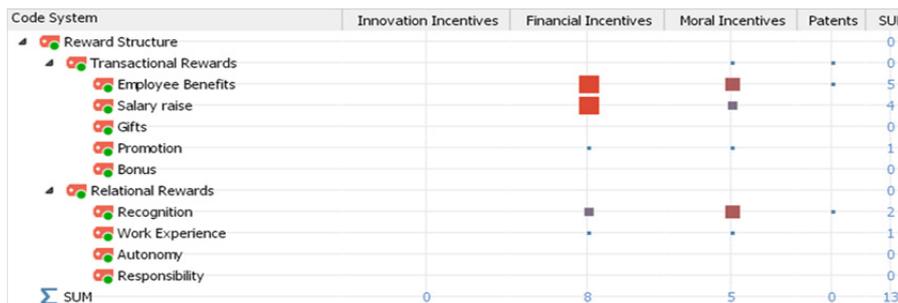
Figure 7   Number of Documents per Code Relations of Near Codes between Reward Structure and Innovation Incentives

The visualisations of the intersections of activated codes in Reward Structure and Innovation Incentives in a group of activated documents by using the MAXQDA Visual Tool - Code Relations Browser are shown in Figures 4, 5, 6 and 7. The Complex Coding Query feature with the following functions were used to retrieve code relations between Reward Structure and Innovation Incentives.

● If inside - Search for segments assigned to any one of the codes in Reward Structure that are also completely surrounded by a segment assigned to the code Innovation Incentives: 18 segments

● Followed by - Search for segments assigned to any one of the codes in Reward Structure that is followed by a segment assigned to the code Innovation Incentives within no more than 1 paragraph: 26 segments

● Near - Search for segments assigned to any one of the codes in Reward Structure that is preceded or followed by a segment assigned to the code Innovation Incentives within no more than 1 paragraph: 26 segments

The above results generated indicated that there were code relations between Reward Structure and Innovation Incentives.

Similarly, the factors Team Distribution, Management Support and Organisation Structure were compared with each innovation management method.

The overall ordering of factors which influence the organisation of IT projects for the innovation management method Reward Structures were as follows:
1) Organisation Structure
2) Innovation Incentives
3) Management Support

4.3.2 Recruitment

The overall ordering of factors which influence the organisation of IT projects for the innovation management method Recruitment were as follows:
1) Organisation Structure
2) Innovation Incentives

4.3.3 Training and development

The overall ordering of factors which influence the organisation of IT projects for the innovation management method Training and Development are as follows:
Team Distribution, Management Support and Organisation Structure were at the same level.

4.3.4 Gamification

Only Organisation Structure influenced the organisation of IT projects for the innovation management method Gamification.

4.3.5 Employee empowerment

Only Organisation Structure influenced the organisation of IT projects for the innovation management method Employee Empowerment.

Table 3   Summary of Comparative Analysis

Criteria	Dimension	Ahmed	Steiber and Alänge	Drews et al.	Martins and Terblanche	Research findings
• Employee engagement • Employee empowerment • Team work • Communication	Cultural	• Challenge and belief in action • Freedom and risk-taking • Trust and openness • Cross-functional interaction and freedom • Face to face communication	Innovation oriented culture	Establish a culture of innovation	• Behaviour that encourages innovation • Open communication	• Freedom to think • Work environment • Gamification
• Employee engagement • Employee empowerment	Leadership	• Leadership commitment and involvement • Innovation time and training	• Leaders as facilitators • Organizational learning • Selecting and developing leaders so that they could support innovative employees	IT innovation should not be limited to the management level	-	• Weekly innovation sessions • Sponsorships • Communities
Employee empowerment	Rewards	• Valued ideas • Respect for new ideas • Celebration of achievements • Suggestions are implemented • Encouragement	Performance and incentive system	-	Support mechanisms	• Transactional rewards • Relational rewards

Criteria	Dimension	Ahmed	Steiber and Alänge	Drews et al.	Martins and Terblanche	Research findings
Resource usage	Resources	-	Selection of individuals	-	-	• Recruitment process • Team distribution
• Customer focus • Supplier engagement • Employee empowerment	Organisational structure	Organisational structure: autonomy and flexibility	Lack of policies, structure and processes influenced innovation positively	The innovation process should be formalized partially	-	Type of organisational structure

Table 3 presents a comparative analysis of innovation management trends in the literature and the findings from this research on how organisations succeed by overcoming the challenges and failures in innovation.

5 Conclusions
5.1 Recommendations
From the observation done on the 11 organisations, it was found that there were no two identical innovation management implementations and each organisation provided a different experience. Designing an innovation management implementation for your organisation will require the careful assessing of the following:
- It is important to do a situation analysis on innovation management in the target organization so that the strengths, weaknesses, opportunities and threats of the organization are identified.
- Also, it is important to assess the benefits the organisation would most value in receiving from the implementation.

Successful innovation management for a particular organisation will not be identical to other organisations. In order to introduce or improve innovation management the following is recommended:

1) The findings suggest that it is useful to determine where to invest the budget for innovation management.

2) It is important to build an innovation management implementation that meets the organisation's needs.

3) The implementation needs to be introduced in a way that the organisation accepts it.

4) Identify ways to evaluate the outcome of the investment.

This study revealed different innovation management trends and the results of such management approaches. In order for the innovation management model to successfully fit the organisation and to reap the benefits from the implementation to the organisation, managers should come up with different strategies.

5.2 Research limitations
The study encountered the following limitations with regard to building up the theory and to the empirical study.

5.2.1 Methodological and empirical limitations
Data sources for the interviews were limited because the preliminary review of opportunities to study innovation management in the Sri Lankan context revealed that only a selected set of organisations would be relevant to the research and a deeper study of management trends at each of these organisations to be necessary.

5.2.2 Theoretical limitations
The researcher identified significant gaps in the available literature. The variables Trend and Project Organisation had a lot of research relevant to it and independent of each other. Only a small fraction of the existing literature attempted to establish any relationships between these variables.

5.3 Future research
This study highlighted the impact of innovation management trends towards the organisation of IT projects. Several important findings were revealed. Suggestions for areas of interest for future research and development are as follows:
● Further study how giving more responsibility can contribute to innovation.
● Comparing innovation management in IT projects from a classless management perspective.
● Study how innovation management in IT projects could lead to organisational learning.

● Study the effect that motivation has on innovative IT projects.

● Researching how job performance can be evaluated in a way that contributes to innovation.

● Study how outdoor training can influence innovation management.

● Study how designations can contribute to innovation.

● The difficulties and challenges that have to be overcome to achieve innovation management success.

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Manufacturing Industrial Agglomeration, Technological Innovation and Regional Differences

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Abstract: The paper carries out empirical analysis of correlations between agglomerating degree of manufacturing industry and technical innovation by utilizing data of industrial enterprises above designated size from 2013 to 2014, and employing generalized least squares method(GLS). It carries out analysis by using innovation ability and innovation activity together as parameters for measuring innovation level, with research results showing, for nationwide manufacturing industry, the higher degree of agglomerating, the stronger the technical innovation ability, also the lower the innovation activity. Throughout various regions, the agglomerating degree of manufacturing industry would have differing effect on the innovation ability and innovation activity.
Key words: Manufacturing industry; Agglomeration; Technical innovation; Regional differences

1 Introduction

The manufacturing industry has always been an important pillar industry in China. In 2015, Made in China 2025 presents a development goal of converting China from a big manufacturing country into a powerful manufacturing country, wherein the innovation-driven implementation is exactly a basic way for such a goal. Thus, the research on relationship between agglomeration of manufacturing industry and technical innovation is of great practical significance.

As early as in the 19th century, Marshall started to pay attention to a phenomenon called industrial agglomeration, and presented the concepts of "internal economy" and "external economy". After Marshall, the theory of industrial agglomeration saw great development, with emerging schools like theory of location of industry by Weber, theory of new economic geography by Krugma, theory of competitive advantage by Port,etc.

Presently, there're three main conclusions of research on relationship between agglomeration and scientific and technical innovation by scholars at home and abroad: first, it's recognized that agglomeration and innovation are interactive (Philippe Martin, Gianmarco I. P. Ottaviano2001), and agglomeration can reduce cost of innovation by external effect, thereby attracting enterprises into a certain region, and thus forming a new agglomeration; second, it's recognized that agglomeration can facilitate innovation, thereby facilitating growing of regional economy (Krugman 1991; Kelly and Hageman 1999; Paci and Usai 1999; Hanson 2001; Megha and Mukim2012; Cao Yuping 2012); third, it's recognized that industrial agglomeration brings no positive influence on innovation by externality, but instead brings negative influence on innovation (Abdullah M. Khan, 2008). From point of view of research, some scholars studied locational change of manufacturing industry at provincial-level from meso-perspective of regional growth (Qiu et al.,2013); while some studied the relationship between development of manufacturing industry and agglomeration from micro perspective of enterprises(Lu and Chen,2009; Rijkers et al., 2010; Yuan et al., 2012a).In recent years, scholars at home and abroad have also carried out empirical research on relationship between agglomeration of manufacturing industry and technical innovation. WangWenyi, An Tongliang(2014) studied a mechanism by which the knowledge spillover of micro subjects within a certain region affected the industrial agglomeration and innovation by using listed companies in Chinese manufacturing industry from 2003 to 2011 as subjects of the study. Han Qingxiao, ZhaHuachao, Yang Chen (2015) examined the influence on innovation efficiency by industrial agglomeration throughout both the population manufacturing industry and the manufacturing sectors as divided by differing factor intensities by using Malmquist index.

2 Model Assumption and Data Explanation

2.1 Model building

To analyze a quantitative relationship between agglomeration of manufacturing industry and technical innovation, we use existing research results and construct a measurement model. The model is set as follows:

$$\ln(\text{Innovation}) = \alpha + \beta_1 \ln(\text{Agg}) + \beta_2 \ln(\text{Staff}) + \beta_3 \ln(\text{EAR}) + \varepsilon \qquad (1)$$

where Innovation is an explained variable-technical innovation level of manufacturing industry, Agg is

an explaining variable-agglomerating degree of manufacturing industry, Staff and EAR are control variables, Staff represents investment of R&D staff in manufacturing industry, EAR represents technology import and technical transformation expense in manufacturing industry.

2.2 Variable explanation and data source

The paper carries out empirical analysis by choosing data of manufacturing enterprises above designated size in 2013 and 2014. Due to incomplete data, the analysis is carried out by using data of 30 subsectors of manufacturing industry across 30 provinces in China.

As data is stemmed from manufacturing enterprises above designated size, which case is different from other researches measuring innovation level of manufacturing industry, the paper, based on status quo of manufacturing enterprises, chooses two dependent variables as parameters for measuring innovation level of manufacturing enterprises, first, as a parameter reflecting technical innovation ability, and second, the number of valid patents is used to measure technical innovation activity. See table 1 for detailed explanations:

Table 1   Variable Interpretations and Explanations

Variable type	Variable Name		Variable Code	Explanations
Dependent variable	Technical innovation level	Innovation	Y1	Innovation ability is calculated by utilizing sales revenue of new products
			Y2	Innovation activity is calculated by utilizing the number of valid patents
Independent variable	Agglomerating degree	Agg	X1	Measured by utilizing location quotient of each region
Control variable	Investment of R&D staff	Staff	C1	The number of R&D staff in manufacturing industry is calculated
	Technology import and technical transformation expense	EAR	C2	Calculation is performed by utilizing the combination of technology purchase, technology assimilation and technical transformation expense.

All data originates from China Statistical Yearbook (2013-2014), China Statistical Yearbook on Science and Technology (2013-2014), and China Statistical Yearbook on Industrial Economy (2013-2014).

3 Results Analysis

Considering short time span of data, we thus carry out analysis by using annual panel data. For data processing, processing on multicollinearity is firstly performed, with White's test showing presence of heteroscedasticity in the results. Thus, estimate is made by choosing generalized least squares method (GLS).

3.1 Nationwide population regression analysis

We estimate the coefficient of explaining variables by utilizing two cross-section data of nationwide manufacturing industry in 2013 and 2014, see Table 2 for results:

Table 2   Regression Results of Agglomeration of Nationwide Manufacturing Industry

Variables	2014		2013	
	lnY1	lnY2	lnY1	lnY2
lnX1	0.145**	-0.681***	0.453***	-0.387***
	（2.309）	（-6.352）	（15.054）	（-2.805）
lnC1	0.954***	1.332***	0.650***	1.126***
	（31.729）	（36.191）	（15.404）	（12.889）
lnC2	0.301***	-0.126***	0.549***	0.019
	（6.521）	（-3.304）	（11.663）	（0.317）
Constant term	0.924***	-1.910***	0.906***	-1.869***
	（5.667）	（-8.532）	（7.573）	（-7.59）
Adj R-squared	0.997	0.992	0.997	0.988
F statistics	3245.441	1176.08	3485.553	794.338
Sample size	30	30	30	30

Note: ***, **, *respectively represents significance at levels of 1%, 5% and 10%, and between brackets are corresponding t statistics of variables.

The regression results demonstrate that:

1) The agglomerating degree of manufacturing industry has positive influence on sales revenue of new products, but negative influence on the number of valid patents. This indicates the scale effect resulting from agglomeration allows new products to embrace a broader market, which drives enterprises to continuously develop new products. But conversely, agglomeration of manufacturing industry would also result in decrease in the number of valid patents, it indicates knowledge spillover incurred by agglomeration is increasing, thereby making enterprises' innovation activity decrease.

2) As is seen from different time period, agglomerating degree has different influences on innovation level. In 2013, the influence on sales revenue of new products was greater than as in 2014, but with less negative influence as in 2014.

3) The investment of R&D staff has great impact on scientific and technical innovation, and the increase of R&D staff would facilitate the enhancement of scientific and technical innovation level regardless of specific years.

3.2 Regional regression analysis

To understand influences brought in by agglomeration of manufacturing industry in different regions, we again perform GLS regression analysis of original data in terms of regions, with regression results shown in Table 3:

Table 3 Regression Results of Agglomeration of Manufacturing Industry in Terms of Regions

Variables	Eastern Region		Central Region		Western Region	
	lnY1	lnY2	lnY1	lnY2	lnY1	lnY2
lnX1	-0.430***	-1.080***	0.647**	-0.236**	0.774	-0.229
	（-4.147 ）	（-8.071）	（3.886）	（-3.134）	（1.284）	（-0.717）
lnC1	1.005***	1.337***	0.591**	1.246***	0.718***	1.222***
	（18.805 ）	（9.611）	（4.171）	（15.228）	（4.163）	（11.355）
lnC2	0.173**	-0.174*	0.885***	0.431 ***	0.727***	-0.073
	（3.469）	（-2.242）	（12.878）	（6.421）	（3.668）	（-0.939）
Constant term	1.496***	-1.635***	-0.844	-4.922***	-0.429	-1.653***
	（8.095）	（-4.582）	（-1.207）	（-26.266）	（-0.376）	（-5.760）
Adj R-squared	0.998	0.980	0.997	0.999	0.879	0.998
F statistics	2175.405	161.875	878.370	3300.149	25.144	1407.686
Sample size	11	11	8	8	11	11

Note: ***, **, *respectively represents significance at levels of 1%, 5% and 10%, and between brackets are corresponding t statistics of variables.

It can be seen from the regression results, the expression of the relationship between regional innovation level and agglomerating degree differs. As shown in regression results:

1) Both sales revenue of new products and number of valid patents had significant negative relationship with agglomerating degree in the eastern region in 2014, which indicated the agglomerating effect caused by manufacturing industry changed in the eastern region, and the market expanding effect caused by the agglomeration of manufacturing industry in the eastern region begun to turn from positive into negative, that is to say, the crowding effect of agglomeration of manufacturing industry in the eastern region begun to emerge.

2) In the central region, agglomerating degree had significant positive correlations with sales revenue of new products and significant negative correlations with the number of valid patents, but with different degree of impact. This indicated the market scale effect caused by agglomeration of manufacturing industry facilitated the improvement in enterprises' innovation ability, and meanwhile the deepening of agglomerating degree would also result in the decrease in technical innovation activity in the central region.

3) There was difference between the western region and the central region as well as the eastern region. The data in 2014 indicated the influence caused by agglomeration of manufacturing industry was not significant, and the agglomerating degree of manufacturing industry had no significant correlations with sales revenue of new products and the number of valid patents, which might be due to relatively weak foundation of manufacturing industry in the western region.

4 Conclusions

The paper first calculates the agglomerating coefficients of manufacturing industry by using regional and industrial data of manufacturing enterprises in 2013 and 2014, and then performs empirical analysis of relationship between agglomeration of manufacturing industry and scientific and technical innovation by utilizing generalized least squares method, with analysis results as follows:

First, the regional data shows agglomeration of manufacturing industry has influence on technical innovation, which effect is represented in increase in sales revenue of new products and decrease in the number of valid patents. The effect resulting from agglomeration of manufacturing industry is due to the fact that agglomeration would create a bigger market, and thereby exert market effect. Meanwhile, as agglomeration would result in knowledge spillover, enterprises can reduce cost of research and development by sharing knowledge with other enterprises, thereby reducing enterprises' technical innovation activity.

Second, innovation effect of agglomeration shows differently in various regions. The manufacturing industry in the eastern region has gained considerable development during last 40 years. Consequently, the market scale effect caused by agglomeration of manufacturing industry has been continuously weakened, and even the over agglomeration of manufacturing industry shows "crowding" effect, which effect would reduce regional technical innovation level. In contrast, the agglomeration of manufacturing industry in the central and western regions has no significant negative effect on regional technical innovation.

Third, the investment of R&D staff has significant positive effect on technical innovation. The increase in investment of R&D staff would significantly increase sales revenue of new products and the number of valid patents, and correspondingly, the technical innovation would rely more on investment of human capital.

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Analysis of Stakeholders in the Emergency Industry Based on Game Theory

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Abstract: With the development of emergency industry, the problem about stakeholders which are in the conflict of interest issues in emergency industry are increasingly prominent. the paper uses game theory to analyzes the relationship of involved stakeholders. then based on the incomplete information game, the specific analysis is made on each pair of stakeholders. At last, according to the game analysis, the paper explores the causes and effects of the conflict of interests between stakeholders, and puts forward the corresponding countermeasures and suggestions. The analysis is helpful to guide the stakeholders to make the right decisions in the conflict environment, promote the healthy development of the emergency industry as well.
Key words: Emergency industry; Stakeholders; Game theory

1 Introduction

In recent years, the sudden disasters occurred frequently in the world, and even have caused serious casualties and property losses. The emergence of the emergency industry is an opportunity, to a certain extent, to enhance the public's ability to respond to emergencies. Emergency industry is an emerging industry which is derived from the occurrence of public emergencies, mainly relating to the production of emergency products in emergency management and the supply of emergency services. However, as an industry, the object groups involved will have the corresponding conflict of interest. According to the "economic man" hypothesis: People always pursue their own best interests. Therefore, in this large group of emergency industry, if each stakeholder pursues its own interests, the conflict of interest will inevitably lead to the public interest can not be maximized. The introduction of game theory can help us to analyze how to make the related stakeholders reach the maximum profit.

It is of great practical significance to study the game process of stakeholders in the emergency industry. Many scholars have already done many researched in the field of emergency up to now. Priscilla, Murphy (1997) used game theory to study the conflict between the organization and the public in the crisis situation, they considered that the game theory helps people to identify specific decision-making models according to certain strategies. Fragnelli, Vito (2008) discussed the problem of emergency unit location based on game theory. Yang Jing, Chen Jianming (2005) thought that the whole process of dealing with emergencies are dynamic game process between emergency management and emergency management decisions. Zhang Xuxia (2007) studied the trust relationship between the government and the public in the process of emergency management of public emergencies based on a simple analysis of the behavior of the government and the public. Pang Hai Yun, Liu Nan (2012) aimed to a situation where short period of time cannot satisfy all disaster emergency needs, put forward a strategy of not completely extinguished the disaster and constructed a complete information non cooperative game model. Zhao Shuhong, Zhang Li (2010) analyzed various game relationship appeared in the process of emergency management, including subject and object.Yaojie (2005) analysed the dynamic game process between emergency management "crises" and "crisis management" in the framework of the dynamic game model , and discussesd how to use game model to make a plan. Yu Lei, Xue Huifeng (2008) introduced evolutionary game theory to study public health emergencies crisis management, and used Swarm to simulate the evolution of the game. Ma Xiangguo, Hui Liming (2013) used cost model to analysis the premise condition where government and enterprise cooperate and the game model of the cooperation of emergency material storage. Si Yaping (2008) accorded the government's attitude and messures in the process of public crisis management in view of the different interest groups of public crisis, to discuss strategies to crack the "prisoner's dilemma" game model using game theory. In general, game theory in the field of emergency is mainly concentrated in the field of emergency management, and for the emergency industry,the classification of stakeholders and the game analysis of the main stakeholders are lack of research. As a new industry, the game analysis of the stakeholders of the emergency industry will help the decision makers to make the right decisions in the conflict environment, and promote the healthy development of the emergency industry.

2 Stakeholders in the Emergency Industry

The emergency industry is a comprehensive industry which involves a lot of stakeholders, mainly including government, profit organizations (mainly refers to enterprises producing the emergency product or retailers), NGOs (charity or the masses, etc.), the media. The government plays an important role in the emergency industry as the main emergency supplies procurement, the storage as well as the supervisory, it has a direct interest relationship with profit organizations, non-profit organizations and the media.
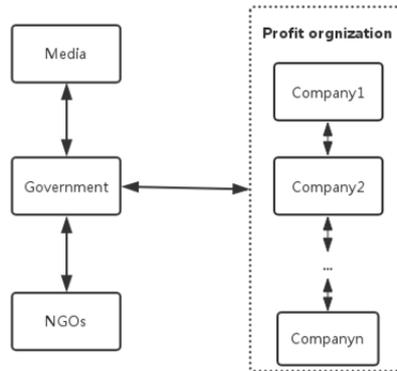
Figure 1   Game Relation Between stakeholders

Emergency industry operation depends not only a single subject but two or more interactions between the subject, and each subject have their own interests, the interests between different subjects may cause some conflict and collision, here comes to the analysis of the game between subjects. The following analysis are about the specific analysis of different subjects of the game analysis.

3 Game Analysis of Stakeholders

3.1 Game between government and profit organizations

In the whole operation of the emergency industry, the game between the government and the profit organization is mainly caused by the intention of cooperation between the two sides. In the event of an emergency, government and profit organizations can adopt a cooperative manner: the government can directly purchase from partners, on the contrary, nonprofit organizations can also derive income. But due to unexpected events, cooperation has a risk. Considering this risk, the paper analysis the game between government and profit organization.

3.1.1 Hypothesis

1) **Participant**. Participant include the government and the profit organizations. Assuming that both parties are fully rational, their decisions depend on the expected benefits that can be obtained. The decision of the government depends on the maximization of the overall interests of the society.

2) **Information**. For both government and profit organizations, information is not complete, whether the two sides are cooperative and non-cooperative are not sure, In this paper, it assumes that the probability of cooperation of the government is x, and the probability of the cooperation of profit organizations is y.

3) **Strategy**. it is assumed that there are two strategies for both the government and the profit organization, namely, cooperation(C) and non-cooperation (N).

4) **Payoff**. when the government does not cooperate, it need pay the betrayal cost C1, in the same situation, profit organizations need pay betrayal cost C2. The payment matrix is shown in table 1.

Table 1   Payment Matrix of Government and Profit Organization

		government	
		C（x）	N（1-x）
profit organization	C（y）	（A1，B1）	（-A2，B2-C1）
	N（1-y）	（A3-C2，-B3）	（A3，B2）

3.1.2 Game analysis

It can be seen from the payment matrix above, Whether government or profit organization, they don't select a particular action in each given information ,but choose a course of action randomly with

some probability, that is, the game between government or profit organization is a mixed strategy Nash equilibrium.

For the government, the expected payoff on the choice of cooperation is $M1=y*B1-B3*$（1-y）;otherwise, the expected payoff is $M2=y*（B2-C1）+(1-y)*B2$.Setting $M1>M2$,that is $y*B1-B3*$（1-y）$>y*$(B2-C1)+(1-y)$*B2$,therefore, $y>\frac{B3+B2}{B1+B3+C1}$.we can come to conclusion, when $y>\frac{B3+B2}{B1+B3+C1}$, the government chose cooperation as the optimal strategy; when $y<\frac{B3+B2}{B1+B3+C1}$, the government chose not to cooperate as the optimal policy.

For the profit organizations, the expected return on the choice of cooperation is $N1=x*A1-（1-x）*A2$;otherwise, the expected payoff is $N2=x*（A3-C2）+(1-x)*A3$.Setting $N1>N2$,that is $x*A1-（1-x）*A2>x*（A3-C2）+(1-x)*A3$,therefore, $x>\frac{A3+A2}{A1+A2+C2}$.There is a conclusion ,where $x>\frac{A3+A2}{A1+A2+C2}$,the profit organizations chose cooperation as the optimal strategy; where $x<\frac{A3+A2}{A1+A2+C2}$,the profit organizations chose not to cooperate as the optimal policy.

Under normal circumstances, the two sides choose to cooperate with the largest revenue, by the results show that when $x>\frac{A3+A2}{A1+A2+C2}$ and $y>\frac{A3+A2}{A1+A2+C2}$, the two sides of the optimal strategy is to cooperate, that is to say, the larger of both sides of the cooperation intentions, relatively speaking, the greater the payoff can get for both side. In other words, the game is fundamentally due to trust issues. On how to improve trust issues, it can be carried out with contract or the high cost of betrayal.

3.2 Game between the government and the media (and NGOs)

In the emergency industry, the media which can not be ignored have an important role in promoting the development of the emergency industry. However, 'Water carry a boat, can capsize them'. Sometimes the government needs to carry out effective supervision of the media to guide the public to the right direction of the event, while for media, false information can enable it to obtain additional benefits,for government, effective supervision need relatively supervision cost. Just like media, NGOs is an organization which can be helpful in emergency industry or do harm to industry, it need government's supervision. The game analysis is similar, so here,in this paper, we just analysis the game between the government and the media.

3.2.1 Hypothesis

1) Participant. Participant include the government and the media. Assuming that both parties are fully rational, their decisions depend on the expected benefits that can be obtained.

2) Information. For both government and media, information is not complete, in this paper, it assumes that the probability of government supervision is α, and the probability of false information of media is β.

3) Strategy. The government's strategy is {S, N}, S means supervision, N means not supervision ;the media's strategy is {F,Y},F means false, Y means right part.

4) Payoff. The payment matrix is shown in table 2.

Table 2　Payment Matrix for Government and Media

		Media	
		F （β）	Y （1-β）
Government	S （α）	（A-C+θD，B-θD）	（A-C，B）
	N （1-α）	（A-D，B+D）	（A，B）

A represents the government's payoff; B represents the media's payoff. When the government conscientiously perform their duties of supervision, supervision cost is C, media's additional income due to false information is D, but if the government find media publish false information , the media should accept θ（θ>1）times fine.

3.2.2 Game analysis

It can be seen from table 2, For the government, the expected payoff on the choice of supervision(S): $E1=β*（A-C+θD）+(1-β)*（A-C）$; the expected payoff on the choice of indulgence(N): $E2=β*（A-D）+（1-β）*A$. Setting $E1>E2$, namely $β*（A-C+θD）+(1-β)*（A-C）>β*（A-D）+$

（1-β）∗A, so $\beta > \frac{C}{(1+\theta)D}$. Therefore when $\beta > \frac{C}{(1+\theta)D}$,government choosing supervision(S) is the optimal strategy; when $\beta < \frac{C}{(1+\theta)D}$,government choosing N is the optimal strategy. For the media, the expected payoff on the choice of F: F1=α∗（B-θD）+（1-α）∗（B+D）;the expected payoff on the choice of Y: F2=α∗B+（1-α）∗B=B. Setting F1>F2,namely α∗（B-θD）+（1-α）∗（B+D）>B, so $\alpha < \frac{1}{1+\theta}$ .therefore, when $\alpha < \frac{1}{1+\theta}$, the media choosing Y is the optimal strategy; when $\alpha > \frac{1}{1+\theta}$, the media choosing N is the optimal strategy.

Seen from the game result between the government and the media, media are always rational and always pursue the maximization of their own interests without considering α and β. Once introducing α, media have to make a balance between payoff and risk, when government increase α, media will consider if it is worthy of risking for the additional income or taking strategy N for safe payoff. On the other hand, once β increase, the government will increase α for the maximum interest for society. The media are always rational and pursue, the government regulation of the media have obvious effect, government regulation will significantly curb the media of false information spread. Therefore, whether media choose the F strategy or N strategy, government should invest a certain fund to supervise. In order to effectively prevent and resolve such incidents, the cooperation of government and media is needed.

3.3 Game between profit organizations

With the development of the emergency industry, the profit organization is increasing rapidly, which makes the market saturated. The competition between the suppliers and the suppliers is more and more fierce. In the supply of emergency products, in order to maximize their own interests, profit organizations will choose a price reduction strategy in their own range. The game between profit organizations is similar to the prisoner's dilemma, if both sides trust each other, the overall income is the largest, but in reality, people are rational and always pursue to maximize their own interests, unfortunately it finally leads to the unwise results.

3.3.1 Hypothesis

1) **Participant**. Participant include organization1 and organization2. Assuming that both parties are fully rational, their decisions depend on the expected benefits that can be obtained.

2) **Information**. For both government and media, information is not complete.

3) **Strategy**. The strategy is both D (decrease price) or N (not decrease price)

4) **Payoff**. Assuming organization1 and organization2 both choose N, the obtained income is 800 yuan; One choose N and One choose D, the side who choose D obtain 1000, the other side obtain 350; both side choose D gains 600. The payment matrix is shown in Table 3.

Table 3   Payment Matrix Between Profit Organizations

		Orgnazition2	
		D	N
Orgnazition1	D	（600,600）	（350,1000）
	N	（1000,350）	（800,800）

3.3.2 Game analysis

Seen from the payment matrix between profits organizations, this game exists two Nash equilibrium strategy: {D, D} and {N, N}, it seems that {N, N} strategy is superior to {D, D} strategy, whether for profit organization1 or profit organization2. But in reality, the final equilibrium is often the same as the strategy {N, N}. Because people often have to consider each other's betrayal of the consequences in a real life.

In emergency industry, It seems that lower prices benefit for the purchaser, but in a long run,it is not conducive to industrial development, this kind of price competition will eventually lead to industry entry barriers for new businesses or retailers. So how to avoid the "prisoner's dilemma"?

1) 'Tit for tat' (Robert Axelrod, 1980). That is, the game party first to adopt a cooperative strategy {N,N}, then adopt strategy same with the other part's strategy. Because the profit organization is not a simple one-time game, but a repeated dynamic game. Therefore, the two sides may start from the long-term interests of the game, and then choose the strategy of cooperation;

2) Third party participation. when the game of the two sides strapped into the prisoner's dilemma,

the introduction of third party players can change the pattern of the game, Here the third party is mainly refers to the government or some regulatory authorities. The three party game together can break the structure of the original game, so as to avoid the occurrence of vicious price war.

4 Conclusions

In this paper, through the game analysis of stakeholders in the emergency industry, the game relationship between stakeholders of emergency industry is systematic discussed. Meanwhile, the game model between different stakeholders and stakeholders is established based on game theory. This paper study is helpful for stakeholders to make a right decision in an conflict situation, and promote the healthy development of the emergency industry as well. However, in this paper, game theory is just applied under many assumptions and limitations, in practical situation, the situation as well as the game mode is often more complex, which is the shortage of this research and it need to be further studied.

Acknowledgement

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The Determinants of Technological Innovation Adoption in SMEs Manufacturing in Malaysia

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Abstract: technological innovation (TI) progress and growth has long been considered as the heart of development. For many years technological innovation adoption was significant with the growth of productivity in SMEs manufacturing sector. Diffusion of Innovation (DOI) and Technology -organization –environment (TOE) framework provides insight into the determinations influencing of TI adoption process. Several gaps have prompted this research including the lack of non-western (particularly Malaysian country) perspectives in the TI adoption literature. Apart from that there are lack of empirical research on the relationship between the adoption of TI and firm performance; and most empirical studies are derived from the DOI theory and the TOE framework as complete model to be considered. Data collected from National Survey of Innovation (NSI) 2012 with 445 firms in Malaysia are used to test the related hypotheses. Structural equation modelling (SEM) was used to empirically assess the research model. Smart-PLS software was used to assess the reliability and validity of the measurement models and structural models. Among the innovation characteristics, we find that compatibility is the strongest driver in determinants of TI adoption. Among the TOE variables, technology contexts are the greater effect on the TI adoption.
Key words: Technological innovation; Diffusion innovation; Technology-organization-environment

1 Introduction

Technological innovation (TI) adoptions has been one of the extensively researches areas. Studies on technological innovation adoption have aimed to understand, predict and explain variables influencing adoption behaviour at individual as well as organizational levels to accept and use the TI. These studies have developed a conceptual models and frameworks to understand the relationship of these variables with the adoption determinants. Therefore, this study makes an attempt to investigate, and acknowledges greater significance of Diffusion of Innovation (DOI) and technology –organization -environment (TOE) framework to explained the determinant of TI adoption. Furthermore, it supports the integration using the set of variables explaining the adoption TI on how the two models can be integrated for better explanation the determinant of TI adoption.

2 Literature Review

Two theories are commonly used in TI and adoption studies in organizations namely DOI theory and TOE Frameworks. Others theories such as technology acceptance model (TAM), theory of planned behaviour (TPB), unified theory of acceptance and use of technology (UTAUT) and etc. are commonly used to determinants the TI adoption in individual level.

DOI theory (Roger, 2003) is a prominent adoption model used in technological innovation research such as in information system research. The theory proposes five attributes that explain the adoption of innovation in an organization. 1) Relative advantage: define as the extent to which an innovation is better than the previous generation; 2) Compatibility: the degree to which an innovation can be assimilated into the existing processes, practices, and value systems; 3) Complexity: the level of difficulty to use the innovation; 4) Observability: extend to which the innovation is visible to others; and 5) Trialability: the ease of experimenting with the innovation.

TOE framework (Tornatzky and Fleischer, 1990) is developed to explain the process of innovation in the context of an enterprise. It considers three features of an enterprise that influence the adoption of technological innovation namely technology, organization and environment. 1) Technology context: refers to the internal and external technology relevant to the organization, and the technologies that are available for possible adoption. 2) Organization context: refers to the characteristics of the organization such as scope, size, and managerial structure, degree of centralization, resources and communication among employees. Finally, 3) Environment context: refers to the area in which a firm conducts its business, referring to its industry, competitors, and dealings with the government.

3 Research Model and Hypotheses

The integrative model is shown in Figure 1. The model is combining the innovation characteristics of cloud computing with the technology, organization and environment context of the TOE framework.
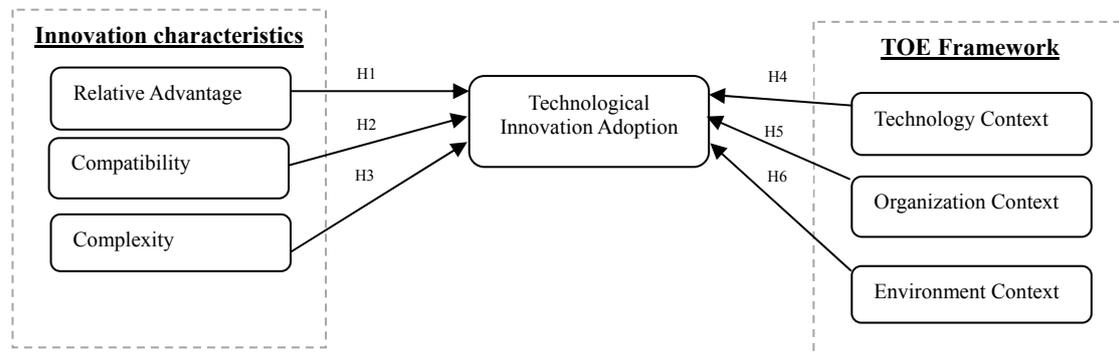
Figure 1　Research Model

Relative advantage is defined as the degree to which an innovation is perceived as being better than the idea it supersedes (Roger, 1995) and perceived as providing better organizational advantages than either the status quo or its precursor (Wu & Chuang, 2010). Most of innovation adoption studies have particularly emphasized that the impact of relative advantage attribute enhance the likelihood of innovation adoption (see Oliveira et al. 2014, Wu & Chen, Lin 2013, Wu and Chuang 2010, Kuan & Chau 2001 and etc.). Since the adoption of technological innovation will benefit and advantage in creating effectiveness in both producing and processing product hence to increase the firm productivity, therefore the merits will positively influence its adoption. Accordingly, the following hypothesis is proposed:

H1. Relative advantage will have a positive effect on technological innovation adoption.

Second DOI attributes that consider in the framework is complexity. Complexity is defined as the degree to which an innovation is perceived to be relatively difficult to understand and use. The attribute has been indicated as negatively associated with adoption of innovation and it is an inhibitor for successful implementation (Wang et al. 2010). Lack of qualified personnel in conducting new technology may lead to reluctant to adopt the new technology. Therefore, the following hypothesis is proposed:

H2. Complexity will have negative effect on technological innovation adoption.

Finally, the third DOI attribute in the framework is compatibility. As relative advantage attribute, compatibility is positively associated with innovation adoption. Rogers defines compatibility as the degree to which the innovation fits with potential adopter's existing value, previous practices, and current needs. Even though compatibility to be relative less important in determinant the innovation adoption (Rogers, 1983) however in this context of study technological compatibility is important in order to be consistent with the business operation and needs. Therefore, compatibility may be an important determinant of technological innovation adoption. Thus,

H3. Compatibility will have positive effect on technological innovation adoption.

The technology context refers to both the internal and external technological characteristics relevant in the organization (Zhu et al. 2002; Oliveira et al. 2014). As for this study, technology context will represent by technology competence as adoption driver. This will consist two predictors to determinant of adoption namely technology infrastructure and training (Zhu et al. 2002). Technology competence are found to be significant adoption facilitator whereby technology infrastructure and training are believed to produce new or significantly improved goods, services, production processes, or delivery method and gaining knowledge know-how through internal and external training. These perspective lead to the following hypothesis:

H4. Technology context will have significant effect on technological innovation adoption.

Organization context is referring to descriptive measures about organization such as scope, size and managerial structure (Oliveira & Martin, 2011). Firm characteristic which includes year of establishment (firm maturity) and firm size has been consistently recognized as an adoption facilitator (see Zhu et al. 2002; Zhu, Xu, & Dedrick, 2003;Zhu & Kraemer, 2005; Lin, 2014; Awa et al. 2012). Literature search for technology adoption and user acceptance models and frameworks used in the past

research by Hameed et al. (2012) found that organization size (firm size) is the most significant factors in the technological innovation adoption. With regard to technological innovation adoption, larger firms have several advantages over small firms in term of financial and the firm capacity. Beside that larger firms are more likely to achieved economies of scale, bearing the high risk of adoption and possess more power to urge trading partners (Zhu et al. 2002).

Top management support have been found to be positively related to technology adoption (Wang et. al 2010; Cao, Jones, & Sheng, 2014). In this study, management support is one of the reason for the adoption of technological innovation. Hameed et al. (2012) literature analysis also found that top management support is among the most considered factors and found significant in the innovation adoption studies.

One of the inhibitors for technological innovation an adoption in the organization is cost (Coa et al. 2014; Kuan & Chau, 2001). Cost too high, lack of funding internal and external are the reasons for reluctant to adoption. It is important to the business industry to getting the funding for innovation activities to overcome the adoption cost. The funding can be internally and externally. Therefore, perceived financial funding is identifying as important factors for technological innovation adoption.

New variable that should be consider in this study that is management awareness of National Innovation Model (NIM). In NIS 2012 objectives, one of its objective have emphasize on the important of NIM in order to transform the country from a resource based economy to innovation based economy; to adopt a balanced approach to market-driven and technology-driven innovation and to raise the country's capacity for knowledge, creativity and innovation and nurture "first classmentality" among organization. Therefore it is important to consider the management awareness of NIM in organization context.

H5. Organization context will have significant effect on technological innovation adoption.

Research has shown that external environment plays an important role in the adoption of technology through a numbers of environmental attributes such as competitive pressure (see Zhu & Kraemer, 2005; Oliveira et al. 2014), external pressure (Coa et al. 2014; Kuan & Chau, 2001), government support (Kuan & Chau, 2001) and regulatory support (Zhu & Kreamer, 2005). Those attributes have been examined and found to be significant (see Hammed et al. 2012). In the context of this study external pressure, partnership quality and regulatory pressure will be examined to the technological adoption.

External pressure or so called referred to the influences from the external business environment (Kuan & Chau, 2001). Competitive pressure can be referred to the market dominated by establishment enterprise. Reluctant to adopt technological innovation in order to create new product good or new processes given more advantages to others establishment to dominate the industries. Other than that, innovation is easy to imitate, this may be a challenges to the business industries. As market competition increases, firms may feel the need to seek competitive advantage through innovations (Wang et al. 2010). Thus, external pressure plays a significant role in pushing firms toward to adopt technological innovation.

Partnership quality may also influence the adoption through it collaboration in creating innovation activities in the industries. This is due to fits the business partners (supplier and main customers) that adopted innovation (Wang et al. 2010).

Regulatory support is another critical environmental factor that influence to effect innovation adoption. Regulatory support is refers to government policies to support or encourage the adaptation of innovation activities in the firm (Zhu, Kraemer, & Xu, 2006). Government regulatory might have either beneficial or a detrimental effect on innovation (Baker, 2012). However, difficulty in fulfil regulation and standard by government can extent the adoption. Other than that insufficiently flexibilities or regulation or standard and limitation of science and technology public policy may also hamper the adoption. Accordingly, the following hypothesis is proposed:

H6. Environment context will have significant effect on technological innovation adoption.

4 Methodology

This study is using a cross-sectional secondary data. Data collected from National Survey of Innovation (NSI) 2012 with 445 firms in Malaysia are used to test the related hypotheses. Structural equation modelling (SEM) was used to empirically assess the research model. Smart-PLS software was used to assess the reliability and validity of the measurement models and structural models. This study is using secondary data; therefore the used of the measurement items for constructs is based on

comprehensive review of literature and empirical studies; and the items is relying on relevance and availability of the data.

a) Measurement Design

There are four influential factors were identified in this study as antecedent variables technological innovation adoption: innovation characteristic from DOI theory with the three main items namely relative advantage, complexity and compatibility; whereas the TOE framework with its three main variables namely technology context, organizational context and environment context. Whereby, firm performance variables will be as dependents variable.

Innovation characteristic was measured by relative advantage which explained by perceived benefits and perceived cost saving; knowledge factors will lead to complexity measurement and rate of innovation activities influences will be used to measure compatibility. For TOE constructs, technology context will be measured by 2 main items that is technology infrastructure and innovation training; Firm size, perceived financial funding and management support will be use to measures organization context; and environment contexts will be measured by three main items such as external pressure, partnership quality and regulatory pressure.

5 Results

a) Measurement models

There are two evaluations of the measurement models, reflective and formative models must be distinguished. The two approaches are based on different concepts and required different evaluation measure (Hair et al., 2014). For this study, only reflective measurement models evaluation are used to assess on their internal consistency reliability and validity. Three specific measures include composite reliability (to evaluate internal consistency), convergent validity (evaluate by individual indicator reliability and average variance extracted (AVE)) and discriminant validity (using Fornell-Larcker criterion and cross loading).

This section discusses the latent variables of the scales used in the study based on: the internal consistency reliability, indicator reliability, and convergent validity (Hair et al., 2014). Basically, there are eight latent variables with reflective measurement models are used in this study namely, relative advantage (RA), compatibility (COM), complexity (CMPLX), technology context (TC), organization context (OC), environment context (EC), and technological innovation adoption (TIA). For reflective measurement models, one need the estimates for the relationships between the reflective latent variable and their indicators.

After performing the assessments, one of the major construct that is relative advantage was deleted from the model and all the indicators below than 0.58 were dropped from further analysis. RA is dropped from the measurement model due to low indicator outer loading (below 0.5) and the value of CRs and AVEs does not exceed the threshold value 0.06 to 0.70 and 0.50 respectively. Therefore, only seven out of eight latent variables are considered for further analysis.

Table 1   Fornell-Lackers Criterion

Construct	1	2	3	4	6	7	8	9
1. CPX	**0.842***							
2. CPB	-0.214	**0.727***						
3. EC	0.073	0.027	**0.749***					
4. FS[a]	0.127	0.010	-0.083	single-item construct				
5. MS[a]	0.123	0.091	0.287	0.164	**0.863***			
6. NIM[a]	0.039	-0.031	0.063	0.051	0.201	**0.87***		
7. TIA	-0.158	0.106	-0.339	0.009	-0.025	-0.025	**0.799***	
8. TC	-0.113	-0.017	-0.302	-0.264	-0.254	-0.142	0.357	**0.763***

*Square root of the AVE on the diagonal (in bold).
[a] first order construct of the higher-order construct organization context

Fornell-Larcker criterion and cross loadings allow checking for discriminant validity. As shown in Table 5.1, the square root of the AVE is greater than the recommended 0.50 values. The square root of AVE each construct each construct is higher than the construct's highest correlation with any other construct in the model. The square root of the reflection constructs' AVE on the diagonal and the

correlation between the construct in the lower left triangle (i.e. construct CPX has value of AVE2 = 0.842, is higher than all correlation value in column 1).   Overall, the square roots of the AVEs for the reflective constructs CPX (0.842), CPB (0.727), EC (0.749), MS (0.863), NIM (0.87), TIA (0.799) and TC (0.763) are all higher than the correlations of these constructs with other latent variables in the path model.

Alternatively, one can check the cross loading to check the discriminant validity when an indicator's loading on a construct is higher than all of its cross loading with other constructs,   i.e. indicator CPX1 has value of 0.71, which highest value for loading with its corresponding construct CPX, while all loadings with other constructs are considerably lower (e.g. CPX1 on CPB: -0.149).   The same finding holds for the other indicators of CPX as well as the indicator measuring CPB, EC, MS, NIM, TIA and TC (see Table 2).

Table 2   Cross Loading

	CPX	CPB	EC	FS	NIM	MS	TIA	TC
CPX1	**0.713**	-0.149	0.325	0.201	0.140	0.416	-0.101	-0.238
CPX2	**0.882**	0.087	0.393	0.149	0.182	0.532	0.067	-0.230
CPX3	**0.915**	0.085	0.445	0.071	0.168	0.563	0.013	-0.153
CPB1	-0.004	**0.685**	0.032	-0.003	0.025	0.099	0.063	0.012
CPB2	0.000	**0.692**	0.029	0.009	-0.054	0.061	0.074	-0.061
CPB3	-0.022	**0.832**	-0.023	-0.017	-0.086	0.010	0.098	0.026
CPB4	0.095	**0.692**	0.066	0.052	0.059	0.130	0.068	-0.077
EC10	0.171	0.005	**0.810**	-0.094	0.038	-0.017	-0.278	-0.230
EC4	0.481	0.022	**0.603**	0.013	-0.007	0.650	-0.191	-0.311
EC5	0.551	0.023	**0.627**	-0.057	0.073	0.597	-0.245	-0.166
EC6	0.206	0.027	**0.830**	-0.077	0.061	0.001	-0.280	-0.251
EC8	0.206	0.027	**0.830**	-0.077	0.061	0.001	-0.280	-0.251
OC1	0.162	0.012	-0.077	**1.000**	0.051	0.168	0.004	-0.259
OC5	0.195	-0.037	0.032	0.077	**0.924**	0.195	-0.023	-0.137
OC6	0.191	-0.030	0.090	0.024	**0.703**	0.204	-0.025	-0.187
OC10	0.572	0.053	0.316	0.136	0.224	**0.923**	0.036	-0.224
OC11	0.560	0.088	0.360	0.166	0.187	**0.902**	-0.073	-0.243
OC8	0.468	0.049	0.361	0.055	0.135	**0.708**	-0.088	-0.249
OC9	0.478	0.118	0.282	0.206	0.143	**0.902**	0.064	-0.256
ORG1	-0.095	0.119	-0.314	0.050	-0.060	-0.104	**0.809**	0.239
ORG2	-0.053	0.090	-0.286	0.000	0.026	-0.045	**0.847**	0.306
ORG3	0.050	0.036	-0.257	0.021	-0.050	0.014	**0.884**	0.374
PCS2	0.107	0.109	-0.250	-0.073	0.014	0.115	**0.639**	0.195
TC1	-0.190	-0.053	-0.287	-0.325	-0.156	-0.230	0.257	**0.770**
TC3	-0.381	-0.093	-0.325	-0.150	-0.279	-0.385	0.264	**0.818**
TC4	-0.065	0.021	-0.116	-0.270	-0.071	-0.088	0.290	**0.700**
TC5	-0.036	0.051	-0.244	-0.066	0.055	-0.089	0.282	**0.758**

b)   Summary for reflection measurement models

Table 3 summaries the results of the reflective measurement model assessment (rounded to three decimal places).   As can be seen, all model evaluation criteria have been met, providing support for the measures' reliability and validity.

Table 3   Results Summary for Reflection Measurement Models

Latent variables	No. of item(s)	Indicator	Loadings	Indicator Reliability	Composite Reliability	AVE	Discriminant Validity?
Complexity (CPX)	3(3)	CPX1	0.713	0.508	0.878	0.708	Yes
		CPX2	0.883	0.779			
		CPX3	0.916	0.838			
Compatibility (CPB)	4(4)	CPB1	0.685	0.469	0.817	0.529	Yes
		CPB2	0.692	0.479			
		CPB3	0.831	0.690			

		CPB4	0.692	0.478			
Technology Context (TC)		TC1	0.771	0.594	0.847	0.582	Yes
		TC3	0.819	0.670			
		TC4	0.699	0.489			
		TC5	0.757	0.573			
Organization Context (OC)	7(11)	OC1	Single item		0.803	0.519	Yes
		OC5	0.924	0.853			
		OC6	0.709	0.503			
		OC8	0.868	0.753			
		OC9	0.872	0.760			
		OC10	0.915	0.837			
		OC11	0.893	0.797			
Environment Context (EC)	5(11)	EC10	0.814	0.663	0.862	0.561	Yes
		EC4	0.603	0.360			
		EC5	0.627	0.393			
		EC6	0.834	0.696			
		EC8	0.834	0.696			
Technological innovation adoption (TIA)	4(9)	ORG1	0.809	0.654	0.874	0.638	Yes
		ORG2	0.840	0.646			
		ORG3	0.884	0.781			
		PCS2	0.639	0.408			

c)   Assessment of structural model

The assessment of the structural model will be addressed once the measurement models have confirmed that the construct measures are reliable and valid.   The assessment involves examining the model's predictive capabilities and the relationships between the constructs.   The central criterion for evaluation the structural measurement model are the significant of the path coefficients, the rate of reliability R^2 of the latent endogenous, the f^2 effect size, the predictive relevance Q^2, and the q^2 effect size (Chin, 1998; Stone, 1974; Henseler et al., 2009; Hair et al., 2012; Hair et al., 2014).

Before doing the assessment of structural model, collinearity of the structural model is examined. To assess collinearity, statistic software package, IBM SPSS Statistic 22 is used to run the multiple regressions between independent and dependent variable in structural model.   With the exception of the collinearity analysis, the results of the regression analysis do not matter and are not further analyzed. The only result that is important for assessing collinearity issues is the VIF (or tolerance). Each predictors construct's tolerance (VIF) value should be higher than 0.20 (lower than 5). Otherwise, consider eliminating construct, merging predictors into single construct or creating higher-order constructs to treat collinearity problems (Hair et al., 2014). As show in Table 4, all VIF values are the threshold value of 5. Therefore, collinearity among the predictor constructs is not the issue in the structural model.

Table 4   Collinearity Assessment

Construct	Collinearity statistics	
	Tolerance	VIF
Complexity	0.936	1.069
Compatibility	0.951	1.052
Technology context	0.868	1.152
Organization context	0.927	1.079
Environment context	0.894	1.119

d)   Path coefficient estimates for the main effects model

The results showed that complexity is not significant to technological innovation adoption while the others four main construct namely compatibility ($\beta=0.07$, $p<0.05$), technological context ($\beta=0.26$, $p<0.01$), organization context ($\beta=0.14$, $p<0.01$) and environment context ($\beta=-0.20$, $p<0.01$)

are significant to the technological innovation adoption. Environment context have negative effect on technological innovation adoption whereas compatibility, technology context and organization context have positive effect on technological innovation adoption. This supported the hypothesis H3, H4, H5 and H6. Among the four construct technology context have the greater effect on determinant of technological innovation adoption. Table 5 below displays the path coefficients, t values and their significance levels, and the 95% confidence intervals for the main effects model, it shows the results of the main effect of the structural model.

Table 5   Significant Testing Results Of The Structural Model Path Coefficients

Path	Coefficient	t-value	95% CI
Complexity → Technological Innovation Adoption	-0.09	0.71	NS
Compatibility → Technological Innovation Adoption	0.07*	1.66	(0.08, 0.10)
Technology Context → Technological Innovation Adoption	0.26**	4.69	(0.22, 0.24)
Organization Context → Technological Innovation Adoption	0.14**	2.41	(0.09, 0.10)
Environment Context → Technological Innovation Adoption	-0.20**	4.45	(-0.21, -0.19)

t-values > 1.645* (p< 0.05); t-values > 2.33** (p< 0.01)

e) Test of hypotheses on direct effect between exogenous latent variables and endogenous variable

Hypotheses H1, H2 and H3 are derived from DOI attribute theory. Hypothesis H1 suggests that relative advantage will have a positive influence on technological innovation adoption however the variable has been remove from the model due to its weaknesses to fulfil the criteria of the measurement model assessment. Therefore relative advantage in this study is not examined for hypothesis test. Hypotheses H2 suggest that complexity will have negative effect on technological innovation adoption. The results do not support this hypothesis at the $p < 0.05$ level (t = 0.705, p = 0.240). The results show significant supports for hypothesis H3 that suggest compatibility will have positive effect on technological innovation adoption at significant level $p < 0.05$ (t = 1.655, p = 0.049). Therefore, only compatibility attribute of DOI theory have significant influence on technological innovation adoption in this study.

Hypotheses H4, H5 and H6 derived from TOE framework developed by Tornatzky and Fleischer (1990). Hypotheses H4, H5 and H6 suggest that technology context, organization context and environment context will have significant effect on technological innovation adoption. The results show strongly significant supports for these three hypotheses. Moreover, hypotheses H4, H5 and H6 are all significantly supported at the higher significance level of $p < 0.01$ with (t = 4.819, p = 0.00), (t = 2.414, p = 0.00), and (t = 4.451, p = 0.00), respectively. Hypothesis H4 and H5 have positive significant influence to technological innovation adoption while H6 have negative significant influence to technological innovation adoption.

Table 6   Summary Of Result Of Hypotheses Testing

Theory	Hypothesis	Relationship	t-value	p-value	Decision
DOI	**H1.**	Relative advantage will have a positive effect on technological innovation adoption.	N/A	N/A	N/A
	H2.	Complexity will have negative effect on technological innovation adoption.	0.705	0.240	Not supported
	H3.	Compatibility will have positive effect on technological innovation adoption.	1.655*	0.049	Supported
TOE	**H4.**	Technology context will have significant effect on technological innovation adoption.	4.819**	0.00	Supported
	H5.	Organization context will have significant effect on technological innovation adoption.	2.414**	0.00	Supported
	H6.	Environment context will have significant effect on technological innovation adoption.	4.451**	0.00	Supported

t-values > 1.645* (p< 0.05); t-values > 2.33** (p< 0.01)

6 Discussion

This study demonstrated the value of using DOI theory and TOE framework to understand technological innovation adoption. The empirical results indicated that there were significant determinants in each context of the DOI and TOE framework. Thus, determinants affecting the

adoption of technological innovation in the SMEs manufacturing industry should include not only the innovation characteristics of the technology itself, but also factors related to the internal organization and the external environment.   Thus, the discussions about each determinants affecting technological innovation adoption were obtained as follows:

DOI theory

In general, the three DOI attributes (i.e. relative advantage, complexity and compatibility) were important antecedent on technological innovation adoption.   In many literatures, among the three attributes, relative advantage (H1) is more important than others in determinant of the adoption (Wu and Chuang, 2010).   In this study relative advantage is not relevance to the adoption.   Complexity (H2) was found insignificant to the adoption.   This may due, the firm can hired outsourcing to overcome the obstacle to the nature of complexity that relatively associated with difficult to understand and use. However, in the earlier study by Wu and Chuang (2010) found that complexity has significant influence on technological adoption. In contrast, compatibility (H3) has positive significant relationship with technological innovation adoption with significant level $p < 0.05$ and $\beta = 0.073$ which explain 7.3% of variance in the technological innovation adoption.   This may due to firm consistent with the business operation and needs.   However the study by Oliveira et al. (2014) found that compatibility was significant in service sector and insignificant in manufacturing sector.   Thus, compared to the earlier study, the results for DOI attributes are mixed and more investigation is needed to reach a definitive conclusion.

TOE framework

Many studies found that TOE has significantly relationship with technology adoption (see Cao et al., 2014; Oliveira and Martins, 2008; Liu, 2008; Zhu and Kraemer, 2005; Zhu et al., 2003; Kuan and Chau, 2001 and etc.).   Consistent with the previous study, TOE was found to have significant relationship with technological innovation adoption in this study.   Technology context (H4) and organizational context (H5) was found to have a significantly positive effect on firm decisions to adopt technological innovation.   Meanwhile environment context (H6) was found to have a significantly negative effect on the adoption.   Among the three aspects, technology context has a greater effect on the adoption.   Thus the finding is consistent with that Wu and Chuang (2010), Kuan and Chau (2001), Zhu and Kraemer (2005).   A reasonable explanation could be that the firm believed that technological innovation adoption by purchase advanced technology and proper innovation training will benefits the firm to improved goods, production, processes and delivery methods.

As posited, organization context is found to have significant effect on technological innovation adoption.   The technological innovation adoption is influenced by the management awareness of National Innovation Model 2007 and management support.   The SMEs believed that the national vision of National Innovation Model is to transform the country from resource based economy to innovation based economy and capable to adopt a balanced approach to market-driven and technology-driven innovation in Malaysia context.   Management with more positive attitude towards change and have ability to devote staffs to innovation activities could lead to technological innovation adoption.   This empirical result corroborates with the findings from others scholars who validated the significant role of management support and IT attitude on technological innovation adoption (T. Ramayah et al., 2016; Al-Qirim, 2005; Lin, 2006).

7 Conclusions

This study sought to explore the patterns of technological innovation adoption by SMEs manufacturing sector in Malaysia.   The factors influencing the adoption are explored base on the DOI theory and TOE framework.   The research model is constructed comprehensively with factors related with innovation characteristics (relative advantage, complexity and compatibility), technology context, organization context, and environment context. The data is analysed with structural equation modelling using SmartPLS 2.0 to examine the model.

The determinant of technological innovation adoption is influence by several factors within innovation characteristics and technology-organization-environment contexts.   Among the three DOI attributes, compatibility found to be significant effect on the technological adoption, meanwhile, relative advantage are not recognized in this study and complexity are found to be not significant.   This study empirically verifies and supports the applicability of TOE framework in the understanding technological innovation adoption.   The TOE framework provides a good starting point for analyzing and considering suitable factors that can influence business innovation adoption decisions.   This study

found that, all the TOE factors are found to be significant in this study. This study found the management awareness of National Innovation Model 2007 significant determinant the technological adoption, which were seldom explored in the prior innovation adoption research. This study empirically uses a large and representative sample which consists of several technological innovation adoption decision makers in the Malaysian manufacturing industry. Thus, the findings of this study are valuable and provide several implications for technological innovation adoption research and practice. This study has following implications for researchers and practitioners initiating on considering technological innovation adoption:-

i.For researchers: this study proposes comprehensive model that features DOI and TOE framework as determinants regard to technological innovation adoption. Apart from that, these model can be used to study other types of technological innovations.

ii.For practitioners: Top management and IS executives need to assess their technological innovation investment that will implies with the firm's compatibility in both physical infrastructure and intangible knowledge including acquisition other external knowledge.

iii.This study emphasizes that it is imperative for firms to pay as much attention to the internal technological innovation activities with their integration trading partners and government regulations.

However, this study has several limitations that also represent opportunities for future research. Since the sample is based on only one country, it may not be sufficient to generalize to the entire population of the manufacturing industry in the world. Furthermore, because the sampling frame of this study was the SMEs list manufacturing firms in Malaysia, these firms might have less resources and capabilities to be able to afford technological innovation adoption investments and risk. For this reason, the adoption rate may be lower than the technological innovation adoption rate in Malaysia or others countries. Thus, caution needs to be exercised in generalizing our findings to the entire industry population in Malaysia or others countries.

Finally, although this study focused on general technological innovation, its fail to differentiate between factors that influence each of the technological. This study is using secondary data, the variables is restricted to availability of the data. Therefore, further research can be performed on non-adopters to determine the differences in the DOI and TOE factors between adopters and non-adopters.

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Study on the Applied and Innovative Personnel Training System of Universities in the New Industrial Revolution Background: A Case Study of the Automobile Engineering Specialty

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Abstract: Training applied innovative talents become an important measure of Chinese industrial revolution to seize the new opportunity. Based on the comparative analysis of the similarities and differences between academic, applied, skilled personnel training methods, combined with "old third theory(stomatology, information theory, cybernetics(SCI))" and "new third theory(theory of the dissipative structure, synergetic and catastrophe theory（DSC))", this paper explores the applied innovative talents in university and how to build systems, and make an example of automotive specialty aim at putting forward hierarchical structure and composition of elements of the applied and innovative personnel training system Then the essay discussed the mechanism design and application mechanism of the applied and innovative personnel training system under the Perspective of "flow" and "potential" visual threshold.
Key words: The New Industrial Revolution; "third theory"; Applied innovative talents; Automotive undergraduate

1 Introduction

For seizing the opportunity of the new round of industrial revolution, all countries in the world have launched to seize the world manufacturing industry at the forefront of the national strategy, for example, Germany have launched "industrial 4.0" plan, the United States have launched the "American Innovation Strategy", the Japanese have launched " Our Growth Plan: Science and Innovation in 2015", the China have launched "2025 strategy to conform to the needs of the times, therefore, a new round of technological revolution and industrial revolution and to accelerate transformation of the mode of economic development to form the historic intersection in China, Chinese Minister of industry and information Miao Wei pointed out that the biggest advantage in China is that there were a number of strong talent resources, and it's an urgent problem to solve that how to transforming talent resources into talent capital. National Conference on science and technology in 2006 pointed out that applied innovative talent training is an important strategic choice for China to build innovation oriented country, in 2007 the Ministry of education issued the documents " under the concept of popular education, the training of undergraduate level applied innovation talents should be different from the academic and research talents, and should be different from the training of skilled personnel". In 2010, "focusing on expanding the application type, compound type, skill type talent cultivation scale" is enshrined in the < National long-term reform and development plan (2010-2020)>. By 2015, the State Council approved the <Overall plan to promote the development of world - class universities and first - class disciplines>, also put forward "to strive to cultivate a sense of historical mission and social responsibility and full of innovative spirit and practical ability of all kinds of innovative type, application type, compound type talents".

At present, there is no unified concept of "Applied Creative Talents", scholars expanded research from different perspectives, Fan Hua (2006) believes that "Applied Creative Talents" is a relative research (theoretical) talent, they believed that the carrier was the application of innovative talents to make science and technology into real productivity. Zhang Xuehong (2012) believed that innovative talents were mainly based on the needs of the market, the discovery, invention, creativity could become a practice or close to practice, mainly responsible for the transformation of the application and the actual production tasks. Che Rushan (2015) thought diversity cross knowledge structure, profound professional technical ability, a strong sense of social responsibility sense, full of critical spirit and innovation consciousness research should be basic quality characterization in applied innovative talents. In this paper the author takes the automotive industry as an example, combined with the background of the new industrial revolution, to try to build a vehicle type application innovation personnel training system.

As table 1 shows, compared with the academic and technical talents, the core of automotive specialty application type talent is "used", in essence of applying what they have learned, with the

foundation which is to acquire knowledge and ability, with the object which is the social practice, with the purpose which is to meet the needs of the society, and to promote the social progress.

Table 1   Academic, Applied, Skilled Personnel Difference

Personnel types	Academic Talents	Applied Talents	Skilled personnel
Training objectives	The discipline of solid basic theory and system of professional knowledge, dispelling any of the discipline of higher level of teaching, scientific research, engineering and technology management work.	In a new generation of vehicle engineering field, especially in the field of a new generation of automotive design, manufacturing, marketing and service in scientific research, technology and product development, production engineering design, quality control and production management of senior specialized talents.	In the first line or work site for the community to seek direct interests of the work
knowledge structure	Discipline system as the standard, focusing on the systematic and theoretical knowledge of the subject.	Based on industry background, the basic theory, basic experimental skills and scientific innovative research methods of the new generation of automotive technology and engineering focus on the current, complex and interdisciplinary research methods.	Based on the professional post standard, the basic theory is built with the principle of "necessary and sufficient".
Ability Structure	Research, innovation	The comprehensive ability of using scientific theories and solving problem in practice, with stronger social skills, such as language expression ability, self-expression, team spirit, coordination, communication ability etc.	Skills of practical ability.

2 Automotive Specialty Applied Innovative Talents Training System

The third industrial revolution is wider range and greater depth of force in the world than ever, and new energy, new network, new materials is subversive to promote modern car industry to higher industry fusion, technical innovation and product replacement. The cultivation of applied innovative talents of automobile specialty cannot exist as a closed system, but it should be adapted to the social environment. The education system is a branch of the whole social system which takes teachers, students and administrative support staff as the core, and the external environment of material, energy and information exchange, dynamic and open system. Education system consists of three aspects, including the level structure, the elements and the internal operation mechanism, respectively, corresponding to the structure, elements and flow.

2.1 Hierarchy

System theory is that the system is hierarchical, and each system can be considered as a component of a larger system. The education system constitutes the three level of information associated with each other(Figure1).
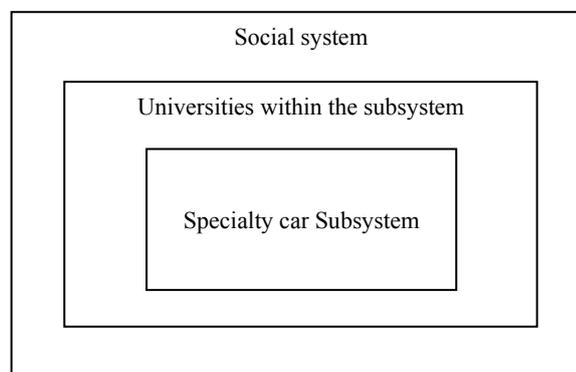
Figure 1   System Structure Of Automobile Talents Training In Universities

2.2 Constituent elements

Automotive specialty subsystem is a component of the subsystem in university. So in the composition, the object of study should be the parallel with the professional automobile components. Similarly, in the study of social systems, the object of study is the composition with the compound to the community with the university. This paper divided the composition of the system into two categories, one is the person or the composition of people, and the other is the composition besides people, but it is created and controlled by people. It is known as the resources and environment, such as equipment resources, cultural resources etc. The specific composition is shown in Figure 2.
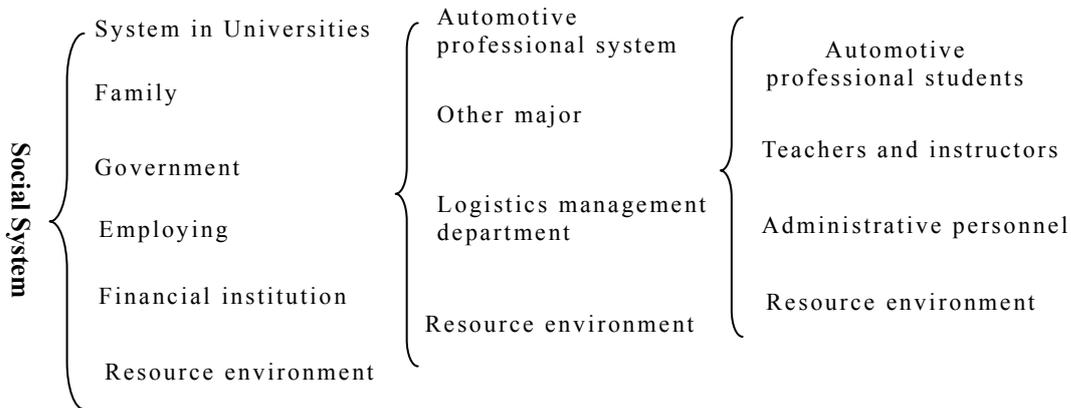
Figure 2   The Automobile Professional Talents Training System

3 "flow" Perspective Applied Innovative Talents Training System Mechanism Design

The components of the system are connected with each other through the flow, and the components of the system are influenced by the input form of the direct or indirect flow to the students of the automobile profession. Significant factors affecting personnel training is the material flow and information flow, and the material flow includes the property rights which are for the role of the physical substance of personnel training such as teaching resources, living resources, and the information flow. And information flow is divided into two categories for conducting research, one is knowledge flow which is information transmission to professional automobile individual students who will continue to maintain the original form or converted into other forms of knowledge; another is the effect of flow which is information transmission that is to affect or change the automobiles majors intrinsic behavior.

3.1 Material flow in the cultivation system of applied creative talents

1) To establish an open laboratory. The cultivation of innovative abilities of students majoring in vehicle needs through a combination of theory and practice, especially some operational skills, completed in the specific vehicle, and only the school or professional laboratory has the equipment. Therefore, schools and colleges should open the laboratory as far as possible without affecting the normal teaching and research, for the students operating the equipment in the laboratory.

2) The construction of practice base. Practice base has two forms, one is school and enterprise cooperation, another is built on campus. In specific practice, practice base can enhance students' application ability and stimulate innovation potential.

3) The establishment of innovation fund. The establishments of innovative funds support students for innovative research work in order to enhance the ability to apply knowledge and innovation in research.

3.2 Knowledge flow of application oriented innovation talents training system

The traditional way of focusing on the students' training of is a solid theoretical foundation, cultivate the way of lecturing, but in such a way, it can't adapt to the cultivation of innovative talents. This paper argues that transmission of knowledge can be carried out in the following three aspects to improve.

1) The improvement of the training system. Automotive specialty is an application of the disciplines, innovation and application of the ability should be obtained in practice, so in the training system, you can take the following methods to increase the proportion of practice:

To encourage and assist students to participate more internship related to vehicle;

In the process of engaging in the application of scientific research projects teachers can arrange for students to participate in;

Schools sets up special application research projects, tendering to students, encouraging the formation of a team of students to complete;

For graduation design, greater emphasis on practicality rather than the usual review of the current theoretical.

2) The improvement of curriculum. For automotive professional students, the curriculum teaching is still the key link of personnel training. Curriculum settings can be set as shown in Figure 3(CheRushan,2015). In addition, due to external other institutions of education, such as training courses, to offer more courses. Therefore, the school can be external courses to be incorporated into its curriculum system that allowing students to participate in external courses, after the audit, it can replace internal course or offset.

Professional elective course	↔	A new generation of vehicle technology, vehicle motor principle and control, power battery technology, power electronic technology, vehicle system modeling and simulation, signal acquisition and processing, vehicle vibration and noise control technology, diagnosis of automobile, automobile marketing, vehicle aerodynamics, vehicle mechanic process, motor control, intersection, DC speed control system, the power of modern technology, digital signal processing, intelligent control and so on.
Professional required course	↔	Automobile structure, automobile theory, new energy vehicle design, new energy vehicle electronics, new energy vehicle test, engine and alternative fuel engine theory, professional English, electrical engineering, etc.
Basic course of Science	↔	Mechanical drawing and C D A, basis of mechanical design, mechanical principle, circuits, electrical technology, electronics technology, engineering mechanics, exchange and measurement technology, engineering materials and heat treatment, manufacturing technology, automatic control theory, SCM principles.
General education course	↔	Higher mathematics, linear algebra, probability theory and mathematical statistics, calculation method, function of complex variable and integral transform, College English, college physics, C language program design, electrochemistry, introduction to the specialty of new energy vehicles, situation and policy, modern history outline, thinking practice and legal basis, "Mao, Deng, three" Introduction and sports such as.

Figure 3   Curriculum Model

3) Changes of the content of the class. In the classroom, especially professional course of study, the teacher teaches how to apply professional knowledge in practice, so this not only requires teachers to pay attention to the secondary practical information, but also to practice.

3.3 The impact of application oriented innovation personnel training system

For the influence of flow, in addition to the traditional control of student daily behavior, and through the influence of the related subject in the system, students improve the consciousness and ability to innovate, which mainly includes the following four aspects:

1) The improvement of classroom teaching methods. In order to improve the students' ability to solve practical problems, the teacher takes interactive teaching, discussion teaching and heuristic teaching instead of the former teaching based on Teachers' teaching.

2) The improvement of students' assessment methods. The assessment methods includes two aspects, one is examination of the adjustment, taking the actual problem solving ability assessment instead of the traditional examination oriented to the book knowledge, including conventional problems and innovation problem; the second is evaluation system of adjustment, from the learning achievement to the comprehensive evaluation.

3) The improvement of the incentive mechanism for students. It will be the material of the incentives to the opportunity to drive, such as the better internship opportunities for the best students, etc.

4) The impact of the composition of the system on the behavior of students. This is not only the school of the composition, such as teachers, the school's cultural environment, etc., other components that affect the students, such as the family and the public, it should also be influenced by the behavior of students, so that students should establish the consciousness of innovation and application, and correct their behavior.

4 Operation Mechanism of Application Oriented Innovation Talents Training System in the Perspective of "potential"

From the dynamic perspective of theories, the synergy is close and organic coordination. The synergy principle shows that, in order to optimize a process, or to obtain some maximum benefit, the relationship between the various factors must be established. Material flow of the flow potential (referred to as logistics potential) is a demand on the material, and material flow resistance (referred to as logistics resistance) exist in the series of activities in the logistics potential (i.e. demand) which in certain conditions should be to minimize logistics resistance, namely the logistics activities were planning, organization, command, coordination, control and supervision , and make the logistics activities to achieve the best coordination and cooperation, reduce ineffective loss in the system, with the flow of material producing the corresponding energy flow and information flow. Macroscopically speaking, due to the material flow is formed by demand, so energy flow potential (potential) and information flow potential (potential) are derived from demand as the same. As shown in Figure 4, applied innovative talents system's internal driving force is "innovation type, application type, compound type talent", which is the important task of colleges and universities "two class" construction, and external driving force is the new industrial revolution which brings the upgrading of talent demand, in order to maintain the competitiveness of colleges and universities graduates, forcing changes in college personnel training mode.
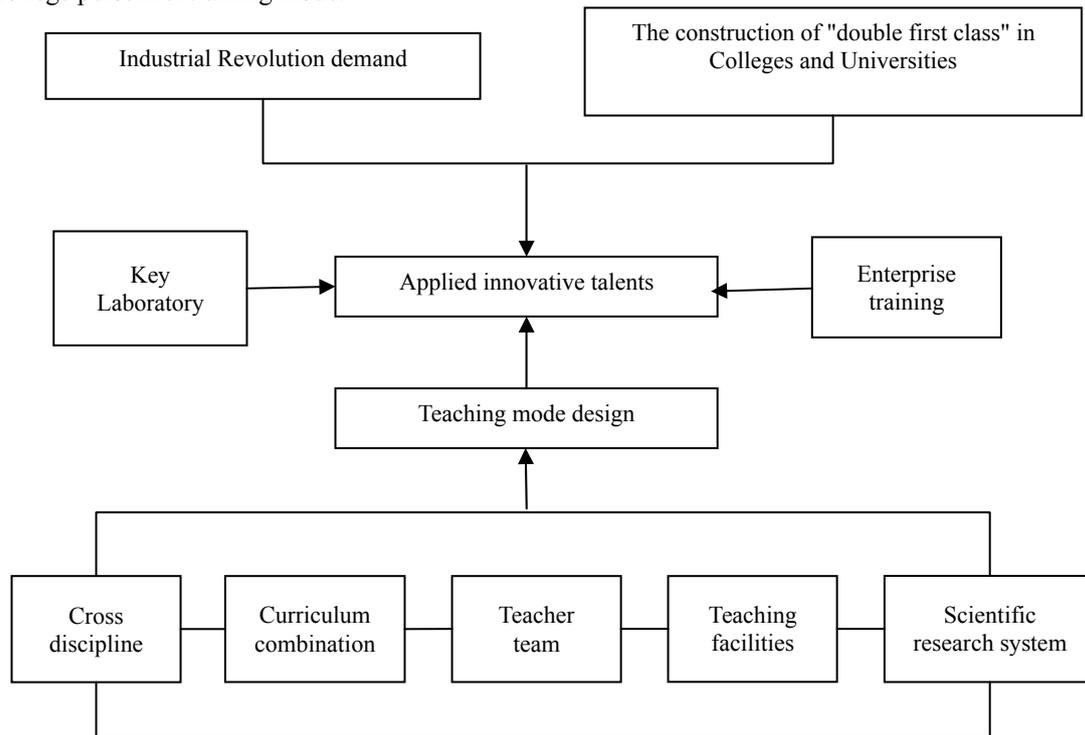
Figure 4   The Internal Operation Mechanism of the Application Type Innovation Talents Training System

Each subsystem consists of a static component with different levels and a corresponding flow to form a dynamic system, which is a MIMO multivariable system. Through the synergistic effect of 3 subsystems, the entropy (thermodynamics Entropy) is achieved for the smallest ordered structure, which makes the system achieve the global optimal result. The three subsystems of the applied innovative talents system include "Key Laboratory, corporate training, teaching mode design" three subsystems, and their objectives and tasks are "frontier research, actual technical requirements of enterprises,

interdisciplinary composite type teaching". The key laboratory is engaged in scientific research, encouraging college students to go to the laboratory to study, which not only can develop their basic scientific research ability, but also increase their knowledge of the leading edge theory. Enterprise training is a necessary part of the combination of theory and practice in university academic, through entering the university cooperation enterprise training center to practice, increasing the student's cognition to the practice, and knowing the society's demand for technology. Interdisciplinary teaching is the key link to cultivate innovative talents, belong to students, teachers and counselors, administrative personnel, logistics support and other diverse subjects, schools, colleges, departments and other multi-level structural elements of cooperation, through the combination of professional, curriculum, teaching staff, teaching facilities, scientific research system and other ways to complete the teaching mode design, to training applied innovative talents. Coordination, coordination, restriction and promotion of the three subsystems achieves the general goal of the large system based on achieving the goals and tasks of the subsystem, to achieve the optimal structure of the application of innovative talents training system.

5 Conclusions

To boost the country's industrial transformation and upgrading to achieve national economy to innovation driven transformation, applied innovative talents cultivation and transportation become an industry vitality for enterprise clusters and cluster development of a supporting element (Chang lv,2008), edition of 2009, 2011 and 2015 version of < National innovation strategy of the United States > will take innovative talent training as an important strategic initiative. It is a complicated system engineering to explore a new generation of vehicle personnel training mode, which is a complicated system engineering, and is also the practical need of the national higher education reform. Ecological system of the automobile specialty talents training is constitute of the social system, sub system in the colleges and universities and automobile professional subsystem in a hierarchical structure, the components of the system are connected with each other with material flow, knowledge flow and influence flow, By coordinating operation with three subsystems of "Key Laboratory, enterprise training and teaching mode design", taking the "double first class" construction and the industrial revolution demand as the driving force and driving force, establishing the training system of applied creative talents of automobile specialty in universities , can the university ultimately realizing the goal of the training of automotive professional application oriented innovative talents in colleges and universities.

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Research of the International Market Power of China Textile and Apparel in USA Market

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Abstract: Textile and apparel is an important export product of China. The product with higher international market power means more profit in return. This paper selects the H61 and H62 two types of products which are the most representative in textile and apparel trade. Using the data of these two categories from 1995 to 2014, the international market power of China textile and apparel in the United States are estimated based on residual demand elasticity model, and the affecting factors were screened, then the weight ratio of various affecting factors are identified through entropy analysis method. Finally, the conclusions and corresponding suggestions are put forward.

Key words：Textile and apparel; International market power; Affecting factors; Residual demand elasticity model; Entropy analysis

1 Introduction

Annual data released by China Customs show that since 2010 the growth of China's textile and apparel exports has gradually slowed down, and decreased greatly. In the meantime, China's textile and apparel exports accounted for the proportion of the country's total exports in slow decline overall, indicating that textile and apparel trade in China's trade position has not been strengthened and its role in promoting the domestic economy has gradually weaken. According to the theory of market power, which is based on the ability of the seller monopoly price addition. Namely, higher market power will bring us more profits in return. Therefore, we need to study the international market power of China's textile and apparel to analyze the main factors and countermeasures in order to get more revenue.
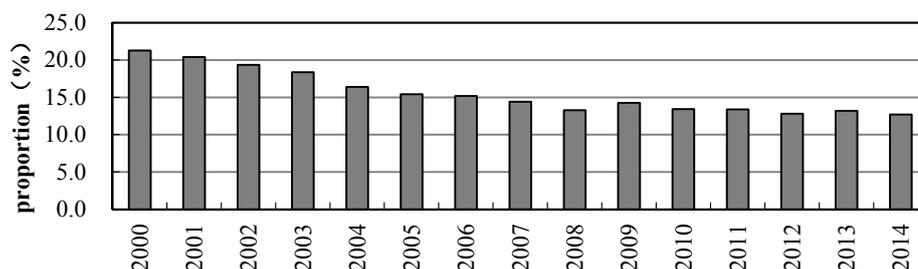
Figure 1   The Proportion of China's Textile and Apparel Exports Accounted for the Country's Total Export (2000- 2014)

Source: Data obtained from the process of the annual data released by General Administration of Customs

Sutton (1995) suggests that the market power is the capability that an enterprise or group of enterprises will continue to maintain prices above marginal cost, even if prices rise, would not lead to a big drop in sales. That is, a price bonus capability. International market power is the price bonus capability of a country in specific industries, which can affect the level of international market position and the amount of benefit of division of a country's specific industries.

In the study of market power, foreign started relatively earlier. According to the traditional theory, market concentration is one of the most important observations of market power, especially in the study from Bain (1951). Bain used CR8 model and found that the enterprise whose degree of concentration is higher will have greater profitability. Hall (1986) collected data on a large number of export products, and used the price - marginal cost model to measure market power of these products, which had attracted wide attention. Soon after Baker & Bresnahan (1988) proposed that the theory that market forces measured by the residual demand elasticity also entered the people's attention. Goldberg & Knetter (1999) refined and improved the model, and the main change is the exchange rate factor joined them. British economist Beccarello (1996) used improved Hall (1986) model to study the market power of Group of Seven manufacturing on the basis of Cost-plus ability.

There are also a number of related research in China, the studies of Wen Hu, Zeng Gang (2004) and Zhang Ye (2006) and others have pointed out the source of market power and found the multinational

corporations' control to market power. Besides, the results have a positive reference to our large-scale garment enterprises. Zhang Xiaodi, Zhu Qin (2007) considered that innovation and interaction have a prominent role in the market power oriented global value chain. Huang Xianhai, Chen Xiaohua (2007) estimated the international market power of Zhejiang Province textile and apparel, so that our theoretical studies of market power are more enriched.

2 The Setting and Measurement of International Market Power Model
2.1 The setting of international market power model
This paper selected the residual demand elasticity model of Goldberg & Knetter (1999) as the model to measure international market power, in order to analyze the international market power of China's textile and apparel.

$$P=D(Q，J，M，ε) \tag{1}$$

we take treating method of double logarithmic to Goldberg & Knetter (1999) residual demand elasticity regression model, the specific form:

$$LnP=CONST+α_1LnQ+α_2LnD+α_3LnC+α_4LnE+α_5LW+ε \tag{2}$$

Where *LnP* represents natural logarithm of China's textile and apparel export price (USD/ piece); *CONST* represents a constant term; *LnQ* represents natural logarithm of China's textile and apparel export quantity (pieces);Target market demand factors include the United States national income (GDP, USD amount) and the consumer price index (CPI), *LnD, LnC* are their natural logarithms; Cost factors of competitors use exchange rate (EX)and the inputs price index (WPI), *LnE, LnW* are their natural logarithms; $ε$ is a random disturbance term.

Our goal is *LnQ*'s coefficient-α1 (namely, residual demand elasticity), whose absolute value measures the relative size of the international market power of our textile and apparel industry, the greater the absolute value of $α_1$, the stronger the international market power will be.

2.2 International market power model data selection and description
In this paper, the model selects the United States for target market, through the residual demand elasticity regression model estimates the size of the international market power of China's textile and apparel in the US market. The United States is a major importer of textiles and apparel, while China's textiles and apparel account for about 2/5in its market share in recent years. Therefore, the model set the US as target market. In this paper, the model selects India as competitor for the reason that in addition to China, India is one of the most major importing countries in the US textile and apparel market.
The trade data mainly comes from the United Nations UNComtrade database, specifically use statistical data of two broad categories: H61 (knit or crochet apparel and clothing accessories) and H62 (not knit or crochet apparel and clothing accessories). These two categories occupy a large proportion in our country's textile and apparel export trade over the years, approximately maintained at around 60%. As a rival, India's exchange data (Rupees per dollar equivalent form) and producer price index are derived from the IMF's IFS database and the United Nations Statistics Division; US GDP and CPI data come from the US National Bureau of Statistics and the ILO database.

2.3 International market power estimates
This article uses Eviews statistical software through the ordinary least squares (OLS) estimates the international market power of China's textile and apparel industry in the US market from 1995 to 2014

Table 1   1995-2014 the International Market Forces of China's Textile and Apparel in the US Market

years	International market power	years	International market power
1995	0.34	2005	0.37
1996	0.40	2006	0.49
1997	0.55	2007	0.51
1998	0.31	2008	0.76
1999	0.28	2009	0.92
2000	0.55	2010	0.93
2001	0.56	2011	0.92
2002	0.68	2012	0.92
2003	0.56	2013	0.91
2004	0.55	2014	0.91

By examining the regression equation on the whole showed that the US textile and apparel market is not fully competitive, indicating that China's textile and apparel export prices may partly be explained by changes in their own exports, which is meant the existence of market power. China has long occupied a market share of about 1/3 to 2/5 of the US market, high market share gives us a favorable market power in return. Compared with Italian market power in foreign countries is more than 0.8 in long-term, Prior to 2008 the international market power of China's textile and apparel industry is still a bit too small. However, the data in Table 3 show that nearly 20 years, despite the international market power of China's textile and apparel industry in the US market had the ups and downs, but on the whole continued to rise, basically in a rising trend. During 2009 to2014, China's market forces have reached more than 0.9. It shows that in recent years, the price addition ability of China's textile and apparel export has significantly enhanced and returns has improved obviously.

3 International Market Power Influencing Factors Analysis
3.1 The sources of international market power
According to the research of the predecessors, there are several important sources of international market power.

1) Economies of scale. Economies of scale generally means an economic model, which is due to the expansion of production scale to bring the improvement of professional level and other factors, which led to reduce unit production costs as well as long-run average cost of enterprises will decline as production increases. Generally it believed that there is positive correlation between the economies of scale and market power.

2) Barriers to entry. Bain (1951) argued that the entry barriers (Barriers to entry) enables enterprises to get access to far more than normal profits without threat by other companies. Which means that when potential competitors enter into unfamiliar market will bear some extra costs and be at a disadvantage in market competition. Generally it believed that there is positive correlation between entry barriers differentiation and market power.

3) Product differentiation. Product differentiation is the company in some way to change those basically same products to convince consumers that these products are different and then have different preferences. Generally it believed that there is positive correlation between the product differentiation and market power.

3.2 An empirical analysis of influential factors
3.2.1 Model setting and influencing factors screening

Based on the consideration of the above three levels of influencing origin, this paper selected 7 variables to validate the role of these factors in China's textile and apparel international market power, respectively represented by X_1 to X_7. Which the total textile and apparel exports to the United States, namely X_1, is selected based on scale effect; Textile raw material purchase price index X_2，other staff salaries X_3, and exchange rate of RMB against USD (unit RMB equivalent in US dollars) X_4 are related to the cost element and selected based on the entry barriers, experiment and development expenditure funds X_5, fixed assets investment X_6, and patent filings X_7 are related to innovation and selected based on product differentiation.

The international market power in the US market S as the dependent variable to build the regression equation:

$$S=CONST+\alpha_1 L_n X_1+\alpha_2 L_n X_2+\alpha_3 L_n X_3+\alpha_4 L_n X_4+\alpha_5 L X_5+\alpha_6 L_n X_6+\alpha_7 L_n X_7+\varepsilon \qquad (3)$$

By using Eviews stepwise regression to take regression analysis on equation, the regression results show that the regression coefficient of some variables is not significant. Based on consideration of the degree of freedom, we remove the variable X_1, X_2, X_3, X_7, the final regression results show that significant level of variable X_4, X_5, X_6 is very high, all in under 1% significance level.

The regression results show that preserved three variables except X_5 is positively correlated with market power, two other variables X_4, X_6 are negatively correlated with the market power. The fixed asset investment on the one hand will bring technological innovation- this favorable factor, on the other hand, the increase of investment will lead to the rise of production costs, particularly in the low-end, disordered, repeated investment will more easily lead to rising production costs, and this kinds of investments bring in a small number of technological advances ,which has not obvious advantage in international market ,therefor the regression results of variable show that the fixed asset investment does more harm than good and is negatively correlated with the international market power of textile and apparel.

Table 2   Regression Results

Variable	Coefficient	StdError	t-Statistic	Prob*
X_4 （exchange rate of RMB against USD）	-2.897193	0.654223	-4.428450	0.0004
X_5 （experiment and development expenditure funds）	0.713684	0.206287	3.459672	0.0032
X_6 （fixed assets investment）	-0.887852	0.273363	-3.247893	0.0050
C	11.09489	2.819889	3.934511	0.0012
R-squared	0.875677	Meandependentvar	0.621000	
AdjustedR-squared	0.852367	SDdependentvar	0.230489	
SEofregression	0.088561	Akaikeinfocriterion	-1.833394	
Sumsquaredresid	0.125489	Schwarzcriterion	-1.634247	
Loglikelihood	22.33394	Hannan-Quinncriter	-1.794518	
F-statistic	37.56578	Durbin-Watsonstat	1.871883	
Prob(F-statistic)	0.000000			

3.2.2 Calculation of influence weight

To further understand the contribution of influence factors for the international market power, the paper continues to perform entropy analysis on X_4, X_5, X_6 to determine the specific weight. If the smaller the entropy of index is, the greater the amount of information will be provided by this index, the bigger the role ought to have in the comprehensive evaluation, the higher the weight should be.

First of all, calculate the proportion of factor "i" in indicator "j":

$$P_{ij} = \frac{x'_{ij}}{(\sum_{i=1}^{m} x_{ij})(i=1,2,\cdots,m; \, j=1,2,\cdots,n)} \quad (4)$$

Entropy of indicator "j" calculated by the following formula:

$$e_j = -k \sum_{i=1}^{m} p_{ij} \, ln(p_{ij}) \quad (5)$$

In equation (5), k is the proportion of factor "i" in indicator "j"; m is the number of influence factors in indicator "j". $Ln\,(m)=2.99$, $k=0.33$.

Table 3   Entropy

Variable	X_4	X_5	X_6
Entropy	0.906774	0.910998	0.877767

Finally, calculate the indicators' weight, calculating equation as follows:

$$g_j = \frac{1-e_j}{n-E_e} \quad (6)$$

Wherein, n is the number of indicators (herein relates to three variables, then $n=3$）， $E_e = \sum_{j=1}^{n} e_j$, $0 \leq g_j \leq 1$, $\sum_{j}^{n} g_j = 1$。

Table 4   Weight

Variable	X_4	X_5	X_6
Weight	0.3062	0.292326	0.401473

The results of entropy weight analysis show that X_4 and X_6 which are negatively correlated with the market power occupy a larger weight and add up to about 70%; X_5 which is positively correlated with market power occupy a smaller weight, accounting for about 30% of the weight. In order to further improve China's textile and apparel market power, we should avoid weaknesses, reduce or inhibit the reverse effect of "exchange rate of RMB against USD" and "fixed asset investment" exert on the international market power and give full play to the positive impact that "experiment and development expenditure of funds" exerts on the international market power.

4 Conclusions

We conclude the following conclusions:

First of all, while China's textile and apparel exports is still in the stage of big in amount and low in price, but there is still international power of China's textile and apparel market in the US market.

Secondly, the international market power of China's textile and apparel in the US market has been rising and at an upward trend in past 20 years. Meanwhile, 2009-2014 the return of Chinese textile and apparel exports improved significantly.

Thirdly, there are three factors significantly impact on the international market power of China's textile and apparel in the US market, respectively are the RMB against the US dollar, experiment and development founds and fixed asset investment.

Last of all, "exchange rate of RMB against USD" and "fixed asset investment "are reverse impact on the international market power, the total influence weight is big and about 70%; "experiment and development founds" is the positive impact on the international market power and its influence weight is about 30%.

In order to maintain the sustainable development of China's textile and apparel trade and obtain the normal trade interests, we should continue to improve the international market power of China's textile and apparel. In this regard, we propose the following measures and suggestions: Firstly, control the production scale of textile and apparel, reduce the disordered and repeated investment of low-end industries and eliminate backward production capacity. Secondly, broaden the value-added channels of value chain. Thirdly, focus on technological innovation, through the combination of schools and enterprises to improve the technical conversion efficiency.

Acknowledgement

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Dynamic Mechanism of Independent Innovation of Biological Industrial Cluster and Its Empirical Study

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Abstract: Independent innovation is the main source of cluster economic growth, and it is also the driving force of cluster development. Through the relevant literature, this paper analyzes connotation and motivation of the independent innovation biological industry cluster, and constructs the dynamic mechanism model on this basis. A case study of biolake in Wuhan, this paper analyzes its status quoined pendent innovation, and puts forward the corresponding countermeasures in view of the obstacle factors restricting the power of independent innovation, and the aim is to provide theoretical and practical guidance value for the sustainable development of the biological industry cluster.
Key words: Biological industry cluster; Independent innovation; Dynamic mechanism; Wuhan biolake

1 Introduction

The development of biological industry has been unprecedented attention all over the world, many countries in the area of technology, talent, capital intensive, has formed a relatively complete biomedical industry cluster, China will vigorously develop modern biotechnology as an important national strategy. According to incomplete statistics, China's bio-industrial park above the provincial level to reach more than 400 at present, the bio-industry will become a pillar industry of the national economy by 2020.

Some scholars have carried out a wealth of research on the dynamic of cluster innovation, representative views are shown as follow: Thomas Brenner (2001) used to set up a mathematical model to explore the dynamic factors for the evolution of the cluster, He believed that the memory of the cluster in seven power of innovation: cooperation between enterprises, enterprises rely on each other, the local capital market, human capital accumulation, informal communication, public opinion and local policy. Swann et al. (2002) through the example analysis method, the dynamic mechanism of cluster innovation depicted as including the interaction of dominant enterprises, new enterprises to enter, enterprise incubation increase and climate, infrastructure, and cultural capital of positive feedback system. Liu Hengjiang and Chen Jixiang (2005) described the dynamic mechanism of cluster innovation from two aspects: the excitation power and endogenous power. Motivation mechanism mainly referred to the clusters where the external environment on the cluster control and planning role, such as related policy and regulations, regional brand awareness, competitive environment; in addition to these external factors, there were some influencing factors from inside the cluster, such as complementary to the innovation of the network, the division of labor, for knowledge contribution degree, which was the impact of the fundamental factors of cluster innovation. Gao Daocai et al. (2007) argued that the independent innovation dynamic system was composed of external power, peripheral motion and driving force of three subsystems, which outer driving force was the foundation, around power was the guarantee, inner driving force was the soul of innovation activities, at the same time, they restrict and promote each other, jointly promote individuals actively engaged in innovative activities.

Previous studies showed that the independent innovation activities may not be determined by the chance of a single factor, it is determined by the interaction of various factors, such as society, economy, science and technology, culture and policy. This paper argues that the independent innovation activity of the biological industry cluster is affected by the external factors and internal factors, its independent innovation dynamic factors are composed of source dynamic factors and environmental dynamic factors.

2 Analyses on Dynamic Mechanism of Independent Innovation of Biological Industry Cluster

2.1 Source dynamic factors

Source dynamic factors, mainly refers to the existence of the biological industry cluster, which produce core power to biological industry cluster independent innovation, including the independent innovation ability of the enterprise in the biological industry cluster, the benefit pursuit of enterprise or innovation organization in the biological industry cluster, the incentive of innovation agents to generate

innovative behavior, and the power of cluster subject collaborative innovation. It directly influences formation and quality of the independent innovation of biological industrial cluster.

2.2 Environmental dynamic factors

Environmental dynamic factors, refers to the biological industry cluster as a result of external factors on its own initiative to promote the role of innovation, including the pulling power of market demand, the driving force of technology, the pressure of market competition, the government's support, the influence of other environment, For example, the macroeconomic environment, cluster regional innovation resources, social and cultural environment, talent market conditions, financial market conditions, property rights, legal system environment and market economic system, etc.. Through the interaction between the biological industry clusters, they have some influence on the formation, operation and duration of the biological industry clusters.

2.3 Dynamic mechanism of independent innovation of biological industry cluster

The dynamic factors and the environmental dynamic factors interact and influence each other; they have a huge driving force for the formation of the independent innovation of biological industry cluster, as shown in figure 1.
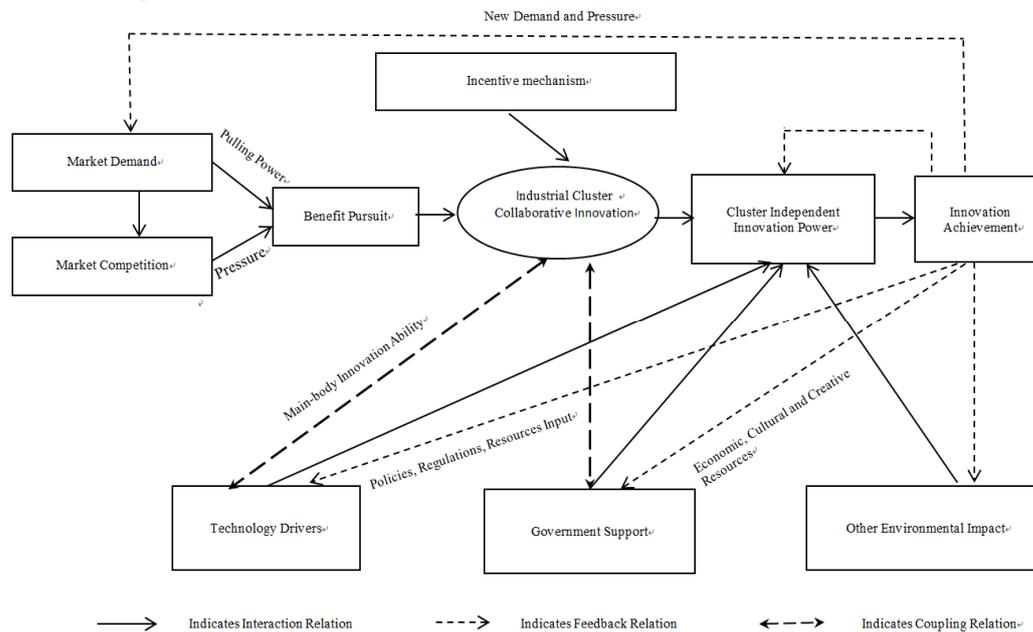
Figure 1   Biological Industry Cluster Independent Innovation Dynamic Mechanism

The pulling power of market demand and market competition pressure force the biological industry cluster to maximize the pursuit of benefit, the benefit pursuit of enterprise or innovation organization in the biological industry cluster directly or indirectly drives enterprise and innovation institution to engage in independent innovation activities. The enterprise innovation ability in the biological industry cluster is the material basis to ensure the realization of the innovation activity, scientific and technological progress is conducive to improving the ability of independent innovation of the cluster, forcing the main body of the cluster to increase R&D investment, develop new technologies and new products to meet market demand, so as to enhance the market competitiveness. However, the improvement of independent innovation ability of biological industrial cluster can promote the progress of the whole society and science and technology. The government's policies and regulations can effectively protect the biological industry cluster to complete the independent innovation activities, and the independent innovation of the biological industry cluster has promoted the improvement of the government's policies and regulations and the increase of tax revenue. Incentive mechanism can stimulate the innovation main body consciousness engaged in independent innovation, collaborative innovation of the main body of in the biological industry cluster enables the innovation resources and elements in the cluster to converge effectively, and promote the flow of talents, technology, information, capital and other factors of innovation in the main body, so that the process of independent innovation is more successful. The success of the independent innovation activities of the biological industry cluster has the promotion effect on the market, technology, government and environment, which in turn stimulates new innovation

motivation, thus forming a continuous cycle, makes independent innovation activities continued to proceed.

3 Status Quoined Pendent Innovation in Wuhan Biolake

Approved by the National Development and Reform Committee (NDRC), Wuhan Biolake is a national industrial base combining biological products research, production and logistics. Having been established for over 8 years, Biolake has gathered 6 companies from world top 500 such as Pfizer, 11 listed companies such as National Medicine Group and other over 900 biological companies. The number of scientific and technological activities has broken through 40000; the scale of industrial production grows by an average of 40% per year and industry revenue has exceeded 80 billion RMB at the end of 2015.At present, compared with the other 107 domestic biological parks, Biolake ranks second relying onits comprehensive strength.

Having introduced 168 international high-end talent teams and 10 academician projects, Biolake has gained financial support up to 180 million RMB with 16 people selected to "National 1000 Talents Program" and 11 people selected to "Hubei Provincial 100 Talents Program". The number of enterprises' patent application reaches 428, among which 186 are approved and 60 are converted into achievements. Wuhan Heathen Biotechnology Company and Hamilton Biological Company have successfully landed at "new three boards"; a number of independent development products such as recombinant human serum albumin, nano-drugs, diagnostic reagents, EPA and DHA with high purity, cell disruption system, pesticides, food testing box have successfully come into the market.

4 Obstacles of the Independent Innovation of Biolake

Although Biolake has achieved a lot during over eight-year development, some problems still exist in the motive aspect of the independent innovation, which is likely to cause a lack of stamina if not paid much attention to.

4.1 Insufficient collaborative innovation capability

The establishment of the Wuhan Institute of Biotechnology provides splat form for the cooperation of enterprises in Biolake and other innovative ones. Yet the industry-university-research collaborative innovative network in the biological industrial cluster has not formed completely, and the jointed innovative atmosphere is not active. There are 85 ordinary universities in Wuhan, among which are 7 "211 Project" universities, ranking the forefront of the country. Although the universities and enterprises have established an industry-university-research cooperation mode to build innovation laboratory, jointly develop technology innovation and develop new projects, the ability of market docking of the scientific research achievements is still not strong.

4.2 Lack of attractiveness to talents

Gathering a large number of colleges and universities, Hubei does not lack talents. According to statistics, there are over 300thousand graduates, but among which only 1% Ph.D students, 4% master students and 11% undergraduates stay in Hubei every year. Meanwhile, universities disjoint market and industry development on cultivating. There are few new-rising subjects, few high-level research and development talents who can master the key technology and have the ability of independent innovation, and even fewer compound leaders with research and development background and operation capability, which cause an insufficient development of Biolake.

4.3 Lack of cooperation and coalition of leading enterprises

The leading enterprises have a great impact and appeal, a certain demonstration effect and guiding function on other peer enterprises in the same industry. Taking a comprehensive view of the successful development experiences of the industrial cluster in the USA, there is at least one leading enterprise that enjoys a high reputation. Such as Genentech and Chiron in Silicon Valley, Biogen in Boston, and Affymetrix in Biotechnology Bay, San Francisco.

Currently, Biolake has gathered the world's biggest pharmaceutical enterprise---Pfizer; Asia's greatest and world's third greatest genome research organization---Shenzhen BGI; the best subcontractor in Asia preclinical new drug's research and development and the world's best small molecule compound new drug's research and development enterprise---Wuxi AppTec; the best enterprise in Chinese pharmaceutical logistics industry---Sinopharm Group Company Limited; the biggest Chinese private vaccine enterprise---Changsheng Biotechnology; the leading enterprises of pharmaceutical industry in China---China National Seed Group, Grand Pharmaceutical(China), Longping High-Tech Agriculture and Wuhan Human well Hi-tech Industry Company Limited etc. But those famous transnational

enterprises contact more with their parent company instead of making technical exchanges with local enterprises in the industrial cluster. Therefore, the participation of transnational bio-enterprises doesn't bring the diffusion of the core technology.

5 Strategies to Promote Independent Innovation in Biolake

5.1 Establishing the innovation union and creating a collaborative innovation network with enterprises dominating and industry-university-research combining

By making the most of technology and talent in universities and scientific research institutes in Hubei Province, the collaborative innovation strategic alliance in Biolake is built, through which the multiform cooperative innovation between independent innovations is achieved. The intellectual property alliance, organization and technology alliance, industrial cooperation are established on major technology projects. Grasping the trend of industrial forefront in time and developing communication and industry-university-research cooperation in international dimensions promote the cooperation between enterprises or scientific institutions in the cluster and enterprises with strong research strength in the world. By following, studying, re-innovating and other ways to improve the independent innovation capability, the international competitiveness of Biolake industrial cluster will be enhanced.

5.2 Perfecting regulation system to create favorable policy environment

As a supporter of independent innovation activities, Wuhan municipal government should do a good job of service and create favorable policy environment. Firstly, the government should reach the grass-roots level, do well in the research work, investigate and analyze the developing situation of enterprises, the status quo of independent innovation and the existing problem in the industrial cluster in Biolake. On the basis of this, effective and pointed policies can be put forward pertinently, which includes financial budget, tax policy, special fund, application of major projects, public service platform and so on. Secondly, the government should adjust and reform the policies and measures in new drugs' approval, in market management, in financial credit, in tax deduction and exemption, in facilities, in talent introduction, etc., and further optimize the independent innovation environment in Biolake. Thirdly, the government should intensify the protection of intellectual property in the biology industrial cluster. Besides, to build a good independent innovation atmosphere in Biolake, the government should formulate and perfect the laws for the intellectual property, and increase the intensity to punish whoever violates the intellectual property of others.

5.3 Promote talent gathering to form the talent pool

To become a "magnetic field" where domestic and foreign excellent talents yearn and gather, Biolake should not only attract talents but also to retain them. In order to achieve this, Biolake should continue regarding "3551" Talent Project and Yellow Crane Talent Program as carriers to intensify high-level talents introduction and bring in the leading talent teams with projects and achievements. A number of outstanding scientists and research teams, as well as technology and products with international influence in biological industry will come into being by assembling high-level talents and supporting specifically. Besides, Hubei Provincial Government should intensify the construction of biological classes in universities and strengthen the cultivation of the professional technical talents and compound talents. According to the market demand, colleges need to adjust professional structures and talent training program, and set new-rising majors concerning biotechnology, so that universities can cooperate with enterprises to establish employment practice bases.

5.4 Cultivating leading enterprises and promoting their cooperation

For the development of the whole industrial cluster's independent innovation, Biolake should focus on supporting Wuhan Human well Hi-tech Industry Company Limited, Sinopharm Group Company Limited and other pharmaceutical enterprises to cultivate the leading enterprises with independent innovation superiority by making good use of management, market, brand, talent, capital, etc., playing the leading role of independent innovation technology demonstration, product radiation, sales network and information diffusion and pulling other enterprises' promotion of innovation ability in the cluster. Besides, Biolake should also take a variety of channels, forms, levels to integrate the research strength and facilitate leading enterprises at home and abroad on projects or technology integrating or high grafting to achieve the promotion of independent innovation and the upgrading and industry expanding.

6 Conclusions

Although Wuhan Biolake has made remarkable achievements, there are still some obstacles to the driving force of independent innovation. The collaborative innovation capability of independent

innovation subject, the government support, talent depressions formed, the collaboration between the leading enterprise aspects has carried on the detailed analysis, and on this basis, this paper puts forward some effective countermeasures.

Acknowledgement

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Country Characteristics and Csr Disclosure in Islamic Banks

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Abstract: Corporate disclosure has been one of major areas discussed in accounting research. It is a tool to discharge a company's accountability and transparency. Basically, corporate information and disclosure is used to diminish the conflict of interests among stakeholders. The most accessible source providing corporate information and disclosure is published annual report. Having particular nature and objective, Islamic banking is one sector that has been growing fast in the global financial industry. Islamic bank is a making profit institution which must be in li ne with Shariah compliance (Islamic requirements) and has social orientation as the prime consideration. Examining 18 Islamic banks in 10 countries, this paper attempts to explore the social disclosure extent provided by Islamic banks. The data is analysed using content analysis and correlation. This study supported the previous theory that Disclosure correlates with country values regarding transparency. Unexpectedly, Disclosure has a negative correlation with Human Development Index. Although the correlation value is relatively low, it can be concluded that Disclosure has a positive correlation with the percentage of the moslem in the country. This study has provided some interesting insights into cultural influences on accounting practices. Last but not least, this study found the themes disclosed comprehensively in the annual reports. Those themes are zakah, employee right, and other community involvement.
Key words: stakeholder theory; stakeholders; shareholders; disclosure; extent

1 Islamic Banking Disclosure: A Background

Corporate Social Responsibility (CSR) disclosure refers to the degree of the information communicated by the companies. CSR is largely accepted as a good instrument which shares the information among the stakeholders. CSR disclosure provides social and environmental information (J. Gunawan,2015; S. Farook,et al ,2011). The discussion on CSR continues in almost all sectors including banking industry as it has got a particular attention after mortgage crisis in 2008(V. Hugo,et al,2015). The industry has been required to be more responsible for the society(M. I. Jizi,et al,2014). Disclosing CSR information shows that the industry complies with the regulation and (B. Fasterling,2012) and provides a moral responsibility of the company (M. Carina,et al,2014)and compliance with legal requirements(A. Hassan,et al,2010).

Islamic banking part of banking industry has been growing fast in the global financial industry (S. Farook,et al ,2011; R. Ghayad,2008; M. Asutayet al,2015). According to the World Bank Report 2015, the growth of Islamic banking assets is higher than conventional counterpart and it plays the role in enhancing society welfare. The development of Islamic banking industry initiates a few researchers to address the matter of CSR disclosure in Islamic banks. They found that many studies explored corporate reporting of Islamic banks in normative and analytical ways (S. Farook,et al ,2011) and empirical analysis is quite rare in the area of Islamic banking industry (R. Haniffa,et al,2007). Some past studies proposed different disclosure patterns for Islamic banks (S. H. Ibrahim,et al,2008; R. Haniffa,et al,2007; M. Rashid,et al,2013). Haniffa and Hudaib (2007) developed ethical identity benchmark for Islamic banks. The banks should provide ideally ethical and social communicative information to all stakeholders.

It is found that CSR disclosure vary among countries (V. Hugo,et al,2015; S. Chanchani,et al,2004; T. Khanna,et al,2004). It proves that culture and country affect the disclosure practice. especially when the countries have weak investment regulations and board governance (H. Jo,et al,2016). These studies are in line with the idea of Gray's cultural accounting framework stating that accountants' decision on reporting is influenced by their cultural values(S. J. Gray,1983). Accounting has been growing in different cultural context; particular values must have been embedded in accounting itself. Hofstede (2001) suggests that the more judgment an activity requires, the more it is ruled by values and thus influenced by cultural differences. He suggests that accounting decision and its implementation must vary along cultural differences(G. T. Tsakumis,2007).

Different countries have different human development which is measured by Human Development Index. Human Development Index (HDI) is a compound indicator comprising educational factors, life expectancy and GNI (Gross National Income). The higher index shows the better human development in a country (V. Hugo,et al,2015; P. J. Reed,et al,2016). Besides that, the number of particular people influence

the level of CSR activity(T. H. Abbasi,et al,2012). The higher the ratio of moslem population in a country inclines to demand for more detailed information provided by Islamic banks (S. Farook,et al ,2011) Islamic banks in moslem majority countries are estimated to disclose more information(Wan,et al,2013).

This study attempts to explore the disclosure extent provided by Islamic banks. More specifically, the focus of this study is more on social disclosure because the Islamic banks claim to have more social responsibilities as compared to the counterpart conventional banks.   This study is expected to contribute towards the existing literature Islamic banking disclosure in different countries.   Furthermore, this paper highlights the influence of country values on the disclosure level. The rest of the paper is organised as follows.   The next section provides the literature review discussing on the disclosure practices in Islamic banks and country characteristics. The next section focuses on data collection and analysis followed by the result analysis and discussion.   The last session concludes this study.

2 Literature Review
2.1 Disclosure practice in Islamic bank
Discussion on disclosure has been still going on since some researchers divided it into mandatory and voluntary disclosure (M. J. Fishman,et al,2003; G. S. Miller,2002). Mandatory disclosure refers to the extent of information obligatory and regulatory required. Voluntary disclosure denotes the information voluntarily published by the companies. Many empirical studies concluded that voluntary disclosure has a positive impact and financial effect on the companies (S. J. Gray,1983; Z. Embong,2014; H. Nobanee,et al,2015). Companies with broader disclosures will generate more financial benefits (Y. Qiu,et al,2016).

Previous studies examined the extent voluntary disclosure in different sides. Hugo & Simão (2015) conducts a study on corporate social disclosure themes in banking sector. One recent work in banking industry studies 24 corporate disclosure themes in environmental and energy (H. Nobanee,et al,2015). Another study focuses on measuring the disclosure   based on each stakeholder's social benefits (A. Khan,et al,2013; Z. Ali,et al,2010). The other study scrutinizes the disclosure on other aspects including environmental, social, health and safety(J. D. Mahadeo,et al,2011). Corporate disclosure may also emphasis on compliance disclosure (B. Fasterling,2012).

The growing Islamic banking industry has raised academic interests in exploring disclosure practice in the industry. Maali et al. (2006) could be the pioneer in proposing the disclosure benchmark for Islamic banks. They proposed the expected disclosure in the industry which has been developed and modified by other researchers. The disclosure has also been extended to other aspects of disclosue (S. H. Ibrahim,et al,2008; S. Farook,et al ,2011; A. Hassan,et al,2010; R. Haniffa,et al,2007; M. Rashid,et al,2013). In general, the disclosure should cover the following items:
   a. Shariah statement – Shariah compliance
   b. Islamically unlawful transaction (haram) – Shariah compliance
   c. Zakah - Social
   d. Qard Hassan (benevolent charity) - Social
   e. Charity - Social
   f. Social activities and expenditures
   g. Employees' rights and welfare
   h. Treatment for bankrupt clients
   i. Environmental activities and expenditures
   j. Other aspects of community development and involvement
Haniffa & Hudaib (2007) proposed "ethical identities". Subsequently, this ethical identity concept was modified by the other researchers (M. Rashid,et al,2013; P. Mia,et al,2009). Basically, Haniffa & Hudaib categorize the disclosure into eight dimension namely visionary objectives and missions, BOD structure and top management formation, products and services, zakah and charitable funds, commitment towards employees, commitment towards debtors, commitment towards customers, and Shariah Supervisory Board structure and competence. Another study proposed "Islamicity disclosure" consisting of Shariah compliance assessment, corporate governance evaluation and social/environment performance (S. H. Ibrahim,et al,2008).
2.2 Country characteristics
Gray's work in 1983 was a pioneering paper contributing the idea that culture might affect accounting practice (Chanchani, Willett, 2004). He proposed some hypotheses derived from Hofstede's work in 1980. Hofstede categorized and grouped the countries based on cultural characteristics. Gray

attempts to see the possibility of cultural values influences accounting practices(S. J. Gray,1983). Gray came up with four hypotheses regarding the issues on measurement and disclosure practices in diverse nations.

Firstly, a country with high level of individualism, weak uncertainty avoidance and low power distance tends to have high level of professionalism. Secondly, a country with strong uncertainty avoidance and large power distance but low level of individualism is more likely to have high uniformity. Thirdly, the higher a country ranks in term of uncertainty avoidance and the lower it ranks in terms of individualism and masculinity, the more likely it is to be more conservative. Lastly, a country with higher uncertainty avoidance and power distance and lower level of individualism and masculinity tends to have higher level of secrecy. High level of secrecy indicates the tendency to disclose less information (R. Orij,2010).

Some studies also found that Human Development Index in different geographical areas affect the distribution of information (V. Hugo,et al,2015; P. J. Reed,et al,2016; S. S. Ali,et al,2014). Human Development Index (HDI) was created to show that the development of a country is also determined by the people and their capabilities. The HDI can also refer to the national policy and government priorities, because two countries with similar Gross National Income can end up with different human development results. The Human Development Index (HDI) is published yearly by the United Nations. It is a summary measure of some human development measurements comprising a long and healthy life, educational level of the people, a standard of living.

A number of countries in one region have differences with regards to disclosure, it is proven by a study in Arabian countries   (S. Askary,et al,2008). Social and political condition may affect the need of particular society interest and distribution of information. The percentage of the moslem population can be considered as a proxy for the Islamic society which could affect the extent of disclosures(S. Farook,et al ,2011). According to Farook et al. (2011) the extent of Islamic bank's CSR disclosures depends on the power of the proportion of particular population who affect the activities of Islamic banks.

3 Research Methodology

This is a descriptive study. By using content analysis approach, this study examines the annual reports of 18 Islamic banks year of 2014 in 8 countries. This study scrutinizes the depth of social disclosure based on the comprehensiveness. Several past studies gave score 1 if the information related to a particular social disclosure was provided, and 0 if there was no information (S. Farook,et al ,2011; B. Maali,et al,2006). However, this study adopts the disclosure score ranging from 1 to 5 (V. Hugo,et al,2015). The disclosure level is evaluated with 1, "None"; 2, "Minimum"; 3, "General"; 4, "Detailed"; 5, "Very detailed", respectively, for each one of the disclosure themes. The operationalization of the variables is tabulated as follows:

Table 1   Operationalization of Variables

MAIN VARIABLES	VARIABLES	PROXY	MEASUREMENT
DISCLOSURE	Disclosure	Social disclosure level: a. Zakah b. Qard Hassan (benevolent charity) c. Charity d. Social activities and expenditures e. Employees' rights and welfare f. Treatment for bankrupt clients g. Environmental activities and expenditures h. Other aspects of community development and involvement	1 = None 2 = Minimum 3 = General 4 = Detailed 5 = Very detailed"
COUNTRY CHARACTERISTICS	Moslem population	The percentage of moslem population in the country	Percentage

	Country Value	Country ranks (Hofstede, 1983; Gray, 1988) Uncertainty avoidance and power distance (Hofstede, 1983) relates to transparency	Country Rank
	Human Development	Human Development Index issued by United Nations.	Index

4 Analysis and Discussion

The descriptive of the data is shown in the following table.

Table 2   Descriptive Statistics

Dislosure		Uncertainty Avoidance		Power Distance		Human Development Index		Moslem Population	
Mean	21	Mean	62.00	Mean	77.67	Mean	0.74	Mean	85.27
Minimum	11	Minimum	36	Minimum	55	Minimum	0.538	Minimum	61.4
Maximum	35	Maximum	85	Maximum	104	Maximum	0.85	Maximum	99.7
Count	18	Count	18	Count	18	Count	18	Count	18

This study examines 18 Islamic banks in 10 countries. It classifies the social disclosure into eight themes. The higher disclosure score is 35 and the lowest is 11. According to the above table, it can be concluded that the data range of each variable is relatively wide. It can be seen from the minimum and maximum value of the data. Uncertainty avoidance and power distance indices shows the tendency of each country to provide the information transparently. The higher the index shows the higher secrecy or the less transparency. In contrary, the higher the Human Development Index should trigger the country to provide more transparent information. The more moslem population in a country is expected to demand for more detailed information provided by Islamic banks.
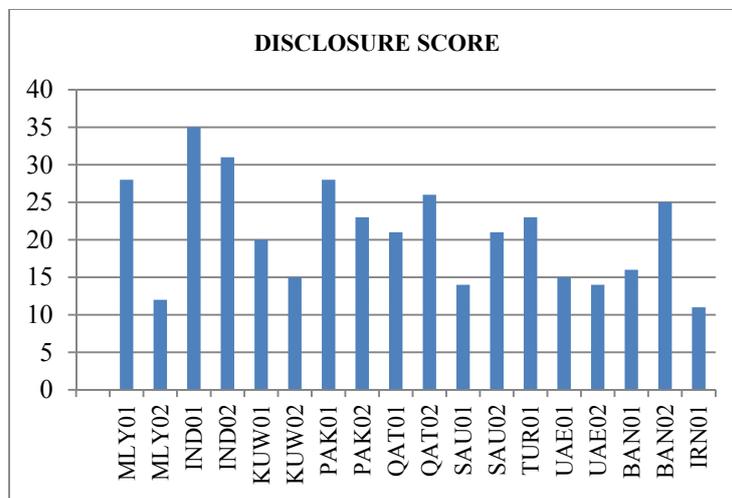
Figure 1   Disclosure Score

The above histogram depicts the disclosure score of the sample banks.   For more detail, the score is described in the following figure:

Mostly, all banks disclose zakah information, employee right, and other community involvement clearly and broadly in the annual reports. However, there is no detail information on how the banks deal with non-performance loan (financing) due to insolvent customers. Besides that, a number of banks do not disclose qard fund comprehensively.
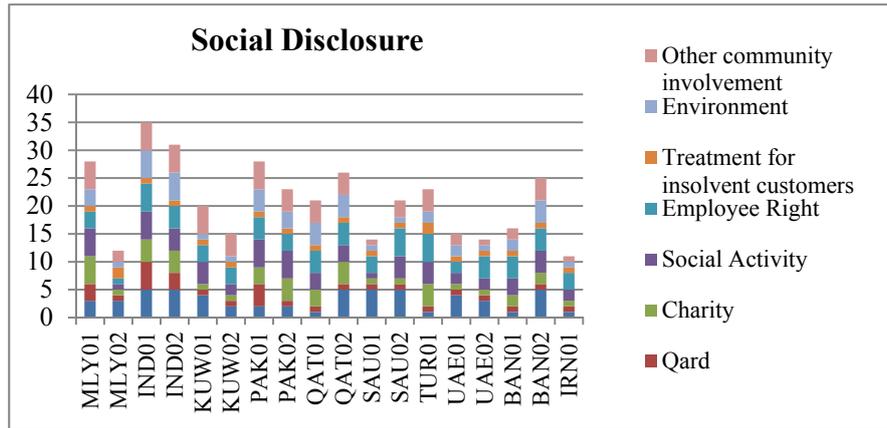
Figure 2　Social Disclosure

Table 3　Correlation

	Disclosure	Uncertainty Avoidance	Power Distance	HDI	Moslem Population
Disclosure	1				
Uncertainty Avoidance	-0.1786	1			
Power Distance	-0.0824	-0.6495	1		
HDI	-0.3839	0.0786	0.4415	1	
Moslem Population	0.0478	0.6237	-0.8335	-0.3176	1

A country with higher uncertainty avoidance and power distance and lower level of individualism and masculinity tends to have lower level of transparency. In the case of Islamic banks, it is proven that Disclosure has negative relationships with both Uncertainty Avoidance and Power Distance. Surprisingly, Disclosure has a negative relationship with Human Development Index. Lastly, although the correlation value is relatively low, it can be seen that Disclosure has a positive correlation with the number of the moslem in the country.

5 Conclusions

Culture and country characteristics have a powerful influence underlying human behavior and social values, and its impact on accounting practices cannot be underestimated. Different characteristics within national boundaries have the potential to endorse and sustain significant differences in accounting practices. Gray (1983) introduced four hypothesis linking relationships between Hofstede's cultural dimensions and accounting value dimensions. However, Gray did not conduct empirical tests to support his framework; rather this has been left to other accounting researches to prove its validity. Reexamining Gray's hypotheses can be very valuable to further prove the impact of culture on accounting.

This study has provided some interesting insights into cultural influences on accounting practices. The differences among countries and nations have contributed towards different disclosure practices. The study found that majority of the banks provide comprehensive information on zakah, employee right, and other community involvement. However, there is no detail information regarding qard fund and non-performance loan (financing) due to insolvent customers.

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Critical Success Factors of Food and Beverages Manufacturing Small and Medium-Sized Enterprises: A Case Study Approach

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Abstract: This research aims to explore and understand critical success factors (CSF) of small and medium-sized enterprises (SMEs) in food and beverage (F&B) manufacturing industry. This research focuses on food and beverage industry (F&B) because F&B manufacturing SMEs play a significant role in a country's economies. However, these SMEs face multiple challenges to gain competitiveness in the marketplace. This research employed multiple case study method and has conducted in-depth interviews with 8 SMEs owners and top management. It has identified 16 CSFs that influence the success of the F&B manufacturing SMEs. Among all, are business strategy, networking, foreign worker management, attractive product packaging, innovation, family capital, business experience, online visibility, access to finance, entrepreneurial orientation, professional management team, effective food safety system, effective quality management system, halal certification, entrepreneurial competencies and supply chain management. The study provides useful guidelines for business owners of SMEs and lays foundation for future research work.
Key words: Critical success factors; Food and beverages manufacturing; SME; Strategic management

1 Introduction

Strategic management is one of the areas of business economics that focus on helping firms to operate successfully and sustain competitive advantage (Breznik & Hisrich, 2014). The market-based views focus on industry effects in explaining variances in firm performance (Mcgahan & Porter, 1997) while on the other hand the resource-based views focus on individual firm effects on the performance (Barney, 1986, 1991). Nevertheless, the quest for best strategic practices remained as globalization has tremendously reduced the average period which business firms are able to sustain their competitiveness (Wiggins & Ruefli, 2005).

This research focuses on the strategic management of small and medium-sized enterprises (SMEs) in food and beverage (F&B) manufacturing industry. First of all, F&B industry is transformed by globalization into a borderless and complex interconnected system in which firm source materials and distributing products around the globe (Trienekens & Zuurbier, 2008). The F&B manufacturers especially SMEs hence face threefold of challenges. With availability of choices and alternatives, consumers are now become increasingly demanding and concerned about the quality and safety of food (Bigliardi & Galati, 2013). Both national and international governments also imposing stricter legislation and regulations to ensure safe production, restricted pollution and prevent excessive wastes. For instance, all F&B manufacturers in Malaysia are governed by Food Act 1983, Food Regulations 1985, and Trade Descriptions Act 2011, additionally Malaysia Protocol for Halal Meat and Poultry Productions 2011 and Malaysian Standard MS 1500:2009 Halal Food – Production, Preparation, Handling and Storage – General Guidelines (Second Revision) for those manufacturers with Halal certifications. For food exporters, they are further required to follow on the foreign countries' rules and regulations. The survivability of F&B manufacturers hence heavily depends on their quality and safety control (Trienekens & Zuurbier, 2008). Furthermore, the phenomenon of globe as a marketplace is especially evident in the F&B sector (Bigliardi & Galati, 2013; Trienekens & Zuurbier, 2008), manufacturers regardless of domestic or foreign owned and sizes compete with one and another. All in all, SMEs are required to meet not only the same set of food safety and quality standards, but also the constantly switching consumer demands and preferences only with lesser resources as compared to the large corporations. Provided the aforementioned stringent conditions to survive in the market, yet limited research explore on the strategic management of F&B manufacturers particularly on SME, as certain F&B manufacturing SMEs still manage to achieve high growth rate consistently over the years and become successful. In addition, SMEs especially in manufacturing industry are important contributors to the world economic and social development (Ayyagari et al. 2011).

Therefore, the research aim is to continue the discussions on manufacturing SME strategic

management and develop the understanding on SME business success (Ayyagari et al. 2011) through the theoretical lens of critical success factors (CSF). So, the critical questions of this paper are: what are the critical success factors of food and beverages manufacturing SMEs? What and how do SMEs do in these factors? How these factors lead the SMEs to success?

The paper's novelty relies on some crucial elements. First, the strategic management has generally study manufacturing industry as a whole and only limited studies has focus on food and beverage manufacturing industry and none to our knowledge has focus on the Malaysia food and beverages manufacturing SMEs. This would result relevant and important insights for entrepreneurs and managers, as it may clearly point out if and how specific factors are able to lead the F&B SMEs gaining advantages over competition. Second, study on critical success factors from a holistic perspective is rare. This would represent, in turn, a solid basis for the development of most effective strategies and policies on the ground. Thirdly, by using the critical success factors theoretical lens to understand the F&B industry in which may offers a unique opportunity to provide empirical evidences of the importance of certain policy measures or systems thus for the promotion of future food policies for manufacturing SMEs. Even though we acknowledge that the results of this study cannot be generalized for all countries and industrial contexts, the findings represent a good basis for further investigation and research in industry.

The remaining of the paper has been structured as follows: in Section 2, a literature review on the main theory supporting present research which is critical success factors theory and explain on how the present research aims to identify CSFs and seeking to extend the theory of critical success factors to strategic management of SMEs in general and more specifically in food and beverage manufacturing industry. Section 3 is devoted to describe the research methods and the sample involved in the investigation. Section 4 will present the findings and analysis of the study. Next, the discussions are presented. Finally, insights are extrapolated from the findings providing the basis for conclusions and implications for managers and recommendations for further research.

2 Literature Review

2.1 Critical success factors theory

The theory of critical success factors (CSF) has its foundation within management information planning (Daniel, 1961; Rockart, 1979). CSF referred as "three to six factors that determine success… must be done exceedingly well for a company to be successful…" (Daniel, 1961, p.111) or more commonly cited as "the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization" (Rockart, 1979, p.85). Strategic scholars then adapted the concept in strategy research (De Vasconcellos et al. 1989; Jenster, 1987; Leidecker & Bruno, 1984). CSF approach in strategic research allows the identification of CSF to achieve organizational target (Leidecker & Bruno, 1984) as well as enable a clear causal relationship between factors and target outcomes to be deducted (Kaplan & Norton, 1996). The measure of success is crucial in identifying the critical success factors of an SME (Watson, 2003). As our research focus on highly competitive F&B manufacturers, success is perceived achieved when SME able to experience positive business growth consistently within a period of 3 years. Business growth is an important business success dimension among Malaysian SME owner-managers (Ahmad et al., 2011). Thus we would explore on F&B manufacturing SMEs which achieve positive business growth for consecutive three years and identify critical factors that contribute to their success.

The next subsection presents literature review on the potential success factors of F&B manufacturing SMEs. With relatively less researchers has focus on the F&B manufacturing SMEs, first we present the common CSF we drew from entrepreneurship, small business and strategic management literature, then from the F&B literature, we identify specific elements of the industry such as food safety, quality management systems and supply chain management that may affect firm success.

2.2 Critical success factors of food and beverages manufacturing SMEs

2.2.1 Common critical success factors among SMEs

1) Entrepreneurial competencies

Entrepreneurs establish their own SME and spearheaded major decision makings. Thus, their characteristics substantially affect their ventures (Van Praag, 1999). In entrepreneurship literature, specific group of competencies related to successful entrepreneurship are identified and referred as entrepreneurial competencies (Mitchelmore & Rowley, 2010). In entrepreneurship and SME research, the personal competencies are often cited as most influential factors to firm performance which include

demographic characteristics (Cowling et al. 2015), personal background and experience (Murray, 1996), education background (Basu & Goswami, 1999), personalities (Martin & Staines, 1994), skills and abilities (Gasse & d' Amboise, 1997).

2) Business experience

Another common investigated variable in entrepreneurship literature is the entrepreneur business experience (Brüderl et al. 1992; Shane & Stuart, 2002; Unger et al., 2011). The business experience can be differentiate into managerial and industry experience (Dencker & Gruber, 2015). Entrepreneurs gain managerial experience or in-general know-how of business operation through involving and understanding the business routines and consistently observing, studying, and making business decisions (Cooper et al., 1994). On the other hand, entrepreneur prior experience in the industry of his venture is known as industry experience (Gimeno et al., 1997). Both managerial and industry experience have been demonstrated positive effects on firm performance (Brüderl et al. 1992; Cooper et al., 1994), however other researchers have failed to identify a significant causal links between business experience and performance (Chandler,1996 ; Kalleberg & Leicht, 1991; Stuart & Abetti, 1990).

3) Family capital

Entrepreneurship and small business literature particularly the family business literature has placed significant emphasis on the family capital (Dyer et al., 2014). Family capital here covers three distinctive forms of resources namely human, social and financial capital that entrepreneurs acquired from the family affiliations (Danes et al., 2009; Dyer et al., 2014). Furthermore, the family capital served as important resources to SME with four distinct advantages inclusive of difficulty to be imitate, high mobilization, low transaction costs and transferrable across generations (Hoffman et al., 2006).

Families may generate human capital from two ways. Firstly, families who own businesses may pass their knowledge of operating and managing business to the family members particularly next generations (Dyer et al., 2014). In fact, research has supported that entrepreneurs worked with family business performed better compare to those who do not (Fairlie & Robb, 2008) Alternatively, research indicate family members can also become employees of the business in which they generally perform better than employees with no family connections due to the social and emotional attachment (Herrero, 2011).

In term of social capital, the family members may have some unique advantages in developing long term relationship with their family's stakeholders (e.g., friends, clients, business associates, community leaders, etc.) that provide the members of that family access to important resources in starting a business because such relationships are difficult for potential competitors to replicate (Dyer & Singh, 1998). Furthermore, these family social capitals are generally stronger and have greater power influence due to the commitments made by families across generations (Danes et al., 2009; Ermisch et al., 2012; Zellweger et al., 2012).

Lastly, as access to financial capital is generally an important limiting factor for business start-ups (Fairlie & Robb, 2008), family may serve as an important source of finance. For instance, (Sirmon & Hitt, 2003) pointed out several important roles of the pooled financial capital of the family in providing the firm a competitive advantage compared with those firms without access to such capital. Firstly, it helps sustain the business during poor economic times. Secondly, they can also assist family members in finding capital to launch new ventures.

4) Access to finance

Finance has been important elements for business firms seeking growth and investment opportunities (Beck et al., 2005), active involving in innovations (Beck & Demirguc-Kunt, 2006; Mazzucato, 2013) and creation of a new venture (Evans & Jovanovic, 1989). When SME has limited access to finance, for instance inability to borrow from banks, it face credit constraints (Blanchflower & Oswald, 1998) which may further lead to capital constraints, the situations in which a firm was prevented from funding the desired investments to and even forced to forgo investments that they made (Lamont et al., 2001). Capital constraints can hinder SME growth (Evans & Jovanovic, 1989; Mazzucato, 2013) and entrepreneurs with lower capital constraints were found more likely to survive (Cheng et al., 2014). The literature has found important of finance-seeking and management skills (Holtz-Eakin et al., 1994) and ways to lower capital constraints (Lamont et al., 2011) important to support SME business development.

5) Entrepreneurial orientation

Entrepreneurial orientation (EO), or commonly regarded as firm-level entrepreneurship (Petersen & Rajan, 2002) is refer as "processes, practices, and decision-making activities that lead to new entry"

(Covin & Wales, 2012) or in general the specific manner in which firms act upon opportunities (Lumpkin & Dess, 1996). The common dimensions associated with EO including proactiveness, innovativeness, and risk-taking (Lumpkin & Dess, 1996; Miller, 1983).

Proactiveness reflects the process of "seeking new opportunities which may or may not be related to the present line of operations, introduction of new products and brands ahead of competition, and strategically eliminating operations which are in the declining stages of life cycle" (Lumpkin & Dess, 1996) which allow firms to identify and seize opportunities and gain high profit (Miller, 1983).

Innovativeness refers to the tendency to "engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes" (Covin & Wales, 2012). It facilitates the use of new approaches to seize opportunities brought about by changes in external environment (Miller, 1983).

Risk-taking implies a willingness to commit resources to projects with high failure rates and unknown outcomes (Miller, 1983). It enables new ventures to conduct risk-taking behaviors in the interest of obtaining high returns (Lumpkin & Dess, 1996) and it contributes to embarking on proactive and innovative initiatives to alter the competitive landscape of the market (Miller, 1983).

As EO has been extensively studied in the entrepreneurship literature, its impacts on firm performance however are not unequivocally strong. Firstly, EO was found insufficient for wealth creation for ventures (Wiklund & Shepherd, 2005). Furthermore, the positive correlation between EO and firm performance were reported most in studies on developed countries in which the same were not found in emerging economies (Rauch et al. 2009). This lead to the argument in which the impacts of EO on firm performance is subject to constraints faced by firms operating in different contexts (Rauch et al. 2009; Wang, 2008).

6) Network

Entrepreneur and businesses are social enactments and hence fundamentally associated with networking (Hill et al., 1999; Lumpkin & Dess, 2001). Furthermore, SMEs are more prone to resource constraints as compared to large firm, network become important as a mean for SMEs to access resources (Hill et al., 1999). The empirical evidences have shown that networks are important mean to extend the potential resource base of the entrepreneur (Jack et al., 2010), improve the possibilities of success (Brüderl & Preisendörfer, 1998; Shaw, 2006) and indeed, increase venture survival (Jack & Anderson, 2002).

7) Competitive strategy

A competitive strategy explores how a firm operates (Huggins, 2000) and competes within its industry (Schendel & Hofer, 1979). Porter's competitive strategies framework (Parnell, 2008) is most widely accepted in strategic management literature (Porter, 1980). According to Porter's (Parnell, 2008) framework, a business can pursue superior performance by either cost leadership or differentiation strategy. Cost leadership generally based on process innovation, learning curve benefits, economies of scale and efficient manufacturing design (Allen et al., 2006; Chaganti et al., 2002; Porter, 1980) in which proven to be successful strategy especially among firms who enter the industry late and able to sustain low-cost designs (Grant, 1998). On the other hand, differentiation aims to create superior and unique value either through product design, quality, range and type of features or after-sales support (Allen et al. 2006; Chaganti et al., 2002; Porter, 1980) as a mean for SME to compete with larger firms (Grant, 1998).

Although some scholars argued that businesses successfully combining the two may create synergies that overcome any tradeoffs that may be associated with the combination (Lechner & Gudmundsson, 2014; Parnell, 1997), it has shown inferior results (Chan & Wong, 1999). Nevertheless, it is anticipated that development of one effective strategy, either cost leadership, product differentiation or combination of both strategy is essential for the performance of small firms (Thornhill & Amit, 2003; Thornhill & White, 2007).

8）Professional management team

As SME develops, it transitions from individual entrepreneurs to the formation of professional management team for further development and expansion (Parnell, 2011). Previous research also highlighted the roles of managers in mediating the relationship between resources and firm performances (Casson & Della Giusta, 2007). Additionally, Sirmon, Hitt, Arregle, and Campbell (2010) show that managers' actions must simultaneously address capability strengths and weaknesses in order to realize a competitive advantage.

2.2.2 Critical success factors in F&B context

1) Effective food safety systems (FSS)

As the consumers have increasingly concerned with food safety issues, alongside with legislative enforcements, food companies would need to ensure food safety and avoid product failures, safety and health problems, customer complaints and failure costs (Van der Spiegel, 2005). Food safety systems (FSS) have hence frequently implemented by food and beverages company (Kafetzopoulos & Gotzamani, 2014) for instance the Hazard Analysis of Critical Control Points (HACCP). Nevertheless, researchers have found that all FSS does not guarantee food safe, rather it is the effective implementation of the food safety systems that prevent food borne diseases and reducing food safety risks to an acceptable level (Kafetzopoulos et al., 2013; Kök, 2009) and thus contribute to the business performance (Kafetzopoulos & Gotzamani, 2014).

2) Quality management systems

As food quality food products were found to be highly inconsistent due to process variability and the nature of their perishability (Gauri, 2003; Pable et al., 2010) and depends heavily on the factors in production processes (Orr, 1999), quality control (QC) and hence Quality Management Systems (QMS) are crucial elements in food manufacturing industries (Oliver, 2009; Paiva, 2013). Quality control is carried out by inspecting quality of final products which is commonly incorporated under QMS and focus on monitoring and controlling of quality of day-to-day operations (Paiva, 2013).

In spite of the limitations, the food manufacturing industry generally impose statistical process control (SPC) as a required effective control techniques for reducing non-conforming products by the quality management systems and food safety systems (Hubbard, 1999) which were found useful in defective products' reduction, food safety management improvement, and cost savings improvement (Abdul Halim Lim et al., 2015).

The previous research also highlight that the quality management system are able to enhance competitiveness of a company in the long run (Anderson et al., 1994). In fact, most food and beverage companies would combine both QMS and FSS to assure the quality of the products (Kafetzopoulos & Gotzamani, 2014).

3) Supply chain management

Supply chain (SC) refers to the chain of organizations composed by those involved in fulfilling a customer's order that may be covering from suppliers' supplier to customer's customer and beyond (Chopra & Meindl, 2007). Supply chain management (SCM) enables organizations to manage the whole SC as single process with a common goal (Rashid & Haris Aslam, 2012). Previous research has found that the SCM is an effective strategic tool to increase firm competitiveness, business stability, and revenue growth (Gunasekaran et al., 2008; Ou et al., 2010) and reduce operation cost (Simchi-Levi et al., 1999). In spite of the benefits of SCM, there are very few researches explore SCM from the standpoint of SMEs food and beverages manufacturers (Ruteri & Xu, 2011).

Moreover, there is an emerging trend in the study of quality management (QM) from SC perspective termed as "supply chain quality management." in the recent years (Kuei, et al., 2011; Rashid & Haris Aslam, 2012; Zhang, et al., 2011) in which the literature suggested that SCM and QM efforts improve each other's performance and integration between the two functions can be beneficial for an organization in many ways (Foster Jr, & Ogden, 2008).

4) Innovation

Food manufacturing industry is often classified as mature and traditional industry characterized by little investment in R&D and low-tech intensive (Triguero et al., 2013). However, previous research have found that the firm's return and growth depend on the innovation capability (Rama et al., 2003) as it allows firms to maintain better process controls, exploit economies of scale, and guarantee food safety, variety, and quality (Traill & Meulenberg, 2002). In addition, changing in consumer demands and requirements have lead innovation be important instruments for food companies to overcome competition and satisfy consumer expectations (Menrad, 2004).

The literature review has highlighted potential CSFs of F&B manufacturing SMEs. Subsequently, the next section present the research methodology used to identify the CSFs for successful SMEs.

3 Research Methodology
3.1 Multiple case-study approach

Given the aim of the investigation and our conceptual starting points, this research employed an "iterative-grounded" research process (Orton, 1997) in which we first reviewed the literature and then used empirical data to fill in the gaps by discover emerging patterns and practices (Meredith, 1998). We adopted qualitative and exploratory approach in our empirical analysis. More specifically, we employed

multiple case study methodology (Yin, 2014). Multiple case study approach is most appropriate method in conducting exploratory research on previously under-investigated areas (Eisenhardt, 1989) and allows us to study the problem and the context to deduce both cause and effect (Leonard-Barton, 1990). The case studies also provide a stronger base for theory building: 'the theory is better grounded, more accurate and more generalisable (all else equal) when it is based on multiple cases' (Eisenhardt & Graebner, 2007).

3.2 Sample

In this study, we adopted purposive case selection based on two selection criteria which are relevance and access to data. Firstly, success in our research context referred to the positive business growth for three consecutive years. We chose relative sales growth as the business growth indicator as it is applicable to all firms, insensitive to capital intensity and as the indicator preferred by managers and practitioners (Delmar et al., 2003). We also ensure our cases fit common business success criteria of Malaysia SME owners managers (Ahmad et al., 2011) in which the owners are also satisfied with their financial and non-financial performance and perceived the firm as market leaders or top-performers. Referring to access, we selected companies for which we could interview their owners and top management (e.g. managing directors, chief executive officers, chief financing officers, general managers). All companies agreed to be the subject of this case study with the understanding that their identity and information would be treated with confidentiality. In selecting the number of cases, several studies recommend that four as the minimum number to achieve theoretical generalizability (Eisenhardt, 1989; Yin, 2014) however case sampling is considered adequate when patterns have emerged in which consecutively two cases do not contribute to additional information (in our case, new CSF) and the study is then deemed to have reached "theoretical saturation" (Eisenhardt, 1989) which in our case occurred during the 7th and 8th cases (Case G and H).

3.3 Data collection

To ensure consistency of data collection across cases and researchers, a case study protocol was established to guide data collection (Yin, 2014). The information gathered regarding the companies was primarily based on on-site interviews with owners or top management of each field study firm. The interview generally last from 2 to 5 hours and it is guided by semi-structured interview guide with open-ended questions. The interview is also supported and supplemented by direct observations from tours around the premises of the company, unstructured conversations with employees, and secondary sources of archival data, such as databases of published financial information, websites, newsletters and news articles about the companies. All of this documentation provided further evidence to corroborate and augment the interview data, thus establishing triangulation for the case studies for construct validity and data verification (Yin, 2014).

3.4 Data analysis

Given the extensive amount of data (both primary and secondary) gathered for each company, it was necessary to codify these into succinct categories that could be used to classify and profile the companies in the sample. This could further facilitate the comparison of the findings from each case study. Thus, a three-step approach was employed. First, following (Graebner & Eisenhardt, 2004) suggestions on the need for data triangulation, individual case studies were built, employing data from the following sources of data: semi-structured interviews, public documentation, archival records and the researcher's participant observation diary to classify the examined companies according to their common characteristics. The analysis was conducted through a within and cross-case approach which was proposed as the most appropriate technique for exploring relationships among different cases (Graebner & Eisenhardt, 2004). The within-case analysis incorporates the study of each case separately, allowing for better familiarization, recognition of patterns to emerge and comparison among cases. In all cases, we were examining the presence or absence of a particular CSF, while at the same time ascertaining whether it had been fulfilled in a meaningful way. To assure the significance and completeness of identified CSFs, feedback cycles among the field study companies were initiated. The field study companies provided feedback on the presented CSFs. Then cross-case analysis was conducted whereby a list of common themes was identified and cross case comparisons were made by using a pattern-matching technique (Yin, 2014).

The following section first presents on the summary of within case analysis before presenting the summary of cross-case analysis and discuss on each CSF identified based on the reconciliation between participant input and literature.

4 Findings

4.1 Within-case analysis

Table 1   Summary of Within-Case Analysis

Case ID	Products	Year Founded	Annual Sales	Critical Success Factors Identified
A	Processed and Ready-To-Eat Poultry and Seafood Products	1997	RM 20 million	Business Strategy Networking Foreign Worker Management Attractive Product Packaging
B	Packaged Coffee Powder and Products	1964	RM 1.5 million	Innovation Family Capital Business Experience Online Visibility
C	Functional Food and Health Supplements	2006	RM 3.5 million	Innovation Access to Finance Entrepreneurial Orientation
D	Functional Food and Health Supplements	2008	RM 3 million	Business Strategy Family Capital Business Experience
E	Frozen and Ready-To-Eat Bakery, Pastry and Sauces	1994	RM 10 million	Access to Finance Professional Management Team Effective Food Safety System Effective Quality Management System Halal Certification
F	Food Pastes and Sauces	1998	RM 6 million	Online Visibility Entrepreneurial Orientation Entrepreneurial Competencies Supply Chain Management
G	Food Pastes	2010	RM 4 million	Networking Foreign Worker Management Entrepreneurial Competencies
H	Coffee Products, Tea and Chocolate Beverages	1998	RM 8 million	Networking Professional Management Team Effective Food Safety System Effective Quality Management System Halal Certification

4.2 Cross-case analysis

Table 2   Summary of Cross-Case Analysis

Identified Critical Success Factors		A	B	C	D	E	F	G	H
CSF 1	Business Strategy	✓			✓				
CSF 2	Networking	✓						✓	✓
CSF 3	Foreign Worker Management	✓						✓	
CSF 4	Attractive Product Packaging	✓							
CSF 5	Innovation		✓	✓					
CSF 6	Family Capital		✓		✓				
CSF 7	Business Experience		✓		✓				
CSF 8	Online Visibility		✓				✓		
CSF 9	Access To Finance			✓		✓			
CSF 10	Entrepreneurial Orientation			✓			✓		
CSF 11	Professional Management Team					✓			✓
CSF 12	Effective Food Safety System					✓			✓
CSF 13	Effective Quality Management System					✓			✓
CSF 14	Halal Certification					✓			✓
CSF 15	Entrepreneurial Competencies							✓	✓
CSF 16	Supply Chain Management						✓		

Note: In Table 2 the "Case Codes" header spans columns A–H.

4.3 Identification of critical success factors
4.3.1 Business strategy (CSF1)

Company A although sell products made from poultry and seafood but has always employed a differentiation strategy. The managing director of the company highlighted "We always try to create value differences and never depend on price competition. We allow our customer to customize the products as they wish and we give them the best quality. Even though our price is higher than other market players, we succeed with our strategy and have achieved consistent high growth rate of over 20% in last 5 years, even when economic downturn in (year) 2015." Company D on the other hand, sell functional food in which this type of products has to depend on unique product value offerings to capture consumers. Companies D generally win customers by consistently offer additional nutritional values and benefits when launching new products to keep themselves on a higher market position as compared with competitors. "Our company trusted you (Company D) and your products. As business partners, we can easily market every single products (of company D) successfully within a short time. " (Company D's business partner testimonial). Align with the strategic management literature, SMEs can create value by differentiation strategy through product quality or unique features of products (Allen et al. 2006; Porter, 1980).

4.3.2 Networking (CSF2)

In case A, the entrepreneur is socially active in business associations and served as community leader. These social networks increase his exposure and have facilitated many business opportunities especially new distribution channels in which the firm captured and grew. On the other hand, Company G has actively joining government efforts and collaboration in growing the business. For instance, Company G will join exhibitions and trade fairs organized by Malaysia External Trade Development Corporation (MATRADE) in which had helped the company attract foreign sourcing agents to distribute the product oversea. Company H, initially as a start-up at home has grew along with many of its customers. Strong rapports were built and when the clients become domestic market leaders in restaurants and hotels industry, company H has benefited from sharing the growth along their business expansion. Compared to large firms, SME often lack the relevant resources to achieve growth (Storey, 1994). However, as case A, G and H demonstrated, networking helps SMEs to market their products and services (O'Donnell, 2014).

4.3.3 Foreign worker management (CSF3)

In order to ensure the operation and product quality, foreign worker management is essential for Company A to achieve success as the proportion of foreign worker is high. The initiatives include reporting yield of each of each production line daily, assigned an internal audit role to all production teams in which they will cross-check the other production team's area and minimizing hygiene issues and defect problems from arising. In regard of Case G, as more than 3 quarters of the workforce comprised of foreign workers, by giving the equal benefits and promotion opportunities to the foreign workers, the company able to engage the employees and achieve high efficient operation. Although workplace diversity is an emerging theme in management, it remains under-study and tends to accumulate on the multinational enterprises practices (Lauring, 2013).   Case A and Case G have shown the significant of foreign worker management toward their success and remain good starting point for further research on the diversity management involving foreign workers with different culture.

4.3.4 Attractive product packaging (CSF4)

Company A has packaged products into different size ranges in which the products are within specific size dimensions. This type of packaging has allowed housewives and restaurants to prepare the food easily. Furthermore, besides nutritional labelling, the packaging also attached with recommended recipe, spices and cooking method for various flavours. This has increased customers attention on the unique product features of Company A and further increase the sales volume. This aligned with empirical evidences which shown packaging can influence consumers' purchase intentions (Löfgren & Witell, 2005).

4.3.5 Innovation (CSF5)

Although a half-decade old firm, Company B is dedicated in R&D and employed various process innovations. For instance, the owner has innovated and created a mobile roof shelter that allow the coffee beans to be completely sheltered from rain with just little efforts. The innovation has replaced the traditional style of moving all coffee beans in- and out-door. Being a functional and health food manufacturer, Company C has relied on research and development in giving the products competitive advantage such as additional nutritional values, new flavors and enhanced formula. Both case B and C have supported the notion that innovation is strategic tool for food firms to capture consumers (Menrad,

2004).

4.3.6 Family capital (CSF6)

Family capital is evident as critical success factors in Case B and D, however in diverse ways. Company B is a wholly-owned family business and current managing director is the 2nd generation of the company founder. He has accumulated years of experiences and knowledge in processing coffee as he has helped his father in business since childhood. These experiences have been fundamental for him to inherit the business from his father and continue to expand the business. While in the case of Company D, the entrepreneur has his start-up capital pooled from the family. Moreover, he set up his first production facility on the piece of land owned by his parents at zero cost. Thus Company D has relatively less financial burden during the start-up stage. Quote the owner-manager of Company D "I was able to kick-in full gear when the opportunities come without worrying about the capital. It is (capital) most important factor for every business." Both case B and D demonstrate how entrepreneur may gain human and financial capital respectively from family which in turn generates competitive advantage for them. Hence, family capital may be CSF for SME by providing entrepreneurs resources (Danes, et al., 2009; Nahapiet & Ghoshal, 1998).

4.3.7 Business experience (CSF7)

Company B produce coffee products in which the processes of drying and roasting severely affect the taste and quality of the products and hence it's required in-depth experience and expertise of the coffee manufacturer in producing consistent high quality coffee. On the other hand, Company D has been able to help clients to launch a new product within 3 months and capable of shortening the period into a month if the product is within Company D specialty after accumulating years of industry experience. The business experiences of any entrepreneur can generally be separated into managerial and industry experience (Delmar & Shane, 2006) in which both types of experience have associated with firm performance (Stuart & Abetti, 1990).

4.3.8 Online visibility (CSF8)

Company B has good online visibility following their strong search engine optimization. Search words such as Malaysia coffee factory, how to make coffee in Malaysia would lead to blogs and medias published about Company B in which lead to even higher traffic into the Company B for coffee visits and purchase. One of the success factors of Company D is their high online visibility. Since 6 years ago, Company D has been working on search engine optimization (SEO). The early initiatives include posting and advertising on online portals, forums and e-commerce websites include Alibaba. The high online visibility allows clients to easily locate them especially when they perform online keyword search regard of contract manufacturer for health food. This in turn generated a competitive advantage where clients will automatically send in inquiries when they locate the contacts online. This has help Company D restrain themselves from doing aggressive persuasive selling, rather they become a focused solution provider for the inquiries. This has guaranteed the automatic generation at least 6 new clients every month. Limited literature has explored on online visibility as source of competitive advantages among SMEs besides tourism (Smithson et al., 2011). The case B and D suggested SMEs from other industry may benefited from high online visibility.

4.3.9 Access to finance (CSF9)

In order to expand the production facilities which were fully utilized, Company C has needed to secure financing facilities from banks. Within the short period of time, the loan is approved and Company C is able to acquire and develop their new factory without disruptions on their production. On the other hand, Company E does not able to borrow from financial institutions; instead it is the government grant which provided them financial aid to market their products oversea. Regardless the finance source, access to finance is important for business development (Evans & Jovanovic, 1989).

4.3.10 Entrepreneurial Orientation (CSF10)

During the initial startup phase, Company C manufactured instant coffee powder and Ji Kut Teh soup packet but low reception from the market. The owner decided to change its strategic direction and venture into become contract manufacturer and producing for business that can do well in marketing. Company F however experience great success during early stages when the firm proactively looking for opportunities and succeed to distribute their products overseas. Both risk-taking and proactive are important dimensions of entrepreneurial orientation (Covin & Wales, 2012) and each single dimension of EO can contribute to firm performance (Wales et al. 2013).

4.3.11 Professional management team (CSF11)

The founder of Company E transformed the company into market leader by establishing the top management by recruiting professional talents. The managers in general are trained to be all-rounder by

performing job rotations and cross-function portfolios. As direct consequences, the company efficiency increases as operations never disrupted under circumstances like employee leaves or turnover. In case H, the entrepreneur appreciates the professional values that a great management brings to the firm. With a complete succession plan and performance appraisal system, the entrepreneur is able to engage young talents into the company and expand the business. Professional management team is thus important contributors to competitive advantage of firm (Parnell, 2011).

4.3.12 Effective food safety system (CSF12)

Company E is able to distribute their products to the oversea when it attracted the oversea distributor by having the accreditation for ISO Food Safety Management System (ISO 22000:2005) and Hazard Analysis and Critical Control Point (HACCP). As another HACPP and ISO22000 accredited firm, Company H is reaping the benefits of having standardized procedures and key performance indicators for key operational and managerial activities. This directly improved the efficiency of the company from top management to the lower subordinates through transparency and clear guides. Thus these cases supported the notion that effective implementation of FSS contribute to the SME performance (Kafetzopoulos & Gotzamani, 2014).

4.3.13 ffective quality management system (CSF13)

In Company E, the GMP and ISO 9001 allows the management and executives to be genuine paying attention on what may goes wrong in the production and operation thus increasing the whole company efficiency and effectiveness in preventing problems and waste. On the other hand, the owner in Company H is benefiting from the QMS as the key activities and performance indicators allow all employees to comprehend the company operations within a short period of time. Both company E and H have benefited from effective QMS in which they gained competitiveness in the long-run for being efficient and effective (Anderson et al., 1994).

4.3.14 Halal Certifications (CSF14)

Company E has able to distribute to the foreign markets within the first year of their establishments mainly due to the Halal certifications which allowed their products to be immediately accepted in Saudi Arabia and started their internationalization. Company H is able to sell to almost all large HORECA (hotels, restaurants and cafes) chain in Malaysia as the products and producing premises are Halal certified. Halal certification in fact has been a new strategic tool for businesses to differentiate their products (Rajagopal et al., 2012).

4.3.15 Entrepreneurial competencies (CSF15)

Following the remark of chief financial officer in Company F, "Our boss (the owner) is a natural leader, he always lead us, both physically and psychologically. He is able to engage everyone and made us want to contribute more to the company. This is key reason why with the workforce of a small company, we have accomplished achievements like a large company and for so many years. He is the key factor." On the other hand, the observations and archival records in Company G shown that the entrepreneur has been frequently awarded as the best trainer in the sector of ICT training and development and had certifications as regional leader in some of the South East Asia projects before she venture into the food business industry. In line with existing entrepreneurship literature, the personal qualities and abilities of the entrepreneur is influential to the firm performance (Martin & Staines, 1994; Gasse & d'Amboise, 1997) and the entrepreneurial competencies of owners are critical factors to successful venture (Mitchelmore & Rowley, 2010).

4.3.16 Supply chain management (CSF16)

Company F main raw materials are spices and seasonings in which Company F has currently producing on their own to ensure the quality and taste. The spices and seasonings are forecasted to be new addition into the standalone product lines after moving into new manufacturing facility in coming 2017. By managing the supply chain, Company F is able to minimize and eliminate production input disruptions and focus solely on improving the operation and production. This supported previous research which reported SCM as an effective strategic tool to increase firm competitiveness, business stability, and revenue growth (Rashid & Haris Aslam, 2012; Gunasekaran et al., 2008).

4.4 Discussions on Findings

16 CSFs were determined from the case study investigation. The overall results mapped well to identified factors from the literature. Some of the CSFs which were not identified in the initial literature review for instance foreign worker management, attractive product packaging, online visibility and Halal certifications. Among these CSFs, foreign worker management and Halal certifications are not common research themes especially in the western countries. On the other hand, online visibility and attractive product packaging are emerging themes in marketing literature (Löfgren & Witell, 2005;

Smithson et al. 2011) which is not extended to the study of F&B manufacturers yet.

5 Conclusions

This paper identified critical success factors (CSF) of the small and medium sized enterprises in food and beverage manufacturing industry. Based on extensive literature review and exploratory research study, this paper identified 16 CSFs that impact the success of the SMEs food and beverage manufacturers, namely business strategy, networking, foreign worker management, attractive product packaging, innovation, family capital, business experience, online visibility, access to finance, entrepreneurial orientation, professional management team, effective food safety system, effective quality management system, halal certification, entrepreneurial competencies and supply chain management.

The theory of critical success factors provided an effective theoretical lens as foundation of this study and served as applicable theory in strategic management. Thus, the research provided a potential area for studies on other industry and sectors. Practically, this study contributes to the understanding of Malaysian SMEs in food and beverage manufacturing industry. Potential entrepreneurs and investors may consider on these CSFs before starting up company in the F&B industry. In addition, current managers and entrepreneurs may improve their operations based on the CSFs identified.

The current study explored only 8 companies in the F&B industry. Therefore the sampling logic for findings generalization may not be applicable. In addition, there may be more potential CSFs available. Therefore, the future research should involve more companies and further validate on the CSFs identified.

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Research on the Development Status of Emergency Industry in China

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Abstract: At present, China, as a big country in the rapid development, has entered a period of frequent public emergencies and emergency management capabilities need to be improved. The demand of emergency management has led to the formation and development of the emergency industry. The production characteristic of the emergency product and the supply characteristic of the emergency service make it become a comprehensive industry. This study that base on relevant theoretical research analysis clear the connotation and characteristics of emergency industry in order to objective and systematic analysis present situation of the development of emergency industry in China and proposed future work about developing emergency industry in our country, in order to provide the corresponding reference to our country emergency management work.
Key words: Emergency industry; Emergency services; Emergency

1 Introduction

China is a country with many disasters. With the development of society, all kinds of unexpected events are more complex, which seriously affect the people's lives and property safety.[1] According to the National Bureau of statistics data ,we can know that in 2014 all kinds of natural disasters caused a serious damage .A total of 2 billion 435 million 370 thousand people were affected in our country, 1583 people were killed and direct economic losses reached 33738 billion yuan, the situation is very grim.[2] Such serious impact would serve as a wake-up call to the China, who's ability to respond to emergencies need to be improved and will be more concerned about the development of China's emergency industry. Emergency industry is a new industry in China, and it is an important material and technical guarantee for emergency management. On 24 December 2014, the State Council formally announced the "guidance of speeding up the emergency industrial development" (Kai Yang,2015), which shows that our country has been highly concerned about the development of emergency industry. Related data show that in 2015 the number of people affected by disaster declined in China, this year was the least affected by disaster since 2000. It can be seen, Chinese emergency response capacity is gradually increased (Ma YuLing ,2016). But the development of China's emergency industry is not mature, the future's road is still hard. The purpose of this paper is to summarize and review the relevant literature, so that put forward the future work of China's emergency industry, and provide some reference for the follow-up development of emergency industry.

2 Development Process of China's Emergency Industry

In this study, the development of China's emergency industry is divided into three periods: establishing, developing and accelerating. As shown in Figure 1.

Establishing: November13, 2007, the State Council convened conference to implement "Emergency Response Law"(Ji Hong Mo, 2009), indicates that the development of emergency industry was been paid more and more attention in China.

Developing: September27, 2009, "guidance on strengthening emergency management in industrial " (Ji Hai Zhang, 2013) issued by the Ministry of industry and information technology, which pointed out the importance of accelerating emergency industry development. In 2011, formulated by the national development and Reform Commission, the industry structure adjustment Guidance Catalogue (2011 Edition) adjust the industrial structure to make further development for emergency industry(Lian She; Xu Jing，2011).

Accelerating: September22 ~ 25, 2012, China's first emergency Industry Exhibition was held in Guangzhou, which theme is "Enlarge emergency industry and accelerate its transformation and upgrading". This made the emergency industry more and more popular with the public. On 24 December 2014, the State Council formally announced the "Guidance of speeding up the emergency industrial development" (Kai Yang,2015). It is the first time to make comprehensive arrangements for emergency industrial development in China.

Establishing（2007~2009）2007.11, the State Council convened conference to implement "Emergency Response Law"	Developing（2009~2011）2009.09, "guidance on strengthening emergency management in industrial" was issued. 2011, the industry structure adjustment Guidance Catalogue was formulated	Accelerating (2012~2014) 2012.09, China's first emergency Industry Exhibition was held. 2014.12, "Guidance of speeding up the emergency industrial development" was announced.

Figure 1   Development Process of China's Emergency Industry

3 Connotation and Characteristics of Emergency Industry

3.1 Connotation of emergency industry

Emergency industry is a kind of economic activity. It includes enterprises and organizations of the economic activities and products and services that with emergency function can meet public growing demand for security. Emergency industry is the creation of human being at a proper social stage and final result of specified social division of labour, which is derived from traditional industry and different from it, they are mutual integration, overlapping and interwoven presenting. Therefore, the emergency industry is a comprehensive emerging industry which is closely linked with other economic sectors. The definition of emergency industry subject to the approval of the State Council. Emergency industry is an industry which provides special products and services for emergency preparedness, monitoring and early warning, disposal and rescue (Jian Guang wang, 2015).

3.2 Characteristics of emergency industry

Beside these features summarized by former research, such as, the universality of demand, rigid demand, diversity of supply, timeliness and use of the convertible. (Ji Hai Zhang, 2013) There are many other characteristics:

Public goods and market failure. A part of emergency products are public goods, which is provided by the government free of charge, so the enterprise doesn't want to provide products or services without corresponding revenue, and lead to market failure.

Industry technology lack of commonality. Initial development of industry is restricted by key technology, but emergency industry involves lots of industries, so that it lacks a universal technology.

Industrial stage property is not uniform. Different products or services is in different stages of technological development, which should be given different levels of attention, such as personal protective equipment at a mature stage, but is not so for emergency decision support system.

Dual attributes of product. Some emergency products and services with public goods properties, but in the daily context show a properties of private goods.

4 Promising Development Trend and Existing Problems of Emergency Industry in China

4.1 Promising development trend

Overall, China's emergency industry is developing at a promising trend.

4.1.1 The emergency industry are developing rapidly.

Coverage of Chinese emergency product is expanding widely. We have made remarkable achievements in those region, such as coal mine risk, high-rise fire rescue, food safety inspection, geological disaster monitoring, emergency communication and emergency command. A number of innovation results were obtained when emergency high technology is applied in emergency management, such as space technology, information technology, networking technology, etc. Emergency service industry is developing rapidly, mainly related to road rescue, air rescue. In 2013, related person in charge of the Ministry of industry and information technology made a estimation about output value of national security emergency, emergency equipment in areas such as special products and services, the number reached nearly one trillion yuan. The number greatly stimulated the enthusiasm of all types of market players and all levels of government to develop emergency industry. (Fang Xiao, 2015)

4.1.2 Force of emergency industry development continues to grow.

In the recent years, force of emergency industry development in China has been growing, and advantages of industrial cluster are more obvious. Emergency industrial base are established in Beijing, Guangdong, Hebei, Chongqing, Anhui. That make emergency industry resources get reasonable configuration,

so that we can timely take measures to mobilize emergency supplies when the emergency will happen. For example, Anhui province constructed public emergency industrial base in Hefei national high tech park, and strive to make public security industry as dominant industry with independent intellectual property rights and international competitiveness**.** (Li Zheng, 2015) Emergency technology innovation and emergency industry alliance accelerate emergency industry development. Xinxing Cathay International Group Co., Ltd has founded industry alliance combined a number of enterprises and scientific research institutions in August 2011, which became only national league in this field. Such as China Aerospace Science & Industry Corp, those large enterprises are paying more attention on emergency industry development. Development of the emergency services bring out a number of small and medium-sized enterprises that expand scale and strength of emergency industry development. (ShengLi Zheng, 2010)

4.1.3 Support capacity of emergency industry enhance further.

With the development of emergency industry, all kinds of emergency products and services have been widely used to deal with emergencies, and have achieved social effects and economic returns. For example, after Wenchuan's earthquake, support capacity of Sichuan Province has been greatly improved. In the matter of earthquake early warning technique, Sichuan Province has formed innovation chain structure of that from scientific research to commercial production, sales, service, which find a new growth point for the Sichuan province to accelerate emergency industry development. In 2013, earthquake early warning products sales revenue is 600 million yuan and contribute 150 million yuan. With society's deepening understanding of earthquake early warning, the product' annual output value is expected to over 100 million yuan.

4.2 Existing problems

Overall trend of emergency industry is better in China, but there are existing notable problems that delay and hinder its developing speed.

4.2.1 Equipment lack of scientific and technological innovation

In recent years, more attention is paid to enhancing level of emergency equipment. In China, foundation of industry is weak and emergency industry starts late. China's emergency equipment and products cannot meet emergency needs. Most emergency products lack of core technology and independent innovation, so key emergency equipment depend on imports that led to the emergency disposal effect is very poor. For example, the main developed countries and some developing countries have formed their own comprehensive aviation emergency rescue industry that have a strong emergency rescue capability and is suitable for national conditions. By 2015, Australia possess 10455 navigable aircraft, Canada keep 28737, Brazil has 9908, but China just have1000 and many of them are unable to fly. There is a relatively large gap between China and foreign countries (Pengyu Ding, Jiangtao Li, 2015).

4.2.2 Talent shortage

At present, there is a serious lack of professional talents of emergency industry in China. According to the Emergency Management Office of Guangdong province, the demand for emergency professionals in Guangdong Province is about 30 thousand people, the personnel lack degree of emergency industry in whole of China can be imagined. Emergency personnel supply cannot meet the demand in our country at present stage. Parts of training emergency personnel is research talents but technology R & D skilled practical talents is particularly deficient. Present main emergency personnel training institutions are not numerous, which concentrated in a handful of universities and cadre education institutions. It is difficulty to cultivate all-around emergency personnel without a specific plan for training emergency personnel.

4.2.3 Policy of emergency industry development is imperfect

There are many policy flaws to promote development of emergency industry in China. Without a sound system of integrating policy of emergency industry development. Current emergency industrial policy scatter various departments and even in various laws and regulations. Relevant policy is short of guidance that encourage society to participate. Now emergency industry mainly relies on government to participate and lack of policy measures to incentives enterprise to take apart in, social organizations don't have confidence and unwilling to take risks to be involved. Policy that only have a general guiding framework without specific details and supporting measures is not conducive to implement. In China, emergency industry management mode is single, independent and decentralized, due to lack of emergency management organization, which cause difficult to integrate and coordinate rescue resources to make systematically and efficiently rescue, once sudden public events outbreak.

5 Conclusions and Future Work of Developing China's Emergency Industry

Although the development trend of China's emergency industry is promising, there is a great gap

with the developed countries' mature emergency industry. Future work of developing China's emergency industry is arduous and heavy. Recent years, scholar no longer analysis characteristics and existing problems of emergency industry, they focus on a certain industry. So future research should promote development of emergency industry according to present opportunities and challenges. Based on the analysis and conclusion of the above research, this paper consider that future works could be carried out from following aspects.

Pay attention to the role of the market in the emergency industry. Previous studies have emphasized the government's leading role not market. The leading role of the market in the emergency industry remained at the level of concept that lack of practical operational measures, and at present related research is less. Actually, the degree of marketization will determine speed of future emergency industry development. If we want to develop emergency industry, we must determine the main tone of market, adhere market-oriented and government guidance, give full play to the decisive role of market allocation of resources. China will continue to build an innovation-demand-driven. Only by doing so, more social capital inflows will be created in emergency industry, and form a virtuous circle

Widen the scope of purchase. Research more on how to enhance the public's emergency awareness, promote demand, stimulate vitality of market. Purchase behavior lead to competition that is a strong way to promote innovation. But the consumer should not be confined to the relevant enterprises and government, it should be expanded to the general public.

Pay more attention on core contradiction. It is about stochastic and fragmented nature of emergency industry demand and the continuity of emergency industry development. The contradiction restricts the development of emergency industry in China.

In the era of big data, Data is becoming more and more important. Due to lacking of normative data system of emergency industry and incomplete data. Exchanging and updating information for all trades become more difficult.

Acknowledgement

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Consumer-Participating Mode of Experience Marketing for Agricultural Products

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Abstract: With the rapid development of the Internet and mobile Internet era of marketing campaigns, experiential marketing theory increasingly influences the corporate marketing activities, because of its own characteristics, marketing of agricultural products changes slowly. With the Internet era of consumer experience marketing has gradually become the new norm, this paper explores the agricultural products experience marketing model based on the theory, proposes a subscription mode of land and urban farm representative mode, analyzes its characteristics and advantages, and provides a new perspective for production and marketing enterprises to refer to.
Key words: Experience marketing; Land subscription mode; Urban farm mode

1 Introduction
1.1 The concept of experience marketing
Experiential marketing refers to marketing to consumers through the creation of sharp eyes, ears, try and use, and other related environmental participation, to mobilize and stimulate customer senses, association, behavior, feelings, thinking, action, contact and other emotional factors and rational factors, subversion in the past to design and create a new type of marketing tool (Wang yonggui,et al, 2011).
1.2 The type of experience marketing
"Experience marketing" Robert • H • Smith for changes in the way of performance experience, invisible, diversity, experience marketing model will be divided into five types, namely sensory experience, thinking experience, behavioral experience, emotional experience, associated with experience. Sensory experience as the name suggests, the integrated use of consumers in the marketing process to see, hear, touch, taste, smell and other senses to experiential marketing.

That perceptual experience sensory experience, the sense of smell, touch, taste, sight, hearing and other organs of perception used in the marketing process(Zhen rui, Yang lei ,2012); experience of thinking through creative to attract customers think and arouse the attention of customers; behavioral experience for consumers first by perception and experience to perception marketing merchandise to bring them to change their lifestyle, and then replace the existing way of life and form; that is the emotional experience of consumers in the consumption process through the emotional perception and experience to choose to buy products; related experience is a high form experience marketing model, that is through practice so self-continuous improvement, so that consumers feel good for marketers, and encourage customers to establish a system of consumer goods and consumer awareness and even social systems and establish some kind of proprietary brand preference.

2 Agricultural Products Experience Marketing Mode
In the traditional perception, the stage consumer participation in marketing of agricultural products can only be reflected in the scene later stage, while the new consumer marketing experience to participate in agricultural innovation model, consumers can pre-sale, sale and through different forms of participation stage based on consumers differ in different stages of the focus of attention (Li guangming ,et al,2010), therefore, the corresponding experience and there are also differences.
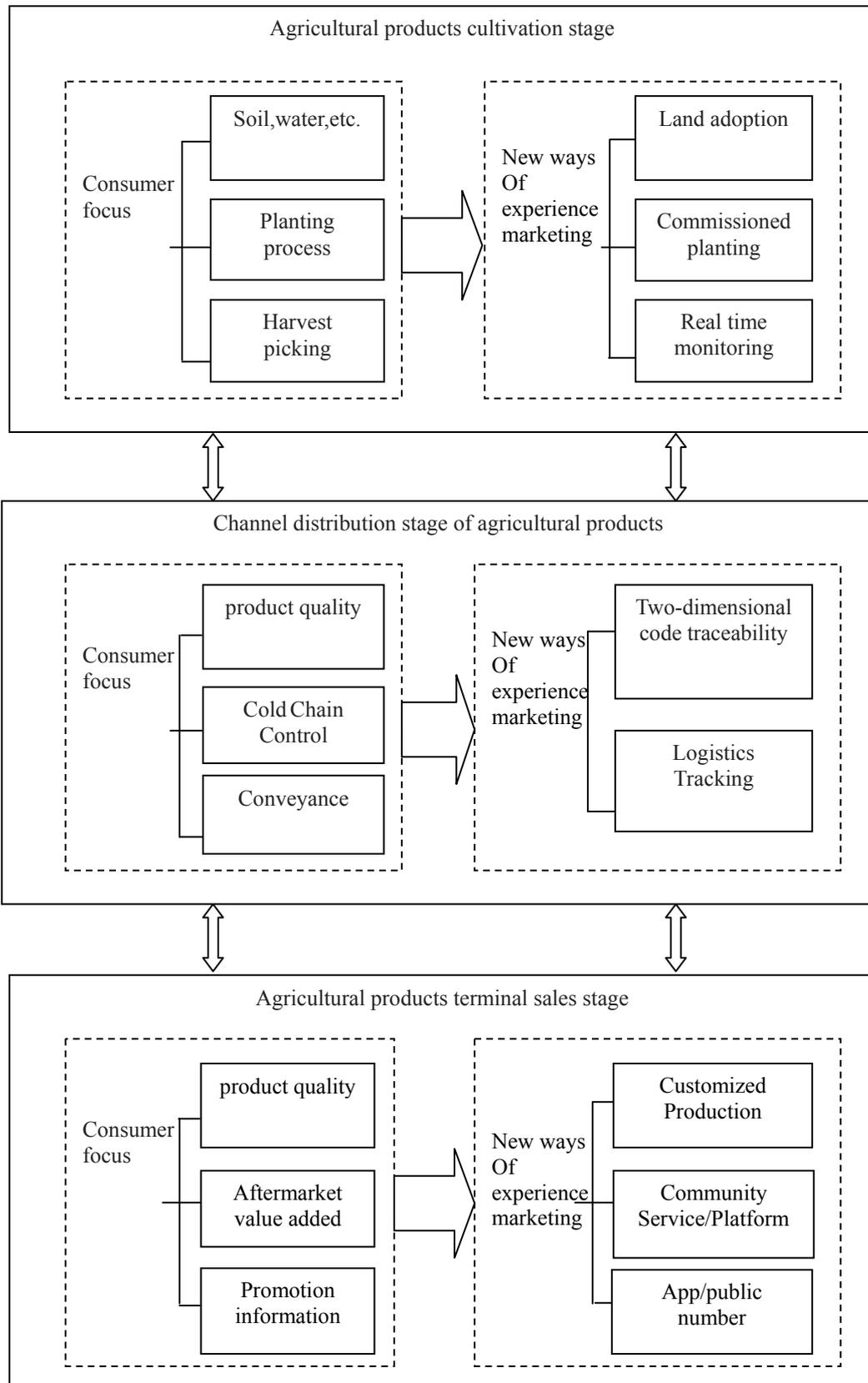
Figure 1   Agricultural Products Experience Marketing Mode of Consumer Participation

3 Agricultural Products Experience Marketing Representation Mode

3.1"Land subscription" mode

3.1.1 Subscription land pattern concept

Land subscription model is the rapid development of agricultural products marketing mode in recent years (Chen Junjin ,2015). Consumers through online subscription customized private farm land, by hiring local farmers harvest their crop, while land planted during the entire all-weather monitoring, and networking with the owner of a computer, consumers can view the computer at any time by planting their own land situation, and be able to receive a monthly output of its own land of fruits and vegetables, and to enjoy free local participation rights planting both travel accommodations.

The participants of land subscription model were land operators, as farmers sell land use rights of the parties, as the end consumer of land use rights of the Subscriber, as sales of land use rights transfer intermediary platform, as agricultural cultivation entrust the management of the local Party cooperative. The main responsibilities of the participants are shown in Table 1.

Table 1   Land Subscription Mode Participant Responsibilities

Objects	Core responsibilities
Land carriers	Collection of land use rights and payment of land rent; Commissioned cultivation, packaging, and farmers pay the wages of labor; Land charge subscription money while completing the agreement of distribution of agricultural products
Farmer	Sale of land use rights, access to appropriate rent; Through labor in exchange for wages
End consumer	Subscription and payment of land through an intermediary platform; Full participation in monitoring the cultivation of agricultural products; Ready to experience the process of agricultural cultivation, and ultimately enjoy physical products
Mediation platform	Responsible for the promotion of land Subscription projects; Acts as contracting platform and network payment platform
Local cooperatives	After the operator entrusted the management of land resources, cultivation, farming, logistics and distribution

3.1.2 Land subscription mode marketing processes

Consumers can subscribe for free land according to the location and size of household demand, full participation, after the subscription, per month what to grow, by the local rural cooperatives responsible for hiring local farmers by the consumer need for professional planting and care, post-mature crops and other local farmers will cycle courier to the user every two weeks. Currently, the "Land adoption + sales" model in the country has the lead in the operation of enterprises, such as the next gather cost-effective platform, "Ali poly land" project, but not universal.
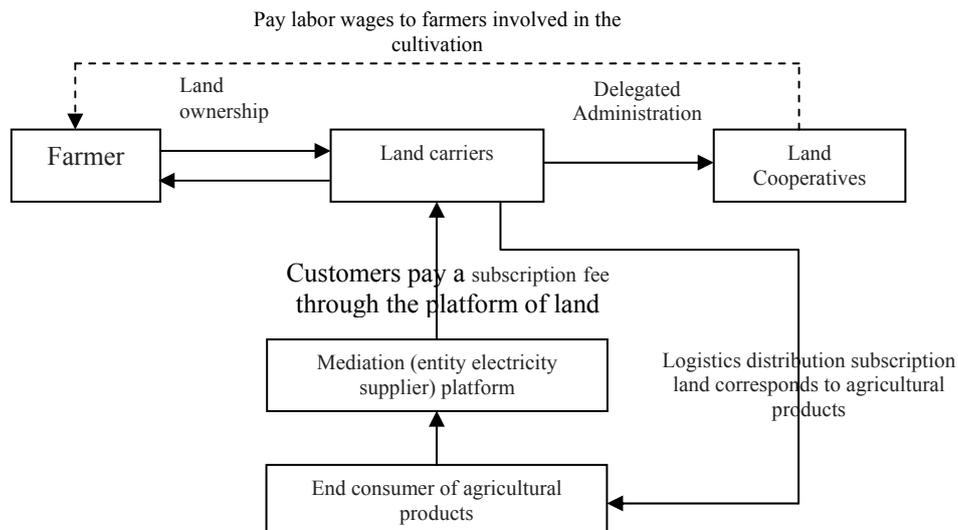
Figure 2   Land Subscription Mode Marketing Processes

3.1.3 Advantages of land subscription mode

1) To achieve win-win situation. Consumers through realization of land subscribe, can give full play to their initiative, full participation in the selection of varieties of agricultural products, to monitor the breeding process of planting, planting and breeding outcome of the whole process has kind; at the same time, by sight, touch, experience and other ways to experience the behavior consumer perception of the realization process, in order to buy more is the price of agricultural products with a more assured quality. For farmers and farmer cooperatives where this pattern can be achieved to provide job opportunities, increase income effect. For countries, revitalize the stock of land resources, creating a new model of land transfer.

2) Social economic benefits of both. On the one hand, for the end consumer, the pattern and the full realization of the leading consumer participation in providing healthy, fresh, safe, and green customized products, but also to meet the consumer a "private agro-master" mentality demand, while also boosting the tourism development of the land where the village subscription; on the other hand, land subscribe to test the water of the government does not intervene directly in the market circulation under the platform through the promotion of mediation, the right to use the subscription price of agricultural land is formed by the market; at the same time since no changes in agricultural land use purposes, the relative does not involve government approval procedures.

3) To the middle part of Mediation platform by the "final consumer of agricultural products" and "farmland management rights owner" directly integrated transaction; not only revitalize the agricultural land, but also to solve the production and sale of agricultural land matching problem (Tan Shenhua ,2014). Crowdfunding sales for ordinary consumers such participation would be difficult to split the "ownership of agricultural land use certificates" to achieve a greater degree of segmentation of "agricultural property the ownership of agricultural land for the production of varieties of farm products discretion "sales.

3.2 Urban farm mode

3.2.1 The concept of urban farm mode

Urban farm model, first proposed by the American urban agriculture advocates Farmery company whose main idea is to let more farms move into the city, in order to try to solve the problems in the current system of agricultural consumption of consumer participation and experience is not enough.

Urban Farm is a holistic system of growing and selling model, the core is the high cost of land in the city (such as a city high-rise buildings or building container roof or shed) where direct selling vegetables grow vegetables, achieve cultivation, harvesting, selling fully integration, able to participate through a unique and complete consumer and customer experience, reduce transportation costs and other storage methods, the value of such products have relatively large increase. Like urban farm can cover a variety of food cultivation and breeding - mushrooms, vegetables, herbs, fish, and the price of organic products is quite common, even cheaper than ordinary organic products.

3.2.2 Characteristics of urban farm marketing mode

1) Low cost replication and expansion. Urban existing farm land may have been the city's most select residential or office / residential high-rise, its low construction cost, easy expansion and rapid reproduction. In the open-air roof can be discarded or recycled containers converted into mini urban farm, the outer wall of the container is a vertical garden, the interior is used to cultivate mushrooms, green construction and organic food sales outlets combined, will be a brand new innovations.

2) Homegrown modes. Yield stability, small-scale cultivation, more diverse species, consumers have the opportunity to plant some unusual varieties, and even participate in determining plant varieties of agricultural products, therefore, do not worry too much about sales.

3) Product quality full traceability. Fresh is an important criterion for good ingredients. Long-term storage and transportation of food will inevitably lead to reduced quality. For example, within 24 hours after picking lettuce, nutrients will be reduced by half. In urban farm, the product collected and sold by now, the full realization of the full product quality traceability.

4) Unique urban farm picking experience. Consumers can pick directly from the farm in the city, such an experience in the city is hard to come by. In enhancing the value of products, but also let the "distance" between the city and the food is greatly shortened; for kids, it was a rare agricultural education places.

3.2.3 Advantages of urban farm mode

1) Because the basic products are homegrown, greatly reducing storage and transport costs, but also reduces the ordinary supermarkets in storage and transport will inevitably lead to food waste.

2) Because reduce intermediate links, urban farm model can make a consumer demand for faster,

more agile response.

3) For the production, packaging is not required, thus saving a lot of natural resources.

4) Consumers personally picking, full participation store experience reduced labor costs and picking originally needed.

4 Conclusions

Experience marketing mode of agricultural products in China is still in the trial stage, it has a huge space for development, but also objective constraints. The problems and difficulties they face including logistics and land distribution. In the absence achieve scale, the layout of the premise, the more obvious its regional restrictions, for a second-tier city consumer, the high cost of land resources are particularly scarce. Therefore, the establishment and consolidation of the distribution network system of land resources is the biggest shortcomings of the current mode of agricultural products experience marketing.

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Inspiration of Geely Automobile's Popularity on Overseas Market to Chinese Manufacturing Enterprises: From the Perspective of Quality Innovation

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Abstract: The paper analyses the reasons of the popularity of Geely Automobile in overseas markets from the perspective of quality innovation. It holds that, when faced with overseas customers, Geely Automobile has been constantly working on product innovation, service quality innovation and management quality innovation, so as to gain a large share of the overseas market. Through the analysis on Geely Automobile's popularity on overseas market, this essay suggests that the inspiration it has brought to Chinese manufacturing enterprises is: (1) innovate on independent research and development, to improve the core competitiveness of the enterprise; (2) optimize quality management system, and establish quality innovation consciousness; (3) perfect quality of after-sales services, and improve consumer satisfaction.
Key words: Quality; Quality innovation; Geely Automobile; Inspiration

1 Introduction

Though the total trade volume of our country is large, problems still exit, such as extensive mode of trade, weak core competitiveness, low level of export products, and lack of enterprises that are capable of participating in in-depth international competition and cooperation etc. Most foreign trade protection measures use product quality standard to inhibit import of our products, and quality has become one of the main means for many countries setting up trade barriers. Promoting product quality development and improving product competitiveness with quality as the core element will be an inevitable choice for our export enterprises to adapt to the complicated trade environment in the international market and realize sustainable development of foreign trade. China has been adhering to the economic policy of trading market for technology, taking technology as rigid index for production of products. However, not every enterprise holds high and new technology; many medium and small-sized enterprises mainly survive as OEM (original equipment manufacturer). With continuous development of science and technology, nowadays consumers focus on quality more and more, and they pay more attention to quality of products. On the relationship between product quality and enterprise, Cheng Hong (2009) pointed out that enterprises need to improve the quality of products to win consumers. Niu Bianxiu (2003) pointed out that the core competitiveness of enterprises is the quality of innovation. Dili Naer Yasheng (2011) emphasized the importance of the quality of the products innovation on the survival and development of enterprises. Melitz (2002) proposed and use quality heterogeneous enterprise model (QHFT), from the theoretical and empirical evidence on the relationship between product quality and enterprise export behavior. Tang Haiyan (2009) pointed out that The main difficulty for Chinese enterprises to "Going abroad" is their lack of technological innovation. Qin Hong (2011) pointed out that improving the competitiveness of "made in China" is to improve the competitiveness of its quality. Li (2015) obtained the conclusion that the product quality promotion significantly improves our country's export competitiveness through empirical study. This paper through analysis on the phenomenon of Geely Automobile's popularity on overseas market, this essay analyses the reasons why Geely Automobile can gain large shares on the overseas market and win high yield and reputation from the perspective of quality innovation. Based on the analysis, the essay also sums up the inspiration it brings to Chinese manufacturing enterprises.

2 Quality Innovation and the Reasons for Geely Automobile's Popularity on the Overseas Market

2.1 Quality and quality innovation

Quality is a concept that varies with time, at first it was used to describe whether the product is good or bad, then with continuous development and evolution, its use has been expanded to all fields

such as services, engineering, and environment etc. Presently the most widely used definition of quality is the one in ISO9000-2000 "the degree of a set of inherent characteristics can satisfy the demand".

Quality innovation means a process in which an enterprise makes constant innovation in manufacturing to ensure quality, performance and services of products satisfy consumer needs. Based on previous researches, Haner (2002) has introduced the concept of innovating quality as a breakthrough. Combining innovation with quality, he holds that quality innovation is the final result of all innovations, including quality of products and services and enterprise management. Swann (1986) brings up that quality innovation is one part of product innovation, the products are ones that already exist, and quality innovation is the way to improve quality and performance of existing products, in other words, quality innovation means innovation to make obvious improvement in quality aspect.

For enterprises, significance of quality innovation shows in three aspects: (1) quality innovation improves core competitiveness of enterprises. The purpose of quality innovation is to improve products quality and competitiveness of the enterprise, and to improve the competitive edge of the enterprise on the market. (2) Quality innovation is fundamental to survival of enterprises. The society pursuing for high quality products is the momentum for enterprises to make constant quality innovation. Only by following development rules and characteristics of social economy and constantly conducting product innovation, can enterprises survive on the market. (3) Quality innovation expands scale economy effect in enterprises. By establishing an efficient production and management system, quality innovation expands operation and reduces costs, and achieves the goal of optimizing profit of the enterprise.
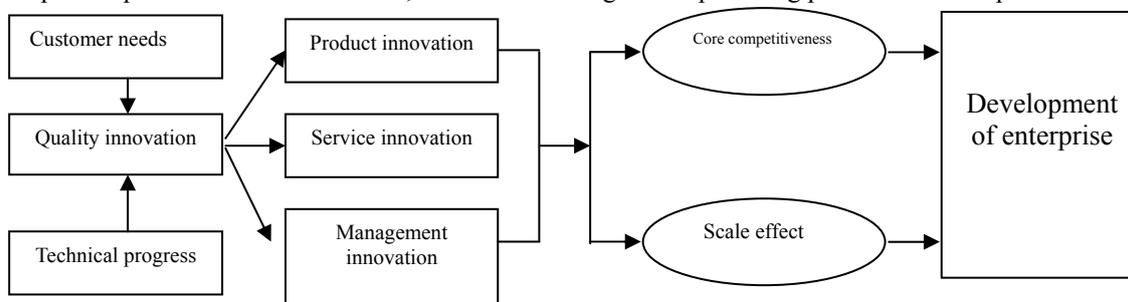
Figure 1   The Path of Quality Innovation Promoting Development of Enterprises

2.2 Geely automobile's popularity on overseas market

Geely Automobile went into the automotive field in 1997, and has been developing rapidly all these years by virtue of its technical innovation and talents training. In 2013, the total assets of Geely Holding Group reached RMB 126.162 billion, and the total turnover was RMB 158.429 billion. It has ranked in world's top 500 enterprises for two successive years, in China's top 500 enterprises for eleven successive years, in top 10 enterprises of China automotive industry for nine successive years, and has been awarded "Innovative Enterprise" and "National Automobile Whole-Vehicle Export Base Enterprise".

In recent years, Geely Automobile is also actively exploring overseas markets, and has established knock down and semi knock down assembly factories in Egypt, Russia, Ukraine, Indonesia, Sri Lanka and Iraq etc... Presently Geely has more than thirty whole-vehicle products under three brands EMGRAND, GLEAGLE and ENGLON, and has DSI automatic gearbox research and development manufacturing center in Australia. Geely Automobile has nearly 200 sales service centers overseas. Up to the end of 2013, cumulative social retention of Geely Automobile has exceeded 3 million nos. In October 2014, the single monthly sales exceeded 12200 nos., creating the highest single month export volume in Geely Automobile history.

2.3 The reasons for popularity of Geely automobile on the overseas market

As a self-owned brand in China, why can Geely Automobile gain such good sales achievements on the overseas market, even more the sales achievement in some countries is no lower than that of international famous brand vehicles? The reason lies in constant quality innovation of Geely Automobile, which has brought to overseas consumers higher sense of satisfaction. The quality innovation of Geely Automobile mainly includes three major aspects: product quality innovation, service quality innovation and management quality innovation.

1) Product Innovation of Geely Automobile

Quality innovation centers on customers and gets to know customer needs any time. The objective of quality planning of Geely Automobile is to manufacture products that satisfy the customers. Geely Automobile launches new products every year to satisfy customer demand for cars. From Haoqing at the very beginning to the most popular one nowadays EC7, every single automobile is manufactured at the basis of consumer market demand. Product planning is to design automobile products with models and performance satisfying consumer preference in the market taking customer demand as a precondition.

2) Service Quality Innovation of Geely Automobile

Geely Automobile firmly holds to the service concept of "Care in details", centering on customer satisfaction, and taking initiative to establish a sound high quality after-sales service system; improves consumer satisfaction by high quality after-sales services, thus to achieve the brand's premium. Geely Group has got rid of the common failing of automobile enterprises "value sales but not after-sales", and established a perfect after-sales service system on overseas market. The services of it include: ① convenient move & rescue services; ②thoughtful marketing services; ③automobile care center.

3) Quality Management Innovation of Geely Automobile

First, Geely Automobile has established a strict quality system. In 2012, the business strategy of Geely Automobile products changed, and it brought up the strategic target of "quality management", and developed a complete set of quality improvement and management system targeted on consumers, to conduct Omni bearing management and control on products in market quality, spare parts quality, manufacturing quality and design quality etc... Second, Geely Automobile has set a strict quality objective. It brings forward the quality objective of "To manufacture the most secure, most environment-friendly and most energy-saving vehicles, and make Geely run all over the world." And improving product quality and product satisfaction becomes the core of Geely Automobile quality management system. Geely launched "2050 project", meaning claims for one model decrease 20%, and failure rate in per thousand vehicles decreases 50%. Establishment of the enterprise quality objective improves quality consciousness of enterprise employees, and starts a comprehensive system reform centering on quality. Third, Geely Automobile has carried out quality culture construction. It encourages employees to take initiative to participate in innovative activities, promote total quality management actively and improve product quality in the whole process from design to manufacture, sales and services. Quality culture construction can improve quality consciousness of enterprise employees, establish proper quality values and make the enterprise always bear in mind "Quality First".

3 Inspiration to Chinese Manufacturing Enterprises

3.1 Innovate on independent research and development

It can be observed from the success of Geely's success that, success of an enterprise is indispensable to its independent innovative capability, which also plays a huge role in improving its own research and development capability. An enterprise should gain independent research and development capability, to have a say in independent intellectual property and technology, grasp core technology, and improve competitiveness; innovate and research and develop new core technologies on the basis of foreign technology, and construct a self-sufficient supply system, thus establish competitive edges in the international market effectively. On the overseas market, it is easy for enterprises with advantage of localization and independent innovative capabilities to break the monopoly of the international market and take up a share and win favor of customers.

3.2 Optimize quality management system

Product quality has been an issue with global focus, quality reflects product performance, and product is realization of quality. Product market competition in the 21 century is competition on quality, and quality is fundamental to products differentiation. In international competition, comprehensive quality management is the inevitable path for enterprises. The purpose of establishing a sound quality management system is to improve quality consciousness and product quality. Enterprises should put quality in the primary position of enterprise management. Quality management is to apply quality management tools to daily management of enterprises, to make quality control from the source.

3.3 Perfect after-sales service quality

The platform of after-sales service is one last means to test an enterprise. Perfect after-sales service can maintain customer relationship, and provide first-hand demand information for quality improvement and product development etc... Geely has penetrated quality service consciousness into every aspect of production. By strictly designing quality indices of products as per customers' preferences, it ensures product quality popular among customers. After-sales service promotes "care in details", and solves

customers' problems in all aspects. Wide coverage and convenient services of an enterprise marketing service network win the heart of customers. When providing services, remember to be customers-oriented, always pay attention to customer demand, establish a timely problem feedback system, provide high quality services to customers, thus to win customer loyalty. With high quality products and perfect after-sales service, Chinese enterprises will be capable of establishing international brands on the overseas market.

4 Conclusions

This essay makes analysis on the reasons of Geely Automobile's popularity on the overseas market from the perspective of quality innovation, product innovation, service quality innovation and quality management innovation. And the conclusion from the analysis is: 1) the main objects of quality innovation are enterprises, and the focus of study is quality of enterprise products; 2) the ways for quality innovation are product innovation, after-sales innovation and quality management innovation. The inspiration of this study for our enterprises in manufacture industry is: 1) innovate on independent research and development, to improve core competitiveness of enterprises; 2) optimize quality management system, and establish quality innovation consciousness; 3) perfect after-sales service quality, and improve satisfaction of consumers.

Acknowledgement

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Research on the Biological Components and Evolution of the Innovation Ecological Environment of Cultural Industry

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Abstract: The insufficient innovation ability is one of the biggest bottlenecks for the upgrading of cultural industry in China. Thus, it is an important way to structure the good innovative ecosystem around perfecting the innovative chain for improving the innovation ability of cultural industry. From the ecological visual angle, this work aims at exploring the structural evolutionary mechanism of innovative ecosystem of cultural industry, in order to offer reference to the improvement of innovation ability and governance ability of cultural industry. Meanwhile, this paper analyses the self-organizing evolution mechanism and games evolutionary model of innovative ecosystems of cultural industry, studies three relations such as competition, intergrowth between the members of innovative ecosystem, analyses their evolutionary mechanisms respectively, and provides the balance condition. Results will help to perfect the innovative network of cultural industry and improve the innovative performance of cultural industry. It also helps to standardize the behavior of the local government further, raise the governance ability of the local government and perfect the innovative management theory, offer reference for the science and technology policy making.
Key words: Cultural industry; Biological components; Innovation ecological environment; Evolution; Industry innovation

1 Introduction

In recent years, the cultural industry research more and more, along with people also found that the appearing in the process of the development of cultural industries in many different phenomena, such as ecological environment is getting worse and worse, credit degree is not high, the innovation of the disorder, bad competition appears and the relative competitiveness of industry is on a downward trend and so on (ADNER R,2006). These phenomena make people have to take the ecology into the future development of the cultural industry, and gradually become one of the current hot topics of research. This study is based on the guidance of eco economic theory, trying to "innovation" to add to the "ecological environment" to compare research. But it should be noted that this study is not simply to create innovative environment as the ecological environment, but the use of the ecological environment of the professional words to build a cultural industry innovation theory (M.E. Porter,1998).

Different scholars from different angles on the innovation of the ecological environment in-depth study, so the definition of this definition also has a different focus, with great differences. Innovation of ecological environment is actually each other is related to the organizational culture and its external environment, with specific mechanisms influencing, interact with each other, and through this mechanism can promote the cycle energy use, promote information sharing and knowledge flows. At the same time, cultural innovation organizations and other organizations in the process of completing the process of innovation related to each other, to complete the exchange of resources and to a more systematic and network of new organizational model development (Porter, M. E,2000).

2 Analysis on the Biological Components of the Innovation Ecological Environment of Cultural Industry

From the main body of innovation in innovation activities carried out by the form to divide, can distinguish the main innovation for individuals, groups, and the main body of the country; from the point of view of the innovation of the main design innovation can be divided into the main theory innovation, culture innovation, system innovation (Machiel, V. and Nowalor, O,2000). Innovation subject is different, the quality requirements should not be the same, and the ability of innovation often depends on the strength of the quality of innovation. Therefore, the improvement of innovation ability mainly depends on two main factors, the main factors of innovation and the quality of the main body (Canines, C.J., Romijn, H. A,2000).

In general, the biological component of the cultural industry innovation of ecological environment mainly composed of government, educational institutions, scientific research institutions, enterprises,

intermediary agencies and other, through the cultural industry, it is the carrier of each biological component to use cash flow, knowledge flow, information flow and concentration and transfer to complete the progress of cultural industry innovation ability (Meine Pieter van Dijk,2005).

Governments, institutions such as the innovation subjects by means of cultural industry value chain and innovation chain play a respective influence, through the different forms of long-term innovation cooperation and communication, together with the completion of the progress of the innovation ability of industrial culture.

2.1 The government -- the main body of innovation system innovation

The government is mainly to support and promote innovative subjects to carry out useful innovation activities by means of injecting capital and providing policy. At present, China's innovation and the market mechanism is not perfect, so in the innovation activities of the culture industry. The impact of government is particularly important. It can support to many aspects of the culture of innovation activities, including the support of policy and legal support and resources and environment.

2.2 Innovative enterprises -- the main body of cultural innovation

The beginning and end of all innovation comes from the enterprise, the main supply of innovative enterprise funds and innovative technology, so it is the main body of technological innovation. And many of the same industry innovation enterprises constitute the cultural industry, they profit duty, independent production and management, has a certain market affordability and capacity for independent innovation.

2.3 University and other scientific research institutions: innovation of the original innovation

Universities and other research institutions are mainly to provide personnel and technology. University is a non-profit organization, it's first duty is to teach knowledge, training of personnel, the second is the scientific research. University of new knowledge and technology to actively develop, teach and use, is the most direct participants, which in the entire ecological environment showed a great spillover effect.

2.4 Innovation intermediary agency: the main body of innovation service

Intermediary organizations as the main body of innovation is mainly responsible for the transfer of information between the main body and intermediary business. Intermediary institutions to connect cultural innovation and cultural innovation side, as the role of the intermediary for the innovation of the main body of professional innovation advisory services.

2.5 Financial institutions - innovation investment subject

Financial institutions mainly invest a large amount of funds for the cultural industry. In the modern economic system, financial as the core strength, any cultural industry development and technological innovation and ultimately into it, and a stable financial market environment is the rapid development of the industry, to enhance the capacity of cultural innovation premise and guarantee. If the heart of innovative enterprises is innovative technology, then the financial is to support the innovation of life blood.

3 The Self-Organization Evolution Mechanism of the Innovation Ecological Environment of Cultural Industry

According to the above analysis, we can see that as a away from the equilibrium state of the opening self-organization system, ecological environment of cultural industry innovation in various nonlinear effects, spontaneously from a disordered state to ordered state of evolution, this process is the cultural industry innovation of ecological environment of self-organization evolution process. According to the theory of association, the dynamic mechanism of self - organization system is used to construct the self - organization evolutionary dynamic model of the cultural industry innovation ecological environment:

$$Z = az^2(1-z) - bz + \Gamma(t)$$

Among them, Z said the development of the ecological environment of the organization, z said that the innovation maturity, a said the intensity factor, $-bz$ said the role of limiting factors on its change, $\Gamma(t)$ said the role of random fluctuations mechanism. The formula is transformed, and the evolution equation of the ecological environment development state can be obtained:

$$\frac{d\Pi}{dt} = -\Pi^3 + \mu\Pi + \upsilon + \Gamma'(t)$$

Among them, $\Pi = \sqrt{a}z - \dfrac{\sqrt{a}}{3}$, $\mu = \dfrac{a - 3b}{3}$, $\upsilon = \dfrac{2a - 9b}{27}\sqrt{a}$, $\Gamma'(t) = \sqrt{\alpha}\Gamma(t)$

Make $\upsilon = 0, \Gamma'(t) = 0$, culture industry innovation ecological environment self-organization evolution model equation:

$$\frac{d\Pi}{dt} = -\Pi^3 + \mu\Pi + \upsilon$$

When the ecological environment is in a stable state, $d\Pi / dt = 0$, three solutions can be obtained:

So we can know: $\mu = 0$ is the bifurcation point of the ecological environment from the evolution of the organization, from the $\mu < 0$ state gradually increase and cross $\mu = 0$ this point, the ecological environment of the system will be a significant change in the nature, as shown in figure 1.
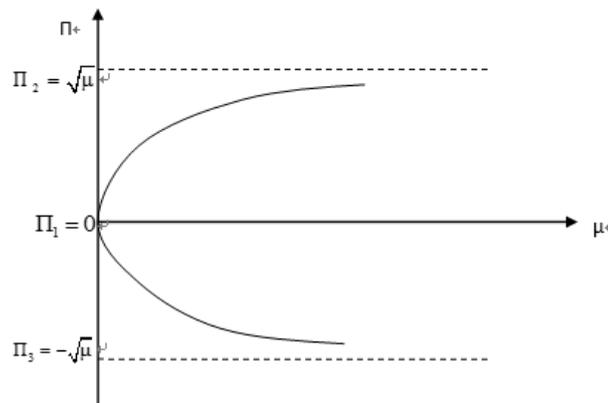
Figure 1   The Bifurcation Diagram of the Innovation Ecological Environment of Cultural Industry

From figure 1 it can be seen that the nonlinear interaction between the various elements of the system to promote the ecological environment change, the realization of the ecological environment from disorderly to orderly change. From the formula, we can see that the innovation process of cultural industry is nonlinear, and the value of $az^2(1 - z)$ will directly affect the evolution path of the system.

In order to realize the innovation of the ecological environment, it is necessary to reduce the limiting factor coefficient b , or increase the strength coefficient a , which is the necessary condition to realize the system self-organization innovation.

4 The Concurrence Co-Evolution Mechanism of the Innovation Ecological Environment of Cultural Industry

In ecological environment of cultural industry innovation, every innovation organizational culture occupies different or similar ecological bit, which leads to the competition and cooperation of the organization members on ecological environment of innovation resources in possession, use, or recharge. It can be seen that the competition among the members of the organization is the main activity of the cultural industry innovation ecological environment evolution.

4.1 Competitive co-evolution mechanism

Assuming that only A, B two cultural innovation organizations in the industry, both innovation and the same ceramic cultural products, and thus there is competition in the market. At the same time, it is assumed that all kinds of innovation factors of regional space endowment are certain, so there is the upper limit of innovation income. Due to the limited size of the market, when A organizational innovation R & D products competitiveness is stronger than that of group B, A will be squeezed out B and win; on the contrary, group B will win. If the two sides cannot be completely squeezed out of each other, then the competition results will reach a state of equilibrium.

The logistic growth equation of two innovation organization respectively:

$$\frac{dN_1}{dt} = r_1(1 - \frac{N_1}{K_1})N_1, \quad \frac{dN_2}{dt} = r_2(1 - \frac{N_2}{K_2})N_2$$

Where N_1 and N_2 are A, B two groups of output level of innovation; r_1 and r_2 respectively A, B two organizations in ideal conditions, the output level of innovation of the maximum rate of change; K_1, K_2 respectively represents two organizations determined by the environment of the maximum level of innovation output.

With competition coefficient to represent the degree of competition in the two organizations, let B organization the organization A competitive coefficient μ, B organization innovation earning convert organization A innovative returns ratio, $\mu = N_1 / N_2$, shows the in limited circumstances, the organization of B innovative returns to a tissue effect. Similarly, A tissue of group B competition coefficient υ, said the organization A creativity earning convert as the ratio B organization innovation profit. $\upsilon = N_2 / N_1$, showing the effect to organization B generated by the organization A benefits of innovation in the limited environment. As a result, the competitive equation is:

$$\frac{dN_1}{dt} = r_1(\frac{K_1 - N_1 - \mu N_2}{K_1})N_1, \frac{dN_2}{dt} = r_2(\frac{K_2 - N_2 - \upsilon N_1}{K_2})N_2$$

When the organization competition reaches the equilibrium state, there are: $\frac{dN_1}{dt} = \frac{dN_2}{dt} = 0$.

Obviously, in the case of competition, is not A organization to eat the B organization, is the B organization to eat A. Therefore, under the conditions of competition between cultural innovation organizations, to maintain the balance of the industrial ecological environment, cultural innovation organizations can not be completely homogeneous, it is necessary to maintain a certain difference.

4.2 Symbiosis co-evolution mechanism

There are only two cultural innovation organizations in the industrial ecological environment. They are symbiotic and cooperative relations, our can get a new logistic equation:

$$\frac{dN_1}{dt} = r_1(1 - \frac{N_1}{K_1} + \alpha \frac{N_2}{K_2})N_1, \frac{dN_2}{dt} = r_2(1 - \frac{N_2}{K_2} + \beta \frac{N_1}{K_1})N_2$$

Using α to express the contribution rate of B organization to the A organization innovation output level, β expresses the contribution rate of the A organization to the B organization innovation output level, $\alpha > 0$, $\beta > 0$.

When the organization competition reaches the equilibrium state, there are: $\frac{dN_1}{dt} = \frac{dN_2}{dt} = 0$.

Its solution is: $N_1 = \frac{K_1(1 + \alpha)}{1 - \alpha\beta}$, $N_2 = \frac{K_2(1 + \beta)}{1 - \alpha\beta}$

$\alpha\beta < 1$ is the condition that the cultural innovation organization should meet the equilibrium state.

From the equilibrium conditions can be drawn: in limited environment of culture industry innovation, improve on upstream of cultural innovation organizational innovation achievements conversion efficiency of middle and lower reaches of the organizational culture and organization of upstream innovation achievement purchase rate and downstream organization to reach equilibrium.

5 Conclusions

The exchange and flow of information, material and energy between different biological components in the innovation ecosystem of cultural industry promotes the development of the industry. In this paper, the integrated use of ecology theory, collaborative theory, game theory and other theories and methods, systematic study of the structure of ecological environment of cultural industry innovation, defines the basic connotation of ecological environment of cultural industry innovation, analysis the ecological environment government and innovation of enterprise, University and other science research institutions, innovation intermediaries, financial institutions, such as different subjects and interests, was constructed based on the equation of the dynamic mechanism of cultural industry innovation ecological environment dynamic model for the self-organization evolution, and ecological environment of cultural industry innovation collaborative innovation evolutionary game model. In addition, the competition, symbiotic relationships of predation and the three typical relationship of investigate the competition between members of the culture industry innovation of ecological environment organization synergy evolution mechanism, the coordination and Symbiosis Evolution Mechanism. This study argues that cultural industry innovation of ecological environment is an away from the equilibrium state of the open

self-organizing systems, it is in the changing external environment and the organization of the innovation in the system of nonlinear impact and innovation of ecological environment spontaneously from disorder to order, or the order to a higher order state transition process.

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Analysis of Regional Economic Growth and Motivation in Guangdong Province Based on TFP

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Abstract: In order to study the factors of economic growth in different regions of Guangdong Province, this paper uses data collected from 2005 to 2014 and makes regression analysis based on the TFP method. The contribution rate of capital input, labor input and technological progress to economic growth are calculated respectively, and the main motivation of economic growth in the four regions of Guangdong province is explored. It is concluded that economic growth depends largest on technological progress is the Mountain area; Economic growth depends largest on capital input is the Pearl River Delta, the East Wing and the West Wing; Economic growth depends on labor input's contribution rate is generally not high in all areas.
Key words: Total factor productivity; Economic growth; Contribution rate; Motivation

1 Introduction

TFP is total factor productivity, it's an important theory of analyzing economic growth and it divides increasing power into factor inputs and efficiency. The scholars of domestic and foreign on research of TFP and economic growth is extensive, they are mainly focused on the application of the TFP and the development study of TFP. The application of TFP method is mainly shown in: Li Xiaoning (2012) used the Solow model to estimate the rates for total factor productivity growth in China from 1978 to 2010. Hu Angang, Wu Qiong (2001) believed that only when China improves the TFP growth rate, will economic growth be sustained. Ding Xiaofei, Kang Shuo (2010) used the Co-integration regression model, Solow residual value to analysis economic growth factors and found that technological progress is the main driving force of economic growth in Guangdong Province. Dong Minjie (2013) researched on the motivation of China's economic growth source and the characteristics of time and space. Wu Peng, Zhang Ziran (2013) analyzed the contribution of TFP growth and other related elements to economic growth. Zhao Lijuan (2015) studied the contribution of economic structure change to TFP and China's economic growth. Jin Fei (2016) estimated the growth trend of total factor productivity in Germany in 1875~2013 using the capital share method and the measurement method. According to the construction of new urbanization quality evaluation index system, He Wenju (2016) analyzed the impact path of Hunan province's promotion of total factor productivity on the new urbanization quality.

The research on the development study of TFP is mainly shown in: Zhang Xueliang, Sun Haiming (2009) using the non-parameter method of DEA, dividing the Yangtze River Delta region's economic growth into four parts of the physical capital accumulation, efficiency improvement, technological progress and human capital input. Zheng Yuxin (2007) from the perspective of the popular TFP measurement method, discussed the limitation of total factor productivity of economic growth quality. Fu Chun (2012) using Romer's endogenous economic growth model and total factor contribution model to calculate the contribution value of the provincial natural resources and other factors on economic growth. With changes in TFP by innovation and technological progress, Hu Pei (2016) introduced variables of trade innovation and that innovation can reduce transaction costs which can promote the division of labor specialization and the total factor productivity of a country.

Guangdong province is China's Economic province with largest population and most open society and culture. Since the reform and opening up more than forty years ago in 1978, Guangdong has made great achievements in economic development, whose total amount of GDP is in the leading level of all the provinces. In the development of socialist market economy, Guangdong made creative practice and achieved a new progress in the economic field. Guangdong Province has a total of 21 urban areas which is divided according to the economic region into four parts as: The Pearl River Delta, East wing, West Wing and the Mountain. Cities included are in the following table 1. Although the overall level of economic development in Guangdong is at the forefront of the whole country, the development of its various regions is different. Previous studies focus on the whole country's or the whole province's TFP

measurement, the sub-regional research has not yet been carried. In order to study the actual development of the various regions of Guangdong, this paper using the total factor productivity method to analyze economic growth of Guangdong Province, explore the main motive factors of regional economic growth.

Table 1   Zoning of Guangdong Province

Regions of Guangdong	Including cities
the Pearl River Delta	Guangzhou, Shenzhen, Zhuhai, Foshan, Dongguan, Zhongshan, Jiangmen, Huizhou, Zhaoqing
the East Wing	Chaozhou, Shantou, Jieyang, Shanwei
the West Wing	Yangjiang, Maoming, Zhanjiang
the Mountain	Heyuan, Meizhou, Shaoguan, Qingyuan, Yunfu

2 Models, Methods and Data Collection

2.1 Total factor productivity measurement model

Total Factor Productivity is also known as the "Solow residual value" which is proposed by American economist Robert Solow in the earliest (1957). It is a measure of the total productivity index, the ratio of total yield and all the factors inputs ratio. The growth rate of total factor productivity is often regarded as the index of scientific and technological progress. TFP abandoned the traditional productivity analysis with only labor and capital two inputs, but taking the technological progress into account in the production function. Due to the widely use of total factor productivity to calculate the rate of economic growth, TFP has been a mature and universal method. Thus, the direct use of TFP combined with Douglas production function are to calculate the economic factor of different areas of Guangdong Province in this paper. Productivity function is:

$$Y_t = A(t)K_t^{\alpha}L_t^{\beta} \tag{1}$$

Wherein, Y represents total output, A represents technological progress, K is capital input, L is labor input, t is time, each variable is changing with time. α, β respectively represents the elasticity of capital output and elasticity of labor output. Note that it is generally assumed that technological progress is Hicks neutral, that is, for a given amount of human capital, the ratio of the marginal products remains the same, and technological progress is at a constant exponential rate. Take:

$$A_t = A_0 e^{\lambda t} \tag{2}$$

Wherein, A_0 represents the initial level of technology, t represents time, λ represents that technology advances at the rate of λ exponential growth over time. Take (2) into (1), we have:

$$Y_t = A_0 e^{\lambda t} K_t^{\alpha} L_t^{\beta} \tag{3}$$

Logarithmic:

$$\ln Y_t = \ln A_0 + \lambda t + \alpha \ln K_t + \beta \ln L_t \tag{4}$$

Assume constant returns to scale, we get α+β=1, then the formula transformed into:

$$\ln(Y/L)_t = \ln A_0 + \lambda t + \alpha \ln(K/L)_t \tag{5}$$

In the formula (5), λ is the growth rate of technical progress, t is the year sequence. Through the logarithmic processing, we eliminated the multiple collinearity and simplified the calculation, to make it easier to solve coefficients. According to the statistics of Y, K and L, we take the least square method of linear regression to obtain the value of A_0, λ, α, then calculate the value of β. And we get the growth rate of technological progress, the output elasticity of capital and labor.

2.2 Contribution rate of economic growth of input elements

According to the growth rate equation, we have:

$$1 = \lambda/y + \alpha k/y + \beta l/y \tag{7}$$

y, k, l represents the growth rate of total output, growth rate of capital input and growth rate of labor input. We give $S_r = \lambda/y; S_k = \alpha k/y; S_l = \beta l/y$, and S_r, S_k, S_l represent the contribution rate to economic growth of technological progress, capital inputs and labor inputs.

2.3 Data selection and explanation

This paper selects a panel data from 2005 to 2014 of four regions in Guangdong Province, the data

are collected from the 《*Guangdong Provincial Statistical Yearbook*》. According to the scientific and data available principle of total factor productivity model, we choose GDP of Guangdong province as the total output Y. In order to make the price comparable, this paper converted the GDP price of 2005-2014 years to the GDP price of year 2000. Capital input(K) selects the year's total fix assets, the same, converted into the 2000 price. Labor input(L) selects the employment population of the year.

3 Empirical Analysis
3.1 Parameter estimation and Interpretation
According to the data of four regions of Guangdong province from 2005 to 2014, this paper use EViews9.0 software to estimate parameter in model (5), we get regression equation of the Pearl River Delta region as follows:

$$\ln(Y/L) = -0.906572 + 0.10834t + 0.655045\ln(K/L) \tag{8}$$

$$\begin{array}{cccc} Se & (0.313281) & (0.049424) & (0.115669) \\ t & (-2.893796) & (2.392071) & (5.663114) \end{array}$$

R2=0.987544   F=277.4912   P=0.000   DW=1.87

Upon examination, the above equation does not exist auto correlation, heteroscedasticity and multiple collinearity. As can be seen in the regression results, the overall fitting effect of the equation is good. When the level of significance is 5%, the coefficients of λ and α are significant, elasticity of capital output is α =0.655045, elasticity of labor output is β =1-0.655045=0.344955. From the economic meaning, the stock of fixed assets of the Pearl River Delta region increased every 1%, the local GDP will increase by 0.655045 percent; Every 1% increase in employment, the local GDP will increase by 0.344955 percent; λ =0.10834, indicating that TFP annual growth rate is 0.10834 percent.

Similarly, we get the regression equation of the East Wing:

$$\ln(Y/K) = -0.796333 + 0.036273t + 0.599161\ln(K/L) \tag{9}$$

The elasticity of capital output is 0.599161, and the elasticity of labor output is 0.400839, λ =0.036273.

The regression equation of the West Wing:

$$\ln(Y/L) = -0.979066 + 0.230767t + 0.386689\ln(K/L) \tag{10}$$

The elasticity of capital output is 0.386689, and the elasticity of labor output is 0.613311, λ =0.230767.

The regression equation of the Mountain:

$$\ln(Y/L) = -1.266829 + 0.331278t + 0.303952\ln(K/L) \tag{11}$$

The elasticity of capital output is 0.303952, and the elasticity of labor output is 0.696048, λ =0.331278.

3.2 Estimation of the contribution rate to economic growth
According to the regression results, the factors' growth rate and the contribution rate of the economic growth are calculated as follows.

3.2.1 Factors' growth rate and contribution rate of the Pearl River Delta calculated from formula (8)

Table 2   Data of Factor Growth and Contribution Rate of the Pearl River Delta

Year	y	k	l	S_k	S_l	S_r
2006	0.186372	0.119405	0.050072	0.419675	0.092679	0.487646
2007	0.187837	0.158458	0.048398	0.552593	0.088881	0.358526
2008	0.162494	0.133043	0.040225	0.536320	0.085392	0.378288
2009	0.073511	0.226660	0.055601	2.019721	0.260909	-1.280630
2010	0.178195	0.182458	0.046866	0.670715	0.090724	0.238560
2011	0.155112	0.089026	0.016294	0.375960	0.036236	0.587804
2012	0.093114	0.129984	0.002375	0.914418	0.008800	0.076782
2013	0.114659	0.147166	0.039918	0.840755	0.120094	0.039151
2014	0.081458	0.094287	0.016162	0.758209	0.068442	0.173349
Average Value	0.136973	0.142276	0.035101	0.787596	0.094684	0.117720

According to the data showed in the table 2, capital input in the Pearl River Delta contributes most

to the economic growth of Guangdong Province. The second factor is the technological progress whose contribution rate is 0.11772. And the lowest contribution rate to economic growth is the labor input with an average value of 0.094684. Technological progress, capital and labor inputs' contribution to the economic growth is fluctuating in a given period. Among them, technological progress and capital input remained a rising trend in constant fluctuation of contribution rate to economic growth, but fluctuation of the labor factor stays a stable state of the contribution rate to economic growth.

3.2.2 Factors' growth rate and contribution rate of the East Wing calculated from formula (9)

Table 3 Data of Factor Growth and Contribution Rate of the East Wing

Year	y	k	l	S_k	S_l	S_r
2006	0.144001	0.212213	0.045356	0.882977	0.126252	-0.009229
2007	0.180447	0.242082	0.006056	0.803817	0.013453	0.182730
2008	0.184740	0.220950	0.015072	0.716599	0.032703	0.250698
2009	0.106265	0.320365	0.028856	1.806325	0.108845	-0.915170
2010	0.157907	0.296811	0.024626	1.126222	0.062513	-0.188735
2011	0.170509	0.101183	0.005667	0.355551	0.013322	0.631126
2012	0.122393	0.163918	-0.006124	0.802444	-0.020056	0.217613
2013	0.119303	0.229947	-0.001840	1.154840	-0.006181	-0.148660
2014	0.092573	0.251290	-0.005954	1.626435	-0.025780	-0.600655
Average Value	0.142015	0.226529	0.012413	1.030579	0.033897	-0.064476

According to the data showed in table 3, capital input of the East Wing's contribution to economic growth rate is the largest, followed by labor input, the contribution rate of technological progress is minimum with an average value of -0.064476, indicating that technological progress has a slight inhibition to economic growth on East Wing in 2005-2014. Wherein the contribution of capital input to economic growth maintain the upward trend in recent years; labor input to economic growth showed a slow downward trend and technological progress contribution rate showed a negative tendency.

3.2.3 Factors' growth rate and contribution rate of the West Wing calculated from formula (10)

Table 4 Data of Factor Growth and Contribution Rate of the West Wing

Year	y	k	l	S_k	S_l	S_r
2006	0.181412	0.199992	-0.028047	0.426293	-0.094819	0.668525
2007	0.149245	0.065210	0.007027	0.168956	0.028877	0.802166
2008	0.185220	0.204562	-0.007843	0.427069	-0.025969	0.598899
2009	0.057093	0.326340	0.009784	2.210293	0.105102	-1.315395
2010	0.203967	0.353851	-0.000492	0.670847	-0.001481	0.330634
2011	0.198468	0.005092	0.025240	0.009921	0.077997	0.912082
2012	0.111941	0.341252	-0.000895	1.178822	-0.004903	-0.173919
2013	0.131139	0.385252	0.005344	1.135988	0.024991	-0.160979
2014	0.091854	0.232901	0.005652	0.980473	0.037740	-0.018213
Average Value	0.145593	0.234939	0.001752	0.800963	0.016393	0.182645

The data in the table 4 shows that the capital's contribution rate to economic growth of the West Wing is the highest with an average contribution rate of 0.800963. Followed by the technological progress whose average value is 0.182645.the lowest contribution rate to economic growth rate is labor input. Trends in capital and labor inputs are basically the same, the overall contribution rate is increased, while the contribution rate of technological progress is showing a slow decline in the overall dramatic fluctuations.

3.2.4 Factors' growth rate and contribution rate of the Mountain calculated from formula (11)

Table 5   Data of Factor Growth and Contribution Rate of the Mountain

Year	y	k	l	S_k	S_l	S_r
2006	0.211437	0.281273	0.005921	0.404346	0.019492	0.576162
2007	0.254640	0.374057	0.014926	0.446495	0.040800	0.512705
2008	0.201355	0.217372	0.000133	0.328130	0.000460	0.671410
2009	0.074102	0.244727	0.011558	1.003820	0.108566	-0.112386
2010	0.114680	0.034733	0.004846	0.092056	0.029413	0.878531
2011	0.170650	0.050470	0.011679	0.089895	0.047636	0.862469
2012	0.083806	0.001698	0.002404	0.006158	0.019968	0.973874
2013	0.102184	0.233955	0.004778	0.695911	0.032543	0.271546
2014	0.096201	0.217154	0.005735	0.686113	0.041493	0.272394
Average Value	0.145450	0.183938	0.006887	0.416992	0.037819	0.545189

According to the data in the table 5, the contribution rate of technological progress of the Mountain was the highest in 2005-2014 with an average contribution rate of 0.545189, which is the highest technological contribution value in the four regions in Guangdong Province. Contribution rate to economic growth ranked second is the capital input with an average value of 0.416992. At the bottom is still labor input's contribution to economic growth. Changes in capital and labor inputs is consistent, and the overall trend is rising, while the technological progress contribution rate is showing a general downward fluctuation.

4 Conclusions

4.1 The region in which economic growth depends largest on technological progress's contribution rate is the Mountain in Guangdong Province

Shaoguan, Heyuan, Qingyuan, Yunfu and other cities in the Mountain area is the gathering place of the industrial park. For those manufacturing enterprises, inputs in technology occupy a large proportion. Shaoguan, Meizhou and Yunfu are rich in mineral resources which may also need certain techniques for the exploitation of mineral resources. Yunfu City committed to education development and institutional innovation with 5 Industry-Academic-Research Innovation Alliances, 3 demonstration bases and implementing 110 provincial science and technology projects, which pushed up the overall technological contribution rate of the Mountain area of Guangdong Province.

4.2 The region with the highest contribution rate of capital input is the Pearl River Delta, the East Wing and the West Wing

Guangzhou, Shenzhen, Zhuhai, Shantou are China's earliest open coastal cities and special economic zones in the Pearl River Delta and the East Wing. The Pearl River Delta district is the most developed region in Guangdong Province, relying on its geographical advantage, the foreign trade and economic cooperation could be developed. It is also the world's well-known manufacturing exports and the most important world industrial transfer place, so the accumulation of capital is abundant. Among them, Guangzhou, Shenzhen, Foshan are significant commercial cities which are also comprehensive industrial manufacturing center and high-tech industrial bases. A large number of commodity circulation and products have also become an important part of capital accumulation in the Pearl River Delta; Jiangmen and Huizhou are rich in marine resources and fresh water resources. The West Wing area of Zhanjiang, Maoming, Yangjiang are the northern economic circle of Guangdong, although they are not so developed when compared with the Pearl River Delta's economy, they have rich marine resources, mineral resources, etc. It's primary industry such as agriculture is the most developed area in Guangdong Province, the capital is substantial.

4.3 The labor's contribution rate to economic growth in all regions of Guangdong province is generally not high

Guangdong Province's overall labor contribution rate is relatively low, considering that Guangdong

is located in the coastal zone, not only trade activities between various commodities are large circulation, but also marine resources and mineral resources are available which forming a natural accumulation of capital. In addition, due to the developed economy of Guangdong Province, advanced technologies have been applied to attract a large number of outstanding talents which enhance the overall innovation capability of Guangdong province. These two factors of capital input and technological progress made great contributions to the economic growth of Guangdong Province, crowding out the contribution of labor input. As a result, the labor input's contribution rate to economic growth is relatively low.

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Detecting Hot Issues on Sports Management Research from Common Key words in Literature

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Abstract: In order to figure out the related results of China's sports management and its future trends, this paper aims to do keyword co-word analysis, clustering analysis and multi-dimensional analysis on 442 documents of CNKI (China national Knowledge Infrastructure). The result shows that China's sports management research includes four aspects: the development of sports management systems under the background of national policy; the present situation and countermeasures of the development of sport management in school especially in colleges; the reform and innovation of sports management as well as the corresponding problems; and the sports management and operation mechanism of community sports, college physical education and competitive sports.
Key words: Co-word analysis; Sports management; Hot issue

1 Introduction

Sports management refers to the process of activity that managers of certain sports organizations achieve established goals through carrying out the functions of decision-making, organization, administration, control and innovation, and so on (Zeng Yonghe ,2012). In the process of social and economic development, the development of sports management also experiences evolution. In the meantime, the researches concerning sports management have always been the important fields in the study of major academics in sports circle. Some scholars defined its' subject. For example, Wen Haiyan, Xiong Wen and Ji Liu (2012) positioned on the role that the subject of sports management played in the sports management in our country, and they also analyzed the management function of the administrative subject. Besides, Li Yuan and Wang Li (2014) studied on the process of development in structure of knowledge, theoretical evolution and its characteristics of Chinese sports management. From the sorting of the above-mentioned study results concerning to the sports management, we are easy to conclude that the method that the above researches adopted is traditional literature statistics method and it focuses on one aspect of relevant fields of sports management, which can reflect the research results of one aspect within a certain period, but it is difficult to clearly present the skeleton of the relevant research on sports management and can't grasp the profound relationship between the different aspects of the field, which are also the unavoidable defects of the traditional literature review study. With the application of analysis method of scientific measurement, the research of large sample documents becomes more and more convenient, and especially the development of mapping knowledge domain has profoundly changed the way of researchers' dealing with literature. Co-word analysis is one of the common methods of mapping knowledge domain and it is a method of utilizing the co-occurrence of vocabulary group or noun phrase in literature to determine the relationship between every subject of the discipline that literatures represent. It is generally acknowledged that the higher frequency of appearance of vocabulary group in the same document represents closer relationship between the two subjects. Therefore, through counting the frequency of occurrence of a group of subject terms in literature, it can form a co-word net consisting of the association of vocabulary group, and the distance between nodes in the net can reflect close or distant relationship of subject content (Guo Wenbin,2015). Generally, the co-word analysis of key words is most commonly used. In the aspect of application of methods, co-word analysis of key words is a kind of method that regards the subject terms as analysis object and adopts cluster analysis, multi-dimensional scaling analysis and other multivariate statistics methods and applies data visualization techniques to simplify the intricate relationship of co-word net so that it can be visually displayed in the form of graph and image (Wang Tingzhao, et al ,2015). Adopting the method of co-word analysis to deal with and analyze the research results in the field of sports management, we expect to find the research focus on the interdiscipline linked by sports management and to get the cutting-edge information in the field of sports management and also to detect the hot issues and direction of the following-up study on sports management.

2 Data Sources and Research Methods

2.1 Data sources

The first step is to look up relevant information. We choose the famous database, China Academic

Journal Network Publishing Database, as our main data sources. We adopt standard retrieval and confine the publication date to a certain interval, the date from January 1, 2011 to April 30, 2016. By inputting the Key words "sports management" on the database, we get 2,596 initial literatures. The second step is to choose the effective information. After excluding non-investigative articles, such as the repetitive literature, conference notice, call for papers, news report, personage introduction, book and film review and so on, we get 442 effective literatures. The final step is to standardize the information. With the effective literatures confirmed, we standardize the Key words to eliminate the meaningless Key words and unify the synonymous or near synonymous Key words, for example, we unify the keyword "university sports" as "college physical education".

2.2 Research method

This paper uses Bicomb (co-word analysis software) and SPSS20.0 as its' main research tools. In the paper, Bicomb is especially used to count the Key words and to set up matrix of Key words. The specific operation is like the following: Firstly, run the software Bicomb and extract the target text that is exported from CNKI. Secondly, standardize the Key words. Thirdly, count the Key words and extract the Key words whose frequency is greater than or equal to a certain number as the main Key words. Next, analyze the matrix of the main Key words and export it. Then, apply SPSS20.0 to make cluster analysis and multi-dimensional scaling analysis. The specific operation is like this: first of all, import the matrix of Key words to SPSS20.0, and adopt sample cluster analysis to get the tree graph of the cluster of Key words. Then, according to the result of cluster, make multi-dimensional scaling analysis towards the matrix of the Key words and make the graph of research hotspot of visual disturbance.

3 Research Results and Analysis

3.1 The analysis of high frequency Key words

Key words can make readers understand research topic in the most concise way, so the statistics of them can help us intuitively know the research hotspot in a certain field. After having a statistics towards the Key words of 442 research literatures, we get 1,872 effective Key words, among which the frequency is greater than or equal to 7 are extracted in table 1. Excluding the searching keyword, "sports management", and the subject Key words, "management system" and "structural reform", there are 18 Key words whose statistics of frequency are greater than 9. They are counted as follows: college (33), the system of sports management (24), mass sports (23), competitive sports (22), management (21), management models (19), college physical education (17), development countermeasures (17), sports management of school (16), school physical education (15), current situation (14), community sports (14), innovation (13), the system of the whole country (11), science of sports management (11), the management of community sports (11), problems (10), sports business (10).

Table 1　The Rank of 27 High Frequency Key words

number	Key words	frequency	number	Key words	frequency
1	Sports management	162	15	Community sports	14
2	Management system	41	16	Innovation	13
3	College	33	17	The system of the whole country	11
4	Structural reform	28	18	The science of sports management	11
5	The system of sports management	24	19	The management of community sports	11
6	Mass sports	23	20	problems	10
7	Competitive sports	22	21	Sports business	10
8	management	21	22	Sports management major	9
9	Management models	19	23	Sports management of college	8
10	College physical education	17	24	Operational mechanism	8
11	Development countermeasures	17	25	Professional sports	8
12	Sports management of school	16	26	The management of competitive sports	7
13	School physical education	15	27	Sports organization	7
14	Current situation	14			

3.2 Ochiai coefficient similar matrix of high frequency Key words

The analysis of similar matrix towards Key words can help to investigate the similarities between the Key words. This paper adopts the software, Bicomb, to analyze the above 27 Key words and generates the matrix of Key words. The next step is to import the matrix of Key words to SPSS20.0 and choose Ochiai coefficient and then convert it to a (27×27) similar matrix, as shown in table 2.

Table 2   Ochiai Coefficient Similar Matrix of High Frequency Key words (partial data)

	Sports management	Management system	college	Structural reform	The system of sport management	Mass sports	Competitive sports	management	Management models	College physical education
Sports management	0.000	0.951	0.713	0.881	1.000	0.885	0.966	1.000	0.964	0.943
Management system	0.951	0.000	1.000	0.705	1.000	0.837	0.634	1.000	1.000	1.000
college	0.713	1.000	0.000	0.934	1.000	1.000	1.000	0.886	0.920	1.000
Structural reform	0.881	0.705	0.934	0.000	0.807	1.000	0.879	0.918	1.000	1.000
The system of sports management	1.000	1.000	1.000	0.807	0.000	0.915	0.956	1.000	0.953	1.000
Mass sports	0.885	0.837	1.000	1.000	0.915	0.000	1.000	1.000	0.952	1.000
Competitive sports	0.966	0.634	1.000	0.879	0.956	1.000	0.000	0.860	0.902	1.000
Management system	1.000	1.000	0.886	0.918	1.000	1.000	0.860	0.000	1.000	0.947
Management models	0.964	1.000	0.920	1.000	0.953	0.952	0.902	1.000	0.000	0.833
College physical education	0.943	1.000	1.000	1.000	1.000	1.000	1.000	0.947	0.833	0.000

In the matrix, every numerical value tells the similarity and distance between the Key words in the row and its' counterparts in the column. The numerical value more approximates to one, the closer distance between the Key words in the row and its' counterparts in the column, so the more similarities they have. On the contrary, the numerical value more approximates to zero, the farther distance between the Key words, which indicates the more differences they have. According to the data in table 2, we can see that most of the numerical values approximate to one, which indicates that there is a close relationship between the research hotspots in the fields of sports management; meanwhile, it reflects that the disciplinary boundary of the relevant research is not very distinct and there are lots of cooperation of interdiscipline and overlapped hotspots.

3.3 The cluster figure of high frequency Key words and analysis

In order to further detect the connection between high frequency Key words, this paper adopts SPSS20.0 to make a systematic and successive cluster analysis, with the result of it shown in figure 1. According to the result of cluster analysis, we can classify 27 Key words into three main types. Type 1 is the operational mechanism of sports management as well as the relevant research of development situation and countermeasures, which consist of two subcategories. Subcategory 1 is about the research on operational mechanism of sports management, and the Key words it contains are professional sports, competitive sports management, mass sports, operational mechanism, management system, competitive sports, structural reform and the system of the whole country. Subcategory 2 is about the research on the development situation and countermeasures of sports management, which mainly consist of six Key words including problems, sports management of college, development countermeasures, current situation, the system of sports management and sports management of community. Type 2 relates to the research on sports management of school or relevant organization of sports business, which include five Key words: they are sports management, college, sports business, sports organization, sports management of school. Type 3 is the research on the management models and innovation of college or community sports, especially on the aspect of school sports management major, of which seven Key words are included: they are management models, innovation, college physical education, management, community sports, school physical education and sports management major.
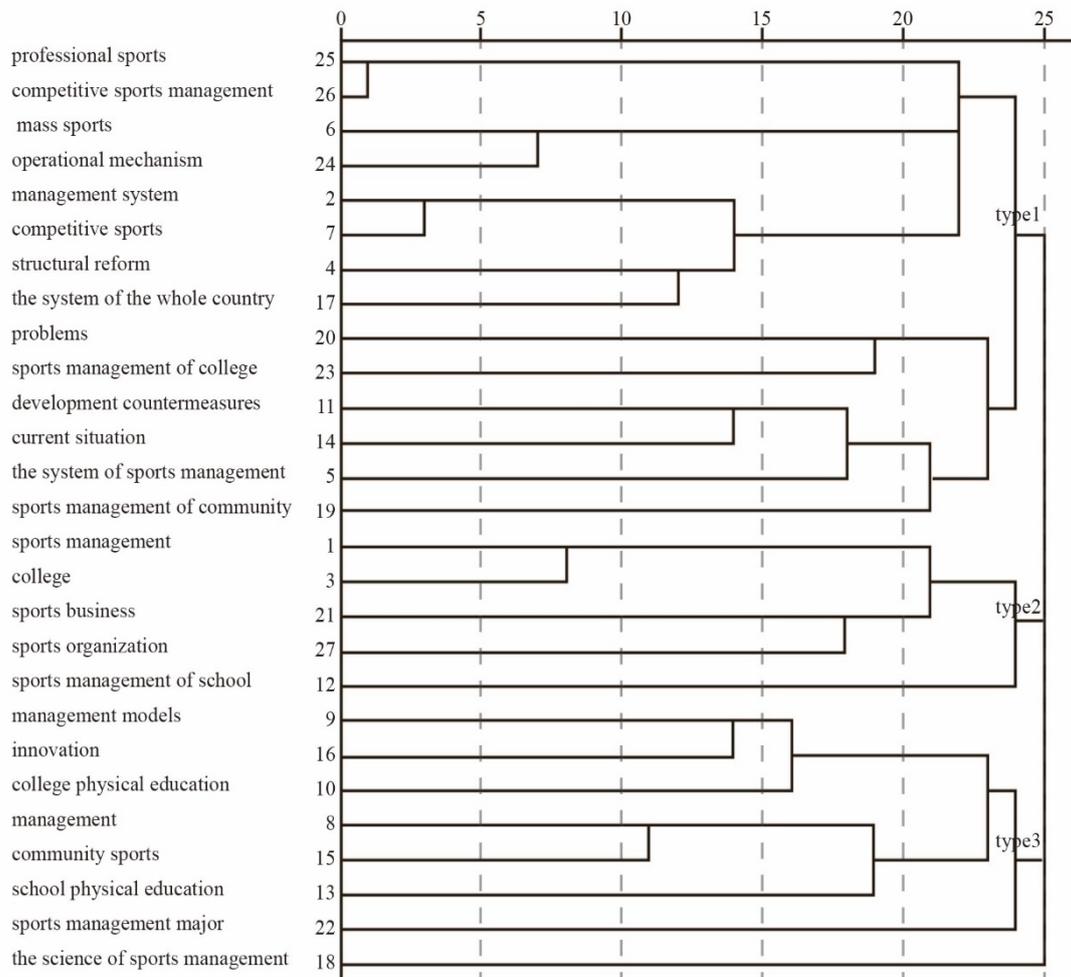
Figure 1   The Cluster Figure of High Frequency Key words about Sports Management

3.4 Mapping knowledge domain of hotspot and its analysis

Multi-dimensional scaling analysis can be regarded as a map of knowledge of a certain research field, which can vividly show the core structure, the history of development, the cutting-edge research and the overall structure of knowledge through its' visualized graph. Multi-dimensional scaling analysis can provide us with a strategic diagram, in which the Key words with high similarity gather together to form the research hotspot of discipline. Besides, the closer a keyword stands to the center, the more related Key words it has, and also the more important role it plays in the research fields. On the contrary, the further a keyword keeps away from the center, the less related Key words it has and the less important role it plays in the research fields. Therefore, multi-dimensional scaling analysis makes it easy to make out the position of academic hotspot and academic fields in research fields. Compared with the cluster figure, multi-dimensional scaling diagram can clearly show the close or far relationship between Key words through its' plane distance, so it is easier for us to judge the position of research domain in discipline (Cottrill CA, Rogers A M, Mills, T1989). In order to eliminate the negative effects that excessive numerical value "0" in the matrix has on the research results, we convert the similar matrix in table 2 into dissimilarity matrix. Then adopt SPSS20.0 to make multi-dimensional scaling analysis, and combine it with the result of cluster analysis to finish the mapping knowledge domain of the relevant research on the sports management fields, as shown in figure 2.

On the basis of the result of multi-dimensional scaling analysis and cluster analysis, and combine it with the relevant literatures about sports management research, we finish the mapping knowledge domain of research hotspots on sports management, as shown in figure 2, in which research hotspots on sports management include four main areas: area 1 is the development of sports management systems under the background of national policy; area 2 is the present situation and countermeasures of the

development of sports management in school especially in college; area 3 is the reform and innovation of sports management as well as corresponding problems; area 4 is the sports management and operational mechanism of three main fields—community sports, college physical education and competitive sports.
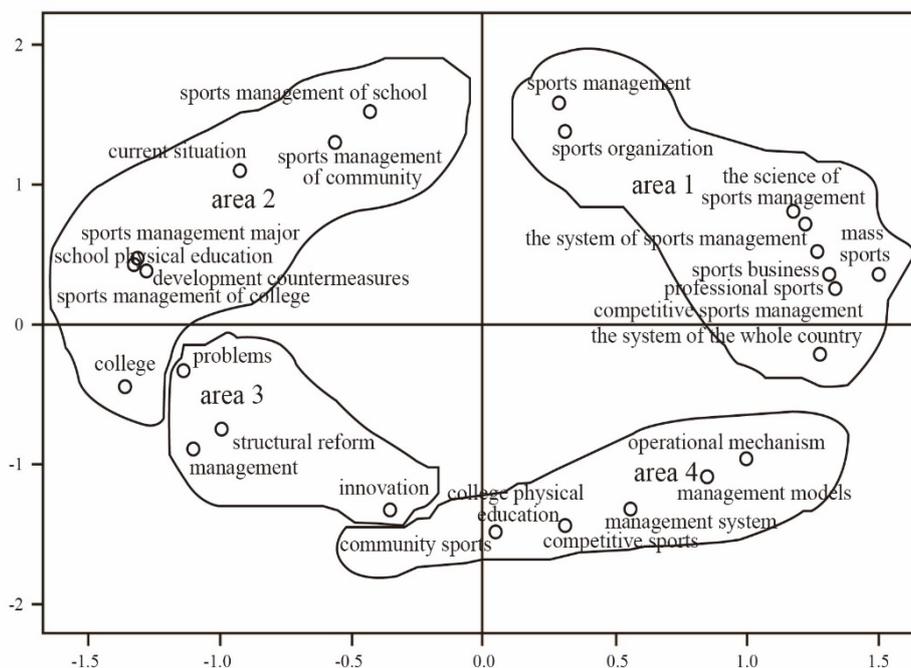
Figure 2   Mapping Knowledge Domain of Research Hotspot on Sports Management

Area 1 mainly involves the development of sports management systems under the background of national policy, which includes ten Key words. They are sports management, sports organization, the science of sports management, the system of sports management, sports business, mass sports, professional sports, competitive sports management and the system of the whole country, among which the keyword "the system of sports management" is in the centre position of the area, so the research of this area mainly focuses on it. Besides, in terms of the focus of literature aspect, it mainly includes competitive sports management, the research on the system of the whole country as well as the limitation and superiority of the system of Chinese sports management (Zhou Jian-xin,2014), and so on.

Area 2 mainly involves the present situation and countermeasures of the development of sports management in school especially in college, in which eight Key words are included: they are sports management of school, sports management of community, current situation, sports management major, school physical education, development countermeasures, sports management of college and college. The research topic on this area is very distinct, which mainly focuses on the sports management of school. Through combining the analysis with literatures, we conclude two main aspects: one is the development situation of spots management in school, the other is the research on the development situation of sports management major in Chinese university and its' countermeasures (Zhang Mao-lin,2013).

Area 3 is mainly about the reform and innovation of sports management as well as problems caused by them, which contains four Key words: problems, the reform of the system, management and innovation. The relevant research of the reform and innovation of sports management as well as its' problems mainly centre on the reform of the system. Besides, the impetus and trend of the reform of Chinese sports management become the focus of literature.

Area 4 mainly involves the sports management and operational mechanism of three main fields—community sports, college physical education and competitive sports, which include six Key words: they are operational mechanism, management models, and the system of management, competitive sports, and college physical education as well as community sports. According to the analysis of literature, there are more research results on the competitive sports management and operational mechanism, which shows the focus of research falls on them.

In the strategic coordinate, x-axis indicates centripetal degree and it can reflect the intensity of interplay between the areas. Y-axis indicates density, which reflects the intensity of internal relations within a certain area. The diagram divides the topic of area in two-dimensional space into four quadrants, and words group distributed in different quadrants indicate different meanings. Specifically speaking, in the first quadrant, both the density of words group and centripetal degree are in a high level, which implies the extensive connection between the words group and others, and of course, the words group is the core of the research. In the second quadrant, words group is in a position of the edge, but it has been concerned and well-studied. In the third quadrant, both the density of words group and the centripetal degree are in a low level, which indicates that the words group is in the edge of the research fields and the research is not very mature. In the fourth quadrant, the centripetal degree of words group is high, but the density of it is low, which means that the research area that the words group constitute is also the core of research; nonetheless, the research on it is immature. According to figure 2, we can find that the research of area 1 is the fundamental research that bases on the sports management itself, and it belongs to the past research hotspot, so the research of it is relatively mature. Besides, in the area 2, the relevant research on present situation and countermeasures of the development of sports management in school especially in college is in the edge of words group, but it has been concerned and has a large room to research in the future. The words group of the third quadrant is in the edge position and it belongs to immature research. In area 4, the Key words "college physical education", "competitive sports" approach to the side of higher numerical values on x-axis, and the research of it is more mature.

4 Conclusions

In conclusion, in terms of Chinese sports management, we have made fruitful achievements in relevant research, and there are a large number of literatures and high frequency Key words. Additionally, the Ochiai coefficient matrix of high frequency Key words implies extensive cooperation of interdiscipline. The cluster figure and mapping knowledge domain clearly show the research hot spots concerning Chinese sports management. Particularly, mapping knowledge domain shows four main areas of research on sports management, which are as follows: the development of sports management systems under the background of national policy; the present situation and countermeasures of the development of sports management in school especially in college; the reform and innovation of sports management as well as corresponding problems; the sports management and operational mechanism of three main fields—community sports, college physical education and competitive sports. Overall, we should attach more importance to the research of sports management in various fields and enhance the cooperation of interdisciplinary research. Besides, the relevant research of sports management should be developed from the four main fields. We should deeply explore the research achievements of sports management, then based on that, making up the deficiency of the current research and promoting the vigorous development of the relevant research on sports management system.

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Present Situation and Countermeasures of Universities' Technology Innovation in China

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Abstract: Based on the technology statistical data of colleges and universities published by the science and technology department and the ministry of education of China, this article argues that China's colleges and universities are the important force of technology innovation in China. However, the government's investment for scientific research of university is not enough and the scientific research achievements conversion rate of colleges and universities are not high. The support for application research is also insufficient. All of these restrained the development of technological innovation of China's colleges and universities. This article proposes that the government should attach more importance on universities' application research, set up the technology innovation promotion fund, increase the amount of funding for colleges and universities and establish reasonable and unified technology innovation evaluation system of colleges and universities.
Key words: Colleges and universities; Technology innovation; Situation analysis; Countermeasure research

1 Introduction

Science and technology is the motive power of the economic development. After the agricultural economy and industrial economy era, knowledge economy become the main subject in 21st century. Many countries in the world attach great importance to science and technology innovation. For example, as the world's strongest technological country, the United States has formulated a programmatic document of science and technology innovation "American innovation strategy" since 2009[1]. The contribution rate of science and technology to social economy of America reaches up to 80%. After the world war II, Japan began to innovate rather than the technology imitation, which benefits from the implementation of the strategy of "technology based state". European science and technology innovation is successful. Germany has many global-level technological companies; Britain is the cradle of scientific and technological innovation; France formulated "the science and technology progress law" after world war II; Ireland believes that scientific and technological innovation is essential and it transforms from an agricultural country into the "silicon valley" in Europe; South Korea become a typical emerging industrialized country under the guidance of "the law of promoting technology", "technology development promotion law", "science and technology basic law" and other legal documents[2]. All of these performance is closely related to the national innovation of colleges and universities. On the one hand, education in universities has cultivated a large number of innovative talents to realize the government policy goals and also become the technology providers of the enterprises (Zhao Hongzhi, Liu Fengchao, Jiang Binbin ,2014). On the other hand, universities are the cluster of scientific researchers and the origin of scientific achievements. The position and role of the colleges and universities in the national innovation system are very important.

There have been abundant researches on universities and colleges technology innovation up until now. Huang Haiyang (2013) used the regression analysis to obtain the equation for technology innovation diffusion in universities and give a predictive analysis based on bass model. Wang Zhejiang (2015) concluded that universities which undertake the task of research and teaching are the source of innovation and innovation system which regards the universities as the core is built under the dimensions of concept, structure and system. Guo Jinchao (2015) believed that it's necessary for the university to have a correct understanding for the combination between university-industry collaboration and technological innovation to reform the mechanism of technological innovation management system. Fu Liping(2015) hold the view that there is a spatial correlation and dependence between the innovation output of the universities and

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http://www.cssn.cn/glx/glx_kjgl/201408/t20140804_1278096.shtml
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enterprises. Liu Bin (2016) distinguished the difference of the cooperation categories and conducted the research on the influence of geographical distance to the collaboration between universities and innovation performance based on the patent data of domestic cooperation of colleges during 1985 to 2008.

2 Present Situation of the Technology Innovation of Colleges and Universities in China

2.1 Great scientific and technological innovation achievements of colleges and universities have been made in China

2.1.1 Colleges and universities are the major force of China's technology innovation

According to the 2015 compilation of science and technology statistics of colleges and universities issued by the ministry of education of China, in 2014, there were 1146 Chinese colleges and universities (including 109 "211" and provincial colleges and universities) with teaching and scientific research personnel 920007 person(including 884317 scientists and engineers); 369510 research and development personnel(including362272 scientists and engineers); 221674 researchers and development full-time staffs(including: 217328 scientists and engineers); 44508 R&D achievements application and technology service personnel(including 43706 scientists and engineers); 26696 R&D achievements application and science and technology service full-time staffs(including 26211 scientists and engineers). According to 2014 R&D activity analysis of colleges and universities in China released by the ministry of science and technology of China, in 2014 China's R&D full-time personnel of colleges and universities was 335000, increasing 3.1% compared to the previous year, accounting for 9.0% of the total number of national R&D personnel; there were 10632 R&D institutions of higher learning, increasing 790 compared to the previous year. The data shows that R&D personnel in China's colleges and universities increases year by year since 2000. Chinese colleges and universities are the major force of China's technology innovation.

Table 1   Technology Human Resource in Colleges and Universities in China

	teaching and scientific research personnel (person)	research and development personnel (person)	researchers and development full-time staffs (person year)	R&D achievements application and technology service personnel (person)	R&D achievements application and science and technology service full-time staffs (person year)
Total	920007	369510	221674	44508	26696

(Data resource: 2015 science and technology statistical data collection of colleges and universities issued by the ministry of education of China)

2.1.2 Colleges and universities are the cradle of China's technology innovation

According to the 2015 compilation of science and technology statistics of colleges and universities issued by the ministry of education of China, in 2014 China's colleges and universities completed 421612 scientific research items and obtained 32 national natural science awards, 57 National technological invention prizes, 186 National science and technology progress prizes, 1135 Progress prizes in science and technology of the various departments of the state council and 3713 science and technology progress award of provinces, autonomous regions and municipalities; published 11804 scientific books, 829873 academic papers; accepted 3694 international projects; applied 144924 patents(including 92975 invention patents, 45079 utility models, 6870 appearance designs); had 82369 patent licenses(including 39294 invention patents, 39069 utility models, 4006 exterior designs); and signed 2257 patent sale contracts (the total amount is 750036000 Yuan and the actual income is 540280000 Yuan), 10517 all kinds of institution of higher learning technology transfer contracts (the total amount is 4012570000 Yuan and the actual income is 2602906000 Yuan).

Table 2   Scientific and Technological Achievements of the Colleges and Universities in China

	scientific books	academic papers	international projects acceptance
Total	11804	829873	3694
	Patent Application	Patent licenses	Patent sale contracts
Total	144924	82369	2257

(Data resource: 2015 science and technology statistical data collection of colleges and universities issued by the ministry of education of China)

2.2 Main problems of technology innovation in Chinese universities
2.2.1 Paying too much attention to basic theory research rather than application research.

For a long time, China's colleges and universities are the important part of national innovation system and they shoulder the task of the basic theoretical cutting-edge research. According to the "2014 R&D activity analysis of colleges and universities in China" released by the ministry of science and technology, universities and colleges ranked the first in terms of basic research activities since 2006, and the R&D funds for basic research was 32.86 billion Yuan in 2014, accounting for 53.6% of the funds of basic research. On the contrary, colleges and universities accounted for 34.1% of the application research funds. Basic research is the core of the national 973 project, 863 project and national natural science funds. It will inevitably lead to the situations that there are more and more frontier achievements of scientific research achievements in colleges and universities but less application achievements. Meanwhile, the economic benefit is not significant and the promotion of the achievement transfer is also difficult.

2.2.2 Scientific research output is large but conversion rate is low

According to the 2014 R&D activity analysis of colleges and universities in China published by ministry of science and technology, the number of patent applications of colleges and universities in China were up to 184000 pieces in 2014, accounting for 6% of the national patent applications, among them, the invention patent applications were up to 112000 pieces. However, the proportion of colleges and universities invention patent applications in the national invention patent applications hovered at about 12% since 2009 and the proportion in 2014 was 12.1%. The number of patent licenses were 92000 pieces, among them, the number of invention patent licenses were up to 38000, only accounting for 16.4% of the national invention patent licenses. Colleges and universities as the seller in the technology market signed 54000 contracts, falling by 5.6% over the previous year, accounting for 18.3% of the national technical contract volume; The turnover of technology contract was 31.51 billion Yuan, falling by 4.3% over the previous year. It accounted for only 3.7% of the national technology contract. It is not difficult to see that although Chinese colleges and universities make great contribution to china's science and technology, the transformation effect of achievements is not obvious.

2.2.3 Investment proportion for university scientific research is low.

According to "2014 China R&D funding characteristics analysis" issued by the ministry of science and technology, in 2014, China's R&D funds was 1.30156 trillion Yuan, and the total input intensity reached 2.05% which was higher than the average input intensity of 28 countries in European union (1.94%). R&D funding that came from enterprise funds was 981.7 billion Yuan, accounting for 75.4% of the R&D funds; Fiscal appropriations of science and technology reached up to 645.5 billion Yuan, accounting for 4.25% of the financial expenditure. Among the national R&D funds, colleges and universities was 89.815 billion Yuan, accounting for 6.9%; among the Colleges and universities R&D funds, the government funds were 53.65 billion Yuan, accounting for 59.7% of the colleges and universities R&D funds; In national R&D funding, government funding in 2014 accounted for 20.25%. The government R&D funding investment in 2014 was 13015.6 * 20.25% = 263.56 billion Yuan, and the colleges and universities accounted for only 20.3% of government R&D funding. On the contrary, the R&D funding of colleges and universities in the United States primarily comes from the government funds (90%) (Liu Fengchao, Jiang Binbin ,2013). In terms of human resources, among full-time personnel equivalent of the national scientific research (including basic research and application research), colleges and universities accounted for 49.1% in 2014. It is obvious that the government's investment into colleges and universities scientific research is relatively low.

2.2.4 Performance evaluation index of scientific research in university is biased

Chinese universities are the important force in the national scientific research. How to establish a reasonable performance evaluation system of scientific research has an important impact to stimulate the enthusiasm of teachers and researchers in universities. Currently, the evaluation system of universities in China mainly focus on statistical papers, all kinds of awards (including national, ministries and local government, etc.), the level and quantity of projects, the amount of funds and the number of patent applications. Some colleges and universities directly use these indicators for the assessment of the professional title and department annual assessment. This will inevitably lead to the formalism of technology innovation in colleges and universities. They attach more importance to theory but ignore the application research, which seriously impede the application and transformation of scientific and technological achievements in colleges and universities. Unlike China, other developed countries put more emphasis on the revenue of the technological achievements in the technology evaluation system. Many indicators have been taken into consideration such as transformation rate of scientific research

achievements, the revenue produced by the scientific research achievements, the number of spinouts from the universities, etc.

3 Countermeasures and Suggestions

3.1 Attaching more importance on application research

There are 1146 colleges and universities in China. However, it goes down to 109 when it comes to 211, 985 and national key universities and the rest majority are ordinary universities. From a perspective of staff structure, there are 920007 teaching and scientific researchers in total across Chinese universities in 2014, while only 40%(369510 person) are R&D staffs. The number declines to 4.8% and 44508 respectively when it comes to achievement application and technology service staffs[1]. Therefore, there are still many people in Chinese colleges available for scientific research. Application research funds in universities nowadays makes up 34.1% of total Chinese application research funds. What's more, only a few colleges and universities can be called research university. 985 and 211 colleges achieve most national-level research projects. It is perfectly fine for those 985 and 211 colleges to undertake basic research projects. But benefiting people's livelihood and serving people's commonwealth is also the fundamental purpose of scientific research of colleges and universities. So scientific research in Chinese colleges and universities not only need to play a role in basic research for national scientific improvement, but also need to contribute to the development of the market and the economy for meeting the demands of time of "to face the world technological frontier, to face the state's major need and to face the key battleground of national economy". There are amount of talents in Chinese colleges and universities. It is essential to make a difference between the application talents and scientific talents. Both basic and application research should be focused on in colleges and universities. For an ordinary university, basic research should play a pivotal role so as to make full use of all sorts of talents.

3.2 Setting up technology innovation promotion fund

Nowadays Chinese colleges and universities tend to pay more attention to research rather than the technology transfer. All kinds of state-subsidizing research projects are aimed at research itself and do not cover technology transfer. But the technology transfer does need strong financial aid and it contains stages: small-scale test, pilot scale test and batch production. Research outcome is already hard to get. We should not abandon these research outcomes which are available. Although there is a sharp increase in patent application and authorization in Chinese colleges and universities, the quality of the patents is not high and the average life span of these patents is about 3 years meanwhile patent transfer rate is behind 5%[2]. To deal with above problems, some suggestions are given as following: Firstly, the country should set up funds of technological achievement transfer for universities and colleges. At present, all kinds of Chinese research projects and financial aid are issued only after application and strict scrutiny. If promotion funds for technological achievement transfer are set up, it would undoubted play an active role in commercialization of research outcomes. Secondly, we should foster comprehensive talents who have both technological knowledge and commercial knowledge. They will become a crucial part of technological achievement transfer system and help to promote the transfer of the economic value of research outcomes. Thirdly, we should establish specialist technology transfer offices. These offices can bridge colleges with industries and accelerate the process of technology transfer.

3.3 Increasing financial investment for university scientific research

As the knowledge intensive institutions, universities have sufficient resource of talents as well as plenty of advance research facilities. They are no doubt the heaven for scientific research and important places for yielding scientific research achievements. However, the share proportion of universities in national R&D funding is declining annually though the strength of Chinese R&D is on the rise in recent years. In 2014 universities' share only made up 6.9%. The main sources of funds for colleges and universities are from governments but from the above analysis we know that the government only put 20% research investment into universities. This proportion is not high compared to other countries in the world. Therefore, it would be better to increase the amount of funding for universities, which is beneficial for scientific research.

3.4 Establishing unified evaluation systems of scientific research in universities

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The evaluation system of scientific and technological innovation involves standard of scientific research level, which influences the direction of university scientific research. Considering the evaluation standard of scientific research in Chinese universities is non-uniform, non-normative and none-reasonable at present, it is urgent to establish an unified and reasonable college research evaluation system and set up scientific evaluation indicators. Firstly, we should pay appropriate attention to scientific publications but do not judge the scientific outcome solely by publications. Secondly, we should tell the difference between the patent application and the patent authorization and do not consider the number of patent application as performance evaluation indicators for teachers in universities. Thirdly, we should make the revenue created by technology transfer into evaluation system so as to truly make scientific research meet the requirements of market.

4 Conclusions

There are plenty of scientific research talents, resources and solid research foundations in Chinese universities. They can be the cradle and base for Chinese scientific and technical innovations. The innovation of Chinese colleges and universities also has great influence on the development of Chinese nation. We can promote the technological innovation of universities and colleges in China by: (1) putting more attention to application research; (2) setting up technology innovation promotion fund; (3) increasing financial investment for research in universities; (4) building reasonable and unified research evaluation system.

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Analysis on Coordinated Development of Sports Tourism Resources in Western Hubei

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Abstract: Based on the investigation of the sports resources of the ecology-culture tourism in Western Hubei and the theories of growth pole, industrial distribution, pint-axle-level, industrial chains, industrial structure, sustainable development, non-balanced development as well as practice. This paper tentatively intends to analysis the current situation, goals, distributions and products design of the coordinated development. As the results indicate, sports tourism sphere consisted of several major mature tourism districts, such as Shennongjia ecology tourism area, the Great Three Gorges area, Wu Dang cultural tourism area, Enshi minorities' sports tourism area, Jingzhou-Jingmen-Suizhou ecology tourism area, the sports tourism resources can be intensively allocated by optimizing spatial structure.

Key words: Coordinated Development; Industry Convergence; Sports tourism

1 Introduction

Sports tourism, booming in recent years, develops very quickly. The tourism production continuously increases in many countries, like USA, Germany, Britain, Italy, Japan and Korea. There are many sports tourism spots abroad, such as, the Alps, Disney amusement park in USA, expenditure of the Amazon and the climbing of the Himalaya(Harryman, 1997).Sports tourism is one crossed Portion which blends of sport and tourism(Canestrelli,1991).It also embodies the sociality of sport and tourism(Zhang Xueying,2001).Sports tourism is a kind of Special tourism and belongs to tourism as an important component(Shen Yuting,2014).Sports tourism is an interdisciplinary subject and a rising and grafting compound Industry which is one organic and interactional social system including sports tourists-sports tourism destination-sports tourism Products-sports tourism consumption(Cao Guoxin,2009).

Equipped with unique geographic surroundings and natural sightings, the ecology-and-culture tourism sphere in western Hubei obtains large quantities of high qualified tourism resources and holds much potential. Sports tourism, the formal product of the change from appreciating-tourism to participating-tourism, derives lots of high-quality tourism resources like whitewater drifting, delta wing, fire balloon, spelunking, paragliding, camping, skiing, recreation and rehabilitation, outward bound, golf, bungee jumping, prompt drop, shooting and parachute, which greatly encourages the development of the sports tourism. This essay, on the grounds of relative theories and practice, did a deeper analysis on the dynamic mechanism, spatial arrangement and development track of the sports tourism development in western Hubei, aiming to provide it a clearer way and more effective suggestions.

2 The Goals of Coordinated Development of the Sports Tourism Resources in Western Hubei

With its vast landmass, rich resources, diversifying cultures and many excellent sports tourism resources, the ecology-tourism sphere embodies its unique characteristics, among which include scenic areas of Wu Dang mountain, the three Gorges, Enshi canyon, Jingzhou ancient cities and Shennongjia covering large amounts of sports tourism resources on the mountains, under the water, and being competitive. Having invested 42,000,000 yuan on the commercials which are shown on the CCTV and propagandized Wu Dang mountain via slogans like 'Wu Dang, a place for Taoism; Tai Ji, a place for regimen', 'Wu Dang, Tai Ji, the paradise for regimen', the special economic zones of Shiyan Town also licensed some TV series and films like 'Dragon Buster', 'Myth of hunters' diaries', 'teenagers in Wu Dang', 'Dream of Kung fu', which motivate the martial arts culture to spread rapidly (Ke ru liang,2004)

On the basis of fully taking advantage of the rich resources, favorable policies, scenic spots and prominence in products, the coordinated development should insists on the strategies of meeting the diversified market, focus on the exploitation of the sports tourism products, mainly construct several special destinations like the martial arts culture tourism, expedition of Shennongjia and the drifting of Three Gorges, positively deepen the coordinated development between sports and tourism, and greatly explore various sports activities, such as regimen, eco fallow, drifting expedition, healthcare, forest bath,

matching sightings, and going alongside the river on foot while coring the ecology and environmental protection.

3 Strategic Procedures of the Coordinated Development
3.1 Dispersion phrase (2009-2013)
In the primary phrase, the ecology-tourism sphere including cities like Yichang, Xiangfan, Shiyan, Shennongjia, Enshi and so forth did not integrate and economic activities were isolated and scattered. Being dispersed, the sports tourism products were at a loss and there was an urgent demand for a correct selective strategy to decide on the targets and the exploitation of the resources.
3.2 Aggregation phrase (2013-2017)
After the primary phrase, the coordinated development basically formed, the second phrase, aggregation phrase, will take the measures of the point-to-axle and the march-along-axle, focusing on the major sports programs like hiking on foot, through the forest, delta wing, rock climbing, motorcycling on water and whitewater drafting. In addition, by fulfilling the functions of the center cities like Shennongjia, Yichang, Shiyan and Enshi to form a sighting circle of large scale and high quality, the second phrase is to finish the primitive aggregation.
3.3 Diffusion phrase (2017-2021)
To realize the strategy of point-to-axle. The core sightings where there have already formed stable tourist resource, consumption aggregate and brand effects have been created by rich sports tourism resources in this phrase. Main targets at this phrase is to progressively promote sports tourism products in areas like Enshi minorities area and Jingzhou culture area.
3.4 Mature phrase (2021-2025)
To carry out the strategy of integration of unbalanced districts. At this phrase, with the successive improvement of infrastructure and brand value and the appearance of scale benefits little by little, the popularity of the economic chain of sports tourism will gradually increase. The ecology-culture tourism sphere in western Hubei progressively becoming the center scenic spot of the central area of China, the industrial cluster effect will have a positive influence on the drive of other fields, for instance hotels, culture, transportation and inns.

Table 1   Procedures of The Development of the Sports Tourism in Western Hubei

phrase	period	schema	goals
Phrase Ⅰ	2009—2013	Key development、spatial arrangement	a correct selective strategy to decide on the targets and the primary exploitation of the sports tourism sphere
Phrase Ⅱ	2013—2017	Point-to-axle, march-along-axle	to mainly construct core sightings, like the three Gorges, Shennongjia and Enshi canyon
Phrase Ⅲ	2017—2021	Point-and-line, all-in-whole	the extension and deepen of the sports tourism resources; the reasonable arrangement of sightings with three core attractions
Phrase Ⅳ	2021—2025	Mature system，industries drive	to become one of the most important attractions in China and to extend the market scale step by step; to form brand effect and a mature sports tourism market system

4 Spatial Structure of Coordinated Development of the Sports Tourism in Western Hubei
The coordinated development operates in a schema of point-axle-layer, which specifically stands for center cities for the concept of point, transportation routes for the concept of axle, and hinterland for the concept of layer (Ruan Han, 2001). Together with the regional economic cooperation integration development which includes the futurity of some sports tourism towns like Yichang, Shiyan, Shennongjia, Xiangfan, Enshi, Danjiangkou, Jingzhou and Suizhou is the exploitation of the sports tourism resources. Absolutely winning over other cities in infrastructure, talents and resources, these cities, acting as the center towns of the ecology-culture tourism sphere, can further classify the schema into three different levels when taking the practical situation of the western Hubei (Liu Mingming,2008). The three levels can be as follows: axle level 1 from Xiangfan to Chongqing; axle level 2 from Shiyan to Yichang(2 routes); axle level 3 with National Highway 209, 318 and some other high ways and the expressway from Yichang to Huangshi.

Table 2　Spatial Structure of the Sports Tourism in Western Hubei

factor	level	Areas / Scales
point	Center level 1	Yichang　　Shiyan　　Shennongjia
	Center level 2	Xiangfan　Enshi　Danjiangkou　Zhuxi　Fangxian　Zigui　Zhijiang Dangyang
	Center level 3	Jingmen　Wuhan　Jingzhou　Suizhou|　Huanggang E'zhou
axle	Axle level 1	Xiangfan—Shiyan—Yichang—Shennongjia—Xingshan—Badong —Chongqing
	Axle level 2	Shiyan—Xiangfan—Jingmen—Yichang、 Shiyan—Xiangfan—Suizhou—Wuhan—Jingzhou—Yichang
	Axle level 3	National Highway 209,318，expressway of Yichang and Huangshi, some other highways
layer	Kernel layer	Yichang
	Hinterland layer	Shennongjia、Xiangyang、Shennongjia
	Fringe/edge layer	Enshi、Jingzhou、Jingmen、Suizhou
	broaden layer	Nanchang、Changsha、Xinyang、Chongqing
	Internal layer	Areas and districts straight access to by airplane, train and ship
	External layer	Countries and states straight access to by airplane, train and ship

5 Spatial Arrangement of the Coordinated Development of the Sports Tourism Resources in Western Hubei

Table 3　Spatial Structure of the Sports Tourism in Western Hubei

sphere	areas	Center town	resources	Core product
Kernel layer	Great Three Gorges	Yichang	Boating ,fishing, rock climbing, golf, hiking, horsing, farm house	Products for entertainment and game-watching
Hinterland layer	Shennongjia	Shennongjia	Rock climbing, driving, expedition, along river, fishing, spelunking, skiing, field survey and so on	Products for expedition
	Wu dang culture	Shiyan Xiangfan	Martial arts, regimen, climbing, mountain biking, rock climbing, overhead cables, martial arts performance and so on	Products for recreation
Fringe layer	Enshi minorities	Municipality of enshi	Cycling, expedition, bungee, horse race, sailing, folk sports dancing and so on	Products of folk tradition
Diffusion layer	Ecology-tourism of Jingmen, Jingzhou and suizhou	Jingmen, Jingzhou and suizhou	Self-driving traveling, hiking, boating, parachuting, rowing, horse race, mountain climbing, spelunking, hot spring, boating, diving, Nongjiale, country traveling	Products for culture and travel
Abroad layer	Jiangxi(partly)	Nanchang	Mountain climbing, hot spring, diving and so on	Products for water activities
	Hunan(partly)	Changsha	Outdoor rock climbing, folk sports and so on	Products for mountainous and watering sports
	Henan(partly)	Xinyang	Martial arts, sports performance and so on	Products for martial arts culture
	Chongqing(partly)	Chongqing	Expedition, outdoor camping, sports entertainment and so on	Products for expedition in canyons

The sports tourism sphere is consisted of the Wu Dang cultural sports tourism area, the Three Gorges sports tourism area, Shennongjia ecology sports tourism area, Jingzhou-Jingmen-Suizhou ecology-culture sports tourism area and Enshi minorities' sports tourism area. The three Gorges area, centered in Yichang, develops products for boating, fishing, rock climbing, golf, hiking, horsing, and Nongjiale. Shennongjia, centered in Shennongjia forest, develops special products for crossing forest, mountain climbing, rock climbing, driving, expedition, along river, fishing, spelunking, skiing, and outdoor survey. Wu Dang culture sports area, centered in Shiyan and Xiangfan, develops sports tourism

products for regimen, mountain climbing, overhead cables, martial arts performance. Enshi minorities' sports tourism sphere, centered in unship municipality, develops the products for minorities resources like hand dancing. Jingzhou-Jingmen-Suizhou sports culture area, centered in the three cities as its name and combing culture of the three Kingdoms, the state of Chu, Yan emperor and Shen Nong with Jingzhou ancient city, Songziweishui beauty spot, Honghu fishing holiday spot and Shishou swan mi-lu national protection area, majorly develops products for drifting, mountain climbing, spelunking, self-driving traveling, hot spring bath, fishing, dragon boat race.

6 Conclusions

Currently, there is great relation and interaction between sports and tourism for the common ground of the convergence. If we can reasonably combine sports and tourism, take advantage of each other and fully realize the merits of both two industries, there will be great brand effect, competition effect and creation effect. Sports tourism sphere consisted of several major mature tourism districts, such as Shennongjia ecology tourism area, the Great Three Gorges area, Wu Dang cultural tourism area, Enshi minorities sports tourism area, Jingzhou-Jingmen-Suizhou ecology tourism area, the sports tourism resources can be intensively allocated by optimizing spatial structure.

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Empirical Research on Quality of Hubei Province Urbanization

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Abstract: With the advent of the third wave of urbanization, the development of urbanization level of quality, began to conclude urban economic and social development, quality, degree of coordinated urban and rural development, urbanization, efficiency, and so on. In this study, focusing on the quality of urbanization in Hubei Province, regional data in 2013, use factor analysis, rotation matrix and other models, to analysis the quality of urbanization in Hubei Province comprehensive evaluation. Finally have three conclusions: First, urbanization is low overall quality of Hubei Province, is the medium level in the China. Secondly, the quality of urbanization contained within the town's economic development and the quality of living standards for the quality of urbanization greatest contribution. Third, the three aspects of the quality of urbanization is a unified whole, in promoting the development of mass urbanization, the need to achieve coordinated development. At last, combining the characteristics of Hubei Province, focusing on how to improve the quality of urbanization in Hubei Province, we have to put forward some countermeasures and suggestions.
Key words: Hubei; Factor analysis; The quality of urbanization; Evaluation system

1 Introduction

The 18th Report of the CCP treat urbanization part as one of the new four modernizations, the annual Central Economic Conference has put "actively and steadily promote urbanization, and strive to improve the quality of urbanization," as one of the six tasks as China's economic work, "urbanization "has become one of the most famous word in China. Since the reform and opening up, Chinese urbanization rate has improved significantly, it increased from 17.92% in 1987 to 51.27% in 2011, an average increase of more than one percentage point per year. Just a few years,

However, there are still many problems of Chinese urbanization process, especially when the urbanization rate has reached about 50% of the time, the development of urbanization will occur more frequently and more serious conflicts. Like: The size of the structure is not reasonable in towns、cities and towns of external radiation are still relatively weak; macro-regional and urban internal spatial layout and other issues led blindly expand outside town, like a pancake, become the "Village in the city" and also cause other phenomena; urban environment shift into rural will cause environmental pollution, to provide rural to urban ecological environment harmful food; widening gap between urban and rural areas, landless peasants serious problem of basic public services failed to achieve equalization.

Urbanization - first appeared in the Spanish designer's urban planning works named "basic principles of urbanization, "Rossi (2016) definition "Social Science Dictionary" for the first time in his book，made a comprehensive urbanization connotation of explanation, in his view, the meaning of the term urbanization should include four aspects the propagation of the rural hinterland of urban centers affected and the whole society gradually accept the process of urban culture; third，the process of concentration of the population, including increased focus on expanding each point and focusing on each point; Fourth, the proportion of the total urban population sociodemographic improve the process. Zhou De(2015) think Urbanization quality assessment is a test of land space, industrial economy, institutional politics, social and cultural reconstruction, and eco-environmental sustainability. Results showed that the urbanization quality was strongly influenced by system structure and function and their relationships. Zeng Chen (2016) think Urbanization in China has been closely associated with urban sprawl, rural migration and the role of government has been more direct and powerful in setting it in motion. And found out that both non-agricultural population and urban land exhibit significant spatial autocorrelation and the superiority in the city center is evident. Tan (2016) think in China, studies across different scales and types of cities, each of which would have implications for understanding of theory relating to sustainable urbanization.

Domestic urbanization quality-related concepts presented is accompanied with" New Industrialization" as the first proposed strategies at the beginning of the 16th by the National Congress Party. After that, with the increasingly prominent urbanization of quality problems, studies have ever main focused on the quality of the urbanization, all the social problems that connecting with this topic have become ongoing concern. Clearly concern of earlier mass urbanization was came up by Ye Yumin

(2001), she made earlier in quantitative methods to study the quality of urbanization, and the core of the city is the quality of urban modernization, the ultimate goal is the integration of urban and rural areas. Other scholars thought the quality of urbanization has multidimensional manifestations to explain mass urbanization, Aping Chang (2005) use factor analysis, analyzing the quality of the urbanization of 30 provincial capitals and municipalities，she thought this can be used as the basis for urbanization analysis. Some scholars preferred to reflect the level of integrated of urban development of urbanization quality, main focusing on empirical research and evaluation.

2 Index System Construction

Evaluation the regional urbanization quality level, we need to consider the quality of urban development, urbanization and urban and rural development to promote the efficiency of these three areas.

2.1 rating index set

According to this, we have set five secondary indicators they are: the quality of economic development, the quality of social development, spatial development quality and efficiency of urbanization and urban and rural level; we also have six of   three indicators: economic level, the level of economic structures, health care and public services and population, infrastructure, energy efficiency, investment income and expenditure of urban、rural differences and ecological environment; we have 14th four indicators: per capital gross national product, registered urban unemployment rate, the proportion of non-agricultural industries, the per capital public libraries book volume, number of beds per thousand medical institutions, population urbanization rate, every million people have buses, urban per capital road area, green space per capita, life garbage treatment rate of urban water penetration, city gas penetration unit energy consumption and GNP fixed assets realized GNP.

2.2 Data collection and collation

In order to accurately the quality reflect of urbanization in recent years of Hubei Province, the provincial urbanization compare the quality difference, this paper select 2013 year as the mainly statistical data, the data are mainly from the provinces and the national statistical yearbook.

First of all, given the differences in the development of different parts of the area will be totally different, such as Xinjiang, Tibet, Qinghai, western region, which did not include relevant indicators, this article is the comparison of the 24 provinces and four municipalities (Beijing, Shanghai, Tianjin, Chongqing) related index. Secondly, in the collection of some indicators, due to the statistical yearbook of the province when the year is not updated, so choose the 2012 annual Yearbook indicators, and after some modifications, it is used to describe the situation in 2013, such as Hebei, Jilin, Yunnan region.

3 Empirical Study

For the evaluation of the quality of urbanization There are many ways, and factor analysis method is a commonly used multivariate statistical methods to objectively evaluate the object.

3.1 KMO factor test, variance analysis and matrix analysis

In this paper, using the SPSS software, put the data into the provinces of KMO factor test analysis. First, the data were normalized, then put the sample data into spss17.0 do KMO to test correlation analysis, KMO value is higher than 0.5, in line with the conditions of factor analysis.

Table 1   KMO and Bartlett Test

Adequate sampling of the Kaiser-Meyer-Olkin measure		.632
Bartlett test of sphericity	Chi-square approximation	282.274
	df	120
	Sig.	.000

At the same time begin the factor analysis, then have the ANOVA table. The data can be seen, the first five characteristic root factor are higher than 1, the cumulative contribution rate of 77.356%, can be relatively completely reflect most of the information of the original data.

Obtained by matrix analysis, factor 1 covers the per capital GDP, the proportion of non-agricultural industries, public libraries per capital amount, population urbanization rate, every million people have public transportation vehicles, urban water penetration, gas penetration rate of fixed assets achieve GDP,

it can be seen as the town's economic development level and living situation. Major urban per capital road area covered by a factor of two, the per capital green area of the park, reflecting the construction of infrastructure and ecological environment of the city. The main factor of 3 million people covering every medical institution number of beds per unit GDP energy consumption. Load factor 4 larger urban and rural Engel coefficient index is the difference between the income gap between urban and rural residents ratio. Load factor 5 larger main indicators for the registered urban unemployment rate.

Table 2   Rotation Matrix Ingredients

index	ingredient				
	1	2	3	4	5
Per capita GDP	.922	.026	.056	.115	.154
The registered urban unemployment rate	.093	.069	.227	-.118	.865
The proportion of non-agricultural industries	.863	.077	-.190	-.146	.116
The amount of per capita public libraries	.771	-.409	-.043	.006	-.225
Number of beds per thousand medical institutions	.124	-.090	-.782	.104	-.093
Population urbanization rate	.939	-.131	.057	.065	.176
Every million people have public transport vehicles	.604	.093	-.023	.097	.540
Urban per capita road area	-.151	.795	.233	.380	-.103
The per capita green area park	-.007	.792	-.144	-.057	.199
Life garbage treatment rate	.363	.433	.379	-.410	-.161
Urban water penetration	.659	.313	.424	.068	-.048
(City gas penetration rate)	.686	.288	.423	.232	.044
Energy consumption per unit of GDP	.282	-.305	.666	.139	.294
Fixed assets investment to achieve GDP	.758	-.413	.122	-.128	.124
The difference between urban and rural Engel coefficient difference	.027	.159	-.079	.843	-.085
Income gap ratio	.603	-.092	.242	.584	.005

3.2 Ranking Analysis

Based on ANOVA tables and factor score coefficient matrix, select variance contribution rate as weights, obtained comprehensive evaluation score model: F = (37.198 × F1 + 14.874 × F2 + 10.066 × F3 + 8.503 × F4 + 6.715 × F5) /77.356. This can be obtained for each factor and factor integrated ranked.

Factor 1 covers the characterization of urban economic development and living conditions of residents in Hubei Province at the general level; the common factor 2 covers the characterization of infrastructure and ecological environment construction in Hubei Province in general backward bias level; common factor 3 mainly covers the number of beds per thousand medical institutions, energy consumption per unit of GDP, also in Hubei province in this regard the general level; the common factor 4 covers characterize of the development of urban and rural, in the provinces of Hubei province in this regard ranking moderate front, greater impact on the ranking boost. 5 common factor larger load index mainly urban registered unemployment rate, this indicator Hubei poor, reflecting the unstable employment situation.

Comprehensive factor scores, Hubei provinces in the country compare the quality of urbanization, the middle level, we need to take further measures, targeted to enhance the quality of urbanization.

Table 3   Composite Score Table

Provinces	comprehensive factor score	ranking	province	comprehensive factor score	ranking
Beijing	1.093678145	1	Hubei	-0.060307002	15
Tianjing	1.002176584	2	Jiangxi	-0.0698877	16
Jiangsu	0.759513538	3	Hainan	-0.09650593	17
Zhejiang	0.682525533	4	Shanxi	-0.102410602	18
Shandong	0.641336535	5	Shanxi	-0.176208294	19
Shanghai	0.622533798	6	Hunan	-0.32682533	20
Guangdong	0.308356501	7	Guangxi	-0.384389537	21
Fujian	0.20197021	8	Jilin	-0.392350449	22
Hebei	0.182680163	9	Heilongjiang	-0.399904464	23
Liaoning	0.154891623	10	SIcuan	-0.467601757	24
Neimeng	0.091482269	11	Henan	-0.667483878	25
Ningxia	0.090635132	12	Yunnan	-0.875011533	26
Chongqing	0.070661187	13	Gansu	-0.888096502	27
Anhui	0.048209457	14	Guizhou	-1.043663621	28

4 Conclusions

This paper introduces the background of mass urbanization, then draw domestic and foreign scholars on the quality of urbanization, mass urbanization in Hubei. Based on this, defines the concept of urbanization and mass urbanization, and analyzes the theoretical basis related.

1) For an overview of the development process of urbanization and the development of urbanization in Hubei province were analyzed. Description of the situation in Hubei Province urbanization development, and find the problems in the development.

2) On the basis of evaluation of previous scholars build, combined with the actual situation in Hubei province, constructed urbanization quality evaluation index system and evaluation model. Using factor analysis model of urbanization to evaluate the quality of various regions of the country, pointing out in all aspects of the development of each of Hubei Province, and the influence of factors aimed at finding factors that affect the quality of cities and urbanization and cities exists in the development of urbanization The problem.

3) To make recommendations to improve the quality of urbanization in Hubei Province from three aspects, preferably combined with the results of the factor analysis.

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Research on Strategy Selection for the Development of "To Exercise" APP in Universities of Hubei Province

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Abstract: "To exercise" is the Hubei sports bureau launching the sports projects, and it is an important measure to implement the national policy to promote national fitness. Hubei College Stadiums have abundant resources, rich human resources, colleges and universities. To understand the development situation of "to exercise" APP in colleges and universities, this paper gives the 'to exercise' APP a comprehensive analysis, the conclusions, and propose development strategies with the SWOT analysis in Hubei Province .

Key words: Hubei Province; College and University; "To exercise "APP; Analysis

1 Introduction

Literature search indicates that more problems about the development of the sports venues and research abroad, operation strategy and management system of the venue construction will have a lot. They not only pay attention to the function of the venue construction and long-term development, also pay attention to the operation management of the venue, many scholars research the problems in the operation and management of sports venues.

Jon A (1998) on American stadium facilities such as statistics, analyze the operation and management mode of the venue, found that 33% of large sports entertainment facilities, both in the form of commissioned to carry on the operation and management, operation management for sporting events and infrastructure, and, in most of the sports facilities to accept government financial support, and its management has gradually realized the trend of the privatization.

Matthew Brown (2004) benefit to study the development of sports venues, such as, by tracking survey, found that sports venues to entrust way, most of the income situation has improved significantly, the benefit of the venues has increased, is worthy of reference.

Robert A. (2006) believes that the development of the sports venues in the fierce competition environment, using a variety of means, can successfully operate sports venues are very important; For the long-term development of the large sports venues, the creation of a good brand to prepare the way for the sustainable development, there are many factors affecting the development of venues, from the perspective of marketing is the key.

Domestic research is mainly focused on the sports facility operation status quo of research in colleges and universities, colleges and universities sports venues management system research, problems existing in the sports facility operation and management of university research, etc. Overall, Hubei University sports facility operation and management of the related research less, not enough depth. Due to the time factor, political background, artificial conditions, etc., function, operation and management of colleges and universities sports venues situation is changing, some new problems to be solved.

2 Analysis for the Development of "To Exercise" APP in Universities of Hubei Province

2.1 SWOT analysis

SWOT analysis is a method of management in organizational strategic planning by the organization and the external opportunities and threats facing the organization's internal strengths, weaknesses comprehensive analysis to identify organizations to better adapt to the changing external environment development strategy. Hubei College "To exercise" the SWOT analysis, that colleges and universities "to exercise" APP Hubei internal strengths (Strengths), weaknesses (Weaknesses), opportunities for external facing (Opportunities) and threats (Threats) analysis performed, draw relevant conclusions and propose Hubei Province, "to exercise" in the future strategic vision and development plan (Lou Jinhai,2013).

Table 1   "To exercise" in Universities in the Development of Internal and External Conditions for Comprehensive analysis

Internal conditions	Internal advantage（S）	Internal disadvantage（W）
	Sports facilities resources very much rich	Caused by competition for resources
	Abundant human resources	Venue unsubscribe and reservation of inconvenience
	To improve the using and management efficiency	Charges owed
	For economic and social benefits	
External conditions	External opportunity（O）	External threats（T）
	Relevant government policy support	Supervision mechanism is inadequate
	Sports consumption demand	The addition of venue is limited
	The convenience of the internet information	To improve the financial management level
	The needs of the sports venues scientific management	

2.2 SWOT analysis of the college "To exercise" development

2.2.1 Strengths

1) Sports venues and facilities are rich in resources

Many colleges and universities in Hubei Province, has rich resources stadiums. In Wuhan City, the number of surveyed 12 stadiums College statistics, the number of the many various sports venues. This will not only meet the school teaching, training needs, and can undertake large-scale sporting events, large-scale commercial performances, but also to meet the sports consumption, physical fitness needs of the community residents and business units. Compared with other stadiums, sports grounds at universities in terms of quality and quantity have a huge advantage, able to provide a solid material foundation for the "To exercise" development.

2) Abundant human resources

According to the first number of the central Hubei Province, the number of college students, the number of college students in Wuhan increased year by year, in 2012 the number of college students is nearly a million (Wang lu,2007). While teachers generally higher level of college sports, sports teachers is strong, it has a good sports infrastructure. Physical Training College atmosphere is good, college talents as a new era, a strong ability to accept new things, spread fast, play the advantages of university students, facilitate rapid development "to exercise" APP.

3) Improve the utilization and management efficiency of venues

"To exercise" APP end reservation by phone customer venues, on-line in a month, more than 500,000 people benefited from Wuhan, more than one million registered members. Currently, running nearly a year, "to exercise" APP platform has been signed with the province more than 100 stadiums, at least 5000 free low-cost sports daily, open to the public. By the end of 2015, "to exercise" internet contract stadiums respectively grown to more than 1000, members of users reach 50 million or more, free and offers sports and fitness opportunities every day can provide the more than 20,000; by the end of 2018, the platform contracted venues will reach more than 2000, membership development to more than 200 million users, providing at least one hundred thousand free and offers daily sports and fitness opportunities. Venue increased distribution channels and broaden public understanding of information sources and venues enable people to obtain timely information on the site, to understand site usage, convenient public venues booking, improve the utilization of venues.

"To exercise" facilitate the application of modern information technology, the Internet, information resources integration stadium, the venue can publish information quickly and efficiently, timely and unsubscribe to accept reservations, so easy and convenient management, improve the efficiency of management and reduce the cost of facility management to improve the management efficiency.

4) Access to economic and social benefits of double

Improve the utilization of venues, naturally led to an increase in economic income, a venue to maximize the use and improve the economic benefits. This will not only ease the government and school stadiums in terms of financial pressure, but also can stimulate the efficiency and management of university stadiums vitality, to get rid of under-funding situation venues.

At the same time, "to exercise" APP social workers provide a convenient platform for fitness, to

keep abreast of the venue information, access to health services they have a great opportunity to help; this model is also fully implement the national policy for the national fitness campaign services benefit the residents of the surrounding community schools, improve school stadiums influence.

2.2.2 Weaknesses

1) Caused by resource competition venues

Limited venues resources to compete with the school teachers and school staff. School teachers and the demand for space can not be guaranteed. "To exercise" APP is an open service platform, not only teachers and students can book and school personnel can also be booked. Under conditions of limited resources tennis stadium, venue of resources will be scarce, teachers, students and school personnel to generate competition. University stadiums must meet the teachers and students under normal usage, it can be reasonably open; but "to exercise" APP mode so that everyone in the same position, could easily lead to the demand for teachers and school site can not be guaranteed.

2) Cancellation and booking venues inconvenience

Under "To exercise" APP provisions venue Book unsubscribe you have to be two hours before, in the face of rain, snow and other external factors and personal emergencies, venues and booking unsubscribe inconvenient, not only affects the use of the site rate, could easily lead to unused space, and that space fees paid can not be returned to normal, resulting in personal economic losses.

On site reservation privileges, having been clearly defined for each client free reservation only twice a week (one-hour), but some groups through the application of multiple clients to book venues, hoarding space. Causing venues resource monopolies, could not get a fair public access to government benefits, so that the site in the hands of a few people, not only can not allow more people to benefit, on the contrary, will make the venue more resource shortages. College tennis venues monopoly, not only affects the normal requirements of teachers, students and school personnel, but also disrupt the normal teaching and training, which is the original purpose contrary.

3) Non-Standardized Charge

After a year of development, "to exercise" app gradual reduction in the free online booking, paid to charge, but charges are not unified. Some sites charge significantly higher, the student population is difficult to bear the cost of the site, some of the sites charge less but booking difficult. The primary target is to serve the College Tennis school students and teachers, the higher the cost of the venue can not allow students to participate in tennis fitness, but also with a comprehensive fitness program, low-cost open space and other relevant national policies are in conflict, causing teachers and students and the community fitness enthusiasm waned, is not conducive to the development of national fitness campaign.

2.2.3 Opportunities

1) Government policy support

The Ministry of Education, General Administration of Sport has issued a number of policies to promote sports venues opening up, the development of the sports industry, driven by sports consumption; Hubei Province, issued a series of policy documents the development of sports, to promote management measures stadiums reform and development.

2) Internet information is convenient

With the convenience of Internet information age, through mobile phones, computers and other multimedia tools to quickly receive and disseminate information, so modern access to information, more and more time getting faster and faster.

3) High demand for sports consumption

With the stability and prosperity of China's sustained economic growth and social development, sports consumption demand of residents will be started on a new basis, China will appear the size of a very ambitious sports consumer market, this should be the development trend of sports consumption of.

4) The need for scientific management of sports facilities

Management stadiums and services are relatively backward, it requires the application of modern scientific management to improve management efficiency, improve service levels. Through institutional reform and the integration of staff to adapt to the new development needs, provide new development path for college stadiums.

2.2.4 Threats

1) Oversight mechanisms is imperfect

"To exercise" APP is launched by the Hubei Provincial Sports Bureau projects that benefit the sport, from September 2013 to date. There is a problem in the implementation of policy, management and supervision "to exercise" APP. First, government policies may not be implemented, some of the venues

do not follow the requirements for facility management and operation in the pre-launch free booking venues, sports consumers cannot properly book, cannot qualify for government benefits. Second venues reservation management, facility management personnel individual, privately hoarding space, resulting in resource constraints venues. Third, the lack of venues and Sports Bureau manager third party monitoring mechanism, in the face of a contradiction between the two, a third party can not communicate quickly and resolved.

2) Inadequate investment in venues

Hubei Province, the number of sports venues rich in resources stadiums universities account for a large part of it. According to the survey, added to the existing "to exercise" a limited number of venues, only part of it, there are many stadiums so far not joined. There are differences in the various projects, currently badminton, tennis, table tennis and other ball games in the majority, followed by swimming and the gym. Quantity and quality of stadiums affects the development of university sports development "to exercise" the need for adequate resources as a guarantee stadium, currently limited added "to exercise" the number of venues, it is not conducive to long-term planning and development.

3) The Level of financial management to be improved

"To exercise" APP Sports Bureau commissioned by the mining company management, that is, from Hubei Sports Science and Technology Co., Ltd. love sports management (Liu Xueqian Feng Yunhui,2010). Sports stadiums consumers booking through the customer service end of all funds into the company's financial, and then returned to the various venues manager. Among the problems: First, consumers unsubscribe stadium funding can not be refunded. Second, the company to return funds are not timely venue managers, venue managers cause cash flow problems. Low corporate efficiency, low level of service and financial management is a big issue currently exist.

3 Measures and Suggestions

3.1 Enhance the level of management services

Implementation of scientific management, promote the improvement of service levels. First, to improve conditions for software, scientific and standardized management services, improve the operational capacity of managers, strict examination system, a clear incentive measures to improve "to exercise" APP function. The second is to improve the hardware conditions, venues and facilities must be standardized hardware equipped with changing rooms, sports equipment and sports drinks for sale at the sports meet the general needs of consumers. Third, improve the financial management system, financial expenditure norms, and timely refund management (units) in operating income, to ensure the normal flow of their funds.

3.2 Giving full play to the advantages of university talents

University Human Resources rich, there are different high-level professional personnel, integration and use of professional advantages and absorbing management professionals, physical education, sports training personnel, changing the stadium management level is low, weak, poor status of service. Change management thinking, colleges and universities to hire staff as a manager, play to their professional advantage, improve management, reduce operating costs, so that "people do their duty, the best use."

3.3 Specifically targeting

College stadiums is always to meet the teaching, training, mainly in the venue management must ensure that the use of teaching and training, and then combined with the actual situation of the school's external operations. When targeting venues, one needs to ensure that our students and teachers venues, give priority to the learning and training needs of our students and teachers. The second is to develop a reasonable, open plan, develop effective venue use plans according to different time periods, to ensure maximum venues operating revenues.

4 Conclusions

"To exercise" APP is the innovation of the sports venues management, is an important way of nationwide fitness campaign, is the national requirements stadiums low-cost opening to the outside world.

In colleges and universities in Hubei province "To exercise" APP development main advantage is that the venue and rich human resources, help to raise the utilization ratio of university stadium, social gap gain economic benefits. There is also a resource competition, venue unsubscribe inconvenience, the problems such as nonstandard charges. With the aid of the convenient and scientific management of the information age, play advantage, make up the shortfall, seize the opportunity to resolve the threat, to

guarantee the overall effective development of "To exercise" APP.

"To exercise" APP mode in colleges and universities in Hubei province selection strategy: Give full play to the resource advantage of talents in universities and colleges, venues, clear objective, improve the level of management services.

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The Carbon Emission Dilemma: Solutions May Come from Market or Behavioural Change?

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Abstract: This article aims to promote a discussion on environmental issues from the perspective of Evolutionary Theory (Nelson & Winter, 2005; Hodgson, 2007). Some evidence regarding carbon market has been used, which is a common proposal for the reduction of Greenhouse Gases. An interdisciplinary and systemic perspective was developed based on areas of production, administration and economy as a background for the discussion of production and consumption conventional processes that seems to show that market solutions are not effective. Moreover, it is emphasized that the issues that motivate evolutionary theorists may help in the search for solutions closer to reality presented in this early twenty-first century. Thus, the forms and organizational routines are focused to understand the reasons to keep on a behavior harmful to the environment.
Key words: Evolutionary Theory; Environment; Carbon Trade; Sustainability

1 Introduction

From the Industrial Revolution until the mid-twentieth century the economy functioned on the basis of an extractive paradigm. Countries believed that economic growth depends exclusively on the free exploitation of resources (Coelho et al., 2008; Lombradi, 2008). An example of this way of thinking may be seen in operating cycles going on in Brazil during what is called the Brazil Empire Period (exploration: Pau Brazil, Rubber, Gemstones etc.).

The mechanized production, mainly introduced with the steam engine, no doubt brought benefits to productivity, but also an increasing consumption of natural resources. After this period began a permanent search of energy for industries to keep and improve production processes, helping companies and countries to increase their competitiveness. The main resources extracted from the environment to provide power for these new production processes have been fossil fuels. First burning coal, and then with technological advances there has been switching to oil, and going to natural gas.

Seiffert (2009) points out that this process of industrialization was largely responsible for imbalances in biogeochemical cycles of carbon, nitrogen and sulfur in different ecosystems, since the burning of these fuels over time released large amounts of gases in the atmosphere. Thus this process is recognized as the main cause of climate change and hence the greenhouse as was mentioned at the recent COP 21 in Paris. Frondizi (2009) confirms that the intensification of the greenhouse effect is directly linked to human activities resulting from the burning of fossil fuels what is now being identify as the Anthropocene. It is noteworthy that this burning occurs in domestic as well as commercial area, in transportation activities in power generation, industry and agriculture.

Therefore, the problem of climate change is directly linked to energy options adopted at each country in addition to the consumption pattern of people (Seiffert, 2009). This discussion has led to several agreements on how to deal with the problem of emissions of greenhouse gases (GHGs), which are considered the main sources responsible for global warming.

The society at the beginning the twenty-first century is still polluting the environment by its industrial processes, agricultural activities, inadequate waste treatment and increased deforestation. However, with the establishment of the Kyoto Protocol it was possible to reinforce the desire to protect the climate system and preserve the quality of life for future generations. Teixeira et al. (2010) said that Kyoto Protocol was aimed to control the rise of the planet's temperature by decreasing the emission of carbon dioxide (CO_2) and other five other greenhouse gas effect. For this purpose developed the idea of a carbon credit market that could charge for the emissions of GHGs.

CO_2 as commodity is currently the physical-spatial product that stands out in these transactions. Each ton of the five greenhouse gases are converted to tCO_2 (ton equivalent CO_2) which is the standard

measure of the negotiations. Thus, the market sets a price for tCO2 according to supply and demand of emissions in the international market (Nápravník Filho, 2006).

Nonetheless, this type of business is uncertain since does not establish new general rules for carbon trading mainly because the rules established by the Kyoto Protocol were worth only until 2012. Nevertheless, the COP 21 that took place in France in 2015 had as one of their objectives to discuss the problems of production and consumption, as well as carbon credit trading (COP-21, 2015).

In this context searching for a sustainable planet and market solutions makes sense since we are globally in an Open System so CO2 (carbon dioxide) acts globally and its impact on the environment is also global. Thus, the solutions based on the carbon market offer a general control that is independent of who is the company or the country that is polluting. An important aspect of this system is that there is compensation in the generation of greenhouse gases on the planet, in a debit and credit relationship.

This article aims to propose a distancing from these assumptions. Logic does not solve environmental problems because the search for a balance in the market becomes a paradoxical activity, since maximization of the firm's results may be adversely affected by the externality factors of production. Moreover it could be mentioned the criticism of evolutionary researchers on the static nature of the problems and Neoclassical models (Nelson & Winter, 2005).

Therefore, it is necessary to rescue the open, dynamic and evolutionary nature of the economy (Nelson & Dosi, 1994; Conceição, 2007). It is worth highlighting that the evolutionary theorists oppose assumptions as equilibrium optimization and substantive rationality, and this is an important to be considered on this paper. Another important aspect to point out in addition to the dynamic nature of society is the focus on forms and routines given by evolutionary theorists. Thus, the behavior of social actors becomes the object of activity and not commercial transactions.

2 Carbon Trade from the Perspective of Evolutionary Theory
2.1 Climate change and the Kyoto protocol
At the end of 1960s, some researchers began to notice an intensification of global warming. Teixeira et al. (2010) explained that the greenhouse effect is produced by a layer of gas existing in the atmosphere that prevent heat from dissipating to levels that make the planet cool down. Lombardi (2008) reports that according to observatory data from Mauna Loa NASA in 2007, there was an increase in more than 100 ppm of CO2 concentrations in the last 175 years, and an increase of approximately 0.7 C° in the planet's surface average temperature.

This global warming promotes the melting at the poles, which causes the flooding of coastal areas; biodiversity elimination of the planet; increased desertification areas; savannization of tropical forests; increase the frequency of droughts and floods; reduction in crop yields; damage to the health of populations as a result of heat waves; increased occurrence of hurricanes and cyclones; among other so extreme events and calamities that the people of this planet are likely to face.

In 1988 in Toronto, during the Conference on the Changing Atmosphere, it was created the International Panel on Climate Change (IPCC). In 1990 he was presented the first IPCC report, and the reports started showing historical events of the last decades, providing scientific information with higher quality and reliability. So it was created the UNFCCC (United Nation Framework Convention on Climate Change), which was approved during the ECO 92 and came into force in 1994 (UNFCC, 2012).

The Conference of the Parties (COP) met for the first time in early 1995, in Berlin. The COP meetings had as main objective to find solutions to the environmental problem of global warming. The conference had the greatest highlight was the COP-3, held in December 1997 in the city of Kyoto in Japan. At COP-3 was established the Kyoto Protocol, which set quantified commitments for industrialized countries to reduce or limit the combined anthropogenic emissions of GHGs (Protolo de Quioto, 2012).

The Kyoto Protocol has also created a system for controlling emissions of GHGs, and was fixed a target of 5.2% reduction of greenhouse gases by the year 2000. Developed countries, which already were in accordance with its obligations reductions, argued the need for financial mechanisms that may allowed the fulfillment of these goals. Three forms of cooperation were negotiated: a) the emissions trading; b) joint implementation, whose different parts of entities could implement activities together, sharing the reduction of emissions; and c) the Clean Development Mechanism - CDM (Lombardi, 2008).

The Clean Development Mechanism (CDM) aimed to achieve sustainable development in developing countries through the implementation of cleaner technologies (Delgado & Altheman, 2007; Teixeira et al., 2010). Paragraph 5 of Article 12 of the Kyoto Protocol lists the essential requirements for CDM projects result in obtaining documents as Certified Emission Reductions (Coelho et al., 2008;

Protolo de Quioto, 2012).

　　The CDM is a mechanism based on the development of projects that have to be responsible to private enterprise. CDM project activities must be related to the reduction in GHG emissions or at least influence the incidence of CO2 (Frondizi, 2009). Therefore, CDM projects may involve replacement of fossil energy by other renewable sources, energy use rationalization, afforestation and reforestation activities, more efficient urban services, among other possibilities.

　　The processing of a CDM project follows a similar logic to the Management System Certification, according to ISO model to ensure the credibility of the certification process of Carbon Credits. In addition, governments interested in implementing the CDM project, should designate by the UNFCCC (United Nations Framework Convention on Climate Change) an institution responsible for the evaluation and approval of CDM projects (Lombardi, 2008; Frondizi, 2009; Seiffert, 2009).

　　The CEMDL is the last and final instance for approval of a CDM project. At this stage it will be up to the Council officially accept or not the CDM project activity (Seiffert, 2009). The certificate issuance of CERs (Certified Emission Reductions) is the later stage to check that analyzes over a period of time, the project activity achieved the reduction of GHG emissions or removals of CO2. After these steps the Carbon Credits are issued. Seiffert (2009) reports that the CERs are carbon credits certificates from a CDM project registered with the UN (United Nations organizations). These issued certificates may be negotiated on the global market (Delgado & Altheman, 2007; Frondizi, 2009).

　　In April 2000 it was launched the Prototype Carbon Fund, which was a partnership between seventeen companies and six governments managed by the World Bank. The purpose of this fund was to bring together, on one hand the money of the participants and on the other CDM projects (Lombardi, 2008; Institute Carbon Brazil, 2012). Thus began an effective carbon market through a marketable commodity for GHG emission reductions.

　　The negotiations on the carbon market became more sophisticated over time and some financial systems began to operate in that segment like traders and as a CDM project financiers (Lombardi, 2008; Institute Carbon Brazil, 2012). Thus, it may be seen that while it came to reduce global GHG emissions, has increased profitability and investment in new forms of sustainable production (Nápravník Filho, 2006). This process is correlative to the Polluter Pays Principle (Pigou, 1932), because with the purchase of emission rights (allowances), the country that need help to meet their emissions targets will pay for it, so it can finance the implementation of mechanisms to generate new URE (Ministério da Ciência e Tecnologia, 2012; Alvim & Goularte, 2011).

　　The logic of this market is that the CO2 (carbon dioxide) operates globally and its impact on the environment is similar to all over the planet, so just seeks emissions to drop below the predetermined limit. Thus, for control purposes, no matter who is the company or the country that is polluting more or less. The important aspect of this system is that there is compensation in the generation of GHGs in the world.

　　After the evolution of this Carbon Market new interested actors have emerged, so there was a supply and demand increase. Of course this made prices arise. In February 2005, when the Kyoto Protocol begin running, the ton of carbon price was USD$ 5.00. Many projects holders indexed the prices of carbon credits according to the European market, where the permissions had a system known as Cap-and-Trade (Lombardi, 2008).

　　The Cap-and-Trade system had government regulators that indicate companies with GHG emission allowances, so they may reach a certain level of emissions. Permissions (allowances) can be acquired plants that may even reduce their emissions beyond the authorized level. Being a market mechanism, any interested party may acquire and / or transact permissions. Each facility could use up to 8% of total emissions (Lombardi, 2008).

　　Carbon market activities started on January 1st 2005 and already in 2008, 404 million tons of carbon were traded, for a total of US $ 6.5 billion (Word Bank, 2015). The evolution of the projects and negotiations have caused prices rose with greater speed and consistency (Robles Jr. & Bonelli, 2006). The existing carbon prices vary significantly—from less than US$1 per tCO2e to US$130 per tCO2e. It is worth highlighting that 85% of emissions are priced at less than $ 10 per tCO2, which is considerably lower than the price that economic models have estimated is needed to meet the 2 ° C climate stabilization goal recommended by scientists (World Bank, 2015). In 2015 in Tokyo the price per ton of CO2 was already USD $ 38.

　　Since the entry into force of the Kyoto Protocol, CDM projects had their lowest level in 2010, during which retreated to about $ 1.5 billion. In addition, the carbon market has brought uncertainty about its course after 2012, and this scenario is influenced by a series of crises and social, political and economic conflicts across the globe.

　　At COP-21, in France, the so-called Paris Agreement established as a celling a Global warming of 2 °

C. In addition, it was also indicated that US $ 100 billion per year should be used to help the poorest countries meet their reduction targets of GHGs. Nevertheless, it is necessary to deepen the discussion on the effectiveness of market or taxation by governments to adjust the emission GEES.

2.2 The evolutionary theory and the limits of market

The formal orthodox economic theory tries to explain the determination of equilibrium prices, inputs and products with regard to various conditions underlying the demand for goods and the supply of factors of production (Nelson & Dosi, 1994; Nelson & Winter, 2005). Moreover, it can be said that the law of scarcity and substantive rationality are part of the postulates of the orthodox argument, where the agents involved in the production and consumption process have their behaviors oriented to maximize individual well-being in an exclusive utilitarian perspective (Stark, Jakubek & Kobus, 2015; Kitchel, 2016).

However, we emphasize here that is quite questionable this market ability to allocate effectively the scare resources, because as points out Hodgson (2007), and is also exposed in the theory of Transaction Costs by Williamson (1971, 2000), the agents do not develop a rational choice able to control the resources in a context of scarcity. These authors, as well as Coase (1998), reinforce the idea that this positive relationship between increased social welfare and efficiency and effectiveness of the production process are only obtained on a real transaction zero cost.

Also in the same line of reasoning on transaction costs, these costs depend on the institutions involved; and it may be said that the institutions are not rational optimization mechanisms of allocative efficiency, which can only arise from the dynamic and continuous interactive process between the actors, and this process is relatively uncertain and inseparable from technological and social changes (Nelson, 1995; Conceição, 2007; Braunerhjelm & Svensson, 2014). Furthermore, there are micro and macro environmental factors that constantly change routines firms (Becker, 2004).

North (1993) stresses that the institutions are not necessarily designed to be socially efficient; moreover they often are created to serve the interests of those with bargaining power to create rules (Willianson, 1979; Willianson, 2000). Veblen (1989) pointed out that the evolution of institutions is directly associated with a circular causation process. Thus, it is worth mentioning that the evolutionary theorists oppose equilibrium assumptions, optimization and substantive rationality hence being necessary to strengthen the fact that the three supporting pillars of orthodox models of the firm are: i) maximizing objectives (profit or present value); ii) the set of things that the firm can do (routines); iii) the optimizer choice rationally based on the market.

Hence, the search for a balance in the market is more a paradoxical activity because the maximization of the firm's results may be adversely affected by the factors of production. Thus, when giving emphasis to rational market mechanisms, a simple relationship of transaction is based on the Pareto optimal vision (Prescott & Townsend, 1984; Fleischer, 2003), forgetting the reality in obtaining and allocation of resources by agents. That is, do not take into account the pragmatism of the real world, where resources are not available or the same amount or in same value for all.

Moreover, the evolutionary theory takes as the unit of analysis not the market, especially in the rational bias understood by the orthodox, but the forms and routines of organizations to understand better the functioning of organizations and society (Nelson & Winter, 2005; Hodgson, 2007). By the same way, processes are analyzed and diagnosed in order to understand the routines and organizational forms that have been institutionalized and recognized as benchmark.

2.3 Evolutionary theory to discuss market rationality

Market-based views actually encourage expansionists, extractive and exploitative activities that contribute to achieving the firm's goals and exceed their profit expectations (Chi, 2010; Teixeira, Koufteros & Peng, 2012). Meantime, the economic model based on "extract, transform, discard" depends on economies of scale, low-cost materials and easy access to goods and services by consumers. However this orthodox model of production and consumption is reaching its physical limits, leading for the need to search for new paradigms of production and consumption (Macarthur, 2012).

Ying and Li-Jun (2012) argue that the economy should be based on reducing, reusing and recycling inside the production and consumer cycle of activities, circulation and consumption of goods and services. Moreover this new paradigm in production and consumption should adopt regenerative and restorative aspects of resources. Therefore, the goal is to keep products, components and materials at its highest level of utility and value for a longer time (Zhu, Geng & Lai, 2010) as is the case of the Led Lamps. This model runs off the rational logic of the exploration market, and aims to mitigate market inefficiencies.

Pigou (1932) explored how the tax could help solve inefficiencies in the functioning of markets and the behavior of economic agents. Pigou said that the costs of the damage that an agent in carrying out an economic activity imposes on third parties should be internalized in the cause of the activity cost. In its

turn Coase (1960) argued that the solution to the problems of the damage caused by economic activities comes from the market itself, or property rights. Regan (1972) points out that the Coase argument may be valid and applicable in an ideal context in which rationality is the dominant logic and negotiation between the agents is an achievable goal, a win-win kind of economy which is not easily found.

These two ideas moreover gives an important question about the problem of social costs such as pollution and the environment protection, because it can't be solved simply by paying a fee or negotiating a simple economic equation of the type: "I pay, so I have the right to pollute ". In this scenario of how to deal with the damage caused by the decisions of production and consumption in the formulation and analysis of the polluter pays principle it should be established the need to internalize the social and not only the environmental costs of pollution. A document should be signed by the polluter regarding the social costs of pollution caused by it, which must prevent, compensate and mitigate the damage, not only to goods and people, but also to nature.

In this line of reallocating resources to mitigate the damage to the environment, some countries receive aid funds and subsidies that could theoretically solve problems arising from polluting processes as may be shown in Figure 1.
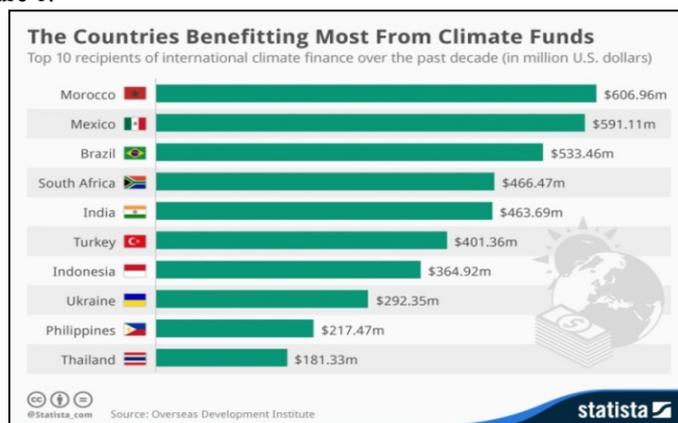
Figure 1   Countries Benefitting from Climate Funds
Source: International-Climate-Finance, 2016.

Therefore to protect natural resources, environmental economics proposes the evaluation of resources, the correction in prices and the accountability of environmental impacts. Therefore, its vision for sustainable development may be understood as the internalization of external costs helping countries to change their activities and processes that may harm the environment.

Moreover although the monetization of the problems is not the best solution, we may have to deal with the use of resources in a systematic and interdisciplinary way and not only by taxation (Pigou) or free trade certificates that allow polluting or using natural resources (Coase).

As it's shown in Table 1 a reduction in GHG emissions over time didn't happen in countries receiving such financial support, on the contrary, we may even see increases in emissions and inefficient public policies that could have help in the sustainability of the planet.

Table 1   Total of CO2 per Capita Emissions Coming from Fossil Fuels

Country	2011	2010	2009	2008	2005	2000
África do Sul	2,51	2,41	2,56	2,54	2,24	2,25
China	1,80	1,66	1,55	1,43	1,21	,73
Ucrânia	1,70	1,80	1,53	1,83	1,94	1,79
Tailândia	1,24	1,22	1,15	1,09	1,05	,81
Turquia	1,20	1,13	1,06	1,11	,95	,93
México	1,07	1,03	1,06	1,13	1,12	1,04
Indonésia	,63	,50	,52	,48	,41	,34
Brasil	,61	,59	,52	,55	,51	,51
Marrocos	,48	,48	,46	,47	,41	,32
Índia	,46	,44	,45	,42	,34	,31
Filipinas	,24	,24	,22	,23	,24	,26

Source: Fossil-Fuel CO2 Emissions by Nation, 2015.

Moreover we could also mention that in global terms, the total value of the carbon market grew 11% in 2011, reaching the figure of $ 176 billion, according to the report "State and Trends of the Carbon Market", published by the World Bank.
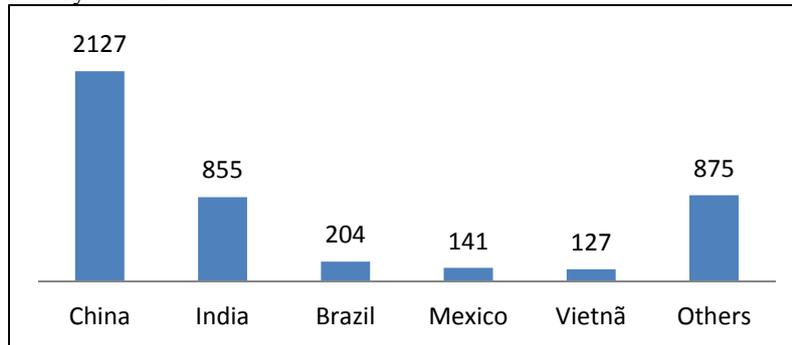
Figure 2   Number of MDL Projects Registered   by 2012
Source: UNFCCC, 2012.

On this Figure 2 we one could see the countries with the largest number of CDM projects registered by 2012. Therefore, it's necessary to question the capacity to regulate market GHG emissions. Moreover, if we compare the maps of Figure 2 one may see that there were no reductions in GHG emissions from 2005 to 2011, and even in countries like India that were benefited from the CDM projects the situation was even   worsened.
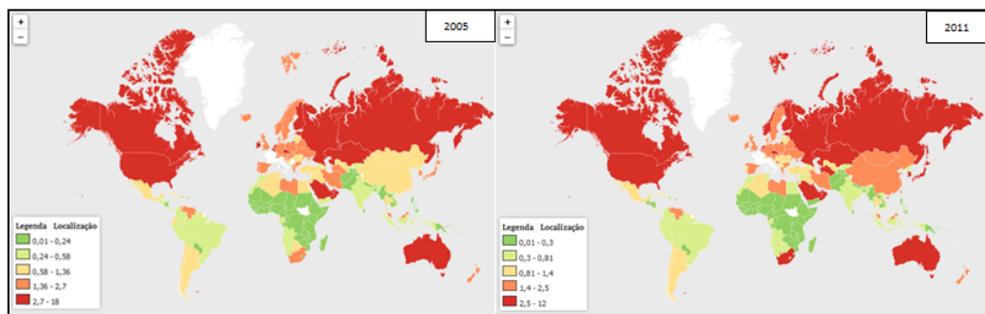
Figure 3   Changes in Total of CO2 per Capita Emissions Coming from Fossil Fuels
Source: Fossil-Fuel CO2 Emissions by Nation, 2015

Therefore a shift in perspective in discussions on the production and consumption processes is really needed; a change that moves away from orthodox economic models adopting concepts of the evolutionary theory to deal with the global problems of sustainability focusing in particular forms and organizational routines in search of a more sustainable planet and the welfare of the population.

3 Conclusions

To deal today with the question of global sustainability there is an increasing need to consider a new perspective in the treatment of production and consumption processes since the orthodox way so far being used is not given satisfactory results in solving the problem of emissions of GHGs; and there is now a need to consider the assumptions of evolutionary theory denying the rationality of the market to solve social and environmental problems.

To be realistic a solution based on Pigou or Coase's view it may work only when the situation presents itself as the Pareto optimal, which it's hardly a case since it will need that all agents have all the needed information and resources to make decisions with respect to production and consumption; and this is may be hardly find in this complex and dynamic early twenty-first century.   Therefore to assume as a fact a substantive rationality of agents in their relationships may lead to paradoxical realities for the sustainability of the planet in the middle and long run. For this reason there is a need to consider an approach of evolutionary theory to lead with the environmental and social problems involved in particular in relation to the sale of carbon emissions, which are actually sealing our health and the health of our planet.

As a matter of fact, as we could see, many of the countries that benefited from subsidies or CDM negotiations did not solve the GHG emission problem, and even some had their situation worsened; so a pure market logic won´t solve social and environmental problems. Hence one may see a need to study forward two main issues of Evolutionary Theory, namely: a) Could a pure market approach solve the resource allocation issues?   b) Are actually the organizational structures that determine the allocation of resources?

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How to Extract the Primary Factors for the Local Economic Development Through the Education Systems Re-Design by Text Mining

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Abstract: This paper describes the Japanese education system improvement for the local development. We make an analysis on what kind of function to offer as a local educational institution to the social big changes. We, the Japanese are facing on the birthrate decline, the growing proportion of the elderly, the population decrease, the popularization of higher education, and the population concentrated in the large city. We focus on the role of the professional high school in this paper. As a result, the role of the professional high school should achieve as the mechanism to maintain the local society are analyzed from the result of the self-evaluation system. Then, we make an interview to the adiministraitive staff of the school for extracting their intention by text mining. This time, we stressed on their motivation. From the result of analysis, Training is an important issue for their motivation. Based on the findings, we will make further research on not only the local government policy study on the population decline measures, but the analysis of the needs consistent with the local industry as our future work. This is the progress report on this kind of the complex social issue.
Key words: Education; High school; Local economics; Local development; Educational system re-design; Knowledge extraction; Morohpograhpy analysis; Text mining

1 Introduction

This paper handles the Japanese education system improvement for the local development. Under the current environment of the Japanese educational system, a significant improvement of the university enrollment rate can be noted. On the other hand, those who get a job after the high school graduation, they try to get better working opportunity. This makes the graduate students rush into the large city, outside of their home town.

One of the school for the age from 16 years old, the industrial high school in the Japanese educational system is prepared. This educational institution is aiming to foster the human resources who are active in the manufacturing fields. The educational systems for the school continues the revision such as the training of future specialists and the local industry leader. With the improvement of the university enrollment rate, not only the technical high school enrollment number is decline, but the regular course enrollment is increased. For example, one-thirds of the industrial high school graduates go on to the university and among the rest of them, only the one-thirds stay and work at their home town. Therefore, the educational positioning of the professional high school has changed from the training of the local industry leaders. This is one of the complex problem not only the re-definition of the educational agenda for the technical high school, but include the challenge on the human resource development and the workplace secure. Furthermore, this issue is in common for the local community except of the large cities.

In this paper, the re-designing policy of the education system is considered, in order to explore the ideal education system for the minimum local human function maintenance under the declining population. At first, the educational environment is overlooked from the government statistics. Then, the provision from the school and the requirement from the parents and students about the education is examined. Finally, knowledge extraction is examined using text mining to capture the teachers' motivation to make one of the important elements in the education system design. From this outcome, the management point of the education side for the education system re-design is considered.

The rest of the paper is organized as follows: Section 2 discusses the backgrounds of the research, Section 3 describes related work; Section 4 briefly describes the analytics of the data and presents analytical results; and Section 5 gives some concluding remarks and future work.

2 Back Grounds

In this chapter, in order to reconsider the educational institutions role, the current high school

condition is described from the Japanese stastical social environment. The overview of the high school enrollment is described. Table 1 shows the trends of the 15 years old population from 2010 to 2020. The 15 years old population will decrease the population of 103,000 in 2020 compared to the year of 2010. Next, the high school enrollment status is described. Table 1 shows the enrollment condition in 2014 and 2015[1]. In 2015, about 77 percent of the students are going on to the senior school, such as the university and the specialized training college. On the other hand, only 18 percent of the high school graduates get their jobs. This number includes the non-full time employment.

Then, the Japanese population density is described. Table 4 indicates the population concentration around the Tokyo metropolitan. From the result of the Census, the aging, the population decrease and the concentration of population are occurred simultaneously in the large cities. Next, the working condition is described. Table 5 shows the employment condition outside of the living prefecture in 2014 and 2015. Table 6. shows the work place destination dominance. Table 7 indicates the age group transition by 3 categories such as under 14, age from 15 to 64, and over 65. Basically, work force is regarded as from the age of 15 to 64, it can be seen that the large cities act as the destination of employment. From those tables, Tokyo metolopolitan has accounted for one-third of the outside prefecture employment.
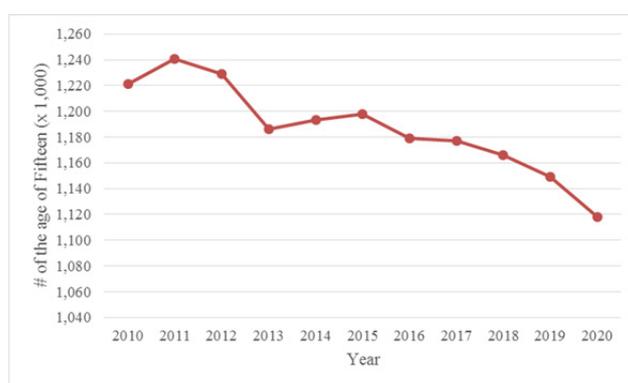
Figure 1   Time Series Trends of the Fifteens

Table 1   Course of the High School Graduates

Year	Upper schools	Work
2014.3	76.3%	17.5%
2015.3	76.4%	17.8%

Table 2   Itemized Course of the High School Graduates in 2015

Year	University	Specialized Training College
2014.3	53.8%	22.5%
2015.3	54.5%	21.9%

Table 3   Total Number of the Graduates Entered the Upper School by High School Course in 2015

Course	Total (a)	University (b)	(b)/(a) %
General	495,329	454,580	91.8%
Agricultural	3,642	2,382	65.4%
Industrial	11,884	10,482	88.2%
Commerce	17,377	12,877	74.1%
Others	51,706	38,811	75.1%
Total	579,938	519,132	89.5%

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[1]   Statistics Bureau (2015) Japan Statistical Yearbook 2015,
available at http://www.stat.go.jp/english/data/nenkan/index.htm (Accessed on September 1st, 2016)
Ministry of Education, Culture, Sports, Science and Technology (MEXT) (2015). School Basic Survey, available at http://www.mext.go.jp/b_menu/toukei/chousa01/(Accessed on September 1st, 2016)

Table 4   Population, Population Density, and Population Increase in 2010

Rank	Prefecture	Population x1000	Increase 2005-2010	Density (/km2)
1	Tokyo	13,159	4.6%	6015.7
2	Kanagawa	9,048	2.9%	3745.4
3	Chiba	6,216	2.6%	1205.5
	Japan	128,057	0.2%	343.4

Table 5   Outside the Prefecture Employment Ratio

Year	Number	%
2014.03	32,949	17.9
2015.03	34,916	18.4

Table 6   Top 5 Employment by Prefectures in 2015

	2015.03	%
Tokyo	10,949	31.4%
Aichi	3,878	11.1%
Osaka	3,241	9.3%
Kanagawa	2,297	6.6%
Fukuoka	1,932	5.5%

Table 7   Time Series Trends of 3 Population Groups by Prefecture

	2000			2005			2010		
	0--14	15--64	65--	0--14	15--64	65--	0--14	15--64	65--
Japan	14.6%	67.9%	17.3%	13.7%	65.8%	20.1%	13.1%	63.3%	22.8%
Saitama	14.8%	72.2%	12.8%	14.0%	69.4%	16.4%	13.3%	66.0%	20.4%
Chiba	14.2%	71.5%	14.1%	13.5%	68.6%	17.5%	12.9%	64.5%	21.2%
Tokyo	11.8%	72.0%	15.8%	11.3%	69.1%	18.3%	11.2%	67.3%	20.1%
Kanagawa	13.9%	72.1%	13.8%	13.5%	69.2%	16.8%	13.1%	66.2%	20.1%

3 Related Work

Then, the school evaluation is described. The school evaluation is carried out with the self-assessment method by the Ministry of Education, Japan. The questionnaire to the parents or guardian, to the student and the opinion hearing from the teaching staff are main evaluation method [1]. The fundamental competencies for working persons is the indicator proposed as the fundamental competencies work with a variety of people at working place and in the local community. This is prepared by the Ministry of Economy, Trade and Industry. The concept of the indicator is composed the three forces such as step forward, think through, and work with the team and include the lower 12 capacity elements. The national technical high school principal association conducted a survey in the fundamental competencies for working persons. It was evaluated by the questionnaire in the achievement of this indicator to their students from the view point of the school management. From the results, it was revealed that the force of think through is more required (2013). Mitsumaru et al. conducted the feature analysis on the school evaluation (Mitsumaru, H. et al. 2014; Mitsumaru, H. et al. 2014). A gap among the beneficiary and the provider was found in the educational function. The specific request function was found to be the development of the future local industry leaders. As a result, the efforts to eliminate the divergence increase the training time of subjects close to the local industry. Thus, in the educational fields, the flexible operation of curriculum fits to the social needs based on the evaluation is performed. In addition, the demand from the industry must be taken into consideration. As for the needs consistent with the local industry, in relation to aging, population decline, and urban concentration, it is necessary to re-design the educational system.

The environment for the Japanese high school is described. It is necessary to understand the requirement as the educational institution with the change such as the population concentration, the aging, the declining birthrate, and the educational popularization. The complex issue is found including not only the issue of the educational goals re-definition for the specialized high school, but the regional

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[1] MEXT (2011). School Evaluation Survey, available at http://www.mext.go.jp/a_menu/shotou/gakko-hyoka/ 1329301.htm (Accessed on September 1st, 2016)

industrial policy such as the working opportunity secure, the work force promotion for the future local industry leaders.

Then, the application of text mining is explored. Takeichi et al., analyzed the relationship between each the self-evaluation and final grade intended for all students who took a class one in the university using text mining. From the result reviled the students were classified into 9 clusters by their score performance [1]. Masuda analyzed the local city council of the conference proceedings, to visualize the primary issues in the city assembly (Masuda, T., 2012). Yukihira is also analyzed a free answer in the questionnaire survey from the fisheries high school students, and captured the word impression of fishermen. As a result, as the grade of the fisheries high school goes up, it was found that the image of against fishermen has been complicated (Yukihira, M.,2011). Sakuyama was analyzed the interview contents to the social worker using text mining. From the result of the study, the focus of social work was made by the people, the environment, and the relationship (Sakuyama, F., 2012).

From the result of the related work, since text mining is one of the method to extract knowledge to the target. Knowledge extraction is examined using text mining to capture the teachers' motivation to make one of the important elements in the education system design. From this outcome, the management point of the education side for the education system re-design is considered.

4 Morphographycal Analysis

We made an intensive interviewing survey to the high school teachers in Fukuoka, Japan. Table 8 indicates the outline of the interview. As for the interviewing contents to the teachers, we tried to bring out the words or experiences made your educatio motivation raised. Next, describing the procedure for the analysis.

First, the interviewing document was made from the interview, then morphological analysis was made.

Semantic analysis was also made by creating word frequency and co-occurrence graph, respectively. Morphological analysis was uses a Groovy[2]. Figure 1 indicates program source. From the result of analysis, the 16,220 words in total were generated and among them, the 5,333 words were used for the analysis. Nouns, Adjective, and Conjugation of the verb "suru" were used in this analysis. As for the term "suru" in Japanese means "Do" in English.

From the result of term frequency analysis, they were frequently used the word such as "Students" or "Teacher". Furthermore, "Research" and "Training" were one of the characteristic words. This was because they thought the training and the research prepared for the teacher as one of the important activities, they consider to rise teachers' motivation through the evaluation of the research and the training. Furthermore, From the words of "Innovation", "New", "Risk", and "Responsibility", they were exploring not only the something new, but considering the risk and the responsibility at the same time.

Then, from the analytical result of term frequency, the co-coorance graph was made. Figure 2 indicates the co-coorance graph. From the analytical result of the co-coorance graph, the effort content to increase the teachers' motivation were analyzed as follows; 1) Senior teacher is involved to the teacher's effort as the coordinator, 2) Share the information each other, 3) Achieve the goals of the department supported by the senior teacher, 4) Promote new initiatives, 5) Perform the training of teachers step by step.

Table 8   Survey Outline

Survey Term	April, 2015-May, 2015
Survey Method	Interviewing
Respondent	6 Administrative staff

From the result of analysis of the term frequency and the co-coorance network graph based on the target domain heuristic knowledge, the school administrative staff were considered to be an important of the training. Furthermore, motivation of teacher and the will of teaching are increased with the training results evaluation. The administrative staff are seeking something new effort to break the current status

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[1] Takeichi, S. et al. (2011): Analysis of Questionnaire about Self-Evaluate Achievement using Data Mining Technique for Improving Lectures, Journal of JSEE, Vol.59, No.4, pp.9-14, available at http://doi.org/10.4307/jsee.59.4_9 (Accessed on September 1st, 2016)

[2] Groovy: https://github.com/atilika/kuromoji (Accessed on September 1st, 2016)

while considering the risks and liability issues. Then, the educational systems re-design method is considered. As Mistumaru et al. work was indicated a potentiality for the feasibility for starting new effort, concurrent evaluation method of the new effort is one of the promising method to start.

Table 9   Word Frequency

名詞/ Noun			サ変名詞/ "sa"-line irregular noun			形容詞/ Adjective		
自分	Myself	72	仕事	Work	32	良い	Good	23
先生	Teacher	55	話	Talk	32	若い	Young	17
生徒	Student	45	授業	Class	29	新しい	New	10
学校	School	30	評価	Evaluation	21	面白い	Fascinating	7
教員	Teacher	27	一緒	together	20	厳しい	Strict	6
リスク	Risk	19	研究	Study	15	悪い	Bad	5
最初	First	18	指導	Guidance	15	楽しい	Fun	4
一つ	One	13	研修	Training	10	強い	Strong	4
イノベーション	Innovation	12	共有	Sharing	9	広い	Wide	4
人間	Man	12	教育	Education	9	高い	High	4
責任	Responsibility	12	改善	Improvement	8	難しい	Difficult	4

```
// Morphological Analysis extract module update
@Grapes([
   @Grab(group='com.atilika.kuromoji', module='kuromoji-ipadic',
version='0.9.0')
])

import com.atilika.kuromoji.ipadic.Token
import com.atilika.kuromoji.ipadic.Tokenizer

//logic module ver.2
Tokenizer tokenizer = new Tokenizer()
List<Token>tokens = tokenizer.tokenize("私は車で帰社した")
tokens.each  {Token token ->
   println "Surface: ${token.surface}"
   println "All Features: ${token.allFeatures}"
   println "allFeaturesArray: ${token.allFeaturesArray}"
   println "Position: ${token.position}"
   println "Part of speech level 1: ${token.partOfSpeechLevel1}"
   println "Part of speech level 2: ${token.partOfSpeechLevel2}"
   println "Part of speech level 3: ${token.partOfSpeechLevel3}"
   println "Part of speech level 4: ${token.partOfSpeechLevel4}"
   println "ConjugationType: ${token.conjugationType}"
   println "ConjugationForm: ${token.conjugationForm}"
   println "BaseForm: ${token.baseForm}" // 動詞の場合その動詞の原型
   println "Reading: ${token.reading}"
   println "Pronunciation: ${token.pronunciation}" // 日本語発音. 基本的
    に Reading の同値. 私は"の"は"の値がここでは"ワ"にする.
   println "Is there in dictionary?: ${token.known}"
   println "declared by user?: ${token.user}"
   println "*"*30
}
```

Figure 2   Morphological Analysis Program Source
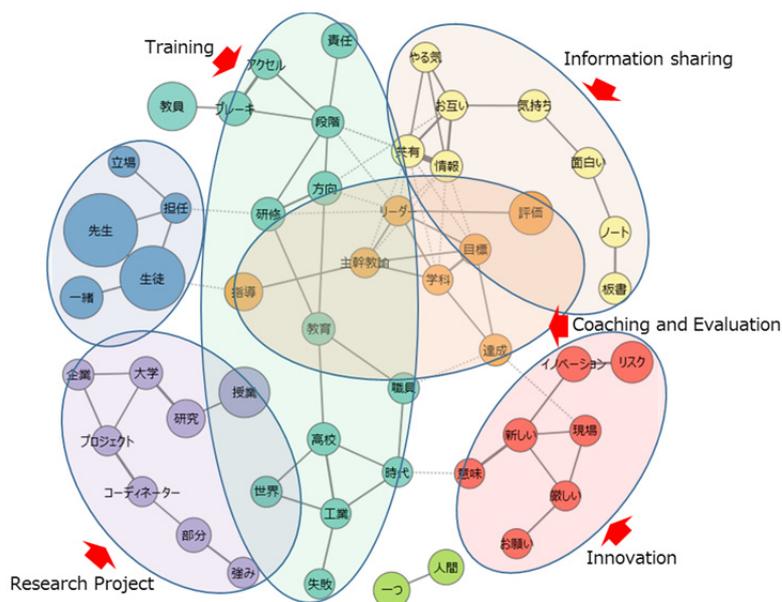
Figure 3　Co-Occurrence Graph

5 Concluding Remarks

This paper handles the analytics on the high school environment based on the Japanese social circumstances. The sufficient functions as the educational institution were analyzed to the major changes such as the aging, the declining birthrate, the educational popularization, population concentration. The professional high school role as a mechanism to maintain the local industry was analyzed. In particular, the attention was paid to the technical high schools as a source of providing the labor force in the manufacturing and the construction. As a result, the flexible operation of the educational curriculum related to the local industry was made from the analytical results. This flexible operation was based on the educational evaluation performed by the school.

Our future work includes; investigating the local government policies for the human resources and the needs analytics from the local industry, local needs survey for the educational system re-design with text mining, execute a trial study for the new lecture fit for the local.

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Impact of Perceived Organizational Support on Organizational Citizenship Behavior Towards Environment: The Mediating Role of Affective Commitment in the Context of Sri Lanka and Pakistan

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Abstract: Corporate Greening and Organizational Behavior (OB) fields of studies pay an increasing attention on voluntary green behavior of employees, which is referred to as Organizational Citizenship Behavior towards Environment (OCBE). The objective of this paper is to identify antecedents of OCBE among university academics in South Asian developing country context. In the light of Social Exchange Theory (SET), researchers conceptualized that Perceived Organizational Support (POS) and Affective Commitment (AC) in a chain of relationship determine OCBE. Researchers employed an online questionnaire among university academics in Pakistan and Sri Lanka and received 136 effective responses. The results indicates a direct impact of POS on OCBE and a mediation effect of AC between the relationship of POS and OCBE. Investigation of the POS, AC and OCBE chain of relationship in South Asian context by the application of theoretical rigor of SET makes this study unique in corporate greening and OB literature. Further, this study sheds new lights to practitioners in order to develop appropriate conditions in encouraging OCBEs at work.
Key words: Organizational Citizenship Behavior towards Environment; Affective Commitment; Perceived Organizational Support; Social Exchange Theory

1 Introduction

In order to succeed in corporate greening "organizational actions need to go beyond technical fixes and embrace new environmentally responsible values, beliefs and behaviors" (Harris & Crane, 2002, p.215). Since Employee Green Behaviors (EGBs) are decisive for effective corporate greening, EGBs receive a greater attention by practitioners as well as scholars. Organizations mandate required EGBs by prescribing in job descriptions and/or communicating explicitly to employees. Interestingly, in practice, required EGBs comprise only a limited scope of green behaviors (Ones & Dilchert, 2012) and are not sufficient to effective and efficient achievement of organizational environmental performance (Boiral, 2009; Daily, Bishop & Govindarajulu, 2008; Ramus & Killmer, 2007) Thus, the necessity of voluntary EGBs cannot be undermined for any organization in achieving environmental performance. These voluntary behaviors of employees towards the environment are recognized as a form of Organizational Citizenship Behavior (OCB) and coined as Organizational Citizenship Behavior toward the Environment (OCBE) (Boiral, 2009; Daily et al., 2008; Lamm, Tosti-Kharas & Williams, 2013) OCBE, the newest addition to OCB literature, refers to "discretionary acts by employees within the organization not rewarded or required that are directed toward environmental improvement"(Daily et al., 2008, p.246). Thus, OCBE is individual, informal, discretionary behaviors that are not directly and explicitly recognized by the formal reward system of the organization and contribute to corporate greening (Boiral, 2009; Daily et al., 2008; Ramus & Killmer, 2007; Lamm et al., 2013).

OCBE is growing as a sub field of OCB and the most of the existing empirical studies on OCBE were conducted in European and American contexts (Lamm et al., 2013; Boiral, Talbot & Paillé, 2015; Ramus, 2002; Ramus & Steger, 2000; Temminck, Mearns, & Fruhen, 2015). Consequently, still, though the attention on greening is growing in developing South Asia, the reality of the concept of OCBE in the region is at dark. Contrasting economic, social, and cultural characteristics between developed world and developing South Asia suggest a conceptual query as to whether the existing knowledge can reveal the reality of OCBE in developing South Asian context? Therefore, the aim of this paper is to uncover the antecedents of OCBE in Pakistan and Sri Lanka, two developing South Asian nations. This study is unique and innovative since it uncovers the reality of OCBE in South Asian context by fulfilling the dearth of knowledge of the phenomenon in developing country contexts with the theoretical rigor of

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Social Exchange Theory (SET). Thereby, this paper expands the OCBE stock of knowledge beyond its present contextual boundaries. Further, it provides insights for practitioners to promote voluntary employee behaviors which help environmental sustainability of the organizations.

The rest of the paper is organized as follows. First, it examines the literature related to OCBE, antecedents of OCBE and derives hypothesis based on Social Exchange Theory. Thereafter, the methodology is described. Then, researchers provide results and discussion. Finally, conclusion and future research prospects are provided.

2 Theoretical Background and Hypotheses

2.1 Organizational citizenship behavior towards environment

Voluntary individual environmental behaviors at work place that are not prescribed by job requirements or explicitly recognized by the organization can be considered as OCBEs (Daily et al., 2008). OCBEs, in aggregate, through the combined efforts of individual employees, help to make the organization more sustainable (Lamm et al., 2013). Based on core construct of OCB, Boiral and Paillé (2012) introduced OCBE as a three dimensional construct including eco-initiatives, eco-civic engagement, and eco-helping. Eco-initiatives are employee-driven environmental actions in the workplace, such as recycling, saving water, saving energy, and other voluntary initiatives that benefit the environment. Eco-civic engagement involves actions such as participation in environmental events organized by the company. Eco-helping involves employees taking the initiative to help colleagues work to become more environmentally friendly.

2.2 Social exchange theory

SET is one of the key social theories that explain human exchange relationship at work. The core argument of the SET, the norm of reciprocity, suggests that an inner obligation to repay towards another party arises within a person since he or she is taken cared by that particular party (Saks, 2006) This suggests that, at organizational set up, employees' readiness to pay back to the organization to achieve its goals increases as a result of the organization's support towards them. Employee discretionary actions and extra role behaviors are relevant to social exchange and SET provides a strong rationale, specifically, in explaining employee engagement in discretionary voluntary behaviors (Saks, 2006). Consequently, SET is used to describe the motivational basis for employee behaviors that are neither formally rewarded nor contractually enforceable (Settoon, Bennett, & Liden, 1996). Owing to its discretionary nature and non-recognition in the formal reward system, OCBE clearly relates to social exchange. Hence, drawing from all the above evidences SET is used as the theoretical ground to understand the factors affecting OCBE of employees.

2.3 Perceived organizational support, affective commitment and OCBE

Perceived Organizational Support (POS) is the employee's global beliefs concerning the extent to which the organization values his or her contributions and cares about his or her well-being (Eisenberger, Huntington, Hutchison, & Sowa, 1986). POS reflects two focal areas of perceptions. The first is the perceived value given to the one's contribution. The second is the perceived caring about one's well–being by the organization. Reciprocal norm of SET proposes that employees with higher levels of POS are likely to be more committed and possibly more willing to engage in organizational citizenship behaviors than the employees who feel that the organization does not value them as highly (Lamastro, 1999; Organ, 1988). Since OCBE is a kind of OCB, it is argued that once employees perceive that they are supported by the organization they reciprocate it by getting engage in OCBE which in turn help the organization. At the same time, recent empirical evidences support that POS has a direct link to OCBE (Lamm et al., 2013; Boiral et al., 2015; Ramus, 2002; Ramus & Steger, 2000; Temminck et al., 2015). Based on the above, researchers develop the following hypothesis.

Hypothesis 01: Perceived Organizational Support positively impacts on OCBE.

Affective Commitment (AC), one of the dimensions of the core construct of organizational commitment, refers to "the employee's emotional attachment to, identification with, and involvement in the organization" (Meyer & Allen, 1991, p.67) SET proposes that employees who perceive a high level of organizational support are more likely to feel an obligation to repay the organization in terms of affective commitment (Eisenberger et al., 1986). Empirical studies also provide evidences of influence of POS on favorable attitudinal outcome of AC (Rhoades & Eisenberger, 2002). Further, organizational behavior literature has widely acknowledged that AC relates to OCB (Podsakoff, MacKenzie, Paine & Bachrach, 2000). Since OCBE is based on the core construct of OCB and AC influences OCB, AC is more likely to influence OCBE. Further, empirical findings in European context also have shown the

impact of AC on OCBE (Lamm et al., 2013). Moreover, empirical studies on OCBE in Western context suggest that POS leads to the attitude of affective commitment and then affect the pro environmental voluntary behavior at work (Lamm et al., 2013; Temminck et al., 2015) . Therefore, apart from the direct effect of POS on OCBE, there supposed to be an indirect relationship of POS through AC on OCBE. Thus, researchers posit:

Hypothesis 02: Affective Commitment mediates the relationship between Perceived Organizational Commitment to Environment and Organizational Citizenship Behavior towards Environment.

The above derived network of relationship between POS, AC and OCBE based on SET is illustrated in the figure 1.
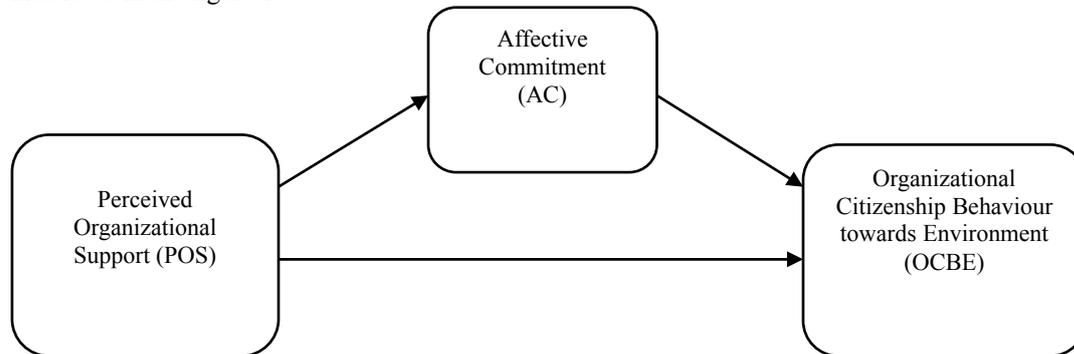
Figure 1   The Conceptual Model

3 Research Design
3.1 Participants
Researchers used online survey strategy supported by a self- administrative questionnaire. An online survey form was created by using Google forms and the permanent academic staff members of universities in Pakistan and Sri Lanka were invited to respond. Researchers collected data during the first quarter of 2016. The questionnaire consisted of two parts. The first part of the questionnaire provided the purpose of the study, contact details of researchers, assurance on confidentiality of the data and the demographic variables. The second part of the questionnaire included measures of key variables (OCBE, POS, and AC). Convenience sampling method was used and the URL of the online questionnaire was emailed to respondents. Researchers received total of 136 effective responses yielding an overall response rate of 41.46% from Academics representing 72 and 64 respectively from Pakistan and Sri Lanka.

3.2 Measures
OCBE was measured by using the 10 item OCBE scale developed by Boiral and Paille (2012) POS was measured by using four high-loading items from the POS scale developed by Eisenberger et al. (1986). Three-item scale developed by Bentein, Stinglhamber, and Vandenberghe (2002) was used to measure AC. Respondents were asked to indicate the extent to which they agree or disagree with the statements in a seven point Likert scale, where 1 denotes 'Strongly Disagree' and 7 denotes to 'Strongly Agree'.

3.3 Data analysis methods
In order to test the set hypotheses the three-step procedure posited by Baron and Kenny (1986) was employed. Additionally, the mediation effect was examined by conducting bootstrapping analysis in SPSS by using the PROCESS macro developed by Preacher and Hayes (2008). This approach does not assume the normality of sampling distribution. Accordingly, 1,000 bootstrap samples with 95 percent confidence intervals were used.

4 Results and Discussion
4.1 Factor analysis
Researchers used KMO and Bartlett's test to measure the external validity of the study. The actual value of KMO was 0.613. It exceeds the threshold limit of .5. Hence, sample adequacy of the study is acceptable. Confirmatory factor analysis, using AMOS 23, shows that all the factor loading estimates were above .5 indicating the convergent validity of the measurements. Further, the model was evaluated with absolute fit indices of Root Mean Square Error of Approximation (RMSEA) and Goodness-of-fit statistic ($\chi 2/df$). As a threshold level, RMSEA below .08 and $\chi 2/df$ less than 2 indicate an acceptable fit

(Hu & Bentler, 1999). RMSEA of the model was .078 and χ^2/df was 1.96. Comparative Fit Index (CFI), Normed Fit Index (NFI) and Tucker Lewis Index (TLI) approaching or greater than 0.9 reveal a good fit (Hu & Bentler, 1999). The present model reported .913 of CFI, .907 of NFI, and .887 of TLI indicating an acceptable fit. Hence, the results of CFA revealed the validity of the factor structure.

4.2 Descriptive statistics, correlations and reliabilities

Table 1 presents the means, standard deviations, and correlations. The results showed that POS correlates with AC ($r = .559$, $p < 0.01$) and OCBE ($r = .293$, $p < 0.01$). In addition, AC is related to OCBE ($r = .415$, $p < 0.01$). All scale reliabilities were highly acceptable with Cronbach's alpha values exceeding the accepted threshold value of .70 (Kline, 1999) (POS: $\alpha = .933$; AC: $\alpha = .843$; OCBE: $\alpha = .928$).

<div align="center">Table 1   Descriptive Statistics and Correlations.</div>

		Mean	SD	1	2	3
1.	POS	4.85	1.28	(.933)[a]		
2.	AC	5.12	1.23	.559**	(.843)[a]	
3.	OCBE	4.68	1.19	.293**	.415**	(.928)[a]

Notes: ** $p < 0.01$ one tailed. [a]Reliabilities are shown in diagonal.

4.3 Test of hypotheses

The results of simple regression analysis reported a positive impact of POS on OCBE ($= .280$, $p < 0.01$). Therefore, the *H1* was supported. This shows that the higher the POS the higher the OCBE. Similarly, POS also positively impacts on AC ($= .559$, $p < 0.01$) and AC positively impacts on OCBE ($= .403$, $p < 0.01$). *H2* suggested that AC mediates the relationship between POS and OCBE. The standardized regression coefficient between POS and AC was statistically significant, as was the standardized regression coefficient between AC and OCBE ($= .354$, $p < 0.01$). The results demonstrated that when AC was added in the equation, the relationship between POS and OCBE was insignificant ($= .083$, $p = 0.389$). Further, the bootstrap analysis corroborated the mediating role of AC since the bias corrected confidence interval of specific indirect effect does not contain zero (from .0881 to .3349). Thus, the indirect effect was statistically proven and it indicates that AC serves as a full mediator between POS and OCBE. This result supported the second hypothesis that AC mediates the relationship between POS and OCBE. These results are shown in the figure 2 below.
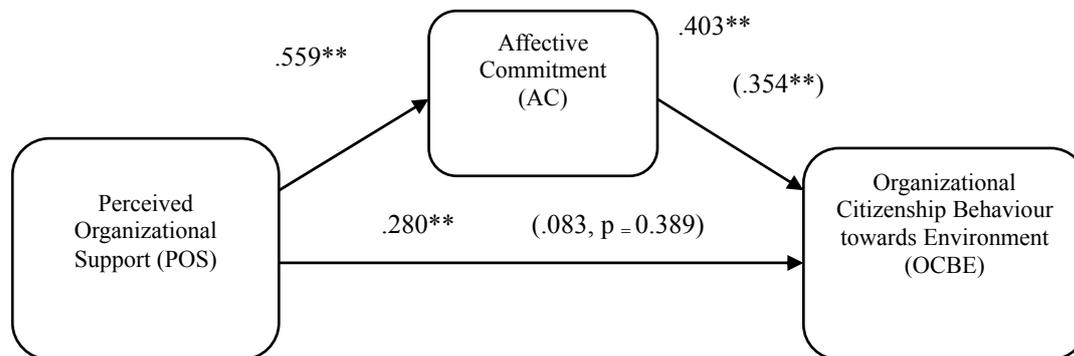
<div align="center">Figure 2   The Tested Model</div>
<div align="center">Notes:** $p < 0.01$, Coefficients in the parentheses represent indirect effect of multiple regression.</div>

4.4 Discussion

Researchers set out to uncover the determinants of OCBE among university academics in Sri Lanka and Pakistan. Informed by SET, POS was expected to predict OCBE and it was also expected that affective commitment mediates the relationship between POS and OCBE. It was found that POS impacts on OCBE and affective commitment fully mediates the POS and OCBE relationship. Accordingly, the present findings are in line with previous empirical findings by Lamm et al. (2013) and Paillé, Boiral, and Chen (2013) that POS impacts positively on voluntary green behaviors of employees. Further, consistent with the findings by Lamm et al. (2013) and Temminck et al. (2015), AC plays a full mediating role in explaining the association between POS and OCBE. The reciprocity principle of SET

provides the rationale for the above relationship between POS, AC and OCBE. When POS is experienced by respondents, they reciprocate it through the attitude of AC. In the next phase, positive attitude of AC influences the voluntary behavior of OCBE. Thus, it can be asserted that perceived organizational support is a significant variable in determining OCBE of Academics and higher POS by academics will result in higher affective commitment towards the organization and, in turn, will demonstrate elevated level of OCBE.

In general, the findings signify the role of organizational support and AC in bringing voluntary pro-environmental behaviors at workplace. Findings indicate that employees are more likely to display OCBE (Eco initiations, engagement in and helping others to engage in pro-environmental behaviors at work) when they interpret that they are being supported by the organization. Accordingly, POS-AC-OCBE relationship suggest that, in the endeavor of promoting OCBE, managers need to create an environment that employees feel that their efforts are noticed and valued while their wellbeing is looked after.

The fact that data were collected from two South Asian contexts, Pakistan and Sri Lanka, makes the study unique in terms of contextual application of the study findings. However, this study is not without some limitations common to field research. First, the cross sectional nature of the study limits the ability to establish causality among the studied variables. Second, data were collected by using self-reports from a single source and, therefore, respondents may have inflated the responses. Third, the respondents represented only one profession in a single industry. Therefore, broader generalization of the study findings is difficult to reach. However, despite concerns of the nature of data and broader generalization, this study facilitates further investigations in this developing research area.

5 Conclusions and Future Research Prospects

In the emerging research area of employee green behaviors, this study attempted to find out the determinants of OCBE based on SET. The results suggest that POS is a predictor of OCBE and AC plays a crucial mediating role in promoting OCBE when POS present. POS appears to create affective commitment, which, in turn, is associated with increases in OCBE. Thus, the role of AC and POS can be identified as vital factors in predicting OCBE of Academics in two developing South Asian nations of Pakistan and Sri Lanka.

Findings of this investigation set the stage for uncovering further psychological, organizational factors that determine OCBE in South Asian context. Future researchers are encouraged to pursue a longitudinal and multi sector study with multiple sources of data. Additionally, discretionary behaviors at work place are complex. Thus, model with only two variables will not serve the purpose of properly understanding the phenomena those results in OCBE. Hence, the existing model needs to be strengthened by testing other possible variables at multiple levels (individual, group and organizational) for a better understanding of the network of associations leading to OCBE.

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Research on the Stability of Cultural and Creative Industries Ecological Environment

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Abstract: With the continuous expansion of the China's economy scale, the resource depletion, environmental pollution and other issues that rose have increasingly become the bottleneck restricting the development of industry. In recent years, the research on the ecological economy by metaphor research method has become a hot topic. In the research of industrial ecological economics, the stability of the ecological environment is a key factor to the self-perfection, self-repair and self-development of the industrial ecosystem system. Therefore, the research on the influence factors of the stability of the cultural creative industries ecological environment has great theoretical and practical significance. By using the empirical methods to investigate the relationship among complexity, diversity and stability of cultural and creative industries ecological environment; constructing the relation model among complexity, diversity and stability of cultural and creative industries ecological environment. The results showed that the complexity of cultural and creative industries ecological environment had limited effect on the stability of cultural and creative industries ecological environment, the diversity of cultural and creative industries ecological environment had the key effect on the stability of cultural and creative industries ecological environment.

Key words: Cultural and creative industries; Ecological environment complexity; Ecological environment diversity; Ecological environment stability; Empirical research

1 Introduction

The meaning of stability has different interpretations in many subjects. From the more common understanding in the control subjects for the definition of the stability of the stability is response to outside interference, if small interference has a little influence on the movement, is undisturbed movement can be considered to be stable; if the interference on the motion of the impact is large, then the undisturbed motion is considered to be unstable (Anja-Katrin Fleig, 2000).

The resistance of cultural and creative industries ecological environment is mainly to ecological environment of cultural and creative industries in resisting external complexity of interfering factors, making the industry environment is in a state of ecological balance, to maintain the structure and function of a kind of comprehensive ability. The restoration of the ecological environment of the cultural and creative industries refers to a comprehensive ability to restore the ecological environment of the cultural and creative industries to the original ecological balance after the destruction of the external disturbance factors. Obviously, the cultural and creative industries, the stronger the resistance of the ecological environment, the better the ecological balance, the recovery of the same situation in this case. Cultural and creative industries is a complicated and diversified system, the ecological environment is an open, stable, inclusive, dynamic. Therefore, only in the resistance and resilience seek some balance to ensure the stability of the ecological environment of the whole. Sumita (2001) research shows that the system, technology, economy, information, organization, law, cognition, and other seven factors hinder the stability of the industrial ecosystem. Heeres (2004) showed that the government intervention in Holland was less stable than the United States. Obviously, the research focus of domestic and foreign focuses on the relationship between complexity, diversity and ecosystem stability. Ecological system is too complex would undermine the stability of the ecological system; diversity can lead to stability, but the formation of the relationship of driving force may not ecosystem diversity, but ecological communities of species.

2 Research Hypothesis

The existing research reflects many factors influence the stability of the ecological environment, because of the particularity of the cultural and creative industries, the industrial ecological environment and the meaning of the stability is very complex, especially as a cultural creative industry which is a special form of industrial organization, the stability of ecological environment and its ecological environment the complexity and diversity of very close at present, the study involved less, this study

intends to use the information platform construction, member diversity, key competence and external support, members of the matching degree of 5 dimensions as the direct factors influencing the stability of the cultural and creative industries of the ecological environment, and the cultural and creative industry ecological environment complexity and diversity as the description of influence the indirect factors of the stability of the ecological environment of cultural and creative industries. Based on the above analysis, the following assumptions are put forward:

Hypothesis 1a: the complexity of cultural and creative industries has a significant positive impact on the construction of information platform.

Hypothesis1b: the complexity of the cultural and creative industries has a significant positive impact on the member structure.

Hypothesis1c: the complexity of cultural and creative industries has a significant positive impact on the key enterprise capacity.

Hypothesis1d: the complexity of the cultural and creative industries has a significant positive impact on the external support.

Hypothesis 1e: the complexity of cultural and creative industries has a significant positive effect on the matching degree of members.

Hypothesis 2a: the cultural and creative industries have a significant positive impact on the construction of information platform.

Hypothesis 2b: cultural and creative industries have a significant positive impact on the member structure.

Hypothesis 2c: the cultural and creative industries have a significant positive impact on the ability of key enterprises.

Hypothesis 2d: the cultural and creative industries have a significant positive impact on the external support.

Hypothesis 2e: the cultural and creative industries have a significant positive effect on the matching degree of the members.

Hypothesis 3: the construction of information platform has a significant positive impact on the stability of cultural and creative industries.

Hypothesis 4: members of the structure of cultural and creative industries have a significant positive impact on the ecological environment.

Hypothesis 5: the key enterprise ability has a significant positive impact on the stability of the cultural and creative industries.

Hypothesis 6: the external support has a significant positive impact on the stability of the cultural and creative industries.

Hypothesis 7: members' matching degree has a significant positive impact on the stability of cultural and creative industries.

Based on the above assumptions, this study proposed to cultural and creative industries ecological environmental complexity and diversity of cultural and creative industries ecological environment of initial variables and to the construction of information platform, a member of the structure and key enterprises, external support, members of the matching degree of the five factors as the intermediate variable, to cultural and creative industries ecological environmental stability as outcome variables, the establishment of the relevant theoretical research model.

3 Research Design

This study through the different types, different levels of cultural and creative industry executives, middle, creative project managers, engineers, experts and scholars conduct on-site investigations and by mail questionnaire in the form of questionnaire to obtain the data to the relevant personnel. This study in the collection of data set up a questionnaire before the experts also asked the experts to the validity of the questionnaire and the issue should be paid attention to the issue of a specific comments and suggestions. The recovery rate and the effective rate of the questionnaire are relatively ideal. A total of 519 questionnaires were distributed, 397 questionnaires were recovered, 366 questionnaires were valid. The recovery rate and effective rate were 76.49% and 70.52%, respectively. The scores were by method of Likert Scale.

1) Measurement of initial variables. Literature (Scott, A.J,1988) in this study, measure the initial variable from the, which complexity of ecological environment of the cultural and creative industry specific measurement items include: between the member enterprises of connection degree, members of the enterprise scale, industry supply chain path lengths, within the industry cooperation enterprise

mutual dependence. Cultural and creative industries, the diversity of the ecological environment of the specific survey items include: the number of members of the enterprise, industry supply chain channel width, member enterprises in the industry, etc.

2) Measurement of intermediate variables. In this study, the measurement of the intermediate variables using the direct method, the specific item from the scale of literature (Isaksen, A, 2000) and literature(Ross Brown ,2000). The information platform construction of the measurement items: information value degree, information network construction situation; for the structural members of measurement items: situation of communication among the member enterprises of the mutual distance, between the member enterprises, member enterprises the main business of similar, members of the corporate management environment; enterprise key ability measurement items: manufacturing of key enterprises quantity, scale, production capacity, ability of market development; external support for the efforts of the measurement items: government support policy, advocates, specialized agencies, government support; members matched the measurement items for: member enterprises related to the degree of, the existence of industry and common language.

3) The measurement of the outcome variable. This study directly asked the cultural and creative industries in the enterprise managers, creative design and development engineers, scholars and experts to measure the level of industrial ecological environment stability.

4 Research Results
4.1 Factor analysis
Due to the others in the factors of influence on the stability of industrial ecosystem design scale is used for reference in this study. Therefore, it is necessary to explore factor analysis, to help us to judge the scale design effectiveness of the amount of the table. Using SPSS16.0 statistical analysis software provided by factor analysis method respectively to the initial variables and intermediate variable principal component extraction. The results showed that the initial KMO value was 0.922, the KMO value of the intermediate variable was 0.961, and the significant probability of the Bartlet spherical test was 0, which indicated that the questionnaire data was suitable for factor analysis. At the same time, the statistical analysis showed that the initial variables can better be explained by a factor of 2, all factor loadings are above 0.821, factor accumulation contribution rate reached 79.99%; intermediate variables can better be explained by a factor of 5, all the factor loadings are above 0.877 and for sub cumulative contribution rate reached 89.61%. Therefore, according to the common features of factor, two initial variables named for the cooperation of cultural and creative industries ecological environmental complexity and cultural and creative industries ecological diversity of, five intermediate variables named for the construction of information platform, a member of the structure and key enterprises can force, the external support, members of the matching degree. The results of exploratory factor analysis are consistent with the expectation of the theoretical model.

4.2 Questionnaire reliability and validity test
This study uses the coefficient as the test standard to observe the internal consistency of each item in the questionnaire. Through calculation, the coefficient of variable initial is 0.929; the cultural and coefficient of creative industries ecological environment complexity is 0.912, coefficient of cultural and creative industries ecological diversity was 0.933; coefficient of intermediate variables is 0.956, in which coefficient of information platform construction is 0.966, coefficient of structure member is 0.946, coefficient of key enterprise capability is 0.890, coefficient of external support strength coefficient is 0.977, coefficient of the matching members is 0.935; the coefficient of stability of cultural and creative industries ecological environment variables is 0.896, all the coefficients are greater than 0.8 standard, which indicates that the reliability of the items in the questionnaire are quite ideal.

The validity verification, because the questionnaire items are from previous studies of relevant scholars at home and abroad, so the content validity can guarantee. At the same time, from the exploratory factor analysis, due to the initial variables, intermediate variables, the results of the survey items of the common degrees are more than 0.6, so the construct validity of the questionnaire is also acceptable.

4.3 Regression analysis
In this study, multivariate statistical regression method was used to test the above hypothesis. In order to avoid the interference of multiple co linearity, the stepwise regression method is used to build the regression model.

1) Regression analysis of initial and intermediate variables. This study first discusses cultural and creative industries ecological environmental complexity and cultural and creative industries ecological

diversity and information platform construction, a member of the structure and key enterprise competence, external support, members of the matching degree between the relationships. At the 0.05 significant level, the relationship between the initial and intermediate variables is shown in table 1. There exists linear regression relation between the variables of the concomitant probability value less than 0.001 in the table of variance analysis.

Table 1   Regression Analysis of Initial and Intermediate Variables

		Information platform construction	Member structure	Key enterprise ability	External support intensity	Membership matching degree
Complexity	Regression coefficient Sig.	0.520 0.332	0.237 0.000	0.098 0.571	0.121 0.000	0.533 0.000
Diversity	Regression coefficient Sig.	0.137 0.000	0.388 0.000	0.612 0.000	0.012 0.171	0.713 0.000

From table 1, we can see that the complexity of cultural and creative industries has a significant positive effect on the structure of members, the strength of external support, and the matching degree of members, that is, there is a significant causal relationship between them. The diversity of cultural and creative industries has a significant positive effect on the construction of information platform, the structure of members, the ability of key enterprises and the matching degree of members, that is, there is a significant causal relationship between them. Therefore, assuming 1b, assuming 1d, assuming 1e and assuming 2a, assuming 2b, assuming 2c, assuming 2e was established, assuming 1a, assuming 1c, assuming 2d does not set up.

2) Regression analysis of intermediate variables and outcome variables. This study is to explore the correlation between information platform construction, member structure, key enterprise capabilities, external support, and member matching and cultural and creative industries. In the 0.05 significance level, the regression analysis between the intermediate variables and the outcome variables is shown in table 2.

Table 2   Regression Analysis of Intermediate Variables and Outcome Variables

		Information platform construction	Member structure	Key enterprise ability	External support intensity	Membership matching degree
Stability	Regression coefficient Sig.	0.129 0.000	0.531 0.000	0.371 0.000	0.416 0.000	0.376 0.000

From table 2, we can see that the hypothesis 3, the hypothesis 4, the hypothesis 5, the hypothesis 6, the hypothesis 7 are established. Information platform construction, a member of the structure and key enterprises, external support, members of the matching degree of cultural creative industry ecological environment stability performance of a significant positive influence, which member structure affect larger, the information platform construction impact to a minimum.

Through the above analysis, the cultural and creative industries to get the stability of the ecological environment factors model (figure 1), and draw the following conclusions:
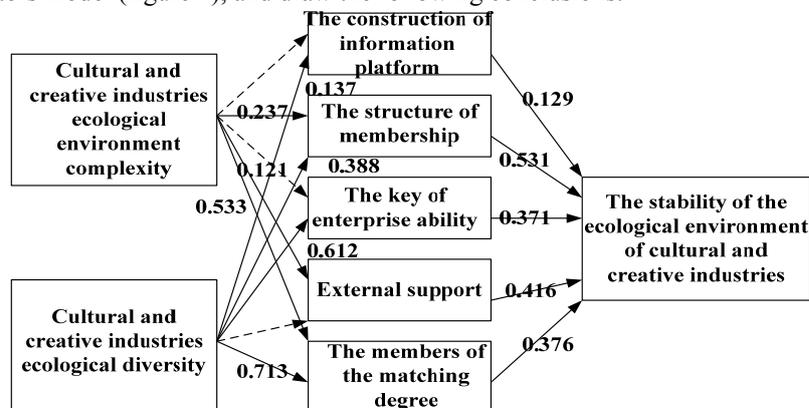
Figure 1   The Relationship Model of Cultural Creative Industry Ecological Environment Complexity, Diversity and Stability

5 Conclusions

The complexity of the ecological environment in the cultural and creative industries is simply the description of the abundance of species, the correlation degree among species, the interaction of species in the ecological environment of the cultural and creative industries. From the perspective of energy flow and ecological environment of the cultural and creative industry belongs to the high complexity of industrial ecological communities, the ecological industry chain and industrial network is more complex, the members of the enterprise can accept a variety of ways, the energy input, can also to other members of the power output of a variety of ways. That is to say, in the cultural and creative industries ecological environment inside the energy exchange in many ways, if a way is disturbed, then industrial community will be through other means to compensate, in this sense and complexity influence its stability. But the complexity of energy compensation based on key information platform construction and to help the enterprise to enhance the ability is irrelevant, the ecological environment for cultural and creative industries complexity affects the members of the structure, the external support strength and members of the matching degree thus affect the stability of the ecological environment.

The ecological environment of the cultural and creative industry diversity refers to the diversification of enterprise ecological environment for cultural and creative industries forms, levels and the industrial complex, say simply, ecological diversity is the sum of the cultural creative industry and environment form the ecological complex, and the correlation of all kinds of ecological processes. Diversity means that the complex structure of the ecological environment, a high degree of network, strong heterogeneity, energy, material and information input and output channels are numerous and dense, crises crossing, uninterrupted, so that the flow is large, fast velocity, high productivity. Even if the individual pathways is destroyed, industry itself will due to varied between allelopathy, mutual compensation and alternative and to ensure that the energy flow, material flow, information flow of normal operation, industrial structure was destroyed part of the rapid repair, restore ecological environment of cultural and creative industries the original steady state, or the formation of a new stable state. In this sense, we say that the ecological environment for cultural and creative industry diversity and stability exists some degree of correlation, in the process of the development of cultural and creative industries, through increase the diversity of the ecological environment, promote the stability of the industrial environment.

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The Analysis on Importance of Sustainable Appropriation of the Company's Intangible Assets

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Abstract: The intangible assets occupy a special role in the competitiveness of companies. Because of the high level of ambiguity surrounding intangible assets, their complementary nature, and possible legal barriers to imitation, competitive advantage based on immaterial assets are perceived to be particularly sustainable and thus of high strategic relevance. However, companies possessing a competitive advantage based on immaterial assets are facing problems resulting from the special characteristics of intangible assets. The intangible assets are accompanied by the central problem of appropriation that results from their public good characteristics. This paper discusses the key importance of the appropriation of economic returns stemming from competitive advantage. The intangible technical assets are a company's strategic reasoning. This discussion leads us to a more holistic view of the term appropriation and points out the key significance of the discussion about appropriation in the management of technology.
Key words: Intangible assets; Sustainable competitive advantage; Patent rights; Economic returns

1 Introduction

In the post, the discussion of the appropriation of intangible technological assets has predominantly concentrated on the analysis of patent and trade secret protection. However, as broadly recognized, these protection modes show significant shortcomings and limits which put their importance in safeguarding the competitive advantage in question. In addition, the current language and focus used in writing patent documents has to be thought over and companies have to take their strategy into consideration in determining the most adequate protection mode and in formulating the patent document.

Then, the company specific resources and competencies must be protected by imitation barriers in order to be of strategic importance for a company. Such a strategic advantage that is appreciated by customers and sustainable relative to competitors can represent a significant source of revenue for the company in question. However, the final economic rent a company can generate with a certain competitive advantage depends on the possibility to appropriate the returns generated by the advantage in question. It is often mistakenly assumed that the possession of a strategic advantage inevitably leads to an economic return for its holder which lies above the level currently assumed to be normal for a certain industry or branch. There are, however, four main factors that influence the appropriation of the returns generated by a certain sustainable competitive advantage:

1) Relative bargaining power;
2) Ownership rights and embed of resources and capabilities;
3) Existence of complementary assets;
4) Regulatory influences (Grant RM, 1997).

2 An Example

The first factor which has been identified to crucially influence the appropriation of the returns generated by a certain competitive advantage. It is the relative bargaining power of the holder and owner of the competitive advantage. If a certain competitive advantage can be clearly attributed to one single employee, the employee can reap off a substantial part or even the totality of the revenues. The bargaining power and thus the extent of the revenue stream which the individual can appropriated, depends on his mobility and if the skills offer the same productivity in another company. The existence of specific complementary assets outside the company holding the competitive advantage represents another factor which can significantly influence the appropriation of the returns generated by a certain sustainable competitive advantage. The company holding the specific complementary asset has the power to appropriate a better part of the returns generated by an advantage, although the advantage itself is owned by another company.

The prominent industry in which companies, even though bestowed with resources and

competencies showing the characteristics of strategic advantage, however, unable to appropriate the returns generated by their advantages due to established firms holding specialized complementary assets, represents the Internet Service Provider industry (ISP). Some Companies offering all-inclusive services, also referred to as flat-rate, such as 'AT&T', 'T-Mobile', 'Verizon' , 'Sprint' ,etc. which offer clients a portal to access the Internet via established telephone lines, may possess a strategic advantage in terms of a high commitment of the customer to a certain ISP due to high switching costs, the distinctive service offerings provided on the portal, but also because of the extremely high set up costs of such a service what server capacity, global presence, software development etc. However, these companies cannot fully appropriate the returns generated by their strategic advantage due to the existence of the complementary assets of the telephone connection. Fox example, France 'T61ecom', Germany 'Deutsche Telekom', British 'British Tel-com', Spain 'Telefonica', etc. (Geroski P, 2015). (see table 1) These operators can turn appropriate a better part of the returns generated by the ISP advantage because of the connection fees the ISP have to pay for their customers which have to use the infrastructure provided by the operators in order to access the provided service. Thus, a company has to control all specific complementary assets and activities in order to be able to appropriate the returns of its strategic advantage

Table 1   The Customer Loyalty of EURO'S Telecom Companies Offering All-Inclusive Services

Telecom Industry Brand	Non-all-inclusive services fees	Customer loyalty (Before)	All-inclusive services fees	Customer loyalty (after)
France T61ecom®	0.56 euro/min	23.36%	30 euro/month	31.66% ↑
Germany Deutsche Telekom®	0.68 euro/min	32.14%	28.99 euro/month	42.12% ↑
British British Tel-com®	0.69 pen/min	21.12%	23.99 GBP/month	39.88% ↑
Spain Telefonic®	0.82 euro/min	28.39%	28.79 euro/month	40.66% ↑
Italy TIM®	0.50 euro/min	40.01%	29.92 euro/month	62.31% ↑

Source: TIM®(Italy, Telecom Italia Mobile) annual report (2013).

3 Methodology and Analyze

The general conclusion which can be formulated on the basis of the discussion of the factors determining the appropriation of returns of a certain advantage. It is that companies have to increase the embed of the resource and obtain ownership rights on the resource or competency, reduce the bargaining power of the agent holding the resource, and try to integrate or generate the necessary specialized complementary assets. A company can, for example, reduce the mobility of employees by long lasting contracts or equity participation and thus increase the embed of the resource. Another, perhaps more efficient method, it is to extract the knowledge constituting a competitive advantage from the individual employee by codification and spreading of the knowledge over several different employees within the firm and consequently increase the connectivity of the intangible asset to the company and reduce the bargaining power of the individual agent (Hausman J,1984). The paper has merely considered the appropriation of the returns generated by an existing competitive advantage.

3.1 The model of the appropriation of intangible assets

The paper has merely considered the appropriation of the returns generated by an existing competitive advantage. This point of view does, however, not account for future strategic assets and completely neglects the central importance of appropriation in the management of technology. In this part section therefore expands our contemplation and presents the appropriation of technology as a key component in the model of the appropriation of intangible assets. The appropriation of returns stemming from an existing company specific advantage considerably determines the profit earning potential of the business enterprise. However, in order to fully account for the strategic role of the appropriation of intangible assets in the field of technology management, we have to enlarge our understanding of the term appropriation. Because of the broad literature available on the general subject of technology management, we have to concentrate our discussion and do merely present the model developed by Morin (Klaus Jennewein, 2011). The particular relevance of the model for our discussion is due to its explicitness about the centrality of appropriation of intangible assets. Morin has identified six central

functions of appropriation of intangible assets: (1) Optimization; (2) Enrichment; (3) Safeguarding; (4) Stocktaking; (5) Evaluation; (6) Surveillance. (Lucchi, N , 2005) (see figure 1)
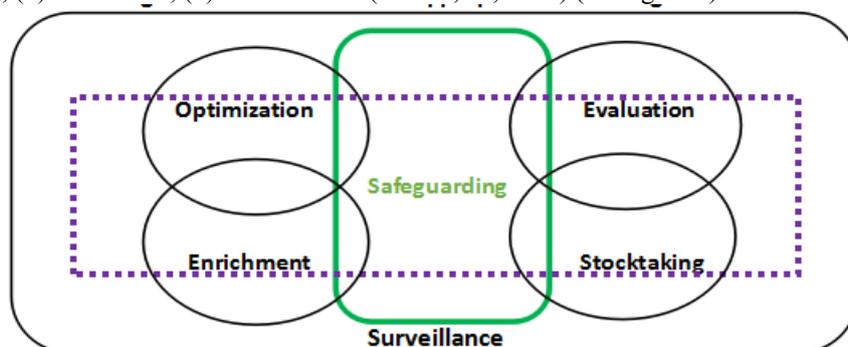
Figure 1   The Model of the Appropriation of Intangible Assets

3.2 The analyzed on the model of the appropriation of intangible assets

These six functions can again be distinguished in three active functions optimization, enrichment, and safeguarding and three supporting functions stocktaking, evaluation, and supervision. As the author has clearly pointed out, the six functions have to be managed in accordance and the efficiency of the entire system of technology management would be endangered by the negligence of any one function. In this system of technology management, the function of safeguarding technological resources and competencies corresponds to what commonly is understood under securing assets and associated returns and thus substitutes for the term appropriation. However, appropriation must not only concern the safeguarding of a company's existing technological patrimony and its returns, but also of potential future technological resources and competencies that may be a source of competitive advantage in the future (Srivastava RK, Shervani TA, 1998). Morin subsumes under the term optimization the verification if all resources and capabilities are efficiently employed. In order to be able to confirm if all resources and capabilities are used to their best potential a company has to access and evaluate its current stock of technological assets and this stocktaking might reveal hidden treasures so far neglected by the company. This stock of resources and competencies has to be enriched and upheld in order to oppose depreciation and to avert obsolescence of these resources and competencies due to the fast progression of technological development. However, has to evaluate the individual resources and competencies in order to be able to efficiently manage the assets and enhance their value. According to Morin, the safeguarding and supervision functions represent the central axes which link the different key functions of the technology management system (Mossinghoff GJ, 1984). The basic model and the interrelation of the different functions of technology management are visualized in the model of appropriation of intangible assets.

4 Results

Consequently, the system of technological management established by Morin clearly points out the central importance of safeguarding and hence of appropriation of technological resources and competencies in the management of technology. However, the management of technological resources does not only concentrate on currently existing resources and competencies but has to include future resources and competencies which can be generated with the existing set of company assets. In respect to the importance of future technological resources and competencies, Morin has referred to the technological diversification of companies and pointed out that companies have to consider in their technology management future technologies, which are in the process of emergence and evolution, and cannot only bear in mind established technologies already existing in the company. (Ernst H, 2007) Therefore, a company has to consider in the strategic management of technology, and hence in the appropriation of its intangible technological assets, not only currently existing resources and competencies, but also future resources and competencies that can be generated with the existing corporate strengths.

Moreover, we do not consider the R&D, production, and intellectual property departments as the key divisions within the model of appropriation of intangible assets presented. We rather include any function of a company in the system and all functions of the company have to perform the six functions of technology management presented above. So is, for example, the personal management department

extremely important in recruiting employees that fit to the current or envisaged corporate culture and add to the current stock of human capital (Chesbrough HW and Teece DJ, 1998). Thus, the company must be able to attract not only employees with the needed technical skills and know-how but which also show the required social characteristics and needs. Consequently, the personal management has to work in close interrelation with the marketing, R&D, production, and any other functions within the company. Hence, we can affirm, a company that wants to efficiently manage its current and potential future stock of intangible technical assets, and thus appropriate its technological assets, has to integrate any function of the company in its technology management system and a flaw in any one function results in the weakening of the whole system.

5 Conclusions

We can hence summarize, the appropriation of the immaterial technological assets which is encapsulated in the notion of safeguarding in the model of appropriation of intangible assets, represents a central aspect of technology management interfering with any of the other five functions. Moreover, the management of technology does not only concern existing technological resources and competencies, but includes future assets, which might not currently exist or are even considered as achieved (Klaus Jennewein, 2011).Last but not least, the technology management with its six principal functions has to be implemented and considered in any acting of the company reaching from top management to the individual employee on the production floor.

Acknowledgement

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Importance and Evolution of Productive Transformation with Sustainable Innovation at the Ibero-American Countries

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Abstract: Industrial Revolution, World Wars and the Great Depression contributed to foster Productive Transformation and Sustainable Innovation of Ibero-American countries. The Technological progress was more intense from 1948 and beyond, when a UN Economic and Social Commission ECLAC was created to help development in Latinamerica; and later on also the Development Bank of Latin America. The sustainable development, inside of a modern approach, is that capable of supply the needs of the current generations, without compromising the capacity of answer the needs of future generations. The importance of Productive Transformations and Sustainable Innovation it is already noticed by governments that are seeking among other things: Better work conditions, Social inclusion and formation of a fairer society. The successful models of Productive Transformation and Sustainable Innovation go beyond the technology with machines, and require a higher level of human capital as already recognized by groups like the Lemann foundation, Erasmus Plus and Instituto Ibero Americano of TIC. The present study presents the rankings on Productive Transformation and Sustainable Innovation for ibero-american countries based on a study of a sample of 132 countries from the Sustainable Development Observatory for The Iberoamerican Region ORIBER.
Key words: Transformation; Innovation; Ibero-American; Sustainable; Development

1 Introduction

The productive transformation and Sustainable Innovation of countries in the Ibero-american axis began in meaningful events of world history like the Industrial Revolution, World Wars and even the financial crash of 1929. From 1948 on when it was created the UN Economic and Social Commission ECLAC for Latiamerica the help develop economic relations among Latin America countries. Portugal and Spain the Ibero-american countries, outside of Latin America axis, by their location, they had economic integration and development with other European countries.

The Development Bank of Latin America – CAF, founded in 1970, loans resources to the development of the region, normally from developed countries, providing better integration between Latin America and these developed countries. However there is a growing concern for the productive transformation to be executed in sustainable way, once that, the inefficient use of the natural resources of Latin America may cause worldwide impacts in the climate and biodiversity.

The Productive Innovation normally contributes to the improvement of production, of development of new materials, of creation of new sales channels, of new process techniques, of marketing and even new administrative processes. Successful Models for Productive Transformation and Sustainable Innovation go beyond applied equipments since requires better prepared people.

The Sustainable Development also promotes the economic development, the environmental care, better work conditions and better Jobs, creating a fairer society. From this context, this research seeks to describe the importance of the development of Ibero-american countries regarding Productive Transformation and the Sustainable Innovation and the anticipatory need to invest on Human Capital considering the value of technological education to the progress.

2 The Productive Transformation and Sustainable Innovation

2.1 The historical conditions regarding the industrial development of countries in the Ibero-American region from the industrial revolution

The process of industrialization has its origin by mid-century XVIII, in England, with the Industrial Revolution, that generated important social modifications, economic and technical, starting the use of technology. The technological expansion, already from the XIX century, extended itself to other European countries, like Germany, France, Italy, Belgium, Netherlands, and even countries outside the European axis, like Japan and USA, that came to be called industrialized countries and of capitalist economy. The Latin American countries, considered not industrialized were not industrialized countries until World War I that created conditions for a discrete industrialization of the region. According to and

Medeiros (2013) and Trepadini and Stedile (2011) until 1917, the Latin American countries got involved in the European wars only as suppliers of raw materials and food to the countries in the conflict, that were the capitalists economies at the time.

According to BEM (2005) the capitalists countries, involved in World War I, started to have difficulties to export industrialized goods to the Latin-American countries, that now having the feeling of the scarcity of industrialized goods started to develop it own industry to attend inner demand.

The financial Crisis of (1929) and World War II from 1939 to 1945 also contributed to the industrialization and scarcity of industrialized goods. The largest Latin American countries, mainly Brazil and Mexico, continued the industrialization process at the beginning of 1970, with the oil crisis the created a slowdown of the industrial process.

According to BEM (2005) and SILVA (2010) the process of industrialization had a retreat in 1970 with the oil crisis and in 1982 by the moratorium decreed by Mexico and Chile. The oil crisis contributed for the emergence of a 3rd Industrial Revolution, with the development of technology of information and transport.

The Latin America countries started having a UN contribution, which provided the entrance of foreign investments to the technological development of Latin America with the creation of the ECLAC an organism of ONU, founded in 1948, seeking to strengthen the economic relation between countries in the Latin America axis and countries in other regions of the world. In 1984, the United Nations council decide that the commission will be called now on *Comissão Econômica para a América Latina and the Caribbean* since 1956 had it headquarters in the city of Mexico, and in 1966 was founded a sub-headquarters in Porto of Spain for development of Caribbean region .

The United Nations has promoted sustainable development through the coordination of regional development actions mainly from the AL, where there is still much to do in this region. According to Cardoso (1993) the Latin America – AL counted with the collaboration of ECLAC, supporting the need for industrialization, tax reforms, land and State actions for national development. This important step towards industrialization, contributed to the creation of a technological culture on the region.

According to the Program to Development and Modernization (2014), there is a consensus among governments and public opinion that in order to achieve sustainable development there is a need to have good policies covering science, technology and innovation; and hence investment in science, technology and higher education is growing in almost all Latin American countries, and most of them have begun to formulate and implement policies to stimulate innovation. Some countries in Latin America have grown at high rates, and is expected to continue growing in the years to come.

The productivity of Latin America, despite being a little better, is lower than the productivity of Asia, as well as a disadvantage regarding the informal economy. The Latin America has positive points concerning full employment, the expansion of human resources at work and domestic credit, which proposes improvements in productivity and increase the GDP.

According to Exame Magazine publication (May, 2014), among the 29 countries with high growth rates for the period 2011 to 2013, were Peru with 6.5 percent, followed by Ecuador, Chile and Bolivia with growth above 5%, on average, for the same period. Despite the high growth in these countries, the current concern for Latin America is still the low growth of most of the countries.

It´s important to mention here that Portugal and Spain, despite belonging to the Ibero-American region, are the only countries are located outside of Latin America. Its geographical location allows for better integration with the countries of Europe, in addition, those countries participating in the European Economic Community and makes use of the Euro as the currency of the country. However, these countries as well as rest of the PIIGS that have been suffering from debt management and unemployment already for some time, recently they suffer the impacts that reach much of the European Community with the problem of the BREXIT. Also due to its geographical location, do not benefit from the programs of the UNITED NATIONS and Latin America Development Bank – CAF intended for loans for Latin America.

2.2 Sustainable innovation

The term sustainable innovation was created from the productive innovation with Sustainable Development.

The OECD- Organization for Economic Cooperation and Development (2005) considers innovations in four major categories: (a) Product innovation; (b) Innovation processes; (c) Organizational innovation and; (d) Marketing innovation.

The productive innovation, typically, is the engine of development of an organization in the face of its competitors. Innovation is present in the improvement of production, in the development of new

materials, creating new sales channels, new process techniques, and marketing to new administrative processes.

According to BRITO, BRITO and MORGANTI (2009), innovation in successful companies, has been touted as a source of competitive advantage.

As the Program for El Desarrollo (2014), sustainable development appears as an alternative to rampant development and challenges in the areas of science and technology, to pursue renewable energy, low or no emissions, as well as take care of distribution and better use of that energy as a way to control the growth of wisdom.

Sustainable development within a current approach that is able to meet the needs of the present generation without compromising the ability to meet the needs of future generations. The development does not exhaust the resources for the future. This definition came about in World Commission on environment and development, established by the United Nations to discuss and propose ways to reconcile two objectives: economic development and environmental conservation.

The idea of sustainable development arises from the urgent need to promote sustainable development, but Recoverable development seeking to reconcile economic development with environmental preservation and the end world poverty and social justice. The fast-changing world of the industrialized countries brought environmental crises as a result of a development that often contemplated the future effects on environmental sustainability.

More recently (2015) the UNDP established the new 17 Sustainable Development Goals - SDG for the next 15 years, that it's expected to have a greater impact on Sustainable development around the world, in particular through Sustainable Innovation.

2.3 The influence and the premises of the productive transformation and sustainable innovation in Ibero-American countries

The Ibero-American countries, many of which are in the development stage, cause concern to developed countries with regard to sustainability. This concern is due to the location and extent of the social and natural heritage almost untouchable, when compared to developed countries. A disorderly development of Ibero-American countries can lead to climate changes and have serious environmental and bioma impacts.

Moreover the Ibero-American countries may become essential to help overcome the global systemic challenges of the so called Anthropocene. For example: in relation to climate change and forests, and also compared with the wealth of its biodiversity, and preservation of the wisdom of ancient traditions. However, the development with sustainability has to meet the social and economic challenges involving the region; and in addition should foster the creation of better jobs and socio-economic development of developing countries.

As is mentioned on the Program for Development (2014), the biggest challenges are to: (a) achieve a productive profile with higher added value; (b) increase fairness in distribution, with cohesion and citizenship; (c) offer quality education and extensive coverage; (d) achieving the environmental balance; (e) cooperate in the construction of regional spaces; (f) strengthening the capacity and technology.

The driving force of jobs, formed by the set of individuals belonging to a country, allied to the qualities of the policies of his Government, the economic condition of the country, the productive and technological development, in addition to sustainable innovation, contribute to the quality of life of its people and allows better working facilities these individuals, who exchange the use of its time and individual effort for financial resources.

Industrialization is necessary to absorb the growing workforce in the light of urbanization and population growth, the increase in productivity due to the growth of the regions and self-support of manufactured products. According to the OECD (1996), production is externally influenced by knowledge and technology. The term "knowledge-based economy" is the result of the recognition of the role of knowledge intrinsic to human beings and technology center of economic development.

As mentioned at the Program for Development (2014), through disseminating technology in the universities, it is possible to achieve a knowledge-based economy, forming researchers and highly qualified workers and creating scientific knowledge that is transferred to companies.

Hence the Ibero-American countries need to strengthen scientific and technological capacity in order to achieve success for the development challenges. Moreover the main contribution to generate productive transformation and sustainable innovation must come from public-private partnerships focused on research and development activities; in addition, companies must be able to adopt

innovations in processes and products, in order to improve the conditions of work and the distribution of resources.

It is necessary that science contribute to the productive activity, creating positive relationship between research and development. In Brazil in 1951, the Ministry of science, technology and innovation created the Conselho Nacional de Desenvolvimento Científico e Tecnológico-CNPq that has as main objective to encourage scientific and technological research with universities and companies, as well as promote the recognition of such research by the international scientific community.

As Maculan and Carvalho (2009), Governments have promoted the interest for development through the interaction between University and company. In Brazil, from the years 90, efficiency in business management and innovation has been the emphasis of economic development model.

Another important and synergically complementary initiative comes from the World Business Council for Sustainable Development – WBCSD,   that has representatives in countries in the region, that elaborated its Manifesto Vision 2050 indicating changes that are necessary, feasible and may offer business opportunities that could turn sustainability into strategy.

3 Models of Productive Transformation and Sustainable Innovation

Successful models for the Productive Transformation and sustainable innovation go beyond equipment within school or under production. Achieving success in the medium and long term it is necessary invest in Human Capital, capable of internalizing and develop new technologies able to improve productivity with sustainable development; and this is now becoming more possible as we move from the III to the   IV Industrial Revolution .

Is on this context of Human Capital and Productive Transformation models and existing sustainable innovation that one may mention some initiatives:

a) The Lemann Foundation, which was created in Brazil in 2002, develops, and supports innovative projects on education and research in public policy. The contribution of the Lemann Foundation, that counts with the support of the Khan Academy, and seeks to improve the quality of education that may form leaders transformers, then acts strategically in the areas of innovation, management, educational policies and talent.

b) The Erasmus programme Plus, which as described by the program para El Desarrollo (2014), reaches every country in the world with academic flexibility in university cooperation projects.

c) The Ibero-American Institute of ICT and education, IBERTIC, based in Buenos Aires, develops research, training, evaluation and knowledge transfer or virtual courses through conferences, workshops and presentation of search results the 19 Latin American countries.

There is also the need in the region to develop a culture of University&Bussiness partnership, based on Open Collaborative frameworks, since leaving private companies the responsibility with innovations ends up in   high costs of development and implementation of innovations.

4 Methodological Procedures

For analysis of the present study its being considered a group of 21 countries of the Ibero-American region - AIBER, namely: Argentina, Bolivia, Brazil , Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Portugal, Spain, Uruguay and Venezuela. This focus group belongs to data bank consisting of 132 countries that includes 3 regions: AIBER (21 countries), Advanced Economy Countries – AVECO (28 countries) and OTHERS (84 countries); as it may be found at the Observatory for Sustainable Development of the Iberoamerican Region – ORIBER of the PUCSP.

The subject Productive Transformation and Sustainable innovation (Basic Features: Productive Transformation and Sustainable Innovation), is one of the 15 dimensions of the Guide for Public Sustainable Development Guide – GPS of the PUCSP, and considers monitoring the following 18 variables:

• Eight Synthetic Indicators: index of Social progress (Social Progress Index), index of
    Ecosystem Sustainability (Ecosystem Sustainability), Combustible renewables and waste
(renewable fuels and wastes), the human development index-HDI, published by UNDP-UN, Susceptibility (susceptibility), Environmental Protection index-EPI (Environmental Protection Index), the Happy Planet Index (HPI), and the index of   GINNI for selected countries.
    • Ten Analytical Indicators: Global Innovation Ind (global industrial innovation), Institutions (institutions), Human Capital and Research (resources and Human Capital), Infrastructure (infrastructure),

Market Sophistication (Sophistication), Knowledge and Technology (knowledge and technology), Creative Outputs (creative solutions), International Cooperation (International Cooperation), Effective use of support (effective use of support) and Regional Cooperation (Regional Cooperation).

In table 1, the description of the 7 more relevant variables selected for this study from the 18 previous ones, after some statistical analysis.

Table 1   Productive Transformation and Sustainable Innovation Selected Variables

Variable	Meaning
HDI-2013	The human development index (HDI) measures the progress of a nation from three dimensions: income, health and education.
Global Innovation Ind	Recognizes the key role of innovation as an engine for economic growth and prosperity, and recognizes the need for a wide horizontal view of innovation, which is applicable to both: developed and emerging economies.
Human Capital and Research	(a) education-quantitative and qualitative aspects of education and information in both the present workforce, as well as the future workforce. (b) Health and wellness-physical and mental well-being of a population, from childhood to adulthood. (c) the labour force and employment experience, talent, knowledge and training in the active age population of a country. (d) enabling environment-infrastructure and other factors that enable returns on human capital.
Infrastructure	Investments in water, sanitation, energy, housing and transport and new information and communication technologies to support social and cultural advances.
Market Sophistication	(a) Availability and accessibility of financial services (b) funding through the local stock market (c) ease of access to loans (d) the provision of risk capital (and) restriction on capital flows (f) Soundness of banks (g) the regulation of stock exchanges and (h) legal rights index.
Knowledge and Technology	Directed to the activity of inventions and innovations, including: (a) Creation of knowledge. (b) About the impact of knowledge: (c) dissemination of knowledge:
International Cooperation	This issue aims to assess the willingness and ability of political leadership in developing good neighbourly relations and cooperate with neighbouring countries in international and regional organizations • support regional and international integration.

Source: author

5 Presentation and Analysis of Results

All variables were normalized (0 to 100) and positivized (the higher the better) and for the means for each of the 3 Regions are shown in Table 2; and represented graphically by the Radar in Figure 1.

Table 2   Means by Region of the 7 Selected Variables

	hdi	glob	human	Infra	mark	knowl
AIBER	65.62	41.19	38.24	44.55	32.98	36.78
AVECO	86.15	79.11	78.67	79.61	60.65	74.9
OTHERS	47.59	37.64	35.25	34.33	32.2	40.39
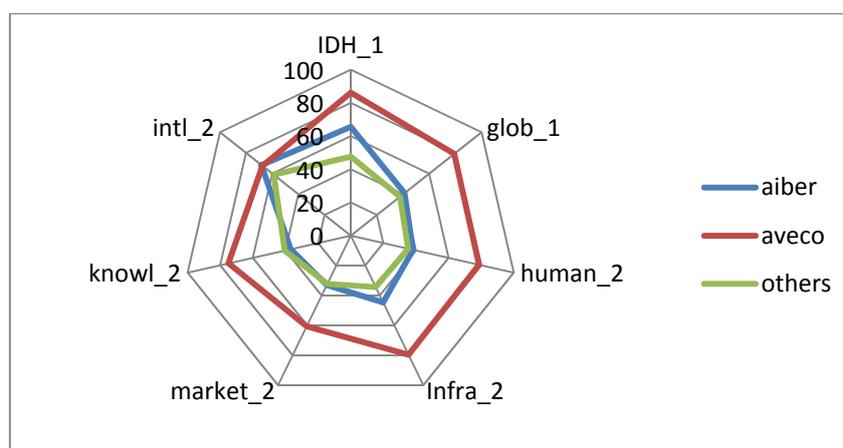
Figure 1   Radar Chart Comparing the Means of the 7   Variables among the 3 Regions
Source: the author

Clearly except for International Cooperation there a great and similar difference in the rest of the

variables between the AVECO region and the AIBER and OTHERS regions.

This may also be seen through a Correspondence Analysis as it's shown in Figure 2. Where in particular Human Capital and Global Innovations are extremely close to the AVECO region and far away from the AIBER and OTHERS.

Figure 2   Correspondence Analysis.

Moreover using Principal Component Analysis and Stepwise Regression it was possible to identify the relative contribution (weights) of 4 most higher impact variables for Productive Transformation and Sustainable Innovation : Global Innovation, International Cooperation, Market Sophisticate and Human Capital and develop a Synthetic   Productive Transformation and Sustainable Innovation Index - PTSI that once again normalized allows comparing by ANOVA the 3 Regions as may be seen in Table 3.

Table 3   ANOVA for the New Ranking Index PTSI:

```
One-way ANOVA: PTSI versus 3 Regions
Source          DF      SS       MS       F        P
Regiao_3_or      2    30196    15098    87,13    0,000
Error          129    22353      173
Total          131    52549


S = 13,16     R-Sq = 57,46%    R-Sq(adj) = 56,80%
                               Individual 95% CIs For Mean Based on
                               Pooled StDev
Level    N    Mean   StDev   ------+---------+---------+---------+---
AIBER    21   48,26  12,53   (----*----)
AVECO    26   82,17  10,13                                   (---*----)
OTHERS   85   43,44  14,08   (-*--)
                             ------+---------+---------+---------+---
                               48        60        72        84
```

From this ANOVA one could clearly see the great and expected difference between the AVECO Region and the rest concerning Productive Transformation and Sustainable Innovation; moreover a t-test shows that AIBER is actually doing better that OTHERS (significance $p < 0,05$).

Finally this PTSI Index allows to rank the countries as one could see in Table 4; and moreover one could renormalize the PTSI (0   to 100) considering only the AIBER region.

Table 4 Classification and New Rankings for the AIBER Region Based on The Transformation and Sustainable Innovation PTSI Index

AIBER		Country		Worldwide
Rank	Level		PTSI	Rank
1	High	Spain	100.0	23
2	High	Portugal	86.6	29
3	High	Chile	80.2	32
4	Medium	Brazil	64.8	40
5	Medium	Costa Rica	62.3	42
6	Medium	Panama	61.9	43
7	Medium	Uruguay	58.9	50
8	Medium	Mexico	54.7	54
9	Medium	Colombia	54.6	56
10	Medium	Peru	54.0	58
11	Low	Cuba	47.8	70
12	Low	Argentina	44.1	73
13	Low	Dominican Republic	40.7	74
14	Low	El Salvador	37.9	79
15	Low	Paraguay	36.9	86
16	Low	Guatemala	33.0	91
17	Very Low	Honduras	22.9	104
18	Very Low	Bolivia	21.7	106
19	Very Low	Ecuador	16.6	111
20	Very Low	Nicaragua	9.0	117
21	Very Low	Venezuela	0.0	124

Source: the author

The AIBER countries located in Europe showed better performance in comparison to the countries of Latin America. Brazil, ranked 4th place, presents significant difference of 15.4 points to the third placed, Chile, indicating the need for improvements. The differences between the best and worst ranked country demonstrates highly significant differences exist in the development of ibero-American countries; and hence the need to seek new and better ways to foster open collaborative partnerships in the region.

6 Conclusions

Based on the study, was possible to identify the heterogeneity of the developing countries of the Ibero-American Region and not only in terms of geographical and socio-cultural characteristics. The countries in Europe, Spain and Portugal, are the first in the ranking defined for Productive Transformation and Sustainable Innovation, while if you consider only the countries of Latin America, there is a great difference between the development of Chile, best classified in Latin America in Productive Transformation and Sustainable Innovation, when compared to the worst ranked country, Venezuela, also in Latin America which every day is getting worst for political reasons..

Already almost 70 years ago were founded the ECLAC and the Latin America Development Bank, to help in the development of the Latinamerican Regioin but still there seems to be a lot that needs to be doing to so that in general the Iberoamerican countries get closer to the Advanced Economy Countries stage of development concerning the important issue of the every day so much needed Productive Transformation and Sustainable Innovation.

It is worth mentioning that the Ibero-American countries is slowly starting to promote partnership between companies and universities, which helps to decrease research costs and bring better innovations, and the development of human capital and the formation of scholars on the topic. But still there is a long way to go and as it was shown the differences between the best and worst ranked countries are highly significant, and hence there is a need to seek new and better ways to foster open collaborative partnerships in the region regarding Productive Transformation and Sustainable Innovation, particularly as we move from the so called Third to the Fourth Industrial Revolution.

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Analysis on Coordination Function of Intellectual Property Rights in Networking Firm Organizations Open Innovation

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Abstract: This paper analyzes the coordination function of intellectual property rights in the networking firm organizations open innovation which is coordinating the relationship among the organization members of network enterprises to reduce production and organization costs and improve the allocation of resources, discusses the relationship between coordination function and traditional function including incentive/defensive function and offensive function.
Key words: Networking Firms; Open innovation; Intellectual property; Coordination function

1 Introduction

In the era of knowledge economy, the traditional enterprise organization form by which represented the traditional hierarchical enterprises has been unable to adapt to the market demand. With increasingly fierce market competition, and enterprise organization changes in the environment. New type of enterprise organization form ----Networked organization arises at the historic moment, gradually replace the traditional hierarchical organization. (Wang Fang, et al, 2015) Nowadays, more and more enterprises begin to pay more attention to build networked organization structure to achieve the target market. The managers of enterprises are focused on the one link of the industry value chain, all the capital delivery to the business with core competitiveness, and based on contractual relationship, will not be good at or gains little business outsourcing or form strategic alliances to other enterprises, so as to better play its role in presenting their own advantages in order to enhance market competitiveness.

In recent years, at home and abroad ,massive research results have had a dialogue about the related problems of networked enterprises organization, analyzes the function of intellectual property in enterprise innovation also is more, and the networked enterprise intellectual property rights in the open innovation function analysis needs to be further expanded. , studied aiming at the problem of the intellectual property in the network enterprise organization function of construction of innovation network. Based on intellectual property can promote enterprise network organization efficient allocation of resources, this article explains the open innovation of intellectual property in the network enterprise organization coordination function, namely the intellectual property effectively dealing with the relationship between network organization members to reduce the cost of production and organization, improve the function of resource allocation ability. In addition, this paper also studied the network organization coordination function and intellectual property rights in intellectual property rights incentive, attack/defense functions such as the relationship between the traditional functions.

2 Networked Organization Overview

Network organization is a kind of present network in the form of enterprise organization structure, is the U type, linear function, H, M type enterprise organization structure following a new type of enterprise organization. Networked organization arose in the late 1970 s and early 80 s, companies in the United States of "outsourcing" contract model and Japanese companies "lean manufacturing"(Liu Weijun, 2013). In the 1990 s, along with the information technology and Internet technology is widely used in enterprise production and management, in the true sense of networked enterprise organization form. (Su Huishuang, et al, 2013) At this point, the networked enterprise basic forms of organization operation to realize the enterprise internal network and external network close integration.

Inspection network enterprise organization the cause of the rise, mainly including the production mode of ford a crisis, the government, market deregulation, and information technology is widely spread, etc. (Kapàs, 2008)

In the late 1960 s, the production mode of ford crisis. Fordism production pattern became prevailing among the public after the second industrial revolution, to mass production and standardization, a single variety of products and services, the organization form of vertical, oligopolistic market structure is typical. Along with the social public demand for products and services has become increasingly diverse, ford socialist mode of production has been unable to meet the market demand. In a

more open market environment, based on the production mode of ford's functional large-scale integrated enterprise bear the growing "cost", lead to such enterprises face increasingly severe competition in the market. In order to adapt to change and diversity of market demand, the enterprise will be the basis of competition from Fordism price into flexible mode of production mode of innovation (Potočnik, et al, 2015), for the network social condition on the formation of enterprise organization.

Since the late 1970 s, represented by the governments around the world gradually relax for goods, services, Labor and the regulation of the financial markets, the increasingly open and free market environment to create opportunities for enterprises to develop new markets. Among them, the new environment for the enterprise multinational business and cooperation to create unprecedented conditions, the enterprise can not only create or buy a new subsidiary in different countries implement transnational operation, can also with suppliers and subcontractors are located in different countries signed a contract to reach a cooperative relationship, for the network on the formation of enterprise organization economic conditions.

With the development of information technology and the widespread, real-time global enterprise production management possible. In fact, scattered in the department of information technology will enterprise closely linked together. The use of modern information technology to reduce the cost of data transmission, will help you in positioning the foreign departments, enterprises and promote the relationship between the domestic and international partners. In addition, the integration of scattered with diversified forms of local knowledge and ability, information and communication technology also plays a fundamental role, for the formation of the network organization has created good technical conditions. (Klein, et al, 2015)

In the production mode of the Fordism a crisis, the government, the market deregulation and the advent of information technology widely spread and so on various factors, integrative enterprise group gradually developed into a large production purposes together around the products and services of network organization. Networked organization of some function units by the core enterprise, while the activities of the other functional units by contractual relationship (partnerships, subcontract licensing and franchising) together. Core business only their best business, focus on the core competitiveness, surrounding to enhance innovation ability and achieve strategic goals better realize enterprise globalization. At the same time, the core enterprise by building enterprise network, through a contractual relationship, the product of the production and commercialization, and other are not good at or poor earnings of outsourcing to other companies do. Among them, the transaction costs as the main measure of network enterprise development, and compared with the tangible assets, the value of the networked enterprise organization increasingly rely on intangible assets such as intellectual property.

Compared with the traditional enterprise organization form, network organization can be more flexible to adapt to the change of market demand and the social environment, have more flexible features, concrete manifestation for external and internal flexible two kinds. Internal flexibility refers to the networked enterprise organization members when dealing with the enterprise internal management work more flexible, focus on research and development, the core management staff in financial and administrative department, and based on different forms and other types of employment contract management work. External flexibility refers to the networked enterprise organization members at the international level management capital the choice of more diversity, free flexible management of human, financial and technology assets.

3 Open Innovation and the Composition of Networked Enterprise Knowledge Capital

3.1 The open innovation

Innovation plays an important role in the process of enterprise development. In response to the increasingly severe economic pressure and market environment, innovation creates a huge value for enterprises to gain market competitive advantage via providing a new developing perspective, meanwhile becomes an important driving force to promote the development of enterprises. Not only that, nowadays, innovation has become an important propeller to accelerate national economic growth and social development, and plays a key role in all aspects of modern life. (Rubera, et al, 2016)

In recent years, a new mode of innovation, which is called *the open style innovation*, has become more and more popular, and has gradually dominated the innovation ecosystem. (Saguy, Sirotinskaya, 2014) To investigate the existing knowledge creation process, a typical open innovation model, is the co-creation of each functional unit of the network enterprise. (Xu Ruiqian, Gong Limin, 2011) The

concept of open innovation pioneered by Henry Chesbrough in *Open innovation: the new rules proposed*, he believes that open innovation is "from within or outside the organization or enterprise value idea, and this idea can be from the organization or enterprise internal or external to the market" (Mladenow, et al, 2014). Subsequently, Henry Chesbrough and Wim Vanhaverbeck coauthored *A new paradigm of redefining: "*Use purposeful knowledge to flow in and out to accelerate internal innovation, and to expand the market for external use of innovation" (Naqshbandi, et al, 2015). According to Henry Chesbrough, since the end of twentieth Century, open innovation has replaced the closed innovation, which has become the main innovation model for enterprises. In the closed innovation mode, the financing, creation, development and sales are carried out in the closed internal logic. This innovation model is a linear innovation model and was once popular back twentieth Century, that is, innovation is the result of a series of steps separation. At the end of twentieth Century, with the increasing mobility of highly skilled workers, booming private investment firms, ideas of new internal market possibilities, external suppliers growing ability, open innovation gradually obtained popularity. (Wu Qiang, 2010)

In the open innovation model, the knowledge creation and the whole innovation process of enterprises are promoted by the research, design, manufacture and marketing services. In this innovation chain model, innovation is the result of the interaction between knowledge and market, and the systematic connection. The open innovation model emphasizes the importance of the organization network in the enterprise development, and thinks that the enterprise organization network is the factory and the booster of knowledge creation. (Schroll, Mild, 2012) Moreover, it is in the organization network, that enterprise has gradually formed its own innovation potential, the knowledge capital. It can be seen that the formation and development of network enterprise organization is based on the open innovation model.

In recent years, open innovation has become the key to competitive advantage, enterprises through a combination of internal and external ideas, open access to knowledge, the use of external technology and solutions, purchase or license inventions, and gradually expand the market share.

3.2 The composition of knowledge capital in networked enterprises

Knowledge capital is the collection of science and technology knowledge, a combination of information from several companies for production purposes and creation, acquisition, combined with systematic together. Intellectual Capital is a dynamic concept, with the gradual dissemination of information, intellectual capital will become increasingly rich. Knowledge capital knowledge relating to a plurality of associated enterprises accumulated or is used in the production process and the value creation process. Value creation is the enterprise knowledge into the main objective of capital. In the process of value creation, corporate capital by way of knowledge include the following two: First, the use of its intellectual capital in the production process; the second is to sell knowledge manner intellectual capital transferred to other companies, so that later knowledge companies can use the library of intellectual capital in the production process. In such cases, intellectual capital is an important resource production or to improve product and service quality, is an important tool for companies to reduce production time.

In recent years, with the increasing popularity of open innovation, networked organizations paid more and more attention to the construction of knowledge capital. In the promotion of innovation in economic development, one of the challenges faced by enterprises is how to build an organization network, as the innovation and development of organizations is deeply affected by the interaction network of each functional unit. (Kovács, 2015) In order to expand intellectual capital accumulated, the networked enterprise organization of each functional unit is usually adopted to create, to seize the scientific and technical knowledge of the strategy, mainly including internal and external ways. Internal mode refers to the investment and management of human resources, R & D, tangible and intangible resources by network enterprises. The external method is divided into two types: the network enterprise organizations each functional unit in the form of joint venture to establish equity relations, in the form of contract and more informal relationship established non-equity relationship. The purpose of these strategies is to reduce the cost, risk and time of technological progress, so as to improve the return on investment in the field of science and technology. With the process of the development of technology is increasingly complex, the external way to achieve this goal has become increasingly obvious, which shows that collective innovation helps to save innovation costs and reduce the risk of innovation. In another word, the networked organization of each functional unit will be based on a low cost, low risk way to develop external knowledge capital, out of the purpose of profit.

4 The Transformation of the Traditional Function of Intellectual Property Rights to the Coordination Function

4.1 The traditional functions of intellectual property rights

Intellectual property rights include patent right, trademark right, copyright and trade secret right and so on. The patent right is the temporary monopoly power of the inventor.   As long as novelty and creativity is involved, and can be used for industrial, all the product or process can become a patented invention. The trademark rights protect commercial products and services from their products and services in producing or selling the logo, it includes source of commodity's name, symbol, three-dimensional symbols, sound, color or the combination of elements above. Copyright protects the works of creators, including the expression of the existing form of writing, music, art, etc. The right of trade secrets is to protect individuals and enterprises from other 's taking improper means to steal trade secrets.

By saying that intellectual property has two kinds of traditional functions, the general theory defines them as incentive / defense and offensive function. The incentive / defense function refers to the legal system of intellectual property rights that granted enterprises' temporary monopoly to recover its investment in the development of new products and services, and encourage enterprises to innovate the new functions, and ensure the enterprise to defend their rights in tort cases. The offensive function is an important source for enterprises to use the intellectual property to realize their own value. It refers to the enterprise actively license others to use its intellectual property rights to seize or maintain the market competitive advantage, and to obtain the largest market share. It usually operates through the development of basic patent technology, active lawsuit against competitors or strategically charge of patent licensing fees, (Zhan Ailan, 2012) so that they can build a market entry barrier which helps to improve the threshold of competitors' entering the market and beat the competitors. In addition, with the gradual popularity of network organizations, the another function of intellectual property rights is becoming increasingly important, that is, the coordination function we are going to talk about, the following will be for this function in detail.

4.2 The coordination function of intellectual property rights

Modern economic theory emphasizes the function of property right in coordinating the activities of enterprises and the allocation of resources. In Kos's theorem, it is believed that the coordination of corporate relations will help to realize the effective allocation of resources in the context of the definition of the property rights and the absence of transaction costs. (Cheng Chengping, 2009) Transaction cost theory and incomplete contract theory point out that in the case of the existence of the specific assets and incomplete contracts, enterprises adopt vertical integration strategy to present a more efficient transaction and organizational form. (Yang Hongli, 2012)

Different from the traditional enterprise organization, the development of network enterprise organization involves the introducing products and services into the market. Influenced by imperfect competitive factors like information retrieval ability, supplier selection, contract negotiation and execution, the development of the network enterprise organization reveals the transaction cost of the enterprise. In addition, taking the importance of the ownership of intangible assets in the network enterprise organization into account, I prefer the opinion that intellectual property plays an important role in coordinating the activities of network enterprises.

Network enterprise organization can help to clarify the relationship between the enterprise organization and network with the help of the intellectual property rights, and can reduce the transaction cost between the core enterprise and other functional units. It is because of the existence of patent right, trademark right, copyright and other intellectual property rights, that the core enterprise can build its own reputation which indicates the quality of the enterprise's products and services based on its intellectual property rights. In the subcontract and the franchise contract cases, core enterprises can all others functional units use patent including trademark rights, copyrights and other intellectual property rights, in form of licensing intellectual property rights, which promote the diffusion of patented products, intellectual property investment and innovation, and promote the development of complementary inventions. The spread of intellectual property rights in the enterprise encourages the production of specific assets. In the development of partnership situation, due to the fact that the specific asset is co-creative and the core enterprise and other functional units share the patent assets, reduce the opportunism behavior between partners may exist.

In short, the network enterprise organization can make full use of the coordination function of intellectual property rights and reduce transaction costs, so that the transaction between core enterprise

and functional units of network enterprise organization can be promoted.

4.3 The relationship between traditional function of IPR and coordination function of networking firm organizations

Though the coordination function of IPR plays an increasingly important role in the development of networking firm organizations, the coordination function of IPR does not hinder the achievement of the traditional function, it even promotes the improvement and development of traditional function. In the process of implementing open innovation for networking firm organizations, coordination function of IPR helps to practice its incentive/defensive function and offensive function.

4.3.1 The relationship between coordination function and incentive/defensive function

In networking firm organizations coordination function (reducing transaction costs) and incentive/defense function (creating new knowledge) are closely linked. From the perspective of coordination function, the networking firm organizations can be able to allocate resources more efficiently by means of IPR. From the perspective of incentive/defensive function, by granting ownership of trademarks, patent right, copyright and trade secret right to the owner of IPR, the legal system motives innovation, and providing possibilities for a new round investment of networking firm organizations. Besides, IPR also helps stimulate enterprises to invest in knowledge production while facilitating the allocation of effective resources. The former belongs to the category of incentive function of IPR while the latter belongs to the category of coordination function of IPR. Thus, it is clear to see that the coordination function is beneficial to the implement of incentive function. With the rise of open innovation model, the two parts would enjoy an increasingly close relationship.

Collective creation of knowledge capital in networking firm organizations concerns the coordination of relationship between core enterprises and other functional units in networking firm organizations, and IPR plays an important part in the process of coordination. This point can be proved by the growing licensing agreement of IPR in recent years. According to relevant research, the volume of patent licensing agreement signed by 60% interviewed enterprises is on the rise, over 70% interviewed enterprises incline to sign more licensing agreement in 5 years ahead. [1] Some other empirical studies also show the importance of IPR protection in the cooperation strategy, including outsourcing, adopted by networking firm organizations, which thereby demonstrates the function of reducing transaction costs of IPR. To be specific, IPR's coordination function illustrates the relationship among functional units of networking firm organizations, thus facilitating the decrease of transaction costs of networking firm organizations and stimulating the collective creation of knowledge capital. Therefore, IPR not only coordinate the relationship among functional units in networking firm organizations, but urge the cooperative investment of functional units and an inside transfer of technology.

Besides, coordination function of IPR is beneficial to solve issues caused by traditional incentive function. IPR system based on incentive theory inclines to strengthen IPR protection, taking powerful IPR protection as an important guarantee to encourage innovation. However, over-protection of IPR may lead to monopoly of knowledge capital, hindering the spread of knowledge of science and technology, and finally doing harm to innovation. The most typical demonstration is that overwhelming IPR protection would bring a bulk licensing agreement signed among functional units in networking firm organizations, thereby increasing innovation costs of networking firm organizations accordingly. Therefore, in order to deal with issues caused by over-protection of IPR efficiently, networking firm organizations should bring coordination function of IPR into full play and thus reducing transaction costs, achieving optimal allocation of resources in a better way.

4.3.2 The relationship between coordination function and defensive function

In networking firm organizations, the structure of knowledge capital illustrates contractual relationship between core enterprises and other functional units in networking firm organizations. Other functional units in networking firm organizations may focus on SMEs in certain fields, but in general, these functional units are more possible to compete against large size enterprises and core enterprises. To reduce development period, core enterprises and other functional units of networking firm organizations try to share R&D costs of new products and new process, which contributes to the main reason of the formation of networking firm organizations. This shows the system of networking firm organizations usually involve a large number of IPR owned alone or partly, by different cooperative

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enterprises, under such circumstances, coordination of IPR become especially important. Following would detail with an example of patent right.

With the emergence of new technology and development, the enterprises typically promoted the development of patented technology in dealing with the change of market environment and tried to obtain patent competition advantage in the fierce market competition, so a large number of patent technology appeared. In the process of the development of new technology, each functional unit of networked organization usually involves obtaining patent authorization and permission problems. In view of the existence of a large number of patented technology, the functional units of networked organization, especially the subcontracting enterprise may get into trouble of "patent jungle", which means the subcontracting enterprises may need to obtain the licensing of all patent technology they need that belonged to different people, in order to use the new patent technology. In this case, the subcontracting enterprises must find all the intellectual property owner and signed a large number of expensive patent licensing agreements, in order to use the new patent technology. The existence of the "patent jungle" obviously unfavorable to subcontracting enterprises to use patent technology, and even hinder the spread of patent technology and the development of the industry. Not only that, "patent jungle" has also led to a trend of gradual growth of the quantity of patent infringement and patent litigation.

Academic and practical circles put forward a lot of plans to solve the   problems above, including the exploitation of the patent compulsory licensing system and non-proprietary licensing system, adjusting the patent protection period and protection scope and so on, which in an attempt to coordinate the relationship between the innovation and spread knowledge.(Zhang Weijun, 2009)In addition, some research results put forward the solution for the construction of a patent pool(Zhu Xiangyu,2015), which is typical embodiment of advocating network enterprises and playing intellectual property rights coordination function. A patent pool is a consortium of at least two companies agreeing to cross-license patents relating to a particular technology, organization members between each other enjoy their one or more patent licenses, or to a third party license one or more patents (Wang, 2016). Nowadays, patent pool has become quite common in the countries all over the world. However, as the patent pool is growing stronger, there are more and more controversy. Supporters thought that the patent pool could eliminate patent authorization in disorder, reduce the transaction costs in the patent license, reduce patent disputes and lawsuit cost, etc. (Li Yan, et al, 2013) Opponents argued that the patent pool seriously hampers free competition, causing market monopoly and unfair competition. Before clarifying the positive role and negative effect of patent pool, the author thinks that we should distinguish the role of the patent pool on the basis of the composition of the patent pool.

Firstly, if the patent pool involved in a competitive patent (alternative patent), so this kind of patent pool could trigger monopoly and unfair competition behavior, such as making high licensing prices, making high profits with invalid patent technology. Secondly, if the patent pool is only consisting of obstacle or complementary patent, then the patent pool can have obvious positive effect, which not only helps to remove obstacles authorization of patent implementation, also helps to reduce the transaction costs in the patent license and reduce patent disputes and reduce litigation costs at the same time.

Since the 1980 s, the discussion of the patent pool positive influence emerges in endlessly. The most typical events is the guidelines released by the U.S. justice department and the federal trade commission in 1995 named Antitrust Guidelines for the Licensing of Intellectual Property, and the guidelines admitted "the beneficial effects on competition   of patent pool" [1][23], And the guidelines indicated specifically that Intellectual Property policy is beneficial to the competition in the situation of integration of complementary technology, saving transaction cost, eliminating the obstacle patent, avoiding high infringement lawsuit and promoting the knowledge dissemination. Therefore, the patent pool in favor of competition is closely related to intellectual property rights coordination function, which contributes to eliminate the obstacle patent problems, reduce intellectual property licensing transaction costs and reduce the risk of the enterprises, thus helps to encourage further innovation.

Furthermore, in addition to intellectual property rights coordination function, and patent pool is closely related to intellectual property attack function. In fact, all types of patent pool are likely to strengthen the oligopoly of knowledge capital. The formation of knowledge capital increasingly relies on interdependent relationship between the enterprises or organizations, and only a few enterprises can get high profits from knowledge capital, because only these enterprises separately or jointly enjoy patent while other companies need to get license from these companies. In addition to enterprise members

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enjoyed the intellectual property rights individually or jointly, other members of the network enterprise organization are not intellectual property owner, and they must pay licensing fees to use intellectual property rights. Not only that, the relationship between the network enterprise organization members have been identified since the patent pool forming, which formed in the network enterprise level while the enterprise members enjoyed the intellectual property rights individually or jointly become leaders in the network organization. The enterprises built market barriers to entry in order to maintain the highest standards of enterprise network and improve the competitor barriers to entry by controlling with the authority of the ownership of intellectual property rights. At the same time, these enterprises can also keep the market competitive advantage through taking capitals from intellectual property rights into a new round of technology research and development.

5 Conclusions

This paper analyzes the traditional intellectual property rights incentive/defense function, attack function and growing coordination functions on the basis of clarifying the networked enterprise organization and open innovation. In view of the development of network organization which depending on intangible assets rather than tangible assets, this paper concluded that the intellectual property rights have become an important tool to coordinate the development of the enterprise instead of tangible property rights, and further discussed the relationship between the intellectual property rights coordination function and incentive/defense function, the offensive function. First of all, through the analysis of the open innovation strategy of network organization, this paper concluded that the intellectual property rights coordination function helps to intellectual property rights incentive/defense function implementation and solve the problem derived from the incentive function. Secondly, based on this kind of special type of intellectual property rights to use patent pool as an example, analyzes the coordination of intellectual property and attack, the relationship between the points out that the intellectual property rights coordination function has become a part of the networked enterprise leadership strategy, create conditions for the realization of the function of intellectual property offense. Secondly, this paper uses the patent pool of this kind of special type of intellectual property use as an example, analyzed the relationship between Intellectual Property Rights Coordination Function and attack function, pointed out that the intellectual property rights coordination function has become a part of the organization leadership strategies of network, create conditions for intellectual property rights offensive function.

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Water Governance: The Future of Grow with Food and Water

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Abstract: Forecasts for the next four decades are warning about shortage of water and food, particularly in developing economies. The demand for food will increase because of population growth, especially in developing economies. The problem is compounded by the lack of water and reduction in food production. Today the consumption of water for food production is high because people do not realize that this is a scarce resource and that can definitely missing. We must create a policy for the management of water and that people are informed that it is not possible to use the feature without any control. The governance of water is important to establish ways and use control mechanisms and implementation of the resource in the various production processes. The waste during the manufacturing process is very high because: a) there is no control on the amount that should be applied to each type of agricultural product; b) the irrigation process is still done by equipment spraying water in large quantities; c) as water is still abundant for the current agricultural production in producing countries, there is no investment in machinery or equipment that can reduce water consumption; d) government authorities in developing countries do not plan and do not make any kind of control on the use of water or water governance; e) the food production process is carried out intensively and in large areas, it produces a single product and this requires large amounts of water.
Key words: Water governance; GDP; Food; Water shortage

1 Introduction

This article proposes a discussion around the issue of water use, today without any control by the consumer. The world population is now close to 7.5 billion and continues to grow. Population growth must accompany the increase in food production and this presses the use of available resources, water is perhaps the most basic resource; and already in countries like Yemen 50% of the population struggle daily to find or buy enough clean water to drink or grow food (Ward, 2014).

The waste during the manufacturing process is very high because: a) there is no control on the amount that should be applied to each type of agricultural product; b) the irrigation process is still done by equipment spraying water in large quantities; c) as water is still abundant for the current agricultural production in producing countries, there is no investment in machinery or equipment that can reduce water consumption; d) government authorities in developing countries do not plan and do not make any kind of control on the use of water or water governance; e) the food production process is carried out intensively and in large areas, it produces a single product and this requires large amounts of water.

In recent decades there has been more frequent climate change. Regions where the climate was defined by periods of regular rainfall began to have problems with the lack of it. This issue generated a pressure on this water resources, with consequent change in behavior the people because the water shortage is inevitable.

The statistics on the theme: water, are still alarming. We are the XXI century, the figures indicate that at least 780 million people do not have access to clean drinking water; some 2.5 billion people lack access to safe sanitation systems. In developing countries the problem primarily affects children. With a simple solution to provide clean water and sanitation systems this problem could be avoided every year (Cooley *et. al.*, 2013).

2 GDP – Gross Domestic Product

GDP - Gross Domestic Product should increase to keep pace with population growth. To maintain this growth in population was produced more food, clothing, medicine and other goods necessary for their survival. With this growing population will need to produce more and more food and other products. This growth will require greater use of all available resources, especially water for food production.

The agriculture sector is the largest consumer of water worldwide and water is a key ingredient either directly or indirectly in almost every good produced. After the global financial crisis in 2008, the world has recovered and the movement of goods between the countries increased. This confirms that globalization is still present, by such production and circulation of goods and services around the world

(UNESCO, 2015).

When a country imports food from another country, it is also buying the water that was used to produce that food. So, when consumers buy food that country imported, he is taking home some of the water that the exporting country used to produce that food.

The countries think of expanding world trade for the economy world is strengthened. The concern is the Increase in GDP and the higher the production of goods and services, higher will be the power of its economy.

When negotiations are made between nations for the import and export of goods and services, the concern with production factors as technology or machine, for example, has been introduced. So, this is a common negotiation process has been repeated over very many years. We did not find a concern with the water that will be used for direct production or indirectly of products that are at stake (Cooley *et al.*, 2013).

Table 1   GDP, Current Prices *(billion USD)*

Country	2013	2014	2015
United States	16,663.2	17,348.1	17,947.0
China	9,518.6	10,430.7	10,982.8
Japan	4,908.9	4,596.2	4,123.3
Germany	3,746.5	3,874.4	3,357.6
United Kingdom	2,712.5	2,991.7	2,849.3
France	2,811.1	2,833.7	2,421.6
India	1,863.2	2,042.6	2,090.7
Italy	2,131.0	2,141.9	1,815.8
Brazil	2,464.7	2,417.2	1,772.6
Canada	1,837.4	1,783.8	1,552.4
Korea	1,305.6	1,410.4	1,376.9

Source: IMF World Economic Outlook (WEO), April 2016

GDP at Current Prices or nominal GDP is the market value of goods and services produced in a country during a year. On the table are a GDP 2015, for example, USA a value 17,947.0 billion dollars, GDP a current prices, i.e., the price for goods and services by 2015 are value by prices 2015.

Table 2   Summary Results of Water Requirement Ratio and Comparison with Water Resources

	Total actual renewable water resources (km3/yr)	Irrigation water requirement (km3/yr)	Water requirement ratio (%)	Irrigation water withdrawal (km3/yr)	Pressure on freshwater resources due to irrigation (%)
Américas	**24 361.760**	**195.291**	**49**	**397.200**	**1.6**
Northern America	6 428.200	137.106	57	240.934	3.7
Central America and Caribbean	801.660	4.666	26	18.112	2.3
Central America	708.010	2.285	23	9.820	1.4
Caribbean: Greater and Lesser Antilles	93.650	2.381	29	8.291	8.9
Southern America	17 131.900	53.519	39	138.154	0.8
Andean	6 324.900	18.225	37	48.777	0.8
Guyana	363.000	0.695	39	1.793	0.5
Brazil	8 233.000	15.296	48	31.700	0.4
Southern America	2 211.000	19.303	35	55.883	2.5

Source: Irrigation water requirement and water withdrawal by country, November 2012 - http://www.fao.org/3/a-bc824e.pdf

The USA is the country that produces more goods and services in their territory and imports various products to supply the domestic market. The GDP has a value 70% higher than the second place is China in 2015.

Whereas agriculture uses 40% of water resources, we note that this volume of GDP is able to use a high amount of water for the production of goods and services both in the direct production process as in the indirect process.

Show the table 2 an estimated global water withdrawal (km3 per year, m3 per capita and as a percentage of total withdrawal) for Northern America the Water requirement ratio a 57%.

GDP growth will consume a greater amount of water for the production of food and other goods. If water consumption is not done within its own territory, the food that will be consumed by the population will have to be imported. When this food is imported, the country is buying indirectly certain amount of water that has been used where the food was grown (FAO, 2012).

3 Population and Foods

Food production will be sufficient to support a global population of 9 to 10 billion in 2050, although food and nutritional insecurity will persist in many regions. With this sentence with a bit of doubt content that The United Nations World Water Assessment Programme (WWAP) under the theme *Water for Sustainable Development* (2015) wants the world to prepare for a possible shortage of water and food.

The lack of food will not be because there are no resources to produce as seed or machinery and equipment, for example. Lack of food can happen because of population growth and, especially, because in many areas there is no water to produce the food.

The population is growing worldwide and can achieve a total of 10 billion people in 2050. Many of these people will live in urban areas by pressing the production sector of goods and services to increase production.

The production of goods and services use water both directly and in an indirect way. If not created policies of water management, it is possible that a region has problems with water shortages, while in another region may be a spare in sufficient quantity to export to.

Table 3   Population Density – Ranks (people per sq. km of land area)

Country	2014	2011	2010	2009	Country	2014	2011	2010	2009
Macao SAR, China	19073,1	18283,7	18000,9	17674,7	Mauritius	621,1	616,9	616,0	614,5
Monaco	18811,5	18594,5	18422,5	18175,5	San Marino	526,6	515,6	511,5	507,2
Singapore	7736,5	7363,2	7231,8	7125,1	Korea, Rep.	517,3	512,0	508,2	506,5
Hong Kong SAR, China	6896,9	6734,9	6689,7	6640,8	Netherlands	500,9	495,0	492,6	490,1
Bahrain	1768,7	1702,8	1655,3	1574,7	Rwanda	459,7	427,9	417,3	406,3
Maldives	1336,7	1256,7	1223,3	1200,0	Lebanon	444,5	429,0	424,0	408,8
Malta	1335,5	1300,8	1295,3	1289,0	India	435,7	419,6	414,0	408,4
Bangladesh	1222,1	1178,5	1164,8	1151,6	Burundi	421,2	381,2	368,4	355,8
West Bank and Gaza	713,4	652,3	633,1	615,0	Comoros	413,8	384,7	375,4	366,4
Barbados	659,0	652,6	650,2	647,6	Haiti	383,6	368,1	362,8	357,5

Source: https://knoema.com/search?query=Population%20density

The city of Macau in China has a territory of 30.3 sq. km, i.e. little land space for many people, according to the Table 3. Data the population density in 2009 was 17.675 people per sq. km, rising to 19.073 people in 2014 with growth trend because the results of the GDP of China (even though below expectations) projects average growth of 7% annually.

Population growth causes an urban concentration because people need work and goods and services. As shown by the table data, the population density is growing every year and the need for water does not appear in statistical data or issue being discussed in the political environment or in the form of water management policies.

In Burindi country the problem is aggravated by the size of its limited territory to 27.830 square kilometers and a population density of 421 people per square kilometer. This represents a total of 10,816,860 inhabitants in 2014 and 11.8% were urban population. The increase in urban population is inevitable. If government officials do not prepare for managing water, the problem is greater because

there is also a lack of food (IMF, 2016).

4 Food Demand and Water

By 2050 the world population expected to gain over 2.3 billion people. This means that the global demand for food will be pressed to increase grain production, for example. Although the growth rate of the population is decreasing, this represents an increase of almost two-thirds of the world population today (FAO, 2009).

Because of a number of influencing factors in the degree of development of some countries, a larger part of the total world population increase will be in developing countries. As the FAO report (2009), sub-Saharan Africa's population would grow the fastest (+114 percent) and East and Southeast Asia's the slowest (+13 percent).

The economic data projected by analysts to the growth of world GDP show that the developing countries will get a growth rate higher than the developed countries (The World Bank, 2014). This does not mean that the rates of malnutrition or starvation, especially for children in these countries will be lower than today.

With this population growth trend, an increase in GDP of developing countries and reducing malnutrition levels and hunger, it is natural that there is a higher demand for food for both people and for animals. Then the Demand for cereals is projected to reach some 3 billion tons by 2050, up from today's 2.1 billion tons today.

Table 4   World Water Distribution and Countries Fresh Water Supply

	Water volume (million km³)	Percent of freshwater	Percent of total water	Countries fresh water supply
Total water	1 386		100.00	Brazil, Russia, China, Canada, Indonesia, U.S., India, Colombia, Peru, European Union and the Democratic Republic of Congo.
Freshwater	35,0	2.53	100.00	
Glaciers and ice caps	24.4	69.7	1.76	
Groundwater	10.5	30.0	0.76	
Lakes, rivers, atmosphere	0.1	0.3	0.01	
Saline water	1 351		97.47	

Source: FAO, 2002; World Bank, 2014

Water is a key chemical for the life of most living organisms. It is used at the beginning, during and at the end of a production process. It is estimated that the world contains about 1 400 million km3 of water. Of this water, 35 million km3 (2.5 percent) are freshwater (FAO, 2002).

The table shows that around 2.53% is fresh water, concentrated in large quantities in countries revealed in the last column. In many areas this feature is not easy to achieve because it depends on the geographical location (mountains and valleys) and the distance where the river or lake and the city, which in general are great consumers.

For example, the large amount of available water in the polar ice caps or glaciers or deep underground soil is not accessible for use. To remove the water from great depths, it is necessary to invest in machinery, equipment and workers to remove this water.

Table 5   Approximate Crop Water Requirements to Produce Food Harvested

Crop/Food	Water Requirement (kg of water per kg of food produced)
Potato	500–1500
Wheat	900–2000
Alfalfa	900–2000
Corn/maize	1000–1800
Sorghum	1100–1800
Soybeans	1100–2000
Rice	1900–5000
Chicken	3500–5700
Beef	15000–70000

Source: Kirby; Bartram; Carr, 2002

Agriculture is the production sector that consumes more water, around 93%. The industry consumes about 4% and the rest is consumed by the population. The values shown in the table are approximate, possible variations with reality is because of the irrigation process employed in the specific region, what kind of care with the handling of the product grown and the creation of animals (FAO-AQUASTAT) .

The table shows that the production of meat consumes 15,000 to 70,000 kg of water per kg of food produced. This consumption is high because the production method should be considered since the birth of the animal, the process of killing and final marketing (Kirby; Bartram; Carr, 2002).

The cultivation time, i.e. how long it takes to get the product ready for consumption, is crucial to the volume of water consumption. The greater the time between planting and harvest, the greater the amount of water needed to make the product ready to be taken to the consumer market.

5 Water Governance

The purpose of this article is to discuss the need for water governance because the consumer has to be informed that water is a scarce resource and the use must be rational and controlled. This feature, which is essential for the survival of people and animals, may be missing and problems for society will be compounded with the possibility of food shortages.

The reasons for the effective implementation of water governance are essential today because:

● The growth of world population continues fast and could reach 10.0 billion in 2050, with an increase of almost two-thirds of the world population today;

● Urbanization grows at the same rate of growth of the world population. For example, the least developed countries will be those with the greatest contingent of people who will live in cities and this presses the consumption of food and other products;

● The growth rate of GDP in developing countries will be higher than the rates of other countries, on average between 4-6% annually;

● Consumption in developing countries will continue to grow, even if malnutrition and hunger are not eradicated. The increase of people living in cities, the growth of GDP and population growth, are sufficient indicators to increased consumption of goods and services;

● Increase in income because of the intensification of globalization, the expansion in relations between governments, bilateral and multilateral trade agreements and ease of mobility features;

These factors were selected for the discussion of water governance. There are other factors that affect the economic order, some contribute to the generation of positive results on the quality of life, while others produce negative results.

The governance of water must be formulated by a number of measures that governs the use of this feature, making the application in the most rational and economical production process, both as regards the volume and the cost of the production process, as can be seen in table 6.

Table 6   Some of the Key Pathways of Water Governance

pathways	discussion
water agreements and laws	establishing international water agreements and laws:
water resource management	financing water resource management and service delivery efforts
establishing and socializing minimum	establishing and socializing minimum and best practices for water resource development and management
technology and knowledge transfer	facilitating technology and knowledge transfer and conducting education and outreach programs;
evaluating water-related data	collecting, monitoring, and evaluating water-related data

Source: Cooley *et. al.*,2013, p.13.

For the purpose to be achieved, the suggested measures should be practiced by all involved. The governance of water must have the participation of all countries because international trade of food, a lot of water is exported while imported by countries in the form of a type of agricultural product, for example, what is called virtual water. In fact to produce 1 kg of cow meat, 15400 lts. of water are needed (water footprint).

The transfer of technology and knowledge to transform brackish water or non-potable water in a water of enough quality for human and animal consumption should be the goal of all countries. When this water governance measure is implemented in its entirety, the amount of diseases decrease.

Agriculture consumes large quantity of water (97% on average), it is also responsible for contamination and spread of disease through the use of contaminated water during the process of agricultural production. Kirby; Bartram; Carr (2002) the concern about the impact of agriculture on the quality of water resources is often related to diffuse sources – contamination by agro-chemicals, nutrients and hazardous microbes (pathogens) in particular.

Countries need to come together to create guidelines for the governance of water as a way to reduce the impact on the prices of agricultural products in periods of lack of rain or climate change in the producing regions.

The climatic phenomenon El Niño and others of the same nature, has caused injury to the production of various agricultural products to countries like India, East Africa and Malaysia. Sugar and palm oil prices have increased because of a drought in India and Malaysia. An adverse market reaction occurred in East Africa, where in the region the prices of agricultural products remained stable because of high inventory levels prior (IMF, 2016). Even in California the period between late 2011 and 2014 has been the driest in California history since record-keeping began and very severely affecting food production in the US.

When the stock of agricultural products diminishes, the price increases and losses for the world economy because imports will be more expensive. The price increase should reduce the volume of international trade and recession in countries that depend on export income of agricultural product.

The governance of water is important as a means to reduce the impact of natural phenomena and other problems caused by consumption without water control. Create control policies consumption, impose measures to reduce withdrawal of water from rivers and other sources of drinking water and facilitate the exchange of knowledge to treat brackish or salt water; are some policies that should be part of the governance of water and should be shared and applied by all countries.

6 Conclusions

The water governance must be made by all involved, both producers and final consumers and governments of the countries.

The actors involved must recognize their role in the process. The producer and the final consumer are polluters and should be charged to use water as a scarce resource and that has a social cost for their production and application in the production process.

Prior to the implementation of water governance, the people involved in the primary production process and final consumers should use rationally and avoid waste in all stages.

The agricultural sector is the largest consumer of water. In many regions, the equipment used for irrigation is not appropriate, increasing the waste. Use the proper equipment, know the geography of the area to know the amount of water available and where it is located, how much rain and at what time it happens; these are some simple steps and does not depend on water governance, but the awareness of users. Increased efficiency in the use of water at all stages of the production process and in day to day tasks of the people, is an important step to avoid total shortage.

The water governance should be implemented because people should be charged for their mistakes. The countries should unite to establish water governance together because the growing international trade, with import and export of products that use water directly and indirectly. The water used in a given country ends up being exported at a low price in the form of an agricultural product, for example.

Forecasts for 2050 indicate that GDP growth of less developed countries will be higher than the other countries. Thus, the demand for goods and services is expected to grow with the same intensity and this is not only by increasing the supply of products or per capita income, the other justification will be the growth of the world population is expected to reach 10 billion.

Unlike the growth forecasts of GDP, the increase in world population and urbanization, the existing drinking water on the planet is a little over 2.5%. Much of it is salt water or is in the form of polar ice cap, therefore, difficult access. To turn sea water into drinking water is needed the use of technology and knowledge. Countries need to come together to undertake the transfer of technology and knowledge for the benefit of all. This is also another issue that the governance of water can handle.

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Measurement on Coordination Degree Between Migrants' Population Development and Resource and Environment of Three Gorges Reservoir Area: An Empirical Study Based on Hubei Reservoir Area

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Abstract: This paper constructs a measuring index system on migrants' population development and resource and environment support system of Three Gorges Reservoir Area, based on the data of Hubei Reservoir Area (2007-2010), it puts objective weights on the indices using Entropy Method, calculates comprehensive development index of population development and resource and environment support system using linear weight sum method, and measures the coordination degree between migrants' population development and resource and environment of Three Gorges Reservoir Area. Through empirical analysis, this essay holds that the coordination degree between two systems of migrants' population development and resource and environment of Three Gorges Reservoir Area is increasing, and the overall level of coordinated development is also on the rise. The study may provide guidance for formulation of policies on regional development.
Key words: Migrants of Three Gorges Reservoir Area; Population development system; Resource and environment support system; Coordination degree

1 Introduction

The Three Gorges Project is one of the largest hydraulic projects in China or even in the world, which involves not only huge construction scale, but also tremendous quantities of migrants. Presently, sustainable development of migrants' population and migrants' communities of Three Gorges Reservoir Area is the focus of current work. The migrants have settled in the current residence from their previous residence. To make they live a better life than previously, it is pointed out by support work of post Three Gorges Project that the income level of migrants shall be improved by way of economic development. Life activities and economic activities of the migrants need support from ecosystem, and will reversely impact operation of the ecosystem. Since support of the natural resources stock to habitation and economic activities of the migrants is not unlimited, beyond a certain carrying capacity, the support function of ecosystem services will get weaken, which will exert a significant impact on surviving environment and living standard of the migrants, and will make the target of sustainable development even more impossible. Therefore, the coordination degree of ecological environment and human activities in the process of migrants making use of natural resources need to be considered. Variation in coordination degree will reflect directly the sustainable development level of migrants' population in the reservoir area. At present, the key difference of the evaluation method of coordinated development evaluation is the difference of evaluation index system. In previous studies, some scholars adopt the "driving force state pressure" (DSR) index system framework proposed by the United Nations Commission on Sustainable Development (Zhao Jingzhu,1995). Ceng Rong et al (2000) of the Chinese Academy of Sciences constructed a system consisting of three levels of internal, relevance and regulation to evaluate the coordinated development of population, resources, environment and economy in Beijing. Ma Qianhua (2006), Majun (2009), Xie Zhizhong etc. (2012), and Cao Bingru (2015),in different periods, from the perspective of sustainable development review the indicators of the economy, population, resources and environment system. In view of this, based on selection of reasonable indices from the perspective of systematic theory, the paper measures the coordination degree between migrants' population development and resource and environment of Three Gorges Reservoir Area with coordination degree evaluation method.

2 Index Processing
2.1 Index selection

Population development system and resource and environment support system are involved in

measurement on coordination degree between migrants' population development and resource and environment of Three Gorges Reservoir Area. Since both population development and resource and environment are multidimensional, one single index is difficult to reflect all aspects of the two systems, thus, this essay designs an index system based on the principles of comprehensiveness, operability and availability etc.

Migrants' population development system measuring indices are constructed in consideration of four aspects: population pressure, population structure, population quality and quality of life. Population pressure mainly consists of five indices: total population at the end of year, natural population growth rate, fertility rate, birth rate and density of population; population structure includes three indices: urbanization rate, proportion of practitioners of secondary industry and proportion of practitioners of tertiary industry; population quality consists of two indices including number of enrolled students among per 10,000 people and education expenditure per capita etc.; and quality of life includes six indices: GDP per capita, urban and rural residents savings, per-capita disposable income of urban residents, per-capita net income of rural residents, Engel coefficient and per-capita health expenditure.

Measuring indices of resource and environment support system consists of two parts, in which the resource support system is measured by six indices: per capita arable land area, arable land area at end of year, per capita output of grain, total crop sown area, utilization ratio of forest resources, and forest coverage rate; the environment support system is measured by six indices: discharge of industrial waste water, discharge of industrial waste gas, output quantity of industrial solid wastes, discharge standard-meeting rate of industrial waste dusts, domestic sewage treatment rate and the proportion of pollution control input to GDP.

2.2 Determination of index weight

There are many ways to determine index weight, and this essay is prone to adopt objective valuation, thus entropy method is used to determine the index weight of population development system and resource and environment system. The process is:

First, standardize indices by $x_{ij}' = (x_{ij} - x_j)/s_j$. In the formula, x_{ij}' is the value of index after standardization, x_j is the average value of j index, s_j is the standard deviation of j index; then, use coordinates translation (to eliminate the impact of negative number). $x_{ij}'' = A + x_{ij}'$ in the formula, x_{ij}'' is the value of index after translation, A is translation range; at last, calculate and determine the index weight by using the formula of entropy method.

3 Method

First, to determine whether the two systems coordinate with each other, comprehensive development level of the two systems need to be calculated. Linear weight sum method $s_i = \sum_{j=1}^{m} w_j \bullet p_{ij}$ $(i = 1, 2, ... n)$ is adopted in this essay for the calculation. So the comprehensive score of migrants' population development indices $f(x)$ and the comprehensive score of resource and environment support indices $g(y)$ are gained.

Then, construct coordination degree formula. Comprehensive development index of population development system $f(x)$ and comprehensive development index of resource and environment system $g(y)$ gained by linear weight sum method can construct the coordination coefficient of population development-resource and environment system.

$$C = \left\{ \frac{f(x) * g(y)}{\frac{f(x) + g(y)}{2}^2} \right\} k \qquad \text{(make K=2)}$$

It is known from the definition of coordination degree that the closer C is to 1, population development system $f(x)$ is more coordinated with resource and environment system $g(y)$.

$$T = \alpha f(x) + \beta g(y)$$
$$D = \sqrt{C \times T}$$

T is comprehensive evaluation index of population development and resource and environment, indicating the overall benefit or level of population development and resource and environment; α, β are undetermined coefficients, since it is held in this essay that population development and resource and environment are equally important, we make $\alpha = \beta = 0.5$. D is coordinative development degree (coefficient).

It is important to note that coordination degree itself only indicates the degree of coordination of

the system, but not reflects the level of system development. Therefore, coordination degree and system development level need to be considered comprehensively to determine D-the coordinative development degree of system.

Table 1   Evaluation Criteria of Coordination Level and Coordination Degree

Coordination level	Extreme disorder	Major disorder	Moderate disorder	Mild disorder	On the edge of disorder
Coordination degree C	0-0.09	0.1-0.19	0.2-0.29	0.3-0.39	0.4-0.49
Coordination level	Reluctant disorder	Primary coordination	Intermediate coordination	Good coordination	Quality coordination
Coordination degree C	0.5-0.59	0.6-0.69	0.7-0.79	0.8-0.89	0.9-1

4 Measurement and Evaluation

4.1 Index weight determination and standardization

Use entropy method to determine the weights of indices in the system based on the measuring index system on population development and resource and environment which has been constructed. And the result is as follows:

Table 2   Index Weight Table of the Population Development and Resource and Environment System of Three Gorges Reservoir Area

Target Layer	Function Layer	Index	Unit	Weight
Comprehensive Index of Population Development System	Population pressure	Total population at end of year	Person	0.074
		Natural population growth rate	%	0.07
		Fertility rate	%	0.064
		Birth rate	%	0.066
		Density of population	Person per km^2	0.071
	Population structure	proportion of practitioners of secondary industry	%	0.034
		proportion of practitioners of tertiary industry	%	0.042
		Urbanization rate	%	0.099
	Population quality	number of enrolled students among per 10,000 people	person	0.06
		education expenditure per capita	Yuan	0.062
	Quality of life	GDP per capita	Yuan	0.065
		urban and rural residents savings	Yuan	0.063
		per-capita disposable income of urban residents	Yuan	0.063
		per-capita net income of rural residents	Yuan	0.063
		Engel coefficient	%	0.05
		per-capita health expenditure	Yuan	0.055
Comprehensive Index of Resource and Environment System	Resource situation	arable land area at end of year	Mu	0.084
		per-capita arable land area	Mu	0.047
		per-capita output of grain	Person per ton	0.101
		total crop sown area	1,000 hectare	0.1
		forest coverage rate	%	0.071
		utilization ratio of forest resources	%	0.083
	Environment situation	discharge of industrial waste water	10,000 ton	0.075
		discharge of industrial waste gas	10,000 standard m^3	0.081
		output quantity of industrial solid wastes	10,000 ton	0.094
	Environmental governance	discharge standard-meeting rate of industrial waste dusts	%	0.104
		domestic sewage treatment rate	%	0.082
	Environmental governance potentiality	proportion of pollution control input to GDP	%	0.078

4.2 Calculation and analysis

In this essay, calculation is based on the data of Hubei Reservoir Area of Three Gorges Project from 2007 to 2010. After analyzing on the data, we can see the coordination degree between migrants' population development and resource and environment during this period changes from 0.393 to 0.907, the coordination level presents a good state. From the perspective of coordinative development degree, it changes from 0.2276 to 0.4381; the level is in continuous improvement. In accordance with the criterial of judgement in table 1, population development and resource and environment development of Hubei Reservoir Area of Three Gorges Project have reached relatively coordinative state, yet the coordinative development is still at low level stage. As analysis shows, between 2007 and 2010, all population development comprehensive scores are lower than 0.3, and all resource and environment comprehensive scores are lower than 0.2. This suggests that during the four years, population development and resource and environment development of Hubei Reservoir Area of Three Gorges Project are at low-level good-coordination state. In the meantime, compared with population development status, utilization rate of resources and environment pollution control efficiency have relatively lagged behind. The coordinative development trend between population development and resource and environment development of Hubei Reservoir Area of Three Gorges Project is shown in Graph 1. In the graph, resource and environment indices are lower than population development indices, indicating that population development level has been higher than resource and environment improvement level along these four years.
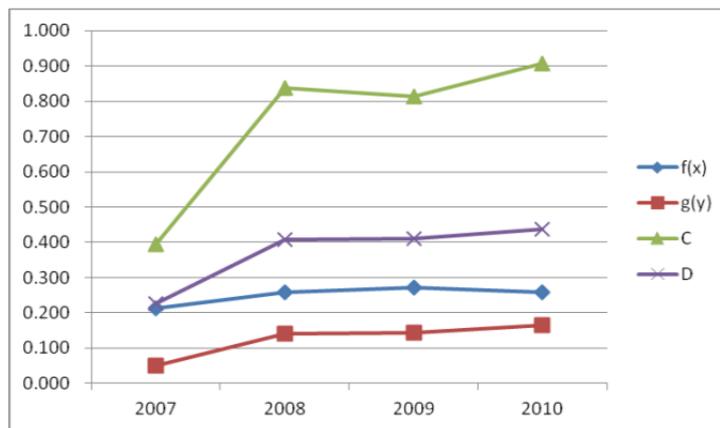
Figure 1   Coordinative Development Trend Between Population Development and Resource and Environment Development of Hubei Reservoir Area of Three Gorges Project

Compared with coordination degree, coordinative development degree is more reflective of the development level of population development and resource and environment system. Coordinative development degree is a static reflection of the coordinative development degree between population development and resource and environment, which cannot show the overall coordinative development trend of the system. And coordinative development trend index can be further calculated. The formula of coordinative development trend is:

$$\beta(t) = \frac{D(t)}{\frac{1}{t-T}\sum_{i=T}^{t-1}D(i)}$$

In the formula, D(t) is the coordinative development degree between population development and resource and environment system at the moment t, $\frac{t}{t-T}\sum_{i=T}^{t-1}D(i)$ is the overall average coordinative development level of a period between population development and resource and environment system from the base moment T to moment t-1. If $\beta(t) > 1$, it suggests the overall average coordinative development level of the system from T to t is in an increase trend; if $\beta(t) = 1$, it suggests the overall average coordinative development level of the system from T to t is in a stable trend; if $\beta(t) < 1$, it suggests the overall average coordinative development level of the system from T to t is in a fading trend.

Based on the above formula, through calculation we get the overall coordinative development trend index between population development and resource and environment system of Hubei Reservoir Area

of Three Gorges Project is 0.652 and 0.975 respectively in 2007 and 2008. And results show that the overall coordinative development level between population development and resource and environment system is in an increasing trend. The conclusion is in consistence with the data state of coordinative development.

5 Conclusions

Since 2007, both population and economy of Hubei Reservoir Area of Three Gorges Project have developed to some extent, as it can be seen that both of the comprehensive evaluation indices have a certain degree of improvement, but the coordination degree between them was at a stage of mild disorder at the beginning of 2007, and then rose gradually. The reason might be implementation of helping policies at the later stage of large and medium sized water resources reservoir area in China bring about economic growth in later years, which results in improvement of population quality, thus improving the coordination of the two systems; or it could be the environmental protection policies at Hubei Reservoir Area of Three Gorges Project has started to work gradually. In general, the coordination degree between population development and resource and environment of Hubei Reservoir Area of Three Gorges Project is continuously strengthened in recent years, and the overall coordinative development level is also increased. To further consolidate the achievement that has been gained, a road of green ecological economy should be stick to in Hubei Reservoir Area of Three Gorges Project in future. Grasp population development with one hand, and green economic development with the other, so that attention may be paid to improvement of population quality while economic development is stressed, also control over population size should earn due to attention, and only in this way can population development and resource and environment of Reservoir Area move towards the sound track of coordinated development.

Acknowledgement

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Biodiversity at the Ibero-American Countries: An Overview about the Natural and Social Aspects

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Abstract: Authors such as Brown (2009) and Sachs (2010) have been discussing the importance of biodiversity and the need to build a harmonious relationship between social capital, natural and economic. Thus, the aim of this study is to make an analysis of the Ibero-American region (AIBER), in which concentrate the greatest biodiversity on the planet. The 21 countries of the Ibero-American region were grouped using an analysis of variables with high explanatory power by principal component analysis. We conclude that there is an imbalance between the variables, noting a preponderance of the capital to the detriment of natural capital.
Key words: Biodiversity; Social; Ibero-American

1 Introduction

Many authors have discussed the importance of biodiversity for human well-being and the need to work it. Moreover, these questions have to work with a harmonious relationship between natural capital, social and economic as well. Scharmer et al. (2014) discusses the passage of a self-centered awareness for an ecocentric consciousness, especially regarding the organizational and social leaders in which this harmony is increasingly present. Thinking about it the aim of this paper that it is to analyze the countries of the Ibero-American region (AIBER). These countries concentrate the greatest biodiversity on the planet, namely Natural Capital and Social. Additionally, the purpose to this research was verifying the degree of relationship between the variables of interest.

The data offered by the Ibero-American Millennium Project - RIBER aims to: promote the study of foresight in Latin America through a community with skills, concepts, methods and prospective practices for analyzing and exchanging information about the different countries. These study also contribute to the collective learning of regional actors to develop skills in prospective, providing references of best practices in the region and the world as a whole.

The sample of study were the 21 Ibero-American, six are among the 17 top most mega-diverse countries, with 70% of the planet's biodiversity are: Brazil, Colombia, Ecuador, Mexico, Peru and Venezuela. Brazil is considered the country with the greatest biodiversity in flora and fauna with 15 to 20% of the biodiversity of the planet, so it can be said that the greatest biodiversity is concentrated in Latin American countries (MARQUES, 2014).

2 Theoretical Framework

Bloch (2005) states that biodiversity is the result of a process that began 3.5 million years ago, at the time that complex molecules began to multiply in the waters of the primordial sea. On the other hand, Franco (2013) based on Wilson (1997); Meime, Soule and Noss (2006), Sarkar (2002) and Lewis (2007) mention that the concept of biodiversity is a recent phenomenon that was set during the forum planning on Biological Diversity, National Forum on Biodiversity, held in Washington, 21 the September 24, 1986 by Walter G. Rosen in 1985, came the Society for Conservation Biology (SCB) and in 1987 published the first Conservation Biology journal issue, which has become the main vehicle for scientific communication on biodiversity.

According to the Convention on Biological Diversity - CBD (2000), biodiversity can be understood as the variety among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and ecosystems. Schaller (2007 apud Franco, 2013) points out that when the subject biodiversity emerged, It was associated with the preservation of species and their habitat, however, the author also said that these issues are directly related to natural, social and economic issues.

Guide Sustainable Public Management (GPS, 2014) brings the idea that is placed to the maintenance and preservation of biodiversity is settled by capital that group together, developing

networks and rules governing properly actions or events affecting biodiversity; The market is a short-sighted and invisible nature of both the social, as the green (Sachs, 2010).

Sachs (2010) believes that the relationship between society and nature promotes efforts to: the social is in charge, while the ecological assumed restraint and economic reattached in its instrumental role (GUIA GPS, 2014).   Brown (2009) proposes, from his book "Plan B 4.0", a global mobilization to save our civilization building a global economy to able to sustain economic progress and the creation of an honest market. It based on three interdependent goals: to stabilize climate and population eradicate poverty and restore natural stands of nature, such as water, soil and air. According to the author it is necessary to restructure the tax system by reducing taxes on labor and increasing on carbon emissions and other environmentally destructive activities.

To understand the relationship between social and environmental is necessary to understand Maslow's theory, she in that behavior is motivated by basic needs based on two groups: (1) deficiency, which are the needs: physiological, safety, love and esteem; and (2) growth, which are needs related to self-development and self-fulfillment of human beings. With that he tried to comprehend and explain what energizes, directs and sustains human behavior.

Maslow (1975) can only move from one level to another if that level is minimally satisfied, that is, when unsatisfied physiological needs of the individual organism is fully focused to meet them being unable to think of other needs. For example, a hungry person think about meeting their security needs is impossible, but as soon as satisfied minimally seeks to meet the need for security, then emotional-social, then self-esteem and last the need located at the top of the pyramid requires full satisfaction, it is the self-realization related to the need of every human being to grow and fully realize their potential.

Thereafter, Maslow added to his theory, the desire of every human being to know and understand and help others realize their potential. Demonstrating a natural human need to seek the meaning of things in order to organize the world in which they live. They are called cognitive needs and include the desire to know and to understand, organize, organize, analyze and seek relationships and meanings.

From needs as described by Maslow, Barrett (2006) developed a model with seven levels of consciousness to measure the values of an organization / company. According to the author the companies and firms with more self-performance are those that establish and preserve a worshiper guided by shared values, which all seek the same future vision, personal fulfillment and meet their physical, emotional, mental and spiritual needs. Barrett (2006) reveals seven levels of personal and social consciousness described in Figure 1.

Source: Barrett Values Center, 1997.
Figure 1   The Seven Levels of Personal and Organizational Awareness

Sen (2000) mentions that the poverty is seen such as deprivation of basic needs. Moreover, privation that causes premature death, malnutrition, illiteracy and other disabilities, according to the author, poverty affects not only the developing countries but also in affluent as Europeans who suffer from the fall in jobs that generates "social exclusion", with loss of freedom, autonomy, self-confidence, physical and mental health. Thus we see the influence of the pyramid of Maslow's needs and the seven levels of Barrett.

3 Data and Methology

This study aimed to carry out analyzes of the Ibero-American region (AIBER) the main theme Biodiversity - Natural and Social Capital, and verify the degree of relationship between the variables of interest.

The data in this analysis included, the 21 countries of the Ibero-American region (AIBER), it is shown in Table 1. These data are represented by synthetic and analytical indicators most relevant to allow analysis and conclusions on the theme Biodiversity, Natural and Social Capital, and assist those involved in ORIBER Project - Observatory RIBER.

The Ibero-American Millennium Project - RIBER aims to promote prospective studies in Iberoamerica through a community with skills, concepts, methods and prospective practices for analyzing and exchanging information about the different countries of the region; and contribute to the learning collective regional actors to develop skills in prospective, providing references of best practices in the region and the world as a whole.

Table 1   Countries of Ibero-American

Argentina	Dominican Republic	Panama
Bolivia	Ecuador	Paraguay
Brazil	El Salvador	Peru
Chile	Guatemala	Portugal
Columbia	Honduras	Spain
Costa Rica	Mexico	Uruguay
Cuba[1]	Nicaragua	Venezuela

This research topic submitted a total of 33 (thirty-three) variables, three categorical - Country, Country code and REGION; and thirty quantitative variables. However, this study only will use the 9 variables identified as high explanatory power, as shown in Table 2.

Table 2   The Variables of Interest for This Work

Variable	Description	Type
Opp (Opportunity) Nominal-Quantitative	Measures the degree to which a country's citizens have personal rights and freedoms .Opportunity also includes the degree to which advanced forms of education are accessible to those in a country who wish to further their knowledge and skills, creating the potential for wide-ranging personal opportunity.	Capital Social
Waterw (Water withd rawals as a percent of resources) Nominal-Quantitative	The ratio of total withdrawals to total renewable supply in a given area. Water available to agricultural, domestic, and industrial.	Capital Natural
Immi (Tolerance for i mmigrants) Percenta ge-Quantitative	The percentage of respondents answering yes to the question, "Is the city or area where you live a good place or not a good place to live for immigrants from other countries?"	Capital Social
Relig (Religious toler ance) Nominal-Quanti tative	A measure of 13 types of religious hostility by private individuals, organizations or groups in society, including religion-related armed conflict or terrorism, mob or sectarian violence, harassment over attire for religious reasons or other religion-related intimation or abuse.	Capital Social
Hdi (Human Develop ment Index) Nominal-Quantitative	Measures of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living.	Capital Social
Gov (Governance) N ominal-Quantitative	Consists of the traditions and institutions by which authority in a country is exercised.	Capital Social
Epi (Environmental P erformance Index) No minal-Quantitative	Measures of average achievement of Environmental Health: Child Mortality (probability of dying between a child's first and fifth birthdays), Air Quality, Access to Drinking Water and Sanitation. Ecosystem Vitality: Wastewater Treatment, Agricultural Subsidies, Pesticide Regulation, Change in Forest Cover, Coastal Shelf Fishing Pressure, Fish Stocks and Biodiversity and Habitat.	Capital Natural

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[1]Note: As stated, Cuba that was originally classified as a country in the Caribbean region, has been integrated in AIBER for analysis and results of this work.

Hpi (Happy Planet Index) Nominal-Quantitative	The HPI measures what matters: the extent to which countries deliver long, happy, sustainable lives for the people that live in them. The Index uses global data on life expectancy, experienced well-being and Ecological Footprint to calculate this.	Capital Social
Democ (Democracy Index) Nominal-Quantitative	The Democracy Index is based on five categories: electoral process and pluralism; civil liberties; the functioning of government; political participation; and political culture.	Capital Social

Source: Made by the authors, based on GPS Guide, World Bank, UNDP, WRI, SPI and Yale informations.

The data were compiled by the World Bank. The statistical software used in this study was Minitab and through him the following analyzes were performed: grouping by similarity (Dendrogram), Principal Component Analysis (dimensionality reduction) and One-way ANOVA (analysis of variance).

4 Data Analysis

The groups were conducted to demonstrate the degree of relationship of the variables presented in Table 2. The best packing arrangement was 4 clusters, using the method and complete the distance measurement by the Manhattan system.
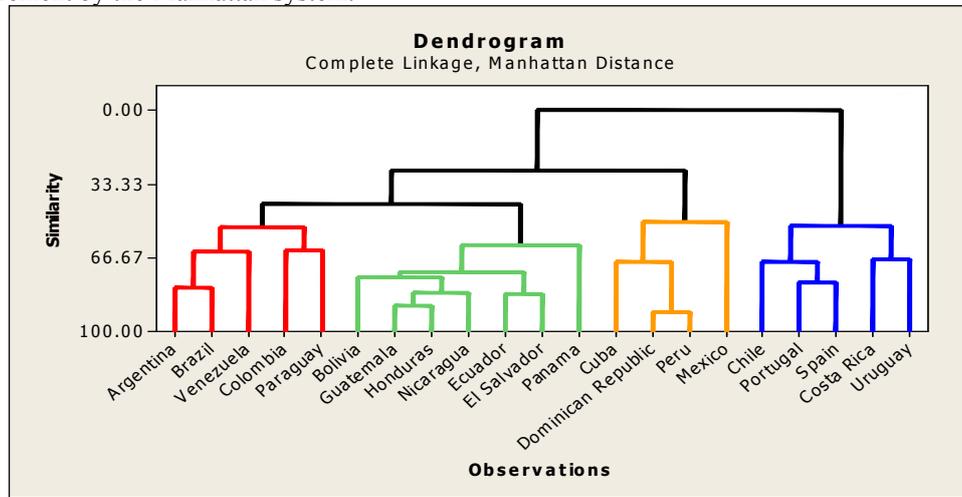
Source: by authors, 2016.
Figure 2   Dendrogram

Therefore, with the defined groups and set each country as a member of their respective cluster, was performed the One-way ANOVA analysis to understand the variability between groups and assist in the classification of countries. A second ANOVA was generated and ordered from lowest to highest average, according to Table 3.

Table 3   Clusters of the Average Order

Level	N	Mean	StDev	Color Cluster
1	7	54,346	10,462	Green
2	4	66,377	4,008	Orange
3	5	67,532	9,720	Red
4	5	79,098	7,065	Blue

Source: by authors, 2016.

Thus, to analyze which variables has been high explanatory power, an analysis of the main components was made, according to Hair (2009) the goal to this analysis is to find a way to condense the information contained in various original variables into a smaller set of statistical variables with loss minimum information.
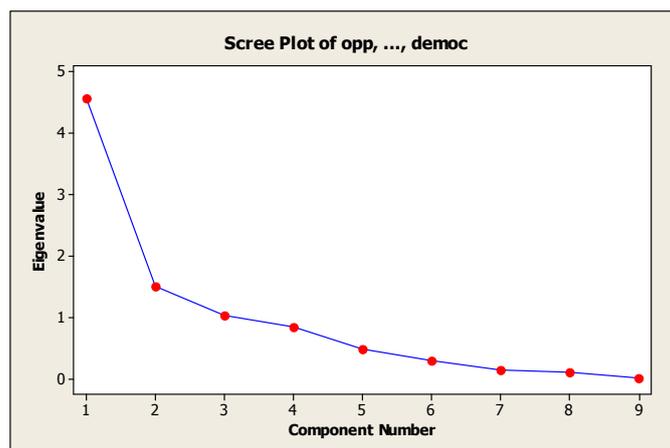
Source: by authors, 2016.
Figure 3 Principal Components Analysis

In the analysis, we see that the PC1 components, PC2, PC3 and PC4, explain 88.1% of the variability of the data. Las Casas and Guevara (2010) show that by convention components must only be considered with a contribution equal to or greater than 1. The AIBER countries were ranked in descending order by PC1 values, which led the ranking:

Table 4   Classification of the Ibero-American Countries–AIBER

COUNTRIES ORD	RANKING	PC1-NORMALIZADA
Spain	HIGH	100.000
Portugal	HIGH	93.662
Chile	HIGH	77.400
Uruguay	HIGH	75.803
Costa Rica	HIGH	62.569
Argentina	MEDIUM	55.208
Brazil	MEDIUM	49.868
Panama	MEDIUM	39.209
Mexico	MEDIUM	36.565
Peru	MEDIUM	34.660
Dominican Republic	MEDIUM	33.901
Colombia	MEDIUM	31.318
Paraguay	LOW	30.862
Bolivia	LOW	20.620
El Salvador	LOW	19.783
Ecuador	LOW	18.680
Venezuela	LOW	18.599
Cuba	LOW	9.896
Nicaragua	LOW	2.564
Honduras	LOW	0.045
Guatemala	LOW	0.000

Source: by authors, 2016.

We can say that due to closeness of the results in the ANOVA analysis, grouped to the countries of the clusters 2 and 3 in the table 4, it shows as "MEDIUM" on the ranking scale of countries AIBER. Figure 4 shows the map with the classification countries.

Source: by authors, 2016.
Figure 4   Classification Map of the Countries of Ibero-America–AIBER

In the analysis of the Ibero-American region, Spain and Portugal are classified in the top of the list (dark green), with the best results. On the other hand, when considering only the Latin American countries was positive especially Chile, Uruguay and Costa Rica. Seven countries were in the middle range of the table (medium green), notably Argentina, Brazil, Panama and Mexico. And in the bottom of the list (light green), with the lowest performances were highlighted, Guatemala, Honduras, Nicaragua and Cuba.

5 Conclusions

This study was carried out analyzes of the Ibero-American region (AIBER) Biodiversity thematic area - Natural and Social Capital, to check the degree of relationship between the variables of interest. Using an integrative view, it was considered here the theme of biodiversity widely, covering not only natural resources, but also considering the social and economic agents in this analysis.

Therefore, It is observed that as the pyramid of Maslow's needs and the seven Barrett's levels of consciousness, so that the individual has the capacity to engage in issues related to the environment, health of the planet and decreased injustice in the world, it needs first have their basic needs gotten.

With the results of analyzes, the countries of the region were classified according to their ability to manage and promote actions to take care of your assets from natural capital and social capital. Thus, countries such as Spain and Portugal made the top of list with the best results, and followed by them, are Chile, Uruguay and Costa Rica. Moreover, seven countries are in the middle range of the table, especially in Argentina, Brazil, Panama and Mexico. And at the bottom of the list with the lowest performances were highlighted, Guatemala, Honduras, Nicaragua and Cuba.

Sen (2000) points out that poverty is seen as deprivation of basic needs, these needs will vary according to the level of poverty in each country and how it is in the pyramid of Maslow's needs and range of awareness levels Barrett. Besides that, countries such as Portugal and Spain, are in a better row position of Chile, Uruguay and Costa Rica, they are countries with a higher HDI, namely that already have well-resolved way dimensions related to: Health (long and healthy life: life expectancy), education (years of schooling for adults and children) and income (standard of living measured by Gross National Income - GNI).

In conclusion, we can said that Guatemala, Honduras, Nicaragua and Cuba appear at lower levels need to care more care of these most basic questions. It was observed that the 9 most important variables for biodiversity only 2 "epi" and "waterw" are related to natural capital; while the other seven variables "opp", "IMMI" "Relig" "hdi" "gov", "hpi" and "democ", are more focused on the capital. So, this can strengthen the theories of Maslow and Barrett, however, fade the placement of Sachs and Brown that the

natural and social capital must go together in equal importance so that we can ensure biodiversity on the planet, as the authors state, a change in social paradigm it is necessary, we need to put the B4.0 plan in place as well as demystify the idea that, as stated Sachs, "the market is a short-sighted and invisible nature of both the social, as the ecological".

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A Research on Urban Households Potted Greening Product-Service System Design

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Abstract: This paper analyzes the current situation of potted greening products of urban households and concludes the problems and requirements of customers to purchase and consume greening products. By using the design method of product-service system, a service system of potted greening products for urban households is built. It provides service related to potted products for urban households. It also helps customers solve related problems in hopes of bettering the current situation of potted greening products and promoting the development of urban greening.
Key Words: Product-service system; Greening for urban households; Potted greening product; System design

1 Introduction

Home greening has a long history and continues impacting on people's daily life. With the popularity of pot culture, more and more people choose to purchase potted greening product to decorate their home. However, it is very common that potted greening products lose their values as time goes by. The reason is complicated. Different plants have different characteristics, such as vital signs, varieties and habits, but consumers are always lack of professional knowledge about it. Therefore, the solution is worth exploring.

As a newly rising way to provide more services to consumers, Product-Service System (PSS) has been paid widespread attention by researchers. As a result, possible solutions related to urban households potted greening product can be discussed through the design of PSS.

In foreign countries, many industrial design experts had started the exploration of PSS design. They have established related theories, research direction and hypothesis. Such as Sustainable Product-Service Systems (Robin Roy, 2000), Product-Service Systems and Sustainability: Opportunities for Sustainable Solutions (Ezio Manzini et al., 2002), A Strategic Design Approach to Develop Sustainable Product Service Systems: Examples Taken from the 'Environmentally Friendly Innovation' Italian Prize (E Manzini et al., 2003), Introduction to Product Service-System Design (Sakao et al., 2009), Product-Service System Design for Sustainability (Carlo Vezzoli et al., 2014). Many successful design cases have also been completed. In China, however, research on PSS design is in the initial stage, and there are few successful design cases. Some influential literatures include Service Design (Luo Shijian et al., 2011) and Service Design and Innovation (Wang Guosheng, 2015). Service Design focuses on the theory, process, method and practical experience of service design. It also states briefly about some strategies and methods of service system design. Service Design and Innovation reveals a new path to China industrial design as service design contributes new ideas to the design development in China. On the other hand, most academic references about potted greening product focus on garden art design, interior design or phytology. There is hardly any research on the actual needs of households potted greening product consumers. The research is much less on how to use the theory and method of PSS to design urban households potted greening product. Accordingly, this paper possesses quite significant sense in both theory and realism by discussing the problems related to urban households potted greening product from the point of view of PSS design.

2 Product-Service System Design

PSS is a new type of service-oriented system which focus on satisfying consumers' basic needs including health, transportation, entertainment, etc. PSS is defined as a system of products, services, networks of actors and supporting infrastructure that continuously strives to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models (Mont, 2004). The efficiency of PSS comes from the value of functional service rather than the product itself. PSS can be classified into three models based on the proportion between product and service. They are product-oriented PSS, use-oriented PPS and result-oriented PSS (Wang Guosheng, 2015).

Product is the core of product-oriented PSS. The product is made available in a different form to the customer, is sometimes shared by a number of users, but stays in the ownership of the provider. It is the usage of the product (so a service) rather than the product itself that is invoiced, without transfer of ownership. Use-oriented PSS means the separation of product possession and product use. Consumers can receive service without fully own the product. Result-oriented PSS is to provide final result for consumers based on their needs. The seller no longer sells a product to the customer but sells the desired result rendered by the product[1].

Urban households potted greening product is in the model of product-oriented PSS, since consumers receive services through possessing potted greening product.

3 Urban Households Potted Greening Product

3.1 Characteristics

Households potted greening product refers to greening product that grows in pot for indoor decoration. It is mainly consisted of planting container, cultivated substrate (soil or soilless substrate), and plants (flowers, vegetables, etc.). The following are four important characteristics of such products:

1) Life Sign

Since plants have life sign, households potted greening product is characterized by life sign. This makes consumers spend time and effort taking care of it in order to preserve its functional value.

2) Universality

Following the accelerated development of urbanization, more and more urban residents desire to a hint of green at home to bring themselves closer to nature. It can not only beautify the house but also improve the quality of life (Dai Jie, 1999). Consequently, a large number of potted plants have become a part of people's life.

3) Complexity

The complexity of urban household potted greening products are mainly embodied in three aspects. Firstly, it is hard to be systematized because of the varieties and classification of plants. For example, succulent plants which is popular with the public recently belongs to dozens of families. There are 50 families and 334 genus are known so far (Ye Fengjuan, 2013). Secondly, containers and tools related to greening product are various (such as flower pot, garden tool, etc.). Thirdly, Environmental factors that influence the growth of plants are complex. Besides the quality of cultivated substrate and the size of planting container, factors like permeability, temperature, lightness, water, nutrition, etc. can also impact on the growth of plants.

4) Uncontrollable lifecycle

The complexity of environmental factors directly leads to the lifecycle uncontrollability of potted plants. Once the environment is not suitable, the plant may die and the value will lose as well.

Household potted greening products are part of the flower industry. There are three main sales channels in China. The first one is flower market. It is also known as plants and pet market where most potted greening products are sold. It is located throughout medium sized cities and covers much area offering various products. The second one is supermarket. Supermarket becomes one of the main marketing channels in recent years. However, because of its limited space, it can only provide small sized potted plants that are popular among most people. There is less variety of potted plant in supermarket (Duan Yun et al., 2007). The last sales channel is retail flower shop. Potted greening products can also be found at scattered flower shop in cities. Even though the flower shop sells popular potted plants, cut flowers and bouquets are usually major selling products. Retail flower shop lacks of the variety of potted plants.

3.2 Current situation

Lacking of plants caring knowledge is always a pain point for urban households potted greening product consumers. They access to little assistance that can guide them in purchasing and caring the plants properly. The complexity of potted plants products also causes problems within after-sale service. Even though the products have an issue after purchase, customers can hardly blame sellers. Since consumers usually take the consequences, there is barely any after-sale service.

To solve this problem, many functional potted plants emerge in the market recently. Classified by the existence of electronic component, they can be divided into "lazy" potted plants and "intelligent" potted plants.

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[1] Christophe Sempels, Jonas Hoffmann. The role of value constellation innovation to develop sustainable service systems [EB/OL]. 2010 (http://www.unep. fr/scp/design /pdf /pss-brochure- final. pdf)

"Lazy" potted plants product uses siphon principle to keep the soil moist helping consumers who forget to water the plants. Although it has low price and high sales, it can only solve watering problem over a period of time.

"Intelligent" potted plants product uses electronic components to provide automatically watering, fertilizing and artificial light. The more intelligence the product has, the more electronic components it has. This may lead to some problems about energy consumption and service life. Considering the construction of the product, it is usually applied on small potted plants. Accordingly, it cost more and has less sales.

Whether it is a "lazy" potted plant or an "intelligent" potted plant, it can never replace a man completely to take care of the plants. Most functional potted plants can only solve simple problem like watering rather than eliminating the pain point of consumer.

There are some service platforms related to potted greening plants, such as online plants forum. It gives plant amateur an opportunity to communicate plants issues and help each other. Since such service providers are not producer or seller, they can't provide professional services or solve consumer's problem efficiently.

4 Potted Greening PSS Design Conception

To deal with above problems, this paper conceives a service model of household potted greening products from the point of view of PSS design. This model focus on connecting customers, service providers, product sellers and professional gardeners together through a service forum. It will help consumers access to assistance related to potted greening products.

4.1 Target user and related service providers

Urban residents who are fond of potted plants are the core customers of household potted greening products service system. They are also the target population and main service objects of household potted greening products service system.

In the service system of household potted greening products, the main service providers are the developer, operator and enforcer of the service platform. Potted plants sellers, registered gardeners, and logistical organizations are the stakeholders that directly relate to the service providers (Figure 1).
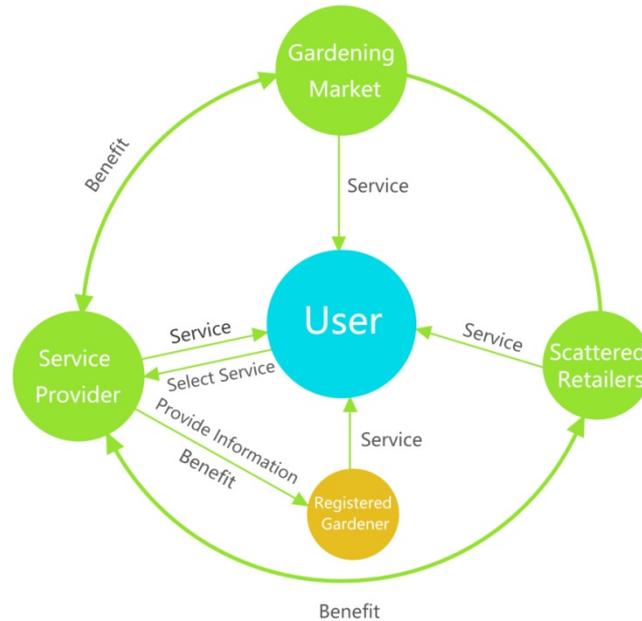
Figure 1   The Relationship of Target User and Related Service Providers

4.2 Service system requirements analysis

The requirements of customers will be elaborated and analyzed by function, interaction and emotion.

1) Functional requirement

Based on the pain points of household potted greening product consumers, the functional requirement for service system includes potted plants caring education, online consulting service,

door-to-door service booking and potted products accessories recycling. It will be convenient for customers if related caring knowledge are popularized, such as the habits of plants and basics on how to care plants. Online consulting service offers online assistance from professional gardeners to customers when they have planting questions. door-to-door service booking applies to problems that can't be solved by online consulting. Professional gardeners will serve customers in person after an appointment. Potted products accessories recycling is when service providers buy idle stuff related gardening from customers. Then professional gardener may clean up or transform them and bring them back to the markets. This will be a benefit for sustainable development of potted greening products.

2) Interaction requirement

Interaction requirement refers to the need between people and service system when they interact. Customers is served through the service forum that supported by software and hardware. If the forum with characteristics of potted plants products is easy to understand, the process of interface operation and other interaction will be smooth and satisfying. These are important aspects of the interaction requirement. household potted greening product service system must provide a cheerful interaction experience for costumers and help them solve problems.

3) Emotional requirement

Emotional requirement refers to the emotion generated during the process of using products or providing service (Luo Shijian et al., 2011). Household potted greening products service system design should focus on understanding the emotional needs of customers. For example, when costumers look for caring information of their potted plants, they can access to accurate solution in a short time, finding a sense of achievement and satisfaction.

4.3 Determination of service contents

Household potted greening products service system is designed to help urban household solve potted plants problems and promote the development of urban household potted greening products. Service content is defined through an analysis of the needs of costumers based on PSS design (Figure 2). This includes potted plant maintenance knowledge query, suggestion of purchasing potted products, online consulting service, door-to-door service booking, planting experience communication, recycle of potted products accessories, etc.
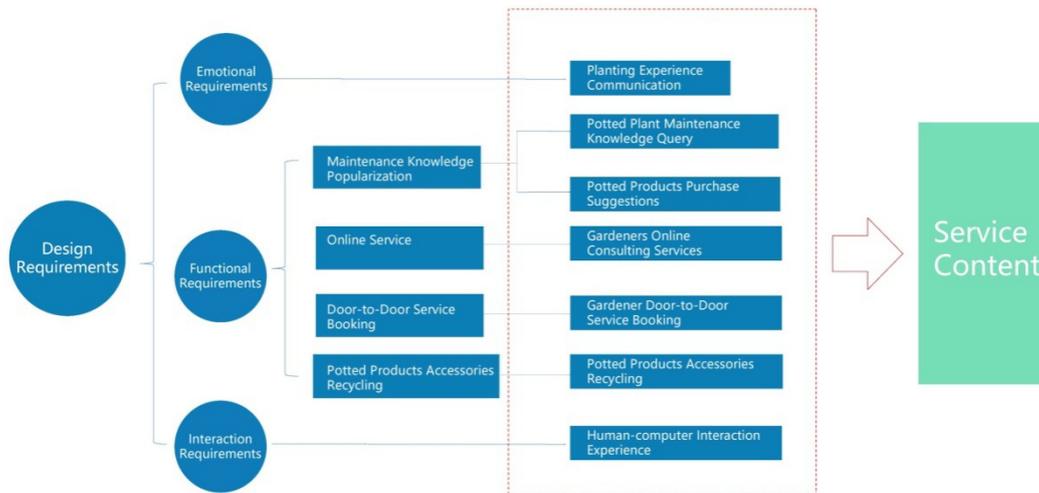
Figure 2   The Analysis of Service Contents

4.4 PSS platform design

The figure below is the representation of urban household potted greening products service system. The figure demonstrates the relationship among urban household user, gardening market or florist's, service provider, and system registered gardener. The figure also points out information flow, material flow, fund flow and service flow (Figure 3).
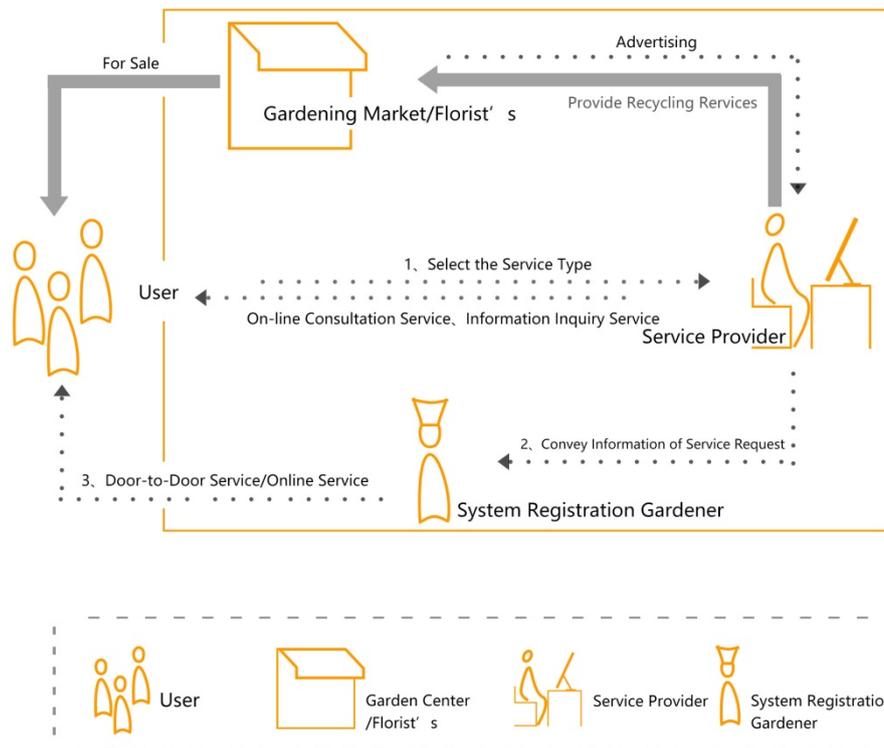
Figure 3   The Analysis of Product-Service System

Costumers choose the type of service based on self-requirement and service provider serve the costumers based on their selections. If customers choose online consulting service or door-to-door service booking, service providers will contact professional registered gardeners. Gardeners will continue to help the costumers with their problems. Service providers will buy recycled garden products from costumers then sell them to sellers who will post product information on the forum. The information will be used for other customers' purchase.

Online consulting service or door-to-door service booking connect registered gardeners and costumers together. Professional gardeners will improve authority and effectiveness of the entire service. The suggestion for potted plants purchase will provide customers with related gardening market or florists to connect consumers and sellers together. Exchange of experience and plant lover community will enable customers to help each other and promote the development of community culture. Personalized potted plants are designed to meet the need of personalization. This can not only satisfy consumers' emotion requirements but also leave memories.

Accordingly, the service forum of urban household potted greening products is the core that connects all the stakeholders together and meets the need of costumers. It is the main approach to realize the value of the products.

5 Conclusions

The problem of losing potted greening product value is very common in urban household in China. Depending on functional products can no solve the problem. Therefore, it is necessary to build a new service model by using PSS design theory and method. It provides services related to potted greening products for urban families. By solving the problems of costumers, current situation of urban household potted greening products will be changed and urban household greening will be improved.

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Analysis on the Performance of Innovation Environment Construction in Donghu Innovation Demonstration Zone Based on AHP

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Abstract: National innovation demonstration zone has become an important force to promote regional independent innovation and high-tech industry development. Regional innovation demonstration area to implement innovation leading strategy, and it makes the leading and demonstration on the development of the region in the policy reform, industrial development, technological innovation, economic contribution and innovative environmental construction. This paper takes the Donghu Innovation Demonstration Zone as an example, selects enterprises, universities and research institutions, experts, government agencies and intermediary financial institutions as the research objects, using the analytic hierarchy process to examine the effectiveness of innovation demonstration zone for the construction of the regional innovation environment, from the reform and opening up in advance, capital construction zone, personnel construction, science and technology new town construction and innovation a culture construction. Through the performance evaluation of the demonstration zone construction of innovation environment, it concludes that the construction of innovation environment effect of Donghu innovation demonstration zone is better, but the transformation of scientific and technological achievements, the superiority of resources utilization and evaluation aspects need to be further enhanced.
Key Words: Innovation demonstration zone; Analytic Hierarchy Process; Construction of innovation environment; Performance evaluation.

1 Introduction

With the rapid development of economic globalization and technology, technological innovation has gradually become the focus of economic development in the country and region. (Porter M E,1990) Chinese government stressed that the essence of the competition in comprehensive national strength is the competition of innovation. In order to improve the comprehensive national strength, we need to in-depth implementation of the strategy of innovation driven development, continue to promote science and technology, industry, enterprise, market, products and management of all aspects of innovation, accelerate the innovation for the formation of mainly to lead and support the economic system and mode of development. The construction of national independent innovation demonstration zone is conducive to improve the innovation system of science and technology, and it has certain radiation and leading role in accelerating the development of emerging industries and promoting innovation and development.

European innovation environmental research group (GREMI) put forward innovation environment is an important place to cultivate the creativity and innovation oriented enterprises, in the environment, whether enterprises is able to get technical know-how, local contact and local investment, close to the market, can get high-quality labor force, that decides the regional innovation factors. On the one hand, the evaluation of the innovation environment can help we find the effects of the environmental construction measures on different objects, on the other hand, it can provide the direction for the improvement and perfection of the innovation environment. Many scholars have studied the impact of the innovation environment construction on the regional innovation efficiency, and concluded that the innovation environment has important influence on the innovation activities. Braczyk and Cooke (2004) pointed out that the gap of regional innovation capability is related to the institution of the area. Li Xibao (2007) concluded that innovation environment such as industrial clusters, the support of local government on science and technology has a significant effect on innovation validity. Li Meng and Cai Jianfei (2012) set up the evaluation system of urban innovation environment based on the four subsystems of the policy law environment, the innovation foundation environment, the humanities environment and the innovation service environment. Zhou Mi, Liu Binglian et al. (2013) pointed out that the innovation environment can optimize the innovation process. Hou Peng, Liu Si Ming (2014) studied the impact of innovation environment on regional innovation capability from the system environment, factor conditions, demand environment and industry environment, and concluded that the

innovation environment has a positive impact on China's regional innovation capability.

According to the project measures of Donghu demonstration zone that in order to speed up the pace of innovation and promote economic development of the region, the Donghu demonstration area construction of environment of innovation performance was subdivided into five aspects: the performance of reform and opening up, the performance of construction of the special zone of capital, talent zone construction performance, the technological characteristics of the metro construction performance and the atmosphere of innovation culture. Select the main policies and measures from each aspect, we regard enterprises, universities and research institutions, experts, government agencies and intermediary financial institutions as the object to evaluate the effects of policies. Different people have different feeling in perception of the effect of the policy implementation, the degree of the policy and the degree of grasp of the subject. By using analytic hierarchy process to calculate the weight of each type of object to evaluate the problem, we can make a more comprehensive, reasonable and objective evaluation.

2 The Performance of Construction of Innovation Environment of Donghu Innovation Demonstration Zone

This paper adopts questionnaire method and AHP method on the innovation of Donghu demonstration zone construction environment drive performance evaluation. The questionnaire was divided into five dimensions according to the direction of environmental construction in Donghu demonstration zone: the performance of reform and opening up, the performance of construction of the special zone of capital, talent zone construction performance, and the technological characteristics of the metro construction performance and the atmosphere of innovation culture. According to the effect of the implementation of the relevant policies, the 5-6 problem is proposed for each dimension. Using the Likert-type Scale, the answer is divided into seven levels, denoted as 1-7 points, 7 points for the full agreement, 1 points to completely disagree. The survey is divided into five categories: enterprises, universities and research institutions, experts, government agencies and financial intermediary institutions. In these five categories, we select a certain number as representatives, participate in the questionnaire survey, and then sort out and analyze the results of the survey, as the basis for the evaluation of the performance of environmental construction.

2.1 Basic circumstance of the sample

170 questionnaires were distributed in this survey, 150 questionnaires were recovered, and 147 valid questionnaires were collected. There were 56 enterprises, 41universities and research institutions, 17 experts, 15 government agencies, 18 intermediary financial institutions, the proportion of sample distribution as shown in Figure 1.
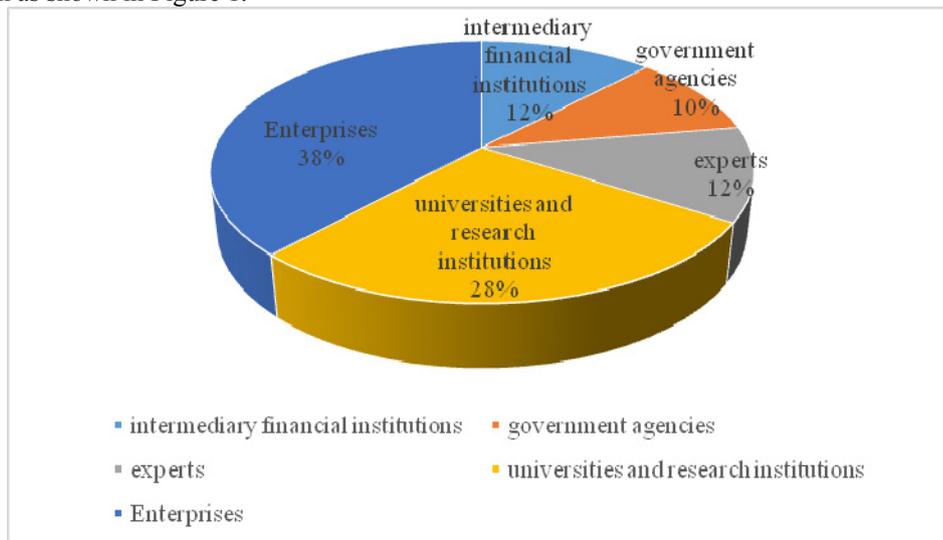
Figure 1   The Proportion of Sample Distribution

2.2 Performance evaluation of innovative environmental construction in Donghu demonstration zone based on analytic hierarchy process

1) Build the model. The innovation environment construction effect evaluation of Donghu

demonstration area as the target, the mark of the respondents as the basis for assessment, setting the actual perception of the policy, policy assurance and examining precision as a rule, the hierarchical structure model is established. (Figure 2)
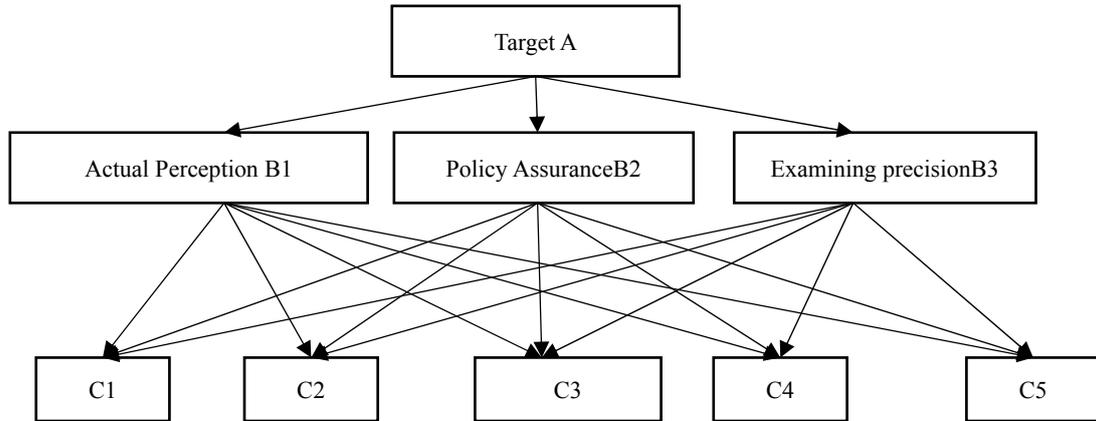
Figure 2   The Analysis Model of Donghu Demonstration Zone Innovation Environment Construction Performance Evaluation Level

2) According to the analytic hierarchy process, the results of the data are sorted out, and the performance evaluation results of innovative environmental construction in Donghu demonstration area are shown in table 1.

Performance Evaluation $=\Sigma$ (The evaluation scores from each organization$\times$Weight value of each organization)

Table 1   Performance of Innovative Environmental Construction in Donghu Demonstration Zone

	reform and opening up in advance	capital construction zone	personnel construction	science and technology new town construction	innovation a culture construction
	5.9798	5.8098	5.8312	5.7161	5.7794
Overall Evaluation	5.8226				

From Table 1 can be drawn, Donghu demonstration area of environmental innovation effect is recognized by the public, especially in the construction of the reform and opening up in advance, the registration system optimization, the administrative process simplification, the management system reform, platform sharing, etc. These policies provide more convenient and quality services for the various departments, and plays a positive role to promote the opening of the Donghu demonstration zone. The demonstration area plays a very good role in promoting to encourage demonstration area innovation activities by supporting high-tech enterprises preferential risk compensation fund guarantee policy support. In the culture of innovation and entrepreneurship, Donghu demonstration zone promotes enterprise innovation and Entrepreneurship by making the cultural atmosphere of "encourage innovation, tolerate failure". Organizing the Optics Valley Sports Culture Festival, Optics Valley Music Festival and other special activities to promote the exchange and learning between enterprises and talents.

3 Conclusions

This paper takes the Donghu Innovation Demonstration Zone as an example, selects enterprises, universities and research institutions, experts, government agencies and intermediary financial institutions as the research objects, using the analytic hierarchy process to analyze the effectiveness of innovation demonstration zone for the construction of the regional innovation environment, from the reform and opening up in advance, capital construction zone, personnel construction, science and technology new town construction and innovation a culture construction. According to the comprehensive analysis of the effect evaluation of the innovation environment construction in the demonstration area, it can be concluded that the overall innovation environment of Donghu demonstration zone has been widely recognized, and it also need strengthen and improve the scientific and technological achievements, the use of resource advantage and evaluation.

In order to improve the Donghu innovation demonstration zone elements aggregation and the

efficiency of the transformation, it can take the following measures:

(1) Innovative talents training mechanism. Donghu independent innovation demonstration zone is located in Wuhan which has rich educational resources and intensive universities, personnel factors have obvious advantages. In this paper, it is suggested that to improve the "Talent + Project + Platform" the innovative talents training mechanism based on the higher education institutions and scientific research institutes. According to the needs of the actual innovation of enterprises, set up the teaching mode and teaching content (Li Xiyuan, Zhou Can;2012), cultivate practical and high-end technical personnel, promote the development of public entrepreneurship.

(2) Quickening the transformation of Science and Technology achievements. Establish the intellectual property creation system that the enterprises as the mainstay, market-oriented, and production-study-research cooperation. Make full use of the effect from universities and research institutes in the creation of intellectual property in the forefront of new and high technology (Zhong Sheng, Wang Min; 2015). Focus on the establishment of incentive mechanisms for intellectual property rights, to increase the inventor of the patent incentive policies and independent intellectual property rights products government procurement policy. Establish intellectual property protection and service agencies, create a cultural atmosphere of respect for intellectual property rights and protection of intellectual property rights, it can improve the creativity of intellectual property rights of the demonstration zone.

Acknowledgement

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Research on the Management and Development of Canada's Arctic Fisheries Resources

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Abstract: Canada is one of the most important Arctic countries. The weather change makes its management and development of Arctic fisheries resources the focus of attention. The thesis, through searching and comparing the related articles in home and abroad, analyses Canada's current situation of fishery resources management, summarizing the effective methods of Canada exploring and utilizing its Arctic fishery resources. The research will not only improve the marine management process of Canada, but it also provides valuable reference for other Arctic nations managing their fisheries resources at Arctic, which will serve the purpose of constructing the system of sustainable development of Arctic fisheries resources.
Key words: Arctic; Fisheries resources; Exploring and utilizing; Sustainable development

1 Introduction

The Marine is becoming the focus of attention in the 21st century because the national and social development of every country is closely related to marine activities and marine management. Thus the whole world begins to set up, or have set up their marine policy for the new century.

Canada has the longest coastline in the world, most of which are located in Arctic and the abundant fisheries resources make Canada one of the most important countries among Arctic nations. Therefore, it is very significant to formulate and implement correct and effective management policy in Arctic region, protect Canada's Arctic environment and maintain the healthy and stable development of its Arctic ecosystem.

There are many essays relating the management and exploration of marine resources in Arctic. Angela C. Angell and John R. Parkins's paper lays the foundation for an informed and critical discussion regarding the unprecedented industrial development in the Canadian north and the corresponding socio-cultural health and wellbeing of northern people (Angela C. Angell and John R. Parkins, 2011). Kathleen A. Miller states that among the most important sources of 21st century stress for marine ecosystems will be the impacts of climate change, ocean acidification, and potentially growing competitive pressure on marine capture fisheries (Kathleen A. Miller, 2013).

And there are also some researches in China concerning fisheries in the Arctic. Jiao Min analyzes the status of Arctic Fisheries resources, and suggests strategies for developing fisheries. (Jiao, 2015) Chu Xiaolin claims that it is difficult to change the existing Arctic management pattern, but strengthening and expanding cooperation is a new path to achieve sustainable utilization of Arctic fishery resources and promote the healthy and stable development of the Arctic (Chu Xiaolin, 2016).

And recently, the ecosystem-based fisheries management (EBFM) has stirred an upsurge of the research for related theories and practice. Though people vary in defining the term of "ecosystem-based fisheries management", its final purpose is to construct a sustainable marine ecosystem. E. K. Pikitch believes that the overall objective of EBFM is to sustain healthy marine ecosystem and the fisheries they support (E. K. Pikitch, 2015). Zhang Yi-long introduces the concept, objective and principles of the ecosystem-based fishery management, and puts forward some opinions about how to improve the actual system of fishery management of China (Zhang Yi long, Mu Yong tong, 2006). Ecosystem-based fisheries management is not the transform but the improvement of the traditional fisheries management methods, which is of practical significance to Canada managing its fisheries resources in Arctic.

2 The Demarcation of Arctic Waters

Before the 19th century, the Arctic was only an untraversed and ice-covered continent, known for its vile weather. However, with the global warming, the ice in Arctic has been increasingly melting. Records show that within the past fifty years, the depth and the breadth of the Arctic ice covers reduce sharply and become more and more fresh. Even some scientists forecast that in the future thirty years, ice will not be seen in Arctic in summer. This phenomenon will obviously shed unprecedented influence to the Arctic fisheries resources and ecosystem, and at the same time, it will also enhance an opportunity for exploring and making use of the Arctic fisheries resources.

2.1 The geographical range of the Arctic and the Arctic waters

The Arctic usually refers to the Arctic region. According to geography, the Arctic region refers to the wide area centered on the north polar, which is within the Arctic Circle (66.33-degree north latitude). This is an area of 21 million square kilometers covering the Arctic Ocean, numerous islands, and the tundra among the north part of Asia, Europe and north America, of which the acreage of land and islands is 8 million square meters. [1]

The Arctic waters, from the point of view of the Arctic Council, refer to the water areas within the Arctic Circle.

There are more than 150 different fishes in the waters, among which gadus, the Arctic trout and the Arctic halibut are most common. Various prawns and plankton attract schools of whales to feed here.

While with the increasing melting of the Arctic ice layer, the exploration and management of Arctic fisheries resources is becoming a practical issue for many countries, especially those Arctic nations.

2.2 The Arctic waters of Canada

Canada is one of the most important Arctic nations, who holds two fifths of the land in Arctic and two thirds of the coastline, with a gross area of 3.5 million square meters and one hundred and ten thousand people living in the Arctic region. Thus, exploring and utilizing the Arctic fisheries resources is of great importance for Canada.

Figure 1   Canadian Arctic[2]

Figure 2   Canada Fishing Zones[3]

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[1] Xinhuanet.com. http://news.xinhuanet.com/ziliao/2006-07/13/content_4826007.htm
[2] Office of the Prime Minister. http://www.pm.gc.ca/
[3] Fisheries and Oceans Canada. http://www.dfo-mpo.gc.ca/regions/index-eng.htm.

Canada is one of the countries which possesses most abundant fisheries resources around the world. It is also one of the most important countries exporting fisheries resources. Till now, Canada has been commercially exploiting more than 45 marine fishes and algae.

There are generally six fishing zones in Canada, Newfoundland and Labrador; Maritimes-Scotia -Fundy; the Gulf; Quebec; Central and Arctic and Pacific.

The central and Arctic region is the largest of Canada's six fishing zones. Comprised of northwest territories, Nunavut, Albert, Saskatchewan, Manitoba, and Ontario, it would be the 7th largest nation in the world if it was a country.[1]

2.3 Canada and AC

Because of the abundant fisheries resources and the specialty of the area, it's very urgent and significant to manage and keep a healthy development of the fisheries resources in the Arctic.

Till now, there are many fishery organizations in this area, such as AC (Arctic Council), NEAFC (North East Atlantic Fisheries Commission), NAFO (Northwest Atlantic Fisheries Organization), NASCO (North Atlantic Salmon Conservation Organization), etc.

AC is the most important one among those organizations which is a high-level forum among international governments. It was established at Ottawa in 1996, composed of eight members: Canada, Denmark, Finland, Iceland, Sweden, Russia and United States of America. The Arctic Council is not a treaty-based international organization but rather an international forum that operates on the basis of consensus, echoing the peaceful and cooperative nature of the Arctic Region. The Council focuses its work on matters related to sustainable development, the environment, and scientific cooperation; its mandate explicitly excludes military security.[2]

It is Canada that first put forward the idea of constructing the Arctic Council. From Canada's point of view, AC must be an international organization that deals with politics, economy, military, diplomacy and environment. In 1996, Canada held the presidency when AC was established, and AC has been playing more and more increasingly important role among international affairs.

Canada has been participating in various multi-corporations in order that AC can be able to work through different kinds of challenges and opportunities in Arctic to enhance nations profits. On one hand, Canada practices actively in the affairs of AC and commits to improving the influence of AC among international affairs. On the other hand, AC is the main route for Canada appealing its Arctic sovereignty and exploring and utilizing the Arctic resources.

3 The Current Situation of Canada Exploring and Utilizing Arctic Fisheries Resources

At present, because of extremely harsh working environment and the cold weather, Canada is still at the lower level in exploring and utilizing Arctic fisheries resources. But with global warming, Canada holds more opportunities in making use of the resources. Thus, it is becoming one of the most important affairs of Canada government to explore and utilize Arctic fisheries resources correctly and effectively.

3.1 To establish a firm foundation to promote the maritime consciousness for exploring and utilizing the Arctic fisheries resources

Maritime consciousness is also ocean conception, which is the general understanding and basic point of view of the sea world. It is the overall cognition for human beings to their own survival and development in the process of marine constitution. Maritime consciousness plays a decisive role in enacting national marine policy, and it is the ideological basis and the premise for a government to formulate and implement its marine policy. Alfred Thayer Mahan indicates that "A nation's mightiness and development depends on its construction of marine culture and the strength and weakness."[3]

In 1970, the awareness of protecting Canada's Arctic sovereignty and Arctic ecosystem has been increasingly promoted, which directly results in the introduction of *Arctic Waters Pollution Prevention Act*

In 1982, *Canada Constitution Act* became formal effective, making Canada an independent country with integrated sovereignty. Since that time, Canada's maritime consciousness has been unprecedented booming and Canada being to identify itself as a marine country. At the third UN Conference on the Law of the Sea, strong maritime consciousness prompted Canada to raise proposals such as protecting

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1 Fisheries and Oceans Canada. http://www.dfo-mpo.gc.ca/regions/central/index-eng.htm.
2 U. S. Department of State. http://www.state.gov/e/oes/ocns/opa/arc/ac/.
3 Alfred Thayer Mahan. The Influence of Sea Power Upon History, 1660-1783[M].Dodo Press,1889,12.

continental shelf in Arctic Ocean and marine environment, etc.

From 1997 to 2009, Canada has laid down a series of laws and regulations, such as *Canada Oceans Act, Canada's Oceans Strategy and Our Oceans, Our Future: Federal Programs and Activities, etc.* All the documents focus on educating the youth to increase nation's maritime consciousness and improve their awareness of the importance for private contribution to protect the oceans.

On July 16, 2015, five countries that ring the Arctic Ocean, Canada, Denmark, Norway, Russia, and the United States, signed a declaration in Oslo, designing to prevent unregulated fishing in the central part of that ocean. The signatories therefore committed to permitting commercial fishing from their coasts only once an international mechanism has been adopted to manage the activity. Furthermore, they have agreed to cooperate in joint scientific research on the region's ecosystem.[1]

All the laws and regulations, to a degree, indicate that Canada has increasingly realized the importance of defending its Arctic sovereignty, protecting Arctic ecosystem and concordantly exploring and utilizing Arctic fisheries resources.

3.2 To lay down laws and regulations to provide strong guarantee for exploring and utilizing Arctic fisheries resources

Canada has the longest coastline in the world, most of which are located in Arctic. Canada possesses abundant fisheries resources in Arctic, thus it is vital to lay down a series of laws and regulations to protect Canada Arctic environment and maintain a healthy ecosystem.

AWPPA of 1970 is regarded as the first statutory document that Canada laid down to protect Arctic ecosystem. Canada began to make use of laws and regulations to implement its ocean management policy.

After signing the *United Nations Convention on the Law of the Sea,* Canada starts the stage of managing seas according to laws and regulations. Canada begins to lay down and implement marine-related laws and regulations, through which to institutionalize its marine policy. Because of Canada's increasingly perfect marine policy, Canada develops a marine integrated management system, centered on sustainable development.

Canada Oceans Act of 1997 makes Canada the first country that lays down and implement integrated marine legislation. The focus of the Act is to reiterate the importance of oceans to Canada and protecting Arctic ecosystem and realizing the final goal of sustainable development.

Canada's Oceans Action Plan of 2005 expounds its target in oceans actions plan is to coordinate and implement effective marine activities in order to successfully deal with the environmental pollution in Arctic area.

To lay down laws and regulations is the premise for implementing effective marine activities. Reinforce ocean-related legislation provide strong guarantee for Canada managing its Arctic fisheries resources.

4 The Future of Canada Exploring and Utilizing Arctic Fisheries Resources

Arctic possesses abundant fisheries resources and with global warming, the possible navigation of Northwest Passage provides both opportunity and challenge. Like all the other Arctic nations, Canada attaches more and more importance to the development in Arctic. Therefore, it is practically significant to implement effective methods to explore and utilize and manage its Arctic fisheries resources.

4.1 It is an important measure for Canada to reinforce international cooperation to explore and manage Arctic fisheries resources

From the international point of view, UNCLOS is the most important basis to normalize and coordinate global fishing activities and resources protection. Thus UNCLOS holds definite binding force for exploring and utilizing Arctic fisheries resources.

The Article 63 and 64 clearly stipulates the exploration of straddling fishes and migratory fishes, which apply to the management of Arctic fisheries resources.

In 1995, *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*[2] pays close attention to the fishing of those fish species, encouraging nations to lay down laws and regulations, or others measures to protect Arctic fisheries

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[1] Library of Congress. http://www.loc.gov/law/foreign-news/article/canada-denmark-norway-russia-united-states-fishing-declaration-covering-central-Arctic/.

[2] Brill Online Books and Journals. http://booksandjournals.brillonline.com/content/journals/10.1163/221160096x00418;jsessionid=i0k8ovn0vh65.x-brill-live-02.

resources.

In 1998, the Task Force on Sustainable Development was established in Iqaluit, Canada. Canada cooperated with Iceland and Denmark, issuing *Arctic Human Development Report* in order to improve people's understanding of Arctic.

Five countries that ring the Arctic Ocean, Canada, Denmark, Norway, Russia, and the United States, signed a declaration in Oslo on July 16, 2015, designed to prevent unregulated fishing in the central part of that ocean.

By cooperating with international organizations, Canada has been guaranteed strong reference for its Arctic sovereignty. Therefore, international cooperation has become the most effective measure to explore and utilize the Arctic fisheries resources.

4.2 It is a valid approach to construct ecosystem-based fisheries management for Canada exploring and managing Arctic fisheries resources

From the day Canada realizes the importance of Arctic, Canada begins to protect the ecosystem in Arctic from the start point of environmental protection even though its previous purpose was to appeal and maintain its Arctic sovereignty. Obviously, the ecosystem-based management does avail to Arctic ecosystem and management of Arctic fisheries resources.

Exploring and utilizing Arctic fisheries resources is of great importance to the economy of the northern part, even the whole country. So the government of Canada realizes the urgent need to take effective steps to maintain the Arctic and national sustainable development of fisheries resources. Therefore, it is especially essential to adopt ecosystem-based fisheries management.

Since 1970s, EBM has been widely concerned because it improves the depth and breadth of the traditional marine management, whose object of study turns from single species to the whole ecosystem, and the short-term target changing into long-term target. EBFM is the effective method of applying EBM to managing fisheries resources.

EBFM provides Canada with valuable references on managing Arctic fisheries resources and all the act and studies on EBFM, on the other hand, contributes to maintain the healthy development of the ecosystem in Arctic, which lays the foundation for the final target of sustainable development.

It is clearly to see that Canada's exploring and utilizing Arctic fisheries resources linked closely with EBFM. Sustainable development on fisheries resources is tightly based on the stable and healthy development of the ecosystem. It is a valid approach to construct ecosystem-based fisheries management for Canada to explore and manage Arctic fisheries resources

5 Conclusions

With global warming, it becomes increasingly significant for Canada to explore and utilize Arctic fisheries resources. Canada is one of the most important Arctic nations and it is the key factor to adopt effective measures to make use of the resources for Canada's economic development and social stability. With international cooperation, Canada tries its outmost to protect Arctic fisheries resources and ecosystem. Above all, the ecosystem-based fisheries management will absolutely improve the sustainable development of Canada's Arctic fisheries resources.

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Influence of Environmental Sustainability in Management and Competitiveness Business and Employability-Perceptions of Brazilian Managers

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Abstract: The goal of this study was to evaluate how professionals holding high and medium management positions, understand the importance of environmental sustainability. This objective unfolds in three specific objectives: 1) evaluating the manager's perception about the importance of environmental sustainability for the business management; 2) evaluating their perception regarding the importance of environmental sustainability for the business competitiveness; 3) evaluating the manager's perception on the importance of environmental sustainability for their own employability. A survey was conducted through an exploratory questionnaire organized into three sections: introducing the main topic of the survey, characterizing the respondents, gathering the data on their perceptions respecting the influence of environmental sustainability on the business management and competitiveness, as well as on the professional's employability. The survey was conducted in two companies, a mining and steel company, located in southeastern Brazil. These companies have similar management levels and invest in awareness of environmental sustainability of its managers and employees. The total sample consisted of 98 managers, 63 of the steel company and 35 of mining one. Of this total of surveyed professionals, 24.49% were part of the senior management and 75.51% belong to the medium management positions in these companies. The questionnaire was delivered by the companies and was answered directly by the respondents by e-mail and internet. Data analysis included a descriptive analysis of the surveyed sample, followed by an exploratory factor analysis and the estimation of non-parametric tests, aiming at verifying the validity of the hypothesis derived from the specific objectives of this research. We conclude that the surveyed managers valued environmental sustainability as being very important to company management, for business competitiveness, and for their own employability and, in this order. The research allowed also for testing the data collecting tool and to identify how it could be improved in order to be used by other companies to evaluate the effectiveness of their management awareness programs on environmental sustainability.
Key words: Environmental sustainability; Management; Competitiveness and employability

1 Introduction
1.1 Context
In his encyclical "on the care of our common home"– "Laudato Si'", Pope Francis talks about the Earth (Francisco, 2015: 1): "We grew up thinking we were its owners and rulers, allowed to plunder it." When plundering, it came to pass the scarcity of natural resources, which put us on the fear for the future of the human species on planet Earth. According to Laszlo (2001), this situation, aggravated by the continuous increase in human population, puts us in a suicide route. Never has humanity had such awareness of the mistakes made in relation to the Earth. The fear caused by the continued and uneven pressure on resources and environmental services - 20% of the world population consumes 80% of all available natural resources (Leemans & Solecki, 2013) reminds us of the Malthusian prophecy (McCleary, 1955). Despite knowing and recognizing the importance of ecosystem services and biodiversity for human well-being, the degradation and destruction of ecosystems remain implacably (Madureira, 2010) in a true march of foolishness.

However, the serious environmental issues, which are facing humanity, have promoted the rapid awareness of the urgency to find solutions that allow us to live within the natural limitations that the Earth imposes.

The growing awareness of environmental problems at the beginning of century result in pressure, which affects businesses, forcing them to adopt the values of sustainability, which will influence how

they survive and remain competitive in an increasingly conscious market on environmental risks we face and solve (Meyer & Rowan, 1977).

1.2 Purpose and relevance of study

The main objective of this study was to evaluate how the high and middle management members of a mining company (identified as Company A) and steel (identified as Company B), subject to institutional awareness programs, realize the importance of environmental sustainability. This central objective was broken down into three specific objectives:

1) Evaluation of the perception of the importance of environmental sustainability for business management;

2) Evaluation of the perception of the importance of environmental sustainability to business competitiveness;

3) Evaluation of the perception of the importance of environmental sustainability for employability;

The assessment referred to the main objective was accomplished through a survey that used an exploratory questionnaire as a way of data collection. This study also evaluated the adequacy and reliability of the questionnaire.

The research was focused on professionals who exercised (then) high and middle management positions. Lubin and Esty (2010) addresses the need to involve higher hierarchical levels to create new paradigms. Although they are not new, or current concerns about pollution and its consequences on the planet's ecosystems, as discussed Riechmann & Buey (1994), environmental sustainability still remains in Brazil, the status of the new paradigm.

Brazilian companies, especially larger ones, before the determination to adhere to the paradigm of environmental sustainability, choose to start this path (towards sustainability) the awareness of its employees, from management levels - high and medium - usually. For this, invest in awareness programs and training and must assess if: 1) really can make their managers realize environmental sustainability as a value for the companies and for themselves? 2) The investment has the desired return in terms of personal awareness of the importance of environmental sustainability? If this matter is highly perceived, it is clear that awareness brought desirable results and business investment had expected return. This study is important because it seeks to provide a means of systematic evaluation of the results of these awareness programs enabling thus the correct direction and the optimization of resources, for the awareness of environmental sustainability in the management levels of the companies.

2 Sustainability, Management, Competitiveness and Employment

Labuschagne, Brent and Van Erck (2005) tell us that the concept of corporate sustainability has grown in recognition and importance. This happened according to the changes and evolved social expectations, changing the social context in which they are based the relationship between society and business (Borger & Kruglianskas, 2006).

It can be observed by the available literature that word sustainability still lacks a precise definition. Károly (2013) came to classify it as a corporate buzzword (word that appears with great noise / impact in the corporate world), which was eventually used to denote all that is good, positive and desirable. Morelli (2011) reminds us that in 2010, the US Federal Trade Commission issued a list of five terms that should not be addressed in its guidelines and "sustainability" headed this list with the claim that there was a clear understanding of expiration among experts. Nevertheless, the term sustainability has become widely used by governments, businesses, NGOs and society in general, popularizing in the world.

The most accepted concept, widespread and referenced concept of sustainability is the Triple Bottom Line, proposed by Elkington (1999). Through it, sustainability is seen from three dimensions: economic, environmental and social. Tambellini (2009) speaks of harmonization of economic efficiency, social equity and ecological prudence. Hockerts (1999) states that the optimal decisions can only be taken when economic, social and environmental consequences are taken into account. It appears increasingly that companies subscribe to the principles of corporate sustainability, which is often described as the integration of economic, environmental and social dimensions (Hansen, Grosse-Dunker & Reichwald, 2009).

Porter and Kramer (2006) address the need for companies to adopt strategic social responsibility through actions that bring benefits both for society and for the company itself. These authors have the view that any company can solve all the problems of society and not bear the costs arising from this intention, but should focus on issues that have some intersection with their area, enabling thus the strategic social responsibility.

To incorporate the principles of sustainability to the management of companies, there is a path to be followed. Dunphy, Griffiths & Benn (2007) show the stages of this trajectory (which allow managers to place their companies on this evolutionary path towards sustainability). Such stages have the following general characteristics:

Phase 1: the total lack of interest in environmental and social issues;

Phase 2: the company sees the deal as it always was, admits the positive environmental consequences and refuses to admit the negative;

Phase 3: managers meet the minimum legal requirements for safety, health and environment;

Phase 4: operational efficiency becomes originated the practices of sustainability and managers are aware of the advantages of sustainability;

Phase 5: sustainability is seen as a competitive advantage and as part of long-term strategy;

Phase 6: there is full awareness that the organization should work to make a sustainable world.

Whereas it is not enough to recognize the importance and the need for sustainability, but also incorporate it into the corporate management, a large proportion of companies around the world, even if they recognize the importance of becoming sustainable, must still ask how to deploy sustainability?

The question of the above paragraph was answered by Lubin and Esty (2010), which tells us that sustainability is a megatrend that will profoundly affect the competitiveness of companies and even their survival and should be treated as other recent megatrends - IT (Information technology) and quality.

Remember that both the implementation of quality programs as information technology There was the need to involve the leaders of the companies and the wide diffusion of knowledge. In other words, there was the need to create an organizational culture that supported such new paradigms.

Currently we know that sustainability when determining uncooperative with the competitiveness of enterprises. The protection and improvement of the environment are a social concern and a new key factor for the strategy and the competitiveness of enterprises (Galdeano-Gomez, Cespedes-Lorente & Martínez-del-Rio, 2010). It is important to consider when looking relating competitiveness with sustainability, to manage a company without social commitment can be expensive, depending on the risks involved (Dunphy, 2003).

The escalation of sustainability promoted the environmental debate to a new level, indicating that the change in the sense of valuing the environment and social welfare is promoted by the innovation of products targeted to the market and new technologies and no more, simply by force of environmental legislation (Berger, Cunningham & Drumwrighy, 2007). It is more a paradigm that can change the way the competition will need to be perceived and treated by the companies.

We have reached a time when educated consumers (environmentally conscious) and organized force companies to become sustainable. This pursuit of sustainability is already beginning to transform the way companies compete and change the way they think about products, technologies, processes and business models (Nidumolu, Prahalad & Rangaswami, 2009: 1). Finally, sustainability becomes, according to these authors, "the key driver of innovation". There is no doubt that competitiveness associated with environmental sustainability is dependent on innovation - sustainable - and has consequences on the image of the companies, to the extent that environmental sustainability becomes more and more a requirement of society.

One of the focuses of this study was to verify how the surveyed managers perceived the influence of knowledge on sustainable employability. Hillage and Pollard (1988) address the relationship between knowledge and employability in stating that, for the individual, employability depends on knowledge, skills and attitudes that have, so you can use these assets and present them to employers.

Despite several international surveys recognize the importance of managing people for effective environmental management, little is known about the dynamics of this interaction (Rothenberg, 2003). Similarly, despite the elapsed time, do not have much information about the interaction between employment and sustainability. There is more information on the teaching of sustainability than its influence on the labor market and this is particularly noticeable in Brazil.

According to Rosini, Guevara Silva Calado and Rodrigues (2011), education should be used to rescue values such as citizenship, cooperation, solidarity, responsibility and ethics that make up the sustainability and provide a culture for Development sustainable. These values form the basis for awareness for sustainability and must be present in both academic teaching as well as in corporate programs for the transmission of knowledge about sustainability to employees.

The interest in sustainability has been responsible for the emergence of courses on the subject around the world and in various academic levels. Mascarelli (2013) analyzes on sustainability courses and presents options in several countries. In Brazil in PUC-SP (Pontifical Catholic University of São

Paulo), for example, there is the Lecture Series I. Sachs (NEF, 2016), whose goal is to study and disseminate the echo social development.

The search for projects, products and environmentally sustainable processes establishes the need for conscientious professionals and able to face these new challenges, which makes the field of theory and practice of environmental sustainability is a determining factor in people's employability.

In order to impart knowledge and begin the process of incorporating sustainability into business management, big Brazilian companies invest in training programs on sustainability. As a consequence, become poles of irradiating sustainable knowledge. This happens, for example, in companies where was conducted this case study, where their employees know the concepts of sustainability.

3 Methodological Procedures and Results

In this work we used the case study method - which is widely used for data collection in the field of organizational studies (Cesar & Valentini, 2005) - in 2015, into two companies, located in the southeastern region of Brazil, with following general characteristics, shown in Table 1:

Table 1   General Characteristics of the Case Study Companies

Companies characteristics	A- Mining company (*1)	B- Steel company (*2)
Capital	Privately held	Privately held
Business	Production of iron ore pellets for export	Steel production for the domestic and foreign markets
Production capacity	31.000.000 t/year	7,500,000 t / year - 3% of the world total volume traded. Third largest iron Brazilian producer
Number of employees	Own employees: 3.000 Outsourced employees: 3.500	Own employees: 4.500 Outsourced employees: 6.000
management systems registration	ISO 14001; ISO 9001; OHSAS 18001	ISO 14001; ISO 9001; OHSAS 18001

Source: Produced by authors
 (*1) – 2014 data, taken from the company's website . Retrieved on 07/04/2016.
 (*2) – Data from HTTP://tubaro.arcelormittal.com/. Retrieved on 07/04/2016.

The study explains causal hypotheses and used a questionnaire, with answers provided on a Likert scale, in order to allow a quantitative evaluation.   It was adopted, therefore, a mixed methodology, it is recommended to develop researches in which the operation of phenomena is the focus, or the application of more than one search method enables increasing the potential analysis (Creswell, 2003).

The questionnaire was built as shown in Figure 1, shown below:
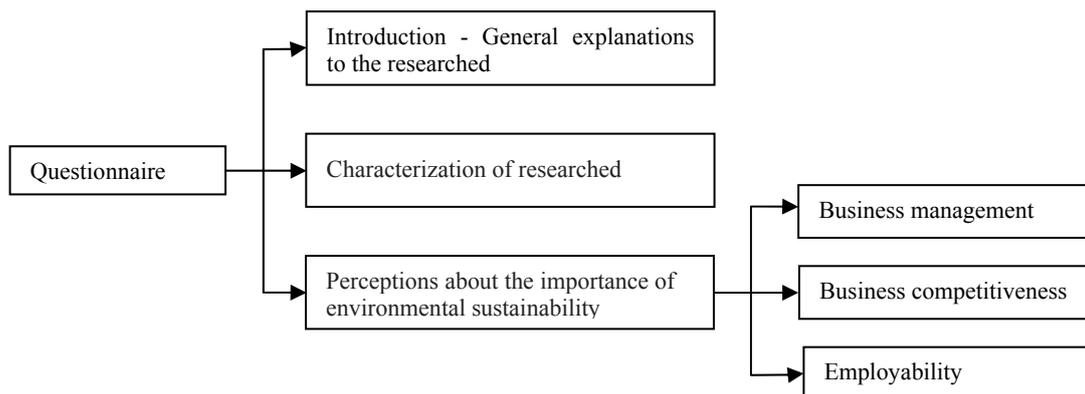
Source: Produced by authors
Figure 1   Construction Scheme of the Survey Questionnaire

The sample was composed of the data coming from the two companies (98 responding) and has the characteristics shown in Table 2 and Table 3, shown below.

Table 2　Sample Composition

Researched by company		
Sample identification	Absolute frequency	Relative frequency
A- Mining Company	35	35,71%
B- steel company	63	64,29%
Total	**98**	**100%**

Source: Produced by authors

Table 3　Percentage of Adherence to Research by Hierarchical Level and by the Total of Managers

Hierarchical level			
Sample Identification	Top management	Middle management	Total of researched managers
A- Mining Company	100%	68,0%	81,4%
B- steel company	60,0%	67,9%%	67,0%

Source: Produced by authors

The sample was considered to be sufficient since the lower sample fraction observed in its entirety (the rightmost column in Table 3.) was 67%. Thus, adopting a single sample and a 95% confidence interval, the obtained sample (n = 98) leads to a sampling error of 5.3%.

The more important results of Descriptive Analysis are presented in Table 4:

Table 4　Results of the Total Sample Descriptive Analysis

Descriptive variables	Comments on the statistics
Genre	91,84 men
Age	71.13 % have more than 40 years
Worked time in the company	86.73 % work the company for over 10 years
Work area	68,37% - production and 31,63% - administrative area
Hierarchy position	75,51% - middle management and 24,49% - top management
Education degree	71,43%　Specialization / MBA
Knowledge degree on environmental management	97,9% - Basic / satisfactory or High knowledge
Knowledge degree on environmental sustainability management	99,0% - Basic / satisfactory or High knowledge

Source: Produced by authors

The factor analysis showed the following results, shown in Table 5 (where we highlight the three resulting factors) and Table 6 (where we presented the *Bartlett's Sphericity Test results)*:

Table 5　Factors Characterization

Factor		
Dimension	Identification	Name
Management	**F1**	Importance of environmental sustainability for business management
Employability	**F2**	Importance of environmental sustainability for employability
Competitiveness	**F3**	Importance of environmental sustainability for business competitiveness

Source: Produced by authors

Table 6　Bartlett's Sphericity Test

Test statistic	Degrees of freedom	P-value
342,183	36	0,00001

Source: Produced by authors

We obtained 0.732 for the KMO index, indicating median suitability, but acceptable (Friel, 2009), of data to Factor Analysis, and we must also consider that Hair et al. (2006) suggest 0.5 as an acceptable value.

The variability explained by Factor Model is shown in the Table 7, presented below:

Table 7   Variability Explained by Factorial Model

Factor analysis results	Factor 1 (Management)	Factor 2 (Employability)	Fator 3 (Competitiveness)
Eigenvalues	3,323	2,040	1,181
Sum of squares of factor loadings	2,520	1,739	1,086
Proportional variance	0,280	0,193	0,121
Accumulated variance	0,280	0,473	0,594
Proportion of explained variability	0,471	0,325	0,204
Proporção da variabilidade acumulada	0,471	0,796	1,000

Source: Produced by authors

According to the above table, it can be noted that factor 1 and factor 2 are bearing most of the data variability load, indicating a higher importance of these attributes (79.6% of the total variance explained). The model showed a value of $R^2 = 0.594$, that is, it explains approximately 60% of the variability of the data, which can be considered an acceptable percentage of explanation, given the reduced number of factors.

4 Conclusions

In the total sample, 98.98% of the managers who responded to the survey believe they have knowledge about environmental sustainability between satisfactory (44.90%) and high (54.08%). This allows us to conclude that it is a homogeneous sample.

By taking the frequency of assessments assigned to the variables that make up the factors we have the following Table 8, shown below:

Table 8   Frequency of Ratings Assigned to Variables Composing the Factors

Factor	Ratings Assigned to the Associated Variables Factors						
	(VI)	(I)	(VI + I)	(M)	(LI)	(VLI)	(LI + VLI)
	Very important	Important	**Subtotal**	Moderately Important	Little Important	Very Little Important	Subtotal
F1- Management	56,12%	40,05%	**96,17%**	3,32%	0,51%	0,00%	0,51%
F3- Competitiveness	33,16%	46,95%	**80,11%**	11,73%	8,16%	0,00%	8,16%
F2- Employability	7,82%	36,39%	**44,21%**	40,48%	13,27%	2,04%	15,31%

Source: Produced by authors

The subtotal column (VI + I), in above Table 8, allows us to conclude that managers attach importance to environmental sustainability for the management and business competitiveness and employability, in that order. Such order of attribution of importance seems logical, since these are companies that promote the incorporation of sustainability efforts of the management and are exporters are subject (in terms of competitiveness) evaluations of customers with environmental requirements. As for employment, one would assume that knowledge about environmental sustainability, when seeking a replacement on the market or a job promotion, is less important than the technical knowledge and experience - especially for the Brazilian employer at this time.

The results allow us to say that have been successful efforts of the companies investigated, in order to promote awareness of its managers in relation to environmental sustainability.

We conclude also that the questionnaire provides sufficient validity, since the RMSE statistic value was 0.08. From the exploratory factor analysis, we obtained three components, which account for approximately 60% of the total variance ($R^2 = 0.594$). The values of Cronbach's alpha for the three factors were, respectively, 0.853, 0.651 and 0.630, considered acceptable for an initial study like this.

The questionnaire can be improved and become an easily applicable tool to measure the results of awareness programs on sustainability, with regard to environmental pillar.

The society expects its sustainability requirements are met by the attitudes, behaviors and business operations of companies. Only then they (companies) may increase their reputation and credibility levels and, consequently, also increase economic performance and own longevity.

Came into existence a global fear in relation to anthropogenic environmental problems also observed in Brazil, in proportion never before seen. This fear causes environmental sustainability walk with long strides to become a consensus in the country, but the road is long and hard.   Already there is talk in the Age of Sustainability (J.D. Sachs, 2015) and you can watch the effort to bring sustainability into the school curricula worldwide.   In the near future, it will not make more sense to research the

influence of knowledge of sustainability employability, as it will be fully disseminated and general domain.

It is suggested that future research can be carried out in order to:

The expansion of this study to other companies, industry areas and hierarchical levels;

The questionnaire improvement using, for example, a scale purification according to Parassuraman, Zeithaml and Berry (1988);

The creation of an awareness level on Environmental Sustainability;

Carrying out studies relating environmental sustainability and employability;

Carrying out studies on the influence of the level of awareness about environmental sustainability in the number of projects and actions for the improvement of sustainability.

It is expected that the results obtained with this research, can arouse interest in larger and deeper exploration of how environmental sustainability is perceived in organizations. And also about how this perception may influence the achievement of truly eco-efficiency, sustainable organizations, committed to the eco-development (I. Sachs, 1986) and with life - in all its dimensions.

Does not lack academic knowledge on sustainability, does not lack disclosure of its importance, does not lack membership of international organizations does not lack statements of major business leaders and heads of government in their favor, but may lack time to mankind to reverse the current unsustainability.

Environmental sustainability is nowadays a precondition for the future of humanity - nothing more.

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Research on the Correlation Between Ecological Vision Library and Innovation in Science and Technology

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Abstract: Library has been showing a multi-level and multi-direction development trend. With the development of digital technology, the library is facing new challenges and opportunities. Improving the competitiveness of the library itself is a major issue in the future development of the library. The most obvious dependence on knowledge and technology is the development of science and technology. Therefore, this article collects some index data of library and innovation in science and technology from 2004 to 2014, with the help of SPSS statistical analysis software to carry on the correlation analysis. The result shows that the development of library and innovation in science and technology is a significant positive correlation. For further study, the article also carries on the regression analysis and use the EVIEWS statistical analysis software to carry on the Granger causality analysis. And then puts forward recommendations for library development.
Key words: Ecological library; SPSS; Scientific and Technological innovation

1 Introduction

With the improvement of the network of laws and regulations, the Internet has become essential to our lives things, mobile Internet technology has attracted wide attention, has increasingly become a topic of concern. According to "China Internet Development Statistics Report" shows that, until December 2015, Chinese citizen reached 688 million, Internet penetration rate of 50.3%. This presents a challenge to the development of library.

Library as an integrated carrier of knowledge, its relationship with innovation in science and technology more closely, effectively grasp the intrinsic link between ecological vision library and innovation in science and technology is the focus of the development of library.

And by using SPSS and EVIEWS statistical analysis and application software for empirical research, conduct innovation in science and technology and ecological vision library quantitative analysis, so as to formulate relevant policies to promote the development of innovation in science and technology to provide reference and recommendations for our government, to promote education career development and innovation in science and technology has certain practical significance.

Ecosystem was by the British plant scientist Tansley proposed; Donley suggested that the library is an organic ecosystem, library development influenced by the ecosystems; Zhao Yinghong (2014) from the perspective of ecological system to verify that the library with material flow, information flow and energy flow of the different forms and social support system to produce exchange; Liu Junxia, Guo Peiyong (2015) put forward the library is a movement of the whole ecosystem.

Lv Xiangqian (2011) proposed university library plays an important role in the University Science and technology innovation service function; Zhao Yinghong (2012) used econometrics to prove that China's economic growth and the public library's comprehensive development is highly positive correlation, and presents Granger causality; Liang Jihong (2015) put forward to strengthen the construction of university library, first of all pay attention to the status and role of management innovation in the library.

Alice B. Ruleman (2012) thought that as mobile technology is exploding in both our personal and professional lives, libraries should begin to implement mobile services; Brian Real, John Carlo Bertot, and Paul T. Jaeger (2014) thought that the development of the library is affected by the technical infrastructure, staffing and funding; Mrs. Manisha Yogesh Rane (2015) thought in terms of technological development of digital library, librarians play an important role.

2 Index Construction and Data Collection

2.1 Index construction

Library under the ecological perspective and technological innovation capability indicators construction follow operability, representativeness and weak correlation principle. Reference to the library index established by Zhao Yinghong, established five secondary indicators including

infrastructure, library resources, financial indicators, customer service, human resources, and includes 25 three indicators. Science and technology innovation two 2 level indicators, including science and technology input and output indicators, and 21 three indicators.

2.2 Data collection

A total of 46 data three indicators, given the limited space, choose the index representative, library indicators selected number of institutions, number of employees, total reserves, books circulation trips, the publications borrow books five indicators , indicators of innovation of science and technology selected research and test development staff full time equivalent, expenditure on research and development, published scientific papers, published works of science and technology, scientific and technological achievements registration number, National Technology Invention Award, the patent application number of accepted, the technology market turnover, a total of eight science and technology indicators. To ensure the accuracy of statistics, data are from China Statistical Yearbook. Due to lack of science and technology statistics before 2004 are more, so select the 2004 to 2014 data for the study.

3 Research

3.1 Correlation analysis

Using SPSS statistical analysis tools for correlation analysis of library index and technological innovation indicators, the results obtained in the following table.

Table1can be concluded that the research and test development expenditure indicators and the indicators of the library show a high correlation, which shows that strengthening the investment in science and technology is conducive to promoting the development of the library. Scientific papers published indicators showed high correlation, and correlation index published scientific works is relatively low, due to the use of digital resources in the wider application of scientific research, literature review, and collected through the library network can be achieved, that is not published works does not affect people obtain resources. This is also the reason why the correlation between publications borrow books and the science index is relatively low.

Table 1　Pearson Correlation Analysis

	research and test development staff full time equivalent	expenditure on research and development	published scientific papers	published works of science and technology	scientific and technological achievements registration number	national Technology Invention Award	patent application number of accepted	technology market turnover
number of institutions	.982**	.988**	.895**	.586	.994**	.866**	.997**	.989**
number of employees	.987**	.976**	.956**	.659*	.963**	.862**	.973**	.952**
total reserves	.984**	.982**	.938**	.652*	.989**	.850*	.983**	.968**
books circulation trips	.982**	.994**	.900**	.629	.982**	.827**	.990**	.996**
publications borrow books	.905**	.928**	.803**	.585	.916**	.724*	.918**	.941**

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

3.2 Regression analysis

We come to ecological vision library and innovation in science and technology is highly correlated, in order to quantify this relationship, we have taken regression analysis, trying to explain the use of quantitative expressions.

On the basis of the selection of relevant analysis indicators, due to limited space, the three groups were randomly selected for regression analysis.

1) Regression analysis of number of institutions and research and test development staff full time equivalent:

Table 2   Coefficient

model		Non-standardized coefficients		Normalization factor	T	Significance
		B	Standard error	Beta		
1	（constant）	2521.620	25.639		98.351	.000
	research and test development staff full time equivalent	1.593	.102	.982	15.584	.000

From the above table we can conclude: Y = 2521.620 + 1.593X (Y = number of institutions; X = research and test development staff full time equivalent), the regression coefficient of 1.593 shows the research and test development staff full time equivalent each 1% increase, number of institutions will increase 1.593%.

2) Regression analysis of number of employees and expenditure on research and development:

We can conclude that: Y = 49096.255 + 0.587X (Y = number of employees; X = expenditure on research and development).

3) Regression analysis of total reserves and scientific and technological achievements registration number:

We can conclude hat: Y = 42236.178 + 4.786X(Y = total reserves; X = scientific and technological achievements registration number).

3.3 Granger causality

Due to limited space, through the sequence of ADF test and correlation test, in the case of the lag length of 2, select three groups Granger causality analysis.

1) Publications borrow books (Y) and research and test development staff full time equivalent (Q) causal analysis:

Table 3   Causal Analysis

Dependent variable: Y			
Excluded	Chi-sq	df	Prob.
Q	6.521075	2	0.0384
All	6.521075	2	0.0384
Dependent variable: Q			
Excluded	Chi-sq	df	Prob.
Y	2.936580	2	0.2303
All	2.936580	2	0.2303

Conclusion: at the 5% level test, research and test development staff full time equivalent is the cause of publications borrow books change.

2) Number of institutions and scientific and technological achievements registration number causal analysis:

Conclusion: In 10% of the test level, scientific and technological achievements registration number is the cause of number of institutions change.

3) Number of institutions and expenditure on research and development causal analysis:

Conclusion: at the 5% level test, expenditure on research and development is the cause of number of institutions change.

4 Conclusions

1) From the correlation analysis, it is concluded that the library is highly correlated with scientific and technological innovation, which indicates that the development of science and technology is closely related to the development of the library.

2) By regression analysis, we can get the three regression equations of Library and science and technology innovation index, which shows that there is a linear relationship between the library and science and technology innovation can be discussed by regression coefficient.

3) By the Granger causality analysis concluded that science and technology innovation on library development there is a one-way causal relationship. That is to say, science and technology innovation is to promote the important factors of the development of the library, but library of science and technology

innovation reverse impact is relatively small.

In short, to increase investment in research and development, and vigorously develop scientific and technological innovation, can effectively promote the development of the library. Therefore, we should strengthen the development of library and better use of library resources for the development of the library and science and technology innovation to provide a more broad space for development.

Acknowledgement

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Essence of Growing Health Food Markets in Asian Countries

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Abstract: So-called health food has attracted attention for more than two decades, since its market has been steadily expanding. However, there are no world-wide studies on relationships between the health food market and the economic or social situations. This is because the definitions and regulations about health food differ from one country to another, so that it is difficult to compare various countries at once. We focused on Asia, since several Asian countries have established the rules and regulations of health food to date, and this area contains various countries in terms of economic situations. We executed multiple regression analysis, in which the per-capita health food expenditure and other six variables were respectively set as the objective variable and the explanatory variable candidates. As a result, it turned out that we can estimate the per-capita health food expenditure with considerable accuracy by using only two explanatory variables: the per-capita GDP and the population aging rate. The regression function obtained in this research enables us to quantitatively predict the health food market size. This can greatly contribute to making a global marketing strategy of health food.
Key words: Health food market; Multivariate analysis; GDP; Population aging rate

1 Introduction

Currently, the concept of "functional food" or "health food" has been widely accepted in Asia, America, Europe and elsewhere in the world (Siró, I., et al,2008). The word "functional food" was used first in Japan in the 1980's. In 1984, the Ministry of Education, Science and Culture of Japan classified the functions of food into three categories: nutritional function as a primary function, palatability trait as a secondary function, and disease prevention by biological regulation as a third function. Among these functions, the third function received a special attention and new food products with this function were called functional food. An original regulatory system of Food with Health Claims (FHC) was established in 1991. Since then, the health food market in Japan has been steadily expanding. In particular, the health food market hovered at a high growth rate from the 1990's to 2005. After that, although the growth rate slowed down due to a labeling regulation of the Pharmaceutical Affairs Act in 2006, the health food market in Japan kept growing and the market size reached 1.21 trillion yen in 2013 . During that time, several institutional reformations were executed and the newest category "Food with Function Claims (FFC)" was established in 2015. It is generally believed that the main factor of the market growth of health food would be the growing health awareness due to an increase in lifestyle-related diseases and an acceleration of demographic aging.

From a perspective of Management of Technology (MOT), a development of health food is certainly a product innovation, and it is often the case of a material or ingredient innovation. Developing innovative materials to achieve innovative functions has often occurred in the functional food area. For a product to survive in such environment, a business organization must understand consumer needs precisely. Although the very idea of functional food has been accepted in many countries to date, the kinds of functional food widely spread among people depend on their culture, religion and environment (Siró, I. ,et al,2008). For example, a fortified cereal and various supplements are very popular in USA, while ginseng powder is a favored product in South Korea. Perhaps for that reason, the previous studies about health food entirely focused on the individual differences of health food instead of shared trends.

On the other hand, various media have already reported that the dietary life changes in accordance with the economic growth. The main changes are that people prefer processed food to fresh food, and they eat more meals outside their home. Also, it is thought that the growth of the health food market would be related to the economic situation change. However, there are very few studies on relationships between the health food market and the economic situation till now, though a lot of studies on the regulations of health food have been performed (Coppens, P., et al,2006; Charalampopoulos, D. ,2002; Bech-Larsen ,2007). This must be because research across countries was not easy since the products, regulations, and rules of health food are different depending on country.

This research was conducted based on the hypothesis that the growth of the health food market would be related to the change of economic and social situations. We focused on Asia, since this area

has various countries in terms of per-capita Gross National Income (GNI). Typical cases are India and Indonesia as lower middle income countries, Thailand and China as higher middle income countries, and Japan, Singapore, South Korea and Taiwan as high income countries. The main purpose of this research is to clarify whether the market size of health food can be predicted using economic and other social indices, and if so, which indices should be used, by using data of Asian countries. This research aims to provide a concrete method to quantitatively predict the future market size of health food. This can greatly contribute to making a global marketing strategy of health food.

2 Previous Research

A lot of studies on health food have been performed. However, most of them were conducted regarding each ingredient (or material), the characteristics, or the national regulations of health food. There has been little research about the relationships between the growth of the health food market and the economic indices. However, they have already studied about the relationships between per-capita Gross Domestic Product (GDP) and other social or health-related indices. Some of typical researches are as follows.

● The relationship between per-capita nominal GDP and product diffusion was reported: (1) the sales amount of daily necessaries, such as hair-care and oral-care products, increases when the per-capita GDP reaches 4,000 US dollars or more, and (2) the sales amount of luxury items including skin-care products increases when the per-capita nominal GDP reaches to a level of 4,000-10,000 US dollars (Takato, N., Mototani, T. ,2013).

● The strong correlation between per-capita nominal GDP and medical expenditure was reported (Hiroi, Y.,1994). Also, the proportion of the medical expenditures is considered to rapidly increase when the per-capita GDP is greater than approximately 10,000 US dollars.

● It is considered that when per-capita nominal GDP increases, the modern-type retail sales increases, and moreover, when per-capita nominal GDP exceeds 10,000 US dollars, the modern-type retail sales reaches approximately 80% of all trade (Takato, N., Mototani, T. ,2013).

● It is found that an average life-span increases as the per-capita GDP increases (Todo, Y. ,2015; Kojima, K., Ogata, H. ,2008). Also, an average life-span increases as the per-capita medical expenditure increases (Hiroi, Y.,1994).

● There is a deep relationship between an average life-span and an aging population (Ota, M.,2009), and an aging population is believed to be one of the factors to increase medical expenditures[1].

3 Definitions and Coverage of Health Food in Each Country

The definitions of health food differ among countries. The definitions and coverage of health food in eight Asian countries (Japan, India, Indonesia, Thailand, China, South Korea, Taiwan and Singapore) of which data was used in this research are as follows. The data was derived from the report published by a Japanese market research company.

1) Japan

According to the Ministry of Health, Labor and Welfare, there is no legal definition of so-called "health food," and the health food indicates the whole range of products which are sold and used for the general purpose of health improvement. However, the health food which meets the government's safety and efficacy standards can be referred to as "Food with Health Claims (FHC)." FHC's efficacy and functions can be officially publicized under the government's rules. FHC can be broken down into three categories, Food with Functional Claims (FFC), Food with Nutrient Function Claims (FNFC), and Food for Specified Health Uses (FOSHC) [2]. FFC, which was established in April 2015, is the newest category. This research targeted the broad health food including FHC: supplements, drinks and others (fortified biscuits, concentrated extracts, etc.).

2) India

In India, the Food Safety and Standards Authority of India (FSSAI) has been working on the establishment of standards and criteria of health food. However, "Food Safety & Standards Regulations 2011" established by FSSAI did not contain the regulations about the health food. This research targeted the following health-related foods and drinks: supplements, drinks, Ayurveda and others (fortified

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[1] White Paper on Aging Society 2014, Cabinet office, Government of Japan, http://www8.cao.go.jp/kourei/ whitepaper/ w-2014/ zenbun/s1_1_3.html
[2] Health Food Homepage, Ministry of Health, Labour and Welfare, http://www.mhlw.go.jp/stf/seisakunitsuite /bunya/kenkou_iryou/shokuhin/hokenkinou/

biscuits, concentrated extracts, etc.).

3) Indonesia

In Indonesia, there is no legal definition of health food. However, so-called health food is categorized as specific processed food. This research targeted the following health-related foods and drinks: supplements, drinks and others (concentrated extracts, herb products, etc.).

4) Thailand

The Food and Drug Administration Thailand (Thai FDA) defines and controls the regulations of food, drug, and dietary supplements. The supplements include all the following forms: tablet, capsule, powder, flake and liquid. This research targeted the following health-related foods and drinks: supplements, drinks and others (fortified biscuits, concentrated extracts, etc.).

5) China

The China Food and Drug Administration (CFDA) defines and controls the regulations of food, drug, and cosmetics. Health food is defined as a part of food, which has the specified health efficacy or aims at supplying vitamins and/or minerals to human. Also, the health food is defined as food that enables some sort of people to get themselves in shape by eating it. This research targeted the health-related food and nutrient-enhanced food including supplements, drinks and others.

6) South Korea

The Korea Food and Drug Administration (KFDA) defines and controls the regulations of food, drug, medical equipment, functional cosmetics and so on. KFDA defines the functional health food as food that contains materials (or ingredients) with beneficial functions for human bodies. The functional health food is divided into two types: one is a standard license type and the other is a license type on a case-by-case basis. This research targeted the following health-related foods and drinks: supplements, drinks and others (fortified biscuits, concentrated extracts, unprocessed materials for herbal medicine, etc.).

7) Taiwan

The Taiwan Food and Drug Administration (TFDA) defines and controls the regulations of food and drug. Food is categorized into three types: regular food, health food, and special nutritive food. The health food is defined as food which has some sort of health efficacy and displays it on the package or endorses it in the advertising media. This research targeted the following health-related foods and drinks: supplements, drinks and others (fortified biscuits, concentrated extracts, unprocessed materials for herbal medicine, etc.).

8) Singapore

Health Science Authority (HSA) takes control of the regulations of health-related products including dietary supplement, drug, medical equipment, cosmetics and so on. The dietary supplements are to be consumed for improving human's health or enhancing the nutrition of a meal. This research targeted the following health-related foods and drinks: supplements, drinks and others (fortified biscuits, concentrated extracts, etc.).

4 Method

Through literature research, the authors developed a hypothesis that the growth of the health food market would be related to the change of economic and social situations. The research method was designed to verify this hypothesis. First the economic and social indices considered important were selected, and then the data of such indices were collected, and finally the multiple regression analysis was performed using the data.

4.1 Variables used in research

The economic and social indices selected are as follows. Henceforth, these indices are called variables.

● Per-capita health food expenditure

This is the value obtained by dividing the size of the health food market in each country by the number of population of the country. In this research, this variable is measured in Japanese yen. This is used as an objective variable.

● Per-capita GDP

This is the value calculated by dividing GDP (US dollar), which is a total amount of added values of products or services produced in the country within a certain period of time, by the number of population of the country. In general, the larger the per-capita GDP is, the higher the living standards are. This is one of the most representative economic indices. Note that, when comparing countries,

purchasing power parity (PPP) of GDP is used to cancel out the difference of price levels between countries, where PPP is calculated using the exchange rates between two currencies.

● Per-capita medical expenditure

This is the value calculated by dividing the total amount of medical expenditures for treatment in a year by the number of population of the country. In this research, this variable is measured in US dollar. For countries that have the publicly funded health system, the value of the per-capita medical expenditure is calculated after the expenditures of the system are added to the out-of-pocket expenditures.

● Engel's coefficient

This is the proportion (expressed as a percentage) of food and drink expenditure in household consumption expenditure. In general, Engel's coefficient, one of the living standard indicators, is considered to decrease as the living standard improves (Arai, Y., 2010). However, it was found in some cases in developed countries that, even when the living standards improve, the Engel's coefficient does not decrease (Yoshimoto,2015). This variable sometimes behaves differently among some social groups that have different social customs from other groups. Since the Engel's coefficient has an opposite correlation with the economic affluence, "100 Engel's coefficient" was used in this research.

● Ratio of the modern retail sales (mail-order, Internet sales, and door-to-door sales)

This is the proportion (expressed as a percentage) of the sales amount obtained by the modernistic retailing (the door-to-door selling, the mail/catalogue order, and the Internet selling), against the total retail sales. In the processed food market, the traditional retailing including over-the-counter sales has a high proportion at the earlier stage of the market, and then the modernistic retailing extends according to the growth of the market (Kaneko, S., et al,1996).

● Average life-span

This value, which is measured in years, means the average number of years a person born in a given country expected to live if mortality rates at each age were to remain steady in the future. This variable, which is measured in years, is one of indices showing the comprehensive level of health and welfare.

● Population aging rate

This is the ratio (expressed as a percentage) of elderly people (the age of 65 or older) against the total population in a country. A high value of this variable indicates that the population is aging.

4.2 Multiple regression analysis

Multiple regression analysis is an extension of simple linear regression analysis. In general, regression analysis is a statistical process for estimating the relationships among variables. Multiple regression analysis is executed to answer how large a change of the dependent variable (or objective variable) is when any one of the independent variables (explanatory variables) is varied, while the other independent variables are fixed. The estimation target of multiple regression analysis is a function of the independent variables called the regression function. Multiple regression analysis also answers the overall fit (variance explained) of the model and the relative contribution of each of the independent variables to the total variance explained.

In this research, the "per-capita health food expenditure" was set as an objective variable, while other variables described above were regarded as the explanatory variable candidates. The following procedures were performed. First we computed correlation and partial correlation matrices using all the variables to understand each relationship. Then, after removing the variable suspected of having high multicollinearity, the multiple regression analysis was performed to obtain the regression function. In this stage, the 2009 data of aforementioned eight Asian countries was used, although only as to the average life-span the 2011 data was used instead because of data unavailability.

5 Results

Figure 1 shows the value of the per-capita health food expenditure (Japanese yen) of eight Asian countries in 2011. The per-capita health food expenditures widely varied depending on the countries. Singapore had the highest per-capita health food expenditure and India had the lowest.

Then, to examine the relationships between two variables in all combinations, we calculated correlation and partial correlation matrices as shown Table 1 and 2. As shown in Table 1, most of the correlation coefficients are more than 0.7. This means that the variables are strongly associated with each other. Only the "ratio of the modern retail sales" had a weak correlation with the "per-capita health food expenditure (=Y)." The following three variables, "per-capita medical expenditure," "100 − Engel's coefficient" and ""average life-span," showed strong positive correlations with Y as shown in Table 1.

However, the partial correlation coefficients of these three variables were negative values shown in Table 2. This would be the evidence that there is high multicollinearity among six explanatory variables.
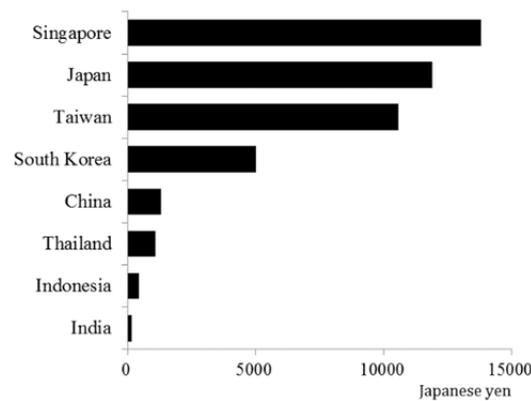
Figure 1　Per-Capita Health Food Expenditure of Asian Countries (2011)

Table 1　Correlation Matrix between Variables

	Per-capita health food expenditure	Per-capita GDP	Average life-span	100 - Engel's coefficient	Per-capita medical expenditure	Population aging rate	Ratio of the modern retail sales
Per-capita health food expenditure	1.00	0.89	0.86	0.79	0.85	0.70	0.39
Per-capita GDP		1.00	0.81	0.86	0.62	0.38	0.21
Average life-span			1.00	0.86	0.81	0.72	0.56
100 - Engel's coefficient				1.00	0.73	0.60	0.57
Per-capita medical expenditure					1.00	0.94	0.58
Population aging rate						1.00	0.74
Ratio of the modern retail sales							1.00

Table 2　Partial Correlation Matrix between Variables

	Per-capita health food expenditure	Per-capita GDP	Average life-span	100 - Engel's coefficient	Per-capita medical expenditure	Population aging rate	Ratio of the modern retail sales
Per-capita health food expenditure	1.00	0.91	−0.41	−0.73	−0.17	0.61	0.09
Per-capita GDP		1.00	0.61	0.83	0.41	−0.77	−0.14
Average life-span			1.00	−0.28	−0.34	0.57	0.06
100 - Engel's coefficient				1.00	−0.10	0.44	0.43
Per-capita medical expenditure					1.00	0.85	−0.46
Population aging rate						1.00	0.37
Ratio of the modern retail sales							1.00

In the end, the three variables, "per-capita medical expenditure," "100 − Engel's coefficient" and "average life-span," were removed from the candidates of explanatory variables. The remaining three variables, "per-capita GDP (= X_1)," "ratio of the modern retail sales (= X_2)" and "population aging rate (= X_3)" were used for the multiple regression analysis.

Finally, the best regression function was obtained by using the stepwise method of the multiple regression analysis. Only two explanatory variables X_1 and X_3 appeared in the best regression function, and the determination coefficient (adjusted R^2) was 0.909. The value of the determination coefficient

shows how well the model fits, and this R^2 was sufficiently high to explain the "per-capita health food expenditure (Y)."

6 Conclusions

In this study, it turned out that the growth of the health food expenditure is explained by using only two indices, the per-capita GDP and the population aging rate. The former variable is an economic index, but the latter is a social index. Interestingly, this is a shared trend among Asian countries. In contrast, previous studies about health food have focused on not a shared trend but the individual food products. This could be because the kinds of functional food spread among people differ from one country to another due to their culture, religion and environment. The regression function obtained in this research enables us to quantitatively predict the future market size of health food, since the determination coefficient (adjusted R^2) was sufficiently high. This can greatly contribute to making a global marketing strategy of health food. However, the amount of data used for estimating the regression function was small because of the limitation of data source. We intend to undertake further verification of a conclusion using new data.

Acknowledgement

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Research on the Environmental Publicity and Public Spirit Cultivation

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Abstract: This paper proposes the concept of environmental publicity by employing the method of literature research and descriptive research and making enquires to problems related to publicity. In addition, we discuss two typical forms of damage to environmental publicity, namely, the repetition of "tragedy of the commons" and the popularity of "free rider". We consider environmental publicity as an universally-linked and universally-shared comprehensive ecological system in which people should enjoy same rights while sharing responsibility. Three common public spiritual qualities, namely the no-harm spirit, the spirit of caring, the spirit of participation, are advocated to defend the environment publicity. We put forward conclusions to cultivate public spirit is the fundamental way to solve problems related to environmental publicity.

Key words: Environmental publicity; Public spirit; Public value

1 Introduction

In modern society, the public environment we live in is under various threats such as the aggravating energy crisis, ecological deterioration, especially the severe haze which has caused serious pollution in many parts of China, draws wide attention at home and abroad, even became a domestic political issue(Chen Zhu, et al,2013). It shows that the environmental publicity has been severely damaged. In recent years, some Chinese scholars introduced the concept of "publicity" into environmental science, which is a beneficial attempt and a new theoretical research paradigm in the field of environmental science from the perspective of philosophical and social sciences, extending the resolution of environmental problems from nature to people. Based on the environmental publicity, this paper proposes three common public spiritual qualities to solve public environmental issues: no-harm spirit, the spirit of caring, the spirit of participation.

2 Environmental Publicity and Typical Manifestation

Environmental issues are of publicity in essence. As the concept of publicity is complex and environmental issues are very urgent, it is necessary to briefly explain publicity.

2.1 Inquiries to environmental publicity

"Publicity" is a very complex concept. Kant, Arendt, Rawls, Frederickson and other western scholars gave abundant description to it. According to Habermas, "Publicity" is the concept of democracy which is characterized by specific social intention and specific political values, and which appeared quite late. "Although publicity appeared in Britain and France earlier and Germany later, Publicity, as a mature concept, was not popular in Europe in the 18th century." (Habermas,1999) Currently, the "public" is widely used in such fields as political science, philosophy, economics, law, literature. Although in different discourse systems, the definition of publicity varies due to different theoretical goals, publicity means "fairness, justice, rationality, service" and so on. (Zheng Hangsheng,2005)

Various theoretical interpretations of publicity given by different disciplines not only reflects the publicity of people's public life, of the national public administration, of global public awareness and public safety, but also demonstrates the publicity of natural environment shared among people. During the ever-going natural matter, energy and information exchange between human society and nature, multi-relations have been formed between man and man, man and society, man and nature, and thus there are different types of public property. As human live in the environment, and the environment provide resources for human life and production, the close relationship between human and environment constitutes the basic feature of environmental publicity.

2.2 Typical forms of environmental publicity damages

With the development of industrialization and urbanization, energy consumption continues to go up, hazy days is gradually increasing in number, especially regional air pollution becomes more and more severe with particulate matter (PM10) and inhalable particles (PM2.5) as the typical air pollutants.

Unlike such natural phenomenon such as wind, rain and lightning, fog and haze is "artificial natural phenomenon", the essence of which is environmental pollution, to be more specific, is air pollution. It not only affects the regional atmospheric environment, and destroys the environmental publicity, also does harm to people. This reflects not only the level and quality of national industrialization, but also people's public spirit and the level of ecological civilization

Therefore, how has environmental publicity been "threatened" step by step? Two typical forms are as follows:

First, the "tragedy of the commons" repeats. "Tragedy of the Commons" comes from the article Tragedy of the Commons written by the American scholar Harding in 1968 in the journal "Science". The article is about a land system in Britain which allows landlords to allocate a piece of uncultivated land in their own territory as public pasture open and free to all herdsmen. Of course, all the herdsmen wanted to raise as many sheep and cattle as possible. However, as the number of livestock is increasing out of control, the overloaded public pasture became a barren land. As a result, cattle and sheep starved to death. Harding specifically mentioned in the text the limited earth's resources as well as its effects on the so-called "quality of life". Although the article of Tragedy of the Commons focuses on such fields as economics, psychology and sociology, many scholars take its metaphorical meaning. Since the environment (such as the atmosphere with some environmental factors excluded) is for the public, not for someone or a group of people, and for humans have in common, when someone uses environment, he will affect others' environmental consumption. Driven by interest and competition, people cannot balance between the earth's limited resources and their "unlimited desires". when system and ethics cannot give full play to their due role, "tragedy" is inevitable. China is a country with a large population, limited resources. because of rapid industrial development and non-standard mechanism, a lack of public spirit, the conflicts between economic development and resources and environment are intertwined, forming a vicious cycle, public environmental pollution caused by industrialization such as air pollution have become more prominent, resulting in the repetition of   "tragedy of the commons" in the environment.

Second, the "free-rider" phenomenon. Environmental publicity is beneficial to all. The beneficiaries of environmental protection are not only a local community, but also the society as a whole, even the future generations. It is the universal benefits that allow people who did nothing to protect the environment can also benefit from the environmental protection campaign. This phenomenon is termed as "free-rider" in economics. In accordance with economic reasoning, environment is shared among all the people. when a person consumes a public good, he will not affect others' consumption and he cannot exclude others from using such public goods. When people fully enjoy the benefits of good environment, few are willing to pay the price for this kind of public goods, because no matter whether he pays the price or not, he can consume this kind of public goods. At present, both for-profit organizations and individual citizens fail to abandon such a maternity as enjoying environmental benefit while doing nothing to protect the environment. "Free-rider" mentality exists in people' mind to various extents. It is very popular in some places and sectors. Consequently, resistance and the cost of environmental protection and management are growing.

3 Three Common Spiritual Qualities to Solve Public Environmental Issues

Objectivity of environmental publicity inherently requires people to defend "dignity" of the environment with reasoning, protect the environment by virtue of awe, thus highlighting the human public spirit qualities which include at least three common spiritual qualities, namely, no-harm spirit, humanism and the spirit of participation.

3.1 No-harm spirit

No-harm means is no damage to publicity. The principle of no- harm is the most basic ethical principle, reflecting the nature of public morality. No-harm spirit emphasizes avoiding intended damage and the risk of harm, intended or unintended as well as comforting to no-harm principle. No-harm spirit is particularly significant to the harmony between man and nature. In the social market economy, due to overemphasis on individual interest, acute conflicts exist between individual interest and public interest, between self-protection and moral obligations. In the private sector, individuals, as self-acclaimed subject in the economic activity, pursue the maximization of individual interests, thus doing harm to others or the public sectors. "In the public domain, individual should act as a member of a community, taking care of others and balancing their own likes and dislikes, probing the social and public interests, seeking mutual respect and common ground while putting aside differences." (Li Ping,2005) People

should enjoy public rights of the public domain while fulfilling obligations in the public sectors.

3.2 The spirit of caring

"The spirit of caring is embodied as consciously caring public interest, main public events, public order." (Jia Yingjian,2007) Communication of man always associated with its value orientation, value orientation from the ideological level affect people's attitude towards things, and through the direct influence on the behavior of the individual. People act according to their value orientation. Value orientation influences people's attitude which in turn affects people's deeds. Value orientation based on the publicity sometimes means consciously abandoning or even sacrificing individuals' own interests. Environmental protection volunteer action typically exemplifies the spirit of caring. Guided by this value, every subject always surpasses individual interest, treasuring consistence between themselves and the outside world. They consider such coexistence as an important condition to realize their value and personal interest, treating other as equal and free as them. In addition, they consciously care the social public order and the ecological environment, regarding protecting public interest as vital criteria to judge people's actions and pursing the harmony between public order and ecological environment.

3.3 The Spirit of participation

In public life, only through participation can people be keenly aware of their rights and obligations, learn reasoning methods of theoretical significance and gradually form a rational sense of participation to achieve the maintenance of the community. In the open public area, it requires everyone to ensure the achievement of public value target through their active participation in public life as well as independent participation in public affairs management. Participation in public affairs, as practical social activities based on the citizen's free will and rational judgment, exemplifies society members' efforts to defend universally-shared value. Only citizens with a strong sense of participation in public affairs can voluntarily conduct social practical activities. In modern democratic life, citizen with strong participation spirit will be actively engaged in public and political life such as protecting the environment as an individual or a member of an organization through voluntary spontaneous behavior. "Participation does not mean that a predetermined target can be achieved immediately, nor a utilitarian result obtained. Participation is where the significance of civil activities lies." (Liu Xinmiao,2007)

4 The Cultivation of Public Spirits

In the early 1960's, the energy and ecological crises was studied by Club of Rome as a global public issue. The Club of Rome called for worldwide cooperation to address these global problems. Today, such problems have not been resolved, but intensified. In essence, energy and ecological crisis is a global crisis caused by contemporary people competing resources and plundering next generations' resource for survival and development. The ideological root of this behavior is the lack of public awareness and public spirit among individuals, group's even nations. To strengthen the public spirit and to develop publicity of universal and high-level significance are the fundamental way to resolve the ecological crisis and other public crises. (Guo Zhan,2009)

4.1 The cultivation of the government publicity

The government is of publicity by nature. The government plays the leading role in environmental protection and management. But due to the difference of national conditions, compared with developed countries, the environmental protection of China started relatively late with the laws and regulations to be improved. It is until 1979 when the first environmental protection laws promulgated - "People's Republic of China Environmental Protection law (trial)". Over the next 30 years, China successively formulated dozens of laws on environment and natural resources protection, on saving energy and promoting clean production and circular economy. However, because governments of various levels and enterprises has more desired rapid economic growth than environmental protection and administrative and legal system construction are lagging behind the real need for environmental protection, many environmental problems broke out in a very short period of time. The rampant "fog and haze in recent years is a typical example. In 2012, the Chinese government issued "twelfth five-year" plan for air prevention and control in heavily-polluted regions, making strict targets and measures for the first time to prevent and control the air pollution in 13 heavily-polluted areas. In order to further improve urban air quality, China released the first atmospheric pollution prevention plan (2013-2017) in September 2013, which requires, before 2017, a 10% fall or even more of PM2.5 concentrations in provincial capitals than in 2012, and increasing numbers of air-fresh days year by year. At a higher level, "the CPC Central Committee decision on deepening reform of the overall number of major issues" points out that accelerating construction of ecological civilization system should not divert from the direction of

constructing ecological civilization which must establish a comprehensive system of ecological civilization mechanism including the strictest source protection system and damage compensation system, responsibility system as well as improve the system of environmental management and ecological restoration.

4.2 The cultivation of the society's publicity

Environmental protection, as the obligation for both the government and civil society organizations as well as individuals, needs the joint efforts of the whole society, "compared with environmental protection campaigns abroad which was carried out from the bottom to the up or from the public and civil environmental organizations in China is basically "government-led" model, the environmental protection campaigns are in the led-by-government mode in which the government is policymaker , administrator , manager as well as supervisor of policies and regulations, almost assume full responsibility for environmental protection. "(Wang Litao,2011) Although it is essential to highlight government publicity and strengthen the administrative publicity, cultivating public awareness, fully carrying forward the public spirit and considering environmental protection as individual's responsibility are the ultimate goal and the fundamental way to address such environmental pollution as fog haze. Judging from the beneficiaries, the public is the beneficiary. As long as the public actively participate in environmental protection campaigns, they can be a strong driving force behind the environmental protection and management. At present, China's public participation is neither active nor effective. First, the social groups, especially non-governmental organizations are limited in number, scale, fund, and influence; Second, the public has few opportunities to participate in participation in environmental policy making. Prior participation is not sufficient, post-supervision is not effective and public participation didn't lead to good result; Third, the system to ensure the public's participation rights is to be perfected, and some system is only for show. Generally speaking, Chinese society is not highly civilized; the public spirit is not strong; the promise of "everybody is responsible for environmental protection" is not fulfilled by all. Only enlarging the size of "eco-citizens" groups, can fully demonstrate the men's leading position in environmental protection, realize the harmonious development between man and nature, achieve multi-win among economy environment and society proposed in "China Atmospheric Pollution Prevention Action Plan", and ultimately build a beautiful China.

5 Conclusions

Earth is the largest public area. No one is an outsider in the environmental protection gam. Everyone should assume the responsibility of protecting the environment. Although the Chinese government has taken various effective measures, policies and laws related to environmental publicity is not perfect. So we must cultivate public spirit of the public to make up for imperfect system. Encourage the whole society to act in accordance with no-harm principle, to voluntarily defense the dignity of public environment, to rationalize the use of natural resources shared among all people and passed on generations by generations and to shape the public's rational thinking, social responsibility and public life. Only by doing so can effectively avoid repetition "tragedy of the commons" and "free rider" phenomenon, solve problems related to environmental publicity.

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Study on the Integrated Care System for the Rural Elderly in the View of Sustainable Development

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Abstract: The rural population aging produces profoundly effects to economy, environment resources and production methods and it causes huge impacts to the sustainable development. In the view of sustainable development, this paper integrates institutional endowment resources and non-institutional endowment resources, commercial endowment resources and non-commercial endowment resources in rural endowment system according to the sustainable principle and integrated care theory, and divides them into the primary endowment system and the secondary endowment system. It constitutes the integrated care system for the rural elderly and illustrates the function and operation mechanism of the integrated care system. This paper thinks that the integrated care system for the rural elderly should base on family endowment and government backstop, and pay attention to cultivate the rural home care system for the elderly and commercial endowment market, integrate and coordinate through community and social organization so as to play its function.
Key words: Sustainable theory; Integrated care system for the rural elderly; Endowment system; Work mechanism

1 Introduction

Under the effect of the trend of the constant ultra-low birth rate, China has entered the stage of rapid aging currently. It is predicted that until 2020, the aging population above 65 years old in China will be up to 167 million, which will be a quarter of the aging population in the whole world (Li Pan, 2014). The effects brought by the population aging are wide and deep, among which the expanding trend of rural aging and the aging problem are more prominent. At present, scholars at home and abroad usually tend to cope with the aging problem through isolated public policies. Including population policy, social endowment security system, basic medical insurance system, reeducation policy of the elderly etc. (Wang, 2006; Chen Sheying, 2010; Peng Xizhe, etc., 2011). But few of them treat the rural aging problem in China in a sustainable development way. In the development and research of the rural aging career, it only focuses on one certain resource. Such as the government supporting resources (Liu Zilan, 2003; Wang Yuan, etc., 2008), family endowment resource (Zhang Zhengjun, etc., 2012) and there are few researches about the comprehensive application of social resources, which lacks of the integrated theoretical analysis frame. Under such a background, in the view of sustainable development, this paper puts forward the integrated care system for rural elderly and its operation mechanism setting the integrated care theory as the frame, which has important significance to the perfection of the rural endowment system and the sustainable development of the rural society.

2 Rural Aging and the Sustainable Development

2.1 The development situation of the rural aging and the sustainable development theory

It shows in the data of the sixth nationwide population census that the aging degree of the rural population in China has reached 15.4%, which is 2.14% higher than the national average level of 13.26%. Due to the effect of urbanization and the migration flow of population, the rural aging degree in China will be more serious than urban area. It is predicted in the report of the development of aging career in China that the aged population in rural area in China will be up to 167 million until 2035 and the aging degree will reach 37.2%. The rapid development of rural aging has important effect to the sustainable development of the national economy and the environment resources.

The sustainable development involves the coordination and unification of three aspects including sustainable economy, sustainable ecology and sustainable society. This requires that human beings focus on economic efficiency, concern about ecological harmony and pursue the social fairness in the development so as to reach the comprehensive development of people finally. Thus it can be seen that the sustainable development has become a strategy about the development of society and economy, and it plays a significant role in the development of the human society. The sustainable development is trying to improve people's life quality under the condition of the containing capacity of the ecological

system. Liu Zhongyan, Ji Zhong, etc. (2005) thought that the sustainable development can optimize people's living space to supply foundation for the development of people. It can be better meet people's basic requirement to promote the comprehensive development of people. It can deepen people's recognition of the natural value and the self-value and let people get freedom in driving natural correctly. In Feb. 2015, the International Council for Science (ICSU) and the International Social and Science Council (ISSC) issued the report of *Review of Targets for the Sustainable Development Goals: The Science Perspective*, which implements independent evaluation to the 17 large targets as well as the 169 sub-targets of the sustainable development. It includes indexes such as ensuring the sustainability of economy and employment, building tolerant and sustainable developed industry and promoting industrial innovation, etc. It can be seen that with the development of the sustainable development theory, the research range of the educational circles has been expanded from the environment sustainability to the sustainability of economic development and production methods.

2.2 The contradiction between the rural population aging and the sustainable development

The rural population aging produces has a great impact on the sustainable development of China's economy and production. The rural population aging is one of the most urgent public problems faced by the industrial countries and the emerging marketing economy. Because the material basis in rural area is weak and the coverage of the social security system for the aged in rural area is relatively narrow, and the rural population aging occupies economic and social resources, the sustainable development of the rural society is facing severe problems.

In the layer of the economic resources, population aging increases the social and family burden gradually. The expenditure of social security and welfare will be increased greatly in order to cope with the population aging. The increasing of the population aging and the aging dependency ratio also increases the burden of the population of the labor age. Besides, the traditional family endowment is also facing severe challenges. The decreasing of the population of rural family and labor force also means the decreasing of the income of rural family and the declining of the ability of supporting old people, which can't sustain the impact of population aging and senility; In the layer of production method, the traditional industries need a large amount of labors of the right age. With the dual effect of the low birth rate and aging, the original high density labor intensity industries are facing severe challenges and the "period of demographic dividend" of the economic development in China is shortened greatly; In the layer of social resources, the aging group has special requirements in aspects such as clothing, catering, residence, traveling, medicine etc. So the infrastructural facilities should be adjusted according to the requirements of the elderly. The consumption field and service field of the society are sure to be changed and different service network will be built to meet the special requirements of the elderly to the maximum. The trend of the rapid development of aging distracts a mass of social resources.

The "integrated care" theory is accordance with the concept of the sustainable development and basic connotation and it is a kind of deep reform to the traditional care methods. It doesn't only adjust the institutional frame of the past care, but also reforms the service concept (Hill, 2007; Du Peng, etc., 2014). Integrated care is a kind of social supporting method that focuses on the sustainable development of resources and stresses performance and harmonious development with the society, which will integrate the rural endowment resources at present to the maximum and save the social resources and play the role of endowment at the same time. Integrated care has the caring advantages of systematisms and sustainability, which has important enlightened significance to lessen the contradiction between the rural population aging and sustainable development.

3 Integrated Care System for the Rural Elderly and Its Functions

3.1 The integration of the rural care system for the elderly

At the beginning of the 21th century, "integrated care" drew attentions in western countries gradually and formed social policy. Integrated care is the integration of different care resources, so that the individual in the fragmentation of care become healthy and happy, the management and organization of integrated care take place at the same time. At present "integrated care" has formed two kinds of main integrated mechanisms: The first one is "institutional integration" mode, which is focusing on the coordination of the institutional layer of care under the promotion of the government policy to perfect and develop the new "institutional" work network and integrate the original care resources to enhance the accessibility of service. Countries in Europe, especially Northern European mainly apply this mode. The second one is "community integration" mode, namely "community care" as the basic unit, which is deploying care resources such as states and institutions to supply constant social services with high

quality. Countries such as British, America, Japan and Singapore are representatives of this mode, which is also a mode that our country can learn from.

Most definitions of "integrated care" describe it as connecting the management and organization that is input, supplied and serviced together to improve the quality and efficiency of service (Kodner&Spreeuwenberg, 2002). So, "integrated care" refers to: (1) Provide healthy and social service by a single organization; (2) Supply healthy and social service unitedly by several organizations(commonly); (3) Connect the primary and the secondary health care; (4) Connect cares of different layers in a single department, such as service of spiritual health; (5) Connect prevention and treatment service (Robertson, 2011). "Integrated care" usually classifies from the two dimensions of integrated direction and integrated function (Hawkes, 2009).

In the direction of integration, the integrated care system for the rural elderly can be divided into "vertical integration" and "horizontal integration". The "Vertical integration" refers to the integration of the primary endowment system and the secondary endowment system. The primary endowment system refers to commercial endowment resources and non-commercial endowment resources. The secondary endowment system includes specific endowment methods and services such as commercial endowment institution, commercial endowment service, government endowment institution, home-based endowment institution, etc. The "Horizontal integration" refers to the integration of the function of the integrated care system for the rural elderly, which mainly includes supplying living care, health care and psychological supporting to the rural old people. When classified from the dimension of functional integration, the rural aging integrated care can also be divided into "functional integration", "organizational integration" as well as "professional integration". Among which, the "professional integration" refers to the coordination work, contact or strategic alliance among experts of aging care or between different government institutions and social organizations.

The important feature of the "integrated care" is comprehensiveness, and it stresses the maximum utilization of the social resources and absorbs rural endowment forces and coordinates and manage through social organization at the same time. In addition, it stresses the management of the performance in the integrated care system. The performance management refers to evaluate and supervise the quality.

3.2 Component elements of the integrated care system for the rural elderly

In the view of the sustainable development, the integrated care system is constituted by institutional endowment resources and non-institutional endowment resources, commercial endowment resources and non-commercial endowment resources by the sustainable principle and integrated direction. It can be divided into the primary endowment system and the secondary endowment system so as to build the integrated care system for the rural elderly focusing on the family endowment and government backstop (as is shown in figure 1). While integrating the endowment resources, it cultivates the home-based endowment system in rural area and the marketing element of commercial endowment, which are coordinated through the community and social organization.
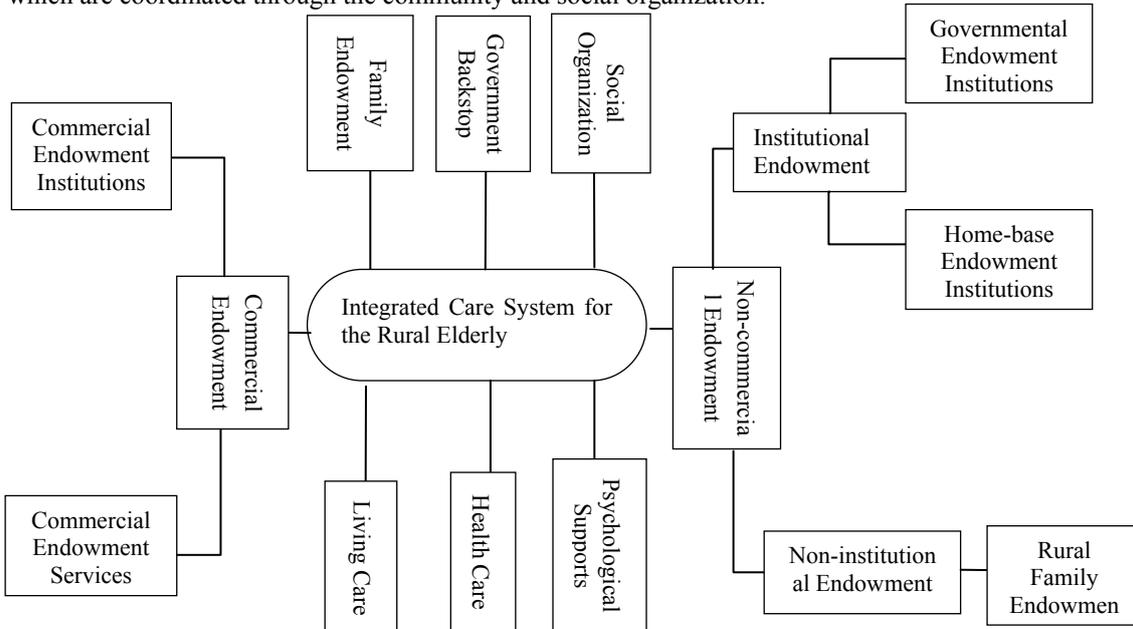
Figure 1　Structure of the Integrated Care System for the Rural Elderly

The commercial endowment resources include the commercial endowment institutions and commercial endowment services. The commercial endowment institution refers to the institutions such as the nursing homes and sanitariums that implement the system of check-in after payment. In other words, the elderly themselves, their children or the units supply an endowment institution with a certain expenses and the endowment institutions supply services such as life care, spiritual consolation to the elderly that check in. The commercial endowment services build endowment communities that are designed especially for the elderly to meet the more and more diversified endowment requirements with high layer for the elderly to provide professional medical service, health care service, entertainment service, psychological service, etc.

Non-commercial endowment resources include institutional and non-institutional endowment. The institutional endowment resources include governmental endowment institutions and home-based endowment institutions. The governmental endowment institutions are the social welfare institutions that are built by the government, which refer to the endowment service institutions that deal with registered procedure in the registration authority organ of the public institutions and they have the nature of the state welfare. The home-based endowment service refers to a kind of service form that the society supplies for the elderly that live at home. It sets solving the routine living difficulties as the primary content and is the supplementary when the home-based endowment service capacity is sufficient. Non-institutional endowment resources mainly refer to the rural family endowment. The family endowment is the most primary and the longest endowment mode in Chinese village. The rural family endowment takes root in the agricultural economy and its substance is being built on the genetic connection and guaranteed by the accumulation of the individual labor benefit. It implements "regurgitation-feeding type" support that is exchanged inside the family.

Besides the subjects that provide the service in the integrated care system, there are also the subjects of coordination and management—community and the social organization. Chinese integrated care system for the rural elderly should adopt the "community mode" according to the actual condition of Chinese rural area. Although Chinese rural communities are autonomous organizations, they still have a certain administrative function, they can better gather the social force. At the same time, there are certain rural autonomy committees in the rural society, such as the elderly associations, the rural public welfare organizations and rural social work institutions that develop newly. Through the government, the community as a unit, the rural associations, public welfare organizations and social work institutions can be integrated to establish regulatory agencies in order to performance evaluation, supervision and coordination functions. The evaluation refers to select the service providers and evaluate the effectiveness of services according to the individual and family status; Supervision refers to supervise the delivery process condition, promptly response when find the malfunction of delivery; Coordination is defined that the service subjects coordinate to meet the needs of the elderly in the rural and keep collaboration and partnership.

3.3 The functions of the integrated care system for the rural elderly

The functions of the integrated care system for the rural elderly mainly perform in three aspects: Firstly, it provides living care for the elderly. In accordance with the principles of sustainability and avoid overlapping and waste of social resources, should be evaluated through a case, the family unit, considering the elderly in rural areas and the actual situation of the traditional culture, give priority to the family endowment. If it is found through evaluation that the functions of family endowment is lost, it should be filled up through institutional home care system. As to the few alone elderly people, it should play more function through the nursing home with the nature of the government subsidy.

Secondly, it provides health care for the elderly, such as periodic physical examinations, supplying household medicines, visiting medical services, routine massage health cares, etc. Health care for the elderly should fully absorb the experience of the United States and other countries, and set the community as a unit to carry out classification management. Through the assessment of community, the number to the elderly in the community and aging state, health care is divided into different levels, which is equipped with different health care resources, as much as possible to achieve the maximization of resource utilization, avoid waste of resources equalization and care not.

Thirdly, it provides psychological supports for the elderly. The psychological supports mainly refer to supply psychological consultancy, lessen emotional barrier and alarm the suicidal tendency, etc. At present, urban communities in our country has built follow-up visit system of the family health and the state is enlarging the investment of healthy in countryside, especially the investment to the left-behind elderly people in the rural. Pay attention to care the left-behind elderly people and oldest-old people of the rural through integrated care system to find out the psychological problem timely.

4 Process and Mechanism of the Integrated Care System for the Rural Elderly

4.1 The process of the integrated care system for the rural elderly

The integrated care system for the rural elderly has characteristics such as comprehensiveness, sociality and publicity, which needs coordination of many sides, integration of resources and building a set of scientific work system to help to straighten out the work relationship so as to guarantee the implementation of the service work. The prominent feature of the integrated care system is the maximum utilization of the social resources, and the maximum playing of the function of endowment at the same time so as to realize the optimization of Pareto.

According to the life cycle of the public goods, the integrated care service includes the service subject and the supply object as well as the demand and so on. Their relationship is reflected in: through the integration of the relevant family, communities and institutions to organize, it provides a full range, the whole process, the whole time of service for the rural elderly. Based on the life cycle of public goods, service cycle can be divided into the service supply section, the service object link section and the service demand satisfaction section. Their relationship model is illustrated in Figure 2. The section of service supply mainly corresponds to the different works of service subject, while the section of the connection of the service objective mainly corresponds to the interaction relationship between the service subject and the service objective and the section of the identification of the service requirement mainly corresponds to the satisfaction condition of requirements after the service objective receiving the service delivery.
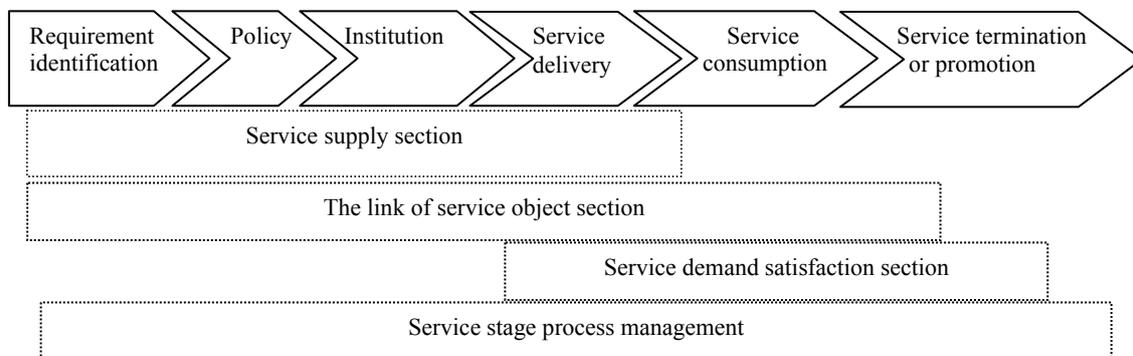
Figure 2   Service Process of the Rural Aging Integrated Care

The figure 2 indicates that the rural elderly integrated care is the mechanism of the whole process management, integrated care can be divided into three stages: pre service, intermediate service and late service. Pre service is needed to integrate the service preparation, including the establishment of public policy and decision-making bodies and the supply of the main screening and establishment, demand identification, etc.; Intermediate service refers to the service output, service delivery and service product consumption, including funds, publicity, service object identification and service use, etc.; Late service refers to the service demand, the end of service supply, referral or upgrade, etc.

4.2 The mechanism of the integrated care system for the rural elderly

The mechanism of the integrated care system can be summarized as follows: the division of labor, the clear object, the comprehensive security and the performance evaluation. Mainly reflected in the following four points:

4.2.1 Cohesion and referral between the primary service system and the secondary service system

The system of the rural elderly integrated care can be divided into the primary service system and the secondary service system. The integrated care system for the rural elderly is embedded into the rural government and the society, which stresses the government backstop and the governance concept of the participation of the whole society.

Under the sustainable principle and according to the actual condition of the rural society in China, the primary service system of the integrated care system for the rural elderly should mainly include rural family, home-based endowment and the institutional nursing home opened by the government. In the current village, family endowment is still a major social force. They play an important economic supporting role and also play functions that other social forces do not have to the life care and psychological support of the elderly. Under the effect of the aging of population and the urbanization, the functions of the family endowment are declining obviously, so it should be intervened institutionally.

The family that is lack of the functions of family endowment should meet the needs of life care through home-based endowment. And the few old people without children should be supported by the institutional nursing homes that are opened by the government.

The secondary service system mainly includes the governmental health system, the public social organizations and commercial institutions. The government health system mainly supplies follow-up visiting service of family health and the intervening service of psychological problems. The public social organizations mainly develop the rural social service projects through the social work organized and developed by the charity institutions and the government, and the commercial institutions mainly supply services such as commercial institutional endowment services and insurance and the commercial institutions mainly meet the requirements of the endowment in many layers.

The primary service system and the secondary service system are evaluated and supervised by the supervision organs of the community endowment and the social organizations. The corresponding service system should be matched aiming at the differences of individual cases of the elderly in community. In the event of service delivery barriers, timely referral.

4.2.2 Screening and determination of the service objective

In the work system of the rural elderly integrated care, firstly departments that are responsible for the organizational decision-making and the business guidance determine the targeted area and population of integrated care, then each responsible department of the village and the subsidiary department in the work system implement further screening and determine the service objective. Before making a decision, the demand of the service object is evaluated in advance. The successful "integrated care" should gather people who are cared, that are the service objectives (Berehtold & Peytremann Bridevau, 2011). The objective of the integrated care should be clear and the gathering should abide by the philosophy of holism and focusing on customers, including all of the targeted area and population (cover and access of geography and population), and promote the participation of service objectives.

4.2.3 Comprehensiveness of the service system

One of the important features of "integrated care" is comprehensiveness. The comprehensiveness performs in the comprehensiveness of the subjects of the service supply as well as the diversification of the service content. The integrated care system for the rural elderly includes the primary service system and the secondary service system, and the subjects of supplying mainly come from family, community, social organizations and commercial institutions, etc. In order to provide comprehensive services for the service objects, the rural elderly care system is based on the pre evaluation of the demand of the service object. In addition, the functions of service system are also diversified, including living care, health care and psychological support, etc.

4.2.4 Evaluation of the performance of the scientific supervision

The sustainable principle requires the maximum utilization of the social resources, so it needs the evaluation system of performance that is supervised scientifically to evaluate and supervise the quality of the rural aging integration care, scan the effect of different care models to the usage of endowment resources with the method of "cost-benefit", measure the performance of the care from the perspective of stakeholder to give a certain stimulation to the caregiver with practical effect.

5 Conclusions

In the view of the sustainable development and combining the sustainable development theory and the integrated care theory, this paper sets the current situation of the rural aging in China as the background and puts forward to apply comprehensively the social resources, integrate the institutional endowment resources and non-institutional endowment resources, commercial endowment resources and non-commercial endowment resources in rural aging system, build the integrated care system for the rural elderly based on the family endowment and government backstop, including the primary endowment system and the secondary endowment system.

The rural population aging in China cannot be simply attributed to the population policy and the age structure in rural area, it is still related with factors such as the rural economic level, cultural educational degree, etc. Alleviating the problem of rural aging cannot simply rely on a hand or a resource, but the comprehensive use of social resources, integrate social resources, realize the maximization of the use of social resources, and maximize the function of providing for the aged, multi-party coordination, integration of resources, to establish a set of scientific and integrated care system working mechanism. Although a set of theoretical system is put forward in this paper, which still needs to be tested practically.

The rural population aging forms huge challenges to the rural environment and economic development in China. Only making the best use of the circumstances, promoting the building of the comprehensive, social and public integrated care system for the rural elderly and the integration of the rural social resources can ensure the social sustainable development in China.

Acknowledgement

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An Evolution Model Applied to Ecological Building Materials Industry

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Abstract: Ecology and evolution models are widened application rather than the traditional ecology field is current megatrend, especially in ecological industry which dynamics evolution process is similar to biological population. In this article a modified patches model was discussed to applied the ecological industry region. We summarize patches model sand discussed what improvements of models have been proposed thus bring the cross elasticity prototype structure in a part of them. The modified model will be discussed optimal solution of model reasonable dynamic development direction for the ecological industry. And with real data obtained from statistical review and numerical simulations which show how parameters affect the models. Our purpose is figure out the modified patches models could support in several other areas, especially in prospective ecological building materials industry.

Key words: Ecological industry; Patches model; Stability; Substituting capacity

1 Introduction

Dynamical evolution systems in ecology often within the structure habitat patches which individuals reproduce and disperse. A vast amount of literature is devoted to Nonlinear analysis of ecological dynamic patches model which has been is firmly related with the development of mathematicians and other natural sciences, related theory and application, interdisciplinary attention. Ecological dynamic model was used to analyze practical ecological community, application and development，according to the actual demand in the relevant discipline as well as in particular ecological building materials.

At this stage with the wide application of computer technology, ecology in both macroscopic and microscopic direction made big progress. Nurmi and Parvinen (2008) and (2011) studied evolution of specialization under metapopulational conditions. Wilson and Yoshimura (1994) and Abrams (2006) showed that both flexible patches choice of the generalists and temporal variability in the relative profit abilities of the different. Governed by local extinction and colonization implies some migration between patches where populations are composed of a large number of subpopulations in patches, but many individuals spend almost their life in single patch, the state of the system in one patch is exactly the same as the state in all other patches at any given time. However, the interaction between a patch and population has not been sufficiently investigated. It has often been demonstrated that a number of patches can promote coexistence of species competing for single patch (Hastings 1980). Such coexistence frequently depends on the existence of a competition, where inferior competitors have larger colonization rates (Tilman 1994) However, situations in which species are able to use more fractions of patches have been little mentioned.

In this paper, we focus on analysis on the important role of interaction between a patch and population for the sustainable growth tendency of ecological industry. Amount of literature have not involved in the field of industry evolution, resource specialization in mixed patches instead that requires rather strict conditions in those models. Butwe discussed the dynamic development tendency of ecological building materials industry as a case, and keepings steady path, by built integrated model using a patches prototype structure as part of them. The suitable measures for optimal solution of model will be discussed and with real data obtained from statistical review and numerical simulations which show how they affect the models.

2 Integrated Models Description

A variety of complexity industry evolution can be describing the process of economic and biological dynamic progress, which exchange resource, energy and information between the external environment and industry system that affect proceeding of the evolution.

In two species industry system, the evolution tendency of the industries population is either a population trend to extinction the other trend to boom period in the progress, or two industries population to achieve some kind of coexistence.

We propose building materials industry systems including two species, ecological building materials industry population and general building materials industry population. Ecological building materials is emerging industry population, which from obtain legal status to high-level degree of organization is detailed and complicated process, thus draw into the patches model to integrated models, which including patches dynamic progress and populations who rely on patches dynamic, so it is a nonlinear dynamic model.

2.1 The evolution model

Mathematical method to establish the nonlinear dynamic model particularly patches model which can be used to make inferences from a complete set of competing models most notably in mechanism of ecology analysis. Such as the cellular automata model considering the spatial distribution of the patch and the population dynamics but difficult to express with mathematical form, and the classical patches model like the Levins model (1969, 1970) which has been frequently used to conduct a comprehensive quantitative description in specific production rates of some products for each individual case. Thus, Compare the reaction diffusion equations as described in the real world of material movement mathematical form, because it's given species in the ecosystem of its uneven characteristics of distribution, those newly patches are always allowing local populations of different sizes with different colonization and extinction rates. The simplified patches the order of species extinction and the population dynamics notational simplicity (Hanski's ,1985, Hastings,1991):

$$
\frac{dD_j}{dt} = f(D_j) - \sum_{i=1}^{n} a_{ij} b_{ij} \left(D_j \right) N_{ij}
$$

$$
\frac{dN_{ij}}{dt} = c_{ij} a_{ij} b_{ij} \left(D_j \right) N_{ij} - d_i N_{ij} - \sigma_i N_{ij} N_{ji} - \varepsilon_i N_{ij} + \frac{1}{m} \sigma_j \sum_{j=1}^{m} N_{ij}
$$

(1)

2.2 Simplified model of ecological building materials industry

Obviously this initial model apply to dynamics processes on ecological industry appears to be deficient such as patches resource heterogeneity on spatial or temporal scales and acquisition capacity of species. Admitting that, simplified model is possible adapted to be more general scope, especially designing and optimizing in the construction industry which is assumed a single-patch for building materials industry system, but the system is not consumed resources and energy of construction industry. Distinct from the initial model, considerations the patch potentially influences are necessary to model; hence models are defined as follows:

$$
\frac{dN_i}{dt} = N_i \left(a_i b_i [f(B)] - \sigma_{ij} N_i - d_i \right)
$$

$$
f(B) = rB[1 - \frac{B}{k}]
$$

(2)

$B =$ Density of building industry resources $a_i =$ The diffusion rate of building material industryI $N_i =$ The population density of building materials industryI, $f\left(B \right) =$ The growth of the construction industry function，$b_i[f(B)] =$ Ability to capture industry resources construction of the building materials industry i，$d_i =$ termination rates of IndustryI，$\sigma_{ij} =$ transfer rate of Industry i to industry j, $k =$ Density parameter s

k = resources loading capacity of Construction industry

We assume that the building materials industry system made up of two populations that ecological building materials industry and general building materials industry that constitute an organic synthesis in building materials industry system, with construction industry as its single patch. For the model, we make the assumptions by: Function f (B) and B (t) is continuously differentiable.

2.3 The processes of steady state

Just two populations in building materials industry system, the persistence evolution is expected to the equilibrium gradually moving to steady state, regardless of dynamic path to choose.
Construction industry that is assumed to be set by Logistic growth model(Eqs 2.1) , Logistic model show that the evolution of the population within a limited space is nonlinear, population presents the s-shaped growth over time, the curve of model is adopted   s=1, （ r denotes the natural growth rate of

the population）, therefore building industry B, ecological building materials industry N1, N2 common building materials industry, the relations between and among can be expressed by the following equations:

$$\frac{dN_i}{dt} = N_i \left(a_i b_i [f(B)] - \sigma_{ij} N_i - d_i \right) \qquad i = 1,2 \; N_i(0) > 0 \tag{3}$$

At a static equilibrium the model is: dXt/dt equal to 0 , and in the N1 , N2 phase space distribution has the following solutions:

$$N_1^e = \frac{1}{\sigma_{12}} \left(a_1 b_1 [f(B)] - d_1 \right)$$

$$N_2^e = \frac{1}{\sigma_{21}} \left(a_2 b_2 [f(B)] - d_2 \right) \tag{4}$$

Both Ecological building materials and general building materials within the development process of construction industry, the system will have 4 kinds of possible combination of equilibrium:

$$E\left(N_i N_2\right) = \begin{bmatrix} 0 & 0 \\ \frac{1}{\delta_{12}}(a_1 b_1 [f(B)] - d_1) & 0 \\ 0 & \frac{1}{\delta_{21}}(a_2 b_2 [f(B)] - d_2) \\ \frac{1}{\delta_{12}}(a_1 b_1 [f(B)] - d_1) & \frac{1}{\delta_{21}}(a_2 b_2 [f(B)] - d_2) \end{bmatrix} \tag{5}$$

four equilibrium state ： C1 （0,0） C2 （N1,0） C3 （0,N2） $C4 : (\frac{1}{\delta_{12}}(a_1 b_1 [f(B)] - d_1) \quad \frac{1}{\delta_{21}}$

$(a_2 b_2 [f(B)] - d_2)$ The above four equilibrium state to calculate these jacobian matrixes,

$$J_1 = \begin{vmatrix} a_1 b_1 [f(B)^{'}] & 0 \\ 0 & a_2 b_2 [f(B)^{'}] \end{vmatrix} \; J_2 = \begin{vmatrix} -a_1 b_1 [f(B)^{'}] + d_1 & 0 \\ 0 & 0 \end{vmatrix} \; J_3 = \begin{vmatrix} 0 & 0 \\ 0 & -a_2 b_2 [f(B)^{'}] + d_2 \end{vmatrix} \; J_4 = \begin{vmatrix} -a_1 b_1 [f(B)^{'}] + d_1 & 0 \\ 0 & -a_2 b_2 [f(B)^{'}] + d_2 \end{vmatrix}$$

respectively calculate characteristic root： $\left| \lambda E - J_i \right| = 0$

Equilibrium state $C1(0,0)$： $a_1 > 0, b_1 > 0, [f(B)] > 0$ System has a positive characteristic root, C1 is not stable state, therefore, the construction industry system and building materials industries will not appear in C1(0,0)

Equilibrium state C2(N1,0), $when \; a_1 b_1 [f(B)^{'}] < d_1$ System has a positive characteristic root, therefore， C2 is not stable state; $when \; a_1 b_1 [f(B)^{'}] > d_1$, and evolved into the C2, system gradually stable in the C2 (N1, 0) In the competition for the resources of construction industry patches, ecological building materials population gradually incline to maximum capacity N1, and general building materials species will become extinct, building industry patches and building materials industry systems will asymptotically stable at C2 (N1, 0).

Equilibrium state C3 (0, N2), $when \; a_2 b_2 [f(B)^{'}] < d_2$,The system is instability; $when \; a_2 b_2 [f(B)^{'}] > d_2$, The system gradually stable in the C3, In the competition for the resources of construction industry patches, general building materials population gradually incline to maximum capacity N2, and ecological building materials species will become extinct, building industry patches and building materials industry systems will asymptotically stable at C3(0,N2).

According to the Routh-Hurwitz theorem ，the characteristic equation for C4(N1,N2):

$$\lambda^2 + \{a_1 b_1 [f(B)] + a_2 b_2 [f(B)^{'}] - d_1 - d_2\}\lambda + a_1 b_1 [f(B)^{'}] \times a_2 b_2 [f(B)^{'}] - a_2 b_2 [f(B)^{'}] \times d_1 - a_1 b_1 [f(B)^{'}] \times d_2 + d_1 \times d_2 = 0$$

when $a_1 b_1 [f(B)^{'}] + a_2 b_2 [f(B)^{'}] - d_1 - d_2 < 0, \text{ or } a_1 b_1 [f(B)^{'}] \times a_2 b_2 [f(B)^{'}] - a_2 b_2 [f(B)] \times d_1 - a_1 b_1 [f(B)^{'}] \times d_2 + d_1 \times d_2 < 0$

system is not stable state; hen $a_1 b_1 [f(B)^{'}] + a_2 b_2 [f(B)^{'}] - d_1 - d_2 > 0, \text{ and } a_1 b_1 [f(B)^{'}] \times a_2 b_2 [f(B)^{'}] - a_2 b_2 [f(B)^{'}]$

$\times d_1 - a_1 b_1 [f(B)'] \times d_2 + d_1 \times d_2 > 0$ system gradually stable in the C4, In the competition for the resources of construction industry patch, ecological building materials population gradually incline to maximum capacity N2, and general building materials species also gradually incline to its own maximum capacity, therefore systems can achieve a stable coexistence between the two sides at C4, building industry patches and building materials industry systems will asymptotically stable at

$$C4 : (\frac{1}{\delta_{12}}(a_1 b_1 [f(B)] - d_1) \quad \frac{1}{\delta_{21}}(a_2 b_2 [f(B)] - d_2) .$$

There is only a single population system is easy to reach the stable state building materials industry, and always maintain a stable state. But consider patches species biodiversity，ecology is more emphasis on equilibrium C4 (N1, and N2)，Related research has focused on a single patch, or population co-evolution on patches, and a series of empirical or theoretical interpretation.

Similar to the ecological evolution process，two building materials industry in the equilibrium under the construction industry, but in the course of the evolution of ecological industry more important alternative equilibrium C2(N1,0).

3 The Significance of Patch Reaction Function

For Analysis the $b_i[f(B)]$,even if the form of this function uncertainty we can estimate related parameters value in the model according to mass of data arrangement from the statistical yearbook data of China. the data processing is used from building materials enterprise gaining environmental protection labelling certification (Fig1):
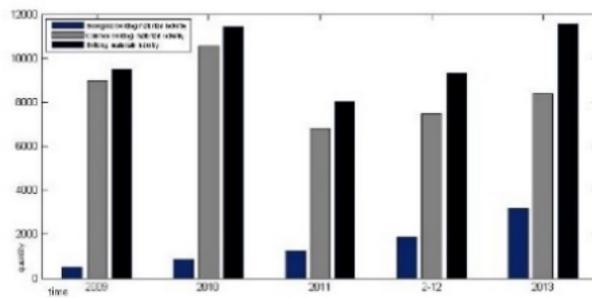
Figure 1   Quantity of Ecological Building Materials Enterprise

Figure 1 shows the evolution of the model parameters，set k and r for: $k = 1$，$r = 0.103$，parts of the model parameters were estimated: $a_i = 0.284, d_i = 0.074, \sigma_{ij} = 0.031$, to find effect function we assume that the different function values: $b_i[f(B)]_{F1} = 4 \; b_i[f(B)]_{F2} = 5 \; b_i[f(B)]_{F3} = 6 \; b_i[f(B)]_{F4} = 9$ simulation the certain period of evolution. Then, adjustments the original value of Ni, we have got Four species common evolution development initial period (Fig2).
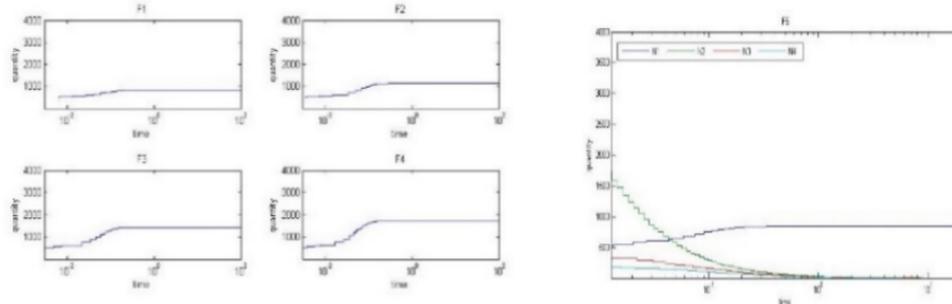
Figure 2   The Population Evolution of Ecological Building Materials

4 Conclusions

Other parameters and conditions of the same, change the function value of the influence of the evolution of ecological industry is significant. Curve F1 as the base period, and gradually increase the

function value changed the uncertainty trend of evolution, accelerate the evolution process to achieve local stability of the time, especially evident on high degree of improving the assignment of Curve F4. At four groups evolution process, N1 population density increased gradually to a steady state, evolution of the other three groups are gradually become extinct, simultaneously, the population density decrease with the add value of the ability to exploit construction industry resources showing a positive correlation.

Simulation process show that in the case of other parameters are the same, the role of ability to exploit construction resource under the industry evolution, so ecological building materials industry population need strong pre-emption ability to compensate for weaker initial population density to steadily evolved in patches environment.

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Predicting Continuance Intention of Mobile Government: Conceptualizing the Roles of Post-Acceptance Beliefs

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Abstract: Mobile government (mGovernment) has emerged to be an innovative way of governments around the world to deliver services and information to their citizens, businesses and organizations. The success of mGovernment initiatives is arguably lies in its continuance intention/usage rather than in its initial adoption. Hence, many studies have been conducted to investigate continuance intention/usage of mobile technologies such as mobile commerce, mobile data services, and mobile Internet service and many others. Nonetheless, the scarcity of similar studies in area of mGovernment is obvious, in addition to the fact that most of these scarce studies, if not all, employed theoretical frameworks/models that are dubiously suitable for information technology (IT) initial acceptance only. The information system continuance model (ISCM) has been strongly supported for IT continuance study. Therefore, this research paper attempts to answer this call by proposing ISCM as a backbone model to study mGovernment continuance intention.
Key words: Mobile government; Post-acceptance belief; Continuance intention; ISCM

1 Introduction

Information and Communications Technology (ICT) has changed the landscape of public service delivery considerably. It has increasingly gained recognition of its important roles by governments around the world (Kaliannan et al. 2010). Electronic Government (eGovernment) has been defined in various terms, and most researchers' definitions revolve around the role of ICTs in promoting the delivery of public services to the government, companies and individual persons (Jyoti and Gheorgite, 2004; OECD: The e-Government Imperative, 2003). However, Bassara et al. (2005) have the definition of Mobile Government (mGovernment) as the leveraging of mobile and wireless technologies, devices and applications of all kinds for the betterment of services delivery to all e-Government stakeholders including all government units, businesses and citizens. From this elaboration, it can be understood that mGoverment is a fragment of eGovernment with complimentary value.

The success of eGovernment initiatives worldwide are often noticeable with benefits such as promoting life quality of people, effective knowledge delivery, fostering social unity, generating incomes and finally helping both private and public organizations and bodies remain competitive in the increasingly challenging electronic market place globally (Hesson and Al-Ameed, 2007). By the same token, as a complimentary subset of eGovernment, mGovernment may bring a similar success, only at a greater height.

The success of ICT is often seen from the lenses of its adoption, whether initial or continued ones. However, prior studies argue that ICT success depends more on continuance usage than initial adoption. As claimed by Bhattacherjee (2001) and Kim & Son (2009), rather than initial adoption, benefits derived from information technology (IT) initiatives are only actualized through sustained utilization. This notion became the basis that led to the inception of the infamous Information System Continuance Model (ISCM) constructed by Bhattacherjee (2001). In a systematic literature review of 191 peer-reviewed articles on IS continuance intention, 100 were found (52%) to use ISCM as their underpinning theoretical framework (Nabavi, Taghavi-Fard, Hanafizadeh, & Taghva, 2016). This study attempts to extend ISCM with other post-adoption perceive constructs in addition to the existing Perceived Usefulness (PU).

Thus, the objective of this study is to propose a conceptual model of mGovernment continuance intention by incorporating post-acceptance beliefs into ISCM.

2 Post-Acceptance Beliefs

Previous studies commonly coined the term beliefs when defining expectation. For example, according to Oliver and Linda (1981), Churchill and Surprenant (1982) and Bearden and Teel (1983),

expectation is defined as "individual beliefs or sum of beliefs about the levels of attributes possessed by a product/service" (Thong, Hong, & Tam, 2006). Based on this definition, PU which represents post-adoption expectations, is a belief that is formed after users' initial acceptance of IT. Post-acceptance beliefs are kept updated by users as they gain more experiences of using an IT. Later, users will assimilate these experiences, causing the expectations towards using the IT to be different from the initial ones (Fazio and Zanna, 1981; Karahanna et al., 1999; Bhattacherjee, 2001).

For the purpose of this study, in addition to existing PU, two additional constructs of post-acceptance beliefs are added to the ISCM: Perceived Enjoyment (PENJ) and Perceived Compatibility (PCOM).

3 Information System Continuance Model (ISCM)

ISCM is the modified model of expectation-confirmation model (ECM) that was proposed by Oliver (1980). ECM is a theory extensively employed to study service marketing, post-purchase and consumer satisfaction, which mostly fall under consumer behavior studies. (Nabavi et al., 2016). Bhattacherjee (2001) suggested an extended model of ECM by importing the belief component of Perceived Usefulness (PU) from Technology Acceptance Model (TAM), which is firstly introduced by Davis (1989), specifically to study IS continuance. ISCM is envisaged to rely on three constructs, that are user satisfaction, the confirmation of expectations through earlier experience with IS use and PU surrogating post-adoption expectations. Bhattacherjee (2001) found that satisfaction is a significant predictor of users' IS continuance intention, followed by PU as a salient but weaker predictor. Confirmation and PU are primary predictors of satisfaction (Bhattacherjee, 2001; Yuan, et al., 2014).
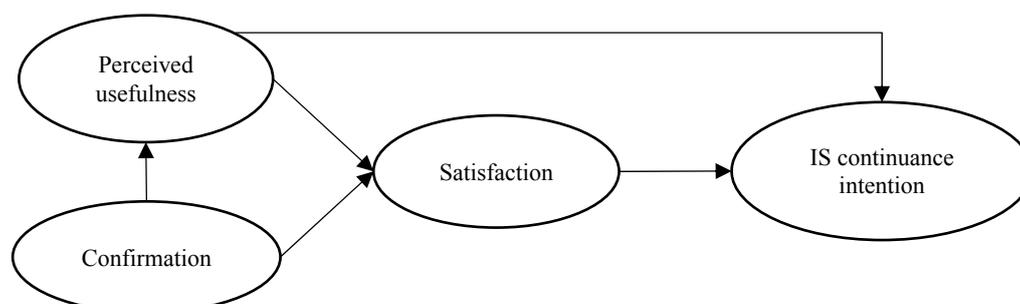
Figure 1   IS Continuance Model (Bhattacherjee, 2001)

4 Proposition Development

There are eight propositions based on ISCM to predict mGovernment continuance intention in this study, based on the findings and rationales from the extant literature. Firstly, users' satisfaction with IT has a positive influence on mGovernment continuance intention. Prior studies in marketing have found that the main reason why consumers decided to repurchase products or reuse services is the level of satisfaction they gained (Oliver, 1993; Cronin et al., 2000; Szymanski and Henard, 2001). Based on the congruence between individuals' continued IT usage decisions and consumers' repurchase decisions (Bhattacherjee, 2001), this study assumes an equivalent relationship in mGoverment long-term usage intention context. Hence, this research posits the following proposition:

P1.   Users' satisfaction with IT is positively related to their mGovernment continuance intention.

Secondly, according the expectation-confirmation paradigm, user satisfaction is influenced by two main antecedents: post-acceptance beliefs regarding the IS and confirmation of expectations. Confirmation of expectations is the discrepancies between pre-adoption expectations and actual performance of the IS (Bhattacherjee, 2001). The reasoning for these associations comes from cognitive dissonance theory (Festinger, 1957). Users construct early expectations about mGovernment before using it. After the users actually experience mGovernment, they renew their expectations of mGovernment performance according to their direct experiences. When mGovernment performs higher relative to their pre-adoption expectations, their post-adoption expectations are confirmed; otherwise, their post-adoption expectations are disconfirmed. Thus, the following propositions are suggested:

P2a. Users' confirmation of expectations is positively related to their PU

P2b. Users' confirmation of expectations is positively related to their satisfaction.

Prior marketing studies have found that as users' expectations move higher, their satisfaction goes to the same direction (Oliver and DeSarbo, 1988). This finding is supported by LaTour and Peat (1980)

who concluded that beliefs resulting from consumers' direct experiences are major determinants of consumer satisfaction. Moreover, various studies in IT adoption has constantly discover that PU is the most salient antecedent of users' adoption intentions (e.g., Davis et al., 1989; Taylor and Todd, 1995; Venkatesh and Davis, 2000). Thus, we postulate the following propositions:

P3a. Users' PU is positively related to their satisfaction.

P3b. Users' PU is positively related to their mGovernment continuance intention.

Perceived enjoyment (PENJ), as defined by (Davies et al., 1992), is the degree to which the activity involving the use of IT alone is believed to be enjoyable, aside from any anticipated performance consequences. Motivation is divided into two types – intrinsic and extrinsic (Vallerand, 1997). Extrinsic motivation refers to the drive of goal-oriented activity that leads to rewards or achievement. On the contrary, intrinsic motivation focuses on pleasing and satisfying feelings when involving in an activity (Deci, 1971). Davis et al. (1992) described PENJ as an intrinsic motivation, while PU in Technology Acceptance Model (TAM) is an instance of extrinsic motivation. From this view, PENJ could be a key post-acceptance belief that influences user satisfaction similar to PU that has been theorized to be a user belief that determines satisfaction in the ECM. Provided the current trend where more and more technologies are able to meet various adopters' needs, it is foreseen that the post-acceptance level of enjoyment would also become vital in developing user satisfaction towards technology usage. Several previous studies have also proposed the role of PENJ in affecting users' IT usage behavior. In reference to the motivation theory view, Davis et al. (1992) found that PENJ to be the key variable of behavioral intention to use personal computers. Similarly, Van der Heijden (2004) found that PENJ directly affects user intention to use Web service. Hence, our propositions are as follows:

P4a: Users' PENJ is positively related to their satisfaction.

P4b: Users' PENJ is positively related to their mGovernment continuance intention.

Compatibility refers to the extent to which an innovation conforms easily to the values and routine of a person (Rogers, 1983; Lee, Cheng, & Depickeré, 2003). Similar finding by Tornatzky and Klein (1982) showed that an innovation stands a better chance to be adopted when it is compatible with individuals' job obligations and value system. Since mGovernment implementation is still at its infancy stage (Al thunibat, Mat Zin, & Sahari, 2011), it can be viewed as an innovation. Thus, compatibility is expected to be a salient predictor to MGovernment continuance intention. This is parallel to (Shareef, Kumar, Kumar, & Dwivedi, 2011) who introduced compatibility as an another IT innovation factor in eGovernment literature. They claimed that compatibility promotes citizens' inclination towards using eGovernment system to restrict personal interaction and social influence. Thus, this study formulates the following propositions:

P5: Users' PCOM is positively related to their MGovernment continuance intention.

5 Research Model
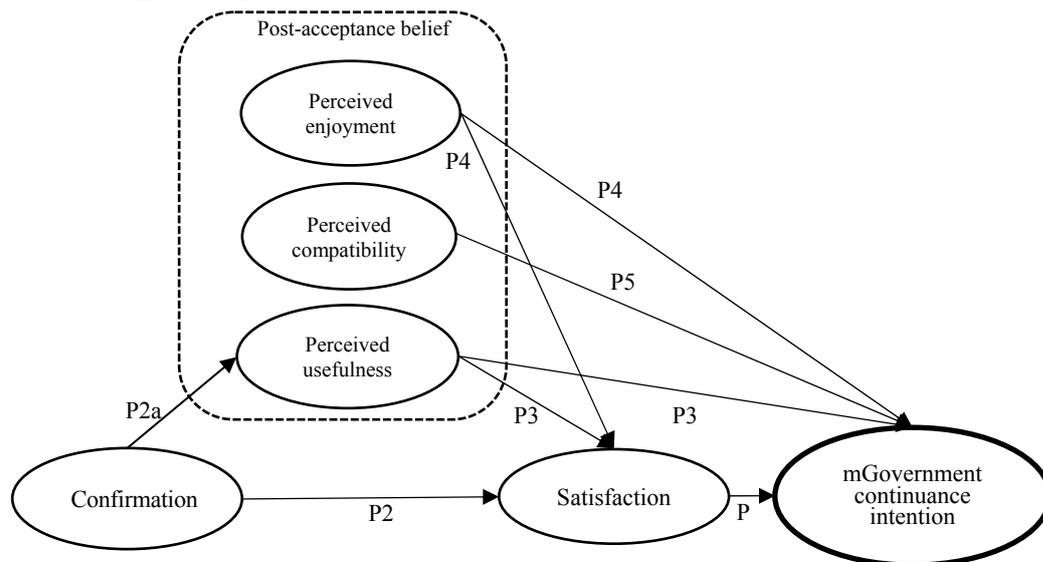
Figure 2 Proposed Research Model

Figure 2 illustrates the proposed research model in which ISCM serves as the base framework with suggested relationships among the independent and dependent constructs.

6 Methodology
6.1 Population and sample
Even though this study is still in the conceptual phase, the researchers intend to postulate the methodology if this research is to be extended to the empirical stage. The population for this study will be Malaysian citizens who has experienced using mGovernment services in any forms such as mobile applications, mobile websites or text-based services. Because reaching the entire population is imagined to be not possible in addition to the absence of sampling frame, non-probability convenience sampling is viewed as the only option. When the population of a research survey is not reachable in entirety, non-probability sampling is not avoidable (Thurasamy, 2016). This convenience sampling will be purposive where qualified respondents are only those who have experienced mobile government beforehand. This technique is supported by Sekaran & Bougie, (2013), who state that purposive sampling is necessary where the sampling is limited to specific types of respondents who can render the intended information. Therefore, the survey instrument will be designed to filter pre/non-adopter and post-adopter respondents.

To lessen the possibility that pre/non-adopter respondents are selected more than the post-adopters, who are the intended respondents, this study will target government servants as the sample respondents. This is important in order to speed up the process of gaining intended sample size of qualified respondents, the post-adopters. Examples of government servants include public school teachers, public higher learning lecturers and government employees who work at government departments and agencies. The rationale behind this is that government servants are more likely to use mGovernment due to job and personal responsibilities such as using Inland Revenue Department's m-filing system for tax purposes, checking out or updating students' marks via mobile devices or applying leaves through mobile human resource information systems.

6.2 Variables and measurement

Table 1   Constructs, Instruments and Questionnaire Items

Constructs	Instrument Used (Authors)	Total Items
Perceived Enjoyment	Thong et al. (2006)	4
Perceived Compatibility	Lin (2010), Verhoef and Langerak (2001), Lee and Kozar (2008)	3
	Shareef et al. (2011)	5
Perceived Usefulness	Bhattacherjee (2001)	4
Confirmation	Bhattacherjee (2001)	3
Satisfaction	Bhattacherjee (2001)	4
mGovernment Continuance Intention	Bhattacherjee (2001)	3

All items for the original constructs of ISCM will be adapted from the originator, Bhattacherjee (2001) while the other two post-acceptance belief constructs will be adapted from others like shown in Table 1. Sample items are as follows:

a)   Perceived Usefulness- "Using mobile government improves my performance in carrying out personal responsibilities".

b)   Confirmation- "My experience with using mobile government was better than what I expected".

c)   Satisfaction- "How do you feel about your overall experience of mobile government use: Very dissatisfied/Very satisfied

d)   mGovernment Continuance Intention- "I intend to continue using mobile government rather than discontinue its use.

e)   Perceived Enjoyment- "I find using mobile government services to be interesting".

f)   Perceived Compatibility- "Using mobile government would fit into my lifestyle".

7 Contribution and Limitation
The contribution of this conceptual paper is that it serves as a preliminary base to explore the intention to use mobile government in the long run in Malaysia since as suggested before, continuance

adoption may realize IT benefits better than initial adoption does. Malaysian Communications and Multimedia Commission (2015) reported that more and more Malaysians have access to the Internet year by year. For example, from 2013 to 2014, the percentage of Malaysians who had access the Internet with their mobile broadband devices increased from 22 percent to 65.1 percent. With the increasing number of Malaysians accessing the Internet through their hand-held devices, it is urgent for the mobile government providers to start studying Malaysian users' inclination towards continuous use of their services. Ignoring this advantage may cost the opportunity of delivering public services and information at a more efficient level.

One limitation of this study is the omission of several other post-acceptance belief constructs that are demonstrated to be important by the literature. For instance, perceived risk and perceived complexity are significant determinants to IT adoption intention with negative relationships. Future researches may include more post-acceptance belief constructs to add more to the robustness of the model.

8 Conclusions

This study has proposed to extend the ISCM, one of the most employed models in IT continuance studies. The extension involves two post-acceptance beliefs, precisely perceived enjoyment and perceived compatibility, which have received much advocacy from prior studies. Since this study is conceptual, no empirical findings yet to be discussed to support the strength of the model. Even so, this study suggests the sampling methods and target respondents to enlighten future researchers who intend to continue this research to the empirical stage. Lastly, this study may serve as a baseline reference to mobile government providers to explore Malaysian users' continuance intention of mobile government services.

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Study on Sustainability in Higher Education

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Abstract: Malaysian higher education system is undergoing significant transformation. It started with the effort to corporatize public universities followed by the democratization of higher education that saw many private universities and university colleges being established. The establishment of Malaysian National Higher Education Fund and the formulation of Malaysian Qualification Framework further shaped the new form of Malaysian Higher Education system. The newly launched Malaysia Education Blueprint 2015 - 2025 (Higher Education) clearly justify education sector as a strong contributor towards meeting Malaysia's need for human resources. At the same time the expectation on public institutions of higher education to be the engine of innovation and creativity is rising. Quality and value for money are two issues among the many emerging issues affecting the transformation of Malaysian higher education system. Meeting the bottom-line while offering quality education drives the public higher education sector. This paper aims describe the marketing situations of higher education. It discusses the strength and weaknesses of Malaysian Public Universities and the trends in the development of higher education system in Malaysia with respect to attracting postgraduate students as well as the sustainability of Higher Education in this era.
Key Words: Sustainable development; Public higher education; Marketing practices in public university; Development of public Higher education

1 Introduction

First introduced to the corporate world in the late 1980s, the concept of integrated marketing communication (IMC) is a fairly new phenomenon in American higher education. Research on the concept within higher education, although limited, suggests that more and more institutions are beginning to adopt the practice due to increased competition for students and funding.   Oregon State University (OSU), for example, is facing a plethora of challenges, not unlike most American higher education institutions (HEI), stemming from the current competitive landscape. These challenges include declining educational aspirations among traditionally aged, in-state college students; intense competition for state resources; aggressive competition among HEIs; and increased competition for federal research funds. In response, in 2009 OSU developed an IMC plan in conjunction with their university-wide strategic plan to elevate institutional marketing and visibility and further the university's progress toward its vision of achieving top-ten status among land grant HEIs (Oregon State University, n.d. para.3).

Higher education is generally seen as a major (potential) catalyst towards sustainable development, in particular through its traditional missions of education, research and public service (Tom,et al, 2012; Dalal-Clayton, 2002). During the last two decades higher education institutions worldwide have implemented various sustainable development initiatives. In Flanders for example, most universities have signed the COPERNICUS Charter which dedicates universities to becoming leaders in SD through their various activities, including research, education, public service and campus operations. There have been numerous other sustainability initiatives at the institutional level in Flanders, and some regional overarching ones have been undertaken (for example "Ecocampus", "Fenix", "Sociale Economie op de Campus" and "Duurzaam Hoger Onderwijs Vlaanderen") (Tom, 2012)

Strategic marketing framework is sector specific and contextual. The education sector, as a driver of most of the developing economy, demands development of effective delivery mechanism to remain competitive in the international market. This is equally true in the case of marketing by public universities in the domestic market. Thus the researcher is in favour of aligning the framework to that of developmental planning to assist decision makers to co-ordinate economic decision-making over the long run.

2 Sustainability Development
2.1 Society in transition

In response to global environmental crises and vast social inequalities, world political leadership formally adopted sustainable development (SD) as a leading development model at the United Nations Conference on Environment and Development, in Rio de Janeiro in 1992 (Carley, 2000; Dalal-Clayton, 2002; Reid, 2005; Rogers, 2008). Embraced by many stakeholders worldwide (e.g. governments, businesses, nongovernmental organizations, higher education, and citizens), SD is deemed highly imperative for the current and future well-being of humanity and the planetary state (Tom, 2012).

In essence, SD stands for: (Gibson, 2000)

- a solution for environmental and development problems
- a set of principles implying positive objectives
- a focus for positive change
- a critique on conventional thinking and practice

In spite of past commitments and various SD measures taken, the practical implementation of SD on societal or global levels falls short (Lafferty ,2000; Sneddon, 2006; Fergus, 2005; Rees, 2010; Quental, 2011). Humanity is increasingly exceeding environmental limits (GFN, 2010; MEA, 2005; Rockström, 2009) and extreme poverty remain widespread. "Businessas-usual" measures do not suffice for sustainable development to succeed. Far reaching system changes are needed, which challenge and fundamentally alter our prevailing ways of development, including our fundamental beliefs, values and assumptions regarding what constitutes development (Rees, 2010). The first essential and logical step should be to eliminate clearly unsustainable practices (Cairns, 2004). —

True, —triple bottom-line‖ corporate planning is now fairly commonplace; various protocols for —green-building ‖ compete to influence building codes; —new urbanism, ‖ —smart growth, ‖ and the ecocities movement are gaining ground everywhere; hybrid and electric vehicles are increasing their market share; and green consumerism is becoming mainstream in many developed countries—but none of this activity has made much difference (apart from fostering the illusion of progress) (Rees, 2010).

From a transition perspective, society is currently in the beginning of a chaotic and turbulent period of transformation towards a new equilibrium, where structural changes become visible through the accumulation of various system changes (e.g. socio-cultural, economy, environment, institutions, technology) – "early acceleration" (Raskin, 2002; WCED, 1987). However, it is unclear whether or not SD, understood as a dynamic equilibrium, will be achieved. An unsustainable future is still looming at the horizon. To many, this depends on society's "willingness to act", the choices yet to be made and the actions yet to be undertaken（Raskin, 2002).

2.2 Definition and principles

The most popular definition of SD is the one of the report "Our Common Future" (ULSF, 2012) also known as the "Brundtland report".

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (ULSF, 2012) The report continues stating the two key concepts:

- the concept of ‗needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.(WCED, 1987)

The report also clarifies the content of the required change processes and as such renders its famous sustainability definition more concrete and operational: —In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. (WCED, 1987)

3 Sustainable Higher Education
3.1 Why should higher education engage in sustainable development?

Sustainable higher education has emerged in response to calls for universities to lead society towards a sustainable future (Cortese, 1992; Lozano, 2012) and is considered a distinct but interdisciplinary specialization of study and practice within sustainability science (Filho, 2005; Beringer, 2008) and education for SD (Beringer, 2008; Fien,2002). Higher education is generally seen as a major (potential) catalyst to work towards SD (Fien,2002). The urgent societal need and broad call for SD allow higher education to assume a fundamental and moral responsibility in contributing to SD

(Carley,2000; Cortese, 1992). Through their societal mandate of advancing knowledge, educating leaders, and furthering societal progress and engagement (Clugston, 1999), institutions of higher education should be moral visionaries and centres of sustainability innovation and excellence. As „learning laboratories,‟ campuses are to provide the lived experience of sustainable communities (Gonigle, 2006).

As major contributors to the values, health and well-being of society, higher education has a fundamental responsibility to teach, train and do research for sustainability. We believe that the success of higher education in the twenty-first century will be judged by our ability to put forward a bold agenda that makes sustainability and the environment a cornerstone of academic practice.（ULSF,2012）

This is a challenging task, recognizing that higher education (still) contributes to and sometimes even accelerates the sustainability crisis (Tilbury, 2012; Sterling, 2008). The scope and range of the negative impacts of university-educated people on the natural systems that sustain Earth are unprecedented. (Corcoran, 2004) and as Orr states, the sustainability crisis is not so much the work of ignorant people but ―[…] largely the result of work by people with BA‗s, B.Sc.‗s, LLB‗s, MBA‗s and PhD‗s. ‖ (Cortese, 1992)

3.2 The situation

Marketing Management usually tends to be overlooked at the early stage of planning. This in turn will lead to higher spending cost due to redundancy plus expensive non-impact promotional materials. Taking Marketing Management seriously is second to none to ensure organization survival. To solve the problem, a context specific strategic marketing framework will be developed to ensure planned activities during the initial phase of service delivery so that any problem can be fixed at an early stage.

Cheryl Slover-Linett and Michael Stoner deployed a second survey in November 2008 asking a wide group of communications professionals to choose their own top three challenges from among our list of nine, and to share their strategies for addressing those concerns. The respondents were professional colleagues; publicized the survey on listservs (Communications-L; Pubs-L; UWEBD); and even sent email to bloggers with links to the survey for them to convey the survey to the members inviting them to respond to the survey. (Cheryl, et al, 2009)

Response was enthusiastic. They heard from 245 respondents, primarily from the fields of marketing, public relations and development. They heard from institutions small, medium and large, with an equal number of public and private institutions represented. Most respondents were in the Midwest, largely due to strong participation on the previous survey. And the results, coming as they do during a distressed economy, are interesting. (Cheryl, et al, 2009)

According to the survey, if some things never change and that institutions are still challenged by fundamental questions about how to market themselves effectively? Here, in order of prevalence, are the top nine challenges identified by respondents to our second survey:

Table 1   Challenges on Marketing Higher Education

Rank	Challenge	Rating it in Top 3
No 1	Branding and messaging	62%
No 2	Rethinking and expanding communication outreach approaches and formats	52%
No 3	Incorporating new media and/or technology strategies	37%
No 4	Economic downturn in general	36%
No 5	Appealing to a wider range of prospective Students	36%
No 6	Budget cuts or insufficient funding	35%
No 7	Decentralization within the university and/or marketing department	20%
No 8	Internal organizational struggles and staff Turnover	18%
No 9	The cost of higher education	10%

(Source: Cheryl Slover-Linett and Michael Stoner: Higher Education Marketing and Communications Challenges for 2009: Dealing with New Issues or Struggling with Old Ones?)

4 Conclusions

In an era of dramatic human-induced environmental problems and failing socio-economic and institutional systems, seriously threatening the well-being of current and future generations, it is widely recognized that higher education has the ethical and moral responsibility to transform itself to become a leading force in catalysing societal changes for sustainable development. Central to its "raison d‟être" higher education has always been at the forefront of societal developments and progress through their traditional mandates of education, research, and public service. As such an extension to sustainable development is logical.

For more than two decades, and since Chapter 36 "Promoting Education, Public Awareness and Training" of Agenda 21 – the global sustainability plan of action – higher education has been examining, grappling with, and in some cases engaging with and attempting to implement the concept of sustainable development. One public way of doing this is by signing declarations and attempting to implement sustainability in various activities throughout the institution. However, in transition terms, it can be argued that higher education must take its efforts further and move towards (early) acceleration in which policy and structural changes become visible. In order to accelerate the transition to sustainability in higher education, institutions must (re)orient themselves "towards" SD, and use it as a constant frame of reference.

In moving towards becoming more sustainable, higher education requires a whole systems approach that targets the entire system and its various subsystems (all activities and the way it is organized) in need of fundamental system changes and considering all sustainability principles together. Maybe we should have started to take marketing as part of the tools on sustaining the higher education. While sustainable higher education is still an emerging field of study and practice, the acceleration process can already build upon a sound body of knowledge of implications and approaches for various higher education activities including education, research, public service and campus operations. Insufficient or unavailable knowledge cannot be an argument to slow-down or postpone further action. If any, it is more a question of priority setting, willingness and learning. We hope that this paper contributes to the transition of Flemish higher education towards SD.

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A Qualitative Investigation of Sustainable Sourcing Practices in the Nigerian Shea Butter Industry: A Case Study of a Top-Tier Supplier

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Abstract: This paper investigates sustainable sourcing practices in the Nigerian shea butter industry. The paper utilised the case study qualitative approach to investigate the sourcing practice of a registered and certified top-tier supplier (Sokaiko Shea Butter and Agro Processing Co. Ltd), a member of the National Shea Products Association of Nigeria (NASPAN) also a supplier under the auspices of the Global Shea Alliance (GSA). The results from the case study revealed that the top-tier supplier developed a business codes of conduct in line with GSA sustainability guidelines to ensure ethical practices which respects the social, economic and environmental aspects of supply chains. The top-tier supplier provides practical ways of how sustainable sourcing is incorporated into the practices of lower-tier suppliers with support from the external actors. The limitation of this study is that, the study concentrated on a single top-tier supplier and its relationship with the lower-tier suppliers, it is therefore recommended that further research should be done using the context of other certified top-tier suppliers within the supply chain network or a comparative study of the sourcing practices of certified and non-certified top-tier suppliers can be carried out to investigate the level of commitment and behaviour of suppliers towards ensuring sustainable buying and selling practices in the shea butter industry.
Key words: Sustainable sourcing; Shea butter; Supply chains; Standards; Nigeria

1 Introduction

There have been concerns about noticeable social, economic and environmental sustainability challenges in The African shea butter and shea kernel supply chains (Boffa, 2000; Lovett, 2010; Carney and Elias, 2006). Many external stakeholders, such as the government, nongovernmental organizations, communities, multinational companies, consumers and the media have been clamouring for sustainability in the industry as well as change in the supply chain strategies and practices of suppliers (Abujaja et al., 2013). In the context of the Nigerian shea butter industry, the external stakeholders' i.e. NEPC, GIZ, GSA, NSCEPA who are not directly part of the supply chain saw the concerns as a wakeup call for intervention to ensure that suppliers and buyers act responsibly in their supply chain activities. Researchers suggest that engaging in responsible supply chain will pave way for innovative ideas and strategies to rejuvenate the shea butter industry and give room for the implementation, transmission, adoption and use of sustainable standards and certification in supply chains, this will further promote sustainability in rural commodity supply chains (Lovett, 2010; Schneider and Wallenburg, 2012; Tertappen et al., 2013). This study therefore, examines and presents the sustainable sourcing practice of a top-tier suppliers and its relationship with the lower-tier suppliers in the Nigerian shea butter industry.

2 Conceptualising Sustainable Sourcing

Research in the area of sustainable sourcing have gained more momentum in terms of suppliers' relationship as well as buyer-suppliers relationships in the developed nations than what is obtained in the developing and less developed countries of the world (Anisul Huq et al., 2014; Pagell and Schevchenko, 2014; Gimenez and Sierra, 2013). Recently, events and attention around sustainable supply chain management research began to change especially in the past one decade when external stakeholders began to raise their voices against companies who are not taking care of the social and environmental consequences of their activities along supply chains. For instance, Nike was hit by serious agitation by activists and campaigners that it should consider implementing corporate social responsibility which will eliminate the social issues associated with its relationship with network of weak suppliers (Holden, 2012). Schneider and Wallenburrg (2012) argued that the implementation of sustainable sourcing in supply chains play a critical role in reshaping the approaches businesses use for procurement and sourcing, though this will require the support of state actors through policy instruments to curb the social and environmental sustainability issues.

Research in this area is considered very important as it encompasses the social, economic and environmental aspect of supply chains which requires adherence to guidelines and standards which must

be respected when sourcing commodities (Gold et al., 2013). Researchers who focused on the social aspect of supply chain in the area of sourcing always advocate of for ethical practices in the relationship between the buyers and suppliers in terms of working condition, pricing and child labour (Leppelt et al., 2013). In this regard multinational companies and other private organization are expected to have ethical code of conducts to promote fair pricing when sourcing commodities, this include SMEs (Wilhelm et al., 2013). While others are advocating for better working condition and prevention of child labour in supply chain (Schneider and Wallenburg, 2012). Nevertheless, in the aspect of environmental protection a lot of research has been done in the area of risk management and resources use and its impact in degrading the ecosystem (Chaplin-Kramer et al., 2015). Researchers have suggested that the interconnections between the triple bottom aspects of supply chain should be studied holistically to determine the performance of buyer-supplier relationship while sourcing commodities (Leppelt et al., 2013).

This development encouraged more researches, in which sustainable sourcing have been termed by various researchers by the different names which all suggest sustainable supply chain management. For instance, some refer to it as ethical sourcing/buying (Chen and Slotnick, 2015), responsible sourcing (Young and Osmani, 2013), responsible procurement/buying (Ferri et al., 2014), socially responsible sourcing/buying (Wesley et al., 2012) environmentally responsible sourcing (Bazan and Jaber, 2016), sustainable procurement (Walker et al., 2012) etc. In a nutshell researchers have come up with various definitions of sustainable sourcing in which the definitions are all struggling to present a comprehensive way of looking at what sustainable sourcing means in the context of triple bottom line. Many researchers have defined sustainable sourcing in various ways but the most encompassing one which brings the triple bottom line approach together, is the definition provided by Pagell et al., (2010) they mentioned that it involves ''managing all aspects of the upstream component of the supply chain to maximise triple bottom line (TBL) performance''.

3 Sourcing Strategy in the Nigerian Shea Butter Industry

Sourcing shea products in Nigeria is not fully controlled even though there is increasing demand for shea butter across the globe which has led to agitation by consumers through multinational companies to ensure certification, labelling and traceability to find out the source of shea butter produced from Africa (Bup et al., 2014). Nevertheless, evidences have shown that shea products are mostly sourced in an unethical manner from Africa countries, in which Nigeria is inclusive and most exporting companies are involved in this unethical sourcing which involves exploitation and use of child labour (Vanguard, 2015).   For example, Elias and Arora-Jonsson (2016) found that Gurunsi and Moose women use their children for shea nut picking and shea butter processing. To discourage unethical sourcing in Nigeria, the federal government, instituted various programs and adopted some international standards   from International Organization for Standardization (ISO) using   the Standard Organization of Nigeria (SON), Nigerian Export Promotion Council (NEPC) in collaboration with the state governments, GIZ, local NGOs and adopted multiple standards geared towards achieving socially responsible value and supply chain   management to mitigate social, economic and environmental issues in supply chain. The adopted ISO standards that are related to sustainable supply chain are ISO/TC 207 Environmental Management, ISO/PC277-ISO/26000 for Sustainable Procurement, ISO/TC/34 food products, Global Shea Alliance (GSA) sustainability guidelines.

The above mentioned standards are not the only standards available to shea butter industry, there are multitude of voluntary standards that can be adopted and used by buyers and suppliers to manage how shea products are produced and supplied. The logic behind this is that, with sustainability sourcing order, buyers and suppliers can be certified and qualified to participate efficiently in domestic and export supply chains i.e. for shea kernel and shea butter supply chains. This certification can promote products by mere labelling as sustainably sourced and processed. Moreover, research on sustainable sourcing in the context of the Nigerian shea butter industry is relatively scarce, even though a lot of effort is ongoing to make the shea butter industry a sustainable one in terms innovating value chain, supply chain practices and most importantly ensuring that responsible relationship exist between buyers and suppliers as well as with the environment.

4 Sustainable Business Code of Conduct

In the sustainable supply chain literature, the implementation and use of business code of conduct is one of the measures taken by companies to ensure sustainability in supply chains. In which, Barkemeyer et al., (2014) suggested that business code of conduct is a tool that can improve business

ethical performance and the study by Gray (1990) confirms this by emphasizing on the importance of business code of conduct and sustainability in supply chains. As a result of the continuous demand for ethically processed shea butter, the shea butter industry needs to ensure that all layers of suppliers abide by sustainability standards and ethical codes of conducts in their supply chain practices. The identification and choice of responsible suppliers to supply either shea kernel or shea butter is an important responsibility of the buying company (Pouliot and Elias, 2013) as Bello-Bravo et al., (2015) opined that socially responsible sourcing of shea butter and kernel from the lower-tier (rural women) has become a matter of urgency for strong suppliers and buyers of shea butter so as to meet up with the demand of multinational companies who want to improve their own cooperate social responsibility.

This is so because it is now an important practice of the big buying companies to ensure that their business code of conducts and policies are incorporated along their supply chains by influencing suppliers to maintain responsible methods of sourcing by enhancing the relationship between the lower-tier suppliers and top-tier suppliers (Lovett, 2010; Drost el al., 2012). Though buyers and consumers may be unconvinced with suppliers' sustainable business code of conducts and be thinking it is just mere business strategy as it is obtained in many commodity supply chains. Many top-tier suppliers may have aligned to various public rules and guidelines for supply chain within their country of operation but may not be able to convince foreign buyers that those guidelines are good enough and can be reliable for international business. For example, the guidelines provided by a state department on sustainability may be recognised within the state of operation but may not be acceptable in the global context. In a bid to find a solution to this challenges many private sustainability standards came up to counter the doubt and that was why most agricultural commodity supply chains are aligning with private standards setting organizations such as Fairtrade (Elias and Saussey, 2013; Elias and Arora-Jasson, 2016)

5 Research Objective

To give an account of a top-tier supplier sustainable sourcing practices and its relationship with the lower-tier suppliers (rural women) in sourcing shea butter and shea kernel in the rural communities of Niger State, Nigeria.

6 Methodology

We adopted a qualitative case study methodology to investigate the sustainable sourcing practice of a top-tier supplier in the shea butter industry. We selected this top-tier supplier (Sokaiko Shea Butter and Agro Processing Co. Ltd) because it is a registered and certified top-tier supplier and a member of the National Shea Products Association of Nigeria (NASPAN) also a supplier under the auspices of the Global Shea Alliance (GSA, 2013). The data collection approach is semi-structured interview approach supported by secondary data from GSA website. The director of Sokaiko Shea Butter and Agro Processing Co. Ltd was interviewed in February, 2015. Going by the research objective, the questions asked were based on the supply chain practices of the top-tier supplier which include buyers-suppliers relationships, use of sustainability standards, and business code of conducts. The logic behind the use of interviews for this study is to get the view of the top-tier supply on sourcing practices in the Nigerian shea butter industry. This approach is exclusively used because not so much is known about sustainable sourcing in the Nigerian shea butter industry and an insight to the phenomenon is required. Letter of consent for the interview with a sample of the interview checklist was sent to the company to seek permission for questioning the director and to use voice recorders for audio recordings and camera for video recordings and photos of the interview session. The data collected were transcribed and analysed using QSR Nvivo 10, this was done thematically and not only the interviews were analysed, the nonverbal expressions of the interviewee was equally considered (Fontana and Frey, 2000).

7 Results and Discussion

This case study focuses fully on Sokaiko Shea Butter and Agro Processing Co. Ltd, a top-tier supplier in the Nigerian shea butter industry, a member of the National Shea Products Association of Nigeria (NASPAN) and it is listed among the top suppliers under the auspices of the Global Shea Alliance (GSA, 2016) the company supplies processed and certified shea butter produced by the company and shea kernel sourced from the rural women but sorted and repackaged by the company. As a certified supplier, the director of the company is an executive member of the Global Shea Alliance who is saddled with the responsibility of ensuring sustainability in supply chain. Sokaiko Shea Butter

and Agro Processing Co. Ltd provides the lower-tier suppliers with the required guidelines to facilitate sustainable practices, the company ensure that it source its shea kernel and butter from registered cooperatives by the state government, some them are also listed as members of the Global Shea Alliance, this is done to show sustainability in the chains of supply. Sokaiko Shea Butter and Agro Processing Co. Ltd also support the cooperatives in the practice of responsible supply chain by providing them with information related to the sustainability of the industry through trainings and sensitization. The managing director of company gave a detailed account of the challenges the company encounter while relating with the lower-tier suppliers especially with the presence of social, economic and environmental sustainability challenges in the shea butter industry.

The Niger State Commodity and Export Promotion Agency (NSCEPA) in collaboration with German Technical Cooperation (GIZ) and Nigerian Export Promotion Agency (NEPA) launched three shea-butter-villages in Farinshinge, Assanyi and Kodo villages to support sustainability and improve buyer-supplier relationship in the industry. The director described sustainable supply chain as "a means of reducing poverty among women and rural communities" (Jibril, 2015). When the director was asked to describe the companies sourcing strategies in relation to sustainable sourcing, Jibril (2015) explained that:

We respect the ethics in the   shea butter industry, as part of our mandate we don't support under age people participation in our supply chain because that is child labour, even our international buyers and development partners don't encourage the use of children in shea butter production…….To discourage this, we pre-finance the products we buy from the rural women   so that they can get adults to work for them in shea nut picking and processing, for instance if a ton is sold for 150,000 naira we give them about 70, 000 to 80,000 Naira to aid ethical production and when they finish processing we pay them the balance……..Also, we buy about 2000 metric tons every year, we contract the middle-men (local buying agents) to help us buy the quantities that we want from the rural women in the villages because it is the fastest way to get the required quantity though we provide them with our code of conduct which respects the principles of sustainability.

He further described the company's labelling and traceability strategy as:

What we usually do is that, we tell the local buying agent to label the products from the source, so that we will be able to know the villages where the shea kernel is coming from because we also monitor the processing practices of the women in various villages. So that we can understand the kinds of quality we are getting from different places and whether the product is ethically produced. We report back to the rural women if the quality is either good or bad…… I have been trained and I have been in the field for 10 years I have gone for different local and international seminars on shea nuts and shea butter processing, we do this because quality and traceability is equally important to our buyers.

Sokaiko's business code of conduct touches the triple bottom line aspect of supply chain. This is shown by its business principles which is in strong alignment with the Global Shea Alliance sustainability guidelines. The sustainability guideline was developed in consultation with various women's groups, non-profit organizations, US and European food and cosmetic brands, and international oils and fats suppliers in which Sokaiko Shea Butter and Agro Processing Co. Ltd was actively involved to promote women's empowerment, decent working conditions for actors, development of local communities where shea is processed, and the protection of ecosystems by outlining best business practices for all actors (GSA, 2015). When asked about the relationship between the company other top-tier suppliers and buyers in promoting sustainable sourcing, he responded by saying:

We need to continue working together to ensure sustainability but the situation is that, the market itself is a buyer driven market because the buyers determine the price and not the suppliers and what it means is that we the suppliers are price takers. We give price usually when there is scarcity and shortage. Though price negotiation at the international market is ok, because the price has relationship with the price of cocoa and it is regulated by different actors from different countries with the support of our international body (Global Shea Alliance).

Jibril (2015) is of the conviction that the shea butter industry can become completely sustainable in the nearest future especially with the intervention of the external factors such as the government, NGOs, communities, multinational companies (buyers), consumers and the standard setting organizations. Innovating the supply chain strategy of the actors involved is an intricate process as many actors who are unregistered are involved which have negative implication for the shea butter industry. Even those unregistered lower-tier suppliers who are willing to practice sustainable supply chain face challenges of lack of infrastructure, inadequate finance and cost of registration to get

certified.

8 Conclusions and Limitation

This research is limited to a single certified top-tier supplier. The case of Sokaiko Shea Butter and Agro Processing Co. Ltd demonstrates how the lower-tier suppliers are carried along in the practice of sustainable supply chain. It demonstrated that the top-tier suppliers' business code of conducts can impact positively on the lower-tier suppliers in their supply chain practices. The participation of Sokaiko in the Global Shea Alliance sustainability program has earned it a global recognition in the very competitive African shea butter industry. Though Sokaiko's concentration on the lower-tier suppliers in Niger State, could limit its potential as a company towards extending its sustainability practices to the other producing states in Nigeria. Nevertheless, the top-suppliers implementation of Global Shea Alliance sustainability guidelines and principles is its major contribution to social, economic and environmental sustainability in the shea butter industry. Conclusively it is recommended that other top-tier suppliers in the shea butter industry could adopt Sokaiko's sustainable sourcing startegies in order to innovate and promote sustainability in the Nigerian Shea butter industry.

Further research can be carried out using the context of other certified top-tier suppliers or a comparative study of certified and non-certified top-tier suppliers sourcing practices can be carried out to investigate the level of commitment and behaviour of suppliers towards ensuring that social, economic and environmental aspect of supply chains is respected in the shea butter industry.

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The Dilemma and Countermeasures on Development of Circular Economy in Iron and Steel Industry in China

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Abstract: By analyzing the current situation of the development of circular economy in China's iron and steel industry, the article points out the bottleneck of the current steel industry, and puts forward reasonable and effective measures to solve the problem. The purpose is to provide constructive reference for iron and steel enterprises to move towards the trend of economic development. At the same time, to deal with the more and more urgent problems of resources and environment, to relieve the pressure of environment and resources, and step forward to the national sustainable development strategy are of great significance. Iron and steel enterprises are gradually developing into resource saving industry, and shaping great significance to the national sustainable development strategy.
Key words: Circular economy; Iron and steel industry; Dilemma; Countermeasure

1 Introduction

The development of national economy relies on foundation industry support. Only when the foundation industry development is established on a solid foundation, can national economy be built steadily and high. As one of the cornerstone industries of the national economy, iron and steel industry supports and promotes the development of national economy. It also shows the level of national economic development.

In the process of foreign industrialization, the developed countries have also encountered problems such as environment, energy and so on. A series of representative theories and methods have emerged. The theory of sustainable development and the theory of circular economy are worthy of our reference. In China, with the rapid development of society and the fast growth of the national economy, resources and environment have become the world's highly concerned problem. Because of the deep dependence on resources and great pollution to the environment, iron and steel enterprises are inevitably subject to more and more constraints. Therefore, it is imperative to explore the development of circular economy in iron and steel industry (Mathews J.A., 2011).

The concept of a circular economy was first proposed by two British environmental economists, Pearce and Turner (1990), who put forward a similar loop of material flows within an economy. It was further used to analyze the relationship between economic and natural systems (Su et al., 2013). Based on the ideas of "reduce, reuse, and recycle", circular economy is a mode of economic development that aims to protect the environment, reduce pollution, and keep sustainable economic development. Consistent with the trends of the globalization, China's iron and steel enterprises are positively implementing the circular economy development schema. Under this background, a lot of scholars have conducted extensive research into the subject in many aspects.

When it comes to researches on the circular economy development in iron and steel industry, Cui and An (2008) affirmed that the circular economy development of the Hebei Iron and Steel Group used the practices of Tangshan Iron and Steel and Handan Iron and Steel to carry on their harbor development mode and city development mode, respectively. Gao et al. (2007) pointed out that the circular economy development of the Hebei Iron & Steel Group should focus on three ways, which are inter-enterprise material circulation, regional circulation, and social circulation. On the basis of study on the theory of industrial circular economy, Wang (2009) suggested that establishing an eco-industrial park would be an excellent model for the Anshan Iron & Steel Group.

By comparison, foreign studies mainly focus on the exploration into the potential of a circular economy as a model for industrial organization at the global level. Central to the circular economy in iron and steel industry is the idea that open production systems, in which resources are extracted, used to make products and become waste after the product is consumed, should be replaced by systems that reuse resources and conserve energy. (Su, B.W., 2013; Troschinetz, A.M., 2014; Tseng, M.L., 2013)

Owing to future-oriented technology and advanced conception, foreign developed countries have accumulated a great deal of experience in the development of circular economy, and there are definitely lessons they can teach us.

2 Status of Circular Economy in China's Iron and Steel Industry

2.1 The status of steel output

It is well known that China's steel production has been steadily increasing in the last ten years. Figure 1 indicates China's steel output data from 2005 to 2014. At the same time, China's iron and steel industry is also highly energy-intensive, accounting for approximately 15% of all energy consumption in China. In recent years, the iron and steel enterprises have been searching for new methods to increase energy efficiency and reduce energy consumption.
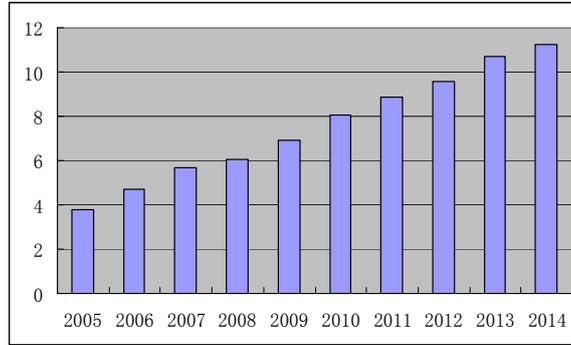
Figure 1   China's Steel Output,2005-2014 (100million tons)
Source: China Steel Yearbook, 2005-2014

2.2 Energy consumption

Over the past 10 years of this century, it is obvious to all that China has achieved rapid development, with high rates of industrialization and urbanization. The direct consequence is that it has to face severe resource related and environmental challenges. Building a circular economy is considered to be essential to fulfill the strategic objectives of building a harmonious and healthy society. Table 1 shows that China's national key iron and steel enterprises have reduced their energy consumption across the board. For example, the biggest difference of energy consumption with respect to steel rolling is up to 233 kgce/t, which reveals that there exists a wide gap in the process of energy consumption, thus energy saving is quietly potential. Only by adopting circular economy principles, can China's iron and steel industry survive and develop in the 21st century.

Table 1   Energy Consumption of Main Process of Key Steel Enterprises in 2014   (unit:kgce/t)

Process energy consumption	Sinter	Pelletizing	Coking	Puddling	Convertor	Electric furnace	Steel rolling
average	66.38	42.11	142.21	466.21	26.57	209.89	92.91
advanced value	52.06	19.22	88.13	395.41	-3.77	146.31	53.68
lagged Values	108.6	83.3	229.15	591.81	75.23	325.44	286.89
the difference	56.54	64.08	141.02	196.4	79.01	179.23	233.21

Source: China Steel Yearbook, 2014

2.3 The Significance of the implementation of circular economy in iron and steel industry in China

With the development of society and economy and the increasing requirement to the living environment, the steel industry has been put forward stricter resources, energy and environmental protection. Ecological environment has become a fundamental problem affecting the development of iron and steel industry. Therefore, the implementation of circular economy is the only way to sustainable development of the iron and steel industry (Yuan Wei, 2014).

The China's achievements in the development of circular economy of iron and steel enterprises mainly focus on energy saving and emission reduction, technical reform and corporate structure change. Energy conservation and emission reduction includes recycling on energy and resource and comprehensive utilization of waste. Without the support of advanced science and technology, the development of circular economy in iron and steel industry cannot be carried out smoothly.

Iron and steel industry is the basic industry of the national economy, is also the high energy consumption, high water consumption and high pollution industry. How to accelerate the rapid development of iron and steel industry in our country, and to improve the efficiency of resources and environmental protection, has become an urgent task. Therefore, circular economy provides an effective way.

2.4 Assessing a circular economy in iron and steel industry

Early studies on the circular economy in iron and steel enterprises mainly focus on the evaluation of cleaner technology (Bao et al., 2003; Zhou et al., 2001); subsequently, the principle of "efficiency" was introduced to evaluate the system, including resource efficiency and iron resource efficiency (Dai and Lu, 2006). Referring to the literature and consisting with the connotations of the term "circular economy" and the characteristics of steel industry in China, this study suggested the following formula:

CEECI $=\sum_{i=1}^{n} \lambda i * W i$

Where:

CEECI is the circular economy efficiency composite index,

λ_i is the weights of indicators, and

W_i is the normalized index value.

The first indicator expresses the level of facility used, such as coal injection into a blast furnace and iron resource efficiency; the second one is the comprehensive utilization efficiency of materials such as coke oven gas, converter gas, blast furnace slag, and so on. The third one indicates the pollutant level (i.e., SO2 emissions), and the fourth one explicates the resource consumption level of fresh water. To ensure that the indicators are comparable, they are supposed to be normalized in advance.

The weights of these indicators were given by conducting a questionnaire survey of at least eight experts, by which we can objectively synthesize those experts' experiences and subjective opinions, then make reasonable estimates of the weight values following several instances of consultation, feedback, and adjustment. Each indicator weight was obtained by reorganizing the information given by those experts after a couple of consultation, feedback, and adjustment sessions.

3 The Dilemma in the Development of Circular Economy in Iron and Steel Industry

Under the common efforts of all sectors of the country, the development of China's iron and steel enterprises achieved remarkable results. But due to the short time of the development of circular economy in China, the development of circular economy of iron and steel enterprises in China is facing the following difficulties (Feng Zhengjiang, 2011).

3.1 Management dilemma

The management of iron and steel enterprises affects all aspects of the internal and external development of enterprises. As long as there is only one problem, it will lead to mistakes in decision-making, even result in huge losses. Because of lack of experience, the enterprises encountered a bottleneck in management. Therefore, the more modern scientific management has become an important part of the development of circular economy in iron and steel enterprises.

3.1.1 Resource management

Taking into account the long-term utilization of resources and the impact of frequent and even over exploitation on the ecological environment, as a major steel producing country, although China's vast territory, abundant resources, and rich iron ore reserves, we still need a lot of foreign imports every year. This leads to an increase in the cost of steel production. On the contrary, as the world's largest iron ore imports, Japan's iron ore import price is far lower than other countries. The reason is that Japan's iron ore resources are acquired by collective purchase. So the enterprises use the advantages of large demand to get more affordable prices. Our country can learn from Japanese experience. On one hand, it can greatly reduce production costs, On the other hand, it is conducive to the management and planning of resources.

3.1.2 Energy management

Due to technological backwardness and lack of energy use planning, energy cannot be fully utilized. In recent years, the lack of energy has made the purchasing cost more and more high, and at the same time, the loopholes in the energy management also increase the production costs.

3.1.3 Product quality

Most enterprises still control product quality by using computer system, which results in lower quality products, and cannot make products among high- rank. Obviously our product quality control is still not perfect and there are loopholes in many aspects.

3.1.4 Production efficiency

As a manufacturing enterprise, the efficiency level of enterprise depends on the production efficiency. If the production efficiency is low, when the customer's demand is great, short supply will

come into being, and enterprises need to pay extra for overtime work. This will make the production cost higher.

3.1.5 Financial management

China's iron and steel enterprises' financial management only stays in daily business settlement. There is no overall, general plan in capital flow, material flow and information flow. Funds cannot be better used, which results that enterprises have no more money to seek a breakthrough.

3.1.6 Information integration management

Due to the influence of information source and information processing, extraction and the speed of information feedback, enterprises cannot get timely and accurate information on consumers and the market. Subsequently, the manager cannot adjust and change the enterprise decision-making timely according to the market change, which affects the long-term development.

3.2 The dilemma in the technology and equipment

In the development of circular economy, China's iron and steel enterprises require both overall arrangement and leading scientific and technological level. The problems such as lower product quality, lower production efficiency, higher energy consumption and higher pollution emissions can be solved only through the progress of science and technology. At the same time, the progress of equipment also cannot be ignored. China's iron and steel enterprises have a lot of room for improvement in technical equipment.

3.3 The dilemma in fund

Due to the short development time, there are many deficiencies in technology and management, it is necessary to buy some foreign advanced technology, and hire foreign top professional with high salary. This makes the financial pressure of China's iron and steel enterprises to become larger. In the face of such a higher investment but less return, many iron and steel enterprises need to support from the state funding. In view of the current downturn in the steel industry, the country's financial burden is also growing, the enterprises are also facing the risk of layoffs.

3.4 The dilemma in talents

Talent problem is the biggest bottleneck in the development of circular economy in iron and steel industry. Talent problem is the biggest bottleneck in the development of circular economy in iron and steel industry. Currently, the overall technology innovation level is low. The building of innovative talent team remains to be strengthened. In China, large and medium-sized state-owned iron and steel enterprises hold relatively more innovative talents, while the small-sized enterprises hold relatively less talents. In addition, although most enterprises pay high attention to the introduction and training to talents, the brain drain is still serious owing to the enterprise system, enterprise efficiency, social environment and other factors.

4 Countermeasures to Implement Circular Economy in Iron and Steel Industry in China

As a typical process manufacturing, iron and steel enterprises have the characteristics of resource intensive and energy intensive. Due to the complex manufacturing process and structure, a large amount of substances and energy are released in production, which contains the possibility of reduction, reuse and recycling process. The implementation of recycling industry chain construction is an effective way to realize energy saving and emission reduction in iron and steel industry. The following measures will be fully considered.

4.1 Countermeasures in resource management

China's iron and steel industry is not concentrated enough, and cannot play a great demand to drive down the price in the resources import. This is also the fundamental reason for the high price of iron ore resources. Therefore, the government should intervene to carry out macroeconomic regulation and control to the iron and steel enterprises, promote the merger of iron and steel enterprises, and play the advantages of advanced technology and adequate capital. Enhancement of enterprise concentration is helpful for the information exchange among the enterprises and the formation of a healthy competition. In order to increase the low utilization rate caused by the waste of resources, the only solution is to develop science and technology to catch up with the advanced level abroad. Only so, can all the iron and steel enterprises make common progress.

4.2 Countermeasures in energy management

Because of the similarity of energy and resources, it is equally important to improve the level of science and technology. As some kind of the energy produces harmful environmental pollutants during

use, iron and steel enterprises have to look for alternatives to clean energy. These alternatives not only reduce energy consumption, but also reduce environmental pollution.

4.3 Countermeasures in product quality and production efficiency

Product quality and production efficiency are related to the management to workers. The enterprises should establish and improve the monitoring mechanism and reward and punishment mechanism to regulate the management to workers. Mutual supervision between workers should be encouraged. A clear division among workers should be introduced. Only when each link in the production of division of labor is very clear, it is conducive to control product quality and improve production efficiency.

4.4 Countermeasures in talents

In the development of circular economy, whether it is management or technical problems, the participation and support from professional personnel is the key to solve problems. The personnel training can be carried out from two aspects at the same time. On one hand, the senior managers of enterprises should receive higher professional training such as MBA. On the other hand, On-the-job training should be offered to new employees.

5 Conclusions

China's Government clearly put forward the target of major pollutants emission reduction and the development of circular economy strategic in 12th Five-Year Plan. As China's major energy consumption, iron and steel enterprises must carry out the two energy recovery and utilization to promote energy conservation and emission reduction by using the principle and principle of circular economy, which has become the key factor in the development of iron and steel enterprises (Yang Xiaodong, 2014).

Facing more and more pressure from resources and environment, iron and steel enterprises must carry on to develop circular economy, commit to the development of eco-friendly enterprises, and adhere to the strategy of sustainable development. In the process of developing circular economy in iron and steel enterprises, due to the lack of experience and theoretical concept, there appeared a lot of problems such as management, technology, human resources, finance, resources, energy and pollution treatment. As the theme of social production and economic growth, the implementation of circular economy is not only the corporate responsibility, but also a challenge and an opportunity. Implementing circular economy can strengthen the competitiveness of China's iron and steel enterprises and enhance the economic strength of the country. The dream of China's "iron and steel power" is closer.

Practice proves that it is the only way to execute sustainable development for China's iron and steel enterprises to develop circular economy, improve the efficiency of resource utilization, improve production efficiency, eliminate backward production capacity, and achieve comprehensive utilization of waste. This study is only a preliminary probe into the circular economy in China's iron and steel industry. Further study is required in the future. By prescribing the aforementioned countermeasures, the iron and steel industry can increase its energy efficiency, reduce its resource consumption, and improve environmental quality. For the national iron and steel industry, the next step would involve building harmonious partnerships in the process of carrying out the aforementioned courses of action.

Acknowledgement

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Health and Environment Ranking: A Study of the Countries at the Ibero-American Region and Its Challenges ahead

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Abstract: This is an exploratory study of Health and Environment conditions concerning 132 countries in the world, that lead to produce a ranking among 21 Iberoamerican countries, based on World Bank Data (2015) and the guide for sustainable planning – GPS prepared by the Future Studies Center of PUC-SP (Pontifical Catholic University of São Paulo) for the Observatory of the Iberoamerican Region - ORIBER. Through a mixture of Multivariate Statistical Analysis techniques this work came to a list of 10 most representative variables of Health and Environment development of the Latin American Region that help to build a rank and classified the region into levels of development, that may help for strategic planning, monitoring and control at a country and regional base.
Key words: Health; Environment; Iberoamerica

1 Introduction

Improvements on the quality of environmental and health policies can make a big difference in the quality of life of the population anywhere. Food, water and energy are basic resources related to health and environment that need to be maintained and well administered in the search for a sustainable development. Iberoamerican countries have different economies, resources, infrastructure, governance, and a number of other factors that influence economic growth, causing inequality between people and disharmony opportunities. Some are more rural, poorer, more unequal internally, others deal with a share of more concentrated workers in urban areas, with a more bourgeois population, that control the means of production, but dealing with so many problems that reverberate in poor health and a lack of protected environment. In other words, the difference between the countries with regard to health and the environment calls for an adequate customization of the application of administrative and financial resources applied. It is important to say that, although Latin American region may have improved over time, there is still a long way in pursuit of sustainable development for which is the main concern of this study.

The concepts behind the theme Health and Environment were taken from the World Bank (2015) and the guide for sustainable planning – GPS prepared by the Future Studies Center of PUC-SP (Pontifical Catholic University of São Paulo) for the Observatory of the Iberoamerican Region – ORIBER. The last one is a document about the Sustainable Public Management. According to the GPS (2016), one of the big challenges facing today for the Ibero-American region is to identify how to balance the necessary economic dynamics to environmental sustainability and social balance in the context of an open, democratic and participative management.

One way to contribute to overcome to this challenge is to promote in each country, through the planning offices, synergies between the scientific, technological, socio-cultural and institutional sectors: such synergies should harmonize the processes and impacts of development in each country and region, making them sustainable, encouraging citizen participation as a contribution to improve the quality of life, and enjoying effectively the exchange of information and exchange of information and experiences with other countries in the Latin American region (GPS. 2016).

The economic, social and environmental imbalances in the Iberoamerican Region motivated the search for responses from the international community, and lead to the proposal of the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (ODS) including 193 countries represented at the United Nations General Assembly adopted in September 2015. These commitments recognize equality and sustainability as the guiding, shared and universal principles on which to base a new set of strategies and global regional and national policies (CEPAL. 2015).

Before the presentation of the subjects of this analysis and data involving the countries, it's important to present the framework behind.

2 The Theoretical Framework

According to the GPS - Guide to Sustainable Countries (2015), the Latin American and Caribbean

countries suffer from a large gap between the theoretical knowledge of environmental health and its practice in public policy. Access and benefits to the population are affected. This contrasts with the richness of these regions in biodiversity, yet extremely threatened. Most of the population is concentrated in urban centers, live in precarious conditions and its development model is historically linked to the predatory extraction of natural resources and exploitation of the land due to large monocultures for export, primarily to the colonies. This process today is called neocolonialism extraction (CEPAL, 2015).

Unfortunately, the destruction of the environment has often been much higher than should be acceptable for the survival of the human species. According to CEPAL (2015), nowadays, it shows two singularities. One of them is that the impact is not only local but affects common resources: the atmosphere, oceans, ice caps and biodiversity. The second is that, for the first time, there is a conscious and informed generation, from scientific evidence of this impact and the risk that human activities pose to the environment.

Changes in climate variables such as temperature and rainfall, have impacts on: reduced yields of subsistence crops such as potatoes and corn in Central America and the Andean countries; reduction in grazing areas, with effects on livestock productivity in Argentina and Paraguay; increased incidence of dengue and malaria in most countries; modification of plant and animal biodiversity, increasing desertification and deforestation; involvement of the hydropower sector of most countries in the Andean Region (Argentina, Bolivia, Chile and Peru) by reduced flows and increased sedimentation, and impact on tourism and infrastructure by high impact events (hurricanes and El Niño / Southern Oscillation) (CEPAL, 2015a, 2014b, 2014c; BID/CEPAL, 2014a, 2014b y DNP/CEPAL/BID, 2014).

As a recent IPCC report (2013) reiterates warming of the climate system is unequivocal (ex. storms in the Rio de La Plata, which have caused severe flooding, and the waves in the Mexican Pacific, as well as in Argentina and Uruguay). It is expected that extreme flood events are becoming more frequent and affect urban areas of the east coasts of the Caribbean and South America, mainly Brazil (CEPAL, 2012b) at the same time droughts are becoming more critical.

According World Health Organization (2015), the variables below traduce some of the Health and Environment problems to confront with:

• Maternal mortality rate (deaths/100,000 live births): The annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, per 100,000 live births.

• Stillbirth rate (deaths/1,000 live births): Third trimester fetal deaths (> 1000 grams or > 28 weeks), per 1,000 live births.

• Child mortality rate (deaths/1,000 live births): The probability of a child born in a specific year dying before reaching the age of five per 1,000 live births.

• Deaths from infectious diseases (deaths/100,000): Age-standardized mortality rate from deaths caused by tuberculosis, sexually transmitted diseases, HIV/AIDS, diarrhea, pertussis, polio, measles, tetanus, meningitis, hepatitis B, hepatitis C, malaria, trypanosomiasis, Chagas disease, schistosomiasis, leishmaniasis, lymphatic filariasis, onchocerciasis, leprosy, dengue, Japanese encephalitis, trachoma, intestinal infections, and other infectious diseases per 100,000 people.

• Access to piped water (% of pop.): The percentage of the population with a water service pipe connected with in-house plumbing to one or more taps or a piped water connection to a tap placed in the yard or plot outside the house (World Health Organization/UNICEF Joint Monitoring Programme, 2015).

• Access to improved sanitation facilities (% of pop.): The percentage of the population with improved sanitation, including flush toilets, piped sewer systems, septic tanks, flush/pour flush to pit latrine, ventilated improved pit latrines (VIP), pit latrine with slab, and composting toilets (WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, 2015).

• Indoor air pollution attributable deaths (deaths/100,000): Age standardized deaths caused from indoor air pollution, including indoor air pollution-derived cases of influenza, pneumococcal pneumonia, H influenza type B pneumonia, respiratory syncytial virus pneumonia, other lower respiratory infections, trachea, bronchus, and lung cancers, ischemic heart disease, ischemic stroke, hemorrhagic and other non-ischemic stroke, chronic obstructive pulmonary disease, and cataracts per 100,000 people. In the SPI model, data is scaled from 3 (<30 deaths per 100,000 people) to 1 (>100 deaths per 100,000 people).

• Life expectancy (years): The number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

• Non-communicable disease deaths (between the ages of 30 and 70 – probability of dying): The probability of dying between the ages 30 and 70 from cardiovascular disease, cancer, diabetes, or chronic respiratory disease.

• Obesity rate (% of pop.): The percentage of the population with a body mass index (BMI) of 30 kg/m2 or higher (age-standardized estimate), both sexes.

• Outdoor air pollution attributable deaths (deaths/100,000): The number of deaths resulting from emissions from industrial activity, households, cars and trucks, expressed as the rate per 100,000 people.

• Health expenditure, public (% of total health expenditure) 2012: Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. Total health expenditure is the sum of public and private health expenditure. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation.

• External resources for health (% of total expenditure on health) 2012: they are funds or services in kind that are provided by entities not part of the country in question. The resources may come from international organizations, other countries through bilateral arrangements, or foreign nongovernmental organizations. These resources are part of total health expenditures.

• The Human Development Index (HDI) measures the progress of a nation from three dimensions: income,   health   and   education   United   Nations   Development   Programme http://www.pnud.org.br/atlas/ranking/Ranking-IDH-Global-2013.aspx

• The Government Effectiveness (Governance): consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them. The Worldwide Governance Indicators report on six broad dimensions of governance for 215 countries over the period 1996-2013: Voice and Accountability, Political Stability, Regulatory Quality, Rule of Law and Control of Corruption.

• The Environmental Performance Index (EPI): ranks how well countries perform on high-priority environmental issues in two broad policy areas: protection of human health from environmental harm and protection of ecosystems. http://epi.yale.edu/epi

• Happy Planet Index 2012 (HPI): is the leading global measure of sustainable well-being. The HPI measures what matters: the extent to which countries deliver long, happy, sustainable lives for the people that live in them. The Index uses global data on life expectancy, experienced well-being and Ecological Footprint to calculate this. The index is an efficiency measure, it ranks countries on how many long and happy lives they produce per unit of environmental input. The 2012 HPI report ranks 151 countries and is the third time the index has been published (ABDALLAH, 2012).

• Ocean Health Index Score (OHI): The Ocean Health Index establishes reference points for achieving ten widely accepted socio-ecological objectives, and scores the oceans adjacent to 171 countries and territories on how successfully they deliver these goals.   Evaluated globally and by country, these ten public goals represent the wide range of benefits that a healthy ocean can provide; each country's overall score is the average of its respective goal scores: Food Provision(harvesting seafood sustainably), Artisanal Fishing Opportunities(ensuring food for local communities), Natural Products(harvesting non-food ocean resources sustainably), Carbon Storage(preserving habitats that absorb carbon), Coastal Protection(preserving habitats that safeguard shores), Coastal Livelihoods & Economies(sustaining jobs and thriving coastal economies),Tourism & Recreation(maintaining the attraction of coastal destinations), Sense of Place (protecting iconic species and special places), Clean Waters(minimizing pollution), Biodiversity(supporting healthy).

• GINI index (World Bank estimate): measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

• Social Progress Index (SPI): measures a complex mix of Basic Human Needs, Foundations of Wellbeing and Opportunity; and "(...) depends on the policy choices, investments, and implementation

capabilities of multiple stakeholders – government, civil society, and business" (Michael Porter, http://www.socialprogressimperative.org/global-index/, 2016).

Due to these all aspects, to deepen the understanding of the data of the variables that make up these issues may help in confronting and overcoming the challenges through which they pass the region.

3 Presentation and Analysis of Results

For the purpose of analyzing how the Iberoamerican Region as a whole is doing regarding Health and Welfare, the present study compares three Regions among a total of 132 countries: The Iberoamerican Region (AIBER) with 21 countries, an Advance Economies Region (AVECO) with 27 countries and the rest of other countries (OTHERS) with 84 countries. The study begins with an exploratory descriptive data analysis to understand the 20 indicators influence the Health and Environment of such countries. For this comparison was used the ANOVAs, based on the Knoema statistical database.

3.1 Individuals

Individuals of this analysis are the 132 countries analyzed by a number of international benchmarks. The data analyzed in each country are the Twenty variables described below.

• Seven Synthetic Indicators: Social Progress Index, Human Development Index - HDI, Governance Index, Environmental Performance Index - EPI, Happy Planet Index (HPI), Health Index Of Oceans - IHO and Inequality Index social or Gini.

• Thirteen Analytic Indicators: Maternal Mortality Rate, Stillbirths Rate, Infant Mortality Rate, Deaths by Infectious Diseases, Access to Piped Water Access The improved sanitation facilities, Deaths Attributable to Air Pollution Indoors, Expectation Life (years) Deaths by No Communicable Diseases Between the Ages of 30 And 70 (Dying of probability) Obesity rate, Deaths Attributable to Air Pollution Exterior, Public Health expenditure, External Resources for Health.

The 21 countries of the Iberoamerican Region which are going to be considered are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Portugal, Spain, Uruguay and Venezuela. Generally speaking, Spain and Portugal are always doing better regarding Health a Social wellbeing, so they may serve as examples for the rest.

Through a Dendogram, that is a specific type of diagram or iconic representation which organizes certain factors and variables based on its similarity or distance, below it is showed the clusters or groups by how correlated are the variables; and hence showing similar behavior.
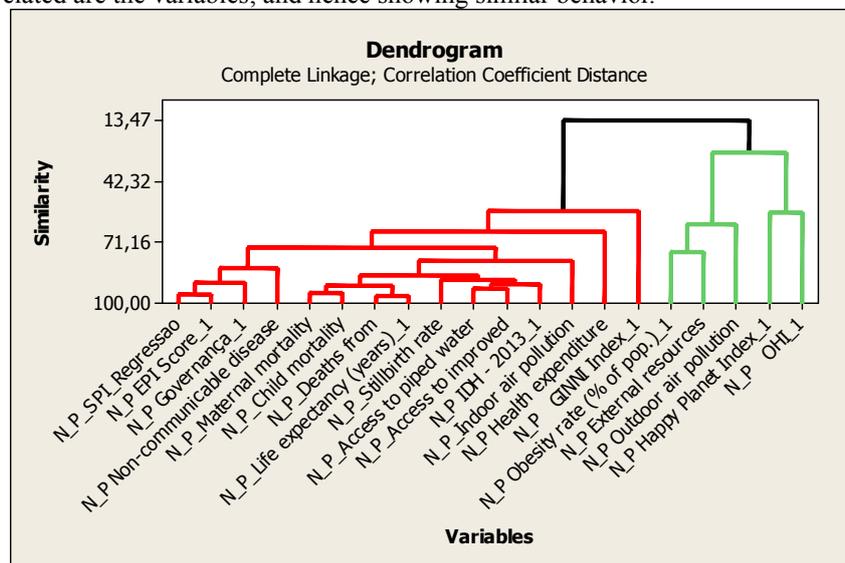
Figure 1   Intercorrelations among the Variables
Source: by authors, 2016.

This figure 1 shows particularly a high degree of behavior similarity among the variables: SPI, EPI, Governance, HDI, Maternal Mortality, Child Mortality, Deaths from Infectious Diseases, Life expectancy, Access to piped water, Access to improved water, Stillbirth rate, Indoor air pollution and

Non-communicable disease; in another level of correlation and for another group of countries, there are the variables Health expenditure, HPI and Gini, , in another degree of similarity, there are: Obesity, External resources, Outdoor air pollution and OHI.

Moreover, SPI and HDI are very closely related, so for practical purposed one may simply use this last one that is simpler and have a longer data history, and actually both are basically dealing with Social Conditions.

A statistical analysis of 132 countries lead to the selection of ten variables (all rescaled from 0 to 100 and positivized - the higher the better) more representative of the Health and Environment conditions. They were: Deaths from Infectious Diseases, Access to piped water (% of pop), Obesity rate, Outdoor air pollution, HDI (0 – 100) Governance, EPI Score (0 – 100), Happy Planet (0 – 100), Ocean Health Index OHI (0 – 100), GINI (0 – 100).

Table 1 helps to understand similarities and differences between the 3 selected Regions. The higher the F the higher the difference among the 3 Regions; so that Governance (GOV) makes the higher difference (F = 97,02), and the AVECO Region has a much higher value (83,25), twice as more, than other two Regions. This could be seen very clearly in Graphic 2 that allows more easily to visualize differences and compare the regions observing where and how much do they differ each other in relation to each of these 10 dimensions.

Table 1 ANOVA Comparing Means of the 3 Regions: AIBER, AVECO and OTHERS; As Well as Fs for the Variables (All Variable were Normalized 0 - 100, and Positivized: the Higher is the Best One)

	Deaths[2]	Access[3]	Obesity	Outdoor[4]	HDI	Governance	EPI	HPI	OHI	GINI
OTHER	70,63	47,27	66,88	74,76	47,46	33,36	37,95	41,79	51,07	62,44
AIBER	92,89	85,22	46,68	82,09	65,62	42,48	52,70	72,36	55,45	43,08
AVECO	98,90	94,89	53,73	77,50	85,11	83,25	81,39	50,58	24,24	79,91
F[1]	19,03	37,63	9,5	1,32	34,45	97,02	69,68	22,69	29,45	24,45

Source: by authors, 2016.

Notes: [1]The higher the F distinguished from other regions; [2]Deaths from Infectious Diseases; [3]Access to piped water; [4]Outdoor air pollution

The Figure 2 shows that the AVECO's region has better conditions than the others in GINI, Access of Piped Water, EPI, Governance, and HDI. In Outdoor Air Pollution, Deaths from Infectious Diseases and Obesity, it is very close of AIBER's region. In Obesity AIBER and OTHERS regions have scores close. Related to Ocean Health Index Score (OHI), and Happy Planet Index, AIBER's region has better scores than AVECO's region. Related to OHI, AIBER's region and Others' region has scores close each other. In resume, the AVECO group is close to Governance and EPI and far from OHI. The AIBER, although closed to the Happy Planet, is far from Gini. And the OTHERS' group is close to Obesity and far from Access to Piped Water.
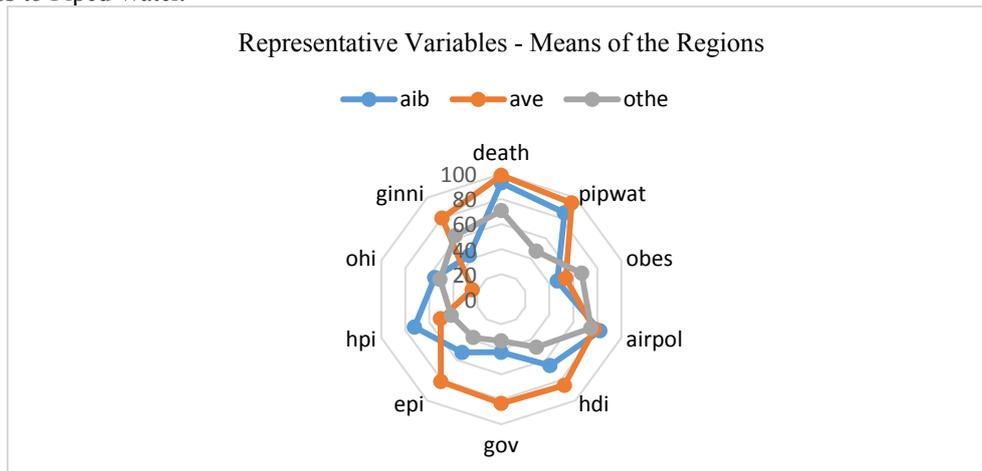
Figure 2 Radar of Means of the Regions AIBER, AVECO and OTHERS
Source: by authors, 2016.

Now using the first three Principal Components (eigenvalues > 1,0) related to these 10 variables and considering the relative contributions of each one of these variables to these component by means of

Stepwise Regressions one may build up a New Synthetic Indicator that we are calling HEN that clearly shows the general relative conditions and differences among the 3 Regions as shown by the ANOVA in figure 3.
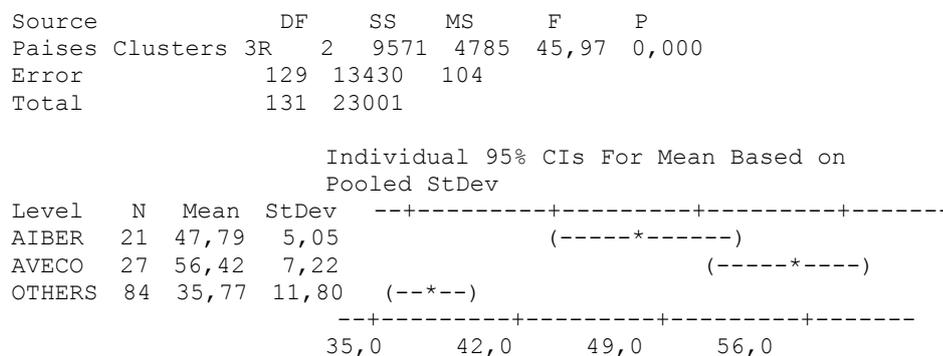
```
Source                 DF    SS    MS     F      P
Paises Clusters 3R      2   9571  4785  45,97  0,000
Error                 129  13430   104
Total                 131  23001


                       Individual 95% CIs For Mean Based on
                       Pooled StDev
Level    N   Mean  StDev  --+---------+---------+---------+-------
AIBER   21  47,79   5,05                 (-----*------)
AVECO   27  56,42   7,22                          (-----*----)
OTHERS  84  35,77  11,80  (--*--)
                          --+---------+---------+---------+-------
                         35,0      42,0      49,0      56,0
```
Figure 3　One-Way ANOVA: HEN Versus 3 Regions

Moreover, this new HEN Health and Environment Synthetic Indicator; allows to us to define a normalized ranking (0 – 100) among the countries of the Iberoamerican Region as shown in Table 2 and somehow establish its present level of conditions in the area.

Table 2　HEN Ranking

Iberoamerican Country	Ranking	Level
Spain	100,00	HIGH
Chile	81,69	HIGH
Costa Rica	79,74	HIGH
Cuba	72,27	MIDDLE
Argentina	69,55	MIDDLE
Panama	68,71	MIDDLE
Portugal	67,23	MIDDLE
Venezuela	60,72	MIDDLE
Uruguay	56,63	MIDDLE
Mexico	52,40	MIDDLE
Brazil	48,87	MIDDLE
Colombia	43,38	LOW
Peru	43,38	LOW
Ecuador	38,45	LOW
El Salvador	24,94	LOW
Dominican Republic	22,38	LOW
Bolivia	14,14	VERY LOW
Paraguay	10,39	VERY LOW
Guatemala	6,95	VERY LOW
Nicaragua	2,67	VERY LOW
Honduras	0,00	VERY LOW

4 Conclusions

Reflecting on the result of the statistical methods applied to the data, it is clear that most Latin American are still at a stage of low level of development and environmental protection and health, confirming the historical data, although the general situation is better than in OTHERS Countries, moreover as we can see by the ranking the worst conditions seem to be somewhat regional (LOW and VERY LOW).

As expected, environmental factors can be improved in general in Latin America. The infrastructure of public health available in each country should also be the focus of attention to resolve the predispositions to diseases.

A few points are worth mentioning. In Latin America, the GPS provided that Argentina, Chile and Uruguay were performing a little better in terms of Environmental Performance Index (EPI) for example, which remains true, although Argentina has dropped a bit on this scale. Brazil improved somewhat in the past few years, so that the HDI rises a little its level, but still very low. Moreover, what is becoming

more evident everyday worldwide is that what makes the greatest difference is the Governance factor; and in this sense we still have a long way to go in at least in the Latinamerican Region, perhaps with a few exceptions of smaller countries like Chile, Uruguay, Costa Rica and Panama.

Therefore, what is expected is that all these data from the Observatory ORIBER will help the responsible public and private institutions that are involved in the monitoring and control of environmental and health risks in order to develop   measures and campaigns to prevent impacts and promote the well-being of the population of Iberoamerican countries; but no doubt this will depend on how fast we advance regarding Governance, and to what extent we become more aware about the Environmental Impacts on our health.

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Engineers as Entrepreneurs: A Dual Role for Successful In-House Entrepreneurial Orientation and Talent Retention

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Abstract: The rarity of the employment of engineers-entrepreneurs dual roles often raises issues of poor in-house entrepreneurial orientation (EO) activities, in which the potential entrepreneurs cannot be developed to support organizational high technology development and innovation. Changes in technology have influenced engineers' career expectations to upgrade specific skills and general competencies to suit engineering demands. Reducing EO from the individual level has been shown to be related to adverse effects in engineers' behavioral intention to leave current jobs. Therefore, this paper fills the gaps in the literature by discussing the emerging role of engineers as entrepreneurs in the context of EO from an individual analysis. In addition, this present paper discusses the relationships between individual EO (innovativeness, proactiveness, autonomy and risk-taking) and talent retention among engineers. Multi behaviors and roles of engineers-entrepreneurs are important factors for confronting engineering task-related problems and the wide exercise of engineers-entrepreneurs dual roles will impact engineers' technical knowledge and non-technical routines. There is strong evidence that individual EO dimensions can be used for measuring engineers' entrepreneurial behaviors and to predict positive behavioral intentions toward current employments. In conclusion, developing engineers as potential entrepreneurs is a crucial organizational entrepreneurial strategy and understanding engineers' behavioral expectations will impact greater career satisfaction and retention.
Key words: Engineers; Entrepreneurial orientation; Entrepreneurs; Retention; Talent

1 Introduction

Entrepreneur is a term used in describing engineers' entrepreneurial role and it is an organizational profit formulation in promoting in-house entrepreneurial activities among engineering talents (Igbaria, Kassicieh & Silver, 1999; Menzel, Aaltio & Ulijn, 2007; Tremblay, Wils & Proulx, 2002). Individual entrepreneurial development involves engineers' unique behaviors and attitudes (e.g. creativity, innovativeness and proactiveness), as these prime forces are meant for influencing engineers' positive behavioral intention toward current employments (Guidice, Heames & Wang, 2009; Igbaria & Siegel, 1992; Mitchel & Zatzick, 2015). At this point, a crucial link between behaviors and employment expectations is an essential combination to develop engineers' internal entrepreneurial development and to sustain sufficient amount of autonomy and innovation activities within organizational area. An official issue that is most likely to be debated, in a different view, when there is less information about engineers-entrepreneurs dual roles in the behavioral intentions research (Kharbanda & Stallworthy, 1990, Menzel et al., 2007; Tremblay et al., 2002). In passive reviews on engineers-entrepreneurs dual roles, efforts to leverage engineers-entrepreneur potentials can only be a temporary strategic human talent planning. Beyond an organization's control, determine whether matching engineers-entrepreneurs dual roles useful for predicting years of remaining in particular employments, it has been now known as an organizational long-term focus.

Early discussions of research into engineer-entrepreneur dual roles include an individual's engineering performance, career satisfaction and entrepreneurial intentions. The conclusion reached by Kharbanda et al. (1990), Igbaria et al. (1992) and Igbaria et al. (1999) argued that, there is no other primary clarification that can change the facts that engineers are now becoming a potential entrepreneur. Although entrepreneur roles are extensively discussed, however, the arguments are limited to engineers' career management and orientation, and entrepreneurial intentions, whilst the entrepreneurial orientation theory (EOT) was not widely introduced and explained in predicting engineers' retention decisions (Igbaria et al., 1992; Williamson, Lounsbury & Han, 2013). Another prime conclusion is that, unless a consistent low score relationships between engineers' entrepreneurial behaviors and career satisfaction, and retention (e.g. intention to stay and leave) are evident; a further study can be unnecessary (Gigliardi, Petroni & Dormio, 2005; Singh, Fuoad, Fitzpatrick, Liu, Cappaert & Figuereido, 2013). Such a benchmark, however, did not disappoint present scholars to interpret engineers' positive behavioral

actions into same arguments. A great interpretation on engineers-entrepreneurs leading roles and competencies will, as a result, enhance engineers' autonomy, entrepreneurial creativity, innovation, pure challenges and proactive behaviors (Abdull Rahman, 2012; Alavi, Moteabbed & Arasti, 2012; Andree & Hansson, 2015; Korte & Li, 2015).

Often, in highlighting an entrepreneur-engineer dual role and talent retention, a perfect relationship establishes in connecting engineers' pure behaviors, attitudes and traits. Putting behaviors, attitudes, or even traits into engineers' positive employment expectations indicate the highest degree of validity, where two mutual aspects of behaviors and expectations are commonly integrated (Campbell, Gluesing & Perelli, 2012; Kharbanda et al., 1990; Oyedele, 2010). If both aspects are continuously linked, developing engineers with high potential entrepreneur roles should not be overlapped with other contamination elements. Growing technology, for example, has an instant reaction towards changes in the labor market demand. Some have argued how technology influences an engineer's bigger performance and positive behavioral intentions toward current employment (Grip & Smits, 2012; Menzel et al., 2007; Oyedele, 2010). Accurate assumptions thus develop that the power of technology closes engineers' gaps on engineering task performances and behavioral actions. The impact of technology can be seen in improving engineers' superior technical knowledge and solving engineering task-related problems, creating engineers' level of competitiveness through adding new skills and competencies and optimizing the opportunity for engineers' spreading talents in global talent competitiveness.

If technology benefits organizations, key individual's behaviors are now the actual contamination overlaps between engineers' behavioral expectations and in-house entrepreneurial development. According to Covin and Slevin (1991), behavior performs a critical component in the entrepreneurial process. Of course, in a fragile form, engineers' behaviors can be flexible, unpredictable and continuously evolving over time (Campbell et al., 2012; Newman, 1998). In today's 'war talent' competitiveness, engineers' behaviors can be changed drastically. If technology is a key issue, engineers' massive task challenges interfere with engineers' strong determination in improving technical knowledge, skills and competencies ability (Andree et al., 2015; Duxbury & Halinski, 2014; Grip et al., 2012; Williamson et al., 2013). If talent exists in a unique form, is rare and cannot be imitated, investing a huge cost for replacing new engineering talents is a major decision that only a single organization has (George, 2015; Ghosh, Satyawadi, Joshi & Shadman, 2013). Because discussing engineers-entrepreneurs dual roles and retaining engineering talents remain vague at arguments and from the theoretical aspect too, linkages of both aspects tend to have low validity to explain engineers' in-house entrepreneurial behaviors and engineers' talent retention. Therefore, this study aims at discussing the following objectives:

a) Engineers-entrepreneurs dual roles from engineers' behaviors, attitudes and traits perspective;

b) Entrepreneurial orientation theory (EOT) from an individual engineer's entrepreneurial behavior; and

c) Relationships between individual entrepreneurial orientation (IEO) and talent retention among engineers.

2 Literature Review

When an engineer plans to move to another job, there exist a gap between engineers' personal career orientations and behavioral expectations. The rationale for updating new specific technical knowledge, ideas, experiences and general competencies are the common principles for fulfilling engineering job requirements (Grip et al., 2012; Kharbanda et al., 1990; Lee, 1994). Relocating engineers' behaviors at the optimum career expectations will stimulate engineers' innovative ideas into clear strategic focus and transform those ideas into tangible results to sustain business performance and positive work environment (Kharbanda et al., 1990). When these two elements disappear (behaviors and employment expectations), or one counted weak, primary focus on evaluating engineers' behaviors is likely to be outstripped. Meaningful strategies, such as adapting technical and entrepreneurial systems and/or carrying both systems (also known as hybrid orientations) into core engineering tasks will carry a high degree of understanding engineers' behavioral expectations and career orientations (Alavi et al., 2012). Here, engineers-entrepreneurs dual roles come into play. When a high level of technical knowledge requires skills to solve engineering-related problems, an engineer-entrepreneur incorporates his or her general competencies and specific skills to increase the entrepreneurial values within an organization area (Grip et al., 2012).

2.1 Engineers-entrepreneurs dual roles

Entrepreneur refers to an independent entrepreneur whose practicing entrepreneurial activities within an organization (Menzel et al., 2007). Numerous sources described entrepreneur as a person who has skill, willingness to take responsibility, risk and opportunity, committed to tasks, working more independently and proactively develop new ideas (Buekens, 2014; Williamson et al., 2013). Entrepreneur exists once an engineer's career anchor is identified and developed. Engineers who compete with a high technical ability need the technical and managerial competence, autonomy, work stability, sense of dedication, pure challenge, life style integration and entrepreneurial creativity (Alavi et al., 2012). A consensus to classify engineers as knowledge workers, professional workers and talented workers have extended to a well-function of an engineer's capability to acquire elite knowledge and skills, attain high level of autonomy, well-experienced in managing uncertainty situations, leadership skills, innovative and advanced in his or her education levels (Abdull Rahman, 2012; George, 2015; Tansley, 2011; Sigler, 1999). This classification appears to be some agreement that engineers can be called as entrepreneur as these dual roles expose rigorous challenges to accomplish major projects, as well as his or her powers at managing non-technical responsibilities. To establish whether engineers are entrepreneurs, Table 1 provides the specific characteristics of describing those dual roles.

Table 1　Engineers and Entrepreneur's Characteristics

Engineer's Characteristics	Entrepreneur's Characteristics
o Autonomy	o Vision
o Flexibility, adaptability and the capacity to cope with and manage change	o Initiative
o Self-motivation and drive	o Internal motivation
o Analytical ability and decision making	o Autonomy
o Communication and interpersonal skills	o Risk-taking
o Team working abilities and skills	o Internal control
o Organization, planning and prioritization abilities	o Commitment and persistence
o Ability to innovate	o Market knowledge/customer orientation
o Mental and physical resilience	o Knowledge of organizational structures and willingness to cross-functional borders
o Leadership ability	o Flexible problem solving
o Managing long term projects	o Visionary thinking style
o Time management	o Resistance to change (openness to change)
o Risk-taking	o Orientation to innovation
o Creativity	o Agent of change
o Agent of change	

Commenting on entrepreneurs-entrepreneurs' behaviors, Menzel et al. (2007) argue that educating engineers as entrepreneurs often focus on business and market knowledge as crucial engineering environment demands. The added technology entrepreneurship in engineering practice allows engineers to experience more opportunities of his or her self-determination on engineering paths, a freedom to make task-related decisions and a power to impose his or her self into accomplishing organizational major projects. One reason why engineers are considered as entrepreneurs is the interpretation of engineers' personality and traits. Prior to fit engineers' new roles into technical innovation and product development, meaningful traits, such as introversion, intrinsically motivated, flexible and creativity, and analytical ability will improve engineers' innovation opportunities and react instantly to the new technology demands (Williamson et al., 2013). Creativity and non-routine engineering problem solving are important sources for positive implications on engineering management where increasing innovation and product development can be guaranteed. As regards to confronting resistance to change, engineers-entrepreneurs dual roles will screen the entrepreneurial uncertainty environment and act accordingly by defining the strategic focus on market changes (e.g. technology, technical knowledge) and analyzing functional strategies to match those changes with available resources (Kharbanda et al., 1990). Multi behaviors and traits, namely leadership skills, autonomy, adequate resources, team work and engineering knowledge are necessary pillars to support engineers-entrepreneurs' successful in-house entrepreneurial orientation to solve engineering task-related problem solving (Campbell et al., 2012).

2.2 Entrepreneurial orientation theory (EOT) and engineers' entrepreneurial behaviors

Entrepreneurial orientation theory (EOT) is commonly related to the processes, practices and decision-making activities when a new entry exists in the competitive marketplace (Lumpkin & Dess, 1996). Areas where new entries are significantly visible in the marketplace can be seen in a tendency of an entrepreneur to act autonomously, be innovative and take risks, have a higher degree of

aggressiveness toward competitors and proactively looking at marketplace opportunities (Lumpkin et al., 1996). In the literature, autonomy, innovativeness, risk-taking, proactiveness and competitive aggressiveness are the dominant dimensions related to entrepreneurial orientation (EO) (Covin & Slevin, 1986; Lumpkin et al., 1996; Miller, 1983; Rauch, Wiklund, Lumpkin & Frese, 2009). Table 2 shows the definitions of EO dimensions adopted from Miller (1983); Covin et al. (1991); Lumpkin et al. (1996) and Rauch et al. (2009). The use of EO dimensions can be linked to environmental factors (e.g. dynamism, munificence, complexity and industry characteristics) and organizational factors (e.g. size, structure, strategy, strategy-making processes, firm resources, culture and top management team characteristics), all of which are important factors to impact the overall performance (e.g. sales growth, market share, profitability and stakeholder satisfaction) (Lumpkin et al., 1996). External and internal environment, organizational mission strategy, business practices and competitive tactics are major factors that strongly affect the entrepreneurial posture and organizational performance (Covin et al., 1991).

Table 2   EO Dimensions and Definitions

EO Dimensions	Definitions
Innovativeness	Support new ideas, novelty, experimentation for new products and services
Proactiveness	Act in anticipation of future problems, needs or changes
Risk-taking	Proclivity to engage in risky projects and prefer bold actions for achieving firms' objectives
Autonomy	Actions of individuals or teams are relatively independent
Competitive aggressiveness	Intensively challenges its competitors for improving position in the marketplace

According to Covin et al. (1991), willingness of an entrepreneurial organization to take high risks in completing major projects and aggressively pursuing business opportunities will impact organizational high return performance. Furthermore, an entrepreneurial organization who leads in technology, research and development tends to capture new market opportunities over the late movers. Strong evidence of positive impact of EO on organisational performance has increased in number of the existing empirical studies that have examined this relationship. Published studies on EO and organizational performances (for example, Davis, Bell, Payne & Kreiser, 2010; Entebang, Harrison & Run, 2010; and Zhang et al., 2011) found that, innovativeness, proactiveness, risk-taking, autonomy and competitive aggressiveness behaviors enhance organizational strategic orientation and commitment to obtain high returns in the marketplace. However, in relation to a higher performance of an organization, Kollman, Christofor and Kuckertz (2007) argued that the successful in-house entrepreneurial organizations that are strongly related to the organizational members' behaviors and attitudes (individuals) are those who are actively involved in any organizational business strategy activity. In their critique of using EO at the individual level, Kollman et al. (2007) considers Gartner's (1985) four key principles of EO from an individual analysis is potentially important. A successful entrepreneurial organization must address these key dimensions:

1) Individual (the persons involved in starting the organizations);
2) Process (the action undertaken by the individuals to start the new venture);
3) Organization itself (the kind of firm started); and
4) Environment in which the organization is active (the situation involving and influencing the new organization)

Questions have been raised about the use of EO behaviors in predicting individual performances and entrepreneurial intentions (Bolton et al., 2012). From an individual analysis, EOT requires assessing individual behaviors towards entrepreneurial intentions (Zhang & Bruning, 2011). EOT connects entrepreneurial intentions and individual behaviors, traits and attitudes to produce an entrepreneur within an organization (Bolton et al., 2012). Focusing on entrepreneurial behaviors and attitudes will make key individuals acquire the ability to recognize opportunities to exploit competitive business demands and to satisfy the current resources. A number of authors have argued that transforming EO into the individual level is an essential strategy to exploit opportunity and develop employees to become an entrepreneur (Kollman et al., 2007; Usaci, 2015). Usaci (2015) reported that successful entrepreneurial behavior of teachers (61.2 percent) is supported by learning and positive entrepreneurial attitude, such as proactive personality, attitude towards learning, attitude towards entrepreneurial behavior and social norms. With an intensive demand in technology, the EO moved further in explaining the acceptance of entrepreneurial behavior towards technology at the workplace (Gupta, Niranjan,

Goktan & Eriskon, 2015). Strong evidence of individual EO was significantly interacted with perceived ease-of-use and willingness to engage with technology, and incorporating between both explained 24.3 percent variance in technology adoption. Kollman et al. (2007) showed how individual EO can be grown in the culture, political and legal, macro-economic and micro-economic environment and these factors are crucial for developing entrepreneurial behaviors.

EO and individual engineers-entrepreneurs' dual roles behaviors cannot be separated in explaining individual entrepreneurial orientation (IEO). As mentioned earlier, IEO is characterized by five main dimensions, namely innovativeness, proactiveness, risk-taking, autonomy and competitive aggressiveness (Covin et al., 1991; Lumpkin et al., 1996). To measure IEO on entrepreneurial intentions and performance, Bolton et al. (2012) investigated 1,100 university students' entrepreneurial intentions and found that the items for innovativeness (α-0.80), proactiveness (α-0.765) and risk-taking (α-0.765) had higher internal consistency, whilst autonomy (α-0.208) and competitive aggressiveness (α-0.585) were removed for further analysis due to lower consistency. In another major study, Wu (2009) examined 337 students' entrepreneurial intentions and he highlighted four key behaviors, namely opportunity recognition, proactiveness, need for achievement and risk-taking propensity. Instead of assessing autonomy and competitive aggressiveness behaviors, Wu (2009) used opportunity recognition and a need for achievement behaviors to explain students' actual entrepreneurial intentions. Although the impact of competitive aggressiveness in predicting an individual's entrepreneurial intention is understudied, previous authors have failed to provide sufficient information that competitive aggressiveness can be used to measure individual behaviours. To date, there is less evidence that competitive aggressiveness and individual behaviours are associated with an individual's entrepreneurial intention and individual performance (Bolton et al., 2012; Gupta et al., 2015; Kollman et al., 2007; Wu, 2009).

This present study believes that innovativeness, proactiveness, risk-taking and autonomy dimensions are core behaviours in predicting engineers' entrepreneurial potentials and positive behavioral intentions. There are several reasons why these behaviors deserve attention. Firstly, changes in technology and technical knowledge require engineers to innovate ideas and strategies to develop innovative ideas and transform them into tangible results (Alavi et al., 2012; Igbaria et al., 1992). Secondly, engineers often emphasize on creativity to solve technical problems and are able to think conceptually (Champbell et al., 2012; Menzel et al., 2007). Thirdly, prior to engage in risky projects, engineers coordinate with project owners, advisors and contractors to ensure that the projects' objectives can be met (Kaewsri et al., 2013; Kharbanda et al., 1990). Lastly, engineers' creativity can be promoted when there is autonomy in their work and engineers are used to work with challenging tasks (Igbaria et al., 1992; Kharbanda et al., 1990). The published study of Rodrigues and Rebelo (2013) about proactive personality and innovativeness potentials with 243 engineers reported that 71 percent of engineers' personality (e.g. extraversion, openness and conscientiousness) had supported engineers' innovative behavior and highly complex job performance. It has conclusively been summarized that entrepreneurial behaviours (innovativeness, proactiveness, risk-taking and autonomy) increase engineers-entrepreneurs' dual roles potential and the ability to engage technology entrepreneurial demands with risks and uncertainties.

2.3 The relationships between in-house entrepreneurial orientation and talent retention among engineers

Talent can be defined as a capital, giftedness and a valuable subject and it can be referred to a person who leads in special skills or abilities (Dries, 2013). A person who has high skills, knowledge and experience in his or her fields potentially be an excellent and unique performer (Festing & Schafer, 2014; Govaerts, Kyndt, Dochy & Baert, 2011). Talent differs not only in individual differences (e.g. personality) but also appears rare, valuable and hard to imitate (Collings & Mellahi, 2009). Talented employees are usually segregated by competencies, skills, abilities, experience and knowledge. Many studies described talented employees as a key individual of organisations and retaining them has become a crucial corporate agenda (Gelens, Dries, Hofmans & Pepermans, 2013; Lewis & Heckman, 2006; Zhang & Bright, 2012). Retaining talent is an important element of talent management and it is defined as a long-term focus of encouraging key employees to remain in the same jobs (Claes & Heymans, 2008; Gangrade, Dubey & Chouhan, 2014). One major issue in retaining talent is brain drain, where huge costs for recruiting new entrants will be invested if the existing talents voluntary leave their current employers (Doh, Smith, Stumpf & Tymon, 2011). A relative importance of retaining talents is a clear employment expectations and behavioral intentions toward career obligations among talented employees. Therefore, linking behavioral intentions and career expectations create mutual understanding between

talented employees and employers toward career satisfaction and positive behavioral intentions.

In response to behavioral intentions and career expectations, high level achievement makes an engineer secure of his or her future engineering paths. An adverse impact of stronger career determination affects engineers moving to other jobs (Yang, Ma & Hu, 2011). Issues related to engineers' leaving current employments can be explained from several factors. Some authors (for example Anvari, Fraccaroli, Sarchielli, Ullrich & Dick, 2014; Bigliardi, Petroni & Dormio, 2005; Ramayah, Lo, Amri & Noor, 2011) highlighted learning and development, career advancement, career aspirations, organizational socialization and self-efficacy as crucial motivational factors for engineers' career satisfaction and decision to remain in their jobs. Other authors (see Abdull Rahman, 2012; Erturk & Vurgun, 2015; George, 2015; Igbaria et al., 1992) predicted role stressors, job involvement, perceived organizational support and organizational commitment as the main players for professionals' and engineers' retention decisions. However, Kharbanda et al. (1990) and Williamson et al. (2013) argued that retaining talented engineers must be linked to behavior problems in solving 'war of talent' and talent competitiveness issues. To avoid premature job performance among engineers, expose to engineers' development and entrepreneurial technology involve engineers' behaviors and traits, such as innovativeness, creative and proactiveness to develop new product development.

Decreasing EO activities concern the growing number of turnover within an organization (Yi, Sheu & Zhi, 2009). The nature of EO remains connected by influencing key talents' behaviors in making task-related decisions, working independently and generating new ideas (Sangar & Rangnekar, 2014). In support of in-house entrepreneurial activities, engineers require a huge amount of autonomy, task challenges, creativity and a freedom to innovate ideas into physical things, and to respond to the competitive engineering demands. As far as EO is concerned, Igbaria et al. (1992) placed EO as an organizational strategic talent agenda in predicting engineers' positive behaviors towards career satisfaction and retention decisions. Innovative behaviors and talented engineers cannot be separated. Higher level of innovativeness is significant behavior in influencing engineers' decision to stay (Guidice et al., 2009; Igbaria et al., 1992). Innovativeness is applied according to the nature of engineers' tasks dealing with innovation processes and product development (Williamson et al., 2013). Articles related to innovativeness often emphasize the need for engineers to upgrade human capital to align with organizational competitive strategy (Grip et al., 2012). The entrepreneurial process educates engineers to be a proactive employee (Crant, 2000). Weak proactive behavior has a significant impact on engineers' seeking feedback, information and opportunities to improve engineering task-related problems. As a result, identifying and assessing engineering problems cannot be generated and entrepreneurial development will slowly disappear. At this stage, lower influence of engineers' expectations toward proactive behavior will affect a great motivation factor for engineers to stay in the same employment (Singh et al., 2013).

A strong relationship between risk-taking and talent retention is likely to be related to train engineers solving technical problems and enhancing engineers' enjoyment to stay the same job (Tremblay et al., 2002). To establish career satisfaction on engineering professions, engineers need to develop his or her interests (e.g. working with risky tasks and work challenges) to solve current risks environment and technical problems. Once these interests are well-developed, most task-related problems can be tackled easier, quicker and less cost. Surveys such as that conducted by Campbell et al. (2012) have shown that 110 engineers who are being exposed to major projects likely felt a powerful effect on his or her tasks toward risks and uncertainty situations. From the risks they learned to think conceptually and critically, and several traits (e.g. leadership, autonomy) have shaped the way engineers' perform best. At least three major implications are gained from risk-taking behaviors. Firstly, great engineers' commitment towards engineering tasks, secondly, various engineering problems have integrated engineers' ability, skills and competencies to identify and analyze rationale solutions, and lastly, acceptance towards risks and pure challenges will make engineers' voluntarily decide to stay. A relationship also exists between an engineer's autonomy and his or her decisions to stay in the same employment. It is clear that autonomy increases attraction and retention among talented individuals (Badaracco & Ellsworth, 1991). For example, opportunities to make decisions in engineers' tasks and work schedules have influenced engineers' career preferences (Tremblay et al., 2002). Other studies reported that engineers' involvement in decision-making processes is an on-going approach to control his or her jobs. Instead of full entrepreneurial being exercised, the amount of autonomy strengthens engineers' commitment and desire to stay for longer periods (Abdull Rahman, 2012; Igbaria et al., 1992; Udo, Guimaraes & Igbaria, 1997).

3 Conclusions

This paper discusses the engineer-entrepreneur dual roles from engineers' behaviors, attitudes and traits perspective. In this paper, the authors provided some insight on how the entrepreneurial orientation theory (EOT) explains the individual EO based on engineers' behaviors. Lastly, this paper highlights the relationships between EO dimensions, namely innovativeness, proactiveness, risk-taking and autonomy, and talent retention among engineers. Engineers and entrepreneurs can be tightly defined from the combination of characteristics, behaviors and traits. Those terms are used to refer to an agent of change and engineers-entrepreneurs clearly obtain autonomy, adaptability and flexibility, risk takers, innovative and creative in performing engineering tasks, non-routine problems and managerial responsibilities (Antoncic et al., 2011; Campbell et al., 2012; Ganiron et al., 2013; Gundogdu, 2012). In previous discussions, the engineer-entrepreneur dual roles are used in the entrepreneurial organizations and this concept stresses research and development activity within organizations. Technological innovations need engineers to perform as entrepreneurs to discover and exploit opportunities from external environmental factors (e.g. dynamism, munificence, and complexity and industry characteristics). In a study conducted by Menzel et al. (2007), several issues emerged relating to entrepreneurial capacity within organizations. They questioned about the definitions of engineer-entrepreneur, requirements of managerial and organizational support to support future entrepreneurs and the educational and work-related consequences once entrepreneurial activities have been developed. From these issues, however, this paper considers that the definition of engineers-entrepreneurs should first be identified and developed to link engineers' behaviors, attitudes and traits.

Associative engineers-entrepreneurs dual role can be seen in four major dimensions, namely innovativeness, proactiveness, autonomy and risk-taking behaviors, as all these behaviors are linked to EO theory. The relationship between EO dimensions and organizational performance (e.g. profit, growth) has been widely investigated (Davis et al., 2010; Entebang et al., 2010; Zhang et al., 2011). This paper argued that a successful in-house EO does not only rely on organizational tangible resources (e.g. cost; technology). In support of EO within organizations, individual behaviors have emerged as catalysts to ensure that the processes, practices and decision-making activities can be implemented successfully. In the engineering industry, engineers determine every single process, practice and decision-making related to his or her behaviors. As was mentioned in the literature review, innovating and developing ideas, emphasizing creativity, thinking conceptually and critically, engaging in task risks and uncertainty situations are the leading engineers' entrepreneurial behaviors. Prior to match these behaviors with an individual EO, engineers' specific skills and general competencies must be defined precisely. This paper strongly argues that EO from an individual level is far more effective to explain engineers' entrepreneurial intentions and positive behavioral intentions (Bolton et al., 2012; Gupta et al., 2015; Kollman et al., 2007; Wu, 2009). Therefore, adoption of individual EO in predicting engineer's positive behavioral intentions (e.g. intention to stay) towards their current employment is relevant investigation for future research.

This paper extends our knowledge about the concept of engineers-entrepreneurs dual role from the engineer's behaviors, attitudes and traits, and how individual EO can be used to predict engineers' entrepreneurial intentions and retention decisions towards their current employment. The theoretical implication of this study is that EO can be used for measuring individual entrepreneurial intentions. This paper has raised important questions about the use of EO and engineers' entrepreneurial behaviors, and how EO behaviors can be expended into talent retention effectiveness. Although this current paper purely discusses the EO-related issues, attention should be given on establishing individual EO items for future researchers investigating entrepreneurial intentions and positive behavioral intentions among engineers. The present paper raises the possibility that individual EO can be used to predict engineers' intention to stay, and the future findings may help researchers to understand engineers' career orientation and satisfaction. In general, this paper helps human resource (HR) managers, engineering practitioners and organizations in upgrading engineers with new specific skills and knowledge, and general competencies to respond to technology development and business challenges.

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Temporal-Spatial Evolution Characteristics and Its Causes of Innovation Output in Yangtze River Economic Belt

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Abstract: This study took Yangtze River Economic Belt as a spatial observing unit to discuss the temporal-spatial evolution characteristics and its causes of innovation output, with local Gini coefficient, spatial auto regression and panel data model, measured by the number of patents authorization and other related data. The result indicated that the overall innovation output in the Yangtze River Economic Belt had been increasing, while the geographic concentration of it presented a fluctuated downward trend. The agglomeration degree of innovation output showed a shape of mirrored *Z* with a fluctuated upward trend. The hotspots area of innovation output, the scope of which had been extending, developed into a monopole-prominent spatial pattern in Yangtze River delta area from a dual-central spatial structure in Yangtze River delta area and Chengdu-Chongqing area. Besides, the cold spots regions were in the middle reaches of Yangtze River; Economic foundation, technology spillover, government actions, spatial proximity and financial supports could make significantly positive effects on the innovation output in Yangtze River Economic Belt. According to the conclusions, this paper also propounded corresponding policy recommendations.
Key words: Temporal-spatial evolution; Causes analysis; Yangtze river economic belt; Innovation output

1 Introduction

Regional innovation is one of engines to promote the economical development. Innovation output is a main method to measure regional innovation, which can reflect regional ability of innovation as well as the level of it. In the background of regional economic integration, the Yangtze River Economic Belt has become one of the most economically developed and strategically important areas, but this area still has broad space for development (Zeng H, Yu R, Zuo Y,2015), with which Chinese other inland economic zones cannot compare (Lu D,2014). Shanghai, Hangzhou, Wuhan, Chongqing, Nanjing and other 33 cities, just like bright pearls, are inlaid on the Yangtze River Economic Belt, constituting the main representative urban agglomerations and leading the development of Yangtze River Economic Belt. Consequently, to study the temporal-spatial evolution characteristics and its causes of innovation Output of the inlaid cities in Yangtze River Economic Belt not only fits into the current background, but also can improve the innovation ability and enhance the overall competitiveness of Yangtze River Economic Belt, so that this study may help this area even China find a way to realize the sound and fast economical development.

In recent years, domestic and foreign scholars had discussed a lot on the innovation output and gained abundant theoretical achievements. The discussions mainly had involved the construction and measure of evaluation systems (Wan Y, Wen H,2009; Yang C, Zhang Q, Ding S. ,2015), efficiency (Shi F,2010) and its internal and external drive mechanism(Dibrov A.,2015). Besides, there were other studies which had revealed the spatial effect (Li H.,2012) and economic growth effect (Fang D, Sun M,2015). Wan Yong had created an evaluation system which was based on the data of international papers number, granted patents and contracted values in technological contacts (Wan Y, Wen H,2009). Shi Feng had discovered that the innovation output efficiency in China was low and the trend of it was declining (Shi F,2010). Artem Rebrov used the data such as transaction cost and labor innovation resistance to confirm that technological change and the policy replacement might reduce the resistance to innovation, thereby increase the level of innovation output(Dibrov A.,2015). Li Heng had found out that Chinese innovative output presented a phenomenon of spatial agglomeration by spatial autocorrelation analysis (Li H.,2012). According to the results of recent researches, temporal-spatial evolution characteristics evolution of innovation output had been one of the research focuses in regional economic development. But as for the researches on the Yangtze River Economic Belt, most researchers had researched this area only from five aspects such as the practical significance and influence (Bai Y,

Guo S.,2015), the regional economic differences (Chen X.,2008), spatial structure (Zheng D, Chen Y,2015) as well as the evolution of the industrial structure (Huang Q, Zhou Z, Liu H.,2014) of construction in Yangtze River Economic Belt, rather than from innovation output. But, what about the development of innovation output in Yangtze River Economic Belt? Is there any spatial agglomeration? Why could the innovation output difference be? These questions haven't been solved yet. Therefore, studying on temporal-spatial evolution characteristics and its causes of innovation Output in the inland cities of Yangtze River Economic Belt seems to be of great theoretical and practical significance.

This study was supposed to use local Gini coefficient and spatial autocorrelation to explore innovation output of inlaid cities in Yangtze River Economic Belt. And the study built a panel data model, combining with economic base, technology spillover, spatial location, innovation, and government behavior and financial support, to analyze the causes of innovative output differences, in order to enrich the regional innovation theoretical researches and provide Yangtze River Economic Belt even China with suggestions on the Innovation-Driven Development Strategy.

2 Methods and Sources
2.1 Methods
2.1.1 Local Gini coefficient

There are many econometric models to measure spatial agglomeration, such as Entropy index, Herfindahl index, Coefficient of Variance and local Gini coefficient. Since the local Gini coefficient is more of mathematical thoughts and easier to operate, it adopted in this study. The formula is shown as the following (He J, Zhang H, Ye Y,2013).

$$GINI = \frac{1}{2n^2 \overline{x}} \sum_{i=1}^{n} \sum_{j=1}^{n} |x_i - x_j| \tag{1}$$

Above formula, n represents the number of the cities; indicates the average of innovation output; x_i represents the innovation output of city i, while x_j represents the innovation output of city j.

2.1.2 Global spatial autocorrelation

This study calculated the global Moran's I index to measure the global spatial autocorrelation of innovation output. The formula is shown as the following (He J, Zhang H, Ye Y,2013).

$$I = \frac{n \sum_{i=1}^{n} \sum_{j=1}^{n} W_{ij} |x_i - \overline{x}| |x_j - \overline{x}|}{\sum_{i=1}^{n} \sum_{j=1}^{n} W_{ij} \sum_{i=1}^{n} |x_j - \overline{x}|^2} \tag{2}$$

In the formula, the meaning of x_i, x_j and n is the same as the meaning of the corresponding variables in formula (1). W_{ij} is a spatial weight matrix in binary system. To test spatial autocorrelation characteristics of innovation output, this study also calculated the standardized statistic Z. The formula is shown as the following (Jiang T,2013).

$$Z = \frac{I - E(I)}{\sqrt{VAR(I)}} \tag{3}$$

2.1.3 Local spatial autocorrelation

Due to the heterogeneity of spatial units, spatial autocorrelation is generally unsteady. Thus, the study introduced Getis-Ord G_i^* index, a local spatial autocorrelation statistic, to analyze local spatial aggregation deeply. The formula is shown as the following (Jiang T, Hua M, Zhang Y,2014).

$$G_i^*(d) = \sum_{j=1}^{n} W_{ij}(d) x_j / \sum_{j=1}^{n} x_j \tag{4}$$

n, x_j and W_{ij} are the same as the variables which in formula (1) and formula (2).

2.2 Index selection and data
As for the measurement of single index, the patents granted are one of commonly used measures of innovation output levels. Cao Xianzhong used patents granted as a measure of innovation output, and concluded the Yangtze River Delta Innovation overall output efficiency is low, but rising (Cao X, Zeng G, Zou L,2015). Wei Yanhui measured the regional innovation output capacity and its trends in mainland China by using patents granted (Wei Y, Zhang H, Wei J,2015). Li Guoping taking the data of patent applications as a measure, combining with the exploratory spatial data method to analyze provincial spatial distribution of innovation outputs, concluded that innovation output varied with

regions (Li G, Wang C,2012). Most scholars had adopted patent data as a measure to analyze issues of innovation output. In consideration of the large-span area and the different levels of development, this study used a single indicator, patents granted, to take an analysis. In view of the economic development and status quo of innovation output in Yangtze River Economic Belt, available scientific data and reference to the relevant research results, the chosen inlaid cities which were Shanghai, Chongqing, Hangzhou, Nanjing, Chengdu, Hefei, Wuhan, Changsha, Nanchang, Ningbo, Suzhou, Shaoxing, Wuxi, Ma'anshan, Luzhou, Yueyang, Jiaxing, Huzhou, Zhoushan, Nantong, Changzhou, Zhenjiang, Yangzhou, Anqing, Tongling, Chizhou, Wuhu, Chaohu, Huangshi, Ezhou, Jingzhou, Yichang, Huanggang, Xianning, Panzhihua, Yibin, Jiujiang and Zhaotong.

The data of patents granted and explanatory variables were from *China City Statistical Yearbook (2001-2014)* and other statistical yearbooks of provinces and cities.

3 Temporal-Spatial Evolution Characteristics of Innovation Output
3.1 Regional overall difference characteristics
In order to analyze regional geographic concentration of innovation output in Yangtze River Economic Belt, the study calculated the local Gini coefficients by using the R programming language based on the formula (1). And the averages and local Gini coefficients of innovation output were plotted in Figure 1.

From the Figure 1, the averages of innovation output rises year by year which in a shape of an opposite *L*, While the local Gini coefficient presents a fluctuating downward trend. From 2000 to 2007, the average of innovation output increases slowly and the overall growth rate in eight years is 41.05%; From 2008 to 2012, it increases rapidly and the overall growth rate in four years is 91.11%, but it decreases in 2013. As for the local Gini coefficient, it reaches the maximum (0.7386) in the chosen interval in 2003, which means the geographic concentration of innovation output in this area is relatively largest; while in 2006, it reaches the minimum (0.6229) reflecting the geographic concentration is relatively smallest. Generally, the changes of local Gini coefficient can be divided into such four stages: 1) From 2000 to 2003, there is an intermediate-speed-increasing stage, where the local Gini coefficient increases as 0.7386 from 0.6987, with the growth rate of 1.33% per year; 2) From 2003 to 2006, there is a high-speed-decreasing stage, where the local Gini coefficient decreases as 0.6229 from 0.7386, with the reduction rate of 3.86% per year; 3) From 2006 to 2012, there is a low-speed-increasing stage, where the local Gini coefficient increases as 0.6734 from 0.6229, with the growth rate of 0.84% per year; 4) From 2012 to 2013, there is a intermediate- speed-decreasing stage, where the local Gini coefficient decreases as 0.6393 from 0.6734, with the reduction rate of 3.41% per year. Figure 1 shows that from the of 2000 to 2013, the level of innovation output of inlaid cities of Yangtze River Economic Belt city mosaic has increased steadily, while the geographic concentration presents an inverted letter *W* shape with a downward trend, indicating that innovation output has changed to be more balanced.
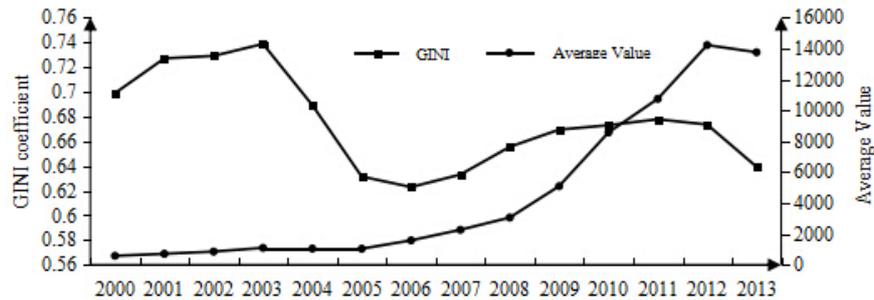
Figure 1   Average Value and Local GINI Coefficient of Innovation Output in Yangtze River Economic Belt

3.2 Spatial evolution characteristics
Based on the formula (2), this study calculated Moran's I indexes with Arc GIS software, and the result was plotted in Figure 2. Figure 2 shows that from the year of 2000 to 2013, the innovation Output in Yangtze River Economic Belt presents as significant spatial agglomeration and the aggregation intensity trends to fluctuating upward. In detail, from 2000 to 2003, the Moran's I index fluctuates slightly around 0.05, which manifests the spatial agglomeration degree is relatively low and stable; Between 2003 and 2007, the Moran's I index rises to 0.0402 from 0.2983 rapidly with an average annual growth rate of 6.45%, which means the degree of spatial agglomeration is growing; During the period of

2007 to 2013, the Moran's I index gets into another trend of fluctuations, which is around 0.3. In term of extreme points, the Moran's I index reaches a minimum (0.0402) in 2003, proving that the degree of spatial agglomeration of innovation output is relatively smallest at that time; Then it reaches a maximum value (0.3339) in 2010, revealing that the degree of spatial aggregation is relatively largest at that time. Overall, the degree of spatial agglomeration of innovation output in the inland cities of Yangtze River Economic Belt is growing, and the Moran's I index is converging to 0.30. The curve of Moran's I index shows a mirror *Z* shape.
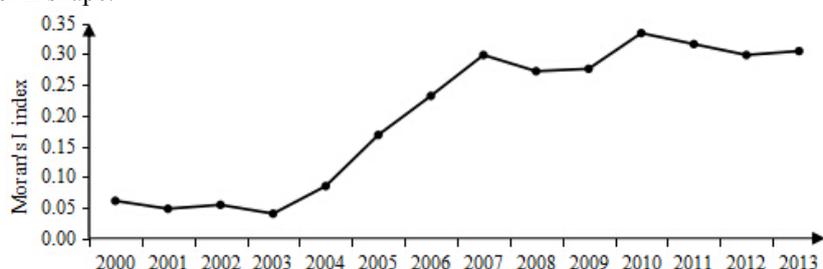
Figure 2   Global Spatial Autocorrelation Coefficient of Innovation Output in Yangtze River Economic Belt

3.3 Spatial hotspots distribution

To explore the spatial pattern of innovation output in Yangtze River Economic Belt further as well as learn its local spatial autocorrelation more, taking 2000, 2007 and 2013 as time notes, this study calculated Getis-Ord G_i^* indexes by ArcGIS 10.1 software. As the Figure 3 shows, the earned Getis-Ord G_i^* indexes were divided into five degrees such as hotspots area, vice hotspots area, random distribution area, vice colds pots area and colds pots area.

According to the Figure 3, The hotspots area of innovation output develops into a *monopole-prominent* spatial pattern in Yangtze River delta area from a *dual-central* spatial structure in Yangtze River delta area and Chengdu- Chongqing area, and the scope of hotspots area is extending, while the colds pots area is concentrated in the middle reaches of Yangtze River. Wherein, the hotspots area of innovation output in 2000 contains Shanghai, Ningbo, Jiaxing, Zhoushan, Nantong, Suzhou, Chengdu and Yibin, showing the innovation capacity in these areas is very strong and forming a significant pattern of agglomeration; The vice hotspots area includes Yangzhou, Zhenjiang, Changzhou, Wuxi, Huzhou, Hangzhou and Chongqing, and the vice hotspots area is close to the hotspots area, indicating hotspots area has space radiation on the vice hotspots area, and there are positive interactions between them; The vice colds pots area includes Wuhan, Hefei, Nanchang, Huangshi, Jiujiang, Yueyang, Xianning, Ezhou and Chaohu; The cold spots area contains Anqing, Huanggang and Chizhou. Generally, in 2000, the hot-cold-spots distribution of innovation output presents a *U* shape, and levels of innovation output in Sichuan-Chongqing area, Shanghai and the cities around Shanghai is higher, while the levels in Anhui, Hubei and Jiangxi provinces are relatively lower.

The scope of the hotspots area in 2007 is more extended than 2003. Compared with the hotspots area in 2003, the area in 2007 absorbs Hangzhou, Shaoxing, Huzhou and Wuxi, but removes Chengdu and Yibin. Since some of the vice hotspots cities evolve into hotspots cities, the vice hotspots area is reduced, such as Yangzhou, Zhenjiang and Changzhou, concentrated in Jiangsu Province and nearing the hotspots area. The vice colds pots regions are Chaohu, Tongling, Changsha, Jingzhou, Yichang, Luzhou, Panzhihua and Zhaotong, the spatial distribution of which is relatively dispersed; The colds pots area increases significantly compared with 2000, including Hefei, Chizhou, Anqing, Huanggang, Wuhan, Ezhou, Huangshi, Xianning, Yueyang, Jiujiang and Nanchang. In 2007, the hot-cold-spots distribution of innovation output presents a lying *L* shape, and the hotspots area is mainly concentrated in Jiangsu, Zhejiang and Shanghai regions.

In 2013, compared with 2007, the hotspots area stays the same and forms a stable pattern, which contains Shanghai, Ningbo, Jiaxing, Zhoushan, Nantong, Suzhou, Hangzhou , Shaoxing, Huzhou and Wuxi; the vice hotspots area increases Nanjing, Wuhu and Ma'anshan, indicating that the degree of spatial interaction of innovative output in east of Yangtze River Economic Belt has been enhanced; The vice colds pots regions decreases, containing Hefei, Chizhou, Changsha, Jingzhou, Yichang, Panzhihua and Zhaotong; The colds pots regions also decrease, but still include Wuhan, Nanchang, Ezhou, Anqing, Jiujiang, Huanggang, Yueyang, Huangshi and Xianning, mostly in Hubei Province and Jiangxi Province. The hot-cold-spots distribution of innovation output in 2013 is similar to 2007, both lying *L* type, and the hot spots area is gathered in Jiangsu, Zhejiang and Shanghai.
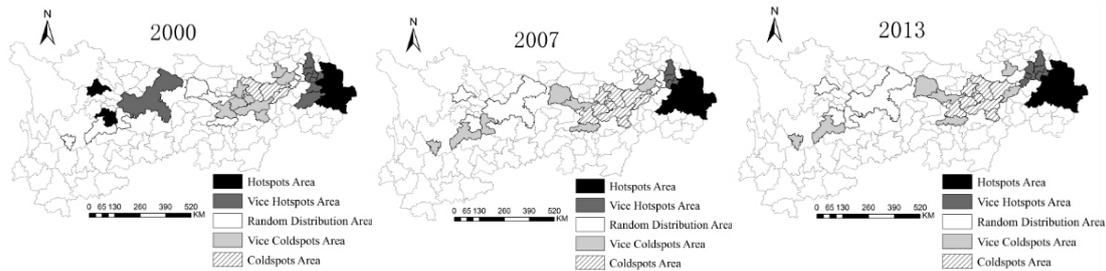
Figure 3　Spatial Hotspots Distribution of Innovation Output in Yangtze River Economic Belt

4 Cause Analysis of Temporal-Spatial Evolution Characteristics

4.1 Construction of regression model

Scholars have gained a series of research results on the cause analysis about temporal- spatial evolution characteristics of innovation output. Jiang Tianying found that technology spillovers, spatial location, economic base and policy regimes have a significantly positive impact on innovation output (Jiang T,2014). Mayer and Sager concluded government action played an important role to support regional innovation (Mayer H, Sager F, Kaufmann D, et al,2016). Throughout the papers which have been learned and considering the available data, this study summarized the explanatory variables into six aspects such as economic basis, technology spillover, spatial location, innovation input, finance support and government behavior. In details, GDP per capital represents economic basis; because the import and export trades make the exchange of information and goods among different regions, which leads technology spillovers, this study take total volume of foreign trade to measure the technology spillover. Total passenger traffic indicates the spatial location; Innovation input contains innovation investment and innovation staff input. Taking the availability of the data and the representativeness of the explanatory variables into account, this study took the number of people who were employed in scientific research, technical service and geologic prospecting to measure the innovation input; The loans of national banking system and public finance expenditure for science and technology represent the financial support and government action respectively.

In this study, innovation output [PAT (item)] is an explained variable, and economic base [Eco (yuan /person)], technology spillover [Tec (million dollars)], spatial location [Spa (million people)], innovation inputs [Inp (million)], government action [Gov (ten thousand yuan)] and financial support [Fin (ten thousand yuan)] are explanatory variables. In order to eliminate the differences in dimension and reduce heteroscedasticity of variables, this study made each variable logarithmic, except the innovation input. The model is as follows:

$$\ln Pat = \alpha_0 + \alpha_1 \ln Eco + \alpha_2 \ln Tec + \alpha_3 \ln Spa + \alpha_4 Inp + \alpha_5 \ln Gov + \alpha_6 \ln Fin + \varepsilon \quad (5)$$

This study measured and analyzed panel data for factors in above model through STATA 12.0 software and the regression result was shown in Table 1. In the regression analysis, this study used Hausman Test. Hausman Test is an indispensable testing tool in the empirical study based on panel data model, helping individual effect make a choice between random-effect model and fixed-effect model (Chen Q, Long Z, Ling G,2013). The inlaid cities in Yangtze River Economic Belt were divided into three groups in this study, with the purpose of analyzing the causes of regional differences in innovation output, such as all cities (named Group 1), the cities on the lower reaches of Yangtze river (named Group 2) and the cities on the middle and upper reaches of Yangtze River (named Group 3). Wherein, the Group 2 includes Shanghai, Hangzhou, Nanjing, Ningbo, Suzhou, Wuxi, Shaoxing, Huzhou, Jiaxing, Zhenjiang, Nantong, Changzhou, Zhousha and Yangzhou; the others were in the Group 2.

4.2 Regression analysis

4.2.1 Regression analysis on Group 1

Based on the results of Hausman Test, the regression model of Group 1 is the fixed-effect model I. Economic basis, technology spillover, spatial location, government action and financial support all have a significantly positive impact on the Group 1. After comparing each variable coefficients, according to the intensity of influence from each variable on innovation output, this study sorts the variables from strong to weak as follows, spatial location, financial support, technical spillover, government action and economic basis. But the innovation input doesn't pass the significance test, indicating that this factor doesn't have a significant influence on the innovation output of Group 1. The reason could be that probably innovative activities often show production externalities somehow, which means the public

benefits of it may over private benefits. So, such production externalities may cause innovation input lacking enthusiasm. Also, today's imperfect innovative input-output mechanism may fail to significantly promote innovation output.

4.2.2 Regression analysis on Group 2

According to the results of Hausman Test, the regression model of Group 2 chooses the fixed-effect model III. From the result of regression, economic basis, technology spillover, spatial location, innovation input, government action and financial support all have significant impact on Group 2, and from highest to lowest are the economic basis, government action, technology spillover, spatial location, innovation input, and financial support. Compared with the regression results of Group 1, the impact of economic basis effects is more significant, the regression coefficient of which is 1.549, indicating that the economic basis is an important promotion to innovation output for Group 2. But the coefficients of technology spillover and financial support are negative and they pass the significance test in Group 2, which means increasing technology spillover and financial support may decrease the innovation output in the lower reaches of Yangtze River. The reason may be that the cities in Group 2 are advanced innovative regions, whose technology presents a negative externality; and the operation in innovation value chain is high-risk. Such risks are from technical development and the exploration of unknown factors in the upstream of innovation value chain. Therefore, in the Group 2, technology spillover and financial support have a negative correlation with innovation output.

4.2.3 Regression analysis on Group 3

In the light of the results from Hausman Test, the regression model of Group 3 took the fixed-effect model V. On the basis of the result, economic basis, spatial location, technology spillover, innovation input, government action and financial support all have significant influence on Group 3. By comparing the coefficients of Group 1and Group 2, here comes a point that the influence of technology spillover, spatial location and financial support on innovation output of Group 3 rises, indicating that the impetuses to improve the level of innovation output in Group 3 are diverse. Increasing technology spillover, rational utilization of spatial location and enhancing financial support may promote the regional innovation to improve the levels of innovation output.

Table 1　Factors Estimated Results of Innovation Output in Yangtze River Economic Belt

Variate	Group 1		Group 2		Group 3	
	Model I	Model II	Model III	Model IV	Model V	Model VI
lnEco	0.158^*	0.055^*	1.549^{***}	1.114^{***}	0.146^{**}	0.020
	(1.77)	(0.87)	(5.75)	(4.94)	(1.49)	(0.35)
lnTec	0.297^{***}	0.338^{***}	-0.16^{**}	0.073^*	0.346^{***}	0.392^{***}
	(4.89)	(7.72)	(-1.16)	(0.63)	(4.96)	(7.48)
lnSpa	0.353^{***}	0.383^{***}	0.125^{**}	0.131^{**}	0.508^{***}	0.488^{***}
	(4.49)	(5.76)	(0.79)	(0.87)	(5.63)	(6.41)
Inp	0.031	0.039	0.032	0.020	0.180	0.126
	(1.19)	(1.89)	(1.32)	(0.90)	(2.99)	(2.73)
lnGov	0.249^{***}	0.262^{***}	0.27^{***}	0.282^{***}	0.151^{***}	0.152^{***}
	(8.15)	(10.32)	(5.88)	(6.18)	(3.83)	(4.57)
lnFin	0.309^{***}	0.303^{***}	-0.006^*	0.029^*	0.380^{***}	0.451^{***}
	(3.83)	(4.29)	(-0.06)	(0.03)	(3.19)	(4.65)
cons	-8.875^{***}	-8.656^{***}	-9.936^{***}	-9.404^{***}	-10.756^{***}	-11.043^{***}
	(-9.07)	(-10.79)	(-5.93)	(-5.84)	(-8.14)	(-9.86)
Within-R^2	0.818	0.817	0.901	0.8988	0.789	0.787
category	FE	RE	FE	RE	FE	FE
Hausman-p	0.000		0.000		0.000	

Note: FE and RE represent fixed-effect model and random-effect model, respectively; ***, **, * means significant at 1%, 5% and 10% level, respectively; the test values t is in the brackets.

5 Conclusions

This study took the 38 inlaid cities in Yangtze River Economic Belt as spatial observing units to discussed regional overall difference characteristics, spatial evolution characteristics, spatial hotspots distribution of innovation output and its causes with the data patents authorization and other related data, and made conclusions as follows.

1) From 2000 to 2013, the overall innovation output in the inland cities of Yangtze River Economic Belt had been increasing year by year, while the geographic concentration of it presented a fluctuated downward trend. The level of innovation output of inlaid cities of Yangtze River Economic Belt city mosaic had increased steadily, the curve of which is in a shape of a mirrored *L*. While the geographic concentration showed an inverted letter *W* shape with a downward trend, indicating that innovation output had changed to be more balanced.

2) The agglomeration degree of innovation output showed a shape of mirrored *Z* with a fluctuated upward trend; the hotspots area of innovation output developed into a *monopole- prominent* spatial pattern in Yangtze River delta area from a *dual-central* spatial structure in Yangtze River delta area and Chengdu-Chongqing area, and the scope of hot spots regions had been extending. Besides, the cold spots regions were in the middle reaches of Yangtze River.

3) As for the 38 inlaid cities in Yangtze River Economic Belt, spatial location, financial support, technology spillover, government action and economic all had significant positive impacts on the innovation output in this area, and the degrees of these impacts were declined by the order; As for the cities which were on the lower reaches of Yangtze river, the economic basis, government action and spatial location play an important role to promote the innovation output, and the degrees of them were declined by the order; As for the cities which were on the middle and upper reaches of Yangtze river, the spatial location, financial support, technology spillover, government action and economic basis played an important role to promote the innovation output, and the degrees of them were declined by the order.

Based on the above conclusions, this study proposed the following policy recommendations.

1) Understand the differences of innovation between regions fully, and optimize the spatial layout of innovation output. When actively creating a good atmosphere for innovation, government may have an objective awareness of regional differences of innovation output in spatial aggregation and spatial characteristics. Try to build a regional linkage development mechanism of innovation output. Focus on nurturing a multi polar regional innovation center, and building a platform for technology sharing and knowledge exchange.

2) Try collaborating and establishing a sound service system for innovation. Governments at all levels can make overall plans and take all factors into consideration to set and implement policies, and the development of innovation might be carries out according to local conditions. As the research institutes and business innovation are the main forces of innovation output, governments at all levels can encourage them to conduct innovative researches and introduce some positive policies, such as the economic support.

3) Collocate the driving element rationally and make the innovation output increase balanced. The impetuses to improve the level of innovation output in Yangtze River Economic Belt are diverse. Increasing technology spillover, rational utilization of spatial location and enhancing financial support may promote the regional innovation to improve the levels of innovation output. For example, in Yangtze River Delta area, the level of innovation output is sensitive to the economic basis. So, the local government can promote the development of innovation output by developing the local economy.

4) Improve the innovation value chain mechanism and internalize the innovation externalities. Introduce various policies, such as financial subsidies and technical protection, to encourage innovation input and form a good conversion mechanism between innovation input and innovation output. Build risk management system to reduce the innovation risks in the process of innovation value chain and attract financial supports. Integrate the innovation resources timely and promote researches with the integration process.

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The Impact of Social Norm on Total Early Stage Entrepreneurial Activity Rate, Evidence from Malaysia GEM Data by Using Big Data Technologies

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Abstract: The purpose of this paper is to analyze the impact of social norm on TEA in Malaysia Context. In this study, Social norm as IV includes Equalinc, Nbgoodc, Nbstatus, Nbmedia. In other words, to examines the relationship between the TEA and social norms indexes as subsection of the entrepreneurial attitudes. The study was drawn from country-level data provided by the National Malaysia GEM (Global Entrepreneurship Monitor) to evaluate the current status of entrepreneurial environments in the country. The findings show that the early stages of entrepreneurship development in Malaysia are very dynamic and volatile. The number of early-stage entrepreneurial activities in Malaysia is still lower than in other parts of developing countries. This paper provides the Malaysian government with theoretical support so that the government can utilize limited resources to develop entrepreneurial activities. This study demonstrates the value of Big Data analytics in understanding of issue within a community. The result of our systematic mapping can help policy makers to obtain an overview of existing situation and identify areas in the field that require more attention.
Key words: Business development; Entrepreneurial activity; Global entrepreneurship monitor; Big data analytics; PCA

1 Introduction

A lot of studies have shown that entrepreneurship has been the primary driver for the economic progress of every nation (Christensen, C. M., Johnson, M. W., and Rigby, D. K, 2002). Entrepreneurship has played such a substantial role in creating innovation, diversity, enhancing the competitiveness, generating new ideas, creating employment opportunities, other than providing social adjustment and economic growth in industrialized and developing economies (Robson, P. J. A., and Bennett, R. J. SME Growth,2000 Gürol, Y., and Atsan,2006). Several scholars have illustrated the fact that entrepreneurship is both beneficial and crucial to achieve a healthy economy (Gorman, G., Hanlon, D., and King,1997 Henry, C., Hill, F., and Leitch, C,2003), W. A significant remarkable causal relationship between entrepreneurship, economic growth and poverty reduction has been proven in previous studies. The emerging concept of entrepreneurship originates from the formation of entrepreneurial opportunities, the understanding of entrepreneurial aspiration, which kick-starts new business enterprise. In the Malaysian context, (Ariff and Abubakar Ariff, M., and Abubakar, S. Y,2002) have observed that since the 1970s, small businesses begun by entrepreneurs had become a net creator of jobs, and wealth creation. Quoted from Abdullah (Abdullah, M. A. H,1999), in a developing country like Malaysia, entrepreneurial activities via small businesses creation serve as a mechanism to improve income distribution, to stimulate economic growth, and to give a new shape to the economic structure. In essence, entrepreneurship is important to the wellbeing of the Malaysian economy.

Since entrepreneurship development is a forceful instrument of activating the nation's economic growth, many industrialized and developing countries have taken some measures to promote entrepreneurship activity among their community. Thus, many researchers have been stressing more on the studies on entrepreneurial environments, opportunities and growth. However, at present, theoretically speaking, most researches are based on the qualitative research analysis. There is a body of evidence that relies on empirical data attempting to study the nature of the entrepreneurship environment in Malaysia. In this regard the works that were based on developed countries, and their conclusion may not always tally with the Malaysian context and perspective. Entrepreneurial surroundings that have been experienced by up-and-coming entrepreneurs from developing countries may not be the same as those in developed countries, as the latter may have more institutional support and the education and training systems that are more ahead, thus they offer support to entrepreneurship activities and

environment. Due to the fact that Malaysia has some unique economic, cultural, value, educational, political and social environments; the study on the consequences of entrepreneurial environments on the opportunities and growth carries a practical significance in boosting regional entrepreneurial activities. The reason that causes the above condition is the trouble in gauging entrepreneurial environments, opportunities and growth. Therefore, theoretically it is vital to pursue the research further. Moreover, while the Malaysian Government proposes a worthwhile strategy of "entrepreneurship as career of choice", it is feasibly significant to study how entrepreneurial environments determine the entrepreneurial phenomenon in Malaysia. It is based on this landscape that this study was undertaken. From this perspective, this paper tries to establish a sound theoretical foundation to the relevant authorities aiming to develop a series of effective strategies and plans to improve the Malaysian entrepreneurial development.

Malaysia is deemed an appropriate case when it comes to evaluating the role of entrepreneurship in developing countries for a number of reasons. First, from 2000s onwards, Malaysia has illustrated a remarkable economic growth, with the average of 3-5 per cent per year.   Based on the assumption that the gross domestic product (GDP) is linked with the entrepreneurship levels, it can be expected that there is a sufficient bandwidth across time to record the changes in the characteristics of entrepreneurship. Second of all, Malaysia has taken part in the Global Entrepreneurship Monitor (GEM,2016) since 2006 on multiple occasions. As a unique project, the GEM that uses standardized methodology to assess entrepreneurial activity all over the world. As a result, the role of entrepreneurship can be assessed in economies in unique development phases. As Malaysia has participated in the GEM study, it gives us the chance to cross-reference data that have proven to be helpful in this study. Moreover, the empirical results in GEM function as a framework for the interpretation of the results established in the Malaysian case. To this end, let us look at how this paper shall be organized. First of all, the next sections shall discuss the literature that concerns with the entrepreneurship environment and economic development. In the subsequent sections, the methodology of the present study is then elaborated, followed by a presentation of the findings that have been gathered. The study ends with the inevitable conclusions and recommendations for future research.

2 Literature Review

A steady body of literature has been known to link entrepreneurship and the stage of economic development. Entrepreneurship is generally accepted to be a vital condition for a sound long-term economic development (Carree, M. A., and Thurik,2003), A. R. The term "economic development" refers to any activity serving to help increase the standard of living in both a community and country. This not only includes an increase in the income for the people, but also it betters the standard of living. Therefore, it is an integration of an increase in wealth and quality of life for every layer of the community. A lot of studies advocate that economic development can be associated with entrepreneurship activity on the national or regional level, based on the growth rate or the GDP as the indicator of the economic growth or development. Development economists outline three major phases of economic development: It has been found in various studies that the economy concentrates on the production of agricultural products and

1) Small-scale manufacturing;
2) The economy shifts from small-scale production towards manufacturing; and
3) With increasing wealth the economy shifts away for manufacturing towards services proposed in a text that countries have to undergo five stages of economic growth:
1) The traditional society;
2) The preconditions for take-off;
3) The take-off;
4) The drive to maturity; and
5) The age of high mass-consumption.

While these stages suggest on the simpler way of looking at the development of modern economies, they have also recognized critical events.

2.1 Literature linking entrepreneurship environment

The environment for entrepreneurship is imperative for a new firm venture (Delmar, F., and Wiklund, J,2008 Ahmad, S. Z., Abdul Rani, N. S.,2010) The term "entrepreneurial environments" refers to a combination of factors that play a role in the development or in the nurturing of entrepreneurship and

entrepreneurial activities. As the infrastructure develops and as the entrepreneurial system prospers, the system will survive only if the environment is deemed suitable for entrepreneurial activity and new venture creation (Pennings, J. M., and Kimberly, J.,1980). The entrepreneurial environment may ascertain the continued or successful existence of the organization. Vast literature has not left the effect of a variety of factors of entrepreneurial environments on entrepreneurship (Ahmad, S. Z., Abdul Rani, N. S.,2010). For instance, (Wennekers, S., Uhlaner, L., and Thurik, R,2002). debated that technology, level of economic development, culture, and institutions are all the influences for the demand for entrepreneurship by creating opportunities available for startups. (Fogel, G,1994). opined that governments can influence market mechanisms, making them function successfully by removing the conditions that give way to market flaws or administrative rigid rules and regulations. (Beck, T., and Demirguc-Kunt, A,2006). argued that for new business to grow, it is crucial for the entrepreneurial environments to be solidified. Changes in the entrepreneurial environment have either a negative or positive impact on the growth or failure of small businesses (Ahmad, S. Z., Abdul Rani, N. S.,2010).

2.2 Problem tatement
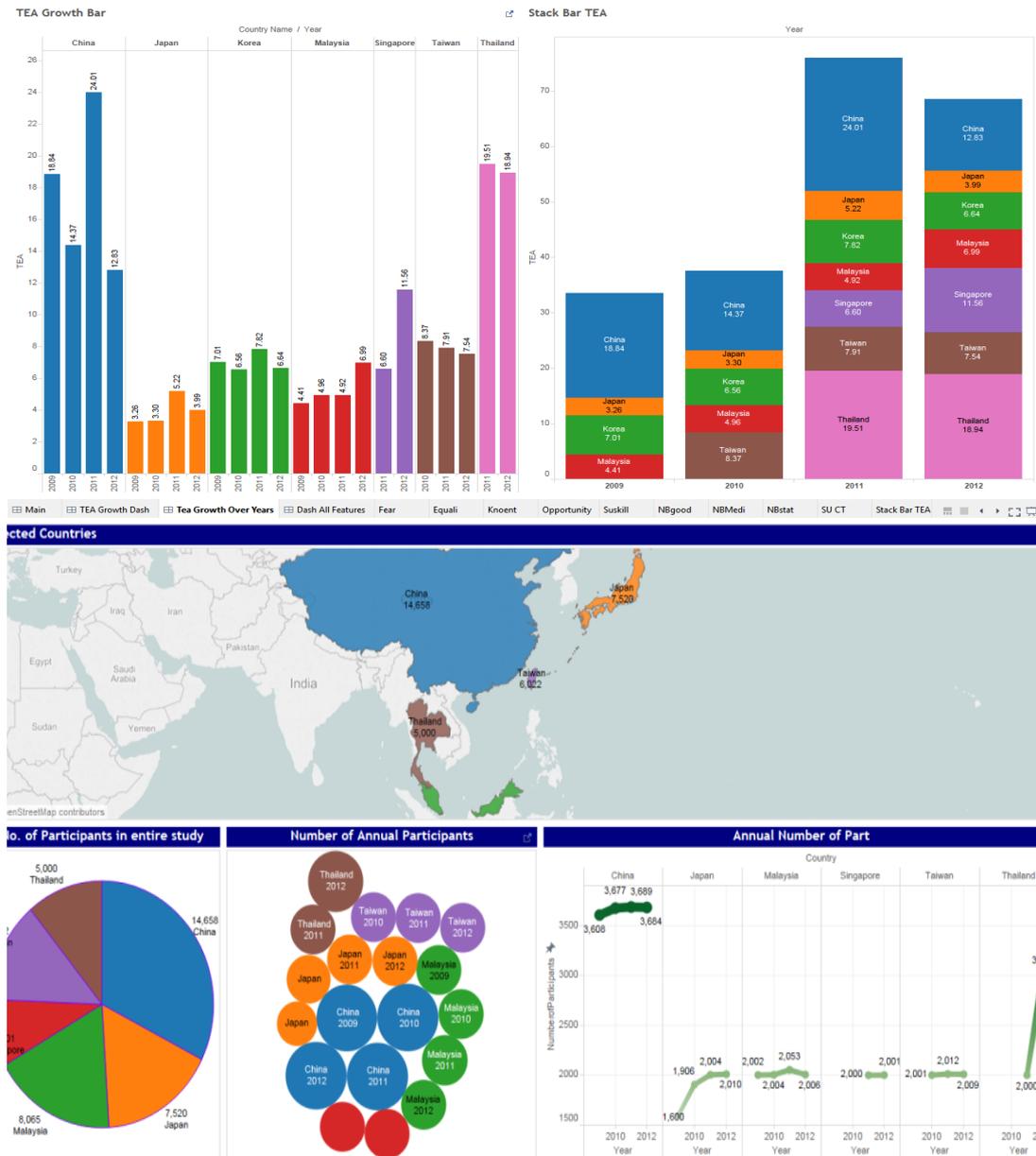
Figure 1   Big Data Visualization to Demonstrate the Malaysia Situation
(Source: GEM Adult Population Survey 2009 - 2012)

Malaysia is amongst the few economies in the Asia Pacific and South Asia region where finance and physical infrastructure to support entrepreneurship are widely available. However, despite such positive factors, the country's Total Early stage Entrepreneurial activity rate (TEA) is the second lowest in the region, with only Japan having a lower rate and this caused low performance consequently (Fig 1). The proportions of those intending to start a business, and of those with positive attitudes towards entrepreneurship, are also amongst the lowest in the region. Growth expectation is relatively low, with less than 7% of new businesses expecting to hire more than 20 workers. Close to 84% see themselves creating less than 5 jobs. The country has a forward-looking entrepreneur-friendly national policy. Indeed, the conditions for entrepreneurship in Malaysia match or better those found in other efficiency-driven (medium development) and even some innovation-driven (most developed) economies. However other factors such as bureaucracy and poor education and training have impeded entrepreneurial growth. The average entrepreneur in Malaysia is likely to be 35-44 years of age, more likely to be male than female, with an upper secondary level of education and a mid-range household income.

3 Research Methodology

3.1 GEM Research model GEM research methodology and sources

Being reminded of the objective, GEM adopts a full view of entrepreneurship and sheds light on the role of the individuals in the entrepreneurial process. As opposed to most entrepreneurship data sets that measure newer and smaller firms, GEM analyses the individual behavior when it comes to starting and managing a business. This sets the GEM data apart from other data sets, most of which are a record of the firm-level data on (new) firm registrations, as established in the GEM 2008 Global Executive Report. New firms are normally started by individuals. Even in established organizations, entrepreneurial attitudes, activities, and aspirations are not the same among individuals. Another guiding principle of the GEM research is that entrepreneurship is a process. Therefore, the GEM observes the actions of entrepreneurs who thrive at different stages of the process of creating and sustaining a business. For the GEM, the wage payment made to anybody for more than three months, is well regarded as the "birth event" of actual businesses. Individuals who actively supply resources to start a business that they expect to own themselves, but who have not achieved this "birth event" are termed nascent entrepreneurs. Those who presently own and manage a new business that has paid salaries for more than three months but not more than 42 months, are known as new business owner-managers. The cutoff point of 42 months has been made on the integration of theoretical and operational grounds. The emerging number of nascent entrepreneurs and new business owner-managers may be viewed as an indicator of early-stage entrepreneurial activity in a country. It depicts the dynamic new firm activity–the extent of experimentation in new business models by a national population. Established business owners usually own and manage their respective business that has been in operation for more than 42 months. Their businesses have survived the liability of newness. High rates of established business ownership may imply some positive conditions for firm survival. However, this may not have to be the case. If a country demonstrates a high degree of established entrepreneurship, coupled with low degree of early-stage entrepreneurial activity, there will be an indication of a low level of dynamism in the entrepreneurial activity. Last but not least, the GEM identifies individuals who have not continued a business in the last 12 months. These individuals may have to penetrate the entrepreneurial process again. The GEM 2009 Global Executive Report includes 54 countries all over the world. In each of these 54 countries, a survey was conducted among a representative sample comprising of not more than 2,000 adults. More than 180,000 adults went for an interview between May and October (outside holiday seasons) and answered questions on their attitudes toward, as well as their involvement in the entrepreneurial activity.

3.2 Data sources

The empirical data in this paper derive from the Malaysian reports of the GEM research program carried out in year 2009 until 2012. The data collection method consists of two main parts: the Adult Population Surveys (APS) and National Experts Survey (NES). The primary data source was collected through the national APS. The second data collection method is NES, a questionnaire that contains questions concerning the assessment of the situation with regard to the entrepreneurial framework conditions (EFCs). The NES was conducted through face-to-face interviews with experts. The national experts' survey is an important component of GEM as it provides insights into the entrepreneurial start-up environment. These experts come from government, universities and organization of venture investment. It is important to note that research findings about the total entrepreneurial activities, characteristics of entrepreneurs, and new business structure are based on the APS, whereas, in order to determine the

environment for entrepreneurship, the responses to NES are used. They grade entrepreneurial conditions according to GEM module. These grades lie from 1 to 5. Higher grade shows finer condition.

3.3 Principal component analysis (PCA)

The dimension of a huge data set can be trimmed down by using principal component analysis (PCA), which is considered as one of the most prevalent and useful statistical methods for uncovering the potential structure of a set of variables. This method is used for explaining the variance of a large set of interrelated variables by transforming them into a new, smaller set of uncorrelated (independent) variables, namely principal components (PCs). In other words, Principal component analysis (PCA) is a multivariate technique that analyzes a data table in which observations are described by several inter-correlated quantitative dependent variables. Its goal is to extract the important information from the table, to represent it as a set of new orthogonal variables called principal components, and to display the pattern of similarity of the observations and of the variables as points in maps.

4 Measures

The APS data document the behavior and characteristics of entrepreneurs and non-entrepreneurs. As such, the survey includes several items some of which parallels those used in other studies to measure the theory of planned behavior variables.
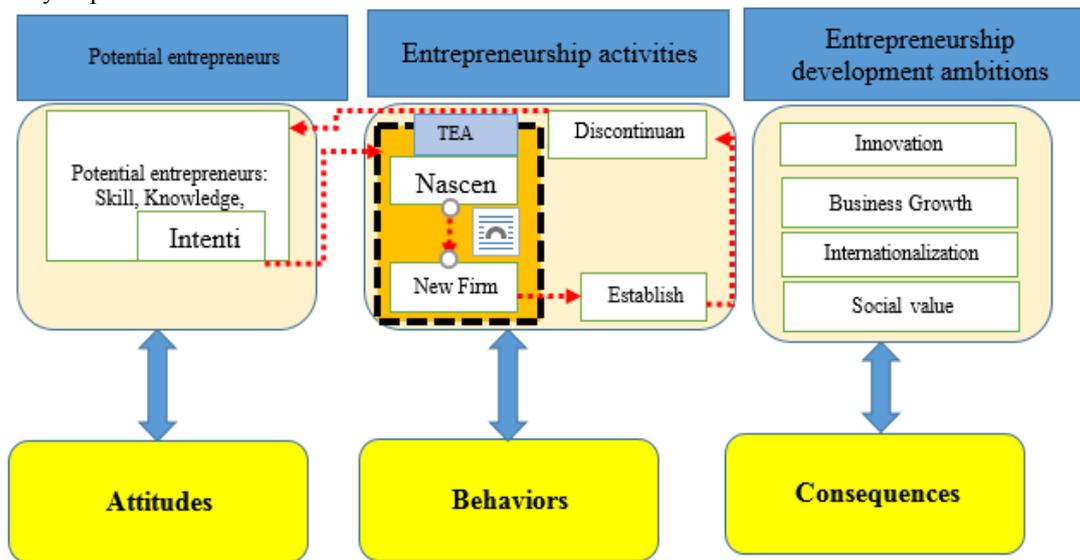
Figure 2　The Entrepreneurship Process and GEM Operational Definition

5 Result

A lot of studies have shown that entrepreneurship has been the primary driver for the economic progress of every nation. Entrepreneurship has played such a substantial role in creating innovation, diversity, enhancing the competitiveness, generating new ideas, creating employment opportunities, other than providing social adjustment and economic growth in industrialized and developing economies. Several scholars have illustrated the fact that entrepreneurship is both beneficial and crucial to achieve a healthy economy. In the Malaysian context, since the 1970s, small businesses begun by entrepreneurs had become a net creator of jobs, and wealth creation. (Quoted from Abdullah, M. A. H.,1999), in a developing country like Malaysia, entrepreneurial activities via small businesses creation serve as a mechanism to improve income distribution, to stimulate economic growth, and to give a new shape to the economic structure. In essence, entrepreneurship is important to the wellbeing of the Malaysian economy.

5.1 The indexes relevant to the entrepreneurial attitudes

1) Dependent variable:

Total Early-Stage Entrepreneurial Activity (% of 18-64 Adult Population) (TEA)

2) Independent variables:

Equalinc: In your country, most people would prefer that everyone had a similar standard of living.
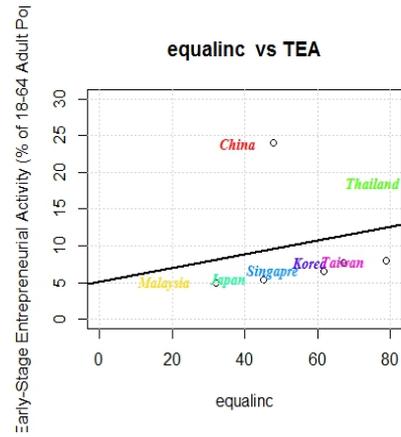
Figure 3   Percentage of the Respondents Who Would Prefer That Everyone Had a Similar Standard of Living

It can be said that individual would prefer that everyone had a similar standard of living will have positive attitude toward entrepreneurship. On the other hand, individuals who do not a similar standard of living have not the positive attitude starting entrepreneurship.

NBGOODC: In your country, most people consider starting a new business a desirable career choice.
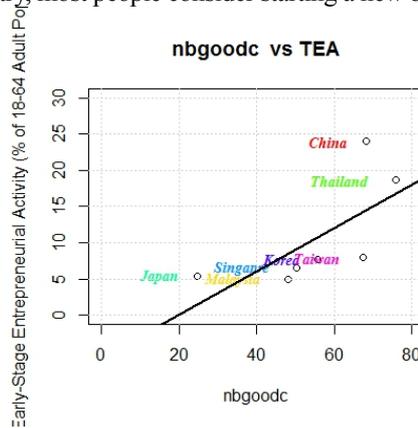
Figure 4   Percentage of the Respondents Who Consider Starting a New Business a Desirable Career Choice

It can be argued that individuals who consider starting a new business a desirable career choice and therefore a positive attitude toward entrepreneurship.

NBSTATUS: In your country, those successful at starting a new business have a high level of status and respect.
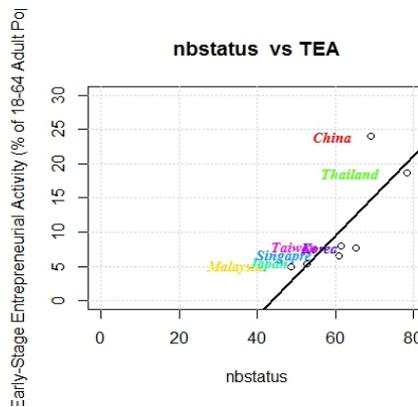
Figure 5   Percentage of the Respondents Who Those Successful at Starting a New Business Have a High Level of Status and Respect

It can also be argued that individuals who a high level of status and respect will be more interested in starting a business and therefore will have a positive attitude toward entrepreneurship.

NBMEDIA: In your country, you will often see stories in the public media about successful new businesses.
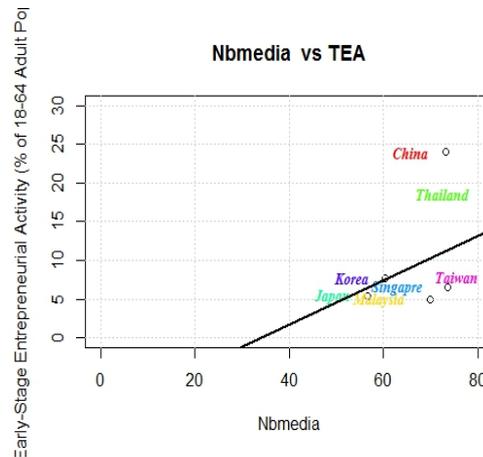
Figure 6   Percentage of the Respondents Who Have Often Seen Stories in the Public Media about Successful New Businesses

Additionally, it can be argue that individuals who have often seen stories in the public media about successful new businesses will have positive attitude toward entrepreneurship. On the other hand, individuals who have not often seen stories in the public media about successful new businesses will have not positive attitude toward entrepreneurship.

6 Conclusions

This paper constructs Big Data technologies to test and analyses the relationship between social norms indexes and TEA according to the conceptual model of GEM and Big Data technologies. Based on the data derived from GEM reports, we use Principal Component Analysis (PCA) to study the impacts of social norms on TEA empirically. The study is based on regional data derived from Malaysia entrepreneurship monitor research program. The social factors comprise equalinc, nbgoodc, nbstatus, and nbmedia that advance the integrality and typification of the study. To some extent, the analyses based on empirical data are also beneficial supplements to current researches. With respect to the statistical results, this paper reveals the relationship between social norm and TEA, and indicates the impacts of social norm on entrepreneurship. Meanwhile, Consideration of the various factors like demographic information for the entrepreneurial activity and their quantitative assessment remain to be discussed.

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The Co-Innovation Alliance Scan, Tool for Effective Collaboration with External Partners

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Abstract: In order to select and assess co-innovation partners, I have developed an integrative framework coined as the co-innovation alliance scan that consist of four 'fits' between alliance partners: a strategic, operation, relationship and network fit. Each fit contains three indicators, to be rated from 1 (unfavorable) to 5 (favorable). High rated indicators prognosticate success, low ones might hamper or impede successful co-innovation cooperation. Using the scan, I constructed a serious "alliance game" in order to develop competencies of (future) alliance managers.
Key words: Alliance management; Partner evaluation; Serious game

1 Introduction

The development and marketing of new products or services is becoming increasingly expensive, complex and uncertain. There are often multiple disciplines required while there is less time to recoup development costs (KPMG, 2012). Therefore, collaborating within (international) alliances and networks is increasingly important (Vanhaverbeke and Noorderhaven, 2001; Chesbrough, 2006). An inter-organizational network is a source of knowledge and learning, and network membership will lead to more information transfer and learning, a larger knowledge base or improved process and product innovation (Beckman and Haunschild, 2002; Caloghirou et al., 2003). Through networking with partners from diverse backgrounds, companies are able to gain from different points of view.

At the same time, inter-organizational cooperation is complex because within an alliance, partners cooperate and compete simultaneously, known as co-opetition (Brandenburger and Nalebuff 1996). Who will spend the time and money and who will benefit from the partnership? Who owns new jointly developed Intellectual Property (IP)? Does the new IP belong to your own company or your partner? Who will benefit from IP-royalties? Effective collaboration does not imply disclosing all IP to every partner in a network. Cooperating with external partners entails added complexities and risks. Even when potential synergies with partners are present, firms face substantial difficulties attaining them. In many cases, implementation of alliances will evolve problematically (Stel, 2011). Four aggregation levels interact often problematically during the implementation: the individual, team, as well as the organizational and network level. Successful implementation implies effective co-ordination of the activities on all four levels (Duysters et al., 2002; García-Valerrama and Mulero-Mendigorri, 2005).

2 The Co-Innovation Alliance Scan

In order to develop crucial alliance competencies and determine and discuss beforehand whether potential alliance partners fit well with your business, I have developed a 'co-innovation alliance scan'. The scan is building on existing alliance scans in use at companies[1] as well as the work of Cameron and Quinn, Denison and Mishra, Rosinski and Trompenaars. I tap from four theoretical domains: the network, contingency, organizational learning, and resource-based perspectives. I include aspects of networks, such as indirect/direct ties, and structural / personal ties, several 'fits' of compatibilities between alliance partners: strategic, operation, relationship and network fit. I focus on facilitating and blocking factors in competence development, on dynamic and combinative capabilities. I use key concepts of the organizational learning theory such as absorptive capacity, combinative capability, cognitive distance and the paradoxes of information and replication. I include facilitating factors and difficulties for organizational learning and competence development in co-innovation alliances (Gomes-Casseres, 1996; Madhok and Tallman, 1998).

I am following the methodology of Insights Learning & Development. This international psychometric assessment and training company has effectively brought into practice Carl Jung's theory on personality and behavioral styles. I have integrated task related and relationship related issues with issues of Introspection and Extraversion. When I combine all four elements, I am able to integrate in a partnership assessment tool organizational and relationship dynamics.

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[1] Philips (c.f.Bell et al, 2011; Bell, 2012) and Elly Lilly (Stach, 1996; Futrell et al., 2001).

Task-related aspects are for instance a strategic compatibility between partners (strategic fit) and the ease of operation (operational fit). Relationship issues are included because at implementation, people make the difference. Excellent entrepreneurs and their 'virtuoso' teams (cf. Boynton and Fisher, 2009) can make a success of mediocre strategies or products, though under-performing individuals or teams will definitely not win a competitive battle. When venture capitalists decide whether or not to take an equity stake in a new venture, they rely primarily on their judgment of the quality of the entrepreneur and his team. Only if they are to be trusted, will a business plan be considered. First the man, then the plan. Interpersonal relationships are important because without them, potential synergies from the alliance are likely to remain dormant, which could result in an underperforming alliance. I distinguish interpersonal aspects as trust, and commitment (personal fit) as well as network relationships (network fit), as is illustrated in Figure 1.
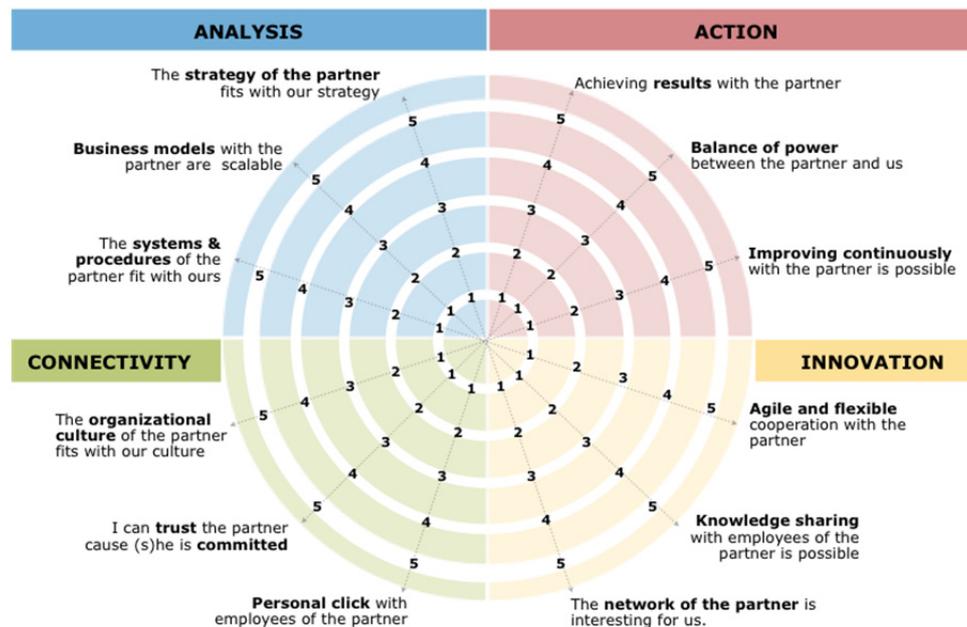
Figure 1   The Co-Innovation Alliance Scan

I will discuss the four elements of the co-innovation alliance scan: analysis, connectivity, innovation, and action.

3 Analysis (Strategic Fit)

In complex, uncertain and dynamic markets, it is impossible to make an estimate of the future. It is certainly not a continuation of the past. In an uncertain world, strategy and business planning cannot be considered purely as a step-by-step rational process based on stringent market and competitive analyses. The traditional analytical and deductive sequence is becoming obsolete. In this approach, known as "causation", firstly a strategy is defined. Based on this strategy, the expected results are defined. Actions are then implemented in order to fulfill the prescribed strategy.

Instead, a more flexible and pragmatic "effectuation" approach to strategy is necessary (Sarasvathi, 2001, 2008). This approach is means-oriented, based on experimentation, existing competences *and* cooperation with external partners. Strategy is much more adaptive instead of being defined beforehand. Learning based on trial-and error and forming alliances with external partners should play a part as well as analytical prediction. Do partners in the alliance –now and in the near future- share ambitions, strategic goals, and strategic approaches? Are the strategies of the partners compatible?

Finding a viable business model is not just a linear, analytical process based on fixed assumptions. Instead it requires iterative experimentation, talking to potential customers, trying new things, and continually making adjustments. As such, discovering a new business model is inherently risky, and is far more likely to fail than to succeed. Are the partners able and willing to take the risk of developing jointly new scalable business models? Do the systems and procedures facilitate and enable experimentation?

In the section "Analysis", I ask the following questions:

● Do the strategic goals and ambitions of the partners match with each other and the market?
● Are joint business models with partners scalable?
● Do the systems and procedures of partners match with each other?

4 Connectivity (Personal Fit)

Connectivity is becoming increasingly important; between businesses and the earth's resources, between ideals and operations, between partners in a network, or between leaders and followers within organizations. In order to make an impactful and lasting partnership, using both head and heart are relevant. When developing a lasting solution of global sustainability issues, both relationship dynamics as well as task related dynamics should be considered. If a company is able to communicate the purpose, cause or beliefs of a partnership properly and consistently, it will win the hearts and minds of both partners and stakeholders, which in itself will lead to greater loyalty as well as the necessary long-term commitment. From Simon Sinek's book "Start with the Why": "I follow those who lead, not because I have to, but because I want to. I follow those who lead not for them, but for ourselves (Sinek, 2009)." Are the values of the employees of the alliances partners connected?

In the section "Connectivity", I observe:
● Do the organizational cultures of the alliance partners match with each other?
● Can one expect trust and commitment between alliance partners?
● Do the alliance partners feel personally bonded to their counterparts in the alliance?

5 Innovation (Network Fit)

In order to implement international business opportunities, radical renewal will be necessary. Business-as-usual cannot bring us to sustainability or secure economic and social prosperity; these can only be achieved by radical change, starting now (World Council of Sustainable Business Development, 2010). Solving sustainability challenges should be beyond incremental change: it lies with systemic change and radical breakthrough innovation. Therefore, a main success factor is radical "thinking out of the box". In order to convert the huge sustainable challenges into business opportunities, an open and creative mindset is essential. This involves breaking out of the status quo in order to consider new possibilities, and exploring new as well as unusual combinations. To paraphrase a famous quote of Albert Einstein: "I cannot solve our sustainability problems using the same thinking as when I created them".

Some unique discovery skills or "Innovator's DNA" abilities are essential: associating, observing, questioning, and experimentation (Dyer et al. (2009). Associating is the ability to successfully connect seemingly unrelated questions, problems, or ideas from a wide range of disciplines. Associating involves observation carefully the activities of customers, suppliers, other companies, or environmental trends that suggest new ways of doing things. The ability of 'questioning' is important, challenging the status quo asking "Why?" and "Why not?" and "What if?" questions. A culture that fosters "experimentation" is relevant. Especially in the early stages of development, experimentation is a means of learning quickly because it allows timely and cost-effective adjusting of development projects (Ries, 2011; Blank, 2007). In order to implement international sustainable business in time, the ability to learn and adapt quickly. Like Darwin's adage, "it is not the strongest that will survive, but the most adaptable".

Learning is defined as "the ability to process knowledge through which the range of potential behaviors can be increased" (Huber, 1991: 89). Previous success complicates the learning of new practices. Because of their success in the past, companies tend to be less eager to change their practices. Often, they will over-value existing practices. As Keynes wrote in 1937, "The difficulty lies not in the new ideas, but in escaping from the old ones". This complacency is known as "corporate rigidity". The adage "never change a winning team" should be substituted by "change a winning team at the right moment". Unlearning obsolete practices is a vital - and often problematic - first phase in learning to adapt. Learning involves acquisition and the use of new knowledge by an organization (Kumar and Nti, 1998).

A firm's ability to value, assimilate, and utilize new external knowledge is known as absorptive capacity (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998). Absorptive capacity is considered to be an important source of competitive advantage (Ghoshal, 1987; Kale and Singh, 2007), which involves the identification, acquisition and use of new technologies[1]. Agility, i.e. a combination of speed and

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[1] Todorova and Durisin (2007) describe the following actions: identification of new technologies, making it

flexibility, is important for sustainable international business. Market conditions are changing faster and becoming more uncertain. In order to benefit from a smaller window of opportunity, sustainable companies should be agile, react quickly and flexibly. Several aspects of networks are relevant: size, diversity, interdependence, structure, intensity, as well as the position of partners within a network.

Therefore, at "innovation" I analyze the following questions:
● Can one expect agility flexibility within the co-innovation alliance?
● Is knowledge sharing and technology transfer possible between the alliance partners?
● Do the networks or ecosystems of the partners yield the alliance?

6 Action (Operational Fit)

Resilience – the capacity to recover quickly from difficulties - is indispensable for successful sustainable business because it involves the development and marketing of new products and services. Novelty brings with it unforeseen obstacles. You never know in advance which projects ultimately leads to new business. Results can often only be achieved after a little inspiration and a lot of perspiration. Half of the innovations in the world were a result of great insight, the other half happened by accident, and none of them happened on schedule (McNamee as cited in Estrin, 2009: 25). It is important to be aware of the potential hurdles, to be prepared to withstand unforeseen difficulties, to learn and re-focus. To achieve sustainable results, it is essential to strive to continuously improve the alliance, adapt and if needed -as Mullins and Komisar (2009) named their book- : "Get to plan B!". One must have the stamina to cope with setbacks and delays. The same applies to the relationship between alliance partners in development projects. The relationship should be resilient in order to withstand strain, conflict and unforeseen setbacks. Therefore, perseverance and resilience are indispensable.

In the section "Action", I consider:
● Can one expect to achieve sustainable results with the alliance?
● Can one expect a balance of power and control within the partnership?
● Are the proposed partners willing to continuously improve the partnership?

7 Conclusions

In interactive workshops, I have tested the alliance scan. The scan provides a nice overview of both the partner selection process as well as an estimate of future organizational and relationship dynamics of an alliance. I use the scan to train skills of future alliance managers and to optimize the search process for potential co-innovation partners. In workshops, based on the alliance scan, I discuss the impact of the four 'fits' of partner selection and partner cooperation. I identify paradoxes and balances in partner cooperation, the alignment of several critical items, and the feasibility of - e.g., technology transfer to and from partners, potential new business models and "dos and don'ts" of leading alliance teams.

I have developed a holistic scan – grounded in theory and practice. The scan deals with the complexity of implementing the alliance cooperation at four levels: the individual, team, organizational an inter-organizational level. Using Jung's theories that have been operationalized by Insights Learning & Development, I offer a shared language to diagnose, build, support, and intervene in alliances.

During alliance cooperation, the scan helps to determine which aspects are developing well or need adjustment. For instance, a looming imbalance of power between alliance partners can be discussed in order to prevent eroding trust and commitment. In order to improve agility of the alliance, certain systems or procedures can be put on the agenda in order to adapt. Strategic, personal, operation or network fit between the alliance partners contribute to alliance effectiveness, while decreasing fits may result in an increasing risk of underperformance or even premature ending of the partnership.

I would like to invite academics and practitioners who are dealing with co-innovation alliances to comment on the scan in order to improve the tool. In addition, I intend to cooperate with researchers in conducting jointly longitudinal case studies in order to study and develop alliance competencies.

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A Research on Scientific and Educational Integration Mode for Innovative Talents Training in Marketing Major of University

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Abstract: This paper analyzes the problems and shortcoming of innovative talents training in marketing major, and puts forward a concept of marketing professional and innovative talents training on the basis of integration of science and education, and constructs three kinds of innovative talent cultivation frameworks: the framework that based on "project as a link", the framework based on center or base, the framework for setting up "modular" teaching curriculum. Relying on these frameworks, universities can explore the mode of scientific and educational integration for innovative talents training in marketing major, in order to cultivate innovative talents in marketing major.
Key words: Marketing; Integration of science and education; Innovative talents

1 Introduction

Integration of science and education is a strong support for the sustainable development of colleges and universities, it is an important way to cultivate innovative talents and promote scientific and technological innovation in China. The so-called integration of science and education that keeps innovative talents training on premise makes the scientific research and teaching permeate each other, and it has deeper meaning about what we widely advocated that the combination of scientific research and teaching. The integration of science and education that we advocate, do not stay in the form of combination and superposition, and must be placed on the top of rich and varied understanding of contemporary scientific research and teaching. By doing so, we can understand that the integration of science and education has deep meaning, as shown below.

The integration of science and education is based on the consistent understanding of scientific research and teaching(Wang Zhijun,2013;Jon Kolko,2012), which makes the scientific research and teaching permeate each other and form a new innovative talents training path[1]. The benefits of mutual penetration are reflected in two aspects: on the one hand, research can improve teachers' teaching quality and academic level, enrich and renew the teaching content, it can also help students to understand and get familiar with the method and the process of the study, then change the simplicity of teaching. On the other hand, teaching is a research process of the arrangement and reflection of teaching content, which is helpful to scientific discoveries of systematic and theoretical, and it also help scientific researchers to update their knowledge systematic, and can promote the teacher's ability and level of scientific research (Tang Shuyan ,2015).

The integration of science and education is based on the diversity understanding of scientific research activities (Qiu Dan ,2015). It is the extension of the connotation of scientific research and teaching. In a sense, the boundary between research and teaching is no longer clear. University teaching is in the field of research (Zhou Guangli, Ma Haiquan ,2012), and scientific research play a supporting and leading role during the development of university, that is to say, university achieve the purpose of education in the process of scientific research (Wu Dexing ,2014). But at present, there is a phenomenon of conflict and separation between research and teaching, and scientific research is narrow in teaching (Li Yuhuan,2015). Specifically, Chinese universities are generally divided into two kinds, one is the research university, heavy research; the other is the applied university, heavy teaching (Zhao Zhi ,2014). This phenomenon is contrary to the concept of coexistence of research and teaching in university.

The integration of science and education is aimed at developing the students' creativity and their initiative (Ma Longhai, Lan Baoiang ,2012). Although there are many scholars researching on the implementation of the integration of science and education as the entry point. Such as scholar Burton Clark believes that "scientific research is an important form for teaching and a valuable way for learning", namely "teaching and learning based on research", which is an important way for modern

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higher education to realize the integration of science and education (Burton R Clark,1997). Haley promotes the students' inquiry learning as the goal, and design four courses that embodies integration of teaching and research (M Healy,2005). Blue puts forward the construction of "inclusive scholarly knowledge-building communities", as the core for this new integration mode's operation (Brew A ,2012). But the above researches want to get a breakthrough in the reform of teaching, they do not carry out the research from the students' individual or group initiative, creativity and innovation.

2 Teaching Purpose and Idea that Based on the Integration of Science and Education to Cultivate Innovative Talent in Marketing Major

2.1 The purpose of teaching that based on the integration of science and education

Combined with the needs of the state and society, and the training objectives of higher education that proposed by Ministry of Education, as well as the background that innovative talents training in marketing major, college marketing major's teaching that based on the integration of science and education has its specific purpose.

1) To perfect the course system of marketing major in Colleges and universities, and to improve the students' ability of innovation

Under the joint efforts of school, the teacher and the students, integration of science and education makes marketing professional curriculum system more perfect, and it is conducive for marketing major to form the ecological chain of discipline, major and teaching; it is conducive to change the marketing professional current unhealthy tendencies that is often said "paid more attention on research, and less on teaching";well, it is also conducive to make teacher devote themselves into teaching, by doing so, it lays a good foundation for the marketing professional innovative talents training. Finally, in the whole society, we can build a large-scale, multi-level, multi-field innovation talents training system of marketing major, and improve the student's innovation ability.

2) To improve students' basic knowledge and enrich their professional knowledge

For the marketing major in Colleges and universities, the integration of science and education makes the scientific research and teaching permeate each other and form a new innovative talents training path. On the one hand, students can concentrate on their study to learn professional knowledge; on the other hand, student can improve their scientific research ability and enrich their professional knowledge, and this can be realized when student conduct market research, analysis the research under the guidance of the teacher.

3) To enrich students' practical experience and improve their practical ability

Nowadays, many college graduates only have theoretical knowledge but lack of practical ability in the work, they are often called "high marks but poor competence". If the university education focus on training the students' ability of innovation and practice, lets the student participate in the activities of scientific research and develops their scientific research ability and practice ability, they would make progress rapidly in practice, master more theoretical knowledge. By doing so, it will be easy for students to accept new things, learn new skills, then, it will improve the competitiveness of students in a great extent and meet the social needs for talents. Based on the integration of science and education, colleges and universities carry out systematic practice teaching for the students of marketing major and cultivate their scientific research ability and practical ability. That makes the students majoring in marketing adapt to the working environment quickly and has a strong ability to innovate, to satisfy the demand of the jobs.

2.2 The idea of teaching that based on the integration of science and education

1) Strengthening the people-oriented teaching idea

Students are the principal part of learning, and schools are existed because of the students, so school's education activities should take the students as the center. On one hand, education should meet the needs of the social economic development, on the other hand, it should pay attention to students' demand of success. Therefore, in the science and education integration teaching process of cultivating creative talents of marketing major, it's necessary to improve the students' subject status, which is one of the important embodiment to insist and implement the scientific outlook on development, meanwhile it is the modern education request. From the perspective of education consumption, the students are the main body of education consumption, so schools should pay full attention to maintenance the marketing major colleges to entitle the legal rights to be educated, to participate and to choose in the process of education, and give full guarantee to cultivate their independent consciousness, improve their innovation ability in the education management system.

2) To promote the education idea of democracy and equality between teachers and students

Creating a good democratic environment and establishing a new type of relationship between teachers and students is an important condition for the intelligence development of students. The traditional idea of teaching formed a single teaching environment, which restrain the enthusiasm and initiative of the students. Modern education regards students as the main body, and pay attention to the equality between teachers and students, which encourage students to think, to speak, to express their views that is different from teachers. Guiding students to think problems, to research and solve problems positively in a timely manner makes bilateral interactive effect get fully reflected. The integration of science and education in marketing major can make a more harmonious relationship between the teachers and students: teacher try their best to teach, students are happy to learn. A teaching environment of equality, freedom, happiness, will greatly stimulate the learning enthusiasm of students and improve their innovation ability.

3) Strengthening the idea of individualized education

To make every student become the professional talent, colleges and universities must take measures that based on the truth, they should offer different training models for different groups of students, such as the classification of teaching, stratified teaching. The implementation of science and education integration give more chance to students, on the one hand, it provides a good scientific research platform for the students who have better scientific research ability; on the other hand, it provides the practice opportunity for the students and enriches their experience. Eventually, it makes the marketing professional graduates have a strong ability to innovate, so that they can meet the needs for innovative talents in society.

3 The Framework of the Scientific and Educational Integration Model for Innovative Talents Training in Marketing Major

3.1 The idea of framework that based on "project as a link"

1) The connotation of innovative talents training based on "project as a link"

The basic connotation marketing professional innovative talents training mode based on "project as a link" is that teachers of marketing major in colleges select scientific project and design project around the goal of training innovative talent. Project drives the implementation of the selection of teaching content and the teaching process, which enables students improve their practical ability and enhance their ability of explore the unknown field during the completion process of the project. By doing so, they can achieve objectives and requirements of innovative talents training in marketing major and enhance the innovation ability of students.

2) The practical significance of innovative talents training based on "project as a link".

Project is the core elements of innovative talents cultivation, which runs through the whole process of innovative talents training. Students can train skills, learn skills, cultivate ability, and enhance the professional quality during the implementation of the project.

Prominent feature of innovative talents training mode based on "Project as a link "is that teaching will be fully integrated with project and project drive the whole process of innovative personnel training, which is conducive to improve the effectiveness and pertinence of teaching. For marketing professional students, if teachers integrate the school education and scientific research, not only can improve the students' theoretical knowledge, but also students can use their knowledge that acquired from project to help enterprises and society. In a word, this mode can realize "zero distance contact" between students and enterprises, social and greatly improve their literacy of marketing aspects, truly achieve the educational idea that take the demand of innovative talents in colleges and universities education as the purpose, take the employment as the guidance, and the combination of production, education, research.

3) The basic framework of innovative talents training based on "project as a link"

Innovative talents training mode that based on "project as a link" in marketing major take teaching objectives as a starting point, shape the professional ability as the core, and make the "project" as the carrier, in order to make "project" drive the choice of teaching content, promote the implementation of the teaching process, promote teaching evaluation reform, drive school enterprise cooperation. Project driven marketing professional and innovative talents training process so that education goals can realize when the marketing professional students in the process of learning and the completion of the project. The specific basic framework as shown in Figure 1.
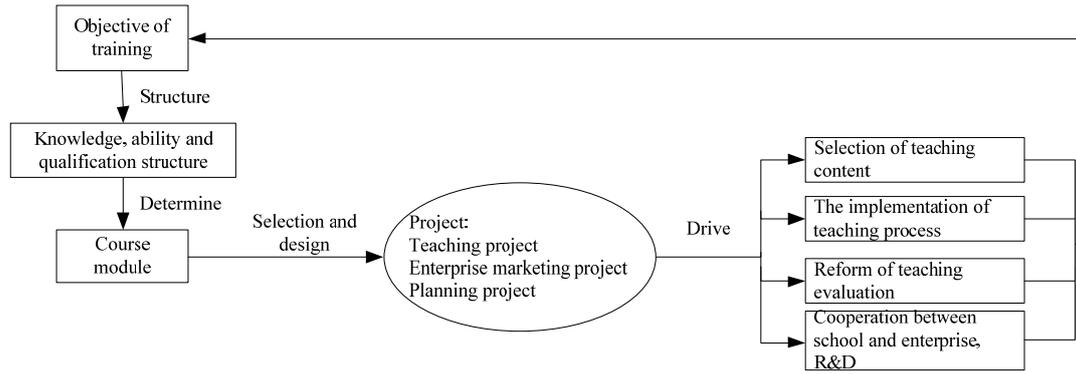
Figure 1   The Basic Framework of Innovative Talent Training Based on "Project as a Link"

3.2 The idea of framework based on center or base

1) The connotations of the creative-talents cultivation based on center or base

With respect to universities marketing professionals, in order to develop more innovative marketing professional personnel, firstly, based on center or base, analyzing the actual situation of the existing personnel training, and then develop training target according to the actual situation and the needs of society for scientific and rational talent. With the talent training centers or bases, marketing professional students can practice, freely discuss, what's more, timely to explore, discover problems and then solve the problems through scientific and reasonable way, which will provide a platform to show their talents. Through that platform, the students can be performed both in-campus and off-campus practical training to get a good workout. As a result, the objectives to develop the marketing professional innovative personnel and to enhance students' creativity will be achieved.

2) The framework of innovative talent training based on center and base
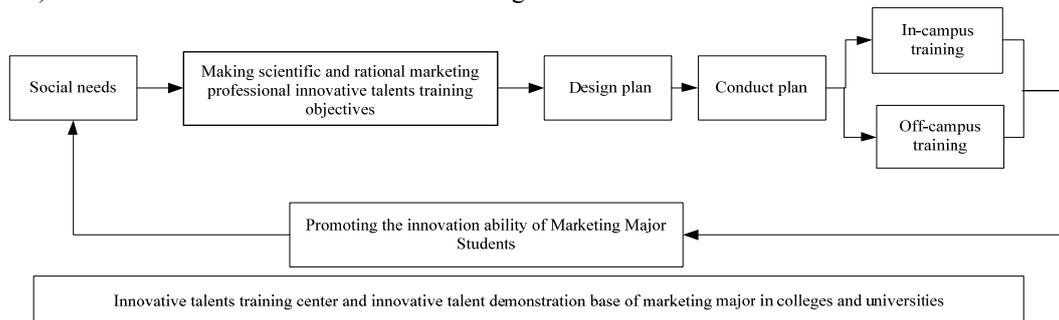
Figure 2   The Framework of Innovation Talents Training Based on Innovation Talents Training Center or the Base in Marketing Major

In order to meet the needs of the society for creative marketing personnel, colleges and universities can alone or corporate with the relevant enterprises to establish marketing professional and innovative talents training center or demonstration base of innovative talents. Taking "talent training center" or "talent demonstration base" as a platform, students of marketing major in colleges and universities would have a talent show stage. According to the needs of society, we can establish training target, and build platforms to design scientific and rational plan for training innovative marketing talents in detail. On the one hand, "talent training center" or "talent demonstration base " provide a practical training opportunity for marketing professional students, make students to exercise their marketing thinking in the simulation environment, advance the true feelings of the marketing environment of society; on the other hand, it can cooperate with enterprises to organize the practice for students, let the students complete the sales task personally, and temper their willpower, cultivate innovative marketing thinking in the changeable market environment. Finally, through in-campus and off-campus practical talents training, it improves students' innovative ability and meets the social marketing professional demand for innovative talents.

3.3 The idea of framework for setting up "modular" teaching curriculum

1) The connotation of "modular" teaching mode

"Modular" is a complex system, it can be decomposed into some semi-autonomous subsystems according to certain rules, and then these semi-autonomous subsystems can integrate into a more complex system process. We called these semi-autonomous subsystems "modules". The modular teaching mode is a set of teaching system in which the teaching content is designed according to the idea and principle of the program, it is under the guidance of established training objectives tode compose all teaching content according to a certain standard or rules. That makes it become a relatively independent teaching module, and each module can be selected according to a certain rule to recombine. Students can choose modules according to their own interests and professional orientation, in order to achieve different goals, by doing so, college or university can achieve the intended course teaching objectives and practical requirements

2) The idea of the construction for setting up "modular" teaching curriculum in marketing major

In specialized course teaching process, modular teaching mode help to cultivate students' solid foundation of knowledge and basic theory of generous and solid professional skills. After that, the basic requirements that students must have wide caliber, thick foundation, high quality can be realized, and their innovative spirit and innovation ability can be improved, the innovative talents training teaching objective of marketing major in colleges and universities can be achieved. Taken the purpose that we cultivate innovative talents who have wide caliber, thick foundation and high quality in marketing major into consideration, the marketing professional course is divided into three parts: general module, personalized module, practice module, as shown in Figure 3.
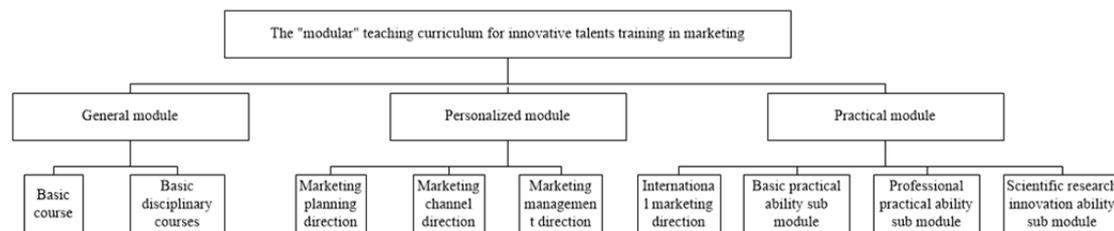
Figure 3   The "Modular"Teaching Curriculum Design for Innovation Talents in Marketing Major

① General module. General module mainly consists of two parts courses including basic courses and basic disciplinary courses. The main purpose is to cultivate students "broad caliber", cultivate their basic labor ability, learning ability, thinking ability, expression ability, communication ability and the basic self-control ability, help them establish the correct values, so that they can adapt to the social environment and lay a foundation for their further study and growth. The basic courses including ideological and political, military history, legal basis, English, computer, sports and so on, these courses help them strengthen their personality shaping; the basic disciplinary courses is about the professional course of the marketing, this course help students learn professional skills.

② Personalized module. The design principle of personalized module is: under the unity of the training objectives, students are given greater freedom of choice that they can choose practice according to their expertise and interest, which contribute to the individual initiative. Specific to marketing major, personalized module focuses on cultivating students' basic skills and ability of professional and technical work, training students' understanding and analysis ability of the practical problems with the use of professional theory, and training students' actual operation ability of study and work in society. Specific can be subdivided into: marketing planning direction, marketing channel direction, marketing management direction, international marketing direction, etc.

③ Practical module. This module is designed for the practice of marketing major, which is composed of three parts: basic practical ability sub module, professional practical ability sub module and scientific research innovation ability sub module. The basic practical ability sub module establish the course of practical teaching in the teaching process, including professional practice in English and computer skills training; professional practice ability sub module is an important link to cultivate and train the students to observe the society, to understand the society and to improve the students' ability to analyze and solve the problems with the combination of marketing theory and professional knowledge; scientific research innovation ability sub module aims to cultivate students' innovation ability, and improve students' scientific research ability in marketing major.

After the study of three modules, it will greatly improve the innovation ability of marketing professional students, and can make it better meet the needs of the community for innovative talents.

4 Conclusions

Through the literature review of the relevant theories of the integration of science and education and current research situation of China, this paper combines integration of science and education and innovative talents training in marketing major, and constructs three kinds of innovative talent cultivation framework: the framework that based on "project as a link", the framework based on center or base, the framework for setting up "modular" teaching curriculum. These theoretical frameworks have a certain reference value for China's colleges and universities, and make contribution to the construction of marketing disciines.

Acknowledgement

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Study on the Focus Strategy of Small to Medium Enterprise & Start-up Companies in the Semiconductor Manufacturing Industry Case Study of Minimal Fab

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Abstract: We have made a hypothesis verification of the focus strategy with the case study of Minimal Fab, that is a new concept of the National Institute of Advanced Industrial Sconce and Technology (AIST) in Japan, when Small to Medium Enterprise & Start-up companies entry into the semiconductor manufacturing industry. We have used a framework of ecosystem as a verification method. It was found that as a focus strategy: their technology development strategy should not follow ITRS, they should have variety & variable production systems which perform short delivery time and low cost and their product category should be a low-end semiconductor device under constrain conditions that the ecosystem is needed and they have Absorptive Capacity,
Key words: Semiconductor manufacturing; Innovation; Minimal fab; Ecosystem

1 Introduction

In the 1990`s, Japan's semiconductor device manufacturing companies accounted for more than half of the world's semiconductor top 10 companies and they occupied more than 50% of the world market. According to the World Semiconductor Trade Statistics, they accounted for 24% of the world market share, even bursting of the IT bubble in 2001. However, they lost market share every year. In 2013, it became 11%, and it was a half of the bursting of the IT bubble.

Currently the semiconductor device manufacturing is progressing oligopoly in Intel Corporation, TSMC and Samsung Electronics. The semiconductor industry has been conducting research and development in accordance with ITRS (International Technology Roadmap for Semiconductors), which has been referred to as the "Wish Map" (Kameyama, 2010) of leading semiconductor device manufacturing companies. How can SME (Small to Medium Enterprise) & Start-up companies cause innovation if they follow the ITRS? Additionally, the maturity of the industry means that even if innovation does happen; whether it is the segregation of existing major semiconductor related companies, how can it be used? SME & Start-up companies have limited resources. Also, even if large companies have a lot of resources, the success probability of business is increased by the focus strategy to focus their resources on the specific technology development and product area (Matsuda & Suzuki, 2010). Based on these, we would like to issue our research question as follows: "When SME & Start-up companies try to enter the semiconductor manufacturing industry, which has such characteristics and issues, what kind of strategy can they enter the semiconductor industry in if they focus it?"

Miyake (2015) described a hypothesis and constraint conditions of the focus strategy as follows:
The hypotheses are,
a. Process innovation isn't to follow ITRS.
b. The process innovation that is an increment innovation that a short delivery time and low cost are enabled.
c. The product domain is a low-end semiconductor device.
d. The production method is a variation & variable production system.
The constraint conditions are,
a. An ecosystem should exist.
b. The SME & Start-up company should have Absorptive Capacity.

We conduct verification of these hypotheses by a case study, and we intend to show a constraint condition necessary to carry out the focus strategy when SME & Start-up companies go into the semiconductor manufacturing industry.

2 The Framework of This Study

Adner & Kapoor (2010) showed the general scheme of the business ecosystem as shown in Figure

1.1. It is composed of the following companies: Complements Company that complements innovation of the customer for value creation, the Focal Firm which becomes factors of the customer's innovation and the Components Company which supplies a component to the Focal Firm.
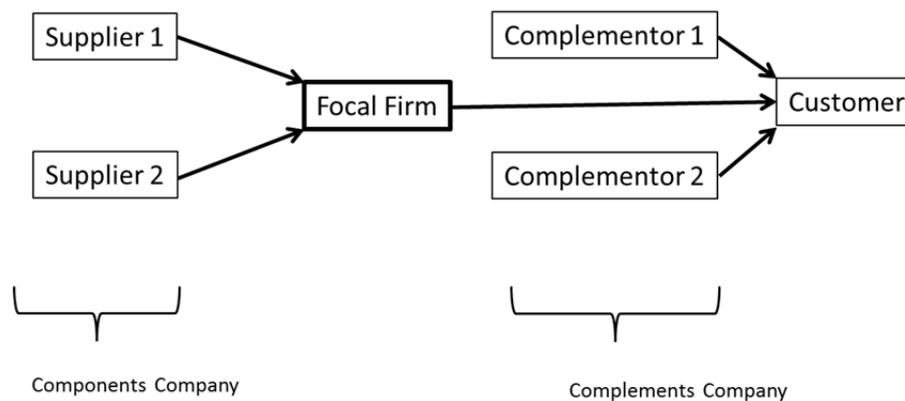
Figure 1   The Generic Schema of Business Ecosystem (Adner & Kapoor, 2010)

Adner & Kapoor (2006) showed the ecosystem of the lithography equipment in the minute processing process of the semiconductor production system like Figure 2 as an example using the framework of Figure 1. The success of innovation of the exposure manufacturer, which is the Focal Firm, dependent on the outcome of Components Company such as lens manufacturers and lamp manufacturers, which   develop a component for part of the equipment. In addition, semiconductor device manufacturer, which is a customer of the Focal Firm, cannot produce leading-edge semiconductor devices by the exposure equipment alone, even if the innovation of the exposure equipment succeeded. Also, the semiconductor device manufacturer is affected by the results of the Complements Companies, which supplies materials such as photo mask and photo resist. In this way, Adner & Kapoor (2006) analyzed the impact of challenges of Components Companies and Complements Companies relate to the Focal Firm.

In the semiconductor manufacturing process, the primary equipment is not only the exposure. There are semiconductor manufacturers in need of more than 100 kinds of manufacturing equipment. Therefore, as a framework of the ecosystem in this study, we apply Figure 2 of Adner & Kapoor (2006) to all semiconductor production equipment as an analogy.

Furthermore, we adopt the following framework for the ecosystem generation that were described in three points by Adner (2012):

a. Co-innovation risk

The risk is that the success of the innovation of oneself depends on the success of the innovation of other companies.

For example, leading-edge semiconductor device production, such as resolution, in the ten nanometer range is needed for the innovation of exposure equipment makers. An example is the liquid immersion technology.

b. Adoption chain risk

The risk is that the intermediary who offers the value to the end user, accepts the value before the end user evaluates it.

For example, when a semiconductor device manufacturer develops a leading-edge semiconductor device, the general consumers, who are an end user, cannot evaluate the device if a set makers does not implement the device in products such as a smart phone.

c. Value blueprint

This represents an overall picture that shows the connection of the partners that make up the ecosystem. In addition, we show the degree of connection with each partner using the familiar color of the traffic signal.   The green signal is strongly connected. The yellow signal has a weak connection. The red signal is not connected.

For example, the ecosystem is not formed if we cannot draw the perspective with the connection similar to the food chain ecosystem.
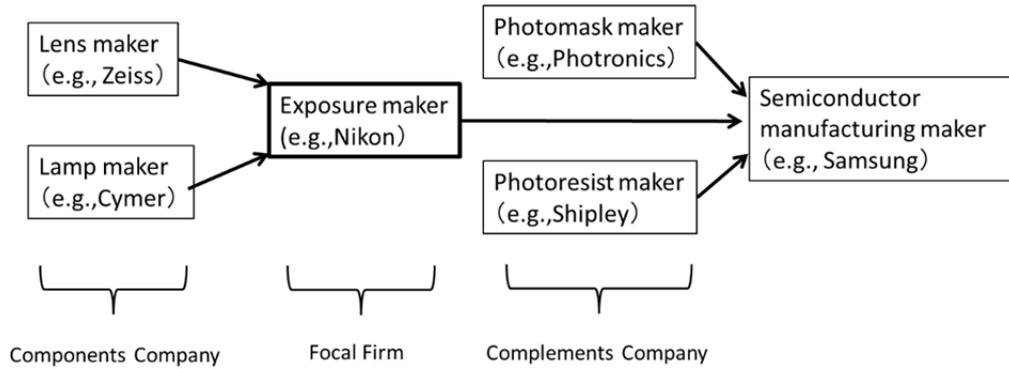
Figure 2   The Ecosystem of Semiconductor Lithography Equipment (Adner and Kapoor, 2006)

3 Framework Analysis of Existing Semiconductor Production System

We apply the ecosystem of semiconductor lithography equipment (Figure 2) to all process, e.g. diffusion process, thin film process, for semiconductor device production. This includes Focal Firm, Components Company such as a valve, a pump and Complements Company such as a semiconductor design tool, photo mask, gas, and chemical (Figure 3).

The dashed line shows the association between ITRS. The major semiconductor device manufacturers such as Intel, which are the demand side, presents the time frame when the technology is necessary for the supply side, such as Components Company, Focal Firm and Complements Company, in the necessary technology according to the product road map of the major semiconductor device manufacturers using ITRS.
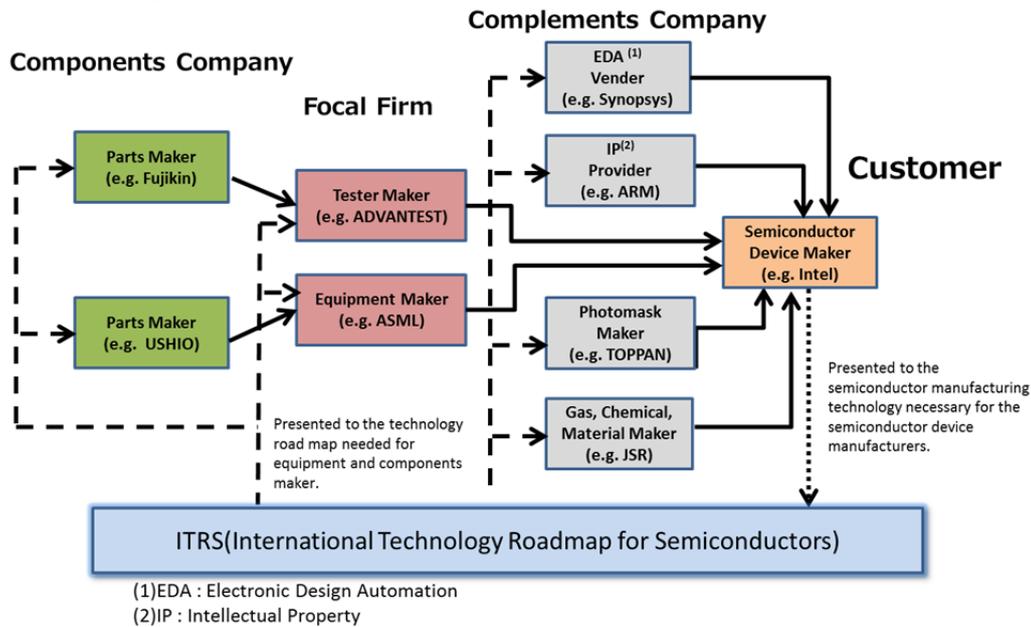
Figure 3   The Ecosystem of Existing Semiconductor Production System

Therefore, the success of its own innovation (Adner, 2012), is co-innovation risk that depends on the success of other companies on innovation has become very low by ITRS. Furthermore, the adoption chain risk has also become very low because ITRS is equipment and components in accordance with the Wish Map of leading semiconductor device manufacturer.

We show the value blueprint indicating the connection with the partner constituting the ecosystem in Figure 4. The dashed line shows connection with ITRS. This is the technology road map in accordance with the product roadmap of leading semiconductor device manufacturer. Therefore, products of Focal Firm, Components Company and Complements Company, related to semiconductor manufacturing, are always purchased. Thus, Focal Firm, Components Company and Complements

Company in the value blueprint are connected to the semiconductor device manufacturer as shown by the solid line. Therefore, between the Focal Firm and Component Company, semiconductor device manufacturer and Complements Company, Focal Firm, become all green signals.

As circulating ecosystem, we think that the huge ecosystem has been built on a global scale by ITRS.

In the next chapter, we will perform a Minimal Fab case study, and indicate that a new ecosystem that has a different value network with the ecosystem of existing semiconductor device manufacturing has been established. Thereby we will verify that the focus strategy hypothesis is implementing.
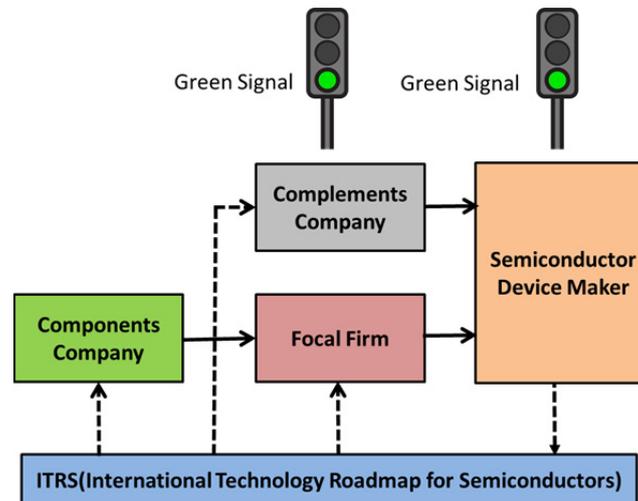
Figure 4   The Value Blueprint of Existing Semiconductor Production System

4 Minimal Fab
4.1 What is Minimal Fab

The semiconductor device production industry becomes the oligopoly, and initial investment has reached more than 5 billion US dollars. Furthermore, there is great waste in existing semiconductor production systems as shown in Figure 5. For example, a complex circuit is designed by a semiconductor design miniaturization. Design verification cost accounts for 90% of the total design cost. There are multifunctional manufacturing equipment. So, software debugging cost account for 70-80% of the equipment manufacturing cost. Fab has waste that the utilization rate of the manufacturing equipment, that price is in the tens of millions US dollars. This means clearly that the utilization rate is low. Additionally, Fab has a mixed production of producing more than 500 kinds of semiconductor devices. Plus, Fab has waste that small amount needed semiconductor device, that is mounted on a satellite, is used only 1-10%. The residual is discarded because the minimum unit of production of semiconductor devices is from hundreds to thousands.

Fab System Research Consortium, which is organized by AIST, proposed a variety & variable production system that is called Minimal Fab (Hara, et al., 2011) as a way to solve this problem. This is contrary to the larger diameter wafer on ITRS, as shown in Figure 6, by using the diameter 12.5mm wafer is 1/1000 area compared to the diameter 300mm wafers in existing Fab, the width of the manufacturing apparatus is 0.294m from existing of about 2m, in addition, clean rooms and clean suits also are eliminated by developing a wafer transport container that is a minimal shuttle and PLAD(Particle Lock Air-tight Docking), that are the local cleaning front chamber system to simultaneously shut out the fine particles and gas molecules, therefore, the goal of capital expenditures of semiconductor factory has been 5million US dollars, that is 1/1000, compare to the existing system.

In existing semiconductor manufacturing systems, equipment contour and size vary in differently from small to large by the manufacturing process. In Minimal Fab, the housing that has been unified as a consensus standard, it is 294 x 450 x 1440mm (Figure 7, Figure 8). In addition, they have performed a standardization of the transport system, wafer and the factory system, further, it has also carried out intellectual property and branding.
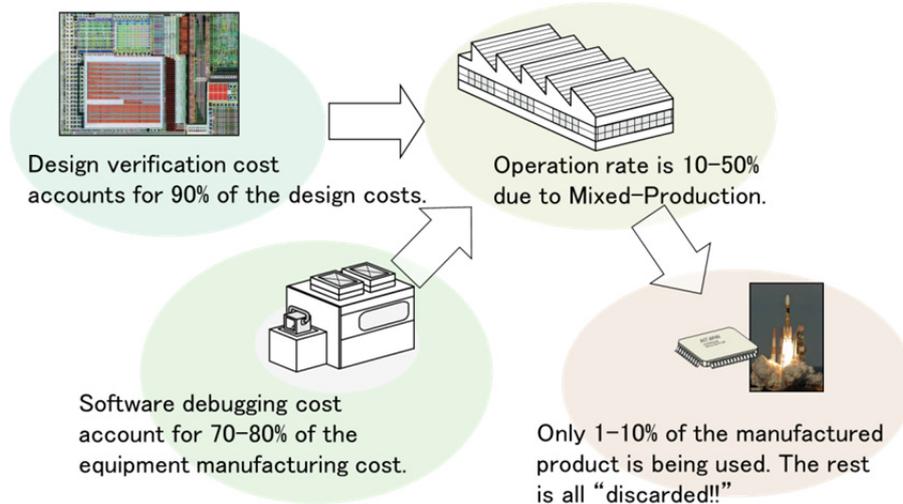
Figure 5   Great Waste Produced in Existing Supply Chain (Hara, 2012)

Figure 6   Minimal Fab (Kubouchi & Hara, 2012)

Figure 7   Minimal Equipment
(Hara, et al., 2013)

Figure 8   Minimal Fab by Fab System Research Consortium

4.2 The framework analysis of Minimal Fab

We have conducted the analysis of the Minimal Fab as shown in Figure 9, based on the framework analysis of the existing semiconductor production system was carried out in chapter 3. The member companies of Fab System Research Consortium consist of Components Companies, Focal Firms, Complements Companies and the semiconductor manufacturing makers, which are the customers of Minimal Fab, as well as the ecosystem of existing semiconductor production systems (Figure 3). As an alternative to ITRS, AIST is presenting a Minimal Fab development roadmap (Kubouchi & Hara, 2015). The dashed line indicates the relations. As with existing, the co-innovation risk has become very low. However, Minimal Fab development roadmap of AIST isn't in accordance with the Wish Map of semiconductor device manufacturers. Hence, we think that Minimal Fab will be difficult to be adopted by existing semiconductor device manufacturers. Accordingly, Minimal Fab has adoption chain risks.

We show the Value blueprint that is indicating the connection with each partner of Minimal Fab in Figure 10. As for the difference with existing production systems (Figure 3), adoption chain risk of the existing semiconductor device manufacturer has become yellow signal. We think that the entry barrier of Mimimal Fab is relatively high, because the semiconductor device manufacturers have customized their production system for their semiconductor device manufacturing. For example, the automotive semiconductor device, if the semiconductor device manufacturer has changed all of the production systems, such as manufacturing equipment and material, to Mimimal Fab, it is necessary to take a product authorized examination of the automobile manufacturer again.
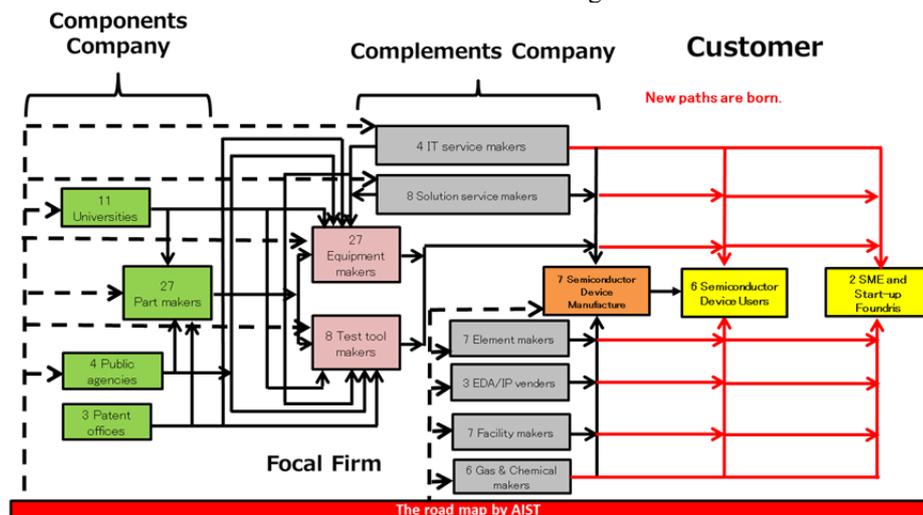
Figure 9   The Ecosystem of Minimal Fab

However, the value network is replaced from the mass production system of existing Fab to the variety & variable production system of Minimal Fab. This system does not need a large amount of capital investment. Thus, the user companies in semiconductor device manufactures have become able

to produce their own semiconductor devices by Minimal Fab. Therefore, the new connections, that are from Focal Firms and Complements Companies to semiconductor device user companies, are born. It is never seen in the existing value network. In fact, The first customer who purchased Minimal Fab is not a semiconductor device manufacturer but JTEKT which is automotive-related company. Moreover, SME & Start-up companies have started a foundry service (Nihon Keizai Shimbun morning edition, 10/20/2014) due to the low barrier to semiconductor manufacturing by Minimal Fab. In other words, these companies have forged a new path to complement the adoption chain risk of the existing semiconductor device manufacturers (Figure 9, Figure 10).

We think that Minimal Fab, which was completed in March 2015 by the national project,　is the incunabula of the new ecosystem showing to Figure 9 with the value network by the variety & variable production that is different from the existing system.
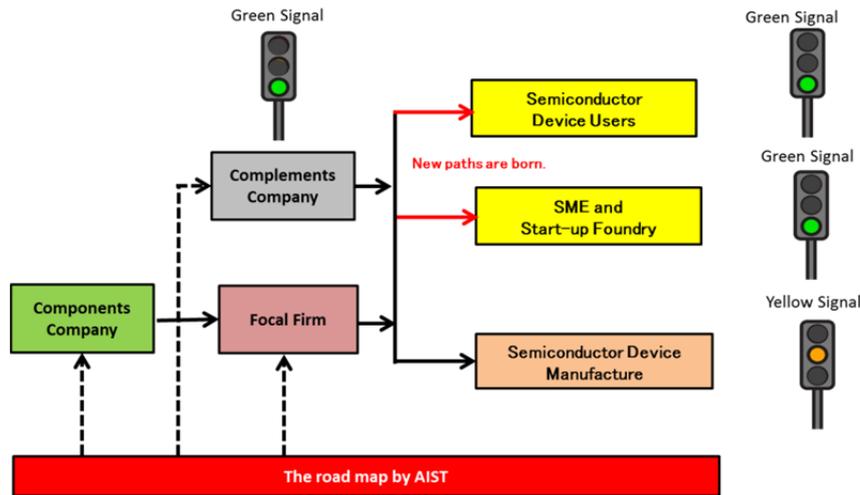
Figure 10   The Value Blueprint of Minimal Fab

5 Discussion

This study is based on the ecosystem by the hypothesis with constraints, we have discussed the ecosystem of a semiconductor production system that compares to the existing Fab with Minimal Fab by the framework. Table 1 shows these differences.

The main constituents of Components Companies, Focal Firms and Complements Companies is SME & Start-up companies. As this reason, the big companies, such as ASML, Tokyo Electron, have performed at　leading-edge R&D that is indicated by ITRS, and the price of their development equipment is from several hundred million to tens of millions US dollars. However, the price of Minimal Fab equipment is several hundred thousand US dollars, so the business model is different and we think that it has become the dilemma of the innovation (Christensen, 1997).

Miyake et al. (2015) conducted a questionnaire survey to Fab System Research Consortium. About 5% of the companies are conducting R&D that does not follow ITRS. The reason for this, we consider that the semiconductor industry has reached at mature phase and they actively participate in Minimal Fab innovation and they are looking for new business. In addition, as activities that contribute to the core technology improvement of the company, about 60% of companies have cooperation with universities, public research institutes, large companies, SME & Start-up companies. In other words, it is open innovation. Ogawa & Tatsumoto (2009) considered that open innovation, such as a conventional national project, has not been made with the distinction of working with competitors, therefore, they have not generated a synergy effect. However, they have created synergies in Minimal Fab.

The reason for this, AIST has made developing minimal standards for PLAD, user interface and the housing that is commonly part of the equipment as a consensus standard. In addition, AIST in the same way as ITRS is responsible for the technology roadmap of Minimal Fab. A part of cooperation and competition became clear with these points. For example, equipment maker competes with a process and control unit that are needed originally, and they have a working group and the synergy effect with other companies in the common parts such as: interface, transfer system, and vacuum system. The standardized equipment in this way has become the platform of Minimal Fab.

Table 1　The Difference of Ecosystem of Existing and Minimal Fab

	Existing semiconductor production system	Minimal Fab
Components Company	ULVAC, Carl Zeiss and so on large companies	27 companies to SME & Start-up as the main
Focal Firm	ASML, Tokyo Electron and so on large companies	35 companies to SME & Start-up as the main
Complements Company	Shin-Etsu Chemical Co., Tokyo Ohka Kogyo and so on large companies	35 companies to SME & Start-up as the main
End User	Intel, TSMC and so on large companies	・Semiconductor user company such as Set maker, Automotive parts maker ・SME & Start-up that have entered the foundry business
Platform	ITRS indicates the wafer size and finer level.	Standardized Minimal Fab equipment
Value blueprint	Mass production system	Variety & variable production system
Co-innovation risk	Reduction by ITRS	・Reduced by Minimal Fab development roadmap by AIST ・Reduction by Fab System Research Consortium
Adoption chain risk	Reduce by ITRS that is made by semiconductor device manufacturer, also they are an end-user	・Because existing semiconductor device manufacturer customizes a production system, the entry barrier is high ・The entry barrier is very low for a company which does not produce semiconductors.
Others: Consensus standard	SEMI standard	Authentication by Minimal Fab standard

6 Conclusions

As the findings of this study, we found that Minimal Fab has the potential that can be the new ecosystem with the value network by variety & variable production system that is different from existing. Also, this new ecosystem has the customer not only a semiconductor device manufacturer but also semiconductor device user companies and SME & Start-up companies. In other words, it is possible to have the segregation from the existing semiconductor device manufacturing because the ecosystem is different.

Thus, new ecosystem with the different value network to the ecosystem of existing semiconductor manufacturing system has been established and we found that they carried out the following focus strategies that we postulated.

a. R&D does not follow ITRS.

b. Deploy variety & variable production system that will enable short delivery date and lower cost.

c. Focus on low-end semiconductor device manufacturing according to the Minimal Fab roadmap by AIST.

In order to enter the semiconductor device manufacturing industry, SME & Start-up company implement this focus strategy. We think that the feasibility of the focus strategy is enhanced more if they have "Absorptive Capacity" (Veugelors and Cassiman, 1999) that can absorb the technology of the other companies which they got by open innovation. Also, Miyake et al. (2013) describes a quantitative evaluation method of Absorptive Capacity.

This study analyzed by the framework in the semiconductor device industry that has the technology road map. Therefore, in order to generalize the ecosystem generation factor in the early stage, we think that it is necessary to continue to refine the system through a case study with the exception of semiconductor related cases.

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Management of Future Generation Needs Through Sustainable Development Law and Environmental Ethics

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Abstract: Ever since the 1992 Rio de Janeiro's Earth Summit, sustainable development law is an object and purpose of many international treaties for both the developed and developing countries as the preambular reference. It influences the international courts and tribunal decisions and national judges who observed its principles. Since positioned at a junction where international economic law, international environmental law, and international social law met, it has since become 'the talk of the town', where its interpretation focuses primarily on ensuring future generations needs through curbing societies zeal for progress. This article aims to review, in general, a range of treaties from 1945 to 2002 to identify whether elements of 'sustainable development law' exist. Secondly, to examine the international convention; the United Nation Convention on The Law of The Sea (UNCLOS), as a comprehensive tool for world ocean management from a new perspective of environmental ethics. This paper serves to contribute towards the importance of recognizing the actual purpose of all treaties; achieving global peace as the ultimate need for future generations through a philosophical method of accomplishing it.
Key words: Sustainable development law; United nations treaties and convention; UNCLOS; environmental ethics; Arrogance theory

1 Introduction

It has been 24 years since the United Nations Conference on Environment and Development, also commonly known as the 'Earth Summit' managed to boost environment consciousness efforts into a global agenda. The 'Earth Summit' was able to directly influence the nations to adopt a global solidarity method to save the world through series of agreements and action plas aimed at stamping out environmental degradations. This concerted effort is a welcomed change compared to the days prior to it where only a few nations had the awareness about the degrading condition of the environment. They now aptly realized that such prolongation would give negative impact not only to the global environment but to the global health as well and also the ability for future generations to live in peace and harmony.

2 Sustainable Development Law

Sustainable development law is featured as an object and purpose for many developed and developing countries to rely on the various international economic, environmental and social treaties[1] as a mean to ensure the protection of their future generations' needs[2]. Thus, sustainable development law is a form of international laws, able to meet the needs of the present generation without compromising the ability of future generations to meet their own needs (K.H. Gupta,2016). Current generation must reasonably foresee the future generations' rights to survive on whatever resources and conditions left behind for them. In other words, sustainable development law is asking current generations to not be selfish and arrogant in reaping all available resources without even considering future people needs.

This paper investigates evidence of sustainable development law within the treaties and conventions formulated under the United Nations at the time of their incorporation and any future

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[1] First introduced by the Brundtland Commission's report Our Common Future (1987) and became the central elements within the "Earth Summit". See J. Lee, 2. Sustainable Development, Yearb. Int. Environ. Law. 24 (2014) 367–372. doi:10.1093/yiel/yvu017.

[2] World Commission on Environment and Development, Our Common Future (Oxford: Oxford University Press, 1987). Defines the concept of needs as essential needs of the world's poor where overriding priority must be given, and the concept of limiting the social and technology in line with the ability of the environment to meet present and future needs.

amendments. Since there are ambiguities on the status of all treaties and conventions, whether they are encapsulated within sustainable development law per se or not, it is therefore pertinent to conduct such determination in order to establish the reach of sustainable development law.

　　Table 1 below is the list of international treaties and conventions existing from the formation of the United Nations until 2002.[1] Listed by international law category according to priority, relevance and significance over the other.

Table 1　International Treaty & Convention (1945- 2002) and Category of International Law[2]

Year	Name	Category
1945	Charter of the United Nations	So, Ec,[3]
1946	International Convention for the Regulation of Whaling	En, Ec, So
1947	General Agreement on Tariffs and Trade	Ec, So, En[4]
1948	Universal Declaration of Human Rights	So, Ec, En[5,6]
1957	Treaty Establishing the European Economic Community ('Treaty of Rome')	Ec, So, En[7]
1958	Convention on Fishing and Conservation of the Living Resources of the High Seas	En, Ec, So
1960	Founding Convention of the Organization for Economic Co-operation and Development	Ec, So, En[8]
1966	International Covenant on Economic, Social and Cultural Rights	Ec, So, En[9]
1969	Convention on the Law of Treaties ('1969 Vienna Convention')	So, Ec, En[10]
1972	Declaration of the UN Conference on the Human Environment	En, So, Ec
1973	Convention on International Trade in Endangered Species of Wild Fauna and Flora	En, Ec, So
1974	Declaration on the Establishment of a New International Economic Order	Ec, So, En[11]
1982	United Nations Convention on the Law of the Sea (UNCLOS)	So, Ec, En[12]

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[1]　Scope of this study.

[2]　So = International social law; Ec = International economic law; En = International Environmental law.

[3]　The UN Charter does not specifically mention the word 'environment' or 'sustainable development'. See 'Introduction,' UN Documentation: Environment, accessed September 10, 2016, http://research.un.org/en/docs/environment. Nevertheless the World Health Organization (WHO) define 'health' as to be about promoting health through a healthy environment with environmental health outlook contained in the document as per Article 13, 55, 57 and 62.

[4]　See Article 20, on general exemption from GATT rules on matters relevance to the protection of the environment: paragraphs (b) & (g).

[5]　Article 28. Everyone is entitled to a social and *international order* in which the rights and freedoms set forth in this Declaration can be fully realized.

[6]　Though there is no specific mentioning on environment, nevertheless the role of environmental threats to *international order* and security is an ever important international political agenda taking the form of water wars, drug wars, diamond wars, oil wars-given the proliferation of resource wars in an era of scarcity-climate change, deforestation or pollution. See J.C. Pereira, Environmental issues and international relations, a new global (dis)order - the role of International Relations in promoting a concerted international system, Rev. Bras. Política Int. 58 (2015) 191–209.

[7]　There is no specific mentioning of 'environment' or similar theme about the environment but recourse to article 235(power to enact the appropriate provisions) allows the Community to develop actions in the field of environmental policy.

[8]　There is no specific indication on the environment mentioned in the original document however later with setting up of OECD's environmental committee in 1970 and OECD's council adopting guiding principles for environmental policy in 1972, reflects a growing awareness of interaction between social and economic development with the environment.

[9]　Article 12 (b) The improvement of all aspects of environmental and industrial hygiene;

[10]　International agreements on environment for example; ASEAN Agreement on Transboundary Haze Pollution, Agreement on the Conservation of African-Eurasian Migratory Waterbirds, Asia-Pacific Partnership on Clean Development and Climate, China Australia Migratory Bird Agreement and many others. Refer M.K. Tolba, I. Rummel-Bulska, Global Environmental Diplomacy : Negotiating Environment Agreements for the World, 1973-1992, MIT Press, Cambridge, 1996 and Cohen, Morris L. et. al., How to Find the Law (9th ed., St. Paul: MN: West, 1989). See chapter 15 'International Law' for a detailed discussion of treaty research including treaty interpretation.

[11]　4 h. "The right of all States, ... to restitution and full compensation for the exploitation arid depletion of, and damages to, the natural resources and all other resources of those States, territories and peoples;"

[12]　See discussions on the convention in the main document.

1986	UN Declaration on the Right to Development	Ec, So, En[1]
1990	Agreement establishing the European Bank for Reconstruction and Development	Ec, So, En[2]
1992	Treaty on the European Union ('Maastricht Treaty')	Ec, So, En[3]
1992	North American Free Trade Agreement (NAFTA)	Ec, So, En[4]
1992	Convention on Biological Diversity ('Biodiversity Convention')	En, So, Ec
1992	UN Framework Convention on Climate Change ('Climate Change Convention')	En, So, Ec
1992	Declaration on Environment and Development ('Rio Declaration')	En, So, Ec
1992	Agenda 21	So, Ec, En[5]
1992	Establishment of the Commission on Sustainable Development	En, So, Ec
1994	Agreement establishing the World Trade Organization ('Marrakech Agreement')	Ec, So, En[6]
1994	Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)	Ec, So, En[7]
1994	UN Convention to Combat Desertification in Those Countries Experiencing Drought and/or Desertification, Particularly in Africa ('Desertification Convention')	En, So, Ec
1997	Protocol to the Framework Convention on Climate Change ('Kyoto Protocol')	En, Ec, So
2000	Millennium Declaration	Ec, En, So[8]
2001	Doha Ministerial Declaration	Ec, So, En[9]
2002	Johannesburg Declaration on Sustainable Development	En, En, So
2002	Plan of Implementation of the World Summit on Sustainable Development	En, En, So

The table classification results (category column) indicate that each of the 30 documents contains all of the three international laws categories, making them all with the exception of the Charter of the United Nations be classified as sustainable development law. Even though there are some variations in the degree of coverage, nevertheless, they remain as the recurring theme in all the documents investigated. From the range of period studied, 'all' instead of 'many' that has been stated by the Centre for International Sustainable Development Law (CISDL) (2005) do have the same object and purpose of sustainable development law. There is also a trend move from the earlier economic and social base toward environment starting from the early 90's to date. The paper deduces that such results might not be about the realization of mankind about the importance of sustainability alone but mankind realization that the ultimate goal of the UN itself must be upheld; global peace and security.[10] Sustainable development law, therefore, helps to ensure future generations need by ensuring peace and security. If this realization is not attainable, they (the future generation) would be put in conditions prone to war, thus defeating the creations of the international documents in the first place. Sustainable development law ultimate purpose is

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[1] Article 1 (2) The human right to development also implies the full realization of the right of peoples to self-determination, which includes, subject to the relevant provisions of both International Covenants on Human Rights, the exercise of their inalienable right to full sovereignty over all their natural wealth and resources.

[2] Article 2 (1)(vii) to promote in the full range of its activities environmentally sound and sustainable development;

[3] Preamble of the treaty states: "DETERMINED to promote economic and social progress for their peoples, within the context of the accomplishment of the internal market and of reinforced cohesion and environmental protection, and to implement policies ensuring that advances in economic integration are accompanied by parallel progress in other fields."

[4] Preamble of the treaty states: "UNDERTAKE each of the preceding in a manner consistent with environmental protection and conservation". See also Article 104, 715, 903, 904, 906, 907, 909, 913 and 915.

[5] The whole document is about sustainable development and this could be seen from the use of the word "environment', printed 1167 times.

[6] Preamble of the agreement states: "Recognizing that their relations in the field of trade and economic endeavour ... conducted with a view to raising standards of living ... while allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development."

[7] See Article 27 (2) and (3) on exclusion from patentability inventions to avoid serious prejudice to the environment.

[8] Part IV is about the protection of common environment.

[9] Refer to item no. 31 to 34 and 51 on "Trade and Environment".

[10] See the preamble and Article 1 of the United Nations Charter 1945.

therefore focusing on achieving global peace. It reflects the global community humility in setting aside their self-interest by formulating an alliance to form treaties, agreement, and conventions. However, the question remains over the position whereby there are nations who are arrogant by refusing to join these treaties. What about the role of promoting awareness among the nations?

In promoting sustainable development law, CISDL is an example of an organization created for the promotion of legal education protecting the ecosystems, through an understanding of implementing the development and international sustainable development law. Governed by a distinguish Board of Governors, the CISDL comprises of Senior Director, Lead Counsel, research fellows of professors, academicians, justices and senior legal professionals and associate fellows, all of which are employed to help in ensuring every legal scholars and researches, publication, articles, working papers, legal briefs, academic workshops, dialogue sessions, legal expert panels to international negotiations, law courses, and seminar series are met with a common aim where legal knowledge would empower targeted society in defending proper sustainability of any development.

CISDL to date has produced priceless efforts in educating the developing and poor countries to be together in the awareness campaign. They defend main aims of these treaties and that includes the decisions of the courts.[1] There is indeed no doubt that their importance is to ensure global environment agenda is met with. [2] Without such efforts, global environment protection awareness would surely be affected. It is a humble and noble act to strengthen the communities in making them aware and to not become selfish by ensuring their own needs are met with, making CISDL's legal awareness programmer a critical part towards global peace and security.

3 Legal Awareness, Sustainable Development Law, and UNCLOS

Legal awareness is meant for all, as it is a global concern and everyone must be made aware of its importance (M. Haris,2014). Legal empowerment is able to provide the poor and marginalized to use the law, the legal system, and legal services to protect and advance their rights as citizens and as economic actors (2008,2014). It should have been made a fundamental human right since there is no point of giving the ability to be protected by the law when individuals themselves are not aware of such rights.[3]

One would argue that the awareness level for those living in developed countries are much better than those developing and poor countries; normally associated with the South. However, as the developing countries had correctly pointed out, it is the North which had consumed most of the world's natural resources. (I. Iqbal, C. Pierson,2016) This has led to the current world conditions as we have today (D. Tladi,2007) and therefore awareness about sustainable development should not be burdened to the South, leading to an extension of Kyoto Protocol implementation until 2020 (R.L. Bryant,2015). The situation occurs since the South continuously argues that the contribution to the degradation actually originates from industrialization countries themselves (N.C. Sahu, A.K.). Nevertheless, the same argument was also said about the South where many serious environmental problems resulted from extreme poverty and a lack of economic and social development (M.K. Tolba, I. Rummel-Bulska,1996, S. Bernstein,2004). The burden of debts suffered by the South increases all existing inequalities between developed and developing countries affecting sustainable development efforts envisaged by the United Nations. Adding to this is the lack of willingness of richer nations to forgive the debts of poorer nations (A.M. Dickerson,2007) thus the blaming game is prolonged without a proper solution.

When it comes to awareness, it is not focused to the society per se but more to the leaders of those countries in implementing the object and purpose of international documentations. If the leaders themselves are oblivious to the existing laws, national policies are unable to be formed making it unsusceptible to promote sustainable development laws. This can be seen from the

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[1] Jorge Cabrera, Frederic Perron-Welch, Alexandra Wandel and Plarent Ruka, Designing Future Just Laws on Biodiversity: Training Materials for Government Officials and Parliamentarians (Hyderabad, India: CISDL and WFC, 2012)
[2] See International Court of Justice case: Gabčikovo-Nagymaros Project, Hungary v Slovakia, Judgment, Merits, ICJ GL No 92, [1997] and also The Permanent Court of Arbitration, Arbitral Award on Arbitration Regarding the Iron Rhine ("Ijzeren Rijn") Railway (Belgium v. Netherlands) (May 24, 2005).
[3] Fundamental human rights as per the United Nations, see The Universal Declaration of Human Rights (UDHR)

inability of the leaders to commit and agree in signing and rectifying the international documentation into their national laws. They are also leaders who had signed the documentations and rectified them into their own laws, but chose not to adhere to them at all.

Thus, the United Nations Convention on The Law of The Sea (UNCLOS) (1982) is an instance remedy to highlight such situations. UNCLOS is an international legal tool that works as the management mechanism and also as a working system for the overall management of the sea (H. Smith, A.,2002). It is the most significant multilateral conventions in history. Established in 1982, and completed in 1994 with the revision on Deep Seabed Mining, the Convention is today applied by all 167 nations plus the European Union. It comprises of 17 parts and 320 articles concerning rights, conservation, and management as being a comprehensive rule of law that has been agreed upon by all signatories' nations. Given the additional of several annexes, the Convention is well recognized as the prevailing document on the law of the sea. UNCLOS has taken over 25 years to develop and has achieved a remarkable breakthrough in oceans law giving coastal nations the needed avenues to utilize their coastal resources and maritime sovereignty while ensuring the continued protection of navigational freedom as being fundamental for global trade and commerce. It entails the ability of the world community to gather and set aside their selfishness and be humble in creating a comprehensive administration and management document for the world ocean (G.K. Walker.,1982)

All countries should be transparent about their aim in adhering to the sustainable development law. For example, the United States of America, although they are on of the signatories of this international documentation, they are quite slow in rectifying it, unlike the rest of the world who had earlier signed and rectified it into their own laws.[1] They have put forwards the ground of security interest and economic basis for the contestation (A. Dastyari,2015). While China, another superpower nation status, who signed the UNCLOS documentation and had rectified it, refuses to abide by the dispute mechanism system over issue decided by the legal system provided. This happens when it comes to their claims over the 'island' located within the South China Sea (M. Haris,2016). This failure would have disastrous effects on the rights of those countries who are members of the convention and to other countries who adhere strictly to the provisions of the conventions.

Both situations above describes the selfishness and arrogance of these two major countries to realize that their actions are contributing to the adherence to this so-called 'Constitution of the Sea' (T.T.B. Koh,1982, P. Ehlers,2016, G. Wright, J. Rochette, T. Greiber,2016). One could only ponder about the adherence to similar documentation by the rest of the world.

4 Arrogance Theory and Environmental Ethics

The problem of our society is to determine a universal moral standard that are applicable in determining human conduct whether they are 'right' or 'wrong'. This is important as only with the right method of determination will the acts be judged correctly and proper action is taken towards eliminating wrongs behaviors. Given that societies are naturally different in their societal makeup, structures, time and locality, and so does their moral standards, it is even more difficult to determine when religious beliefs are taken into account making a universal right and wrong behaviour could not be conclusively determined. Nevertheless, if there is a common denomination over major behavioral characters, it might lead to the step towards tackling moral and ethical issues.

Amazingly, human behavior is timeless. Behavior allows humans to interact with one another, in a positive or negative manner. Every culture and civilization know about these behaviors and how they are relate to each other. Among the behavior, one which is having disruptive nature would be of arrogance. It is universal in nature and can be identified anywhere, in any locality, culture and society in the world, whether in a civilised society or to those living in a distant jungle would be bound to know about arrogance and its disruptive nature. Everyone has it, no one is excluded. It is inbuilt within us and never dies.

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[1] Objection of the United States has been addresses by the Agreement Relating to the Implementation of Part IX of the United Nations Convention on the Law of the Sea (1982) in 1994

Another human character which is the opposite nature of arrogance is humility or humbleness, which allows a human to generate all the good behaviors like love, compassion, mercy and benevolent. Without humility, mankind would not be able to be merciful towards others. Then, there is also selfish behavior, where we humans act selfishly, acting only when it brings personal benefits rather than benefiting others. This character is founded on survival instinct which enables humans to survive.   From these three main behavioral traits come all the positive and negative acts of mankind.

Figure 1   Arrogance Theory
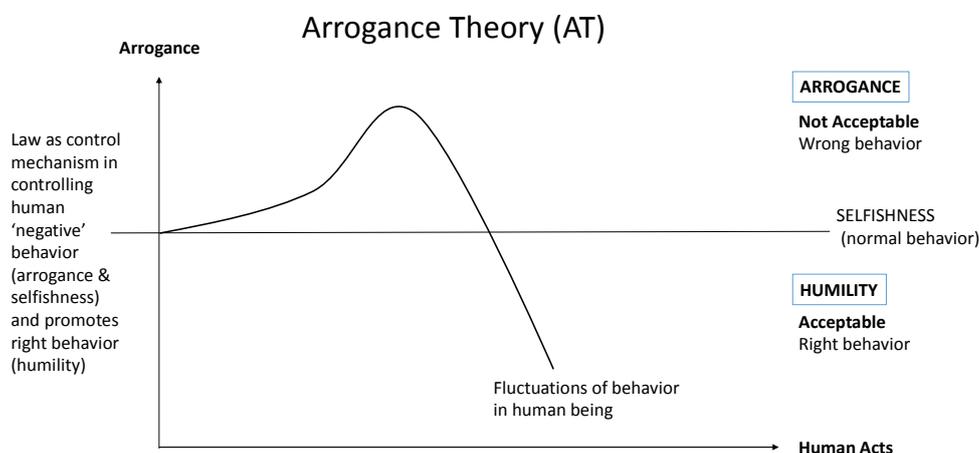
Arrogance theory is a philosophical theory about human nature and their conflicting characters (M. Haris,2016). It divides human behavioral characters into three major types; arrogance, selfish and humility. Selfishness is viewed as a constant value in human character due to their human nature which acts mainly for survival (R.F. Baumeister, B.J. Bushman,2013) behaving similarly to animals (J. Maritz,2010). Realistically, we act selfishly in order to gain as many advantages towards ourselves known as psychological egoism, attributed to Thomas Hobbes and Jeremy Bentham (M. Velasquez,2016). It is only natural and an inbuilt survival mechanism in humans (R. Dawkins,2016, D.P. Fry,2015), regarding self-preservation and the need for reproduction (R. Stokes,2013), by being self-centered and self-motivated (Gupta, 2007). It starts at the infant stage and progresses constantly throughout human's life (D. Stove, 2013,S. Williston, 1836, M. Hancock, 1999).

Whereas arrogance and humility are not the same, as they fluctuate over time. Greed, for example, is arrogance as compared to compassion as for humbleness. One can only act truly compassionate when he is in humility. Of course then, one can argue that a person can also act compassionately while being arrogant, however, they are not the same and this would not result in the reduction of negative behavior of that particular individual. Human moral conduct does not rest on the society moral standards but based on the person itself because of their own free choice to do whatever they like despite the existence of the law. If arrogance in that person is not suppressed it would harm the particular human in the long run as arrogance level have the tendency to increase as long as the human maintains arrogance in them.

Humility, on the other hand, must be nurtured (R. Minthorn, A.F. Chavez,2014, J.E. Cooper,2010) as an acknowledgement of equality , whereas arrogance[1] has a tendency to behave like addictions as it might increases over time if not checked and toned down towards humility. This is observed by looking at repeated offenders (recidivism)[2] where they have the tendency to commit increase crimes. From theft to assault, assault to robbing, robbing to raping and towards the pinnacle of crime; murder. A change from this criminal lifestyle (2013) is therefore needed. There

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[1] Hobbes called it as pride, see endnote no. 32 (Julie E. Cooper) for further insight of Hobbes's pride and humility arguments.
[2] "Recidivism is one of the most fundamental concepts in criminal justice. It refers to a person's relapse into criminal behavior, often after the person receives sanctions or undergoes intervention for a previous crime." [39]

must be efforts to maintain the highest level of humility so that good behavior and outcome would generate from it.

In respect of the sustainable development law, it is natural for countries to be selfish in their behavior to gain all possible benefits for their country. It is their own right to progress and develop according to their official mandated national policy and as part of sovereignty principles. Such behaviors allow a spirit of competitiveness amongst nations and with it, positive interactions would lead to bilateral and multilateral cooperation between nations or its counterparts, [1] (bilateralism, plurilateralism, and multilateralism as against unilateralism) would lean towards attaining global peace (2005, R. Huisken,2009, V. Aggarwal, S.2013). Whereas arrogance would make a country behave in a way that it will only benefit themselves while at the same time suppressing the rest of their own rights. An arrogant country would only see other countries as subservient to them. They want to gain advantage without even considering the rights of others by belittling and ignoring them. An incremental build-up of arrogance would only bring animosity and differences between countries and these could lead to war. The negative impact must be avoided as it disregards the future generations' need of peace and security.

This behavioral condition is perhaps best captured in the area of environmental ethics in regards to the negative impact of development towards the environment and how to solve it based on the morality of mankind. It became a topic of discussion based on mankind's destruction attitude towards the world's ecosystem, with mankind's excitement for development and progress. It is basically about the human's own ethical relationship with the natural environment caused by the widespread use of negative activities or negative impacts that threaten the public health and facilitate the destruction of wildlife. The destruction of the world that we are witnessing now is basically founded on the arrogance of man, by not acknowledging the importance of the environment or not seeing that their destructive actions are a real cause to the burden of cleaning up, along with having others who face negative effects linked to pollution such as reduced body resistance, sickness, disease and even death.

If only we are to adopt humility while observing that we are indeed the selfish kind, we would be made more aware of our actions. It can guide mankind for identifying and rectifying the cause of pollutants, and this perhaps would resolve this issue because pollutants are an outcome of the arrogance of man. It is estimated that currently there are around 5.25 trillion pieces of plastic debris in the ocean. From that mass, 269,000 tons are floating on the surface, while some four billion plastic microfibers per square kilometer litter at the deep sea (L. Parker,2015). If every one of us is able to identify our own actions, whether they are done in arrogance or not, then we could perhaps make a drastic change to our environment. States who has signed UNCLOS must be able to respect other nation's rights by not being arrogant to reap all that they can from the sea which would cause other states to suffer, unable to enjoy their marine rights.

The environmental awareness of the western society is akin to the lesser level of arrogance or humility as compared to the eastern countries, where most of them adopts the 'couldn't care less' attitude because their justification is that since everyone is doing it, then why not they do the same, or since we are fighting a failing battle, if you cannot beat them, join them. This accelerates the destruction because of our disrespect towards the environment. Since we never want to respect the environment, failure to acknowledge this would surely bring disastrous effects, not just to the environment, but to all of mankind and animals alike.

5 Conclusions

In concluding, let us be reminded to not cloud ourselves with the current theme but instead to look at the bigger goal of all the laws and treaty that have been created by the United Nations. The answer is only one, that we should make the world a better place for everyone else including ourselves. Having realised this, let us gather all efforts in promoting sustainable development law, not just educating the society about the importance of environment, social and economic alone but

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[1] In September 2016, 350 Chief Executives, Heads of State and Government, leaders of UN Agencies, Funds and Programmes, and leaders from civil society, business associations, foundations and investor groups will attend the United Nations Private Sector Forum 2016 to jump-start progress on the Sustainable Development Goals (SDGs) to secure a peaceful and sustainable future for all.

as intermediaries' efforts towards the ultimate goal of the founding members of the United Nations; global peace.

The international and national leaders should be more aware about the importance of protecting the environment as our last frontier of global society. It is not only to focus on specific laws and regimenting the minds of the society into thinking about the laws that have direct effects on the sustainability of the environment as important, but also those not listed which carries similar or even more significant than those of the sustainable development laws. We must not get carried away with the names of the laws or categorized them as specifically targeting specific agenda without being able to properly inform the society of the other laws which may even help further the cause of global environment protection and the future generations.

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Research on the Modes of Hubei University Innovation Teams Serving for the Innovative Hubei Construction Project

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Abstract: The university innovation team is a core research team which focuses on academic issues, stands on the frontier of science and technology, and carries out scientific researches on major national research projects. However, the construction of university innovation team in China started late, and the relevant theories and experience is insufficient, which leads to a series of problems to be solved and improved in the construction and development of University Innovation Teams. On the basis of relevant literature, this paper takes science and technology innovation teams in Hubei's universities as research objects and sets up four following modes: team integration mode, major projects mode, industrial technology research institute mode, and collaborative innovation alliance mode. This paper is expected to improve the existing theories about construction and operation of university innovation teams and offer a guidance for scientific and technological innovation.
Key words: University innovation team; Innovation in hubei; Modes

1 Introduction

The university is not only a gathering place for talents, but also a place for innovation teams. In addition to knowledge innovation, university innovation team should take the missions including technology innovation, technology transfer, serving in the industry development, and serving in the regional economic development. It is an important manifestation of the advantages of intelligence resources in Hubei Province of China where there are a lot of universities and colleges. Currently, more than 120 universities and colleges are located in Hubei Province. It brought together with a large number of high-quality technological innovation talents and academicians from the Chinese Academy of Sciences and Chinese Academy of Engineering, and form strong science and technology innovation teams playing a crucial role in Hubei construction process. The research and development system which is led by a number of national laboratories, engineering centers and covers from basic research, application development to the industrialization of scientific and technological achievements has been set up. Furthermore, Hubei university innovation teams become an important force and supporting conditions for economic and social development in Hubei.

2 Literature Review

As for the innovation teams, the discussions among foreign sociologists, scientists, and experts from scientology to psychologists are different to some extent. The most representative one is presented by Kuhn (1980) and Bernardo (2003). On the basis of the concept of "paradigm" and sociological "Community", Kuhn put forward the concept of "scientific community", which serves as a conceptual tool for the analysis of the science and technology innovation team's formation and maintenance. Moreover, from the viewpoint of Chris Harris's opinion (2005), innovation team, a kind of organization, which takes up a non-continuous work, aims to meet the extraordinary demand and obtain extraordinary efficiency and gains. In general, innovation team has basic features of cooperation, unity, integrity, complementary, self-confidence, and team spirit.

Until 1990s, the theory of "Innovative Research Team" was presented, gradually, spread in the field of scientific research in China. In particular, the plan of "high-level Creative Talents Program" was launched officially by the China Ministry of Education in 2004. The first level of the plan, which focused on the implementation of "Changjiang Scholars and Innovative Research Team" program, strongly advocates the construction of university innovation team in scientific research around the country, and concentrates on providing financial assistance to the outstanding scientific and technological innovation teams which focus on top-notch innovative personnel and engage in national key development areas or international cutting-edge research about science and technology.

On the study of operating features of university innovation teams, many scholars generally only explore the common innovation team features, such as organizational mode, behavioral framework, interactive process and the inherent law. Li Jing (2008) gave a definition of the mode of university innovation teams, by using the experience about the mode gained by famous foreign university innovation teams. She advocated and regarded "leaders, academic leaders, academic backbone, academic development power" as a new mode of university innovation Team. Meanwhile, Wang Yiran and Zhang Nannan (2010) believes that the university innovation teams form a multiplayer interactive system in certain situations. Rational and irrational interactions between members constitutes the framework of team behavior. Team members will exchange and cooperation with each other through some interactive processes such as knowledge sharing, team cohesion and risk taking. Thus, it will promote the development of the level of team interaction. Further, it will ensure significant improvement of team performance. Starting from the current practices of the construction of university innovation team, Chen Jin, Xiang Yang Xue and Liu Hongzhi (2010) have focused on the formation conditions and the dominant power which construct the mode of university innovation team, and their study is based on R&D chain, industrial chain and service chain which are related by Industry-University-Research strategic alliances. The inherent law of the accreditation, establishment, management, operation, evaluation and incentive of the university innovation teams has been systematically revealed.

In summary, the theory of university innovation team is still in the exploration and development stage, and it has not formed a complete theoretical system yet. Most scholars focus on the overall profile of the construction of university innovation teams in China. Thus, a research on local university innovation teams is obviously insufficient. Especially, the empirical study of university innovation teams of Hubei is relatively weak. So, combining the characteristics and status quo of the different regions, this paper has important theoretical and practical value for researching on construction of modes which are suitable for local university innovation teams.

3 Team Integration Mode of University Innovation Teams Serving for the Innovative Hubei Construction Project

Based on the strategic alliance of industry-university-research cooperation, universities in Hubei should produce effective innovation output according the key input features including academic background, ability advantage, resource integration, network contact and innovation performance in the process which they grasp the right scientific research positioning in. Thus, it will promote systematic, structured, dynamic innovation of team integration mode. As shown in Figure 1.
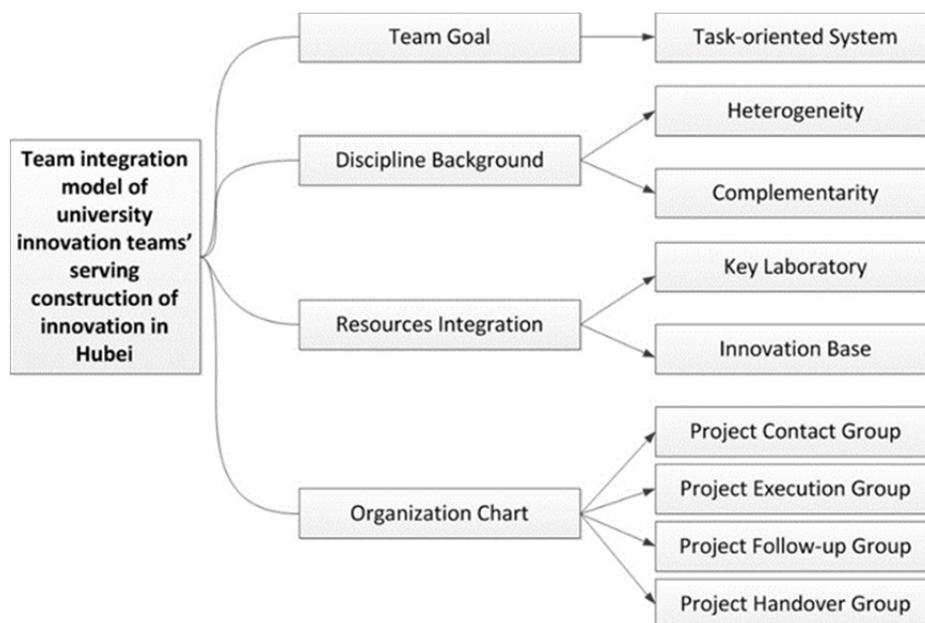
Figure 1   Team Integration Mode of University Innovation Teams' Serving Construction of Innovative Vision in Hubei

1) Universities innovation teams are formed with the aim that it's asked to achieve a given task. The reason they exists for is serving to innovation. Task-oriented system is mainly realized through clear team goals and explicit team norms.

2) From the point of view about discipline backgrounds, university innovation team should be armed with discipline development advantages of systematic research and development, which is interdisciplinary. Knowledge with high levels of "heterogeneity" and "complementary" makes members have the cross-departmental and interdisciplinary expertise to achieve the team goals.

3) In the process of integration of resources, it can rely on national key laboratories, national key disciplines, Science and Technology Innovation Platform of "985 Project" or Philosophy and Social Sciences Innovation Base, "211 Project" Construction Base and other types of organizations. Thus, it can have an integration of the interior resources of universities including technology, intelligence, knowledge and others to form an effective crucial power of intensive scientific research and development. In addition, it also need a good multi-disciplinary nature on the knowledge structure and capability advantages.

4) In the step of designing organizational structure, team members will take a stable one according project cooperation process. That includes project contact group, project execution group, project follow-up group and project handover group.

The mode has an operation mechanism which combines integration, sharing, service and innovation with support features. The nature that are publicity, service, cross-organization, combination involving production, teaching and research determines a kind of essence that it is based on innovation of cross-organizational cooperation and technical alliance body providing coordinated services. And it plays a core role whose responsibility includes leading, supporting, organization and coordination in the aspects covering from gathering, integration, optimization, openness and sharing of scientific and technological resources to promoting the industry development and regional innovation. Therefore, it forms a long-term, stable and symbiotic R & D network through building an interdisciplinary cooperation research platform. So, it can have an effective integration of theory research, technology export and talents cultivation. Ultimately, it will serve to science and technology innovation activities of the whole society through conducting cross-organizational cooperation innovation and collaborative service.

4 The Major Projects Mode of University Innovation Teams Serving for the Innovative Hubei Construction Project

The word "major" in the description of the major projects shows its important strategic significance, and these projects usually are aimed to solve the problem about strategic high-tech fields or people's livelihood.

In this mode, government of Hubei Province should establish the major projects leading group, and regard it as a specialized management agency for guiding major projects directly.

Its main function is entrusted by the competent authorities and other relevant government departments, the co-ordination and daily management for the major projects will keep the pace with it. "Major projects leading group" have three committees which are responsible for financial management, administrative management and technical management. As shown in Figure 2.

Implementation of the projects should go through seven stages from the top-level design, project application, implementation and management, project acceptance, transformation of achievement, project evaluation to following up. According to modern project management theory and combining with major projects in Hubei province, we have designed the specific work for each stage. As shown in Figure 3.
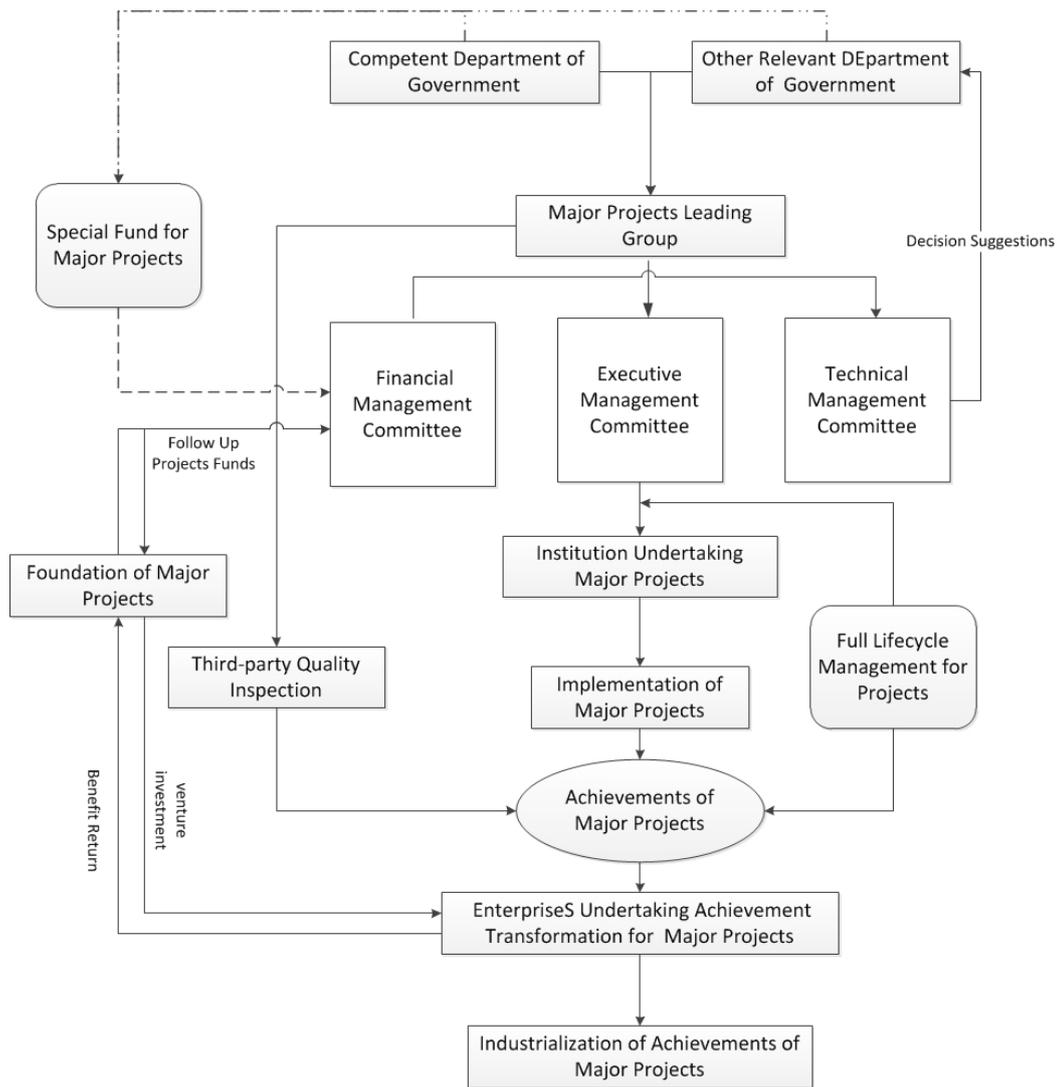
Figure 2　The Major Projects Mode
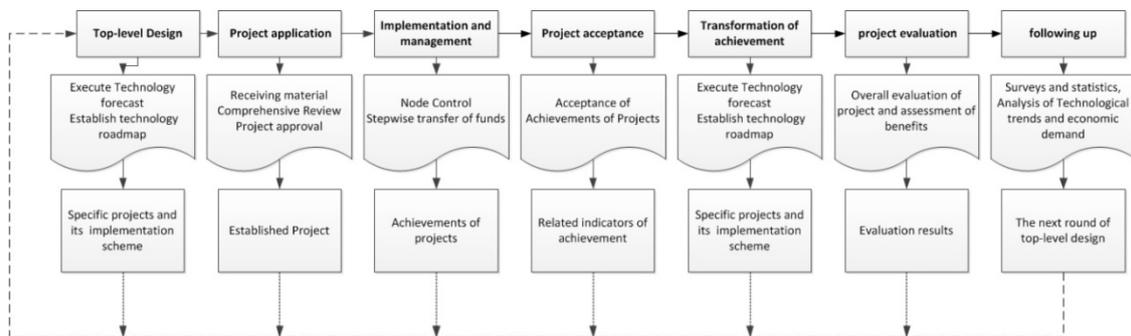
Figure 3　Specific Work Design for All Stages of Full Life-Cycle

5 Industrial Technology Research Institute Mode of University Innovation Teams Serving for the Innovative Hubei Construction Project

Industrial Technology Research Institute (hereinafter referred to as "ITRI") first appeared in Taiwan, China, in the 1970s. After 30 years of development, Industrial Technology Research Institute of Taiwan have produced a lot of research achievements spreading to the whole industry by technology transfer

and technical guidance. It has become one of Taiwan's three major research institutions. And compared with similar institutions from other countries all over the world, the cumulative number of patents it had obtained is in first place.

1) Positioning and Function of ITRI of Hubei

The establishment of Industrial Technology Research Institute of Hubei should regard promoting development of key industry and projects as the core, industrial technology integration as a link, commercialization, industrialization and marketization of innovative, critical, forward-looking technology as the goal. It will become a core hub institution promoting the efficient resource collaboration between government, enterprises, universities and research institutes. It also will become a technical service institution which allocates a various types of innovation resources effectively and enhances the ability of industry innovation greatly. Its positioning is shown in Figure 4.
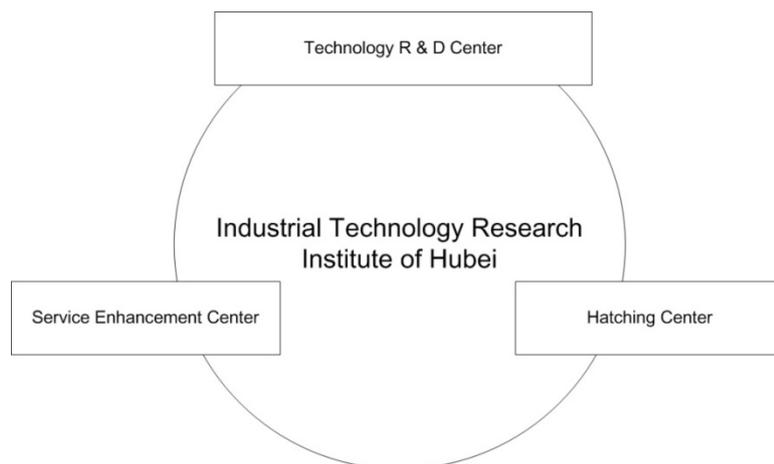
Figure 4   Positioning of Industrial Technology Research Institute of Hubei

① Research and development center of Hubei for key technology of major industry. It mainly researches and develops key technology, generic technology and forward-looking technology, and it provides technical support for major industry of Hubei.

② Incubator center of major industry of Hubei Province. It will be promoted as a new growth point of major industry of Hubei Province through technology transfer, incubation system and so on.

③ Service Enhancement center for major industry of Hubei. It is aimed at providing enterprises with public technology services and information training services such as product design, development, test, process, inspection, detection and standardization. And it will optimize survival and development environment for small and medium enterprises (hereinafter referred to as "SMEs") in Hubei Province to enhance their competitiveness.

Table 1   Five Functions of ITRI of Hubei

Function	Overview
Technology research and development	Combining enterprises, universities with research institutes and conducting research and development of application about key technology, generic technology and forward-looking technology around key industries in Hubei Province.
Public technical service	Setting up SME-oriented public technical service platform to provide information consulting services for government, enterprises, universities and research institutes.
Technology transfer and incubation	Promoting the level of technological achievements transfer, technological achievements incubation and technological achievements training which are researched and developed by ITRI, universities and research institutes; Promoting the industrialization of technological achievements.
Investment and financing	Establishing project financing platform for industrialization of new industrial technology of Hubei. To achieve effective transformation of technological achievements by means of market.
Training management	Providing SMEs with personnel training, management training, technical training and other multi-level services.

ITRI of Hubei is asked to have five functions which are technology research and development, public technical service, technology transfer and incubation, investment financing and training management. As shown in Table 1.

2) Organizational structure and Operational mechanism of ITRI of Hubei.

The establishment of ITRI of Hubei should be mainly lead by government. It will be a research and development institution which has open applications and a qualification of independent public institution legal person   and which is nonprofit. It also will adopt the model of public institution legal person management and enterprise operation. About the organizational structure, it will adopt president responsibility system under the leadership of the Council. So, it will have extensive autonomy in all aspects such as organization, staffing, budget and technology transfer etc. As shown in Figure 5.
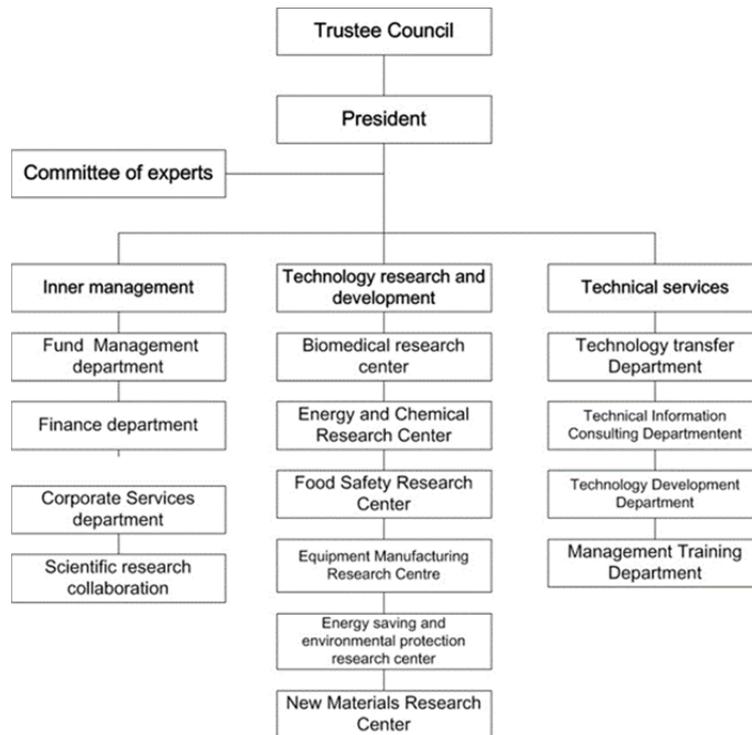
Figure 5   Organizational Structure of ITRI of Hubei Province

Hubei Province will adopt the idea that it needs strong government support, efficient industry-university-research cooperation and market-oriented operation. Eventually, ITRI of Hubei will achieve its unique role in industrial innovation system, and then it will enter the social circle. The operating mechanism is mainly reflected in the following aspects:

1) Fund operation mechanism. In the initial phase of ITRI, the government provides sufficient and stable special funds to support its development. Thereafter, the ITRI can strengthen service capabilities, and then contracts projects and topics entrusted by relevant departments of government or enterprises.

2) R & D projects selection mechanism. Selection of R & D projects should be industrial development-oriented. Whether it carries out research and development to meet the technology needs of major industries or to create new industries by regarding technology as a starting, knowing about the actual situation of the surveyed enterprises should be the first step in the selection.

3) Technology research and development mechanism. Research and development conducted by ITRI should focus on dislocation with academia and industry. Generic applicable technology and forward-looking technology should be concerned. It includes own research and development and technology transfer, as well as industry-academia cooperation and other forms.

4) Technology diffusion mechanism. In the aspect of technology transfer, there are different directions which the ITRI can concentrate on, such as technical cooperation and technical services for individual enterprise, generic technology R&D for a number of enterprises, forward-looking innovation for technology without receiver in the industry and so on.

6 Collaborative Innovation Alliance Mode of University Innovation Teams Serving for the Innovative Hubei Construction Project

In 2011, Chinese president Hu Jintao proposed the idea — "collaborative innovation" at the centennial celebration of Tsinghua University, and he said that university should have deep cooperation with scientific research institutions and enterprises to establish a strategic alliances of collaborative innovation. The Industry-University-Research Cooperative innovation is based on the collaborative idea which is in order to promote technological innovation carried out by University, scientific research institutes and enterprises. They will achieve the goal by sharing resource, working together, fusing capital, distributing benefit, undertaking risk.

In the collaborative innovation service mode, the main functions of the government, university and enterprise are specific and confluent. As shown in table 2.

Table 2   The Functions of the Three Subjects in Collaborative Innovation Service Mode

Subject	Positioning	Function
Government	Driving power	The government plays an important role in the government-university-enterprise collaborative innovation activities, and provides policy support, exchange opportunities, fund financing and implementation platform.
Institute of scientific research in Universities	tractive power	Universities and research institutes should actively play a leading role in the government-university-enterprise research cooperation. It means that they should overcome the tendency of breaking away from social practice, and carry out extensive cooperation with the industry and society, and enhance the ability of social adaptation.
Enterprise	pulling power	Enterprise is the pulling power of need in the government-university-enterprise cooperation. At the same time, enterprise should attach great importance to the linkage with government and university. Besides, enterprise have to break the negative, passive situation, and actively carry out technological innovation, and actively make a use of research results of universities or research institutes to improve competitiveness.

Based on the reality of the situation in Hubei Province and analyzing systematically the related literature, this paper has summarized the types and characteristics of the domestic and foreign mode of government-university-enterprise cooperative innovation. According to the partition of the relationship between cooperation subjects, we set up the collaborative innovation alliance mode of university innovation teams' serving construction of innovative vision in Hubei from three different types which are the single dominant mode of cooperation (the university dominant), double leading mode of cooperation (university-government dominant, the university-enterprise dominant) and multiple dominant mode   of cooperation (university-government-enterprise dominant) . As shown in table 3.

1) Single dominant mode of cooperation is the most basic mode in the industry-university-research cooperation. It is also a currently popular one. This mode mainly includes technology transfer, transformation, university science and technology industrial park, personnel training, technical consulting, university-owned enterprise, establishing Asset Management Co. Ltd. etc.

2) Double leading cooperation mode is the main form. It means there are multiple research units to cooperate with each other, but it only takes two of them as the leading. This mode has two types, the university-government cooperation and the university- enterprise cooperation. The first one includes cooperation with other countries in the world (international cooperation or overseas cooperation), as well as cooperation with China's central government ministries or local government. The other one includes joint cultivation of talents and talents exchange, joint research and development (tackling key technical problems, technical commission), building a joint scientific research base (R&D institutions, laboratories, engineering technology research center), establishing high-tech entities together (technology appraised as capital stock). etc.

Table 3 Collaborative Innovation Alliance Mode of University Innovation Teams' Serving Construction of Innovative Vision in Hubei

Type of Mode	Leading subject	Form of Mode	Case of Mode
Single dominant (the most important)	University	Technology transfer, transformation, University science and technology industrial park, personnel training, technical consulting, university-owned enterprise, the establishment of asset management Co., Ltd.	Tsinghua Science Park, Tsinghua Tong Fang, Founder of Peking University
Double leading dominant (the most basic)	University - Government	Institute of research cooperation, the establishment of the Institute of technology, industry-university-research cooperation fund	Wuxi industry university research base, China Medical City research and Development Center
	University - Enterprise	Joint training and personnel exchanges, joint research and development (technical research, technical Commission), university- enterprise cooperation base of scientific research (R & D institutions, laboratories, engineering technology research center), joint high-tech entities (technology appraised as capital stock) etc.	Sound Research Institute of Nanjing University, Sinopec (Shanghai) Joint Laboratory, Jinchuan Metal Chemical laboratory
Multi dominant (Highest form)	University - Government - Enterprise	collaborative innovation platform (base), the strategic alliance of industry-university-research cooperation	Collaborative innovation platform of universities in Shanghai

3) Multi dominant mode is the highest level of form in the industry-university-enterprise cooperation. It includes the platform (base) of the collaborative innovation, and the strategic alliance of industry-university-research cooperation, etc.

7 Conclusions

As the uppermost existence of university innovation teams, the modes of university innovation teams serving for the innovative Hubei construction project have important means for healthy and efficient development of university innovation teams. This paper has come up with several modes such as team integration mode, major project mode, industrial technology research institute mode and collaborative innovation alliance mode. The choice of modes for university innovation teams depends on teams' characteristics, types and mechanism.

Acknowledgement

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Game Analysis of Mode Selection about the Industry-University-Research Collaborative Innovation

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Abstract: This paper designs two industry-university-research collaborative innovation modes through literature review: commission development mode and technology intermediary mode, and describes their basic principle of respective operation. Then, the game model of the two industry-university-research collaborative innovation modes would be constructed using the method of game theory, with the purpose of providing theory reference for enterprises choices of Industry-University-Research collaborative innovation modes and formulation of related policies and strategies in enterprises and government.

Key words: Game theory; Industry-university- research cooperation; Mode; Innovation

1 Introduction

With the increasingly fierce competition in the economy, technological innovation has becoming the key to gain a foothold and the driving force behind the development of enterprises. Enterprises rely on their own resources and ability to carry out technical innovation activities have become increasingly difficult. Collaborative innovation has become an inevitable choice. Enterprises need technological achievements of universities and research institutes to gain competitive advantages. At the same time, universities and research institutes (learning research side for short) is call for approaches to transform scientific and technological achievements. So there is interdependence between them, which is an important reason for industry-university-research collaborative innovation. In this process, selecting the mode of cooperation is a crucial issue. The cooperation between the subjects of the industrial-academic-research cooperation often leads to the failure or rupture of the cooperation because of the improper mode selection. So choosing a fair and reasonable mode of cooperation has become the key to successful cooperation.

The research on industry-university-research cooperation appeared along with more and more cooperation in the mid-1970s. The process of industry-university-research collaborative innovation was also the whole process of knowledge and technology production (Gibbons, 1994). Bloedon pointed out that in the process of cooperative innovation within an organization's internal agent was superior to the intermediaries', furthermore. And the information exchange and research cooperation is conducive to innovation (Bloedon 1994). Industry-university- research cooperation can indeed give the learning research side with more benefits, and improve its enthusiasm of technology research and development (Campbell,1995). Enterprises, which adopted the open type R&D strategy and high R&D investment, tended to view universities as a source of innovation (Laursen, 2004). Gulbrandsen pointed out that the professors funded by enterprises claimed that the research is applied to a wider range, and they can bring more papers and business results (Gulbrandsen, 2005). Universities and enterprises can use a variety of collaborative innovation cooperation channels, such as consultants and contract research, joint research or training, patent or spin-off activities (Este, 2007). The mode selection results of the evolutionary game can be all chooses the building economic entity mode or all selects the technology acquisition mode or reaches a stable state (Luo Xiaofang, 2014). Some policy recommendations should be given such as building a reasonable additional revenue allocation and cost apportionment scale，establishing effective incentive and punishment mechanism，enhancing the value of collaborative innovation and curbing speculative behavior and positioning the role of the government in the collaborative innovation correctly (Li Gaoyang, Liu Mingguang, 2014). Based on the new industry-university-research cooperation model of regional innovation capability, we should establish internal motivation mechanism, interest distribution mechanism, organization mechanism and build up external social mechanism, policy mechanism, adjustment mechanism, in order to make innovation effects of the regulation system of industry-university-research alliance into full play (Liu Yifeng Sun Haojin, 2015). Through consulting literature, the study on industry-university- research collaborative innovation focused on the specific cases and empirical research.

2 Industry-University-Research Collaborative Innovation Modes

In this part, I design two industry-university-research collaborative innovation modes: commission development mode and technology intermediary mode. Based on the two modes, I will analyze the game later.

Commission development mode is on the premise of forming a commission relationship between enterprises and universities, research institutes. Universities and research institutes make use of relevant resources provided by enterprises to conduct customized development according to the needs of enterprises. As shown in Figure 1, Universities and research institutes have the advantages of talent, discipline, research resources. While enterprises have the advantages of technological innovation, industrialization of scientific research and marketing expansion capabilities. Enterprises judge the shortage technology according to market demand. Then they commission universities and research institutes and support funds and equipment to universities and research institutes. Ultimately, universities and research institutes provide new technologies, new crafts to enterprises.
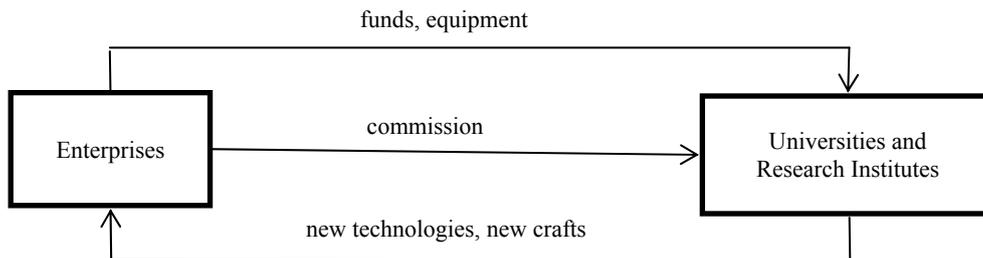
Figure 1   Commission Development Mode

Technology intermediary mode, which comprehensive resources of government, enterprises, universities and research institutes, is an industry-university-research collaborative innovation mode, regarded technology intermediary as the collaborative innovation center. As shown in Figure 2, Technology intermediary is the core part of this mode, playing a role of bridge. Government's support and guidance is an important guarantee for cooperation. Government provides finance, banking, tax and other concessions for enterprises, and provides policy support for universities, research institutes and technology intermediary. Enterprises are the main source of funding. But for the critical investment in basic technology, sharing technology and forward-looking technology, the government should set up special funds to reduce the pressure on the enterprise. At the same time, universities provide technology, equipment, and talent for technology center.
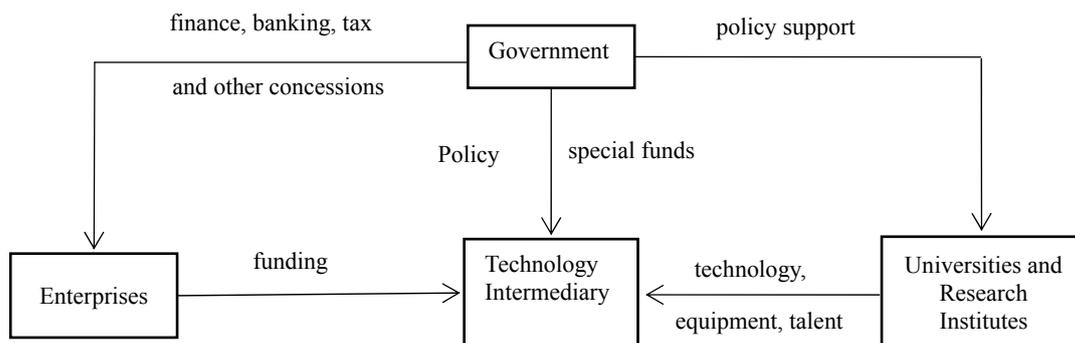
Figure 2   Technology Intermediary Mode

3 Game Model of Industry-University-Research Collaborative Innovation Mode Selection

From the above, selecting the proper industry-university-research collaborative innovation mode is the key to the success in cooperation. However, universities, research institutions and enterprises are different types of organizations, based on different organizational goals and organizational characteristics. Their choices of cooperative mode utterly different. In other words, among universities, research institutions and enterprises and even among different universities and different enterprises, technical capabilities of their own, the attitude to innovation risk, and revenue expectations are totally

different. Therefore, universities, research institutions and enterprises have different preferences for the mode of cooperative innovation. Only when universities, research institutions and enterprises make a consistent selection, the cooperation can be reached. Thus, the choice of the cooperative modes is the result of the game. Next, we will analyze the game selection on collaborative innovation mode.

3.1 Hypothesis of game model

In order to construct the game model, I made some basic Hypothesis in the first:

1) Assuming that enterprises only choose from two modes, one is commission development mode, the other is technology intermediary mode.

2) In general, learning research side's preference for cooperation mode is the same. So I put them as one side of the game, put enterprises as the other side.

3) Assuming that the probability the enterprise proposed commission development mode to learning research side is ρ according to their own condition. The probability learning research side accept is α according to their reputation and financing.

4) Assume innovation capability of the enterprise is X, innovative ability of learning research side is Y. In general, $X < Y$.

5) In the commission development mode, assume that enterprises paying learning research side commission fee is P. learning research side's cost to developed outcome is C_1.

6) Assuming that the future return of the enterprise Π is increasing function of innovation ability. So the return of enterprises' individual innovation is $\Pi(X)$, the return of innovation of learning research side is $\Pi(Y)$, so $\Pi(X) < \Pi(Y)$. In the commission development mode, if learning research side cooperate with enterprises, enterprises will gain the benefit from cooperation is $R_1 = \Pi(Y) - P$, and learning research party gain the benefit from the cooperation is $R_2 = P - C_1$; If learning research side won't cooperate with enterprises, the return of enterprises' individual innovation is $R_1' = \Pi(X)$, and learning research side gain the benefit $R_2' = 0$.

7) In the technology intermediary mode, assume the total input of two sides is C, the input of enterprises is mC, the input of learning research side is $(1-m)C$, and the benefit of cooperation is $\Pi(X+Y)$. If learning research side agree to cooperate with enterprises, the profit distribution proportion between learning research side and enterprises are $1-\mu$ and μ, which we already set before cooperation. So enterprises gaining in the cooperation is $R_3 = \mu\Pi(X+Y) - mC$, and learning research side is $R_4 = (1-\mu)\Pi(X+Y) - (1-m)C$. If learning research side won't cooperate with enterprises, the return of enterprises' individual innovation is $R_3' = \Pi(X)$, and learning research side gain the benefit $R_4' = 0$.

8) Assume two sides won't consider their risk aversion, that is to say, ignoring the risk cost. Enterprises proposed a mode, learning research side elects cooperation or non-cooperation.

3.2 Game model construction

According to the above assumptions, the game tree in Figure 3 shows the game process of mode selection about the industry-university-research collaborative innovation.
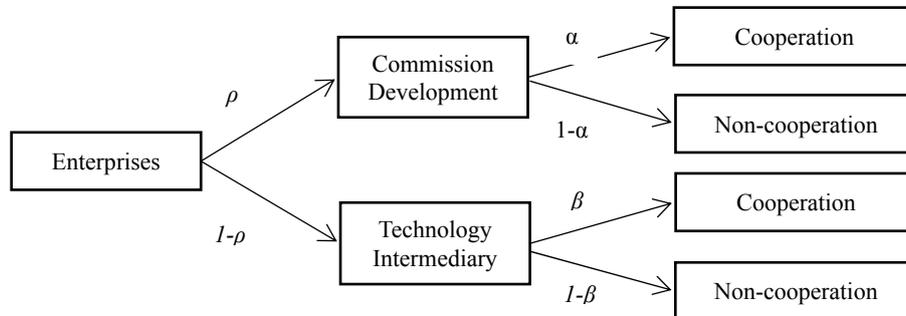
Figure 3   Game Tree of Industry-University-Research Collaborative Innovation

In the process of game, enterprises based on their own research and development funds,

technological innovation capabilities, market environment, social needs and other aspects to put forward a mode of cooperation. According to the game tree, we can get the game matrix of it (Table 1).

Table 1   Game Matrix of Industry-University-Research Collaborative Innovation

		learning research side	
		cooperation	non-cooperation
Enterprises	Commission Development	$\prod(Y)-P, \prod(Y)-P,$	$\prod(X)$，0
	Technology Intermediary	$\mu\prod(X+Y)-mC, (1-\mu)\prod(X+Y)-(1-m)C$	$\prod(X)$，0

It can be concluded that the expected return of each mode is:

1) The expected return of enterprises choose commission development mode to cooperate with learning research side is

$$E_1 = \alpha[\Pi(Y)-P]+(1-\alpha)\Pi(X) \tag{1}$$

2) The expected return of enterprises choose Technology Intermediary mode to cooperate with learning research side is

$$E_2 = \beta[\mu\Pi(X+Y)-mC]+(1-\beta)\Pi(X) \tag{2}$$

3) Average expected return of enterprises is

$$\overline{E} = \rho E_1 +(1-\rho)E_2 \tag{3}$$

Therefore, when $E_1 > E_2$, i.e. expected return of commission development is greater than technology intermediary for enterprises , the enterprise choose commission development mode. At the same time, when $P > C_1$, learning research side will accept the cooperation, vice versa.

When the $E_1 < E_2$, i.e. expected return of the commission development is less than technology intermediary for enterprises, the enterprise choose technology intermediary mode. At the same time, when $(1-\mu)\Pi(X+Y) > (1-m)C$, learning research party will accept the cooperation, Vice versa.

4 Conclusions

In this thesis, the two cooperative modes of industry-university-research collaborative innovation are analyzed by game theory, considering that choice of industry-university-research collaborative modes is a process of mutual game. There is asymmetric information in the process of cooperation, making adverse selection appears. On the one hand, it has taken positive influence to the learning research side. Because of the uncertainty in research and development progress, so the learning research side needs subsidies for research and development from enterprises especially when research and development brings low results. On the other hand, because of the asymmetry of information, the market is flooded with low results. Furthermore, some universities and research institutions in order to obtain short-term interests, regardless of the damage the long-term interests of enterprises, and there will be some phenomenon of the achievements in scientific research of low cost but have high purchase cost due to the black-box operation .

Therefore, in order to promote research collaborative innovation reached smoothly, I put forward the following policy recommendations.

First, the government should establish the linkage mechanism of industry-university-research collaborative innovation. I recommend to establish the Conference group leading by the Municipal Economic Commission, making up of Municipal Development and Reform Commission, City Commission, Municipal Finance Bureau and other departments. Conference would regularly address important issues of local industry-university-research collaborative innovation, promote major projects, and promote cooperation smoothly.

Second, the two sides should build a reasonable income distribution scale. Participants are to achieve the goal of maximizing their own interests. Only to reach equilibrium proportion of income distribution, the two sides can accept. We should make comprehensive measure of resources of both sides' input factors, contribution degree, risk factors and innovative capacity, introducing third-party assessment institutions, so as to determine a synthesis coefficient proportion of income distribution as a basis for revenue distribution.

Third, we need establish an effective incentive and penalty mechanism. On the one hand, we should give both material and moral incentives based on reasonable incentive system, and fully mobilize

the enthusiasm of the participants, and ultimately improve the success rate of collaborative innovation. On the other hand, when the two sides signed a collaborative research agreement innovation, we must define their respective rights and obligations. Defaulting party must be given severe financial penalties, increasing the cost of the defaulting party's breach.

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Open Innovation Approach in the Development of Malaysia Higher Education Blueprint

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Abstract: The Ministry of Education, Malaysia (MOE) launched the Malaysia Education Blueprint 2015-2025 (Higher Education) in April, 2015. The blueprint specifies concrete plans on how to move Malaysia forward in the higher education sector. This paper looks at the development process of the blueprint by the MOE team, and examines the Open Innovation approach used during the blueprint development. The paper also highlights some of the benefits gained from the Open Innovation approach. Finally, the paper concludes with some suggestions on how Open Innovation approach can be further implemented in the future.
Key words: Open Innovation; Malaysia; Higher education blueprint; Crowd innovation

1 Introduction

The 'Malaysia Education Blueprint 2015-2025 (Higher Education)', or the MEB (HE) was launched by the Prime Minister of Malaysia on April 7th, 2015. As the name suggests, the blueprint serves as a guide for the development and growth of the higher education sector in Malaysia over the next ten years. According to the Ministry of Education (MOE), the blueprint sets "to create a higher education system that ranks among the world's leading education system and that enables Malaysia to compete in the global economy" .

It took two years for the MOE to develop the blueprint, and during that time they collaborated with various stakeholders to come up with the comprehensive plan. At its core, the blueprint outlines 10 Shifts as the main agenda to further promote excellence in the higher education sector in Malaysia. The 10 shifts are shown in Figure 1 below.

Figure 1   The 10 Shifts

While it is important for every Malaysian to understand the blueprint and what the 10 Shifts entail, this research is not going to go into the details of its content.   This particular study is to understand what went behind the scene while the committee was preparing the blueprint.   Of particular interest is to understand what the process was like, and how Open Innovation concept was applied in the development process.

2 Literature Review

Innovation is very critical to the survival of any organization.   According to Chesbrough (2006), organizations that don't innovate will die.   Based on this premise alone, it is very important for any organization to keep innovating to ensure its survival.   Interestingly enough, Chesbrough(2006) further asserts that   most innovations fail.   Thus, the question is no longer whether the organization should innovate, but rather, what kind of innovation approach should the organization adopt to remain relevant in the marketplace?

Traditionally, many leading companies had their internal Research and Development (R&D) teams to create new products or services.   According to Chesbrough(2006), these companies performed their research using internal R&D resources, and viewed the internal R&D as a strategic asset, and even a barrier to competition.   Established companies like IBM and AT&T did most of their research internally, and because of that, they became successful and were leaders in their respective industries. This traditional way of innovation is called 'Closed Innovation'.

These days, however, the way companies generate new ideas and produce new innovations is undergoing a drastic change.   According to Chesbrough(2006), established companies are facing strong competition from many newcomers, who may not conduct much of internal R&D on their own.   They use research findings of others in their innovation process. Companies have now moved to a new paradigm called 'Open Innovation', and the traditional approach of Closed Innovation has eroded in various industries. The Open Innovation paradigm treats R&D as an open system, whereby valuable ideas can come both from inside or outside the company.

Why do companies move to Open Innovation?   One of the reasons is that, companies cannot possibly hire all the best brains in the market.   So, by opening up the innovation process, companies will be able to produce products faster at lower cost (Reeves,2011). Furthermore, by combining external and internal ideas, the resulting products will suit customers' requirements better (Hilgers,2010).

Of late, Open Innovation has been receiving more and more attention.   A lot of research has been performed to understand the practice of Open Innovation by various companies and industries.   The continuous increase in popularity is due to its relevance to industry practice (Bughin,2012; Chesbrough,2012; Harison,2010). Large firms, such as Procter & Gamble and Dell, complement their internal R&D functions with external intermediaries such as InnoCentive and IdeaStorm to solicit new ideas and solutions to solve their problems.   This has allowed them to innovate faster and at a lower cost than competitors (Bayus,2013; Reeves,2011).   By leveraging external knowledge to supplement their R&D, smart companies such as Cisco and Genzyme are able to challenge the leadership positions of large industry players (Whelan,2011).

As expected, the high technology industries such as IT are well-known in their quest to embrace various forms of open innovation for many years (Alexy, 2012). Not to be outdone, the more traditional industries, such as banking and insurance, have been able to utilize ideas from external parties in their new product development (NPD) processes as well (Ramaswamy,2010). In their research, Ramaswamy and Gouillart(Ramaswamy,2010) describe how a large European bank has managed to introduce a new product by getting all the internal and external stakeholders involved in the product design process. The sale of the new product had surpassed expectations, and was the most successful product launch in the company's history.

Open Innovation concept is not just applicable to private companies or organizations.   Many public institutions are adopting Open Innovation approach to bring new ideas and innovations to better serve their customers: the public. Collm and Schedler (Collm,2012) did a study on how governments are using crowd innovation approach to open up innovation processes in the public sector, and the challenges they face using Web 2.0 technologies. According to them, these public institutions "invite their stakeholders to participate in a weakly structured, public process of generating and developing innovations in the administration". Hilger and Ihl (Hilgers,2010) meanwhile, present how citizen sourcing can provide new ways for citizens to participate in the government's effort to improve their public services.   They argue that, "by incorporating a much larger variety of ideas and knowledge into new product and service development, the performance of this process will improve, and the resulting

products will have a better fit with the public requirements".

While Open Innovation concept has been widely explored worldwide, not much research has been done to look at Open Innovation practice in Malaysia. In one such study, Nasqhbandi and Kaur (Naqshbandi, 2011) did a quantitative study on 60 Malaysian firms, and they conclude that informal organizational structures suit Open Innovation paradigm more than the rigid formal structures. They further argue that firms also need to have strategic alignment with their stakeholders, such as suppliers and customers, in order to be successful in their Open Innovation approach.

This leads us to another question: How can Malaysia benefit from Open Innovation? While the answer is not so simple, the author believes that Open Innovation could be one of the catalysts for Malaysia to transform into an advanced economy, as envisaged in the Vision 2020. Since Malaysia still lacks the extensive R&D capabilities of developed nations, Open Innovation could be the breakthrough to bring new ideas and innovations required to move the country forward. More studies need to be done to explore how Open Innovation can be implemented in Malaysian organizations. One way is to look at some Malaysian organizations which have opened up their innovation process to come up with new products or services, and learn from them. One such example is the Ministry of Education (MOE), where they used some aspects of Open Innovation when they were developing the higher education blueprint recently. Therefore, it is definitely fitting for us to do a study on how the MOE used Open Innovation approach during the development of the blueprint. Hopefully this will add new knowledge and interest on Open Innovation in Malaysia.

3 Methodology

The purpose of the research was to explore and understand the development process of Malaysia Higher Education Blueprint 2015-2025, and how Open Innovation concept was used during the development of the Blueprint. The following research questions were formulated to guide the understanding of the research:

Q1:   How did the MOE develop the Higher Education Blueprint?

Q2:   What Open Innovation approach did they use to develop the Blueprint?

For this study, a qualitative approach (Silverman, 2013) was adopted as the researcher aimed to understand what the respondents went through in the process of developing the blueprint. The study was not intended to seek generalization, but rather to look more in-depth into the subject matter.

The study used case study method (Yin, R. K,2009) as we were only interested to study one case in detail from the perspective of the participants involved. The unit of analysis here is the blueprint development. As for the data collection, the methods used were semi-structured interviews, document analysis and personal observation.

For the interview part, the researcher conducted a one-hour interview each with two respondents. The respondents were chosen because they were key team members of the committee responsible for the blueprint development. **Respondent A** was a higher education consultant, and one of the key members of the blueprint committee. He had about 30 years of experience in higher education. **Respondent B** was a Program Lead in the Ministry of Education, and a member of the blueprint committee. He had more than 30 years of higher education experience.

4 Research Findings and Discussion

This section will discuss major findings after the data were analyzed. The findings are related to the main topic of the research by getting the answers to the earlier research questions.

4.1 Process Flow of Blueprint Development

The findings of this section help to answer the following research question:

Q1:   How did the MOE develop the Higher Education Blueprint?

According to Respondent A, the Higher Education Blueprint was not developed from scratch. It was developed based on a review of the National Higher Education Strategic Plan, or Pelan Strategik Pengajian Tinggi Negara (PSPTN). The PSPTN was earlier published in 2007 as the strategic plan for Malaysia Higher Education for 2007 to 2020. It contains 23 key initiatives or Critical Agenda Projects to further propel the Higher Education sector in Malaysia (Ministry of Education Malaysia, 2007).

The development of MEB(HE) was divided into three phases, as shown in Figure 2, below:
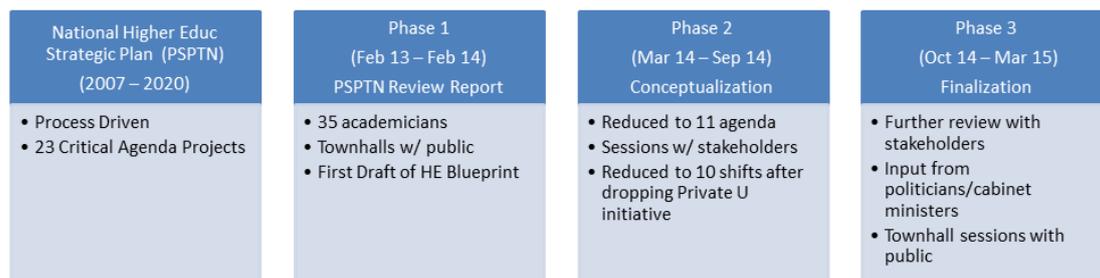
Figure 2　Phases of Higher Education Blueprint Development

Phase 1 started from February 2013 to February 2014, where a review of PSPTN was conducted. A team of 35 academicians were invited to sit on the review panel. Just like any initiative, the ministry wanted to know how well they had performed based on the PSPTN initiatives. The review panel spent a year to study the performance of Malaysia Higher Education sector and, how well they followed the PSPTN implementation. The review panel studied the achievements and shortcomings of the PSPTN, and evaluated the successes and limitations of these key initiatives based on the available data.

According to Respondent A, the data were only half of the story. To get the full picture, they also needed to get the feedback from the public and people on the street. To do that, they conducted town hall sessions to listen to what the public felt about the impact of Malaysia higher education to them. Throughout the town hall sessions, they gathered the feedback from the public to understand the impacts they felt in terms of their outlook, and how they had benefitted from the PSPTN initiatives.

After they had studied the available data and the feedback from the town hall sessions, the review panel came up with the PSPTN Review Report. The report contained the findings as well as recommendations for future initiatives, and different strategies to recommend. This PSPTN Review Report then became the basis for the development of the higher education blueprint.

Phase 2 (March to September 2014) was the Conceptualization stage of the blueprint.　At the start of this phase, the MOE set up its own internal committee to handle the development of the blueprint. The committee started to study the PSPTN Review Report in an attempt to further improve the proposed blueprint.　In the previous PSPTN, according to Respondent A, the plan was process driven, meaning it was based on achieving certain Key Performance Indicators (KPIs) eg. how to strengthen research innovation, how to strengthen the universities etc. However, for the new blueprint the committee had decided that it should be driven by outcomes. So, while studying the PSPTN Review Report, the committee also tried to align the recommendations with the new thinking (outcome-based).　After further deliberation, they had narrowed the 23 key agenda from PSPTN to 11 Shifts. The shifts were the major initiatives that would spur continued excellence in the higher education system.　With 11 Shifts, the committee thought that they could capture the immediate needs, and would be scalable enough to cater for future needs.

After that, the Deputy Prime Minister (also the Minister of Education) invited a group of national thought leaders to solicit their views on the initial proposal of the Blueprint. This group of people were prominent people in their fields, such as former chairmen of the university boards, former Vice Chancellors, prominent educationists, scientists, National Laureates, etc. The Deputy Prime Minister chaired the one-day workshop to enable these people to give their input. At the same time, the team also arranged for feedback sessions with various other stakeholders such as the board of universities, Vice Chancellor committee, Deputy Vice Chancellor committee, student leaders and other groups. The team also met the private higher education association, and to their surprise, the private university group was not agreeable to a shift specifically for private higher education. After listening to the feedback from the private higher education group, the team decided to drop the shift specifically for private higher education, and the blueprint now had 10 Shifts, instead of 11.

The last phase of the blueprint development was Phase 3, the Finalization phase (October 2014 to March 2015).　To finalize the blueprint, the committee invited relevant stakeholders again to give their final feedback to the committee. In addition to that, the committee also presented the proposed blueprint to the cabinet ministers and politicians.　Several town hall sessions were also conducted to allow the public to review and provide their recommendations to the blueprint.

After the committee was satisfied with the content of the blueprint, the Malaysia Education Blueprint 2015-2025 (Higher Education) was launched on April 7, 2015 by the Prime Minister of Malaysia, Dato' Seri Najib Tun Razak.

4.2 Why open innovation approach?

The process of developing the blueprint involved using Open Innovation approach by collecting data and getting feedback and ideas from external parties or stakeholders. While the committee did not specifically label this as Open Innovation, it was clear that the work they did conform to the Open Innovation concept as defined by Chesbrough (2006).

During the interview with the respondents, they stated several reasons why they chose this approach. According to respondent A, it was very clear at the outset that the committee wanted the blueprint to be consensus, meaning that it had to get the support and buy-in from the people involved in higher education. They did not want to shove it down to people's throat, so to speak. To achieve this, the relevant stakeholders must be part of the process through open discussions and various feedback sessions which the committee had planned to organize.

Another way to get the buy-in and support from the people was by getting the external parties to be involved in the process. This was evident when they got people in education to actually do the work such as writing some chapters of the document. The writing team included people from the ministry, the directors, heads of division, university professors, Deputy Vice Chancellors etc. Once these people got involved in the process, it would be easier to get the support and buy-in from them.

4.3 Open innovation methods

This section will take a look at various Open Innovation methods the committee had employed in the development process. This section will attempt to answer the following research question:

Q2:   What Open Innovation approach did they use to develop the Blueprint?

There were various methods the MOE used in adopting the Open Innovation strategy. One prominent method they did was conducting engagement sessions with various stakeholders to seek their views and recommendations on the blueprint. To ensure they covered all angles, the committee invited various groups of stakeholders to the engagement sessions.   Among the groups invited were :

● Higher Learning Institution Chairmen, Vice Chancellors, CEOs
● Higher learning institution staff
● Industry/professional bodies
● National Education Councils
● Senior Thought Leaders & Professors
● Parent Teacher Associations (PIBG)
● Unions & Associations
● Students & Alumni
● Ministry staff

The engagement sessions were done to explain what the proposed blueprint was all about, and to seek feedback from the audience. They held more than 30 engagement sessions for each of the stakeholder groups separately. In most of the engagement sessions, they would start with a presentation on the proposed blueprint. After that, the participants would be allowed to ask questions, and provide their feedback on the plan.

Besides the normal engagement sessions, some sessions were also conducted using workshop style. This was to cater for bigger groups, such as student representatives, the committee of Deputy Vice Chancellors and National Thought Leaders. In a workshop, a brief presentation would be conducted by the committee before the participants were divided into smaller groups. Each group would need to discuss among themselves what they thought about the blueprint, what should be included, and what should be removed from the blueprint. They were also encouraged to offer any suggestions for the improvement of the blueprint. After the breakout sessions, the groups would come back, and a representative of each group would present their findings.

Another method the committee organized was town hall sessions. These sessions were conducted to cater for bigger audience, especially involving the public. In a town hall session, the committee would present an overview of the proposed blueprint. After that, the floor would be opened so that the audience could ask any questions, or provide their views on the blueprint.

In conjunction with the town hall sessions, the committee also arranged what they called "Satellite" setup. A Satellite is a temporary public place where the committee put up posters and whatever documents related to the blueprint. Members of the public could visit the Satellite and view the information available, and ask any related questions to the MOE team. According to Respondent A, they

set up 6 different Satellites in Sabah, Sarawak, Penang, Johor, the East Coast and the West Coast.

In the sessions with the stakeholders, not all participants would have a chance to air their views, especially if it was a big group. Therefore, questionnaires were also provided for everybody to give written feedback on the blueprint. The questionnaire contained simple questions, as well as space for written comments. Besides questionnaires, anybody from the public could also provide their input online or via email.

Another aspect of Open Innovation was the use the various media to blast the information. Print media, electronic media and the internet were used to disseminate information about the blueprint to the public. Various appearances on TV shows were also arranged to highlight the blueprint to the public.

With various means provided for the stakeholders and the public to give their opinion on the blueprint, the committee felt that they had covered every angle in terms of soliciting feedback for the betterment of the blueprint. As Respondent A put it, "so, in terms of engagements, I think we were very thorough. There was not one segment that we felt we missed. And if anybody says that they missed, of course we cannot get everyone involved. But at least the representatives were there, and at least everybody was given the opportunity to be involved. Whether they actually get involved or not, that's a different matter".

5 Conclusions

This study has shown that the MOE has successfully adopted the Open Innovation approach in developing the higher education blueprint. They made every effort to get various stakeholders to work and collaborate with them in formulating the blueprint that would meet the stakeholders' requirements.

By having open discussions with various external parties, the committee had uncovered certain requirements which they did not realize before, such as the need to remove specific shift for Private University only, and the need for National Identity to be included after consultation with the public.   If they did not collaborate with the external stakeholders, the committee might have excluded these important requirements from the stakeholders.

While there were challenges in organizing various engagement sessions, they definitely benefitted from the process. In the end, the blueprint was designed based on the feedback from the people, not just the internal MOE team. Therefore, the end result was the blueprint which took into consideration every aspect of requirements from the stakeholders.

Perhaps one limitation of the approach was the main use of face-to-face sessions with the stakeholders to get their feedback. While this approach had its advantages, the MOE could have utilized the latest ICT technology (Web 2.0) more to enable wide range of participation from stakeholders. For the record, MOE did use email and its website as mechanisms to gather feedback from the public. However, this method was not the main method utilized, and not well known by the public. In the future, MOE or other organizations should use more of the latest ICT technology to collaborate more effectively with the public and stakeholders.

One way to implement this is for MOE to create an online Open Innovation system during the implementation stage of the blueprint. The implementation stage is scheduled from year 2015 to 2025. While the blueprint looks good on paper, the real test is to see how well the whole blue print can be implemented and how it benefits the nation as a whole. There will be a lot of challenges to be faced, and it would be good if the MOE create an online Open Innovation System in the process. This will allow the stakeholders to access the Open Innovation System and give feedback anywhere and anytime convenient to them, not just during face-to-face meetings. The MOE should also publicize and encourage the public to use the system so that they can collaborate and give feedback or suggestions to better implement the blue print for the benefit of the nation.

Throughout this paper, we have seen how the MOE has benefitted from the Open Innovation approach in getting the blueprint to cater to the requirements of various stakeholders. As Open Innovation concept has proven to be beneficial, other Malaysian organizations (public or private) should also be encouraged to adopt Open Innovation approach in their R&D effort, or even in any process improvement.

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A Survey on the Contributions of Rational Redeployment of Higher Learning Institutions in the Vast Chinese Countryside to the All-around Healthy Development in China

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Abstract: With the analysis on the economic practices and literatures in the developed countries, based on the fact that China is now in the booming period in its economic development, the article puts forward the suggestion that some Chinese colleges and universities should move to the vast countryside from big cities. With the analysis on the economic and cultural benefits of this practice to the local communities of the new campuses, the article gets the conclusion that the redeployment of Chinese higher education institutions in the countryside is economically and socially beneficial to the national development and gives some suggestions on the rational redeployment.
Key words: Chinese higher learning institutions; Redeployment; Contributions; Chinese national development strategy

1 Introduction

With the rapid economic development, the urban-rural developmental gap is becoming bigger and bigger in China. Because of economic reasons, the development of cities in China has been supported by the governmental policies. Up till now, this practice is practical. Urbanization is one of the major features of market economy. At the beginning of Chinese economic opening up and reform, cities had to take the leading and demonstrating position of new economic practices to be the models for the underdeveloped regions to copy. On the one hand, Chinese cities have consumed the major part of national developmental resources, fulfilled the leading and demonstrating role in economic practices and have become overdeveloped even worldwide. The urban population has increased from about 18% to about 56% of the total Chinese mainland population from 1979 to 2016. This reality has greatly boosted Chinese economic development and China is now ranking 2nd among the world economies. On the other hand, the economic development in the vast countryside in China is still comparatively slow compared with the economic development speed in the urban areas. Besides the economic development, the cultural development in the vast Chinese countryside is also comparatively backward. In some rural regions, the main economic activity is still family farming. The main function of agricultural activities is to meet the need of family survival. In some regions, the rural residents' knowledge is limited and this gives possibilities to social instability.

A healthy state should be a state healthily developing both in economy and culture nationwide. Considering the present proportion of the rural residents among the national population (about 44% of the total 1.37 billion populations), the development of the rural areas in China will be a key sector in the national prosperity strategy and its success will decide the success of the national development.

It is time to boost the development of the countryside in China. What is the most economical but fruitful way to achieve this target? At present, the redeployment of higher learning institutions in the countryside is sure the most effective way to boost the economic and cultural development in the vast Chinese countryside. It is the demand of Chinese reality and modern times.

The functions of higher learning institutions are educating, innovating and serving. Some scholars in China have done some relevant researches. Wang Zhuo (1990) did researches on nationality education. Xie Anbang (1998) did some researches on the space distribution of higher learning institutions.Up till the 21st century, some other scholars did some researches on the regional disparity of higher learning institutions(Xue Huiying,Xuelan,2003;Du Ruijun,2007). And some other scholars did some researches on educational equality and effectiveness (Shen Hongmin, Liu Qiushi,2008; Yu Hongliang, Meng Xianyun,2013). This article will analyze the benefits, the possible difficulties and the corresponding measures of the redeployment of Chinese higher learning institutions in the vast countryside in China.

2 The Significant Influences on Regional Economic and Societal Development of the Distribution of Higher Learning Institutions
2.1 Theoretical basis of the higher learning institutions' functions in regional economic and

societal development

The Regional Competitiveness Theory thinks the key factor to promote regional competiveness is the "national quality and science and technology" from higher education. IMD and WEF regard science and technology competiveness as the core competiveness of the eight key factors of international competiveness.

The New Growth Theory points out that human resources and knowledge are the decisive factors of economic development. The scientific and technological development from higher learning institution is the decisive factor of regional economic development.

The Unbalanced Growth Theory points out that higher learning institutions can function well in innovating technology, upgrading local industrial structure and educating labors with necessary knowledge.

The Theory of Newly-developed Advantages points out innovation is the key to have the advantages of developing late. Innovating is just one of the 3 main functions of higher learning institutions.

We can get the conclusion from the previous four theories: higher learning institutions are the power sources of regional economic development. This will provide us a fundamental theory basis for the rational redeployment of higher learning institutions.

2.2 Facts on the functions of higher learning institutions in promoting economic and societal development

In Europe in the 18th century, education, especially higher education was attached to great importance in promoting national economic and societal development in England, France, Germany etc. Since the industrial revolution in the 19th century, developed countries actively promote the reform and development of higher learning institutions. Since late 19th century, in the world economy history, some less developed countries surpassed the more developed countries. For example, Germany surpassed England, America surpassed England, Japan passed European economic powers. All these show the rapid development of higher education is a necessity of economic booming.

In a nationwide region, many famous universities, with their own scientific findings and discoveries, become the regional locomotives, and therefore, accelerate their own further development. In some sense, we can say Stanford University makes chip valley and the University of Utah and Brigham Young University boom Utah state.

3 Stimulation on Economy

The redeployment of Chinese higher learning institutions will be a very big project. Up till 2016, the number of Chinese higher learning institutions is 2879 (Ministry of Education of PRC); the number of college and university students is 26.253 million (Ministry of Education of PRC). Even if only part of them will be redeployed outside big cities, the project will contribute a lot to the economic development.

3.1 Direct economic positive influence

The reconstruction of the higher learning institutions is sure to contribute greatly to the economic development in a relatively long period of time. The construction cost of an average college or university in the cities in China is at least 2 billion RMB yuan. Considering the comparatively cheap labor and low land and building material prices in the rural areas, the construction cost of an average higher learning institution is at least 1 billion RMB yuan. This is a very big project for a local community. It will promote the local economy greatly. Nationwide, the redeployment of higher learning institutions is a super huge project, besides other positive influence in the national development, it will directly stimulate the national economic development at least for ten years. It will provide local people many employment opportunities and directly increase the local economy.

Table 1　Some Changes of the Local Community Economy before and after a Community College was Built in Hubei Province in China

Before the college was built		After the college was built
Number of local manufacturing businesses	13	25
Number of local service businesses	25	83
Local unemployment rate	4%	1%
Per capita income of local community	￥2000/year	￥6000/year

3.2 College people's contribution to local economy

People learning or working at universities or colleges are great consumption power, and their need for daily necessities is sure to contribute to the local economy. This will greatly change the local production types and forms and will provide a lot of chances for the local services. Every average Chinese university or college is just like a well-organized small town. It can play a core role in a local economy. Population is the basis of consumption. Consumption patterns and demands determine the production modes. College people usually lead the fashion, culture and technology tides. Their demands are various, modern, fashionable, which will give demands on the local markets and so promote the local economy.

3.3 The function of colleges and universities in changing local economic developmental modes

Colleges and universities are just like small societies formed of social cultural and technical elites. Colleges and universities can not only provide convenience of specific technical educations, but also change local people's ways of thinking. College people's general living ways usually represent the current tendency of modern times. Their living ways will gradually influence the locals' living ways and make the local people's living ways meet with the needs of modern times. The most significant change will be the shift of local economy from small-scale farming or animal husbandry economy to market economy. This will make the underdeveloped regions in China to catch up with national economic developmental pattern in a comparatively short period of time. To change the production modes to satisfy the college people's needs (of course, to make more profits), the locals are sure to change their thinking ways and learn more knowledge to become more modern.

Table 2   Some Changes of the Local Community Economy before and after a Community College was Built in Hubei Province in China

	Before the college was built	After the college was built
Types of local manufacturing businesses	3	11
Types of local service businesses	5	23
Local unemployment rate	4%	1%
Per capita income of local community	￥2000/year	￥6000/year

4 Colleges' and Universities' Function in Reforming the Local Community Culture

4.1 Colleges and universities can gradually change locals' knowledge quantity and composition

Colleges and universities play a very important role in modern mature economies. as mentioned above, colleges and universities will not only provide locals specific technical educations and instructions, they will also promote locals' knowledge and civilization level. Reforming people's thinking ways and increasing their knowledge is the easiest way to accelerate civilizing communities. Once people's mind has been changed, the corresponding actions will be a matter of course. At present, it is not feasible for the government to pour a lot of money into each underdeveloped region directly to improve the local people's living conditions because there are too many underdeveloped regions in Chinese countryside and the state funds are limited. So, changing people's mind in the underdeveloped regions and give them necessary and specific educations and instructions to make them know the necessity and feasibility to change their life better themselves is a very practical and economical way. The redeployment of universities and colleges outside big cities will not only reduce the pressure of big cities, but also improve the facilities of the newly-built universities and colleges and promote the development of the underdeveloped local communities. College people bring in new things of modern tendency and can greatly narrow the urban-rural developmental gap, especially civilization gap.

4.2 The redeployment of colleges and universities in the vast Chinese countryside can significantly improve the local living and cultural facilities

Colleges and universities are well-organized social public institutions. The necessary school facilities will benefit the locals a lot. For one thing, the locals' sharing the use of the facilities will save the government funds in public facilities in the local communities (which is a necessary responsibility for a responsible government); for another, the facilities of the well-organized educational institutions can better meet people's needs, and can be good models for the local government to copy to build other local public facilities. This will surely promote the overall civilization and the scientific urbanization of the local communities. Modern life ways and civilization advocated by college people will infiltrate into locals' life and locals will join in the main stream of modern civilization unconsciously. This will surely contribute to the national culture civilization as well as the economic prosperity.

4.3 Colleges and universities can bring the locals modern awareness and the concept of national prosperity developmental strategy

Colleges and universities function as educational and training institutions. Besides the subtle demonstrating influence of college people's life ways and modern awareness on local people, colleges and universities can also function as publicizing bases of national prosperity strategy. By educating the locals as well as the students the necessity and rationality of the national developmental strategy, colleges and universities can unify people's thinking and understanding on the national developmental strategy and accept it. This will greatly contribute to the execution and realization of the national developmental policies and measures, and it will also benefit the formation, development and stabilization of the national prosperity idea among people, especially among the locals in the underdeveloped regions. All these will greatly promote the modernization of the underdeveloped regions and improve the civilization of the local people.

Table 3   Some Changes of the Local Community before and after a Community College was Built in Hubei Province in China

	Before the college was built	After the college was built
Rate of locals accepted specific technical trainings	1.8%	23%
Local illiteracy rate	18%	3%
Internet and smart devices penetration	10/100 families	81/100 families
Private vehicle ownership rate	0.1/100 families	10/100 families

5 Conclusions

The economic development of China has passed the extensive development stage and has entered the booming stage. In the first stage, cities consumed the majority of governmental resources to take the leading demonstrating post in the national development strategy. Chinese cities have become highly developed economically even worldly. The target of the first developmental stage of Chinese economy development has been realized. The benefit of economic reform and opening up has now been recognized by the majority of Chinese people. Economic reform and opening up has become a necessity and a center in Chinese economic activities. Economic development and prosperity have become an undeniable request and a necessity in China. The target of the second economic developmental stage is to urbanize the vast countryside in China and infiltrate the benefits of economic reform and opening up into the underdeveloped countryside regions and make economic development a request from the locals in those regions.

The biggest obstacles of redeploying higher learning institutions might be the cost and the college and university staff members' willingness to move to the new campuses. In fact, these are not problems (See *Necessity and feasibility: A study on the redeployment of Chinese higher learning institutions in the countryside at resent, Proceedings of the 12th international conference on innovation& management, pages 569-573*).

The redeployment of colleges and universities nationwide is a very large-scale project. It should be planned carefully and scientifically. The redeployment of colleges and universities might have some exceptions, but it usually should be planned according to the principle of rational distribution.

The distribution of colleges and universities in a region should take into consideration the cost of redeployment. Colleges and universities are usually redeployed in the regions near where they were to reduce the redeployment cost.

The distribution of colleges and universities in a region should take into consideration local population. Densely populated regions need more colleges and universities.

The distribution of colleges and universities in a region should take into consideration local needs. For example, in a pasturing region, colleges and universities featured with animal husbandry may be considered first. It is the same with crop farming areas. In some national autonomous regions, nationality higher learning institutions should be considered.

The distribution of colleges and universities in a region should be considered together with establishing new ones if necessary. In some regions, to build a new college or university might be cheaper than move and redeploy one from a faraway place.

The purpose of redeploying higher learning institutions in the vast Chinese countryside should center around the principle: to serve the national material and cultural prosperity strategy, and to serve the people.

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Issues and Challenges of Entrepreneurship Education in Malaysia

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Abstract: This research is a program evaluation of an entrepreneurial education in public and private higher education institution in Malaysia. Among the problems of the Entrepreneurial Education face by Ministry of Higher Education Malaysia as stated in Entrepreneurship Development Policy for Higher Education Institution (HEI) is the lack of mechanisms for quality, effectiveness and impact measurement. This study aims to evaluate what are the issues and challenges in the implementation of entrepreneurship education practices by Higher Education Institution (HEI) in Malaysia. There are two higher institutions involved in this research, University Teknologi Mara (UiTM) and International Islamic College (IIC). Both institution offer Bachelor of Entrepreneurship and have more than one cohort of students graduated.   This study adopts qualitative approach utilizing case study method. The collection techniques included semi-structure interview, document analysis and observation. This study focuses on entrepreneurial program at public and private Higher Education Institution (HEI) and it contributes to the present literature on the real phenomena of entrepreneurship education in this country, specifically focusing the actual issues and challenges which relates to the monitoring and evaluating the effectiveness of the entrepreneurship education programs faced by the Ministry of Higher Education and the Higher Education Institutions in Malaysia.
Key words: Evaluation; Entrepreneurship Education; Issues and Challenges

1 Introduction

There are various policies and plan emphasizing on the human capital development. In Vision 2020 working paper in 1991, our former Prime Minister, Tun Dr Mahathir Mohamad has highlighted the need to establish 'a scientific and progressive society' as the sixth challenge out of nine outlined in the national agenda. Until now various efforts provide by the Malaysian government with the assistance of many agencies in establishing programs to the young entrepreneur and graduates in a tandem to this national agenda. Small Medium Enterprise Corporation (SME Corp), Malaysia External Trade Development Malaysia (Matrade), Ministry of Entrepreneur and Co-operative Development (MeCD), have been offering grants specifically for local SMEs and small/medium industries that meet the criteria. Obviously, the government wanted to see more technopreneur and entrepreneurs running the small and medium enterprises (SMEs) in the country.

As for the education sector, Ministry of Higher Education has instructed all local public and private universities and colleges students are required to seat for the entrepreneurship course. The intention of the Ministry of Higher Education (MoHE) of revitalizing entrepreneurial acumen of all graduates and also in tandem with the Ministry of Entrepreneur and Co-operative Development (MECD) to encourage young generations to venture into business and be courage to explore opportunities through this sector (Mansor & Othman, 2011). On top of that MOHE is also including the entrepreneurship skill as one out of nine generic skills or domains that should be possessed by the students in a new Outcome Based Education System (OBE). This skill needed to ensure graduates at all discipline are not solely depending working with others but creating a thinking of having their own business in the future. "We are producing more graduates than jobs," said Minister of Higher Education (MoHE), YB Dato Seri Mohamed Khaled Nordin during the launch of Ready Work portal held at University Teknologi Malaysia (UTM) Kuala Lumpur Campus. He added that entrepreneurship education helps stress the power of ownership to create wealth. (November 2, 2012)

Several studies have shown that entrepreneurship has been identified as a potential catalyst for expanding economic growth and to maintain competitiveness in facing the challenges of globalization. (Minniti, M. & Levesque, 2008). The involvement of graduates in the field of entrepreneurship is supported by the government as an alternative to reduce the unemployment rate in the country (Othman, Othman, & Ismail, 2012). However, past studies are based on the studies conducted abroad of how the effectiveness of Entrepreneur Education implemented that lead to the reducing number of unemployment rate among graduates.

This present study focuses on issues and challenges of the entrepreneurial program within the public Higher Education Institution in Malaysia by using the system approach based program evaluation.

This part will also touch the research gap, research objectives and research questions, research framework and research scope.

1.1 Research gap

There are a number of gaps that show the ineffectiveness of entrepreneur education in Malaysia as indicated by the previous researcher such as those involving the gap in skill expectation and skills acquisition. The studies show the ineffectiveness of entrepreneurship education in Malaysia in matching students' skill expectations with their skill acquisition. (Cheng, Chan, & Mahmood, 2009). Then it follows by the gap between the aim of Entrepreneurial Education and the curriculum imposed for this program. The aim of Entrepreneurial Education on the expected entrepreneurial characteristic hold by the students after they learn this field but there was no deeply evaluation done to the curriculum teach to the students, whether it is enough to meet the required expectation. (Ismail & Ahmad, 2013)

At the same time according to Ismail & Ahmad, 2013, The lecturer was rated low in term of performance, there were few research highlighted the competency standard that should be possess by the Entrepreneurial Education lecturer/ instructor. (Ismail & Ahmad, 2013)

Apart from that there is also a gap between the government aim and the actual outcome of the grandaunt. The government intention/aim/plan toward EE's students to be self-employed but the real outcome contradicts with this intention/aim/plan. (Liv Anne Storen, 2014). Gaps in the implementation of the entrepreneurship program, reflecting an imbalance in the entrepreneurship education process (method of teaching, curriculum) and the program objectives aimed at producing future entrepreneur. (Nasrudin & Othman, 2012)

1.2 Research objectives

The purpose of the program evaluation proposal is:

To determine issue and challenges of Entrepreneurial Program in Higher Education Institution in Malaysia in achieving its Program Education Objective through the lens of the System Approach Based Program Evaluation Model (Fatma Mizikaci, 2006)

1.3 Research questions

In this study a system approach based program evaluation model will be deployed, therefore the research questions will be divided into the three sub components that comprise of Social System, Technical System and Managerial System.

1.3.1 social

1.3.1.1 To what extend does the Ministry of Education give support in ensuring the success of this program in meeting its objectives?

1.3.1.2 Is there any mechanism use by the Ministry to monitor and evaluate the success of the Entrepreneurship Program in Higher Education Intuition in Malaysia?

1.3.1.3 Are the stakeholders satisfy with the outcome of this program?

1.3.1.4 Are the institutions concerned about the continuous improvement of this program?

1.3.1.5 What effort has been made to ensure the continuous quality improvement of this program?

1.3.2 Technical

1.3.2.1 To what extent have the resources needed able to meet the program requirements

1.3.2.2 To what extend the curriculum provided meets the Program Educational Objectives

1.3.2.3 How is the institution following the activities/strategies that have been previously outlined? Execution/implementation strategies?

1.3.2.4 To what extent does the program meet program educational objectives?

1.3.2.5 Are the employer satisfied with the performance of the graduates?

1.3.3 Managerial

1.3.3.1 What are some alternative strategies or approaches that could be used to enhance the merit of this program?

1.3.3.2 Does the policy, vision and mission of the organization in line with the objective of the program?

1.4 Conceptual framework

This research will evaluate an existing entrepreneurial education in public higher education institution in Malaysia using System Approach Based Program Evaluation Model in quality system. According to (Mizikaci, 2006a), this model is powerful in two ways:

1) it is a well-integrated model for program evaluation and understanding of the quality systems in higher education institutions from the perspective of systems approach.

2) it offers a multiple-sources approach to stakeholder-oriented measurement in terms of both varieties of dimensions and sources. (Mizikaci, 2006b)

The entire system is open to internal interactions and external influences. The relationships are analyzed using a program evaluation approach. Quality implementations are described in relation to the subsystems for achieving the overall goals. Subsystems are set up for developing systematic evaluation and methods for the analysis of, e.g. social, technical and managerial processes in the given institution. As listed by (Mizikaci, 2006a), there are six steps to follow by this model.

1) Set criteria for program evaluation:
• The criteria and the program are based on the quality concepts re-defined accordingly, representing shift from industry-based concepts to education based concepts and issues for higher education.
• Adopt the systems approach model in order to set the strategies for the program.

2) Stakeholder identification:
• Define the stakeholders as those that have an influence directly or indirectly on higher education of the

programs such as students, academic staff, administration, parents, graduates, employers, Higher Education Council, Ministry of Education and other related institutions.
• Conduct interview to define the needs and expectations of the stakeholders.

3) Sector analysis
• Analyse inputs sources, e.g. the graduates and trained personnel in the employment market.
Analyse performance skills and knowledge expected from trained employees.
• Analyse existing employment sources embedded in the community which can have indirect influence on higher education, e.g. public offices and non-governmental institutions, other national and international   bodies of research and education.

4) Identification of resources:
• Identify what resources are available.
• Identify whether the resources are appropriate to the objectives defined.

5) Data gathering:
• Gather data from multiple sources.
• Use data analysis procedures.
• Adopt a systematic data collection procedure (collect, analyse, interpret and make use of data systematically)

6) Program development:
• Plan all the stages identified in the technical system of the model.
• Make use of quality measurement tools in planning instructional processes.
• Make use of relevant educational research on planning teaching/learning processes.
• Make use of technologies when planning instructional material
• Emphasize frequent feedback and evaluation.
• Plan continuous education strategies.
• Adopt suitable evaluation strategies for program improvement.

As can be seen here, each stage provides for the implementation of the model components and directs the data interrelated to the sub-system components: social, technical and managerial systems. (Mizikaci, 2006b)

1.5 Research scope

This research will specifically focus to the undergraduate Entrepreneurial Program offered by Public Higher Institution in Malaysia. Through System Approach Program Evaluation Model, the issues and challenges of program will be view through the stakeholder and the organization system as a whole. Therefore, in this research the stakeholder composed of students, the academic staff and the managerial level were interviewed.

1.6 Conclusion

Most of the Higher Education Institution in Malaysia focuses on quality and program evaluation but it has been done in isolation. Therefore, it is a time to use System Approach to Program Evaluation Model which involves a comprehensive evaluation that covers internal and external aspect. This research involves students, teachers, management and stakeholders.

2 An Example

In Malaysia, several researchers have conducted a study on the effectiveness of EE in various aspects, such as focusing on entrepreneurial skills and characteristics. The results show the ineffectiveness of entrepreneurship education in Malaysia in matching students' skill expectations with their skill acquisition. Thus, educational institutions need to review the existing curriculum and design a more appropriate curriculum to develop effective entrepreneurship programs and enterprising individuals. (Cheng et al., 2009). There were also researchers who study the ability of entrepreneur students in highlighting the characteristics of leadership that should be possessed by the entrepreneur. The main purpose of this study was to explore personal competencies of student entrepreneurial leaders (Bagheri, Lope Pihie, & Krauss, 2013).

Like other developing countries, Malaysia should also look at the level of readiness for the implementation of this program. The study indicates that Malaysian students' readiness in terms of entrepreneurial willingness and capabilities are strong. However, the readiness of entrepreneurial attitude and readiness for entrepreneurship education within the internal environment of public universities remains insufficient and requires improvements. (Othman et al., 2012). The level of readiness should also be viewed from the curriculum adopted by the HEI. Does theoretical and practical contents are balance in the existing curriculum. Curriculum and co-curriculum activities need to adopt a more practical and hands-on approach, distinct from business education, while public universities should open up opportunities for students to pursue entrepreneurial education, in order to increase awareness and change the mentality or culture of "wage-earning" careers in favor of entrepreneurship. (Othman et al., 2012).

Effective curriculum is crucial to ensure that the objectives are achieved. This can be seen from the research done on the polytechnic in Malaysia which still have problems with the curriculum. Indeed, this result gives important impact to Ministry of Higher Education (MoHE) in Malaysia, especially polytechnics, in planning and developing Entrepreneur Education in the institutions. Regarding these issues, the reformation of curriculum and pedagogy is important. The entrepreneurship modules, activity and program executed throughout polytechnics are unable to provide students with entrepreneurial tendencies. (Ismail & Ahmad, 2013). In addition, a competent instructor is needed to ensure that students are motivated and really understand the need to become an entrepreneur. Unfortunately most of the instructors who teach Entrepreneurial Education in HEI, equip with theoretical knowledge but do not mastered this entrepreneurial knowledge practically. This finding confirmed that polytechnic lecturers are not imbued with entrepreneurial tendencies. (Ismail, 2013)

3 Data and Methodology

Data for this study were collected through two higher education institutions, University Teknologi Mara (UiTM) and International Islamic College (IIC) where both institutions offer undergraduate entrepreneurship program. The data obtained through interviews conducted with lecturer and coordinator who have been involved in entrepreneurship program (manage to get consent from both interviewee). Researcher also managed to obtain documents which related to the curriculum and course syllabus of these two institutions

In this study, qualitative method is adopted for data collection and analysis.   Qualitative research is an inductive process that used to reveal the meaning of significant of participants in their context. It is as described by. (Merriam, 2009, p. 13), qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world.

Case study was chosen to describe in detail and analyze a system that has limits and boundaries. As mentioned by (Merriam, 1998), a case study is an in-depth description and analysis of a bounded system. Entrepreneurial Program is a bounded system where researcher can limit or fence in what is going to be studied.

Semi-structure interviewing, observations and document review are the techniques chose as data collection method for this study. Interview is best used when researcher does not know one's feelings through observation and how people describe what is happening around them. Semi-structure interview according to (Merriam, 1998) is in the middle between structures and unstructured.

4 Result
4.1 Curriculum
The existing curriculum needs a lot of improvement because it must meet the requirements of a

future changes. "For present yes, for future always have to review because the trend that change very fast. So we have to keep up. We have to quite regularly, keep up with the current need of our society". (Interviewee - 1). At the same time, the course that teaches on how to deal with risks in the business should also be included in this curriculum. It is very important that students know how to deal with a business risk. That was recommended. I think Prof Hassan from Univesiti Teknologi Malaysia, he mentioned about risk course, because recently we have round table dialog with industry. He said, Entrepreneurship is about risk taking. Our students are not tough enough. To become entrepreneur, we need to be very strong, when we go down we have to go up, that is why Chinese they are very persistence, they want to be success and always look forward. (Interviewee - 1)

Most of the contents of this curriculum emphasizes on theory. (Please refer to the Appendix 1 - Curriculum Structure of Bachelor in Administration (Entrepreneurship)) While experiential learning through practical training are required by the students "Theoretical enough, practical is still insufficient. As University Malaysia Kelantan UMK, its organize practical training during semester break to expose students" (Interviewee - 1). It happens to the other HEI, where the existing curriculum is not appropriate to the current requirements The present curriculum should be improved to meet the current changes. According to the feedback, the majority of the IHLs recognize the current challenges faced in executing entrepreneurship education into the present curriculum. (Yusoff, Zainol, & Ibrahim, 2014)

4.1.1 Practical training

Practical training should be given priority as well as providing students with incubator facilities, shops and the like to enable students to always practice what they learned. "To make it difference you have to embed them with the industry then to exposes them with lots of entrepreneur stuff, provide them with incubator and let them practice. Like retail, the program that I teach, we provide the simulation store. Students go in, and then for a week they have to go for three hour training, to expose them on how to handle customer, how to handle with difficult customer and to make sure how to arrange the goods in order, that's in retail right. It same to entrepreneur, I think we need to provide store so that they can practice what they have learn. This is not materialized yet". (Interviewee - 1)

The time allotted for practical training was too short, which is supposed to be extended to one year. "Just being discuss and need to revise our curriculum, we are a in the process of reviewing and try to put forward the ideas of one year of internship instead of four months" (Interviewee – 2)

4.1.2 Redundancy

The importance of learning how to create or do a business plan is one of the things that have been emphasized in the Entrepreneur Education. But repeated learning can make students every semester feels bored and lose focus on the lesson. "I think that is redundant. It's really redundant. In New Venture course students are required to produce with a business plan. Semester 3,4,5 and even in semester 6 they also have to do the business plan, for what?" (Interviewee – 2). This causes students to feel unhappy and expressed their dissatisfaction with the frequent task that they need to do every semester. "So many complain from the students, that's why at this moment we try to revise back our curriculum, we try to eliminate, for example the latest news I heard last week, Small Business Management will be eliminated. It will be eliminated probably due to the redundancy". (Interviewee – 2) This shows there are still weaknesses, not only at the curriculum level but the instructor ability in providing a more creative learning techniques are still lacking. Academicians should teach entrepreneurship through learning focus that is upon 'know how' and 'need to know' rather than functional expertise. The 'need to know' stems from the development problems and opportunities of the business. The challenge to academician is therefore to organize knowledge around organization development processes, radically different from the conventional functional paradigms. In guiding them to the survival of a business in the early years, the target might, for example, be to anticipate the problems that lead to business failure and 'bring forward' the knowledge in such a way as to enable entrepreneurs to anticipate development problems before they occur and take remedial action. (Zakaria et al., 2011)

4.2 Issues and challenge

4.2.1 Different thought

To ensure an effective curriculum, all those involved, lecturer, program developer and management must work together and unite. The problem faced by many HEI is disagreements between parties. This led to the failure of implementation of the good ideas. We are in the process of reviewing our curriculum and try to put forward the ideas of one year of internship instead of four months. The problem we are facing here. Sometime, those senior do not support the new ideas. Sorry to say, this department is having little tribes, who are untouchable. That's a problem. When we proposed they cannot accept. Just need to listen to them. (Interviewee – 2). Opinions and ideological differences

arising on Entrepreneurial Education are among the issues and challenges stated in The Entrepreneurship Development Policy for Higher Education Institutions (HEIs). This matter must be addressed by all involved HEI so that it does not give a negative impression on the implementation of this program

4.2.2 Limited time

Way of learning Entrepreneurial Education is different from other education programs, it requires a lot of time doing practical tasks, participate in training and workshops related to entrepreneurship. Unfortunately, in most HEI, most of the students are busy, they involved in activities initiated by the HEI. They have no time to get involved in the entrepreneurial activities. "(Extra curriculum or activities) Being provided but some time if we want to conduct team building, there is no room, no room here means no time, there is so many activities in the UiTM, sometime we cannot put any slot in one semester. It's very hard to arrange our own activities". (Interviewee – 2)

4.3 Monitoring and evaluation

4.3.1 Centre of entrepreneur education and development

To ensure the success of EE, a special center should be established in each HEI. The role of this Centre is to mediate between HEI and industry, it is also necessary to evaluate the effectiveness in producing entrepreneur graduates entrepreneurs as expected by the government. The center needs to keep track of graduates and get the latest information about their involvement in the field of entrepreneurship. Besides that, the center is also responsible for providing information about the development of Entrepreneurial Education in the HEI to the Ministry of Higher Education as well as reporting on the effectiveness of EE activities to the Ministry. Unfortunately most of the center is not properly played a role. Ministry do ask about the number of entrepreneur graduates? That's why (Malaysian Academy of SME & Entrepreneur Development) MASMED under hot seat. If you want to ask, ask MASMED, as Retail Program, when the ministry ask, they have some figure. (Interviewee -1)

A radical yet practical approach is to separate entrepreneurship education initiatives from business schools by creating a unique entrepreneurship centre parked under a strategic division that oversees the entrepreneurship development activities at faculties, including Engineering, IT, Humanity, Arts and others (Hindle & Lansdowne, 2005)

4.3.2 Resource person

To evaluate the extent of the effectiveness of this Entrepreneur Education it should be handled by a center or department or unit. In some HEI, a representative of the center is responsible for the respect of the graduates. It is possible if the number of graduates produced is too many. "The effort actually being tried to do by the resource person, I think she does its own her own effort, she made a wide data base, because we are just new, she tried to gather students information, anyone who going into business, which got loose, who further study who did not. She basically did that She simply cannot do that when the increase in number of graduate. She created her own initiative, imagine she was also lecturer in MASMED handling training, I thing by now she could not cope. She did that time I was a coordinator. I remember she said, she created data base, address, contact. (Interviewee -1)

Because there is no special department or unit responsible for the alumni . Most lecturers have to make their own initiative. This is the evidence that shows the absence of a special evaluation conducted by HEI and in getting information about the graduates and no effort to determine whether the PEO is reached or not. "There is no actual person who handle this but through the informal conversation, we try to seek their (students) opinion than we know where they are, that's how we contact our students. For example , my students and I, we always contact , ask about their current position"(Interviewee – 2).Through studies conducted by a group of researchers , the failure of HEI not only in handling Alumni , in fact, there is lack of commitment from the staff that led to the ineffectiveness of the Entrepreneur Education implementation. Among the top challenge was lack of commitment among IHLs' staff and students. This feedback came from five IHL participants who found that staff and students were not committed to the entrepreneurship programs. .(Yusoff et al., 2014).

4.3.3 The effort done by the HEI in getting a right entrepreneur students

To be an entrepreneur is not only necessary to have knowledge but require high interest and passion in this field. At the top of the list was a lack of soft skills among the students. Students following the entrepreneurship programs lacked communication skills, leadership skills, knowledge of marketing strategies, general business knowledge, and abilities in networking .(Yusoff et al., 2014). Thus in UiTM starting this semester, students who want to enter into this entrepreneur program has to go through an interview session to ensure that they are really interested. We just started recently. Before this, the student intake just like any other program that's why we decided recently, we just implemented this

semester, we need to interview. Otherwise we get garbage. Just people who come in not interested and then they become not so interested. The first batch was quite bad because the students they don't know, they took this program because they have the opportunity to study. (Interview - 1)

5 Conclusions

Various issues and challenges are centered on an unstable curriculum between practical training and theory as well as internal problems between the academic staff with different opinions and thought as well as the absence of the role played by entrepreneurship center on the implementation of the program. There are also repeated topic in the curriculum especially on the business plan preparation which cause students feel pressured t. All of these issues and challenges need to be improved in order to ensure comprehensive impact on graduates

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Enhancing Cooperative Learning in Learning Community: From the Perspective of Knowledge Management

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Abstract: From the perspective of knowledge management, this paper discusses the migration of knowledge management concept into the field of cooperative learning. By using concept of knowledge management, the process of the cooperative learning in a learning community is analyzed from the aspects of knowledge acquisition, knowledge application and innovation, and knowledge feedback. The author points out the factors that affect the cooperative learning, and puts forward and discusses the measures to enhance the cooperation in learning process among members of the learning community.

Key words: Cooperative learning; Knowledge management; Learning community; Knowledge flow

1 Introduction

Knowledge management emerged as a scientific discipline in the earlier 1990s(McInerney, Claire，2002). Since Dr. Nonaka published "The Knowledge Creating Company" in 1991, the research of knowledge management has been gradually extended to the field of education from the business community. The milestone was "The Knowledge Creating School" (Hargreaves, 1999) which is considered to be the most direct and significant literature of knowledge management in education. In 2000, the Organization for Economic Cooperation and Development (OECD) collected important papers in the symposium *Knowledge Management in the Learning Society*. Since then, the research is becoming more in-depth and extensive, for example: "Knowledge Management and E-learning in Higher Education" (Darko Dukić, Gordana Dukić, Kay I. Penny, 2012), "Knowledge Management in Higher Education" (Marjan Laal, 2011), and "Constructing Networked Learning Community Based On the Education Knowledge Management Platform" (Yang Lina, 2012), etc. China began her research of knowledge management in education when "On 'Knowledge Management' in School" (Liu Yu, 1998) was published. After that, papers like "Multiple Perspective on Educational Technology Practice" (Liu Hehai, 2011), "Specifications of Knowledge Management Research Methods in the Domestic Library and Information Field" (Chu Jiewang, 2012) and "The Application of Knowledge Management in the Management of Higher Education" (Yan Kunwei, 2013), studying knowledge management in educational technology, library and information science, education management and other fields, has been emerging in China.

However, in the field of education nowadays, with the rapid development of the information technology, cooperation and communication appears to be vital in the process of learning. Traditional classroom teaching can no longer meet people's needs. We still lack interaction and communication between teachers and learners. We advocate personalization education but overlook the influence of cooperation in education. Personal knowledge can be categorized mainly to tacit knowledge, including cognition like perception, vision, value etc., and those techniques and skills obtained from the experience of practice. The exchange and sharing of the personal knowledge helps the innovation and creation of knowledge, improve the competitiveness and the capacity for sustainable development. And this exchange and sharing is advancing at an unprecedented rate to all aspects of the society. That makes the interaction and collaboration between teachers and learners go beyond the boundaries of traditional learning and form a learning community, in which the interdependence and mutual cooperation in the learning process become more and more important.

As two independent research topics, knowledge management and cooperative learning have attracted much attention of scholars, but few studies have been carried out to explore the profound relationship between the two. This paper tries to use the concept of knowledge management to fully understand, collect, comprehend and utilize all kinds of information resources to form knowledge, which can promote cooperation between members in the learning community, enable learners to acquire knowledge and be flexible in the application of knowledge.

2 The Process of Cooperative Learning in Learning Community

A learning community is a group of people who share common academic goals and attitudes, who

meet semi-regularly to collaborate on class work. Such communities have become the template for a cohort-based, interdisciplinary approach to higher education (Goodyear, P., De Laat, M., and Lally, V,2006). It is an organic unity of the modern teaching methods, learning styles, and learning environment. A learning community focuses on the inspiration of social contexts to cognition and learning motivations. It lays stress on the common desire to learn together, emphasizes the sharing of information, insights, and visions among members, and encourage learners to form and render their knowledge via consultations with others or other cooperation activities.

Cooperation is the key component in a learning community. From the perspective of knowledge management, cooperative learning can be described as a process of knowledge to flow, to be obtained, applied, created and finally to get feedback, as an infinite loop in a learning community. With the loop running, knowledge stock, learning ability and the competitiveness of all members will all be improved in a virtuous circle. The following figure presents the process of the knowledge flow of the entire loop in a learning community:
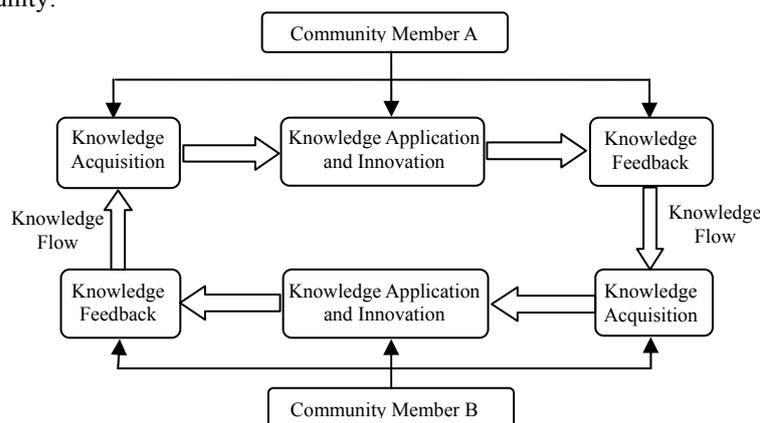
Figure 1　Knowledge Flow of the Cooperative Learning in Learning Community

2.1 Knowledge flow

Knowledge flow refers to the exchange of knowledge through the cooperation and communication among the learners with multidirectional transmission and delivery process in various ways, which includes the acquisition and the formation of knowledge, communication and exchange, transmission and reception. A healthy mechanism of knowledge flow favors the formation of the learning community and the smooth progress of knowledge management. It is a decisive factor for learners in the community to acquire knowledge, enhance their learning ability and competitiveness. It also helps to promote affective interactions thus builds mutual trust among members which enhances the effect of learning.

2.2 Knowledge acquisition

Knowledge acquisition involves complex cognitive processes: perception, communication, and reasoning etc. In a learning community, learners acquire knowledge from internal or external resources, and transmit it to the knowledge that they can use and apply into innovative activities. It includes different sub-activities: a) identify appropriate knowledge from internal or external resources by searching, storing and outputting, evaluating or screening; b) confirm the knowledge captured from internal or external sources by assimilating, collecting and accumulating those important, relevant and reliable knowledge; c) organize the knowledge by refining, localizing, interpreting, compiling or converting it into useful forms; d) store the knowledge in the learning community for exchange or internalize it and convert it into personal knowledge.

2.3 Knowledge application and innovation

Knowledge application is a process which involves the practical use of knowledge one retrieved from resources inside or outside the learning community in an appropriate way to explain new knowledge and the new problems for a particular purpose. It stresses a full coordination and cooperation among all members in the community, including the coordination of the knowledge stock, the absorption capacity, the knowledge processing and utilization ability, and also the ability to interact with social and culture environment timely and appropriately.

Knowledge innovation refers to activities of discovering, acquiring or utilizing prior knowledge to solve problems, or reorganizing the existing knowledge to produce new one. Included in these activities are: proving the effectiveness of innovative knowledge by invoking and applying the existing

knowledge; constructing new knowledge, transferring it and obtaining real time feedback on the basis of the comparison, synthesis and analysis of prior knowledge; and etc.

2.4 Knowledge feedback

Feedback occurs when outputs of a system are routed back as inputs as part of a chain of cause-and-effect that forms a circuit or loop (Andrew Ford,2010). In this process, new knowledge generated in the innovation process goes back as a flow of knowledge to the entire learning community for other members to learn or use. Other members make comprehensive evaluation of the new knowledge during the practice of utilization and send the assessment of the feedback to the new knowledge innovator, who makes modification and adjustment of the new knowledge so as to provide it with the completeness and accuracy. Thus, through formal and informal contacts, knowledge is stored in the intellectual resources of the learning community. After the analysis, evaluation, screening and absorption of new knowledge, positive or negative feedback are obtained to improve the entire loop.

3 Benefits of Knowledge Management in Cooperative Learning

3.1 To knowledge itself

The concept of knowledge management promotes the rapid flow of knowledge and helps to make the tacit knowledge explicit. In cooperative learning, the utilization of new technology expands the horizons of the vision of learners. It offers convenience for the rapid flow of knowledge in the learning community, and also provides a practical basis for the cooperative learning. Knowledge management is a means to combine individual and group, circulate personal knowledge, and contribute to the explication of tacit knowledge. It also helps to integrate the internal and external knowledge or internalize the external knowledge, emphasizing the innovation of knowledge, the sharing and explication of tacit knowledge.

3.2 To learners

Using knowledge management skills in cooperative learning helps learners to grasp the key points of knowledge, gain insights into the nature of the problem, and improve their interaction skills. The quick speed of knowledge flow brings much more information, new views, vision and cognition to learners. Thus they have more opportunities to provide their understanding and views of the problem and discover more profound knowledge. With the unceasing deepening cooperative learning, learners will sink their teeth into a problem and try their high-leveled reasoning and the critical thinking to solve the problem. As a result, they will be more creative, imaginative, and are more likely to try even more diversified strategy and original approaches to deal with the problem.

3.2 To cooperation

Knowledge management serves to promote learners' achievement motivation, improve interpersonal relationship, and strengthen their psychological self-adjustment. Learners share their views, ideas, perceptions and problem-solving methods in knowledge flow among the learning community, where knowledge management helps to provide more information and knowledge to share and reduce prejudices against others. So, less misunderstanding arises while apprehending other people's perspectives and positions. This enables learners to express their views in a more accurate way, to pay more attention to other people's opinion, and it also leads to a better use of knowledge provided by others. All these help to meet the needs of cooperative learning.

4 Influencing Factors in Cooperative Learning

4.1 Incentive mechanisms and the level of trust

Incentive mechanism has a direct influence on cooperative learning and learners' motivation. It plays an important role in the recognition of individuals' tasks in a learning community, which as a spiritual force, is one of the main factors maintaining the cooperation in the community.

Mutual trust is the basis of effective cooperation which promotes mutual understanding and inspires learner's confidence to further efforts. Tacit knowledge in a learning community can only be learned through communication and cooperation among members where mutual trust is needed. It also benefits learners to make close contacts with each other and reduces conflict between them, and thereby facilitates the transfer and the formation of effective incentive mechanism of learning tacit knowledge.

4.2 The ability to accept and disseminate knowledge

Individuals as recipients of knowledge, have to study with a purpose to acquire knowledge, and learned to blend with the existing knowledge with the acquired to create new knowledge. Only after the recipient truly understand and master what they have learned can it be fully converted into their own

knowledge so as to make the knowledge flow and cooperation circulate smoothly. But for individual members, the time and energy needed in understanding the identical kind of knowledge are not the same. Similarly, individuals as disseminators, diversify in the capacity to transfer knowledge. The differences in transmission capacity affect the speed of knowledge transfer and knowledge diffusion, thereby affecting the effective use of knowledge. Besides, the personalities of community members will also affect the transfer and acceptance of knowledge.

4.3 Knowledge stock of members in the learning community

Each member in the long-term learning process has accumulated a wide range of skills and experience, and each of them can master and control their own knowledge. Knowledge transfer depends on a certain basis of technology or knowledge as a prerequisite. So, when the gap between existing knowledge stock and the expected transfer of knowledge is too large, or when learners expect too much for certain knowledge, the transfer will not occur, therefore affects the smooth-going of the knowledge flow. Thus, although knowledge stock is not an essential element of the learning capability of a learning community, the level of knowledge stock has a significant impact on the level of knowledge transfer which further affects the occurrence and process of the cooperative learning.

4.4 Complementarities between types of knowledge to learn and knowledge structure of learners

Knowledge can be divided into explicit knowledge and tacit knowledge. Explicit knowledge can be encoded, expressed and disseminated through a formal language. It can be learned quickly by using certain text materials. However, tacit knowledge is established on the basis of the experience from the organizations or individuals and involves many intangible factors of knowledge which is unlikely to be formularized and formulated. It is a process of knowledge accumulation, and difficult to transfer between learners. Compared with explicit knowledge, tacit knowledge can not be easily transferred, and it is this existence that constricts the smooth progress of cooperative learning. Therefore, with complementary knowledge structure, members can better their cooperation and learning so as to promote each other's progress. This may also bring unexpected skills and knowledge for the learning community. So, the greater the complementarities we have between the members of the learning community, the more frequently the cross integration and innovation of knowledge will occur and the faster the diffusion of knowledge will be.

5 Measures to Enhance Cooperative Learning

5.1 Taking the improvement of learning ability as the purpose of study

Learning ability is the ability of the learners to acquire and absorb the knowledge of the community members. It has certain dependence, and has a great relationship with the learner's knowledge accumulation, knowledge structure and the quality of learners themselves. To get knowledge from the community and make progress, learners must have strong learning desire and clear learning objectives, and take advantage of every opportunity to acquire knowledge and integrate it with their existing knowledge. Due to the different learning effect of different learners, members must take acquiring knowledge as their purpose of cooperation. Thus, they should regard the learning community as a way to enhance their ability rather than an alternative resource to discover knowledge.

5.2 Establishing knowledge protection mechanism

Strengthen the reasonable protection of the member's knowledge against plagiarism and cheating. Constrain their inappropriate behavior, so that learners understand their rights and obligations. Coordinate their cooperative learning by using appropriate methods to complement advantages of each member and realize knowledge sharing in the community, thus to promote learner's all-round development. Only under the premise of full respect and effective protection can the members make full use of the knowledge resources and develop their ability to integrate the knowledge of the community effectively. This premise serves to help learners, according to their own needs for different types of knowledge, to use tacit knowledge resources closely related to themselves to achieve knowledge recombination and acquisition.

5.3 Building a platform in favor of cooperative learning

Use modern information technology to establish a comprehensive information system, such as database, file management system, and information management system to connect knowledge resources of each individual through the network. The network can be used to help learners distinguish and determine general and professional knowledge they need to learn, and keep track of the knowledge disseminators and recipients in order to facilitate the interaction and cooperation among the members. Develop a variety of knowledge sharing methods, such as the activities of face-to-face exchange of

experience so as to promote cooperative learning in the learning community.

5.4 Developing corporate culture and establishing an open and flexible culture environment

Develop corporate culture and provide cultural support for the flow of knowledge among members. Due to the differences of culture, knowledge stock, skills and experience among the members, obstacles occur in the learning process of communication, interaction, and cooperation. The effective measure to solve the problem is to cultivate corporate culture to strengthen the corresponding cognition of learning. Meanwhile, an open and flexible culture environment enables learners to communicate with the outside world, which is conducive to spur learners on to continue the adjustment of their learning of culture and values and promote the knowledge flow and transfer. Correct values and a good learning environment can become the motivation for learning, which contributes to knowledge production, flow, application and innovation.

5.5 Establishing mutual trust and mutual learning mechanism

With the increasing of the learner's knowledge stock, the environment that learners get along with becomes more and more complex and changeable. In such a competitive and cooperative learning environment of the learning community, members must achieve the best balance between competition and cooperation, which requires their mutual trust and cooperation to establish an equal partnership in the cooperative learning. Cooperation helps to the rapid movement of knowledge flow and mutual trust plays a coordinating role to reduce the instability of cooperative learning, and lay the foundation for the stable development of learning community.

5.6 Developing a sense and ability of introspection

Introspection is also a means of self-evaluation. It can promote learners to test their knowledge and promote the innovation of learners' knowledge, which is conducive to the smooth progress of knowledge management. Learners' introspection is one of the key factors to success in learning. It guides learners to timely summation of the attitude, effect and result of their learning. When learners have the awareness and ability of introspection, the cooperative learning is easy to carry out.

6 Conclusions

Knowledge can be used only when it is acquired, and the thoughts and creativity of the people comes not only from the individual efforts, but also requires practice, inspiration and cooperation from a community. The essence is in fact a process of mutual learning in a learning community. The circulating flow of knowledge in the community provides the convenience for the learners to cooperate with each other. However, the generation, formation and flow of knowledge are not out of nothing, but the result of interaction of various factors. Through the application of knowledge management concept in cooperative learning, analyzing its influence and the characteristics of knowledge transfer, learners can improve the management of themselves and their ability of learning.

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An Evolutionary Game Analysis of Higher Vocational Colleges' Industry-Education-Research Cooperation Based on the Triple Helix Model

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Abstract: The process of higher vocational colleges' industry-education-research cooperation is dynamic and complex. In the process, there are multiple subjects. The key to the success or failure of their cooperation have a harmonious relationship with the cooperative subjects. Based on the triple helix model, this paper first identifies the cooperative subjects in higher vocational colleges' industry-education-research cooperation. Then constructs evolutionary game model on cooperative subjects, analyzes their game behaviors with bounded rationality in dynamic point of view, discusses their cooperative relationship, and researches their cooperation factors. Finally, some suggestions on their optimal cooperation are put forward.
Key words: Triple helix; Higher vocational colleges; Industry-education-research; Cooperation; Evolutionary game

1 Introduction

Higher vocational education is an important type of China's higher education, which plays a significant role in the development of the national economy in China. Higher vocational education cultivates high-quality technical skilled labor force, meets the demand of enterprise personnel, and promotes the development of technology innovation for small and medium-sized enterprise. In 2014, Opinions of the State Council on Decision on Speeding up the Development of Modern Vocational Education, pointed out those higher vocational colleges should strength the cooperation of industry, education, and research institutes, train the technology skill talented persons who service for developing area, especially technology research and development and product upgrading in small and medium-sized micro enterprise (State Council ,2014). In 2015, the Ministry of Education of the People's Republic of China issued the Action Plan of Higher Vocational Education Innovation and Development (2015-2018), indicated that it should deep the cooperation between colleges and enterprises, promote their cooperation in the field of cooperative running schools, cultivating person, and development (Chang-wen W, Cheng Z ,2015). Obviously, it is a very significant issue to set up industry-education-research cooperative mechanism effectively. However, the cooperative process of industry-education-research in higher vocational colleges is dynamic and complex. For example, the cooperative subjects have different resources, the cooperative information are asymmetric, and different cooperative subjects pursuer different profit. These barriers deterred the industry-education-research cooperation in higher vocational colleges. The triple helix model of colleges-industry -government describes the cooperative subjects' adjacent and collaboration, which can be used to analyze the subjects' cooperative behavior, and clarify the relationship among them (Etzkowitz H,2000). Furthermore, Evolutionary game theory differs from classical game theory by focusing more on the dynamics of strategy change as influenced not solely by the quality of the various competing strategies, but by the effect of the frequency with which those various competing strategies are found in the population (Smith J,1982). It is widely used to discuss on social habits and economic activity. As a result, this paper applies the evolutionary game theory, analyses on cooperative subjects' game behaviors with bounded rationality, discusses their cooperative relationship of industry-education-research cooperation in higher vocational education, and provides a theoretical support for their cooperative optimization.

The paper is organized as follows. Section 2 identifies the cooperative subjects by means of the triple helix model, introduces the evolutionary game theory, and creates the evolutionary game model of cooperative subjects. In Section 3 attention is turned to analyses the evolutionary game model of cooperative subjects, explaining influential factors of their cooperative. Section 4 takes cooperation with a higher vocational college and an enterprise as an example to discuss the effect factors on the college

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and enterprise. Section 5 puts forward some their cooperative optimization suggestions.

2 Applicability of Triple Helix Theory Model
2.1 Identifying cooperative subjects based on the triple helix theory
Since the 1980s, the theoretical analysis research on emerges in endlessly. Especially, Etzkowitz and Leydesdorff's Triple helix-concept of relations provides a neo-evolutionary model of the process of university-industry-government cooperation. The Triple helix is a spiral model of innovation. The core of the theory is to regard the government, enterprise and university as three basic elements of the national innovation system and economic development. The three basic elements have the obvious characteristics of interaction and self-converse. Their interaction is that government, enterprise and university exchange to produce knowledge. Otherwise, their self-converse is that government, enterprise and university have their own system to be capable of operating independently.

Cooperative subjects of industry-education-research cooperation in higher vocational colleges are the organizations and persons who participant in the cooperation, including government, enterprises, higher vocational colleges, and students. Based on the Triple helix's theory, the main subjects of industry-education-research cooperation in higher vocational colleges are government, enterprises and colleges. The government aims to promote the performance of system under the jurisdiction. The enterprise is a basic economic unit of regional development, who direct participants to regional economic competition and cooperation. As the most active subject, the enterprise drives the development of technology and economic. Meanwhile, employee training and introducing technological talents in enterprises depend on students in higher vocational colleges. It is the duty that higher vocational colleges cultivate high-quality talents. Therefore, higher vocational colleges must establish cooperative relationship with enterprises to teach practical training, and transform theory to practice.

2.2 Evolutionary game theory
Evolutionary game theory is a new theory that it combines game theory with dynamic evolution process. Different form traditional game theory, it does not limit participants to be perfect rationality and have perfect information. Originated as an application of the mathematical theory of games to biological contexts, it is arising from the realization that frequency dependent fitness introduces a strategic aspect to evolution. Evolutionary stable strategy (ESS) and optimal reaction dynamics are its core contents. In the process of repeated game, limited information individuals are regulated their games continually for maximize profit. They use more satisfactory thing instead of less satisfied situation continually, as a result, reached equilibrium. Recently, it has been used in the field of economy, sociology, and anthropology researches widely.

2.3 Evolutionary game model on cooperative subjects
Based on industry-education-research cooperation in higher vocational colleges, the paper discusses the cooperation between enterprises and higher vocational colleges with the government subsidies. It analyzes cooperation between an enterprise and a higher vocational college in detail. The evolutionary game has two sides. Side A is the muster of the enterprises in participant system. Side B is the muster of the higher vocational colleges in participant system. Both sides accorded with the following basic assumption:

1) Generally, in order to develop the regional economy, the local government designs the support police f. The index of the government offering to industries is θ, while the index of the government offering to higher vocational colleges is $1-\theta$. Here, $0<\theta<1$.

2) When there exists no cooperation, $\Delta\pi_1$ and $\Delta\pi_2$ is the profit of enterprise and higher vocational college respectively. $\Delta\pi$ is the excess profit of enterprise and higher vocational college. The index of industrial excess profit is m, while the index of higher vocational college excess profit is 1-m. Here, $0<m<1$.

3) The total cost of the industry-education-research cooperation in higher vocational colleges is c. The index of industrial cooperation cost is r, while the index of higher vocational college cooperation cost is 1-r. Here, $0<r<1$.

4) The strategy space of the industry and higher vocational college is $S=\{s_1, s_{2,}\}$. Here, s_1 is an actively participation in the cooperation; s_2 is a passive participation in the cooperation.

According to the above assumptions, the combination of higher vocational dynamic system formation on static game model's effect matrix as is shown in Table 1.

Table 1   Effect Matrix of University-Industry Cooperative Innovation

		Higher vocational college	
		s_1	s_2
Industry	s_1	$m\Delta\pi + \theta f - rc$, $(1-m)\Delta\pi + (1-\theta)f - (1-r)c$	$\Delta\pi_1 + \theta f - rc$, 0
	s_2	0 , $\Delta\pi_2 + (1-\theta)f - (1-r)c$	0 , 0

A side replicated dynamic equation is:

$$E(x) = x(1-x)\{y(m\Delta\pi - \Delta\pi_1) + \Delta\pi_1 + \theta f - rc\} \tag{1}$$

B side replicated dynamic equation is:

$$R(y) = y(1-y)\{[x[(1-m)\Delta\pi - \Delta\pi_2] + \Delta\pi_2 + (1-\theta)f - (1-r)c\} \tag{2}$$

3 Analysis on Evolutionary Stable Strategy of Cooperative Subjects

3.1 Evolutionary stable strategy analysis

According to Friedmam, equilibrium points of the group dynamic that described by differential equation system can calculate by the local stability analysis of Jacobian det (Friedrnan D,1991). Based on Eq. (1) and (2), the Jacobian matrix is calculated.

On the basis of the local stability analysis of Jacobian det, suppose $p = \dfrac{rc - \Delta\pi_1 - \theta f}{m\Delta\pi - \Delta\pi_1}$,

$q = \dfrac{(1-r)c - \Delta\pi_2 - (1-\theta)f}{(1-m)\Delta\pi - \Delta\pi_2}$, the equilibrium points can be calculated. The two-sides game has four local equilibrium points and a saddle point. They are $E_1(0,0)$, $E_2(1,0)$, $E_3(0,1)$, $E_4(1,1)$, and O (q,p), respectively. The evolution system track is shown in Figure 1.
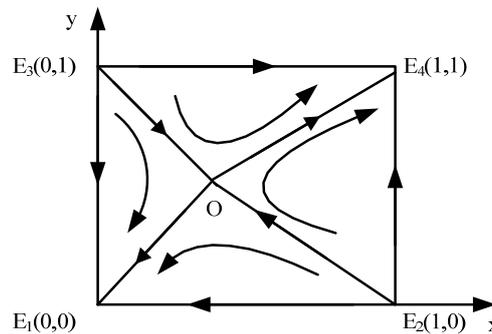
Figure 1   Evolution System Track

3.2 Analyses on evolution stability factors

1) The government affording support f, which can be financial subsidies or is preferential policy, will promote cooperative subjects to cooperate more actively.

Since $\dfrac{\partial S_{E_2E_1E_3O}}{\partial f} < 0$, $S_{E_2E_1E_3O}$ is the monotonic decreasing function off. From the Figure 1, if the

value of f increases, the area of $S_{E_2E_1E_3O}$ decreases. Thus, the two sides trend to choose the cooperation.

2) Cooperative risk is an important factor to block industry-education-research cooperation in higher vocational colleges. Enterprises tend to cooperate with higher vocational colleges in mature industries, while higher vocational colleges can give full play to offer human resources and intellectual support.

Since $\dfrac{\partial S_{E_2E_1E_3O}}{\partial c} > 0$, $S_{E_2E_1E_3O}$ is the monotonic increasing function of c. With the cooperative cost

increasing, the cooperative risks of two sides increase. Meanwhile, the cooperative system *is convergent* to $E_1(0,0)$ as well as the area of $S_{E_2E_1E_3O}$ increases. Thus, the probability of cooperation decreases. On

the other hand, since $\dfrac{\partial S_{E_2E_1E_3O}}{\partial \Delta\pi_1} < 0$, $S_{E_2E_1E_3O}$ is the monotonic decreasing function of $\Delta\pi_1$. Given mature industries, enterprises have gained higher profit $\Delta\pi_1$. Then, the area of $S_{E_2E_1E_3O}$ decreases, the cooperative system is convergent to $E_4(1,1)$, and the enterprise trend to build a cooperative relationship with the higher vocational college. Similarly, since $\dfrac{\partial S_{E_2E_1E_3O}}{\partial \Delta\pi_2} < 0$, the higher vocational college want to participant cooperation if it has more superior resources in the field.

3) With the increasing of excess profit, industry-education-research cooperation in higher vocational colleges is closer than before. The cooperation of industry-education-research has always existed. Simultaneously, when all factors are fixed, there is an optimal excess profit allocation proportion to support the cooperative system.

Since $\dfrac{\partial S_{E_2E_1E_3O}}{\partial \Delta\pi} < 0$, $S_{E_2E_1E_3O}$ is the monotonic decreasing function of $\Delta\pi$. Given mature industrial development, enterprises have gained higher profit $\Delta\pi_1$. If the excess profit increases, the area of $S_{E_2E_1E_3O}$ will increase, and they will trend to choose the cooperation. Furthermore, since $S_{E_2E_1E_3O}$ has a minimum, the prolixity of O point moving toward $E_4(1,1)$ reach the maximum, and the cooperative prolixity is maximum.

4 Case Study

To study the evolutionary game in detail, we take a college-enterprise cooperation as an example to discuss the effect factors, such as government support policy, cost and income distribution mechanism, on the college and enterprise.

1) We assume that the government's support policy f values range from \$0 to \$500,000 dollars; θ is 0.6; $\Delta\pi_1$ is \$500,000 dollars; $\Delta\pi_2$ is \$100,000 dollars; $\Delta\pi$ is \$5,000,000 dollars; c is \$3,000,000 dollars; m is 0.8; and r is 0.7. The effect of government's support policy on the cooperation is shown in Figure 2. The cooperative possibility of the college and enterprise increases more with the government's support enhances stronger.
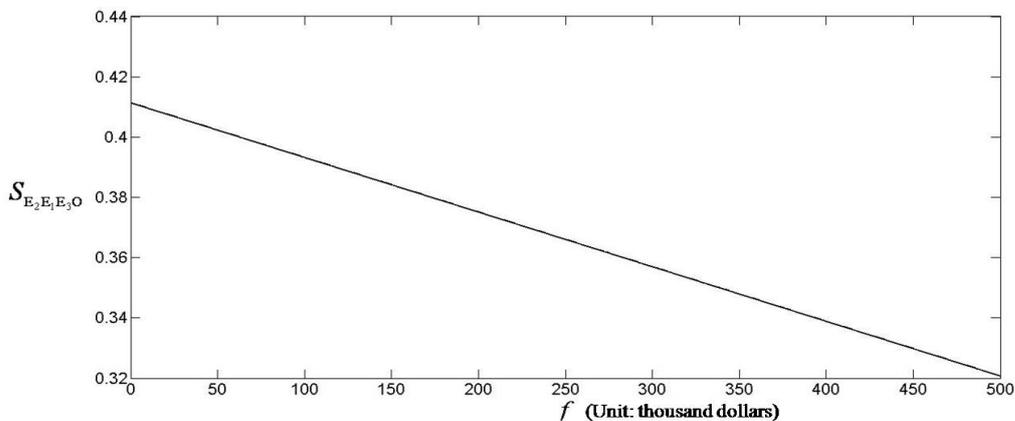
Figure 2   Effect of Government Support Policy on the Cooperation Between College and Enterprise

2) We assume that the research total cost c values range from \$1,000,000 to \$5,000,000 dollars; f is \$200,000; θ is 0.6; $\Delta\pi_1$ is \$500,000 dollars; $\Delta\pi_2$ is \$100,000 dollars; $\Delta\pi$ is \$5,000,000 dollars; m is 0.8; and r is 0.7. The effect of research cost on industry-education-research cooperation is shown in Figure 3. The cooperative possibility decreases with the research cost increase.
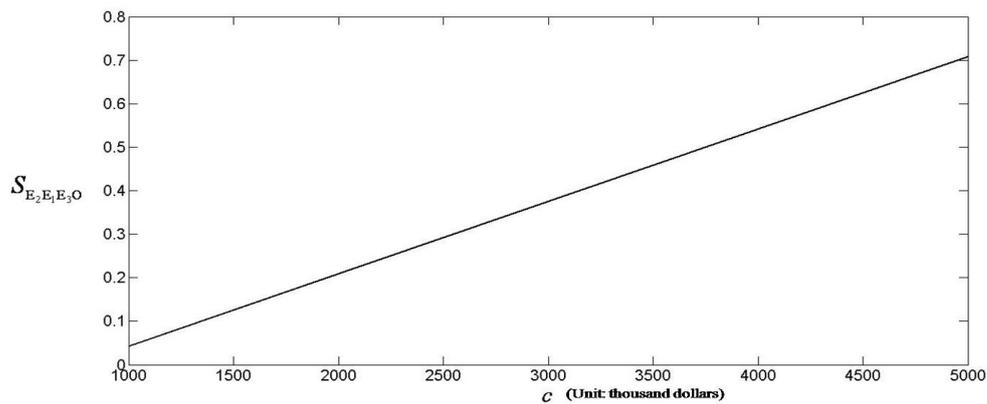
Figure 3   Effect of Research Total Cost on the Cooperation Between College and Enterprise

3) We assume that the index of industrial excess profit m values range from 0.1 to 0.9; f is $200,000; θ is 0.6; $\Delta\pi_1$ is $500,000dollars; $\Delta\pi_2$ is $100,000 dollars; $\Delta\pi$ is $5,000,000 dollars; m is 0.8; and r is 0.3, 0.5, and 0.7 respectively. The effect of research cost on the cooperation is shown in Figure 3. Rational profit distribution mechanism helps the cooperation between college and enterprise.
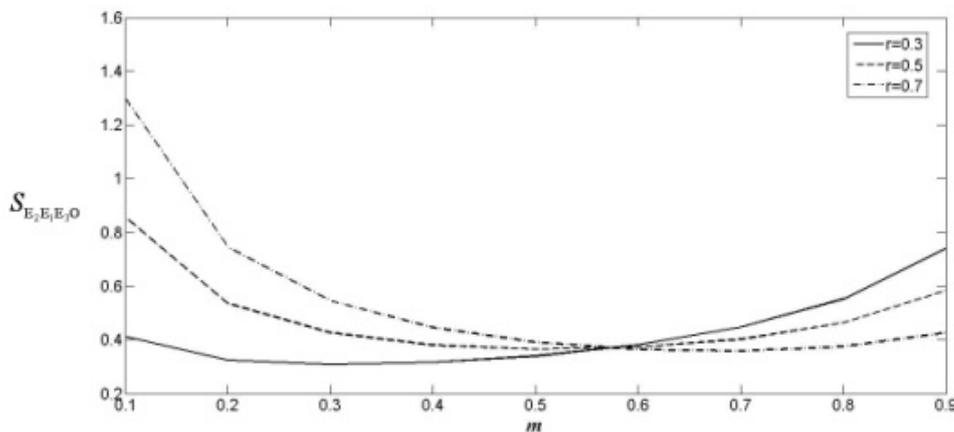
Figure 4   Effect of Profit Distribution on the Cooperation Between College and Enterprise

5 Conclusions

This paper takes evolutionary game theory to analyze the industry-education-research cooperation in higher vocational colleges. In order to promote the cooperation among the subjects, it can take the following measures. Firstly, develop market system construction that completing intellectual property protection system, setting up profit allocation and risk sharing mechanism, which can maintain the cooperative relationship stability. Secondly, create effective supervision mechanism in industry-education-research cooperation. And governments, bank credit departments and mass should supervise the participants' behaviors. Finally, construct rational profit distribution mechanism between enterprises and higher vocational colleges. If we can do these better, we will make progress in industry-education-research cooperation.

Acknowledgement

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A Study of Opportunities in the College Students Affairs from the Perspective of Industry-University-Research Collaborative Innovation

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Abstract: In the new period, college students affairs are faced with both opportunities and challenges. And promoting cooperative innovation has become a major measure to improve the quality of China higher education comprehensively in a new historical period. The research method literature review is adopted in this paper, and the status quo on industry-university-research collaborative innovation is introduced first in this paper. It is acclaimed by the author that industry-university-research collaborative innovation has its impact on college students affairs and promotes the development of the idea, pattern and team construction of college students affairs. At the same time, opportunities and challenges in college students affairs are reviewed and evaluated in this thesis, electing a new pattern of college students affairs from the perspective of collaborative innovation.

Key words: Collaborative innovation; College students affairs; Pattern transformation

1 Introduction

Colleges are shouldering the responsibility of cultivating qualified socialist constructors and reliable successors. And college students affairs is an important component of the educational work in colleges, which should advance with the times with pioneering spirit. Collaborative innovation embodies the integration of technology and economy, and the essence of knowledge economy. Collaborative innovation indicates a new thinking in the improvement of a nation's technical innovation capacity and is an inevitable development tendency of science-technology innovation. As an essential part of scientific research system, colleges are facing a major strategic opportunity to promote collaborative innovation. Meanwhile, innovative thinking should be made in college students affairs.

Since concept of collaborative innovation was put forward, it is embraced with enthusiastic response. And, the promotion of collaborative innovation and industry-university-research collaborative innovation has gradually become the focus of attention in the education circle.

In terms of the innovative significance of industry-university-research, Zhang Li claims (2011) that promoting collaborative innovation, especially facilitating strategic alliance, is both a top design of national strategy and a multi-lateral systematic engineering. A deep integration of resources in industry, university, research and other social aspects is demanded in collaborative innovation. At the same time, a balance between guiding exterior needs and stimulating endogenous power should be achieved, constantly constructing beneficial policy environment and social atmosphere in favor of the sound development of collaborative innovation. Xi Li and Yang Chenlu (2012) make a horizontal comparison the organization patterns of three types of industry-university-research collaborative innovation, that is, enterprise-dominate type, college-dominate type and research institution-dominate type. And, the operation mechanism of enterprise-dominate industry-university-research collaborative innovation has been deeply analyzed by them. All these provide a reference for enterprise-dominate industry-university-research collaborative innovation in various aspects and could further advance the development of enterprise-dominate industry-university-research collaborative innovation.

In terms of industry-university-research collaborative innovation implemented in colleges, Shen Lijian, et al (2013) claim that mechanism of industry-university-research collaborative innovation should be improved from the fields of deepening industry-university-research collaboration, constructing an information platform for achievement in scientific research and strengthening a reasonable overall planning. And his claim has been made on the basis of an analysis of difficulties and challenges faced by industry-university-research collaboration in colleges. Zhou Huali, et al (2010) discuss the industry-university-research collaborative pattern of a type whole-course enterprise involvement, a type of virtual enterprise in college, a type of school-government cooperation and a type of industry strategic cooperation in Being Union University. Liu Yuanguo (2010) thinks that educational

thought should be further transformed to deepen education and teaching reform. And a scientific objective of talents training should be determined, the practice training of college students should be strengthened and the structure of major should be adjusted timely. Close connection should be built between the local government, social enterprises and colleges, in order to effectively facilitate mutual development of local colleges and local economic construction. Zhang Shuichao (2014) makes a design of a system prototype of the collaborative innovation in local colleges based on the mechanism of target pattern and patter and target environment. Further, the spiral tactic strategic theory is applied to analyze possible routes for improve the collaborative innovation capacity of local colleges.

British scholars Geuna and Nesta (2006) publishes an academic paper *University patenting and its effects on academic research: The emerging European evidence*, and say that financial support from enterprises could be gained to advance the applicability of research achievements through collaborative innovation between colleges and enterprise. They claim that more academic achievement could be accomplished when new research areas are found out and explored.

German scholars Senano and Fischer (2007) propose an idea that synergy effect means cooperative behaviors of all sub-systems will generate a more powerful effect than that of individual sub-system in a big complex system, thus a unified and collaborative effect of a whole system takes shape and exerts exterior positive effect. This idea is included in their *Collaborative innovation in ubiquitous systems*.

British scholars P.D'Este and P.Patel (2007) find in their research that formal cooperative forms, like associated research and development, research and development outsourcing, technology license and joint venture company, are main forms of cooperative innovation. They claim that informal forms of connections (such as personal exchanges, achievements sharing, information communication and seminars) will be attached importance gradually.

A British scholar Etzkoeita (2008) puts forward a trebling spiral model theory, which proposed that inter-coordination should be made between colleges, enterprises and the government to push together the production, transformation, application, industrialization and upgrading of knowledge in a context of knowledge and economy. Etzkoeita says that all the three sides should play their roles well while the integration and multiple overall interaction of complementary resources are strengthened, and all these are the essential conditions for the construction of national innovation system.

2 Influence of Industry-University-Research Collaborative Innovation on College Students Affairs

2.1 Idea innovation in college students affairs promoted by industry-university-research collaborative innovation

To innovate working ideas and facilitate sustainable development of young college students is the common target of higher education at home and abroad and the new idea and new method in college students affairs at the background of industry-university-research collaborative innovation. In a new era highlighting collaborative innovation, capacities of knowledge innovation and technology innovation in college students should fostered in college students affairs. Besides, college students should be guided to establish the ideology of lifelong learning, master the method of acquiring new knowledge and explore students' potential in participating and adapting to reforms(John H·Schub, 2011). This idea establishes the dominant role of students and appeals to respect for the subjectivity of students. Students are guided to pay attention to their personality development and build their conduct pattern. Focusing on students' study and development and centering on the thirst for knowledge, creative thinking and practical abilities of students, this idea calls that every student should be guided to make his or her career planing and development program.

2.2 Team construction in college students affairs advanced by industry-university-research collaborative innovation

A sophisticated, scientific and powerful team is an indivisible part of idea upgrading, mechanism reformation and objective innovation of college students affairs. A team with collaborative innovation capacity for college students affairs is more needed in the development of industry-university-research collaborative innovation. Bearing the idea of industry-university-research collaborative innovation in mind, colleges are turning to reform their team construction and provide more intelligent support for the collaborative innovation (Hurtabo, 2003).

2.3 Pattern transformation in college students affairs facilitated by industry- university -research collaborative innovation

An excellent team has its scientific pattern to help make a function. For a long time, colleges are

exploring to improve and transform current patterns in students affairs. It is know that the strategy of industry-university-research collaborative innovation advocates guidance in innovating mechanisms in higher education and policy programs. A deep cooperation between colleges, scientific research institutions and enterprises is encouraged to be finished and strategic alliance in collaborative innovation is guided to be established. Then, resources sharing could be facilitated while major projects are united together to tackle key problems. Finally, substantial achievement will be gained in key fields.

3 Demands of Industry-University-Research Collaborative Innovation on College Students Affairs

Industry-university-research collaborative innovation is a major strategic choice which can promote the combination of education and technology, economy and culture. A better development of national higher education when the percentage of national science and technology innovation in a country renews and economic, social and cultural development requires a new environment.

3.1 Idea upgrading in college students affairs demanded by industry-university-research collaborative innovation

The higher education in China has transformed from the model of elitism to the model of popularization. At the present stage, especially when industry-university-research collaborative innovation strategy has been raised, new requirements have been put forward on talents cultivation by the communist party of China and Chinese government. Colleges should advance with the times, seize the opportunity of development, and propel high-quality talents cultivation program. A higher-level research strength should be given full play in innovation-oriented national construction. All these press for idea upgrading in college students affairs (Rita Colwell,2003). College students affairs should completely transform from the past pattern of experience affairs to the current pattern of academic research, from empiricism to collaborative innovation. Guided by multi-disciplinary theory, college students affairs should aim at technology innovation. Trivial matters in college students affairs should be scientifically integrated, and routine work in college students affairs should be systematically regulated (Gertner,2011).

3.2 Mechanism innovation in college students affairs demanded by industry-university-research collaborative innovation

To achieve the value pursuit in college students affairs powerfully guarantees a mechanism of collaborative innovation. The mechanism of college students affairs is cultivation-oriented, which focuses on establishing an all-member training pattern that covers the whole school and is based on the basic level. As a result, a multi-sector, multi-directional, mulit-layer and multi-context collaboration is formed to creatively unite effective operation in the middle level, lay a solid foundation in college departments and spare no efforts to break through problems in the overall development of students (Bruneel J, et al,2010). Measures should be taken initially to effectively improve students affairs organizations, then open the channel for industry-university-research collaborative innovation. Innovation should be made in adjusting the working model in college students affairs, providing support for industry-university-research collaborative innovation. Emphasis should be placed on consolidating the basis of students affairs, thus laying foundation for industry-university-research collaborative innovation.

3.3 Objectives innovation in college students affairs demanded by industry-university-research collaborative innovation

The essence of today education is to cultivate inter-disciplinary talents well developed in an all-around way, who are excellent in comprehensive qualities, character and learning, innovation spirit and high emotional quotient, with both political integrity and professional competence. Currently, higher education puts more emphasis on intelligent education than moral education, theories than practices. Then, it is hard to achieve the goal of fostering an overall development of talents and cultivating inter-disciplinary talents (Bruneel J, et al,2010). As a result, college students affairs should be guided by the idea of industry-university-research collaborative innovation, and objectives in students affairs should be innovated. At the same time, the cultivation of students' collaborative capacities should be given attention to facilitate collaborative development of college students, who are guided to consciously coordinate the unity of individual dreams and social development, harmony between emotion and rationality, study and work. College students also should be guided to finish their career planning actively and rationally, improve their collaborative innovation capacities. Conforming to development demands of industry-university-research collaborative innovation strategy, the goal of

cultivating sophisticated inter-disciplinary talents will be achieved.

4 Route Transformation in College Students Affairs Based on Industry-University -Research Collaborative Innovation

4.1 Establishment of students-oriented working idea

Students-oriented idea is the fundamental starting point and final destination of college students affairs, and the value pursuit in students affairs. In the context of industry-university-research collaborative innovation, the working idea should be transformed promptly to guide students timely.
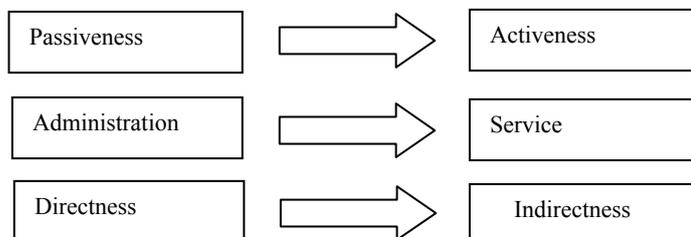
Figure 1   Influence of Industry-University-Research Collaborative Innovation on the Working Idea of College Students Affairs

Passiveness should be transformed into activeness. Measured should be taken to guide students to explore innovation programs. As one of the main subjects in industry-university-research collaborative innovation, college students should actively devote themselves into science and research activities. The working ideas of whole-journey nanny service and parenting style should be avoided in college students affairs. Students should be guided to think dependently and take initiative to explore science and research projects they are interested and actively participate in collaborative innovation.

Administration should be transformed into service. Measures should be taken to help college students to establish a scientific research platform. College students affairs plays an role of bridge connecting all subjects in industry-university-research collaborative innovation strategy, not a single subject role. College students affairs should be transformed from the model of administration to the model of service. And, the transformation will be reflected in new tasks of actively setting up a communication platform and a collaborative platform between students and professional teachers, students and scientific research institutions in industry-university-research collaborative innovation.

Directness should be transformed into indirectness to promote the establishment of collaborative channel in students. Industry-university-research collaborative innovation should aim at not only collaborative innovation between colleges and scientific research institutions, colleges and enterprise, but also collaborative innovation between internal organizations in colleges, different disciplines and enterprises, and students and their supervisors. College students affairs should be improve to encourage communication among students with different major backgrounds, collaboration between students with different discipline background and communication between college students and their supervisors. The, a channel for collaborative innovation in colleges will be opened, facilitating the progress of industry-university-research collaborative innovation strategy (Zheng Quehui,2008).

4.2 Refinement in the construction of students affairs management team

The direction of professionalism of college students affairs team is the premise of team construction. Professionalism of college students affairs team indicates the direct requirement of refinements in functions and distributions of labor in colleges. Professionalism of college students affairs team represents a historical choice of professional belonging and value in the process of developing the colleges students affairs team. Moreover, professionalism of college students affairs team provides powerful guarantee and effective support for industry-university-research collaborative innovation strategy. According to requirements of good political quality, excellent professional ability, strict discipline and upright moral integrity, colleges students affairs team should be built to be the core force of ideological and political work in college students and the backbone team in daily management of college students (Cui Hai,2008).

Persistence in the professional construction of college students affairs team is the foundation of college students affairs. And, a professional and scientific team is needed in industry-university-research collaborative innovation. Ideological and political work is the foundation and premise of college students affairs. And, professional construction of the team of college students affairs naturally reflects

professional requirements for ideological and political education. The working team of college students affairs should keep professional talents of ideological and political education at all levels, ensuring a professional team of college students affairs.

Sticking to the diversified development of the team of college students affairs is the key point. Students affairs is both a practical and comprehensive work and a technical and scientific work. Different majors make different requirements over students, and students from different discipline background are different in features. Under the requirement of industry-university-research collaborative innovation, the team of college students affairs should be diversified to achieve collaboration between different disciplines and complementation between different majors. A diversified team in college students affairs could help better guiding both study and life of college students, which conforms to the development requirements of industry-university-research collaborative innovation strategy in a better way (Zhang Wusheng,2008).

4.3 Working pattern transformed to guide college students to actively participate in industry -university-research collaborative innovation

The working pattern in college students affairs is mainly guided by discipline theories. A research-based and academic working pattern should be adopted to replace past traditional and empiric one. Management of students affairs should be combined with researches, systematizing complex trivial matters. Managing experiences of students affairs should be listed as achievements and managing practices should theorized actively.

An integrated environmental mechanism of college, family and society should be implemented, thus the educational function of society, family and schoolfellows can be given full play. Industry-university-research collaborative innovation strategy is in need of broad horizon and well integrated environment. Previous enclosed school-running pattern in colleges should be abandoned. And college students should be cultivated under the circumstances of a collaborative and harmonious context, in which college, family and society should be integrated. College students should be fostered according to school-running orientation, excised in the light of social demand and molded on the basis of family influence. Respect for individuality should be given to every student, in order to foster all-round developed talents for the new era. At the same time, requirement of collaborative innovation should be met.

Integrated guiding mechanism of moral education, intellectual education and physical education should be implemented to give play to the educational function of ideological education, professional study and scientific research practices. The educational function of college should be strengthened in this process. When cultivating students' individual character, attention should be paid to the molding of perfect personality. A sense of equality should be fostered among college students. Concerns should be given to students, as well as understanding and respect. A working pattern of students affairs, which focuses on construction of study style, should be established. The core status of the construction of study style in college students affairs should be built. The pivotal role of the construction of study style in the quality cultivation program of college students should be ascertained. Physical excises and physical quality of college students should be put emphasis. Physical education curriculum and physical excises should be carried out to enrich students' extra-curricular life.

Integrated working mechanism of class, students organization and scientific research team should be set up to give full play to the educational function of knowledge imparting, interest activities and scientific research tasks, thus improving the educational level in colleges. A tiered team integrated by talents, disciplines and scientific researches is needed in industry-university-research collaborative innovation. Students should be guided to combine curricular knowledge and extracurricular practices together, integrate interests and social demand and correspond scientific research tasks with social practices as required in college students affairs. Classroom learning could help college students to find out how to combine individual interests and social demands. Extra-curricular activities is beneficial for college students to find out how combine professional knowledge with social practices. And, college students could explore how to integrate their abilities with technology innovation in scientific research tasks.

5 Conclusions

When industry-university-research collaborative innovation is being promoted comprehensively currently, colleges across China is press ahead with collaborative innovation to varying degrees. The colleges are actively carrying out researches on teaching, construction of study style, improvement in the science and technology capacities and structural reform based on collaborative innovation. However, researches on the innovation of the working pattern of college students affairs are scarce. This thesis is

based on document researches relevant with industry-university-research collaborative innovation at home and abroad. The function of facilitating college students affairs by industry-university-research collaborative innovation is analyzed in this thesis. It is claimed that idea upgrading, mechanism innovation and objectives innovation are needed in college students affairs in the context of industry-university-research collaborative innovation. Further, a students-oriented idea should be established in college students affairs to guide college students to erect a correct understanding of industry-university-research collaborative innovation. The construction of the team of college students affairs should be refined, the working pattern should be transformed, and multi-directional and integrated working mechanism is complemented.

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Challenges and Innovations in Household E-Waste Management in Malaysia: A Comparative Review

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Abstract: The approach of this paper is to briefly look at the challenges in managing household e-waste in Malaysia and what can be done in terms of innovation management to develop a system that can effectively manage the recovery and treatment of the waste. First the paper looked at the definition and content of the e-waste itself and its impact on environment. The authors found that there is significant gap in terms of material recycling and recovery method between formal and informal material recovering facilities and it is very important for the government to look seriously into how they can solve this gap in order to protect the environment and human health in Malaysia. The paper also proposed innovative actions that can be taken by the relevant authorities to be incorporated in managing e-waste in the future. Malaysia should study systems that have been established internationally and use it as guidance to develop its own system. It is also imperative for Malaysia to ensure the sustainability of the system and to ensure an effective implementation and enforcement for the betterment of the environment in Malaysia and the future.
Key words: E-waste management; Environmental management; Technology; Management; Innovation; Malaysia

1 Introduction

As Malaysia is expected to become a developed nation in the future, it is very important for the country to develop a plan that will be able to sustainably manage its environment. The rapidly increasing volume of e-waste (electrical and electronic waste) is expected to become a serious threat to the environment in the future. It is imperative for the country to take innovative actions in order to develop a plan that will be able to manage this expected threat or challenges in the future. E-waste is expected to be among of the most challenging hazardous type of waste in the country.

E-waste is described as waste generated from electrical and electronic component assemblies that contain smaller parts or components such as accumulators, cathode-ray tubes, mercuric switches or sensors, polychlorinated biphenyl capacitors, electronic parts that are contaminated with cadmium, mercury, lead, nickel, chromium, lithium, or manganese. This definition is derived by Malaysia's Ministry of Natural Resources and Environment (MNRE) since 2005 and is still applicable until today.

Malaysia is expecting to be a developed country by the end of this decade through the implementation of Vision 2020. Rapid economic growth in the country, coupled with massive urbanization, has significantly increased the consumption of electrical and electronic equipment.

According to a research done by Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes (coordinated by Ministry of Environment in Japan), the generation of e-waste in Malaysia was expected to be around 800,000 tons from 2013 and increased to 1,000,000 tons in 2020. With this situation, e-waste has become one of the most challenging types of hazardous waste in the country[1]. Electrical and electronic industry is one of the main manufacturing sectors in Malaysia, this situation has significantly contributed to the higher amount of e-waste being generated and disposed (Brandt T & Sue Wei C. 2012). Developed countries such as USA (United States of America), Europe and Japan, legislation and system to properly manage and recycle e-waste have been well developed. Currently in Malaysia, managing household e-waste is basically a business that is driven by the market with less intervention from the government, even though there are some voluntary activities to recycle the e-waste (especially household e-waste).

In accordance to that, the system to be developed in the future should be an innovative system and able to manage the recycling and recovery of useful materials from electrical and electronic products being disposed. The system should also be able to improve the product's life cycle and to ensure that the

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[1] Asia E-waste Project. The E-waste Inventory Project in Malaysia, 2009. Available from: http://www.env.go.jp/en/recycle/asian_net/Project_N_Research/E-wasteProject/06.pdf [Accessed 8 September, 2016].

products will be properly disposed and treated to avoid contamination to the environment. In the next section, the authors will discuss in more details about the challenges and innovation in household e-waste management in Malaysia.

2 Challenges in E-waste Collection and Treatment

In country like Malaysia, e-waste is generated from premises such as business offices, housing estates, institutions and industrial areas. They are collected as a complete or dismantled unit. The dismantled unit was not collected as a whole but were being collected as separate components such as plastic casings, fittings, PCBs, metal part and copper cables.   However the completed units generated by all the above-mentioned premises (except industrial areas) is presently not collected by e-waste contractors licensed by DoE. This is because currently in Malaysia, the e-waste contractors only collected e-waste generated from the industry. Therefore separate legislation for household (business premises, housing estate and institutions are considered as 'household' in Malaysia) is needed in order to manage this type of e-waste. Figure 1.0 lays out the flow of Malaysian e-waste, from the point of where it is being generated to the point where it will be disposed. The diagrams indicated that there are gaps between licensed vendors facility (partial and full recovery facility) and informal recyclers.
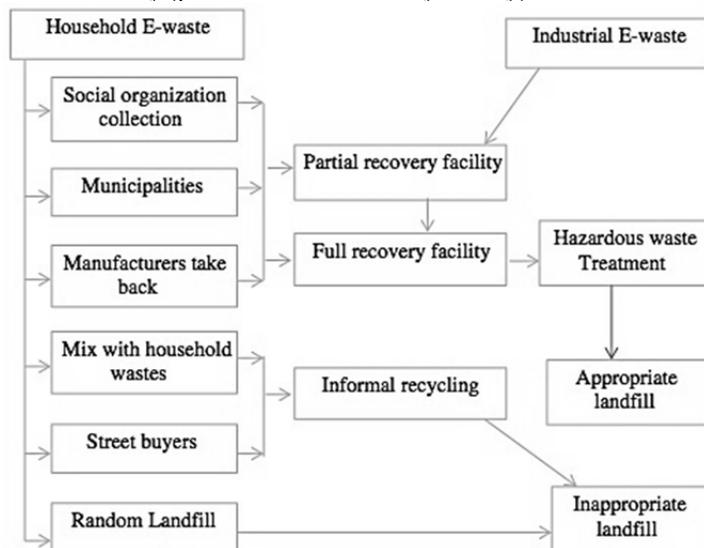
Figure 1   General Flow of Malaysian E-waste[1]

Still on Figure 1, household e-waste is collected from different sources for example collection activities from non-governmental organization, municipal waste collection by local authorities, retailers and so on. E-waste collected from household is sent to three different treatment facilities, partial recovery, full recovery and informal recycling facilities. While industrial e-wastes are directly sent to partial and full recovery facilities which later sent to appropriate landfill, the informal recycling facilities do not have proper process to treat e-waste and are hazardous to human and the environment. Due to this improper treatment, the e-waste thrown into landfill site has contaminated the environment through leakage to watercourses underground. Next, after explaining the general flow of Malaysian e-waste, the authors will show an example of e-waste recovery flow in Malaysia as shown in Figure 2 below.

Challenges in making sure that the e-waste goes to appropriate recycling or treatment facilities are vital to the future of environmental protection in Malaysia. This is due to many useful and valuable materials that can be recovered from the e-waste such as shown the Figure 2.0 above. With the advancement of technology the recovery of the materials become more effective and efficient thus the recovery process becomes easier and productive (Shumon, M. R. H., et al,2014).

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[1] Asia E-waste Project. The E-waste Inventory Project in Malaysia, 2009. Available from: http://www. env .go.jp/en/recycle/asian_net/Project_N_Research/E-wasteProject/06.pdf [Accessed 8 September, 2016].
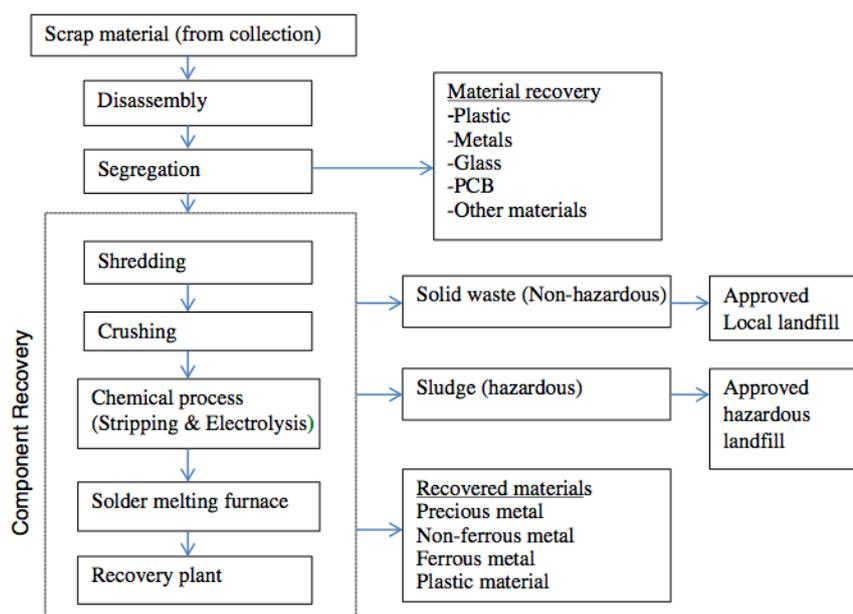
Figure 2   E-waste Recovery Process Flow in Malaysia [1](Shumon, Ahmed, Islam, 2014)

Malaysian government should take the challenge to further promote to the community to recycle e-waste. Currently the percentage of e-waste recycling especially household e-waste is still very low due to low awareness about the importance of e-waste recycling[2]. Many Malaysians currently just throw their e-waste into normal dustbins. An innovative methodology to promote the increase in the recycling rate is paramount to the future of environmental protection and resources recovery activities in Malaysia.

3 Innovation in E-Waste Recycling and Material Recovery

In this section, the authors will describe, in brief the process of e-waste recycling and material recovery as part of the challenges and innovation in e-waste management. Generally recycling process of e-waste is regarded as the processes of dismantling waste electrical and electronic products to recover the original reusable materials (Cui, J., & Forssberg, E.,2003). In detail e-waste recycling process is an intricate process that involves steps such as collection, testing, sorting, dismantling, shredding, crushing, melting to hone various materials so that the original material can be recovered such as shown in Figure 2(Hageluken, C.,2007).

Throughout the processes mentioned above, valuable materials such as gold, silver and copper can be recovered. A study done by Hageluken (Hageluken, C.,2007) for example, has found that most of the precious metals as mentioned previously are found in printed circuit boards (PCB). These valuable materials that can be found in PCB have attracted many informal recyclers to get involve in dismantling and recycling the e-waste. Unfortunately the process is normally done improperly with inadequate facilities. The PCBs contains hazardous and toxic materials and are harmful to human. This situation pose challenges to the authority to consider regulate the informal recyclers so as to reduce the risk to human health and also to the environment. Nevertheless the regulation shouldn't be too stiff, which in the end scare them away from the activities. Informal recyclers such as scavengers do play significant role in Malaysia's household e-waste collection.

Innovation in recycling technology now enable the process of recovery of up to 95% of useful materials from electrical and electronics equipment. The use of Plasma Waste Treatment technology for example, offers a very promising technology to treat hazardous waste in the near future (Tippayawong,

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[1] Reclaimtek (M) Sdn Bhd. WEEE recycling technology in Malaysia. Asian Electrical and Electronics Green Society, 2009. Bangkok, Thailand. http://www.thaieei.com/eeidownload/conference/PPT _Room%20A/7_ WEEE% 20RECYCLING_2003VER. pdf. Accessed on 31 August 2016.
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N.,2009). The innovation in using thermal plasma technology enable the e-waste to be converted to combustible gas with solid residues that can be use in other industrial processes. With this technology a massive loss of volume and weight of the e-waste can be achieve easily in a single set-up without involving any other third party processes. This is the type of innovation in recycling technology capable of contributing to significant savings in the future and capable to significantly acquire valuable and recyclable materials as well as energy generation from the e-waste. Table 1 presented the different percentage of energy savings by materials recycling.

Table 1   Energy Savings from Recycling and Recovery of Various Materials in E-Waste (Cui, J., & Forssberg, E.,2003)

Materials	Energy (savings in percentage %)
Aluminium	95
Copper	85
Iron and steel	74
Lead	65
Zinc	60
Paper	64
Plastic	>80

In developed countries, this process is carried out formally and supported by intense awareness in environmental protection among the community. In countries like Japan and Switzerland, recycling activities are done using high technology and are very save to the environment (Aizawa, H. ,2008; Andreola, F. ,2007). However the technology used by these countries involved high capital investment. Asian countries do not have much choice except to find ways to invest in high capital investment to manage waste in order to protect its environment in the future. A study has shown that in USA, the cost of e-waste recycling in the country is ten times more expensive than in Asia (Jain, A.,2008). This is due to the difference in terms of technology, processes and other related activities being used in both continents. However in less economically developed country, such as India and Malaysia, majority of the household e-waste recycling activities are being done by informal sector whereas in Japan and USA for example, it has been done in licensed recycling and recovery facilities. Among the reason why this scenario happened is because of the absence of legislation to control e-waste recycling that makes it compulsory for the community to segregate and recycle e-waste.

With the advancement of technology since late 1970s the popularity and usage of electrical and electronic devices is expected to increase significantly throughout the world (Ongondo, F. O. ,2011). With the increase in volume of electrical and electronic devices, the life cycle of these products becomes shorter due to competition among the manufacturers and the rapid technological changes that contribute to the increase in e-waste volume (Mallawarachchi, H.,2012). This phenomenon has alerted many countries around the world to take action, both in terms of how to protect the environment and recycle the waste (Osibanjo O.,2007). The incorporation of creative and innovative Design for Recycling method for the electrical and electronic product also needs to be taken into consideration. The government for example can offer incentives and introduce legislation onto products that are design with recycling in mind to further encourage manufacturing companies to adopt the method.

The approach to incorporate such innovative initiatives in dealing with e-waste is very important to ensure the sustainability of this effort in the long run. Furthermore, hazardous substances available in e-waste will eventually cause harm to the environment if action is not taken. Significant increase in terms of volume from electrical or electronic appliances being thrown to landfill site without proper treatment will bring disastrous impacts to the environment. Contaminated substances in e-waste components may leak into the soil through the watercourses, causing contamination of soil and water and is harmful to the human and animal health. Even small amount of e-waste disposed into the landfill sites may contain a relatively high amount of contaminated materials and has the potential to harm the environment (Janz, A.,2008). A study done by non-governmental bodies in USA, such as Basel Action Network (BAN) has proved that 70% of heavy or contaminated metals found in landfills site in USA mainly came from e-waste (Puckett, J.,2005).

Besides being thrown into landfill sites, e-waste was also being disposed of in waste treatment

facilities such as incinerators. Liquids such as flame retardants and chlorine elements which can be found in plastic casing, can caused the release of dangerous gaseous through combustion or pyrolysis processes such as dioxins, polycyclic aromatic hydrocarbons (PAHs), furans and polyhalogenated aromatic hydrocarbons (PHAHs) and hydrogen chloride which can contaminate the air through smoke and dust (Robinson, B.H. 2009). These hazardous substances may also affect human's system through consumption, breathing and physical contact (Robinson, B.H. 2009). In addition to the said situation, in a recent discussion in May 2016 between the authors and incinerator operators in Malaysia also revealed that water content in Malaysian municipal solid waste is very high, resulting the contamination to become even worst. Due the richness of water content in Malaysian municipal solid waste, the e-waste has to be segregated from other types of waste, which later resulted in the cost of recycling to become even higher. E-waste recycling provides opportunities for lucrative and profitable business for many people in this country. E-waste has become a sought after by-product of municipal solid waste. This has caused in the increase of informal e-waste collectors and recyclers in Malaysian waste management market.

An effective e-waste management system especially for household e-waste is very much needed for the country. There is already a system or act available for industrial e-waste but not for the household e-waste. This system needs to be establish even though it seems to be a complicated task due the high cost involved and difficulty in the implementation and enforcement for the system (Wath SB, Vaidya AN,2010). Domestically, the government through Department of Environment (DoE) is currently undergoing a comprehensive research to manage household e-waste. Internationally many countries have done research on how to manage e-waste such as in North Asia, Europe and North America. Liu et al. (Liu X, Tanaka M,2006), for example, has done research on progress of e-waste management in China, and the challenges that are to be overcome there. Taghipour et al. (Taghipour H,2012)., studied e-waste management challenges in Iran, and discussed strategies to improve the activities involved. Terazono et al. Terazono, A,2006), documented a study on the status of e-waste and related issues in Asia. In Korea, Lee et al.(Lee J-c, Song HT,2007), studied the recycling of bulky e-waste equipment such as washing machines, refrigerators, air conditioners and televisions. The study reveals findings related to current issues in e-waste management and ways to solve it. Kahhat et al. Kahhat R, Kim J,2008), studied and compare e-waste management practices in developed countries in Asia, Europe and USA. There are many other significant researches that have been done with regards to this matter but the attention given to this research is very low. These academic researches and discussions should be use as guidance and possible roadmap to help improve and innovate new and better ways to manage e-waste in Malaysia.

4 Conclusions

With the increasing amount of e-waste being generated on a daily basis, managing e-waste has become a challenge to Malaysia. The country needs a formal legislation and system to manage its household e-waste. The system has to be an innovative system that is able to manage the recovery and treatment facilities available. Currently there are significant gaps in terms of the method and technology being used between the formal and informal players in this industry. The design of the electrical and electronic products also need to adopt a method that will make it easier and productive for the recyclers to recycle the product such as introducing Design for Recycling methodology in product design. Even tough technology has evolved and the method of recovery and recycling of e-waste has improved, the government and community still have to aggressively promote and support the recycling activities. The recycling rate in this country is still very low compared to other developed countries.   Many studies on facing the challenges and innovation in e-waste management have been done throughout the world. Malaysia should use these studies to compare and guide the country to develop the best system in managing its household e-waste in the future.

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Evaluation of PLM Technology Components Requirements:
A Case Study in Automotive Components Manufacturing Company

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Abstract: Automotive industry is facing tough challenges due to economic downturns. Globalization and implementation of AFTA in this region had put Malaysia local automotive manufacturers into a much tougher situation where delivering better and quality products had become a must to ensure staying competition in the market. The chain impact has extended to automotive components suppliers whose must not only compete for lower product cost; they also have to meet the required quality and delivery lead-time. In order to fulfill more stringent requirements given by automotive manufacturers, automotive components manufacturing companies explore the PLM (Product lifecycle Management) solution adoption in order to improve productivity and efficiency. PLM defines as a strategic business approach that applies a consistent set of business solutions to support the collaborative creation, management, dissemination and use of product definition information across the enterprise from concept to end-of-life. Companies that successful in dealing with these PLM related issues report benefits such as increased innovative ability, shorter time-to-market, increased profits, less engineering changes late in the lifecycle, less product faults in the field and higher efficiency. PLM is a strategic approach driving organizational change that leads towards operational excellence. However, PLM adoption is not easy but rather complex. This qualitative research was conducted in a local automotive components manufacturing company that studied its PLM requirements in order to determine the suitable PLM technology components for adoption to improve production lead-time and product quality. The results of this case study showed that change control, improve communication, reduce error, meeting company policy and industry compliance and better decision making were the key challenges to be addressed by company using PLM. Researchers mapped those PLM requirements to the PLM solution in order to identify the suitable PLM technology components for implementation. The outcome of this research can be used as a reference case study for the automotive components manufacturing companies that having similar PLM requirements and challenges.
Key words: Product Lifecycle Management (PLM); PLM Technology; PLM implementation; Automotive industry

1 Introduction

Automotive industry is one of the most important industries in Malaysia. It has seen as the primary driving industry to bring the manufacturing sectors towards industrialize. Globalization and implementation of AFTA in this region had put Malaysia local automotive manufacturers into a much tougher situation where delivering with better quality products, lower product cost and shorten time to market had become a must to ensure staying competition in the market. MAI 2010 reported that the country has higher import than export of the automotive components. In order to close up the gap, the local component manufacturers are looking into sustaining their capability to meet the local demands, and at the same time improving their competency and to grow the export market. These have resulted the local automotive component manufacturers' start looking into technology adoption not only to compete with lower product cost but also to meet the product quality and delivery lead time.

PLM concept offers comprehensive solutions to help enterprises address their challenges and create competitive advantage. CIMdata, the global leader in PLM consulting, defines it as a strategic business approach that applies a consistent set of business solutions to support the collaborative creation, management, dissemination and use of product definition information across the extended enterprise from concept to end-of-life (Matteo, 2012). PLM allows the enterprise to create, capture and share the product-related requirements, expectations. Knowledge and "lessons learned" are captured for potential re-use in a process of continual innovation. Companies that are successful in dealing with these PLM related issues report benefits such as increased innovative ability, shorter time-to-market, increased profits, less engineering changes late in the lifecycle, less product faults in the field and higher efficiency (Ronald, 2005). In short with PLM adoption in placed it enables enterprise to achieve business goals related to costs reduction, quality improving and time to market shortening, during the

innovation of products, services and business operations (Matteo, 2012).

However, many companies struggle with adopting and implementing PLM (Ronald, 2005). A major reason is that PLM affects a wide range of processes within and outside the company. This makes PLM a complex organizational change effort (Ronald, 2005) and Grieves (2009)emphasizes that PLM implementation requires four aspects to be coordinated: people, processes, practices, and technology (Batenburg, 2006). The challenges of PLM implementation can be related to the technology on one hand and business strategy on knowledge information management on the other hand (Hannu, 2009). This instead led to the perception in most of the automotive component manufacturing companies where implementing PLM is huge and massive in identified the right solution along with its appropriate roadmap. They recognize the needs and the important but it is always time consuming for them to evaluate the right solutions that would mapped into their environment. They are looking at standard out of the box (OOTB) solutions which embedded with industry best practices as the reference guideline to shorten the pre-evaluation process in selecting the PLM technology components. Therefore the objectives of this paper is to identify the PLM requirements in local automotive component manufacturing and perform the solution mapping in order to determine the suitable PLM technology components for adoption that could address the needs in this industry.

There are many assessment in related to PLM adoption in evaluating its maturity state were discussed about business alignment for People & Culture, IT infrastructure, Management, Process and tools (Ronald, 2005; Batenburg, 2006; Hannu ,2009; Anneli ,2009; Anneli ; 2011) prior to the PLM implementation. However there are not many research papers related to the evaluation of the PLM technology components especially in mapping to the PLM requirements. In this paper the researchers focused on assessing the PLM requirements in local automotive component manufacturer in order to determine the suitable PLM technology component for adoption. The objective of this research is to identify the typical challenges where the local automotive component manufacturer would like to improve and subsequently mapped the requirement with the related PLM technology component to provide as a guideline in PLM implementation. The outcome of this research can be used as a reference case study for the automotive components manufacturing companies that having similar PLM requirements and challenges.

The main research questions of this study are:
1) What are the most concerned business challenges in automotive component manufacturer?
2) What are the PLM technology components that would address the needs for automotive component manufacturer?

2 Literature Review
2.1 Industry background
Automotive industry is one of the most important industries in Malaysia. As reported by NAP (2014) (NAP, 2014), in 2012, automotive industry has contributed 3.2% to GDP, it is forecast that the industry will contribute 10 per cent to the country's GDP in 2020 where the vehicle production is expected to increase to 1.35 million units. There are more than 700 components parts manufacturers producing more than 5000 parts locally. In 2012, there are about 45 vendors in the automotive component industry who has the capabilities and competency to design and develop, source components and part and manufacturer the whole module/component both for the original equipment and replacement market.

Today apart from the radical process of consolidation and liberalization portraying the introduction of ASEAN Free Trade Agreement (AFTA) and World Trade Organization (WTO), the local automotive is also hit by the rapid technological changes, alliances and acquisitions (Talib, 2012).The inevitable rapid changes in the global landscape of automotive industry must not only be seen as challenges but also as opportunities because many of the major international manufacturers are actually outsourcing their component sectors (Talib, 2012. Given the opportunity of larger market for automotive part supplies, the Malaysian automotive components manufacturers ought to venture into gaining the competitive edge, aiming for larger market penetration and to play a serious role in the global automotive industry. The strategy to achieve these objectives is by producing high quality automotive parts at competitive cost. Having said these, the local car manufacturers need to enhance the quality of their processes, and the quality of their automotive parts so as to meet the demand for high quality supplies in both local and global marketplace (Talib, 2012.

Although, the Malaysian automotive industry expanded in terms of sales, production, employment and local content, however failed in industrial upgrading and international competitiveness. The failures

can be attributed to (a) lack of political promotion for high challenge-high support environment, (b) low technological and marketing capabilities and (c) limited participation in the global value chain (Wad, et al, 2011) NAP 2014 aimed to increase market access for the domestic automotive industry, promote product recognition and local branding in targeted countries while encouraging transfer of technology. In view of the dynamics in automotive technology development, it is necessary to develop a domestic automotive industry that is responsive to change and latest technology application. To ensure the sustainability of the domestic automotive industry, the focus will be on strategies to drive exports. This will include improvements in the (i) Quality management system; (ii) Operational management system; (iii) Business management system; (iv) Testing and validation capabilities (NAP, 2014).

2.2 PLM requirement

The automotive industry is facing new and pressing challenges. Globalization, individualization, digitalization and increasing competition are changing the face of the industry as we know it. In addition, increasing safety requirements and voluntary environmental commitments by the automotive industry will also contribute to the changes ahead. Size is no longer a guarantee of success. Only those companies that find new ways to create value will prosper in the future (Gallasch, 2004).

Automotive suppliers have responded to these pressures by seeking new ways to strictly contain costs without sacrificing innovative, feature-rich products and platforms. With the demands for faster innovation, higher quality and increased regulation, it becomes apparent that the winning automotive suppliers will be those that leverage product innovations to rapidly develop new platforms and win new programs (E. M. O, 2009).

PLM provides a measurable and tangible return in many areas for an automotive supplier. The following investment and potential return framework is based on a $2.5 billion international automotive supplier with multiple divisions (E. M. O, 2009). This has led to the needs for the local automotive components manufacturers exploring the Product Lifecycle Management (PLM) to assist them in achieving product innovation and operation excellence. PLM enables companies to manage information about their products from initial concept through to manufacturing and after-market service within a single source of truth. Benefits of a PLM implementation can be seen throughout the new product development (NPD) value chain. They include: (i) Competitive advantage and faster time-to-market through streamlined global collaboration, automation and greater process efficiencies; (ii) Improved product quality at a lower cost through re-use of materials, components and product intellectual property (IP); (iii) Cost savings resulting from a consolidated supply base with fewer, more strategic suppliers and partners; (iv) Tracking, measurement and reporting of critical NPD process metrics; (v) Adoption and standardization of best practices for NPD processes; (vi) Systematic project and program management to ensure profitability (E. M. O, 2009).

Even though it is reported PLM will bring great values to the company however due to its magnitude of transformation a controlled and proper PLM implementation can be very challenging in practice (Batenburg, 2006; P. H. J, 2012. Baker (2002)(M. Bokinge, 2012;　E. M. O, 2009; Gallasch, 2004) stated that "nobody could have foreseen how big, messy, and tough this project would turn out to be". The reason is mainly due to lack of clear understanding of what PLM is and how it could fit with the needs and requirements of the companies in terms of product management. The key success of PLM implementation lies in the selection of right PLM tools that fits into the organization culture and processes. However, each organization's business requirements and objectives are different(Matteo, 2012). In this context, it is important to assess the PLM requirements to be addressed in automotive component companies in order to mapped its requirement and identify the right PLM technology components.

3 Research Methodology

The research model was structured as follows: the first section was to carry out the interview at the identified case study company. A set of semi-structured research questionnaires was prepared as a guideline prior to the interview.　The content of questionnaires was related to the PLM requirements that identified through the literature reviews and researchers working experience in the related industry. These questions perspectives could be categorized into simple, yet most profound indicators such as, Quality, Cost and Time which needed to be monitored, controlled and optimized. The study was based on a case study research and the target focus group was a local automotive component manufacturing company. The study utilized an action-oriented approach. The target respondents were the company management who could provide insight view of the company vision. Subsequently, in the second section,

based on the interview result the researchers performed interpretive research methods to analyze the data using four-step procedure of gathering, categorizing, analyzing and finally mapping the data to the PLM components available in the PLM solution portfolio offered by the PLM solutions provider. The data collection was to achieve interpretation and organized the data to form a case description. Our research interest was to find out a PLM requirement in a local automotive component manufacturing company. In summary, the following Figure.1 was the research approach adopted by researchers:

Figure 1   Research Approach

4 Data Collection, Analysis and Results
4.1 The case company
The case company is an Engineering Company (EngCOM) specializing in designing, manufacturing and producing of automotive suspension components. The parts produced are supplied to both OEM and REM local and export marketing. The team is divided into research and design team who are focus on develop new and improve of the existing products, and product development team who will be stationed at plant to managed and coordinate daily operation at the plant. Currently the used IT systems include Enterprise Resource Planning (ERP), Multi CAD tools for 2D/3D Design, CAE tools, project and document management in excel as well as custom made RFQ software. One of the main challenges recognized is how to integrate the PLM with the existing data system. There are 3 respondents participated the interview. They are Head of R&D Department, Project Leader and Design Engineer. The respondents are having at least 3 years and above working experience in its related field. The identified respondents should be the key persons in the organization and they are representing the top management, middle management and executive level.

4.2 Research findings
The major concerns in EngCOM are (i) Past Project experience and configuration is known only to a few senior users. This does not allow for optimal IP re-use and capturing the lesson learned; (ii) Huge database for part/BOM and its related specification, the part/BOM management only known by the dedicated person. This make the search process difficult and time consuming; (iii) Document and Project management are under manual file based system, this does not provide audit trial in tracking project deliverables and document traceability across the project development from RFQ to Product design and development till Prototyping and Production; (iv) Manual SOP management in managing the Engineering Change. All changes will be documented in the amendment log and kept by respective department. This again information is not stored in centralized system and there is no governed workflow to automate the review and approval process; (v) The visibility of related dash-boarding on status report and progress for the management make the decision. In summary, the key mission for the case company that would like to achieve in adopting PLM are better quality control to meet customer requirement and achieve lead time in the project delivery. The respondent feedback has been transcript in the Figure 2 below in according to the research approach i.e. Gathering, Categorizing, Analyzing and finally Solution Mapping.

4.3 Results
Based on the feedback gathering, researchers categorized the PLM requirements into five main areas (i) Change Control in-placed (ii) Improve Communication (iii) Reduce Error (iv) Meeting Company Policy & Industry Compliances (v) Better Decision Making. Continuously, based on the analysis data above researcher mapped the PLM requirements in accordance to the PLM technology components as made available in the PLM solution portfolio (D. Systemes, 2016). In summary the PLM technology components which have identified here are summarized in Table 1.

Figure 2   Research Findings

Table 1   Summary of Required PLM Technology Components

No	PLM Technology Components	Descriptions
1	Platform Collaboration	Portability-online data access Data driven in single source of truth Dashboard: view the status update in real time
2	Project/ Program Management	Integrated Project Management
3	EBOM Management	Synchronize of CAD product structure with EBOM
4	Engineering Change	ECR/ECO integration-Change Management
5	CADx Integration:	Robust Multi-CAD integration

The solution portfolio is designed in such with role base for instance Project Manager/ member, Product Manager/engineer, Cross functional team and Designer. With the identified PLM technology components, it will help the organization in achieving the following goals:
● Improve user productivity and time-to-market through data-driven applications
● Securely provide design information to suppliers and customers
● Collaborate around real-time design information or other information related to design
● Manage work-in-progress data for design teams located throughout the world
● Manage collaborative projects involving internal and external teams of prospects, customers, suppliers and partners
● Immersive user interface inside the CAD application allowing designers to get benefits of a PLM system without modifying their business processes
● Drive a phased-base decision making process using process templates with predefined phases, gates and milestones
● Provide real-time access to project status for rapid analysis and decision making

5 Discussion
This research was based on one local case study. The results might not be able to reflect the entire local automotive component industry. The researchers would suggest the identified PLM technology components in this paper could be served as an initial platform to be considered to kick-start the PLM implementation in the organization.

However, for today's global automotive enterprise, the complexity of automotive product design and development continues to increase as advances in electrification, software and connectivity become integral to innovation. With increasing product complexity, automotive product development is no longer just about mechanical components. Manufacturers need a different approach for managing the

design, development and release of mechanical, electronics, software and hardware components (Aras Corp, 2015). This means that solutions for EBOMs and MBOMs, change management, requirements and configuration management, technical documents, application lifecycle management (ALM) and more can all be linked together across electrical, mechanical and software/firmware disciplines (Aras Corp, 2015).With the statement above, researchers recognize that others requirement which did not captured in this case study like requirement management, configuration management, sourcing management, bidding management, system integration and etc. can be seen as an add-on modules to consider in the next phase of project implementation upon the foundation of the mentioned PLM technology components has adopted.

Today's winning automotive manufacturers gain true value from a PLM platform and a complete set of capabilities for multi-disciplinary product development (Aras Corp, 2015). The current research paper is only covered the preliminary stage of PLM technology component identification and yet there are more to be considered subject to the organization direction. The future research could also investigate how to integrate the necessary business alignment in the later stage and the relationship or the precedency of each technology components along implementation process.

6 Conclusions

This research is a qualitative case study research to identify the typical challenges where the local automotive component manufacturer would like to improve and subsequently mapped the requirement with the related PLM technology component to provide as a guideline in PLM implementation. The research has achieved its objective to address the research questions below:

1) What are the most concerned business challenges in automotive component manufacturer?
Findings: Change control in-placed, Improve Communication, Reduce Error, Meeting Company Policy and & Industry Compliances and Better Decision.

2) What are the PLM technology components that would address the needs for automotive component manufacturer?
Findings: Platform Collaboration for data driven in single source of truth and real-time Dash-boarding status update for decision making; Project Management for online project team collaboration and improve communication, EBOM Management for better traceability in part relationship and improve search capability for IP re-used;   Engineering Change with better control in audit trial for review and approval; and CADx Integration for better revision and version control as well as CAD product structure synchronization with EBOM.

The outcome of this research can be used as a reference case study for the automotive components manufacturing companies that having similar PLM requirements and challenges.

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Developing a Method to Evaluate the Performance of Affordable Housing Project

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Abstract: housing is one of the most important issue for very one and often is the largest single household expenses. It is basically more than a shelter which combines environment and life style and facilitate people access to the services and work opportunities. Besides, housing is considered a major item in public budget and major pubic investment are needed to create, maintain and services residential areas (ARA,2011). This study focuses on affordable housing area which tries to provide shelter for low-income population of a society. The study tries to present a model to evaluate the satisfaction of three different stakeholders in affordable housing market as: society/ government, residents and company which provides affordable housing services. The model will be implemented later in three different countries: Finland, Poland (city of Warsaw) and China (city of Wuhan). Therefore this study also presents the current situation of affordable housing system in those mentioned countries.
Key words: Affordable housing; Stakeholders; Customer satisfaction; Sustainable competitive development

1 Introduction

There are two approaches towards housing market: first is to let market mechanism adjust by itself without considering guarantee for low income papulation to have a shelter. Therefore, this approach brings social problems in short time and forces some part of society to live below living standards. Second approach is to consider a responsibility for government to provide proper house for low-income population of society. Government and municipalities in different counties allocate tax revenue to support low-income people with decent shelter. So, they have suitable tools to subsidize low- income population to live in a house with a good living standard. This thought considers social safety net concept (Forss, T. 2013)[1].

One of the keys to sustainable development and economic growth in any countries is the access of different people to a decent houses and affordable housing ensures 'a decent home for every household as a price they could afford (Scanlon, K., Whitehead, C. & Fernandez Arrigoitia, 2014).

Apart from residents (customers) two other stakeholders play role in affordable housing project: government (municipality) and companies which provide affordable housing services. A successful AH model is the one in which all the need of different stakeholders is satisfied. In other world, in order to establish a successful AH project, the need of these three stakeholders should be identified and satisfied at the same time. Even though, sometimes these three stakeholders have different motivation and conflicting interest.

The AH studied once carried in Finland in 2012 in comparison with the same study in Chania and Thailand. In that study a triple helix model was proposed to evaluate the satisfaction of different players. However, the AH studies is a longitudinal studies and has to be carried out in specific period of time to evaluate how much AH project made progress towards its goal and what would be improvement priorities for the next coming planed period.

This study presents how different stakeholders could be evaluated in AH model. Later on, the AH situation in three countries (Finland, Poland and China) will be presented. The contribution of this paper is to demonstrate Finnish affordable housing as a good and advanced example and support other countries to follow the same way to success.

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2 Sustainable Competitive Advantages

In today's turbulent business environment, companies' main goal is to stablish a business to obtain sustainable competitive advantage rather that a temporary competitive advantage. One of the latest approaches towards sustainable competitive advantages is resource based view (RBV) which is introduced by Wernerfelt 1984. Wernerfelt believes that analysis a company from the resource side has more benefit rather than from the product side. The key point in RBV is that the firms are different even within an industry. These differences among firms come from their resource and if a firm has advantages in something, should use it (Wernerfelt,1984). As the resources and condition of AH project are different from one country to other, therefore RBV approaches could be useful to evaluate and improve AH in different area.

3 Method to Measure the Performance of Three Different Stakeholders in AH Project

In the study which is conducted in Finland in 2012, three different stakeholders were identified: Government and Regional Policy, Company which provides AH services and tenants. For evaluation the satisfaction of these three different clients, three different tools will be used as follow:

1) Governments and regional policy will be Evaluated by AHP Priorities analysis

2) Tenants satisfaction will be evaluated with customer satisfaction feedback and open question

3) Company which provides AH services will be evaluated by sense and respond method and critical factor index analysis

The AHP priorities for government and regional policy are:

Figure 1　AHP Priorities for Government and Regional Policy

For company performance evaluation, senses and responds questionnaire will be used to determine Critical factor index (CFI). The sample of questionnaire is as follow:

Table 1　Format of the Questionnaire (Ranta, Juha, Takala, 2007)

Performance attribute	Scale: 1=low, 10=high		Compared with competitors			Direction of development		
	Expectation (1-1)	Experience (1-10)	worse	same	better	worse	same	better
attribute 1								
attribute 2								

4 Introduction to Cases Studies and Expected Results

4.1 Finland

Finland is one of the first countries to provide affordable public housing. For example in 1909, wooden houses were built to provide shelter for city works in Helsinki area. After Second World War, affordable housing policy in Finland faced a big challenge to provide shelter for about 400 000 immigrants who had lost their home during the war. Another important milestone in Finnish affordable housing policy is rapid urbanization which has started 60 years ago is still continuing strongly (ARA, 2011).

There is some specification about housing policy in Finland. For example, Finnish housing system

is built on this assumption that household satisfy their need mainly by relying on other than of public housing. Also in Finland, AH is considered as a branch of social policy. Another characteristic of Finnish housing system is that it's a dualist system. In fact, in Finnish housing market both free market and regulated market works at the same time. In Finland, there is nonprofit social rental housing mainly owned by municipality rental housing companies and nonprofit developers. This housing sector offers 'welfare housing' for people suffering from different social problems (Forss, 2013).

In the studies which have been carried out 2012, the results showed that the human development index increases constantly in Finland from year 1980 to 2010. Also the urbanization tendency also grows constantly from 1960 till 2008. The following charts present the results in detail (Forss, T. 2013):
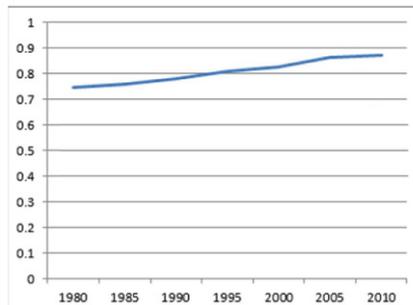
Figure 2   Human Development Index (HDI)   Figure 3   Urban Papulation Tendency
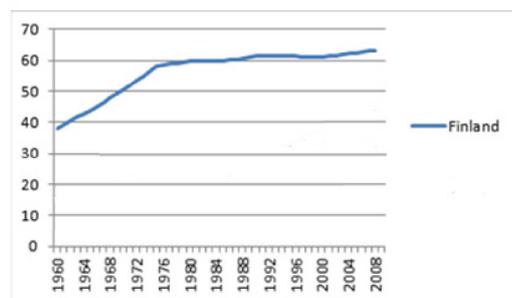
Also, AHP studies for evaluation national and regional policies showed that the criteria "Maintain and management" is the first priority for decision makers in Finland.

In 2014 the same studied has been started to conduct in Finland. The purpose is to have longitudinal studies to compare how priorities have changed during these years and how Finland succeeds to make progress in AH project. The questionnaire has been Finalized and distributed in Jun 2016 to get answer to analysis.

4.2 China

China has the largest population in the world and it has one of the most challenging Affordable Housing policy's. In most of western countries social welfare systems have been running for years and experience and knowledge from public housing system is strong. However in most of Asian countries the social welfare systems is still developing and are seen as inadequate compared to their large amount of low-income population (Forss, 2013).

In 2014 the same studied has been started to conduct in Finland. The purpose is to have longitudinal studies to compare how priorities have changed during these years and how Finland succeeds to make progress in AH project. The questionnaire has been Finalized and distributed in Jun 2016 to get answer to analysis.

Over the years China has gone through a change from a centrally planned public housing system to a market-oriented housing production industry (Deng, Lan & Shen, Qingyun & Wang, Lin,2009). Chinese government is monitoring the environment of provinces and cities centralized from Beijing. Objective is to ensure the development with urbanization, modernization of the infrastructure and economic growth. That is done by Chinese governments control over land, regulations and capital (Forss, T2013).

Under the old system Chines government institutions and state-owned enterprises provided housing to residents as part of social welfare system. The provision of housing was dealt like obligation. The old system caused housing shortage and the Chinese government launched the first economic reform 1979. In the agenda there was also a housing reform which aimed to adjust rents and to privatize the existing housing stock. The second wave of the housing reform was launched in 1994 when programs called Economical and Comfortable Housing (ECH) and Housing Provident Fund (HPF) was initiated. Aim of the program was to alleviate the progress of both supply-side and demand-side programs of a housing markets so that the gap between housing supply and demand would decrease. Short after the third wave of the reform was launched in 1998 where the housing production were strongly guided from government's institutions to private sectors (Deng, Lan & Shen, Qingyun & Wang, Lin,2009)[1].

As the ECH and HPF are homeownership programs, the Cheap Rental Housing Program (CRH)

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[1] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.455.8500&rep=rep1&type=pdf

was focusing on expanding the affordable housing supply. The program was launched in 2004 by Chinese central government and it was supplemented with Cheap Rental Housing Guarantee Plan in 2009. The CRH program was created to target groups like seniors, people with disabilities and extremely low-income households and households that cannot afford to buy ECH unit or to rent a house form market. Urban poverty is seen as China's main housing problem (Deng, Lan & Shen, Qingyun & Wang, Lin, 2009).

Figure 4   The Framework of China Housing Policy (Forss,2013)

Both private and public capital are financing housing in China.   The government controls housing markets development by controlling the guarantee needed for the bank loans. Also by supporting housing supply the rents are being decreased. China's housing supply system is comprised into two parts, commercial housing supply system and security housing system. The Government security housing supply system is targeted for the low-income group and the commercial housing supply system is targeted for the medium-income and high-income groups (Forss,2013).

With UVA cooperation the Affordable Housing studies have been executed in China in the city of Wuhan. The answers are being analyzed and the results will be published subsequently.

4.3 Poland

Since economic transformation in 1989 the housing market in Poland did not change rapidly. The privatization of housing market in Poland increases the importance in becoming an owner-user of an apartment or house. Renting an apartment in Poland is still identified with lower economic status, comparing to Western countries, where it is concerned with high mobility societies (Cesarski, M.2011). Therefore, since the mid-90's housing policy in Poland focused on individual construction of credits for the middle class. Government Housing Policy concerns on financing two programs: "Family on its own" 2007-2013, and "Housing for the Young" 2014-2018. These programs are mortgage-subsidy program that supports the first-time home buyers. The housing market in Poland still noticed housing shortage comparing to the number of households (Żelazowski, K, 2011. GUS, 2012)[1]. Polish housing market could be divided into to two parts that include free market (individual, commercial and cooperative housing) and regulated (affordable housing and social housing).

Affordable housing is not so popular in Poland, and generally play rather marginal role comparing to other individual and commercial housing. The investors of affordable housing in Poland are mainly: municipal, companies (mainly for their workers) and Social Buildings Societies.

In Poland existed two types of activities that support affordable housing market on varied scale. First type of support is available for municipalities, that receive support for social housing by direct investment in new construction and renovation of old resourced (since 1990). Second type of support include implemented by government a number of programs that use direct and indirect financial instruments that were supporting housing market in Poland (Salamon, M,2015). The example of these instruments is: 1993-2001 - tax relief for the personal income tax, since 2004 - preferential VAT rate on construction materials and services.

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[1] This deficit is calculated according to data of Polish Central Statistical Office. More about that:
http://stat.gov.pl/cps/rde/xbcr/gus/lud_raport_z_wynikow_NSP2011.pdf
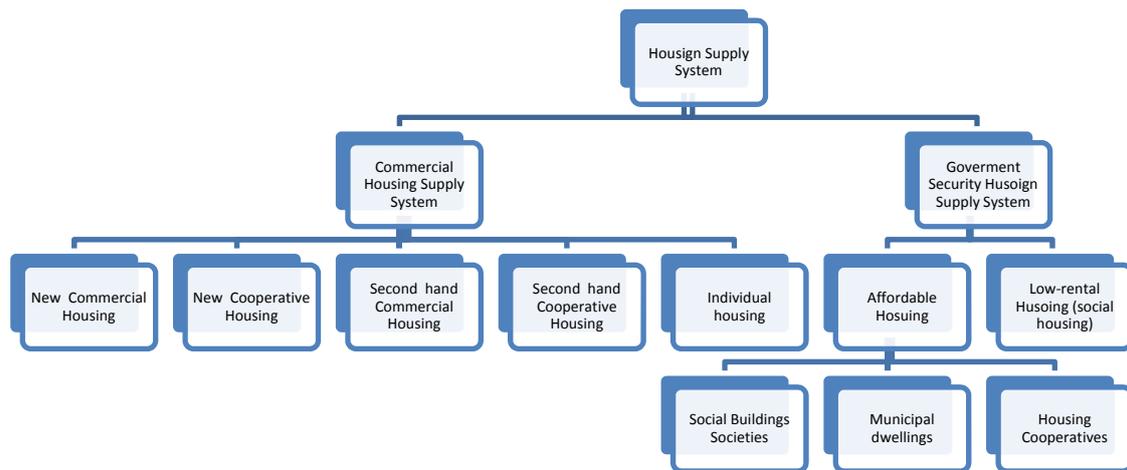
Figure 5   The Polish Housing Policy Supply System

Social Buildings Societies operate on the basis of the Act of 26 October 1995 concerning certain forms of support for housing construction (Ustawa z dnia 26. Października, 1995). Apartments for rent are finance up to 70% from credit and the rest by the natural or legal persons (30%) (Rozporządzenie Rady Ministrów z dnia 28 grudnia, 2001). In 1995 - 2009 functioned National Housing (Rozporządzenie rady Ministrów z dnia 4 lipca, 2000) Fund granting Social Buildings Societies and housing cooperatives preferential loans for social housing investments. Since 2009 Social Buildings Societies is not supported on large scale.

The development of affordable housing in Poland takes place in housing model that depend on the three types of government intervention: housing allowances, creating a new social rented housing sector (new program - announced by the government in 2016) and support households in obtaining the status of the owner-user. The new government perspective for affordable housing is "Apartment plus"[1] program with a scheme focused on stable, long-term rental, foresees building affordable housing on land owned by the state or state companies.

5 Conclusions

This paper describes that in AH project different stakeholders play role which have different and sometimes opposite interest. This paper presents a frame work to evaluate three different stakeholders in affordable housing project. In order to have a successful AH system, the need of these stakeholders should be satisfied at the same time. Main stakeholders in AH projects are: Government and regional policy, tenants and companies which provide AH services. For government and regional policy AHP priorities tools is suggested. To evaluate company performance, resources based view approaches is suggested using sense and respond tool and critical factor index. Finally to evaluate tenants needs, customer satisfaction questionnaire and open questionnaire is suggested.

Affordable housing project was studied once in Finland in 2012 and this paper presents those results briefly. Besides, as the same studies have been started in different countries, therefore the paper also presents the AH situation in two of them: Poland and China.

As the tendency towards urbanization is growing rapidly and the conflict in different part of the world increases the number of immigrants and asylum seekers, therefore the AH studies has a curtail importance in any society. The paper tries to present a model towards a sustainable AH system in which the needs of all stakeholders can be fulfilled. This model can be used later on to compare how much AH achieve its goal in different societies. Above all, this model also suggests improvement plan for next step.

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[1] https://mieszkanieplus.com/   https://www.premier.gov.pl/multimedia/wideo/konferencja-prasowa-projekt- mieszkanie -plus.html

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Open Data Innovation: Business Models, Taxonomies and Challenges: Insights from Existing Literature and Research Agenda

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Abstract: Open data is seen as a promising source of new businesses in the form of services, products and innovation solutions. Emerging opportunities for open data based business is broadly recognized and expected to generate large amount of social and economic value. However, the raw open data has little intrinsic value in itself, the economic value comes from a balanced combination of high quality data resources together with the right business model. As apparently marching of open data has brought so many aspects of the commercial development, the practice of constructing and implementing the right business model (BM) has proven to become an ever more important area of study in data based innovation. This paper is based on the state-of-the art knowledge explored from the literature, and aim to build up a "big picture" from the viewpoint of business models taxonomies, business model elements and combine with the related value network for open data businesses. The study also classified the enablers and barriers within an open data initiative that influence its commercial value.
Key words: Open data; Business model; Taxonomies; Barriers; Enablers

1 Introduction

The exponential growth of available and potentially valuable data have become an important parcel of modern digital economies. The increasingly use of techology and the subsequent generation and utilization of data compounded by Internet, social media, mobile devices have an embedded value that are encouraging us to re-think how social and economic value can be generated and appropriated (P. M. Hartmann ,2014). Recently, governmental and non-governmental organizations around world are increasingly opening up and publishing their data on the internet to allow everyone freely to use and reuse without restritions of copyrights, patents or other mechanisms of control,which often referred to as open data (A. Immonen, M. Palviainen, and E. Ovaska.2014). The benefits of open data are widely recognized towards greater government accountability, process improvement, operating costs reduction and business innovation in both government and commercial organizations (F. Ahmadi Zeleti,2014). In particular, the commercial re-use of open data has brought a promising economic potential to unlock more than $3 trillion economic value across seven industrial domains (J. Manyika,2013）.

While open data has little intrinsic value in itself, the main challenge in releasing social and commercial value is coming from the realization to the way that how open data can be reused from its "productization", yet it becomes valuable when it is used (V. Dander ,2014; G. Magalhaes,et al ,2014; M. Janssen ,2012). Therefore, the open data industry requires the choice of the right business model as part of the innovation management to support open data companies to create and capture value. Yet, most business model concept covers only generic aspects without considering specific industrial characteristics. For instance, there are many impediments and challenges faced by organizations in the data economy should be identified as the adoption factors are ignored during the open data driven business model concept. In addition, there are no scholarly studies available that provide a sophisticated tool for open data businesses to describe, design and pivot those factors towards an open data business model. Hence, for many existing business model concepts will not be significant enough to carry out analyses, development and comparisons of open data business models, the question of what business models will be applicable remains (F. Ahmadi Zeleti,2014).

In this paper we attempt to answer the following research questions: *what types of business models are present among companies relying on open data as a resource, and what are enablers and barriers can be identified as important mechanisms in the processes of value creation?* With this research question we aim to address the niche in existing literature with regards to the business re-users who create value from open data. Hence, this paper builds up a comprehensive overview to identify the open data business model elements, taxonomies and related open data business value chains. Additionally, barriers and enablers have also been addressed towards the open data adoptions as the consequences for business model development. Some directions for further research have been outlined as well.

2 Open Data Business Value Network and Business Actors

A business ecosystem is a dynamic structure of organizations that work together as interconnecting and interacting parts, and the concept of value chains was coined to identify how value is created or co-created in order to achieve a product or service. The value chain model describes value-adding activities that connect an industry's supply side (e.g. raw materials) to its demand side (e.g. sales and marketing), which often carried out within traditional industries. While in more-tangible systems like data and information business environment, the original concept of value chain is becoming unsuitable to define. Thus in such data based business system, value is not created alone or not necessarily follow a linear model, but more accounts for the various interconnected network of actors that work together to co-produce value (J. Peppard and A. Rylander ,2006; L. Morgan, J. Feller, and P. Finnegan,2013). According to (A. Immonen, M. Palviainen, and E. Ovaska.2014), an open data based business ecosystem is formed by organizations that each has their own parts and know-how in the data-based business. The involving actors affect and are affected by the creation and delivery of the other business actors within the value network system.

Authors in (A. Immonen, M. Palviainen, and E. Ovaska.2014) defined five types of business model actors within the open data ecosystem (ODE). The five roles for the ODE's actors are data provider, service providers, application developer, infrastructure and tool providers and application user. Similarly, (J. Lindman, T. Kinnari, and M. Rossi, 2014) also investigates the merging open data value network structure and identify several business models actors. These value network participants are data analyzer, extract & transform, use experience provider, open data publisher, and support service and consultation. Researchers in (E. Ferro and M. Osella ,2013）identified four types of business model archetypal actors, namely core re-users, service advertisers, enablers and advertising factories (Deloitte, 2014) introduced the "open data marketplace" based on a network of independent organizations supplying and consuming open data services. The resulting five types of organizations are suppliers, aggregators, developers, enrichers, enablers and customers. Among these organizations, three of these belong to the group of intermediaries which between data suppliers and end customers to transform the raw data into a more useful format. The group of enablers provides support services to other organizations. In line with open data themes, (A. Latif, A. U. Saeed, et al,2009) focus on linked data and present the linked data value chain, a model that conceptualize the foundation for the development of business cases around the adoption of linked data. The identified participating business entities are: raw data provider, linked data provider, linked data application provider and end-user.

Whichever model it follows, the activities within the data driven environment do not follow a sequential structure, rather, activities can be executed in cycle and repeated on a data product/service. In addition, within the data value network, multiple actors can participate together of adding value to data for effective value creation and capture and result in a new data product.

3 Open Data Business Model Elements

A business model is a system of interconnected and interdependent activities that defines "how a firm does business" (R. Amit and C. Zott ,2012). In this study, we adopt the notion of business model provided by (A. Osterwalder ,2004), which consider a business model as a conceptual tool that contains a set of interrelated elements that allows a business to generate financial returns. Closely follows by the business model definitions is the extraction of compositional element (sometimes also named as component, building blocks) that describes what a business model is made of and supporting for the business conduction (A. Osterwalder ,2004; M. Morris, et al,2005; M. M. Al-Debei and D. Avison ,2010; H. Chesbrough,2002).

In the field of open data BM elements, (A. Immonen, M. Palviainen, and E. Ovaska.2014) formed a business model comprises eight elements, namely value proposition, key partners, co-creation, cost structure & revenue streams, customers/market, key channels, data structure and business development.(F. A. Zeleti, A. Ojo, and E. Curry,2016) have a rather generic view on open data business models. They derived a BM consisting of six categories, including value proposition, value adding process, value network, value in return, value capture, and value management, which named as 6V business model conceptual framework. Whereas it has little reflection towards open data industrial aspects (J. Lindman,et al,2014) borrowed a business model framework from software industry developed by (R. Rajala,2009) to consist of offering, revenue model, resources, relationships, and mind-set. Based on an exploratory case study, (G. Smith ,2016) identified four key elements of the marketplace has the potential to facilitate open data use, including: technical platform, websites, support

services, and knowledge sharing activities.

4 Open Data Business Model Taxonomies

Study in (E. Ferro and M. Osella ,2013) Identified four types of business model archetypal actors, namely core re-users, service advertisers, enablers and advertising factories as stated in the above section. On top of that, distinctive business model patterns emerged from each business model actors have been addressed. The resulting business model patterns are premium product/service, freemium product/service, open source like, infrastructural razor & blades, demand-oriented platform, supply-oriented platform, free as branded advertising and white-label development. Through case studies in understanding the diversity of open data utilization in the Netherland's context in (M. Janssen and A,2014) identified six business model taxonomies, including single-purpose apps, interactive apps, information aggregators, comparison models, open data repositories, and service platforms. Finally, grounded in the comprehensive data obtained from a sample of 500 firms that use open government data in U.S., (G. Magalhaes,et al ,2014) proposed a taxonomy that encompasses three business model archetypes in the context of the open government data ecosystem. These business model archetypes are enablers, facilitators, and integrators.

5 Enablers/Barriers of Open Data Value Creation

The process of utilizing data and creating value from the data is perceived as cumbersome and with challenges taking place on multiple levels to both the data publisher and data re-users (A. F. van Veenstra,2013). Within the data value network, value creation is both dependent on a number of perspectives and also results in impact on other dimensions (J. Cranefield ,2014). To this end, the identification of enablers and barriers is found critical to deal with in undertaking value creation efforts and more likely to help develop future open data business models as they control the extent how value is created(A. F. van Veenstra,2013; J. Cranefield ,2014; F. A. Zeleti and A. Ojo,2014).

5.1 Technical dimension

Technical issues mostly concern the data itself. As a practical matter, one significant challenge faced by open data users arise from working with poorly captured, maintained and described data of a generally low quality (M. Janssen ,2012; G. Smith ,2016; S. Martin,et al,2013). Since the open data is freely available from the data publisher, thus users and re-users have little or no control over the data they obtained. When the data does not meet sufficient levels of standards due to e.g. incomplete, missing information, unclear structure or trustless sources, efforts to develop services based on such data become fruitless. More problematically, data are often left scattered across a wide range of sources using inconsistent standards and formats (M. Janssen ,2012; G. Smith ,2016; M. A. Hossain,2015). For open data to be usable, compatibility is a serious concern as different parties may use incompatible dataset formats or platforms. Additionally, many data cannot be used due to language barriers (S. Martin ,2013). Furthermore, being able to use and make sense in large amount and structures of data remains a significant challenge which requires both technical facility and human skills and capabilities to access, link and interpret data from the available data (M. Janssen ,2012).

5.2 Organizational dimension

This dimension is concerned with the strategic aspects of the involved stakeholders. This is especially relevant for the data publishers. Due to the managerial barriers lack of awareness, knowledge and unwillingness to change of the leaders can severely impact data users by resulting in insufficient, poor quality and unsustainable data (G. Smith ,2016; M. A. Hossain,2015).

5.3 Governance and policy dimension

When data opened up, it become a common, shared resource, available for use to public and private stakeholders within an open network (T. Jetzek, et al,2014). Therefore, a lack of consistency and perseverance in public behaviors can also put risks for data re-users in case to sustainably rely on and use an open data. Many stakeholders expressed concerns about the willingness of the authorities to continue publish open data and establish policy to support the culture of open data growth. The government is the major player that regulates the open data market and data infrastructure that allows things to run continuously and sustainably. Making data and information resource accessible, discoverable, usable and reach to certain standardization can help fuel innovation, entrepreneurship and contribute to significant political, social and economical benefits. In order to let citizens and businesses be able to take full advantages of the information resources, governments should be promoting the openness and interoperability associated with open data to users or re-users in order to maximize its

value and deliver effective services.

The open government "ecosystem" will be essential dimension of the open data concept. The social, economical and technical infrastructures for creating, managing, sharing and maintaining data along with the governance structures and standards will be significant for the future open data development. In this way, supporting government policy can enable open data providers to profit from publishing data as well as to encourage re-users to coordinate the open data process.

5.4 Legal and license dimension

The issue here lies with the incompatibility of licenses and copyright for open data. In case of open government data, generally government initiatives strive towards publishing data in an open format and allowing the free access to use, re-use and distribution of data under open government license. However, some other public data might contain restrictions that prevent data with different licenses from being merged. A number of data products are based on multiple datasets mash-ups to create value. Thus, heterogeneous licenses across datasets for reuse are incompatible and raise challenges in managing the conditions of reuse open data.

5.5 Economic/financial dimension

Opening and using data both requires an extensive resource includes technical, human and financial resources that can be seen as major obstacles. New procedures and systems and business environment need to be established for processing, managing and maintaining data, and the benefits and financial return are unknown. In order to foster value creation and gain back commercial benefits, revenue should exceed the risks and costs.

5.6 Sustainable business model for the production of open data

Obtaining data for free on the Internet entails a risk that can weaken the data production process and jeopardize the data quality. In addition, the uncertainty on the extent and nature of the financial returns of the investment represents a clear risk for the sustainability of open data business development. Therefore, without clear addressed business models in the case of open data industry put risks regarding the commercial re-use of open data and turn it into meaningful and actionable product/services.

6 Conclusions and Future Work

In the digital economic society, value creation processes have the potential of extracting the maximum value from data through value mash ups. Open data initiatives introduced the possibility of sharing information between different entities and provide vast opportunities for the commercial development. All stakeholders of value creation can participate this openness of corporation through different roles to result in a data product. The major challenge in this public value is not open data itself, but how it become valuable through different other means.

This study has analyzed the existing business model taxonomies, business model elements and the open data business value network where various open data actors activated wherein. From there we can observe that the concepts of open data business model are increasingly raised attention but not well understood regarding a business model's compositional elements. Most business model concepts applied cover generic business model aspects without considering the characteristics of open data industry. In contrast to the business model conceptualizations, the business model taxonomies and business model actors reflect the characteristics of the industry. It is clearly that in an open data business ecosystem, value is not created alone but more in a network of actors, where each has their own parts and know-how in the data-based business affect and are affected by the creation and delivery of the offerings of the other actors. This requires institutional environments to be cooperative and interactive thus to enhance resource and information exchange across intra- and inter-organizational boundaries in the context of creating business value.

With the identified barriers and enablers from different dimension as this study outlined, our research highlights the need for open data based organizations to take consideration of these factors as it affects the future of open data business models in value creation. In future research studies, researcher must take a holistic approach to re-think the processes that facilitate value creation and capture for open data based firms thus foster the implementation of the open data economy. A comprehensive business model framework is required that allow researchers and practitioners to design, describe, categorize, and analyze any kind of open data driven business model with consideration of both internal and external factors, and incorporating the characteristics of the open data industry.

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The Effectiveness of Hard Skill Training Programs in Manufacturing Industry of Malaysia

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Abstract: Most of the technical training providers in Malaysia offer hard skill training programs that designed to help increase and enhance knowledge and skills of participants. In conducting these programs, technical training providers use training modules designed by foreign writers as a primary source of instruction. It is important to evaluate the impact of training program as perceived by participant organizations and as measured by financial performance. The main objectives of this study was two-fold: (a) to discover the effectiveness of existing hard skill training program measurement model in Malaysia and (b) to formulate an integrated evaluation framework for hard skill training program in Malaysia.   The effectiveness of existing hard skill training programs was determined based on whether or not the participants believed the hard skill training programs helped to increase and enhance their knowledge and skills.   Hard skill training program effectiveness was further assessed by whether or not participants indicated they used the knowledge and skill in performing their duties.
Key words: Training effectiveness; Training evaluation; Hard skill training; Malaysia manufacturing industry

1 Introduction

The objective of this research was two-fold: (a) to discover the effectiveness of existing hard skill training program measurement model in Malaysia and (b) to formulate an integrated evaluation framework for hard skill training program in Malaysia.

For this study, the effectiveness of existing hard skill training programs was determined by assessing whether or not participants believed the hard skill training programs did assist in improving and enhancing their (a) understanding of program knowledge, (b) skills, and (c) attitudes.

Hard skill training effectiveness was further assessed by whether or not participants indicated they used the knowledge and skills gained from the hard skill training programs in performing their duties. The effectiveness of the hard skill training programs was evaluated by using an interview and observation.

1.1 Research questions

This research was addressed through the following research questions:
1)   How did the hard skill training programs increase participant knowledge?
2)   How did the hard skill training programs increase participant skills?
3)   How did the hard skill training programs increase participant performance related attitudes?
4)   How did the participants apply the acquired knowledge and skills in manufacturing industry?

1.2 Subjectivity statement

As a training manager in a training provider company, it is important for me to find out whether the training program conducted to participant has been effectively transferred the necessary knowledge. Most of the manufacturing company would like training provider to convince the human resource department that how the training provider can prove that the impact of training program from the training investments. The measurement of the either financial or non-financial will help to convince human resource department.

Therefore, it is important to develop a training program measurement model that can be adopted as framework for developing training programs and evaluating learning outcomes, which could benefit the manufacturing company. Further research need to be done by reviewing existing journal of what is the current research result on training evaluation related issue. The below section is the summary of the literature review on a few journals of the main topic covered. It is important to understand the latest development on the training evaluation that is still in research.

2 Literature Review

2.1 Training needs assessment

Needs assessment is considered to be part of the training program design process to improve the training effectiveness. The definition of needs assessment is "a systematic set of procedures undertaken for the purpose of setting priorities and making decisions about program or organizational improvement and allocation resources" (Witkin, B.R. & Altschuld, J. W ,1995). Training needs assessment is a process to collect raw data to identify training needs in order to develop a training program to achieve company vision and mission (Brown, J. ,2002).

2.2 Ways of conducting needs assessment

Normally, data gathering techniques are one of the common issues concern. Data gathering techniques consist of subject matter expertise' consultants, survey questionnaires, observation, review of relevant documents, interview, tests, work samples and group discussion (Goldstein, I. L.,1993). Needs assessment data gathering methods can be divided into three data sources such as interview, archival data and analytical data (Witkin, B.R. & Altschuld, J. W ,1995). Currently, people use a specific model or analytical framework for training needs assessment compare to classical training needs assessment techniques mentioned earlier.   Some of the latest specific models for training needs are fish boning, success mapping, human resource competency model and fault tree analysis (Witkin, B.R. & Altschuld, J. W,1995).

2.3 Roles of the training needs assessment

There are four major roles of training needs assessment (Brown, J. ,2002). The first role of training needs assessment is to identify specific problem in an organization to guide the training direction. The second roles of training needs assessment is to grant top management approval or interest for the training program. The third role of training needs assessment is the training needs assessment has to sets specific goals of the training programs which can be used as the criteria to evaluate the result of the training programs. The fourth role of training needs assessment is to capable of capturing the benefits from the training discrepancy analysis in result and the cost to have the training programs. The return of investment in training program will help the top management in making fast decision for approving the training programs (Gorman, P., et al,2003).

2.4 Training evaluation

Human resource development (HRD) scholars feel that the evaluation of training can be used to examine the impact of training on individual performance requirements and on organizational goals. The well-known evaluation framework is the Kirkpatrick model (Kirkpatrick, D.L. ,1996). The important of the Kirkpatrick model is the concentrate on the behavioral result of the learners from the training program (Mann, S. & Robertson, I.T. 1996). The Kirkpatrick model was introduced, a few approach of improvement of this model have been applied by different researchers to attempt to create an even realistic evaluation model.

2.5 Measures by evaluation level

Kirkpatrick's evaluation model has been the famous applicable model in training evaluation. Many researchers have developed the new model base on the background of Kirkpatrick's evaluation model (Alliger, G.M., et al,1997). From a research mentioned that not more than 10 percent of companies assess measure of behavioral change or organizational results (Van Burren,2002). Most of the company measure reaction level and second will be learning level. The most difficult measurement will be the business impact from the training program. Many researchers have started to identify the reliable measurements such as turnover rate, sales, cost, quality and productivity. The next section will be described the measurement has been identified to examine the fourth level of organizational result (Goldberg, M. & Ramos, L. 2003).

2.6 Measure of financial

Most of the time organizational used financial measures to examine impact of training to the company. Most of the research studied the impact of training based on individual returns from training (Jacobs, R.L. & Washington, C. 2003). The frequently use to measures training impact is the individual's wage (Lynch, L. 1992). This measurement assumes that training will increase organizational performance and indirectly will improve the total wages of all employees. If company short term goal is to increase revenue, training impact related to growth will be the major criteria measurement for organizational performance (Kalleberg, A.L., & Van Burren, M.E. 1996).

Non-financial measure has been used by company in the recent study to assess training outcome (Leach, M.P. & Liu, A.H. 2003). Non-financial is used to measure such as turn-over rate, market share,

product quality, retention, employee satisfaction, organizational commitment and customer satisfaction (Leach, M.P. & Liu, A.H. 2003). There are not many reliable measures available to examine performance of participant on non-financial. These indicators of factor will be such as turnover rate, absenteeism, job satisfactory and organizational commitment (Leach, M.P. & Liu, A.H. 2003).

3 Methodology

The purpose of this research was two-fold: a) to discover the effectiveness of existing hard skill training programs in manufacturing industry of Malaysia and b) to formulate an integrated evaluation framework for hard skill training program in manufacturing industry of Malaysia.

This study focused on one of the in-plant hard skill training session for an iron ore manufacturing company in Sri Manjung, Perak. This is a three days in-plant hard skill training course for ten participants.   All of the participants are mainly from maintenance department to learn about bearing technology and maintenance.

This study gathered information about hard skill training program and surveyed participants about their perceptions and views about the effectiveness of those hard skill training programs.   The effectiveness of the programs was determined by whether or not participants believed, as indicated by the observation and sampling participant interview, that the hard skill training program did assist in improving and enhancing participants (a) knowledge, (b) skills, and (c) attitudes.

Procedures

The observation has been conducted during the hard skill training course is in progress. The observation is to monitoring the participants' reaction and learning attitude during the course.

Two participants were randomly selected from the ten participant based on individual's willingness to engage further. These interviews were conducted at the training classroom.

4 Results

The objective of this research was two-fold:(a) to discover the effectiveness of existing hard skill training programs in manufacturing industry of Malaysia and (b) to formulate an integrated evaluation framework for hard skill training program for participant in manufacturing industry of Malaysia. The effectiveness of existing hard skill training program was determined based on whether or not participants believed the hard skill training program did assist in improving and enhancing their (a) knowledge, (b) skill, and (c) attitudes.   The effectiveness of hard skill training program was evaluated using an interview and observation.

In this chapter, the analysis of the data is reviewed.   First discuss the participant for this hard skill training course and then the analysis of observation and interview data.

4.1 Participant demographics

All ten participants are male and responsible for the maintenance of the iron ore production line. All the participants have working experience ranging from 3 years until 16 years. All of them have been using the bearing but never have a formal training course related to the bearing.   All the experience learned mainly through the on job training or from the senior.

Interview

Theme 1: Improve Knowledge

Both participants attended the training agreed that the hard skill training program did improve their knowledge.

Theme 2: Improve their Confidence in their work place

Both of the participants believed that after attended this class, they have confidence to handle the problem related to bearing issue.

Theme 3: Challenge of application of knowledge

Both of the participants have different idea on the application of knowledge in work place. Management support is important and the other one is team work among the colleague is the important factor.

4.2 Observation

This is a three full day in-plant hard skill training course to train participants about the bearing technology and maintenance. This hard skill training course will conduct through theoretical class about bearing and practical workshop on mounting and dismounting bearing with different method on different bearing type.   The first day before the class start, there will be a pre-test with twenty objective questions of open book concept to answer within duration of one-hour time.   The result from the

pre-test result showed that all of the participant score below ten correct answered and the highest score is seven correct and the lowest score is one correct.　From the pre-test result, it showed that most of the participant has limited knowledge on the training program.　At the last day of the training program, post-test has been conducted using the same question paper as pre-test, all of the participant score more than 10 with lowest score of 13 and highest score 17.　This is the measuring learning due to training program as mentioned in the Kirkpatrick's level 2 learning.　Participants willingness to improve their attitudes, their knowledge or their skill is the result of learning during the training program. Some common method of measuring learning is through course exam, tests, or survey measure this kind of change.　At the end of this course, every participant will fill up an evaluation form mainly to measure the participants' reaction toward the training program.　This evaluation form will collect data from the participant's reaction to the trainer, to the course content, and to the learning environment.

5 Summary, Conclusion, and Recommendations

Research question one. How did the hard skill training programs increase participant knowledge? The majority of participants believed that the hard skill training program increased and enhanced their knowledge.

Research question two. How did the hard skill training programs increase participant skills? The majority of the participants believed that the hard skill training program increased their skill.

Research question three. How did the hard skill training programs increase participant performance related attitudes? The majority of the participant believed that the hard skill training program enhanced their performance-related attitudes.

Research question four. How did the participants apply the acquired knowledge and skills in manufacturing industry? The majority of the participants will apply the knowledge and skill in their work place.

In conclusion, the hard skill training program was responsive to the individual needs and advanced their competencies and personal development.　Therefore, participants were at ease in applying the knowledge and skill in their work place. The data is collected after the training program which might not be able to provide an ample time for them to apply in their work place. Therefore the Kirkpatrick level three measuring change in behavior due to the training that has taken place is much more complicated and costly.

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A Discuss on Symbiotic Development of Financial Industry and Manufacturing Industry in Wuhan

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Abstract: Based on industrial symbiosis theory, with empirical analysis establishing regression model between GDP of Wuhan manufacturing industry and loan balance of financial institutions from 1998 to 2014，the work proved the symbiotic relationship between financial development and manufacturing industry in Wuhan. Through the data analysis, the result shows that the interaction and coordination between financial services and manufacturing industry in Wuhan is insufficient, mainly due to the insufficient financial support to manufacturing. Finally, the paper proposed the advice of optimizing and innovating financial services and promoting symbiotic development of financial and manufacturing in Wuhan.

Key words: Finance industry; Manufacturing industry; Symbiosis

1 Introduction

During the growth of modern economy, the highly development of manufacturing industry shows a new trend of "service". The border between manufacturing and service is becoming increasingly blurred, and the effect of service industry is growing in the value chain manufacturing industry. As a leading core of modern service industry, the financial industry is playing an increasingly important role in the development of the manufacturing industry.

Economic development of Wuhan depends greatly on the manufacturing industry. Although Wuhan has important manufacturing bases, the level of manufacturing industry is low in the global manufacturing chain. To enhance the core competitiveness of the manufacturing industry in Wuhan, promotion of symbiotic development and benign interaction between financial service and manufacturing of is needed.

"Symbiosis" is derived from biology, generally referring to relationship of living together, co-evolution or mutual inhibition between two or more different kinds of organisms (Yi Changjun,2008). Symbiosis theory is introduced into the field of economics with its own development. Neusser and Kugler (1998) found an association between financial development and manufacturing through a study. Stiglitz (1998) creatively introduced the symbiosis theory into financial circles and opened a new road for the study of economic relations. The domestic research is mainly to test the theory based on Chinese situation, such as Bin Guoqiang (1999), which proved that finance can promote economic development by the method of measurement. Yuan Chunqing (2002) use biological symbiosis theory in academic research on finance for the first time, and the term "financial symbiosis" was born then. Hu Xiaopeng (2008) proposed a theory of the three characteristics in symbiosis when studying the symbiotic relationship between producer services and manufacturing industry, which are fusion, interaction and coordination.

This paper selects from GDP of Wuhan manufacturing industry and loan balance in financial institutions from 1998 to 2013, to test the symbiotic relationship between Wuhan financial and manufacturing industry using empirical analysis by establishing a regression model, and make recommendations with scientific basis in order to promote the symbiotic development of both.

2 Empirical Analysis of the Symbiotic Relationship Between Financial and Manufacturing Industry in Wuhan of China

2.1 Selection of variables and data processing

The data of output of manufacturing industry and the loan balance from financial institutions at current prices from 1998 to 2013 in Wuhan is got from the "Wuhan Statistical Yearbook". The reason of selecting the year 1998 as a start in the study is mainly due to that 1998 is a time when China's economy has entered a rapid development period and manufacturing grows fast, with the deepen of China's reform and opening and the introduction of foreign investment. The output of manufacturing industry(M) is summary GDP of 30 selected manufacturing sub-sectors (shown in Table 1 about the 30 sub-sectors in

manufacturing industry). In view of a bank-based financial system in China, and the main way of external financing is obtaining loans from banking sector, the loan balance of financial institutions in Wuhan over those years is selected as the financial development index (FN). Relevant data are shown in the following tables:

Table 1   List of Manufacturing Sub-Sectors

Agro-food processing	Food Manufacturing	Manufacturing	Tobacco	textiles	Textiles, clothings, shoes, hat
Leather, fur, feather products	Timber Processing, Bamboo, Cane, Palm, Straw Products	Manufacturing	Papermaking and paper products	Printing and copy of Recording Media	Education and sport articles
Petrochemical, coking and nuclear fuel processing	Chemical materials and products	Medicine	Fiber Manufacturing	Rubber products	Plastic products
Non-metallic mineral products	Ferrous metal smelting and rolling processing	Non-ferrous metal smelting and rolling processing	Metallic products	General equipment	Special equipment
Transportation Equipment	Electrical machinery and equipment manufacturing	Communication equipment, computers and other electronic equipment	Instrumentation and office machinery manufacturing	Crafts and other manufacturing	Waste resources and clothing waste processing

Source: Wuhan Statistical Yearbook

Table 2   Gross Output of Manufacturing Industry and Loan Balance in Financial Institutions from 1998 to 2013 of Wuhan (Unit: 100 million)

Year	Gross output manufacturing industry(M)	Loan balance in financial institutions(F)	Year	Gross output manufacturing industry(M)	Loan balance in financial institutions(F)
1998	654.08	495.78	2006	2548.19	3681.38
1999	703.65	574.81	2007	3149.28	4414.84
2000	860.08	1342.94	2008	5044.91	5632.37
2001	974.41	1518.73	2009	4950.17	7535.32
2002	1083.49	2004.74	2010	5780.39	9093.71
2003	1281.91	2525.13	2011	7397.31	10157.53
2004	1596.94	2845.95	2012	8304.38	10486.87
2005	2050.16	3170.88	2013	9391.42	12803.87

Source: Wuhan Statistical Yearbook (2009-2014), Statistical information of Wuhan, Wuhan Economic and Social Development Statistical Communique

2.2 Scatter graph

We draw the scatter graph of the sample data using Eviews7.2 to get an intuitive linear relationship between Wuhan manufacturing industry and financial development, as shown in Figure1. By observing the scatter graph, we determine that there is a linear relationship between Wuhan manufacturing industry(M) and financial development (F). The econometric model can be built as:$M=\beta_1 + \beta_2 F + \mu$ (1)

where β_1 is the constant term, β_2 is a coefficient, μ is the random error.

2.3 Parameter estimation

According to the data in Table 2, using OLS method, we obtained the regression function:

$$\hat{M}_i = -127.48 + 0.7385\,\hat{F}_i \quad (2)$$

$$Se = (194.1975)(0.031334)$$

$$t = (-0.656442)\ (23.56730)$$

$$p = (0.5222)\ (0.0000)$$

$$R^2 = 0.975413 \quad DW = 1.634768$$
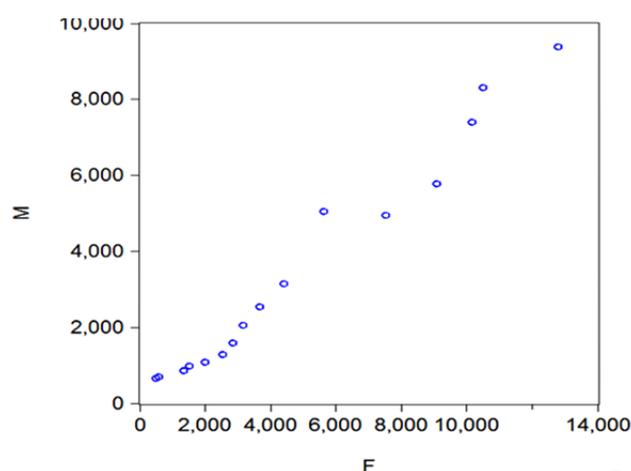
Figure 1   Scatter Graph of Manufacturing Industry and Financial Development of Wuhan

2.4 Evaluating and testing the regression analysis results

2.4.1 Evaluation of economic theory

According to the analysis about the relationship between financial development and manufacturing, we know the sizes and the signs of the parameters are consistent with theoretical analysis.

2.4.2 Statistical significance

Since β_1 and β_2 are deduced by the sample, even if their true value is zero, and we still cannot get an estimated value of zero due to fluctuations in the sample. Therefore, we determine the significance of the regression coefficients by t-test. In this analysis, the regression coefficient is statistically significantly different from 0, and the *p*-values are approximate to zero.

2.4.3 Fit goodness of regression model

To what extent the F-variables explains variation of variable *M*. In the above analysis, R^2=0.9754, which is a very good fit, shows that financial development explains 97.54% of the manufacturing industry in Wuhan.

2.4.4 Testing whether the regression model meets the Classic assumptions

Firstly, we make heteroscedasticity test using White test. The basic idea is that if there is heteroscedasticity, the variance σ_i^2 has some relationship with the explanatory variables, so we can determine heteroscedasticity through whether σ_i^2 is related to the explanatory variables. The calculated nR^2 is 3.239312 by the statistical software, given significance level α = 0.05, checking X^2-distribution table, we know $nR^2 <= 5.991$, therefore, there is no heteroscedasticity.

Secondly, test the auto-correlation relationship. The results of the regression analysis shows that DW value is 1.634768, based on the sample size n = 16 and the number of explanatory variables k', checking DW distribution table, the critical values are 1.10 d_L and d_U = 1.37, DW value is between the two, therefore, we cannot determine whether the serial correlation exists. Doing Lagrange multiplier test, we obtained LM = nR2 = 3.808057, the corresponding P value equal to 0.1490, which is greater than the significance level 0.05, indicating that the model accepted the null hypothesis "there is no first-order autocorrelation".

Through the above results of regression test, we get the final regression model.

According to the above empirical test, we conclude that the symbiotic relationship between the financial sector and manufacturing in Wuhan exists.

3 Advice about Symbiosis Development Finance and Manufacturing Industry in Wuhan

Although symbiotic relationship between financial development and manufacturing in Wuhan exists, the interaction and coordination between the two is not enough, mainly support from financial service to manufacturing. In year 2014, traditional services in Hubei occupied 34.9% of the added value of total service industry, while the finance accounted for only 12.1%. Viewing from the implementation of funds invested in manufacturing, the self-financing accounted for more than 70%, indicating that support from finance to manufacturing industry is not enough. According to the financing needs of

private enterprises in the survey conducted by Wuhan Individual Association, a total of more than 800 private companies have expressed financing needs, the total amount needed is nearly 7.8 billion yuan, and mostly concentrated in the manufacturing sector. This shows that the loaning of small and medium manufacturing enterprises is difficult and the funding gap is large (Zhou Fang,2011) Therefore, for the symbiosis and prosperity of financial and manufacturing industry in Wuhan, the financial service should be optimized and innovated.

3.1 Optimization of financial service

Reformation of credit management and improvement on credit financing system to manufacturing industry is demanded. Banks should establish the concept of co-development with the real economy, serve the real economy and the weakness of national economy; also they should change the credit marketing strategy, and place the financial business towards small and medium firms as a new strategy, make the appropriate mechanism innovation and system innovation. Banks even should segment market seriously, make differentiated development strategy, industry leading enterprises and good development prospects, offer preferential interest rates to the leading enterprises, as well as small and medium manufacturing enterprises with good economic indicators, reduce operating costs, provide financial support to transformation and upgrading of manufacturing industry, effectively solve the financing problem of the manufacturing sector.

3.2 Construction of multi-faceted financing channels for SMEs

Diversified financing channels should be opened up to solve the financing problem of SMEs in manufacturing industry chain. Also, we should encourage the development of local small and medium financial institutions, focusing on SME financing services, and develop financing companies, trust and investment companies, establish leasing companies, small loan companies, and diversified non-bank financial institutions such as varies of professional loan companies, to meet financing needs for the development of manufacturing enterprises and create diversified financing channels. Establishing private banks and specialized loaning institutions by directing private capital is an effective way to solve the difficult loaning problem of small and medium private enterprises, while cutting down the lending rates by competition and improving banks' service form a virtuous cycle of manufacturing development and full use of private capital.

3.3 Innovation of financing method of manufacturing industry

New financing methods such as cluster financing and supply chain financing, should be explored.

Supply chain finance refers to a financing pattern in which the banks provide flexible financial products and services to the core and a plurality of upstream and downstream enterprises in an industry. This financing method exceeds the credit accessing requirement limits such as of traditional rating credit and mortgage guarantee, providing flexible financial products and services for its core and upstream and downstream enterprises in the supply chain, particularly solving the financing difficulties for small and medium enterprises. Wuhan should vigorously develop financial products and services focusing on manufacturing chain.

The phenomenon that SMEs in close contact with a large number of industries form a spatial cluster around a leading industry and they form a strongly sustainable competitive advantage through synergy is known as SME clusters. Practice has proved that the development of SME clusters promotes regional economic development, SME cluster has certain financial advantages. Wuhan should vigorously promote SME cluster development in manufacturing industry, implement and innovate SME cluster financing during their development.

4 Conclusions

This paper studies on two major aspects. On one hand, selecting the GDP from 1998 to 2013 manufacturing and loan balance of financial institutions in Wuhan, the paper makes empirical analysis on the symbiotic relationship between the financial industry and manufacturing in Wuhan based on the regression model, and proves the presence of the symbiotic relationship between the two. On the other hand, based on the status of financing difficulties for manufacturing enterprises in Hubei in recent years, puts forward that the financial support to manufacturing industry in Wuhan is not enough, and advances the advice that optimize and innovate financial services in Wuhan to promote symbiotic development of financial the manufacturing industries.

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Exploring the Shunt Capacity of Transshipment Port in front of the Three Gorges Dam Based on Arena Simulation

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Abstract: With the rapid development of economy and shipping in the upper reaches of the Yangtze River basin, the transportation demand through the Three Gorges Dam will continue to increase. The ship backlog has become normal in front of the Three Gorges Dam. In order to alleviate the pressure of the Three Gorges ship lock, the strategy of emergency transshipment over dam is carried out. This paper takes Ro-Ro ships transshipment over the dam as an example, and establish a diversion port transportation system model in front of the Three Gorges Dam by using Arena simulation software, which simulates the future emergency shunt capability when the ships backlog occurred in front of the Three Gorges Dam port. The results indicate that, in the future, the demand of transshipment over the dam will continue to grow, while the capacity of the Three Gorges ship lock would be gradually saturate. As a result, there are excess emergency shunt capacities in the early time, but insufficient capacities later.
Key words: The three gorges dam hinge; Simulation; Transshipment; Emergency shunt capability

1 Introduction

Dam ship lock capacity has become a bottleneck restricting the development of the Yangtze River shipping. Ship backlog in front of dam has become normal. In order to avoid the backlog of ship, a large number of transshipment were passed over the dam. Therefore, it is extremely onerous and arduous to explore the emergency shunt capacity of the port in front of the Three Gorges dam, which is not only the need of improving the efficiency of the ship, but also the guarantee of the economic development of the Yangtze River Basin.

Port diversion system of the Three Gorges is a discrete system. At the same time, the transportation facilities and the activities of the port are driven by discrete events. It is difficult to realize the direct quantitative calculation or to establish the mathematical model, so the simulation model can be built by using the effective simulation technology.

In terms of the using simulation technology, the scholars such as Wang Yonghui developed the actual port operation process measurements simulation system based on simulation software Arena 3D player (Wang Yonghui, et al,2007). Liu Jingxian analyzed the characteristics of the port channel system and the ship traffic flow, established the port channel capacity model based on the characteristics of the ship's behavior (Liu Jingxian, 2009). Wu Dan used the theory of discrete time system simulation, established the channel through ability simulation calculation model, and used the simulation software Arena Rockwell to carry on the model realization (Wu Dan, et al, 2007). David Kelton W described the discrete system simulation theory in view of the simulation software Arena, and describe how to use Arena for discrete simulation modeling and optimization (W David Kelton,1998).

2 The Definition of Emergency Shunt Capacity in front of the Three Gorges Dam

In front of the Three Gorges Dam, there are three operating areas named Tai Ping River operating area, Mao Ping operation area and Jing Jiang River operating area, function as shunting capacity in front of the dam. These operation facilities are not only for the daily transport of dam, but also for maximizing the use of the remaining free resources to carry out the diversion of the Three Gorges Ship Lock's backlog of ships, the maximum throughput of these residual resources, that is, the emergency shunt capacity in front of the Three Gorges dam.

Consequently, the emergency shunt capacity in front of the Three Gorges Dam= Maximum throughput capacity of transshipment in front of the Three Gorges dam −the actual daily turning over dam throughput.

3 Simulation Modeling of Transferring in front of the Three Gorges Dam

3.1 Selection of simulation tools

This paper aims to draw the emergency capacity of the Three Gorges Dam on the ship's backlog. Furthermore, it is to simulate the normal port of the dam and the backlog of state, get the emergency diversion scheme and the freight volume under high load operation of port. Under this consideration, this paper chooses the Arena simulation software as the simulation tool.

Comparing to other simulation tools, Arena's simulation towards dam transshipment port of The Three Gorges can get a more specific result of whether the ability of dam-front ports' emergency transshipment satisfies the ships' dam-passing demands at critical moment, and judge whether the production ability of the port is insufficient or excess.

3.2 The hypothesis of the simulation system

At first, the model of the port transportation system of the Three Gorges project is established, and the model has two ship production events: The first ship production event simulates the ships turning over the dam in front of the Three Gorges Dam, input simulation parameter value; The second ship production event simulates the backlog of ship, by changing the input value, in the view of the different arrival time intervals, the utilization rate and queuing quantity of the quantity of the ship and the berth resources of the port are analyzed. We can calculate the port emergency capacity. Before the simulation by the following assumptions: 1) the arrival of the ship follows Poisson distribution; 2) port working, loading and unloading efficiency; 3) vessel operation without mutual interference; 4) good weather and no accidents; The idea and the steps of the simulation is shown in Figure 1.
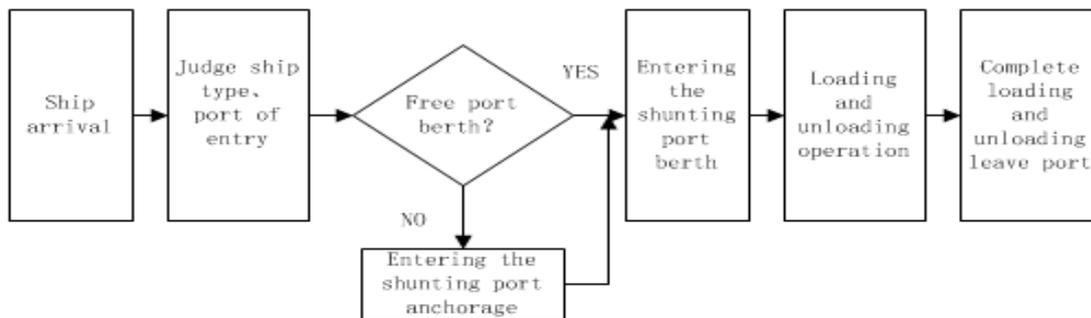
Figure 1   Ship Shunting Operation Logic Model

4 Defining the Simulation Parameters

Simulation models can be divided in to three sub-models according to their different positioning which are dam-transshipment demand sub-model，backlog of ship sub-model and diversion port sub-model with main input parameters of the law and amount of emergency diversion, the amount of quay berth, the proportion between diversion ships and ro-ro ships, the time of loading and unloading ro-ro ships, the carrying capacity of ships, the judgment variable of completing diversion,etc.Since there are so many variables, here only presents an example of emergency diversion to indicate.

According to the annual statistical yearbook and Yearbook， the combination of exponential smoothing method, grey model and correlation analysis are uses to predict the Ro-Ro terminal throughput in front of the Three Gorges Dam transshipment port, which are 2016, 2020, 2030 are 1310.73 million tons in 2016，2103.73 million tons in 2020, and 5449.14 million tons in 2030.

5 Results Output and Verification

5.1 Simulation of the shunting capacities in the transshipment port

1) Simulation of the shunting capacities in the transshipment port in 2016

The input was obtained from the actual materials to the model. At the same time, simulation is to get the emergency shunt capacity of the transshipment port, so the ship production number of the backlog of ship model is changed, the parameter λ of the sub model of the backlog model is a variable. The record data are as shown in Table 1.

From Table 1, it can be seen that, when the time interval is 1 h, the system stranded ship number is 4, resource utilization rate is 0.9; when the time interval is shortened for 0.5h, system stranded ship number increased to 387 ships, terminal resources utilization rate also increased to 1. It is clear that the average time interval from 0.6h reduced to 0.5h, the stranded ship quantity, resource utilization rate is

increasing rapidly. The time interval continues to decreasing, resource utilization is still 1, while the average queuing time of the ship continued to rise, so need to find the critical point of the terminal resource utilization rate of 1 in the 0.5-0.6 time interval. The λ in 0.5-0.6 value, repeatedly operating model, that when λ is less than or equal to 0.55, resource utilization rate is 1, stranded ship and queuing time continued to increase. At this time, the backlog of vessel departure is the maximum ship emergency diversion Tai Ping River operation area of Ro-Ro Terminal number.

Table 1   Simulation Results of Ro-Ro Terminal in Tai Ping Operations Area

λ	Stranded ship in the system	Resource utilization	Average queuing time
1	4	0.903	5.57
0.9	1	0.910	5.72
0.8	15	0.917	6.38
0.7	7	0.936	7.03
0.6	20	0.948	8.18
0.5	387	1	8.76
0.4	319	1	10.34

When the time interval is 0.55 h, the backlog of Ro-Ro ship number is 14054, the completion of the operation of the rolling stock vehicles is 420.8thousands from the simulation report. According to the historical data, the load of each rolling truck is 35t, so it can be calculated that in 2016, the emergency shunting capacity of the Ro-Ro Terminal in the Tai Ping River operation area is 14728 thousand tons per year.

2) Simulation of the shunting capacities in the transshipment port in 2020

Compared with 2016, the simulation model of the pre dam transit port in 2020 is different from the module and the parameters of the working area in Tai Ping River, and the parameters are different. So this section only lists the different parts of the parameter input in 2016. Port simulation model parameters of the port before the dam in 2020 are as shown in table 2.

Table 2   Simulation Parameter Input of the Transshipment in 2020

Module		Meaning	Parameter	Parameter values
Ship production sub model	Create（Roll ship）	Number of ships produced	λ	0.45
	Create（cargo ship）	number of ships produced	λ	3.02
Shunting Port sub-model	Seize dam tpx1	number of ro-ro berths of Taiping operation area	dam tpx1	4
	Seize dam mp1	number of ro-ro berths of Maoping operation area	dam mp1	3
	Seize dam mp2	number of ro-ro berths of Maoping operation	dam mp1	2

The simulation results of the rolling loading dock in the Tai Ping River operation area are as shown in table 3.

Table 3   Simulation Results of Ro-Ro Terminal in Tai Ping Operations Area

λ	Stranded ship in the system	Resource utilization	Average queuing time
0.8	4	0.7365	0.3857
0.7	0	0.7602	0.4333
0.6	4	0.7999	0.5344
0.5	3	0.8413	0.6615
0.4	0	0.9089	0.9821
0.3	6	1	4.793
0.2	120	1	7.5211

It can be seen from table 3 that, when the time interval is shortened from 0.4h to 0.3h, the stranded

ship quantity, resource utilization rate is increasing rapidly. The time interval continues to decreasing, resource utilization is still 1, while the average queuing time of the ship continued to rise. When λ is less than or equal to 0.37, resource utilization rate is 1, stranded ship and queuing time continued to increase. At this time, the backlog of vessel departure is the maximum ship emergency diversion Tai Ping River operation area of Ro-Ro Terminal number. When the time interval is 0.37 h, the backlog of Ro-Ro ship number is 20960, the completion of the operation of the rolling stock vehicles is 641.4 thousand from the simulation report. According to the historical data, the load of each rolling truck is 35t, so it can be calculated that in 2020, the emergency shunting capacity of the Ro Ro Terminal in the Tai Ping River operation area is 22449 thousand tons per year.

3) Simulation of the shunting capacities in the transshipment port in 2030

According to the construction period, the simulation model of the diversion in the transshipment port in 2030 is basically the same as the simulation model in 2020.

When λ is less than or equal to 0.68, resource utilization rate is 1, stranded ship and queuing time continued to increase. When the time interval is 0.68 h, the backlog of Ro-Ro ship number is 11666, the completion of the operation of the rolling stock vehicles is 358.2 thousand from the simulation report. It can be calculated that in 2030, the emergency shunting capacity of the Ro-Ro Terminal in the Tai Ping River operation area is 12536.4 thousand tons per year.

Table 4 Emergency Capability of Ro-Ro Terminal in Tai Ping Operation Area

Year	2016	2020	2030
Roll vehicle（10^4vehicles）	42.08	64.14	35.82
Distributary ability（10^4tons/year）	1472.8	2244.9	1253.64

Compare the Three Gorges ship lockage freight demand with the Three Gorges ship lock through capacity, the transshipment demand over the Three Gorges ship lock will continue to grow, and the Three Gorges ship lock through capacity has reached saturation. The one-way freight capability gap has reached 680 million tons in 2016, 11.3 million tons in 2020, and 35.5 million tons in 2030 in Tai Ping River operation area through the, . As shown in table 5.

Table 5 Supply and Demand Balance Analysis of Ro-Ro Terminal in Tai Ping Operation Area

	2016	2020	2030
Unidirectional freight capacity gap of Ro-Ro terminal in Tai Ping operation area(10^4tons/year)	680	1130	3550
Emergency bypass capability of Ro-Ro terminal in Tai Ping operation area(10^4tons/year)	1472.8	2244.9	1253.64

6 Conclusions

From the simulation results of each operation area of the Three Gorges project, it can be seen that the emergency shunting capacity in transshipment port in front of the Three Gorges Dam is surplus in the early stage, but insufficient from 2020. As a result, the following Practical guidance are put forward:

1) Before 2020, the relevant departments for the new terminal construction project should be strict to check and build approval system.

2) From 2020 to 2030, the construction of the new terminal can enter the preparation and construction stage on the basis of the scientific prediction of the capacity and throughput of the port. . Reasonable layout of the port to avoid blind construction

3) After 2030, adjusting the structure of the port, optimization and integration to the port area to use them reasonable.

In addition, reasonable to improve the utilization rate of berth. Make a schedule to increase the number of berths in the future construction. In order to the problem of the ship backlog, it is suggested that the number of berths in the transshipment in front of the Three Gorges Dam should be planned step by step.

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Research on the Evaluation Method of Logistics Service Innovation Based on the Perspective of Logistics Cost

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Abstract: This paper puts forward that the logistics cost is one of the factors that affect the logistics service innovation. And hierarchical structure model of logistics service in the view of logistics cost is put forward based on the analysis of the relationship between logistics service and logistics cost. By using the value engineering analysis method, the relationship between design function of logistics service innovation and life cycle cost of logistics service is analyzed, and the value evaluation model of logistics service innovation is put forward, which provides a set of scientific evaluation method for enterprises to develop logistics service innovation.
Key words: Logistics cost; Logistics service; Service innovation; Evaluation method

1 Introduction

European scholars first launched research on service innovation. CIS (2007) following the view of technical school held that, for the enterprise, service innovation is the innovation of new or improved products, process and delivery. Some domestic scholars also define the connotation of service innovation. Lin Lei & Wu Guisheng (2007) held that the service innovation is a broad concept, and service innovation activities occur not only in the service sector but also in other industries and sectors. These scholars put forward that the generalized service innovation refers to all service innovation behavior and activity related to or aimed at service; the service innovation in narrow sense refers to the innovation behavior and activity occurring in the service industry. Therefore, it can be considered that logistics service innovation includes not only the service innovation occurring in the logistics enterprise, but also logistics service innovation occurring in production and trade enterprises. Specifically, logistics service innovation refers to the process in which enterprises under the guidance of the innovative strategy and to meet customers' demand, apply various new logistics technology which is mainly based on the modern information technology, innovate logistics management ideas and methods, improve or develop logistics service products and processes, innovate logistics service content, implement strategy of logistics differentiation, improve the logistics service quality, create value for customers and at the same time improve performance of the enterprises, and gradually form the core competitiveness of enterprises. Logistics service innovation is a systematic and complex project, and the factors that affect the innovation of logistics service are various.

2 Literature Review and the Influence Factors of Logistics Service Innovation

2.1 Knowledge factor

Kan-dampull (2002) held that the key of the service innovation lies in the knowledge, technology and relationship network. He believed that knowledge is very necessary in the exploration process of logistics service innovation, and pointed out that the technology and ability are the best representation of knowledge and the key of logistics service innovation is to carry out knowledge management within and between companies. Chapman et al (2003) discussed that the knowledge and other factors will affect the logistics service innovation, and discussed the contribution of logistics service innovation to enterprises. Flint et al (2005) through interviews with experienced senior logistics managers in the United States, Europe and Scandinavia, created a process model of logistics service innovation which is composed of four parts, including establishing contact with customers, collecting information of all the customers, discussing and exactly reflecting customers' information, and the mutual learning and mutual discussion among organizations.

2.2 Relationship network factors

Chapman et al. (2003) also pointed out that the relationship network will be able to lead to the innovation of logistics service. They thought that enterprises need to work together to understand customers' needs and meet customers' demand and potential demand, and the enterprise can form horizontal or vertical alliance with other enterprises, to acquire knowledge their own businesses cannot get. Hakansson, et al (2004) also found in the study that cooperation can lead to innovation.

2.3 Technical factors

Richey et al (2005) explained the importance of logistics service innovation in the field of reverse logistics in an empirical study on the reverse logistics by using "resource advantage" theory, and pointed out that the technical resources play a positive role in reverse logistics service innovation. Chapman et al (2003) pointed out that technology plays an important role in overcoming the inconvenience of time, space and communication; technology can provide more effective knowledge sharing for the enterprise; in order to adapt to the application of new technology tools, enterprise must carry out business process innovation.

2.4 Cost factor

Fu Guilin (2007) held that the logistics cost refers to various fees accompanied by the activities of enterprise logistics service, the monetary expression of materialized labor and living labor consumed in logistics service activities, the sum of manpower, financial power and material resources expended in the process of goods' physical movement, such as transportation, warehousing, loading and unloading handling, packaging, circulation processing, distribution and logistics information processing. As long as the logistics activities occur, expenditures of logistics costs will be generated. This paper will focus on the relationship between logistics service innovation and logistics cost, and construct the evaluation method of logistics service innovation.

3 Analysis of Logistics Service Innovation from the Perspective of Cost

3.1 Analysis of the relationship between logistics cost and logistics service

Logistics service is the results of enterprise's carrying out a series of logistics activities to meet the logistics demand of customers, including internal and external customers. The essence of logistics is service, and it itself does not create the form utility of commodity, but the space utility and time utility. Logistics service belongs to the category of customer service, and it is the main component of customer service. The logistics service here mainly includes the following three constitute elements: customers' expected commodity (stocking assurance); delivery of goods in customers' expected time (transport assurance); meeting customers' expectations of quality (quality assurance).

In the relationship between logistics cost and logistics service, the logistics cost control is the form, the logistics service is the content, and the coordinated development of the content and the form is the responsibility of modern enterprise logistics management. It is the essence of the logistics management theory of modern enterprise to achieve the service level which satisfies customer with the lowest logistics cost.

The relationship between logistics cost and logistics service is the trade-off relation. Logistics service of high level is guaranteed by logistics cost of high level. In the absence of a large technical progress, it is difficult for the enterprise to not only improve the level of logistics services, but also reduce the logistics cost. Logistics management is the process with the aim of meeting customer demand to the maximum, to organize with efficient and economical means the movement and storage of the raw materials, semi-finished goods, finished goods and related information from supply place to consumption place, and to implement solution, organization, command, coordination and control. Therefore, customer demand has become the driving force to lead the enterprise to carry out the strategic adjustment of logistics; customer service has become a strategic means of enterprise competition. There is no end to the logistics service innovation, and a key factor restricting the logistics service innovation is the logistics cost. How to coordinate the relationship between logistics service innovation and logistics cost is an important issue in logistics management?

3.2 Analysis of hierarchical structure of logistics service from the perspective of logistics cost

The two core elements of logistics capability, logistics service and logistics cost are contradictory and complex. To more accurately describe the present situation and the change range of logistics capability, with logistics cost level and logistics service level as the two axes, divide logistics cost level and logistics service level into high, medium and low gears, and form nine kinds of logistics capability section. The logistics capability status of each section is different and variable, and there are many kinds of changes. As shown in figure 1.
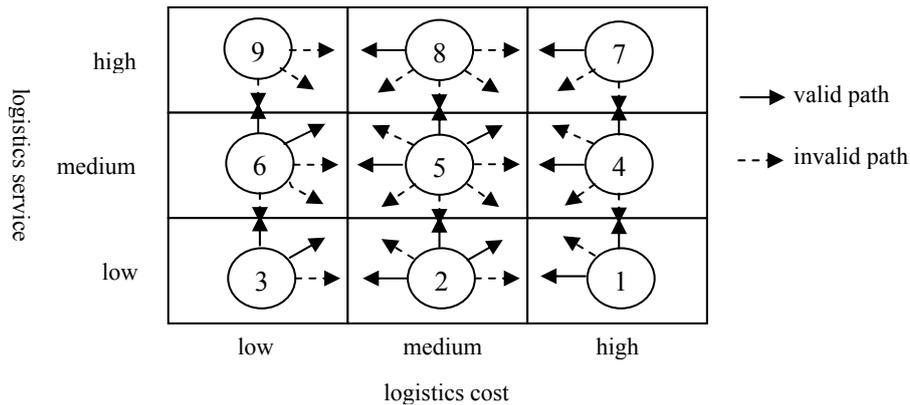
Figure 1   Hierarchical Structure Model of Logistics Service from the Perspective of Logistics Cost

4 Construction of Value Evaluation Model of Logistics Service Innovation
4.1 Theoretical basis
The value evaluation model of logistics service innovation in this paper is based on the value engineering analysis method. All the expenses of logistics costs are decided by logistics system design before the beginning of logistics service activities. Therefore, the decision-making of the logistics service innovation can choose the best program in the design stage of logistics innovation ability, through the value engineering analysis of logistics service innovation activities and logistics cost. Value engineering focuses on function analysis, so that all the tasks of logistics achieve the appropriate value, that is, to achieve and create the necessary functions of logistics services with the lowest cost.

1) Value engineering is to realize the necessary function of a logistics service activity with the lowest cost in order to achieve the best value of logistics service, in which the function is the function or the effect of a logistics service. Function first meets the needs of consumers as a precondition, and the improvement of the function is unlimited, but it is also subject to customer demand and cost constraints. Value engineering is to determine the necessary function of logistics service innovation, to avoid the phenomenon of excess function and insufficient function. Cost refers to the life cycle cost of logistics service, that is, the costs that occur to realize the necessary function of logistics service in the whole process of logistics service. Value engineering is to make the life cost lowest under the premise of ensuring the necessary functions of logistics services.

2) Value engineering is to find the best value according to the internal links of the logistics service costs and functions, and through scientific comparative analysis. Carrying out the logistics service innovation cannot be separated from the constraints of customer's cost, in one-sided pursuit of high function, but also cannot be separated from the customer's demand, in one-sided pursuit of low cost, resulting in the deficiency of necessary functions of logistics services. The real purpose of value engineering is to realize the necessary function of logistics service innovation, and to reduce the life cycle cost of logistics service, and to pursue the best value of logistics service innovation.

3) The core problem of value engineering is to analyze the function of logistics service activities. In the process of logistics service innovation, the analysis and research on the function of logistics service innovation is focused on, to determine the effective method to realize the necessary functional optimization. Through the functional analysis it can be discovered which function customers need, which function is unnecessary, which function is excess, and which function is insufficient, so that the function of logistics service innovation is more reasonable, to not only meet customers' needs, ensuring the necessary function, but also reduce the life cycle cost of logistics service innovation.

4.2 Value evaluation model of logistics service innovation
According to the value engineering analysis method, based on the relational adaptation degree between the design function of logistics service innovation and life cycle cost of logistics service, the value evaluation model of logistics service innovation is proposed: logistics service innovation value coefficient = logistics service function coefficient / logistics cost coefficient,

That is $FCR_i = FR_i / CR_i$ (1)

In this equation,

FCR$_i$ represents the logistics service innovation value coefficient;

FR$_i$ represents the logistics service function coefficient;

CR_i represents the logistics cost coefficient;

C represents cost

F represents the various functions of logistics service innovation

According to the functional comprehensive average score of logistics service innovation solution, the function coefficient is calculated, that is, the proportion of the functional comprehensive average score of a solution in functional comprehensive average score of all solutions. Let F_i denote the functional comprehensive average score of a solution, then the function coefficient of the scheme is $FR_i = F_i / \sum F_i$. According to the estimated total investment of service innovation program, the cost coefficient is calculated, that is, the proportion of the estimated investment of service innovation project in the total investment. Let C_i denote total investment of an innovative solution, then the cost coefficient of the solution is $CR_i = C_i / \sum C_i$. The function coefficient and cost coefficient of an innovative solution is compared, and the ratio of function cost coefficient is calculated, to evaluate the adaptation degree of the investment and the function of the innovation solution. If FCR_i is close to 1, indicating that the design function of the service innovation solution roughly adapts to the expected investment, the solution is desirable; If FCR_i is more than 1, indicating that the function evaluation of service innovation solution is relatively high, while investment is insufficient, it is possible that the design function is difficult to achieve; if FCR_i is less than 1, indicating function evaluation of the service innovation solution is relatively low, but the investment is too high, it may result in excess function or waste of investment.

4.3 Value band analysis of logistics service innovation

The so-called value band of logistics service innovation is the value range of logistics service innovation. Generally speaking, the value range of logistics service innovation can be divided into two types, which are rational range and irrational range. Rational range is that the design capacity of logistics service innovation basically adapts to life cycle cost of the logistics service, that is, the value coefficient of the logistics service innovation is close to 1. Irrational range is that the design capability of logistics service innovation does not adapts to the life cycle cost of logistics service, that is, the value coefficient of logistics service innovation is far greater than 1, or far less than 1. As shown in Figure 2, the green value band is rational range, the red value band is irrational range, and the yellow value band is between the rational and irrational.
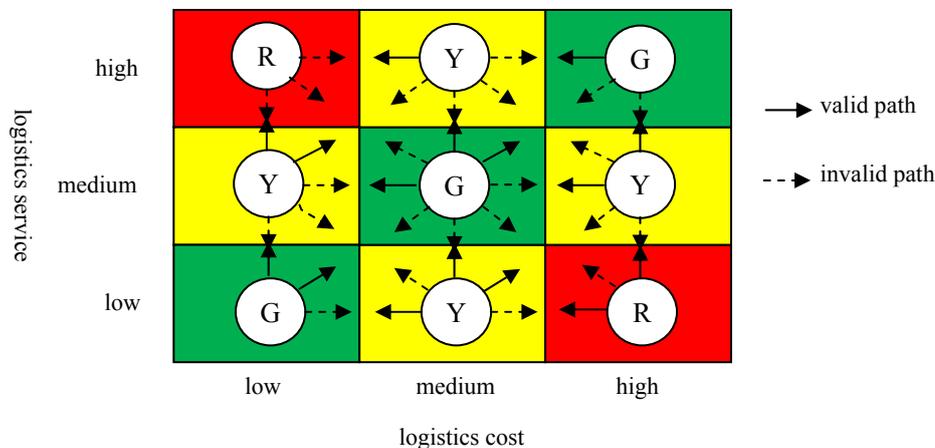
Figure 2   Distribution of Value Band of Logistics Service Innovation

Of course, this approach evaluates the innovative solutions only from the point of view that design function of the logistics service innovation adapts to investment costs. In addition, whether solution of logistics service innovation is feasible should be evaluated be based on the indicators such as payback period of investment, rate of income on investment, customer satisfaction and core competitiveness, which is not involved in this paper.

5 Conclusions

The research on logistics service innovation by scholars at home and abroad has formed a relatively completed system, including the theoretical basis and research perspective of logistics service innovation. However, the breadth and depth of logistics innovation research is still far from enough, and

there is little research on the mechanism of logistics service innovation and logistics service innovation management and other aspects. The influencing factors of logistics service innovation value include knowledge, network, technology and cost. For the first time from the perspective of logistics cost, this paper analyzes the relationship between logistics service and logistics cost and proposes the logistics service hierarchy model from the perspective of logistics cost; using the value engineering analysis method, analyzes the relationship between the design function of logistics service innovation and life cycle cost of logistics service, and puts forward a set of evaluation method for logistics service innovation value. The following research perspective will continuously focus on logistics cost, and will construct logistics service innovation system and establish management system of logistics service innovation.

Acknowledgement

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A Critical Review of Cultural Approach to the Brand

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Abstract: Cultural branding is a new approach emerged in the early 2000s. Theoretical background of this approach rooted in customer culture theory. This approach by using hermeneutic methods considers how branding affects culture and how culture affects branding. In this research first we focused on literature and theoretical background of this approach. According to literature and related researches in marketing, social studies and psychology we presented a critical review of cultural approach in international branding. we extracted four weaknesses for cultural branding which are: needs, wants and demands are regarded same, Branding in this approach has two tools and don't use from all potentials and capabilities, Cultural branding doesn't consider culture as a multi-layer construct and Culturel approach is applicable in countries and societies which are in terms of physical, safety and belongness needs are in good condition not in all countries.
Key words: Culture; Brand; Consumer culture theory

1 Introduction

There are two streams that have classified different approaches in branding and brand management. Heding extracted seven approaches encompassing: economic approach, identity approach, consumer-based approach, personality approach, relational approach, community approach and cultural approach.(Heding, Knudtzen & Bjerre, n.d., 2008) Cultural approach introduced by Holt's works. Holt through case study provided 4 models for managing brands: viral branding, emotional branding, mind-share branding and cultural branding (Holt,1998). Cultural branding focus on cultural layers behind brand and their interactions. This approach by focusing on iconic brands argue that how they create a stream that dictate a culture to the society. Introducing new elements to the culture that affect it, is the strategy of this approach to transfer the meaning to society. In fact, marketer should transfer meaning to the customer by utilizing advertisement and fashion system.
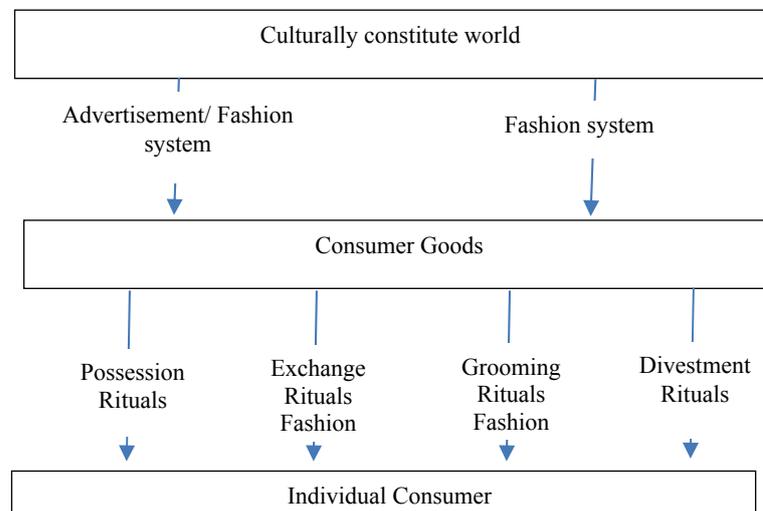
Figure 1   The Movement of Meaning

In this paper we are going to have a critical view to cultural approach. We will review this approach to highlight its flaws and explain that this approach is applicable in specific situations and has distinct requirements which related to environmental factors. Herein, we first review related literature and its theoretical background and then we will discuss about its flaws.

2 Cultural Approach

Cultural approach focus on the brand as a cultural artifact which can broaden the focus of analysis

from an individual consumer level to a macro level about the role brands play in consumer culture. This approach studies the effect of culture on brands and vice versa. Brand icons and the counter cultural anti-branding movements are the core of the cultural approach. Iconic brands are the ones that have managed to integrate themselves in culture more skillfully than others. At the same time, brand icons are also subjected to the greatest concerns regarding cultural imperialism, cultural standardization and globalization. Core to the cultural approach is the idea of the marketer deliberately endowing the brand with cultural meaning and through that playing an active role in consumer culture. The brand is seen as a storied product putting shared myths relating to cultural identity projects up for consumption. The cultural approach reveals the mechanisms behind brands becoming icons. At the same time, the approach also relates to a consumer culture increasingly concerned with the branded products, pressuring for changes in the way brands behave. (Heding, Knudtzen & Bjerre, N.D., 2008)
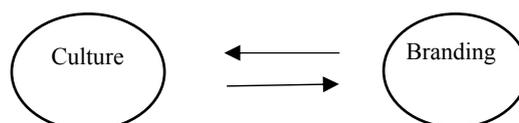
Figure 1   How Does Branding Affect Culture?

3 Consumer Culture Theory

Theoretical background of cultural approach rooted in consumer culture theory. Consumer culture theory is a marketing school of thought interested in studying consumption choices and behaviors from a social and cultural point of view, as opposed to an economic or psychological one. It does not offer a grand unifying theory but "refers to a family of theoretical perspectives that address the dynamic relationships between consumer actions, the marketplace, and cultural meanings". CCT has advanced consumer behavior knowledge by illuminating sociocultural processes and structures related to (1) consumer identity projects, (2) marketplace cultures, (3) the socio-historic patterning of consumption, and (4) mass-mediated marketplace ideologies and consumers' interpretive strategies. (Holt, 1997) (Holt, 2003a) (Holt,2003b)

4 Discussion

We reviewed the cultural approach and how it has evolved. Now we discuss to criticize cultural branding approach.

4.1 Needs, wants and demands are not same

Needs wants and demands are a part of basic marketing principles. Though they are three simple words, they hold a very complex meaning behind them along with a huge differentiation factor. In fact, a product can be differentiated on the basis of whether it satisfies a customer's needs, wants or demands. (Kotler & Armstrong, 2001)

Needs -Human needs are the basic requirements and include food clothing and shelter. Without these humans cannot survive. An extended part of needs today has become education and healthcare. Generally, the products which fall under the needs category of products do not require a push. Instead the customer buys it themselves.

Wants – Wants are a step ahead of needs and are largely dependent on the needs of humans themselves. For example, taking a bath is a need but taking bath with the best soaps is not a need. Thus Wants are not mandatory part of life. For example, a good smelling soap is not a need but a want.

Demands –A step ahead of wants is demands. When an individual wants something which is premium, but he also has the ability to buy it, then these wants are converted to demands. The basic difference between wants and demands is desire. A customer may desire something but he may not be able to fulfill his desire. The needs want and demands are a very important component of marketing because they help the marketer decide the products which he needs to offer in the market.

It seems that in cultural approach need is forgotten. The focus of researchers is on want not need. So sometimes they forget that what is substantial and intrinsic is need. This approach focus on advertising that they should design an advertisement. Modern and postmodern techniques introduced by Holt is a review from all of these topic. Holt mentioned there are three principle techniques in modern branding paradigm: Cultural engineering, scientific branding and Freudian branding. In modern paradigm, consumer was assumed as a compelled person that brand by advertisements should seduce him/her to

buy service or product. In postmodern paradigm assumed consumer is free and can choose product/ service. The company cannot force customers to buy specific product. Even they can show reaction and do against branding. Reflexive Resistance and Creative Resistance are some techniques which consumers use them to counteract branding. Holt counted 5 techniques for branding: Relevant and Authentic Cultural Resources, Ironic, Reflexive Brand Persona., Coat tailing on Cultural Epicenters, Life World Emplacement, and Stealth Branding. (Holt, 1998) The first pitfall of forgetting the need is marketing myopia. (Levitt, 1960)

4.2 Branding in this approach has just two tools: advertisement and fashion

But marketers have other instrument which can apply them in branding. Price, product, people and price are other tools that can be capable in cultural branding. The main theme of cultural branding is culture can transfer through branding. In fact, in this approach brand interact with culture in macro level. So advertising and fashion are bold. But we think other factors like people and price also can be affective.

4.3 Cultural branding doesn't consider culture as a multi-layer construct

Culture has three layers: Basic assumption, norms and values, artifacts and symbols. Branding can interact more with the third layer. In fact, brand can be a part of third layer- artifacts. But values and basic assumption are tough and change barely. Even acting unlike them may result in defect. For example, the logo of Nike that was like "Allah" means God in Arabic. Nike used this logo for shoes and carve it on the back of shoes. This was an insulting for Muslims so they boycotted Nike products. Honda Motor cycle is another example. In Unite states it was obscene a lady rides a motor cycle. Honda company design an advertisement shows a lady is riding a motor cycle. Through this they changed a norm in America society. So interacting with culture is so delicate. Wrong interaction may omit brand from market and right interaction can make the brand dominant. Basic assumption is so dangerous. Because they change hardly and very slowly. In Honda example, people accepted motor cycle as a vehicle for ladies because it was just a norm. The basic assumption in that case was that women should be chaste. people believed lady who rides motor cycle is not chaste. So it became a norm in society. Honda Company by that advertisement change this view to ladies who ride motor cycle.

4.4 Culturel approach is not applicable in all countries

Culturel approach is applicable in countries and sicieties which are in terms of physical, safety and belongness needs are in good condition. According to maslow's hierarchy of needs humans have several needs. Physiological needs are the physical requirements for human survival. Physiological needs are thought to be the most important; they should be met first. With their physical needs relatively satisfied, the individual's safety needs take precedence and dominate behavior .Safety and Security needs include: personal security, financial security, health and well-being safety net against accidents/illness and their adverse impacts.

After physiological and safety needs are fulfilled, the third level of human needs is interpersonal and involves feelings of belongingness. According to Maslow, humans need to feel a sense of belonging and acceptance among their social groups, regardless if these groups are large or small.(Maslow,1943) For example, some large social groups may include clubs, co-workers, religious groups, professional organizations, sports teams, and gangs. Some examples of small social connections include family members, intimate partners, mentors, colleagues, and confidants. Humans need to love and be loved – both sexually and non-sexually – by others.

Herein, every country has a specific condition. International brands face various cultures and different conditions. Every country has its own special social, cultural and economic situations. One of key success fator in international space is local needs. Cultural approach is applicable just in advanced countries. It is not suitable in majority of third world countries. For example countries like Afghanistan or some of African countries are not in good situation in physical and security needs. So they want to fulfill their basic needs and other think is not imporant for them and maybe don't show any reaction. companies also don't spend a lot for attracting and retaining customer because aften in these markets the competition is low and customers more eager to satisfy basic needs.

5 Conclusions

Cultural branding is one cluster in branding literature and a model for managing a brand. The theoretical background of cultural branding rooted in consumer culture theory (CCT). Consumer culture theory is a marketing school of thought interested in studying consumption choices and behaviors from a social and cultural point of view, as opposed to an economic or psychological one. A group of

researchers by using qualitative methodologies, such as interviews, case studies and ethnographies focused on consumption contexts and studied the influence of brand and branding on culture and vice versa. Culture in these studies considered in macro level not micro. With the emergence of postmodernism, no logo movement formed. They presented some technique for counteract brands which try to seduce customers to choose them. On the opposite side communication specialist presented some technique for branding that they didn't promote directly without using exaggeration. Citizen- artist view developed in this space. Reviewing all the literature and other fields related to branding we extracted four points and weaknesses for cultural branding which are: 1) needs, wants and demands are regarded same 2) Branding in this approach has two tools and don't use from all potentials and Capabilities 3) Cultural branding doesn't consider culture as a multi-layer construct 4) Culturel approach is applicable in countries and sicieties which are in terms of physical, safety and belongness needs are in good condition not in all countries.

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How Information Technology Reduce the Transaction Costs in Retail Industry: Taking Walmart as an Example

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Abstract: Transaction costs are involved with the enterprise "production, supply, sales", and the index is difficult to measure. However, information technology provides an effective solution for the reduction of the cost of enterprise macro transaction. Based on the basic theory of transaction cost, this paper expounds the operation mechanism of information technology to reduce the transaction cost of retail trade. That is a way, through the synergy and efficiency of information technology, to establish the enterprise's information, electronic and network. Collecting information and processing information reduces the retail industry "macro" transaction costs ex ante and ex post, and brings low-cost competitive advantage for the retail, so as to obtain a sustained and healthy development in the situation.
Key words: Transaction cost; Information technology; Retail industry

1 Introduction

Ronald H. Coase (1937) firstly presented the economic concept— "transaction costs", after that, the usage of this concept in economic life had been deepened and extended with the research by Alchian (1972), Willamson (1975), Cheung (1983,1998). According to their research, transaction cost which occurred in each link of the enterprise "production, supply, sales" was the most difficultly measurable index in corporation management. However, there was not a clear definition about transaction cost, and some academics (such as Kunxu Zhang, 2012) pointed out this indistinction would disturb the assessment of enterprise and impede the development of economic science. The cost of search, information, bargain, contract, etc. in a company is a "Hidden" opportunity cost. Because we could not measure the transaction cost in every items accurately, it is much more important to reduce this cost and enhance economic efficiency and effects, and on a macro-scale, to create low-cost advantages. This is why information technology need to be used in a company.

With the development of information technology revolution since the new century, a new tendency that firm boundary shrank gradually and firms made a deal via market occurred (Malone et al., 1987). In the internal and external enterprise environment, extensive utilization of information technology had made an increasing number of economic organizations, especially those in the retail industry which is closely related to national economy, rely different network techniques and communication technologies as well as equipment to complete changes from traditional industry economy age to information economy age (Chuhong Zeng, Danming Lin, 2006). So what kinds of important effects information technology has in a transaction process in retail industry, and what kind of mechanism it can apply to achieve the advantages of low-cost trade for retail industry?

2 Literature Review

2.1 Effects of information technology on transaction cost

Dewett and Jones (2001) concluded the effects that information technology has in transactions as two types: information efficiency effect and information coordination effect. Efficiency effect means that applying information technology can raise efficiency of collection, transfer, disposal and usage of enterprise information, and it can save the cost of time and material. Coordination effect represents that utilizing this technology across organizational boundaries to aggregate information and achieve information sharing. This "1+1>2" effect can be beneficial not only to cost saving in terms of production and coordination, but also to enterprise communication and exchanges across boundaries.

On the one hand, information technology can play an efficient role in transaction cost. Electrical network between organizations reduced the cost of search, assessment, supervision which are related to transaction (Malone, Yate, Benjamin, 1987). Meanwhile, information technology in an enterprise can played the role of five types such as auxiliary production, supervision and performance evaluation, decision support, transaction disposal, record and communication (Gurbaxani etc. 1991). The widespread use of information technology usually can be more attractive than hierarchy. It can effectively save the cost of commodity circulation, negotiation and decision-making, thereby increasing

efficiency of transactions.

On the other hand, information technology can play a coordinative role in transaction cost. Companies can utilize this technique to connect with business process, and set up barriers of conversion to customers (Fulk, DeSanctis, 1995). In this way, it allows various forms of strategic alliance, internet organization, and virtual enterprise emerge constantly. According to the discovery from Gang Fu (2008) etc., the cost of information flows can be displayed by three indexes (information integration, information sharing and classified index), which can reduce probability of information distortion, shorten the supply chain and save transaction cost outside the company. Apart from that, information technology benefits the balance of entire enterprise logistics, and promotes the development of enterprise networks and information exchange (Qin Zhao, 2011).

2.2 The use of information technology in retail industry

Si Wu and Jian Jiao (2005) considered that information technology refers to business information transfer, processing, analysis and appreciation in the retail industry. It can allow their competitors, suppliers, customers, replacers and themselves fulfill success together in this market. And it can also bring the advantages of inventory control, cost control, human resources and material control. Its impacts are shown primarily in five aspects including information processing, automated processing, order control, decision-making handling, monitoring and tracking, and make enterprise boundaries more extensive and indistinct (Huanzhou Yu, etc., 2006). Yang Liu realized that the emerge and development of information technology totally changed the traditional business pattern in retail industry, and promoted the development of newly-developing e-commerce model. In addition, information technology can be the basic condition for innovation of retail business, and conversely, it may be improved through the innovation of management, business state, management patterns (Rui Wang, 2014). Lun Zhang (2014) discovered that information technology created the business state pattern of online and offline integration, and many kinds of techniques including mobile internet, location service, online payment and etc. provided support for the development of retail industry.

Despite some risks brought by information technology, including risk factor, risk environment, risk result and risk mechanism (Bouchaib Bahli, Suzanne rivard, 2003), but Jeffrey James (2002) realized that information technology is the major mechanism of driving force for enterprise globalization. It reduced the transaction cost between economic agents, consumers, enterprises and governments in a certain extent.

2.3 Brief reviews

Applying of information technology in retail industry is a convenient way for information acquiring, processing, transferring and utilizing. This convenience came from information coordination and the control of enterprise macro level (Zaheer & Venkatraman, 1994). Therefore, information efficiency and information coordination provide the decrease of transaction cost with "two-fold tunnels". The development of enterprise information promotes development of enterprise network, information processing and e-commerce, changes traditional business pattern in retail industry, and accelerate the pace of innovation in retail industry. More important thing is that development of information technology reduces significantly the difficulty in transactions, shrink scale of trade, strengthen market fluidity, facilitate information sharing, and reduce the reduces the retail industry ex-ante and ex-post transaction costs at macro level.
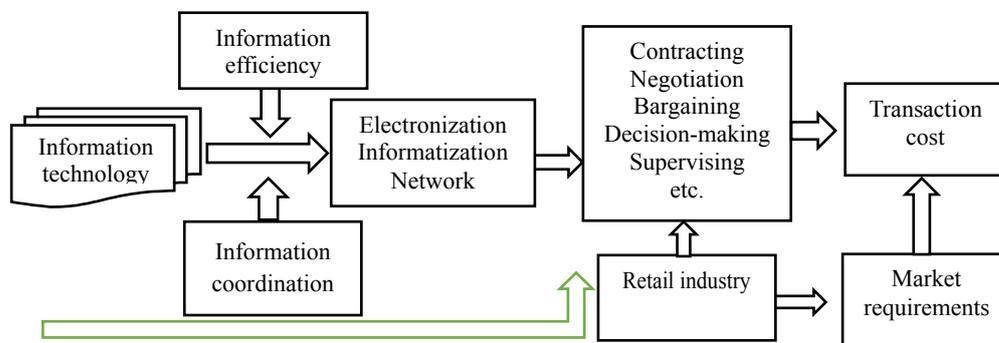
Figure 1   Operation Mechanism of Reducing Transaction Cost in Retail Industry

3 Case Analysis of Walmart

Walmart is the biggest retail chains company around the world. This company has different four

types of business models: Walmart shopping mall, Sam club stores, Walmart stores and Walmart neighborhood market. It has approximately 8500 branch stores in different 15 countries. Its operating profit reached to 16,002 million dollars during 2014, which was the top one around the world. However, the champion of sales in retail industry was Sears corp. for a very long time before 1992. At the same price level, why Walmart could beat Sears and keep the dominant status? Besides integrity, service, independent innovation that Walmart pursues, the more important factors are related to applying of information technology, which can reduce the cost in each link in terms of logistics, delivery, inventory, ordering. With this, Walmart is able to achieve the operating goal that makes its cost less than competitors and conducts profit sharing.

Walmart has a variety of goods and a wide range of customers, and their supply chain is long and their transaction cost covers extensive projects which are difficult to measure precisely. This cost can be classified as two types: ex-ante transaction cost (including contracting cost and negotiation cost, etc.) and ex-post transaction cost (including supervising cost and contract-breaking cost, etc.), the function of transaction cost is:

$$TC=Cb(C1，C2，……，Cn)+Ca(C1，C2，……，Cn) \tag{1}$$

Considering customers' practical requirements, Walmart utilize the management information system (MIS) and electronic data interchange system (EDI) to make a plan for transaction cost, reducing consumption of resources in every links and acquiring low-cost advantage.
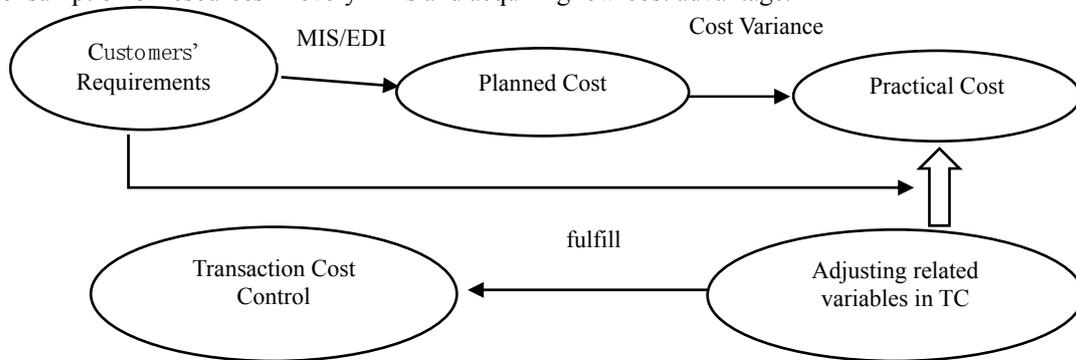
Figure 2   Control Process of Transaction Cost in Walmart

3.1 The control of ex-ante transaction cost in Walmart

The function of ex-ante transaction cost is:

$$Cb=f(C_1，C_2，……，Cn) \tag{2}$$

and this function mainly consists of ordering, contracting, negotiation, bargaining, information and decision-making cost. While there was no newly-developing information technology that acts as the support, dealing with orders, contracting matters, and the statistics about the number of goods delivery need to be done by manual work. After the 1970s, Walmart established the management information system and developed retail chains system. The automatic supply system, which had been established by using barcode scanner and satellite communication equipment as the basis, could automatically check the inventory and submit an application of purchase to suppliers. And then, it could acquire the receipt and transport list, so as to reduce the intermediate links and costs. After that, the automated information of orders would be transferred to delivery center via network system, and the delivery center could find the number and location of corresponding goods by checking barcode information. Finally, it can print the labels of related stores, make goods sent to transport vehicles and ensure cross distribution (CD). The approaches of handling significantly boost the efficiency and accuracy of purchasing, guarantee the quality of goods, extend the ways of purchase, shorten the processes of purchase, and obtain competitive advantages in ex-ante transaction cost. According to incomplete statistics, in many enterprises, the average purchasing and transport costs represent 10% of their sales incomes. Especially in the food industry, a few companies have larger costs which even account for 20% or 30%, while Walmart applies information technology to reduce the cost of purchasing and transport to 2% of sales.

As the inner management, cash desk could record the goods which have been sold through goods' barcode, and write automatically in a computer with the information of price and remaining inventory. Automated ordering system will submit purchasing information, when the number of inventory of a certain good is less than the optimum amount. In this way, an enterprise is able to increase the inventory

turnover ratio, increase the flow of money. By keeping inventory in an optimum amount, enterprises can efficiently, reasonably utilize room of storage, reduce storing cost and risks, and boost inventory turnover ratio. Dynamically improving information handling process can decrease the repeated, waiting, incorrect and speculative behavior of related company in cost control of supply chains, which can finally achieve optimal configuration of material and fund flow and reduce transaction costs in a company.

3.2 The control of ex-post transaction cost in Walmart

The function of ex-post transaction cost is:

$$C_3 = f(C_1, C_2, \ldots\ldots, Cn) \tag{3}$$

and the function mainly consists of supervising, customer service, and opportunity costs. Since Walmart has complete barcode valuation system and commodity management system, it can accept full refund if customers do not have reasons and even receipts after buying a product. Customer service office only need to scan the barcode of this product, then they can know whether the product is sold by their company and all information of it. Besides, by investigating customers' expectation and cases of sales return or change with these barcodes, managers can respond to the problems and correct them in time according to the collected information from computer information system, so as to create a comfortable environment for customers. This quality customer service will increase the level of satisfaction, thereby reducing the cost of customer service. And meanwhile, it can help develop the brand effect and create highly efficient customers' responses (ECR). According to the report form Europe supply chains management committee, since retail industry implemented "ECR", sales incomes increased by 5.4%, cost of storage reduced by 5.9%, the average inventory dropped about 13.1%, and sales in per meter rise 5.3%. It can be seen that complete barcode valuation system and commodity management system set a stable base for the platform of information sharing, decreasing information asymmetry, ensuring that the communications and exchanges between enterprises and distributors can be more timely and precise.

3.3 Brief summary

In a long term, Walmart's information technologies, including information management system, automated supply system, retail chains system and etc., are the most important support for its globally dominant status. By recording and controlling every transaction, Walmart has achieved to reduce the ex-ante and ex-post transaction cost, and further control the performance of company at macro level. The company can utilize information technology to record non-simulated data, such as contracting cost, ordering cost, delivery cost, sales quantity, operation cost, to a simulated system. Through the analysis of horizontal and vertical spanning and changed situations of different indexes, the company can simulate the cast measuring standard for performance management, which could reduce TC to the bottom line. The way that controls transaction cost must generate effective index system. That means it needs to not only reflect the conditions of cost control, but also present cost information in any single node. Apart from that, Walmart also needs to extend the range of performance measuring to cover the information of real-time operation, and needs to make ex-ante analysis well. Moreover, the process of transaction cost control is able to help enterprise find what kinds of shortages it has, and correct the deviation, encourage excellent departments and improve unhealthy departments.
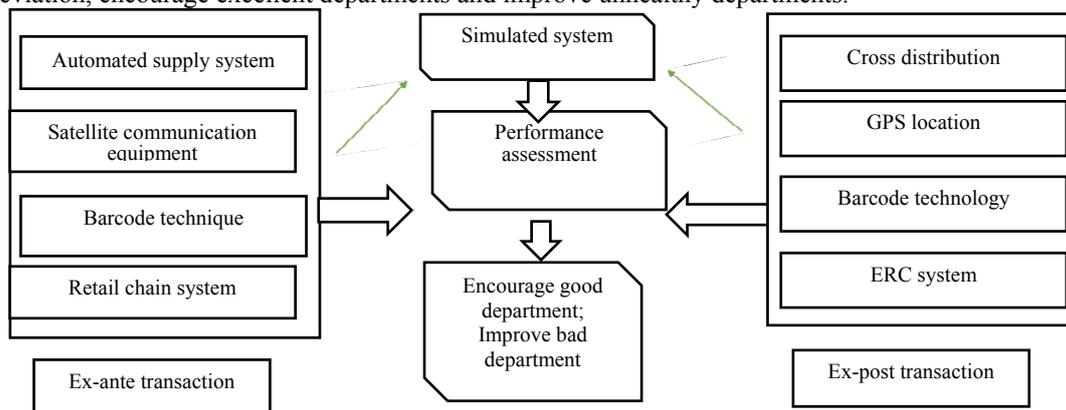
Figure 3   Control Process of Transaction Cost in Walmart

4 Conclusions

This study uses the basic theory of transaction cost, discussing the operation mechanism of information technology and how this technique reduce the transaction cost in retail industry (using

Walmart as an example). Modern retail industry makes the most of coordination and efficiency effects of information technology, promoting the development of information, networks and electronization. With that, it not only allows retail industry to hold the highly-efficient and highly-effective advantages in terms of information collecting, processing and using, but also brings itself advantages in decision-making, contracting, bargaining, supervising aspects. The advanced information technologies (including EDI, MIS, satellite communication equipment, retail chain system, etc.) of Walmart help it form a better performance assessment system, and cyclically decrease the ex-ante and ex-post transaction cost, ensuring that it can obtain low-cost competitive advantages around the world and keep a dominant status in global retail industry.

Acknowledgement

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Consumer Acceptance of SMS Marketing: Evidence from Tanzania University Students

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Abstract: The paper examines the consumer acceptance of short message service (SMS) Marketing as a tool for mobile marketing with Tanzania university students as a sample. The conceptual acceptance model was developed and empirically tested using data collected through online questionnaire. The findings show that the general consumer acceptance of SMS marketing is negative however it can be boosted up if permission, trust, control and privacy and consumer attachment to their mobile phones will be considered. The implication from these findings related to theories and managerial issues have also been drawn.
Key words: Acceptance; SMS marketing; Mobile marketing; Consumer

1 Introduction

SMS marketing become direct marketing communication vehicle for its nature as a one-on-one, one-to-many communication channel to reach the consumer but also as a new way that brand and consumers becomes well connected and integrated(Sultan, Rohm, & Gao, 2009; Watson, Mccarthy, & Rowley, 2013).

According to recent report by Tanzania Communications Regulatory Authority September, 2015 reports shows that, there is an average of 4 billion SMS sent every month from July to September, 2015 which makes a grand total of 13,330,829,144 SMS both international and local for a period of 3 months from July to September, 2015. Therefore, the use of SMS by Tanzania consumers is of highest level and increased drastically.

1.1 SMS marketing

SMS marketing research is still at early stage (Watson et al., 2013),.The evolvement of mobile marketing contributed to the advancement of electronic marketing innovation (Ndyali, 2014). SMS is among the mostly used approach globally (Leung, 2007 cited by (Alhrezat, 2013)). Marketers use SMS marketing as an effective direct marketing tool (Ndyali, 2014; Scharl, Dickinger, & Murphy, 2005; Watson et al. 2013)

1.2 Acceptance of SMS marketing

Several key factors that influence the acceptance of SMS marketing were discussed by various past studies.

1.2.1 Trust and irritation

According to(Awan & Hassan, 2015), trust hold a positive relationship with the attitude of the consumer, while irritation had a negative relationship with the attitude of the customer , this view was also supported by (Huq, Nekmahmud, Aktar, & Alam, 2015)

1.2.2 Permission, control and privacy

Consumer permission on receiving SMS marketing advertisement was considered as a key driver that affect acceptance of the consumer (Carroll, Barnes, & Scornavacca, 2005; Tsang, Ho, & Liang, 2004). Acceptance can be boosted up by permission based marketing (Watson et al., 2013),.On the other hand consumers perceive their mobile device as only for their personal use, hence the highest preference is to have full control over any interaction with the organization or company sending SMS marketing advert (Watson et al., 2013).

On contrary other past researches found contradicting results out from what was discussed in other studies mentioned earlier in this discussion. (Barutcu, 2007) found that there is a positive attitude on acceptance of mobile marketing tools like advertisement among Turkish consumers, while (Izquierdoyusta, Olartepascual, & Reinareslara, 2012) found similar results among Spanish consumers. Therefore, considering this literature review discussion on past research studies the contradictions need to be cleared by doing more research.

2 Conceptual Frame Work and Hypothesis

2.1 Mobile Marketing

According to mobile marketing association (MMA) cited by (Sultan et al., 2009) defines mobile marketing as *"The use of wireless media as an integrated content delivery and direct response vehicle within a cross-media or standalone marketing communication program"*

2.2 Consumer acceptance of SMS marketing

Consumer acceptance of SMS marketing refers to an individual willingness to be involved different marketing activities operated by using mobile phone, these actives may include but not limited to promotion offers, receiving SMS via mobile phone(Sultan et al., 2009)

2.3 Research model

The paper aim at examining the acceptance of SMS marketing among University students in Tanzania, with reference to fore mentioned literature review, past studies and research objective, this study proposed the following research model.
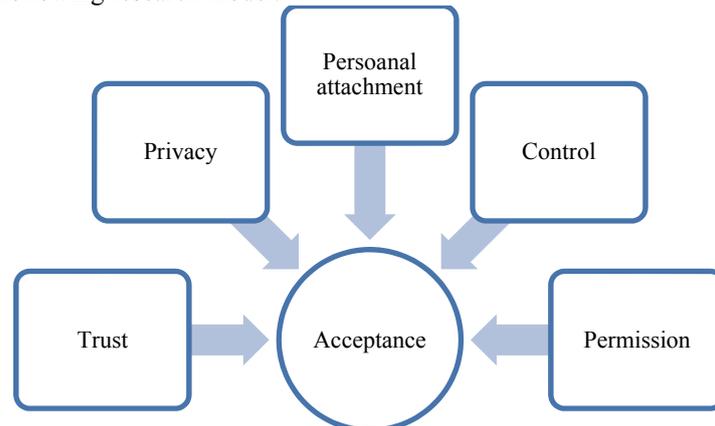
Figure 2   Research Model

2.4 Research hypothesis

H0: The acceptance of SMS marketing by consumers is negatives

H1: Permission has a positive relation towards acceptance of SMS marketing

H2: Trust has a positive relationship towards consumer acceptance of SMS marketing

H3: Control has positive relationship towards consumer acceptance of SMS marketing

H4: Privacy has a positive relation towards acceptance of SMS marketing

H5: Personal attachment has a positive relationship towards consumer acceptance of SMS marketing

3 Methodology

3.1 Data collection method

In viewing of the research Hypothesis, the paper employs both primary and secondary data. Secondary data were collected from different related literatures and past studies. Primary data were collected using a self-monitored questionnaire which found to be affordable as far as the cost is concern, but also as an easy way of data collection (Jinyevu & Mwasha, 2014),.The questionnaire was adopted from (Watson et al., 2013) and adjusted to meet the objectives of the study. The questionnaire was divided into two sections. First section had three questionnaire constructed using 5-point Likert scale with the focus on measuring independent and dependent variables while the second section had 4 multiple choice questions dealt with Demographic data of the respondents. A total of 150 questionnaire links were distributed among the respondents but only 123 successfully filled in questionnaires were collected which makes 82% of the response rate   which is valid since the validity of the response rate should be approximately equal or greater than 80% (Bernard, 2010 cited by (Ndyali, 2014)). Data collections process took a period of one month from January 20th- February 20th, 2016.

3.2 Population and sample selection

The population of this study involves Tanzania consumers. A convenience sample of Tanzania university students were selected from Tanzania consumers. Students selected were those who study in different Universities across Tanzania so as to widen the range of representation.

3.3 Test reliability

The paper employs Cronbach's Alpha Test to test the reliability coefficient. For the data to be reliable, Nunally, 1967 cited by (Ndyali, 2014) and (Bagozzi & Yi, 1988) clarified that the results of Cronbach's alpha should be more than 0.60 which is a minimum value. The Cronbach's alpha result for the total values of this paper is 0.683. This means that the reliability outcomes of this study are acceptable.

Table 1   Reliability Statistics

Cronbach's Alpha	N of Items
0.683	6

3.4 Data analysis technique

With the aid of SPSS software V.16, The research used different data analysis technique to carry out analysis.

Among the analysis techniques used include Cronbach's Alpha (α) to test scale validity of the data, Descriptive statics by computing frequency, mean, sum and percentage. Lastly, regression analysis was computed

4 Findings
4.1 Sample composition

Table 2   Demographic Details of Respondents

Characteristics	Frequency (f)	Percentage (%)
Age : A) 18-30 B) 31-40 C) 41- 50 D) Above 50 Total	100 20 2 1 123	81.3 16.3 1.6 0.8 100.0
Gender : A) Male B) Female Total	78 45 123	63.4 36.6 100.0
Level of education A)Undergraduate B) postgraduate C).Non-degree Total	88 32 3 123	71.5 26.0 2.4 100.0
Marital status : A) Single B)Married Total	85 38 123	69.1 30.9 100.0

4.2 Mean results for independent and dependent variable

In order to have a clear understanding of the mean score interpretation, the paper   adopted Walsh (1981) interpretive scale as cited by (Jonathan & Thibeli, 2013). The Walsh (1981) interpretive scale suggest that a mean scores of 1.5 or less = strongly disagree which interpreted as (very low), 1.51-2.50 = Disagree which interpreted as (low), 2.51-3.49 = Neutral/Moderate/Medium, 3.50-4.49 = Agree which interpreted as (high) and 4.5 or greater = strongly agree which interpreted as (very high). The mean score results of this study show that Permission has a mean score= 3.69 which interpreted as very high, this is to say that consumer permission has a very high acceptance of SMS marketing, which also support H1. Furthermore, Trust has a mean value of 4.17which suggest that trust has a high influence on consumer acceptance of SMS marketing, which also support H2. Control has a mean value of 4.04 which indicates high influence on acceptance of SMS marketing. Moreover, privacy has a mean value of 3.53 which employs high influence in consumer acceptance of SMS marketing. Additionally, attachment has a mean value of 3.46 which indicates moderate acceptance of SMS marketing, hence H5 is supported. Lastly, Acceptance has a mean score of 4.64 which denotes that consumers strongly agree that there is negative acceptance of SMS marketing among consumers which support H0. Therefore, the general consumer acceptance of SMS marketing is negative.

Table 3   Mean for the Independent and Dependent Variable

		Acceptance	Permission	Trust	Control	Privacy	Attachment
N	Valid	123	123	123	123	123	123
	Missing	0	0	0	0	0	0
Mean		3.6423	3.6911	4.1707	4.0407	3.5285	3.4553

4.3 Correlation results

A simple correlation analysis was performed. In order to interpret the   correlation   results (from 0 to 1), the Cohen (1988) proposal as cited by (Jonathan & Thibeli, 2013) was adapted which propose that when r= 0.1 - 0.29 (small correlation), r = 0.30 - 0.49 (medium correlation) and r = 0.50 - 1.0 (large correlation).The inspection results of the correlation matrix of independent variables (permission, trust, control, privacy and attachment) and independent variable (Acceptance) show that permission has a significant and medium positive correlation with consumer acceptance of SMS marketing ($r=0.380, p\leq0.01$) , hence supporting H1. Trust had a significant and medium positive correlation with dependent variable ($r=0.30, p\leq0.01$) hence supporting H2. Control had a significant and medium positive correlation with dependent variable ($r=0.36, p\leq0.01$) hence H3 is supported. Privacy had a significant and small positive correlation with dependent variable ($r=0.12, p\leq0.01$) hence supporting H4. Consumer attachment had a significant and small positive correlation with dependent variable ($r=0.28, p\leq0.01$) hence H5 is supported.

Table 4   Correlation Analysis Results

Variables	Sig(1-tailed)
Acceptance	1
Permission	0.380*
Trust	0.297*
Control	0.355*
Privacy	0.117*
Attachment	0.277*
Correlation based on n=123 *p<0.01	

5 Managerial Implication

The paper found that consumers have a negative acceptance of SMS marketing; it is the recommendation of this study that managers will take a consideration of the influencing factors (independent variables) in making a right decision as far as SMS marketing communication is concern. Since among other factors, permission found to be a great concern to customers, thus managers should establish opt- in-out strategy so as to make SMS marketing effective to their potential customers and profitable to their organizations.

The respondents' age also suggests that, SMS marketing could be more effective to youth than adults since youth are more exposed to mobile phone because most are perceived to have been grown up in mobile technology era. This will also help managers to make decision to which campaign best fit who when establishing their marketing business model.

6 Conclusions

The objective of this research was to examine the acceptability of SMS marketing among Tanzania University students. The results show that, generally consumers have negative acceptance of SMS Marketing while permission, trust and control show a significance medium positive correlation. Privacy and personal attachment shows significant small positive correlation with the acceptance of SMS marketing. The mean score interpretation found that consumers does not accept SMS mobile marketing unless other factors are considered such as permission, control, trust, privacy and personal attachment. Future research with a wider sample need to be done to investigate what kind of message content that customers would likely be willing to receive as far the consumer acceptance of SMS marketing is concern.

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Analysis of Online Customer Behavior in Social Commerce: Case Study of Consumers in Jakarta, Indonesia

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Abstract： Indonesia as an emerging country is having high growth of e-commerce and social media use. Online shoppers transactions increases significantly both through peer-to-peer or business-to-business platform. People and businesses have been gradually using social web services to reach wider range of customers, engage with customer and to assist online buying and selling activities. This phenomenon, also known as social commerce, is becoming increasingly popular in the country.This study aims to provide better understanding regarding social commerce in urban cities in Indonesia by capturing Indonesian customer online behavior in terms of social media uses for online transaction. The study used online questionnaire to survey 150 respondents in Jakarta, the capital of Indonesia. We used independent-samples t-test, Chi-square test and a Spearman rho correlation analysis in order to compute our data. Our results showed that customers age and gender directly influences the frequency of social media usage and online purchase. On the other hand, occupation and income have no influence in purchase pattern on social commerce. We also found that online shoppers in urban areas of Jakarta are considering transaction security as the most important factor affecting purchase decision-making among online shoppers and bank transfer still remain the main payment tool when purchasing online on social medias.
Key words: Customer online behavior; Social media; Social commerce

1 Introduction

Over the last five years, the usage of Internet has been rising rapidly in Indonesia (Nielsen, 2011). Social web services such as Facebook, Twitter, or YouTube has rapidly gain popularity. Millions of Indonesians, mainly in urban areas like Jakarta, embrace this new digital form of communication to collaborate, participate, and interact online with their friends, relatives or colleagues (Utuma, 2012).

Leveraging social media platform, small entrepeneurs and big enterprises make use of it for the benefit of the company. This phenomenon is known as soccial commerce. Social commerce can be defined as the use of social media channels allowing users and businesses to participate in the promotion, buying, selling, and sharing of products and services (Zhou, et al., 2013).

With the huge popularity of social media such as Facebook, many Indonesians have started taking advantage of the presence of millions of connected users and started displaying their sales items online. Furthermore, by social media, Indonesian customers have found new channels to talk about things that are both relevant and compelling to them.

By using digital technology, the power of electronic word of mouth (e-WOM) has completely expanded beyond physical barrier. They have now the ability to talk to each other, sharing their online or offline shopping experiences, criticizing or recommending products with people who trust them (Harvard Business Review, 2010).

This study aims to provide a better understanding on customers online behavior in terms of social media use for online transaction in Indonesia urban areas. We mainly focused our research on Jakarta because it is the capital of the country and the center of digital technology-based economic activities in Indonesia. The results of this study can provide information for Indonesian enterprises in increasing sales volume by giving attention to factors that influence sales via social media.

2 Literature Review

There are few existing studies to understand the transformation of e-commerce into social commerce.

Wang & Zhang (2012) try to describe the characteristics of social commerce and its potential future directions. They provided a chronological and detailed examination of social commerce practice evolution from 2005 to 2011 with a framework that contains four important dimensions (people, management, technology and information). Their analysis showed that social commerce is an emerging

global phenomenon that continue to develop and evolve.

Zhou, et al. (2013) revealed that social commerce evolves rapidly due to the increasing change in business practice, evolving consumers needs, development of advanced information technology, and information created from user-generated content.

Huang & Benyoucef (2012) argued that due to the growing demands for services and applications from customers and companies, the e-commerce industry is now facing new challenges about the way to engage customer participation and support company's development. There are huge prospects for companies in using social media as a leverage to ease social commerce transactions such as consumptions, payments, order fulfillment, marketing promotion and customers after sales services (Zhou, et al., 2013). From their researches, we are confident that the future of e-commerce is strongly correlated to the development of social commerce.

Another interesting study made by Leitner & Grechenig (2008) found that the innovative development of social web favored the development of a broad range of social media from social network sites to more complex forum communities and e-commerce platforms having fully implemented social media features.

Hajli (2012) argued that customers trust is the most important factor for companies when adopting social commerce. The role of social media in business has changed from marketing channels to reach broad into an fully online sales channel (Market Publishers, 2012). Never before companies had such opportunity to advertise, obtain feedback, and directly sales products and services to millions of consumers at a relatively low cost. And also the opportunity for millions of customers to share information, criticize and recommend products or services to each other (Evans, 2008). It is the power of electronic word of mouth (e-WOM) that companies are seeking ways to harness (Eastin, et al., 2011).

Indonesian customers are now looking for a conversation and relationship with their favorite brands, rather than one-way communication (Muchransyah & Iswardani, 2013). In order to take advantage of e-WOM, Zhou, et al. (2013) argues that companies should focus on developing social media marketing programs which will create messages that entices the attention of potential customers, and which encourage them in turn to spread it within their own social media channels.

3 Research Methodology

To perform our research, we used an online survey questionnaire through freeonlinesurvey.com. The survey investigates consumer's social media usage, online shopping experience, and online purchase behavior through social media.

The questionnaire had two parts, which consist of: demographic information and questions related patterns of social media usage and internet shopping behavior: the first part of the questionnaire measured respondents' demographic information asking for the participants' sex, age, current status, and monthly income; while the second part of the questionnaire had questions related patterns of using social media and actual internet shopping behavior. It also looked in detail at preferred products, most popular social media use by customers and where consumers search for information and inspiration before they buy.

An interval scale is used to collect data about the importance of 12 factors in their online purchase decision making. And a few questions had binomial responses to assess customers' trust on customers review in online shopping platform.

The data collection was initiated from June 2015 and terminated in December 2015 covering a period of 6 months. The link for the online questionnaire was distributed randomly through popular social networking (Facebook, Twitter), forum (Kaskus, Detikforum), instant messaging (BlackBerry Group). The study surveyed 150 respondents in the urban city of Jakarta, capital of Indonesia. However, during the data processing, we omitted 18 respondents questionnaires results because of the insuffisance of information, reducing the numbers of usable responses to 132 respondents. Among the respondents, 55 percent were female and 45 percent of male. The majority of respondents were aged between 17 to 34 years old (86 percent) with an important numbers of employees (39 percent) and students (31 percent).

4 Data Analysis

This study focused on finding out the patterns of social media usage and internet buying behavior in the urban areas of developing countries such as Indonesia. In order to sell anything over the internet, it is important to take into account about who are the customers, what are their spending habits are like

and the products and services they prefer (Richa, 2012). The following sections of this article summarize the results and discuss the implication of these results.

4.1 Age demography of social media users

The first research question assessed the age demography of social media users in Jakarta. Our survey showed that 89.1 percent of the respondents under 35 years old are using social media compare to 10.9 percent only for respondents above 35 years. From the result, we can estimate that the majority of social media users in urban area are young and middle age Internet users.

However, after having conducted an independent-samples t-test to compare the frequency of social media usage for young (below 35 years old) and older (above 35 years old) Indonesian citizens, our results showed that there are no noteworthy scores difference for young (M=3.22, SD=1.011) and older citizens (M=2.94, SD=1.063; t(132)=1.025, p=307, two-tailed). The difference of scale in the means (mean difference =.278, 95% CI: -.259 to .815) is small (eta squared =.008). This result indicates that older generations (above 35 years old) are increasingly adopting social media in their daily activities.

4.2 Gender demography of social media users

Based on our questionnaire, we found that the amount of males using Facebook is higher compare to women. This results are backed by the data provided by Facebook Audience Insights Tool.

However, after conducting an independent-samples t-test to assess the frequency of social media usage between male and female Indonesians, our results show that there is no important scores difference for males (M = 3.18, SD = 1.049) and females (M=3.18, SD=.998; t(132)= -.016, p=.988, two-tailed). The difference of scale in the means (mean difference =-.003, 95% CI: -.356 to .350) is small (eta squared =.000001). Although there is a higher number of male account registered on Facebook, it doesn't mean men are using more Facebook compare to women. Our result show no difference between the frequency of access and usage of Facebook between Indonesian man and women.

4.3 Age demography of customer shopping via social media

According to the results of our survey about the age demographic of online shoppers through social media, 87.1 percent of the respondents claimed of having already experienced online shopping. Among them, 88.7 percent of online shoppers in urban areas range below 35 years old, and only 11.3 percent for Indonesians above 35 years old.

To analyze the purchase trend between young and middle age citizens (below 35 years old) compare to older generation (above 35 years old), we runned an independent-samples t-test to compare their frequency of online shopping via social media. Our results show that there is a significant difference in scores for young (M=2.61, SD=1.109) and older Indonesian citizens (M=2.13, SD=.806; t(132)=2.152, p=.042, two-tailed). The magnitude of the differences in the means (mean difference =.487, 95% CI: .020 to .955) is small (eta squared =.034). The result reveal that young Indonesians citizens find more convenient to use the different social media channels such as Facebook and Twitter to purchase online. On the other side, Indonesians citizens age above 35 years old tend to be less responsive to advertisement or products sold via these channels.

4.4 Gender demography of customer shopping via social media

Our survey showed that among the 87.1 percent of the respondents already experienced using social media to purchase online, 58.3 percent are females and 41.7 percent are males. In order to assess the difference between man and women purchasing online, we ran a Chi-square test for independence (with Yates Continuity Correction) to test our hypothesis. The result indicated an important association between gender and online purchase experience, χ2 (1, n = 132) =3.876, p =.49, phi = .194. We rejected the null hypothesis, thus confirming a statistical difference between gender and the propensity of buying online. Our result confirmed similar outcomes made by previous study on the gender impact on the frequency of online purchase indicating that female Indonesians tend to purchase more online compare to their male counterpart (Veritrans & DailySocial, 2012; Utomo, 2012).

4.5 Purchase power of online shoppers in Jakarta

It is estimated that higher income level is positively correlated with domestic consumption. Therefore, high earners among urban social media users in big cities will positively correlate with a high frequency of online transactions.

In order to verify the relation between the amount of income and frequency of online transactions through social media, we used a Spearman rho correlation analysis. The result showed that there is no correlation between the two variables, r = .090, n = 132, p < .305.

This result matched with a previous study made by Utomo (2012) demonstrating that the amount of income earned by an individual have little influence on the frequency of online purchases in Jakarta.

Compare to citizens in developed country like United States, England or Japan, the income of Indonesians citizens is not a major factor that affect their frequency of online purchase indicating that the tendency of buying through social media depend mainly of the products features and need of the customers.

4.6 Popular social media channels use for sales

Based on the survey, we found that Facebook is considered as the most popular social media among urban users with 43 percent of the respondents claims of using FaceBook to purchase online. For 2nd and 3rd positions, we have BlackBerry Group (40.5 percent) and Kaskus (31.3 percent).

As we can see, International social platform is still the most popular social media used by citizens, which is mainly due to the great features, and services that it provides to their customers (IBM, 2012b).

4.7 Categories of products purchased via internet

Based on our survey, we found that fashion represents the most popular category of products purchased via social media with 48.5 percent of the respondents declaring having purchased at least one product of this category. This category includes all different types of products related to fashion (cloths, shoes, bags etc.).

Our finding presents similarity with the result found by Yi-Sheng, Priambodo, & Meng-Dar (2012) when they analyzed the popular products purchased on ecommerce websites. The second most popular category of product among Indonesian shoppers is toys and hobbies (books, toys, flashlight, bicycle etc.) with 41.7 percent. The followings categories are electronics (video games, computers, phones etc.) and health & beauty (cosmetics, medicines, vitamines etc.).

4.8 Factors influencing urban online shoppers purchase decision-making on social media

In order to provide a deeper analysis on urban customers perception of the different factors influencing their online purchase decision, we based our model on the model proposed by Javernpaa and Todd (1997). This model demonstrates the shopping intent and behaviors towards online shopping which include: product value, shopping experience, quality of services received from the e-commerce sites, and finally the characteristics and severity of the risks associated with online retail shopping.

But in order to add the aspect of social commerce to the model, we added five factors: friends/family opinions, product review on blog, customers review, expert (scientist/doctor) and seller recommendation. These factors involve customers perception about the importance of source of information from others customers online or offline shopping experiences shared through social media, third party and seller recommendation.

From the result of the survey, our main concern is to test the reliability of our findings. To do so, the measurement model evaluation included the assessment of internal consistency for reliability, and the use of discriminant validity and tests of convergent for construct validity.

We used Cronbach's alpha to analyze the internal consistency. According to the results, the Cronbach's alpha coefficients is equal to .907 which indicates a strong reliability of the results obtained.

Based on our findings, we found that the majority of urban customers perceived that information from other customers experiences are somewhat important or important (59.1 percent for friends/family opinions, 72 percent for product review on blog, 73.5 percent for customers review) for their online purchase decision-making which correlate with our previous results.

In comparison, although 63.6 percent of urban customers attach importance to information from third party like expert (scientist/doctor), 41.7 percent of respondents are neutral about the importance of seller recommendations. The result show that urban customers tend to have a low degree of trust on online merchants which is due to the important numbers of frauders in the cyberspace.

An interesting fact is that the value of the product (45.5 percent for brands, 43.9 percent for the design/feature, 59.8 percent for the price, 63.6 percent for the quality of products), quality of service offered by the website (46.2 percent for convenience, 45.5 percent for purchase procedure) and the characteristics and severity of the risks associated with online retail shopping (75.8 percent for transaction security) are among the most important factors for Indonesian customers. The results obtained validated our assumptions that transaction security is considered as the most important factor affecting purchase decision-making among Indonesian urban online shoppers when buying on social medias.

4.9 Preferred types of payment

This study also analyzed the preferences in payment types used by social media users when purchasing online. Even though, over the past years, many new online payment gateways have been implemented in Jakarta with the sole purpose to provide secure online payment for urban digital customers (Sfenrianto, 2015), our results showed that 92 percent of the respondents are still using bank

fund transfer via Automatic Teller Machines (ATMs) as a payment tool for online transaction, and 8 percent are using mobile money services. Previous studies also showed that urban customers widely prefer to use non-Internet banking service such as ATM money transfer which are more popular and considered safer (Susanto, et al. 2011; Moertini, et al. 2011). Indonesian online shoppers still have a limited trust in Internet banking mainly due to the dimensionality of trust in mediating the use of technological system.

5 Discussion

The objective of our study is to analyze the different aspect of urban online shoppers behaviors when purchasing through social media.

In terms of age demography trend of social media users, two major reasons explain why older generations are also increasingly using social media despite their lack of digital literacy:　the widespread of Internet-capable mobile phone and the collectivism aspect of Indonesians culture.

First, according to a study made by Abud (2012), Indonesians people suffer of a lack of digital literacy in general. However, people are increasingly using mobile phone and home Internet, and are capable to increase their level of digital literacy and use social media in a daily basis.

Secondly, with the collectivism of Indonesian people, they have the desire to be part of a digital community such as Facebook. Pushed by young ones, citizens above 35 years old are likely to create an account on social media which represent a cheaper and easier way of communication compare to call or mobile text message. Older generations are also adopting social media in order to continue to be able to communicate with younger generations.

In terms of online shopping among urban social media users, our results showed that those of age below 35 years old are getting more and more receptive to promotions on various social media platforms, while those above 35 years old are less/or not purchasing on social media.

This result can be explained by the lack of understanding about the processes system of buying online for some older age consumers not used with using PCs or online payments. On the other side, young middle class consumers are eager to emulate trend in developed markets such as the US, Europe or Japan which affect their desire of experiencing online purchase. In order to show their status, purchasing online is becoming a new way for young people to differentiate themselves with normal peoples. Furthermore, since younger generations tend to be more easily able to improve their digital literacy by faster assimilating information about Internet-based technology, it become easier for them to learn how to purchase online.

When it comes to gender and their tendency to online purchasing, we have seen that although there was more social media accounts created by men compare to women, there was no difference in terms of social media use frequency. The results can be explained by the Javanese social structure which is focusing more on the strong desire to integrate the social network communities such as Facebook groups rather than the desire to build friendship communication. However, when it comes to online purchase via social media, women have an higher tendency to purchase online compare to men. This result is directly correlated to the fact that fashion is the most popular product category which is women prefered category.

Similar with previous study, our results also showed that the most popular website where Indonesian online shoppers go purchasing is Facebook, followed by Kaskus, BlackBerry Group, Twitter and Instagram. With more than 78 millions Facebook users in Indonesia, it is quite understandable that this social media plateform is the most used to sell and purchase online.

Finally, when it comes to the main concern for Indonesian urban shoppers when it comes to purchasing online, we found that transaction security was the most mentioned. The lack of trust between Indonesian sellers and consumers can be explained by two main reasons: the huge number of of scammer cases in social media registered over the last few years and the lack of familiarity with the online purchase processes. The concern over transaction security also have a direct impact on the development of online payment methods in Indonesia. Money transferred via ATM remains the most popular payment tool as it is assumed to be the best payment method to avoid scam and frauds.

6 Conclusions

An important reason why social commerce is developing so fast in big cities like Jakarta is due to the astounding growth of the social media usage. The fact that millions of consumers are using social media every day has revolutionized the way customers are experiencing online purchase and firms and

entrepreneurs to do e-business.

Our study is focusing on the analysis of Indonesian urban customer online behavior in terms of social media uses for online transaction. Our results showed that the age and gender of Indonesian citizens have little influence on their use of social media but have a direct influence on consumers tendency to purchase online. Occupation and level of income have not much influence to purchase in social commerce. Facebook and BlackBerry group are the most popular social media in the country. Fashion and toys & hobbies represent the most popular categories of products among Indonesian consumers shopping online on social media. Finally, we found that the most important challenges of social commerce development in Jakarta were transaction security and the limitation of the bank transfer via ATM as main payment tool for online transactions.

Based on these results, we can provide recommendations for vendors willing to tape into the growing Indonesian social commerce market. For instance, vendors who want to reach the biggest segment of consumers should focus on targeting women online shoppers and adapt their marketing strategies around transaction security and accurate products information.

It is important for them to gain consumers trust and ensure the reliability of both their products and services otherwise it will hinder consumer from purchasing online. Finally, because social media in Indonesia is mostly about sharing information, vendors need to form an active social expression around their brands, which will result to the development of a social reputation, and competitive opportunities compare to traditionally organized and managed firm.

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Rescue Instruction System Design Considering Location Monitoring Based on RFID Technology

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Abstract: It's significant for people trapped to evacuate outside to a safe place when disaster occurs inside a building. The way to survive is to wait for others' rescue, and traditional rescue way is searching for each place to find victims which wastes a lot of time and resources. We propose a method to locate and monitor trapped victims, technical feasibility in this paper analysis indicated this method is realizable. Then we design a system to apply this method to real rescue based on RFID and GIS. At last, we conclude that the operation of this system will be high efficient among rescue.
Key words: Rescue instruction; Location monitoring; RFID; GIS

1 Introduction

With the fast development of economy and society, more and more large-scale buildings appear, such as superstore, hospital, stadium and railway station, etc. Comparing with traditional architecture, these buildings are higher and larger, and more crowds can be contained. Obviously, large-scale building brings people more comfortable space, but once disaster happens in such places, it is possible to cause mass death and casualty, as the potential high density of crowd.

It is common sense that people should escape from the inside of building to the outside safety area when disaster occurs such as fire. While people may be stranded inside because of route blocking and panic emotion, for whom the only way to survive may be waiting for help of the rescue team. As the uncertainty of the accurate position of victims, rescue process usually has to waste much time to search them. Therefore, method or technology which can locate and track people is positively important for improving rescue efficiency, which is also the goal of most emergency researchers.

In order to achieve such a goal, some scholars have conducted studies and proposed relevant theories and method in system development or application level. A preliminary plan was proposed to design and develop emergency rescue system for underground space based on GIS technology, and describe the fundamental structure, content, realization approach of system module (Liu Wenjie, 2012). The key problem was analyzed in emergency rescue of transportable hazards, and designed the principles for coordinating work among emergency rescue institution (Yuan Xuliang, 2009). The author explained the structure of the accident disaster emergency rescue system, and analyzed the content of the emergency management in accident disaster, meanwhile constructed the man-machine-environment response procedures of accident disaster emergency rescue (Yang Jing, 2010).The author analyzed the impact factors and defined their relationship through network topology model, as a result, it was believed that three factors are crucial to improve the reliability of emergency system, i.e. reaction ability of affected people, reaction ability of emergency commander and management mechanism (He Xuan, 2013). A system was designed of fire evacuation and emergency rescue based on the laser-guided technology, which solved the defect that the current disorder placed and low efficient evacuation signs of fire system often   identify mistaken (Yang Jun and Shi Xiaolu, 2012). A method was proposed to realize evacuation guide in case of power failure with RFID technology, in the guide system, the mobile terminal communication and RFID system realize collaboration of safety and dangerous routes among evacuees to share information of the routes (Ishii et al., 2011). The author proposed an accurate algorithm and a three-dimensional RFID based indoor identification system (Reza et al., 2012).

Although above studies have presented theories to establish emergency rescue system and related technology to implement rescue instruct, however, locating and tracking people overall process when they are inside the building is lack of consideration. While real-time locating and tracking of people can provides more accurate position information for rescue. In this paper, we will propose a design of information guide system considering location monitoring based on RFID technology, which may be

helpful and practical for the emergency rescue.

2 RFID Technology

RFID is short for radio frequency identification, it's a communication technology. It can identify specific target and read and write related data though radio signal, without any mechanical or optical contact between identification system and specific target. Figure 1 shows a RFID reader and a kind of RFID tag.

2.1 Principle of RFID technology

The basic principle of RFID technology is not complicated: after the label enter into the magnetic field, it receives RF signals emitted by the reader, sending out product information stored in the chip by obtaining energy from induced current, or transmitting a by a signal with specific frequency initiatively. The reader reads the information and decodes it, then send to a central information system for related data processing. Figure 2 represents the data transformation in a RFID system.

RFID consists of three parts: RFID reader, RFID tag, control center. Every tag has a unique identity code, when a tag passes through a reader, it can identify the code and feedback to the control center.

The reader is controlled by the control center to achieve two-way communication with the label, read or write tag information, the main function is as follows:

1) The communication between the reader and the tag, between computers;

2) Encoding, decoding, encryption the data transmitted between reader and tag;

3) Simultaneous reading and testing multiple tags within the sensing range and anti-collision feature.

The tag is not only convenient but multifunctional, it has following features:

1) Tag data can be changed dynamically: Using the programmer can write data to the tag, giving the RFID tag function portable interactive data file, and write less time compared to print bar codes;

2) Better security: not only can be embedded in or attached to the different shapes, types of products, but also to read and write tag data can be password protected, so as to have higher security;

Dynamic real-time communication: Label with the 50 to 100 times per-second, the frequency of communication with the reader, so long as the RFID tag is attached to identify the object appears in the effective range of readers, you can dynamically track and monitor its position.
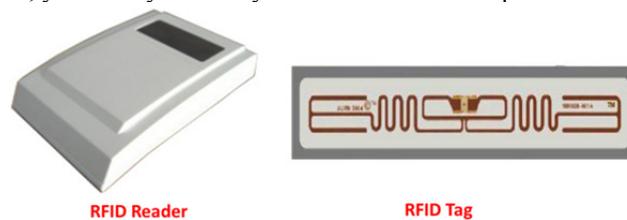
Figure 1   RFID Reader & a Kind of RFID Tag
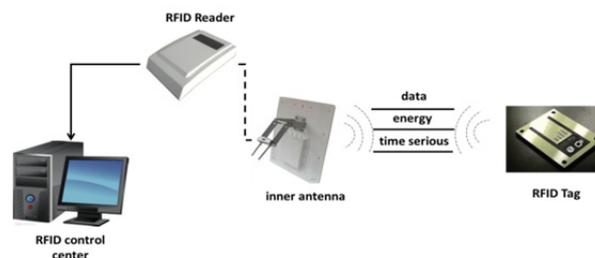
Figure 2   RFID Working Principle

2.2 Application of RFID technology

RFID is mainly applied in access control system and food traceability. Access control system can realize no-parking traffic for which are attached with RFID tag. Meanwhile, the system can implement real-time monitoring on passing cars and verify whether the driver and the vehicle are matching in case of car thieves. In the food traceability system, each food is attached with a RFID tag containing

information of country of origin, logistics information, this technology can realize a whole-process monitoring and tracing on food, thus, identifying the wrong step when food quality problem happens.

3 Location and Monitoring Method

Location and monitoring technology become more popular in safety area, including searching missing person and tracking vehicles. With the large market demand, there appear kinds of location and monitoring technologies.

3.1 Traditional method

The most popular location method in building is the GIS location method, it combines geographical spatial information figure of building in the system with GPS. The GPS terminal sends signal to 4 satellites of which the position is known according to the ephemeris. Then the satellites compute the 3-dimensinal position based on each of their position, then feedback the information to the console. The GIS map the coordinate to the spatial information figure building. Then we can see the position of people in a building.

A typical method to monitor is video surveillance video surveillance consists of 5 function modules: camera shooting, transmission, control, display, record. The camera transmits video images to control host computer through coaxial video cable. The control host computer distributes video signal to each monitor and video equipment, and records synchronized voice signal in the VCR (Video Cassette Recorder). With video surveillance system, rescue team can tell the position, physical condition, crowd density and any other information about people trapped. So they can implement better rescue.

3.2 Feasibility and advantage of RFID technology

While, traditional location and monitoring method has a few defect in practical application. Considering the GIS location method, when people are trapped in the building of which building materials is concrete, it will weaken signal strength, as a result, the location accuracy will be erroneous. This will mislead rescue team to a wrong place. There exist disadvantages in video surveillance, on the one hand, the hardware facilities are vulnerable that will be broken under disaster, on the other hand, the distribution of camera is not full covering, and each camera has a limitary monitoring range, there will be a lot blind areas in this system, which will influence rescue efficiency.

RFID technology has advantage over them on several aspects. RFID is a non-contact automatic identification technology, it can recognize target and access to relevant data automatically and identify work without human intervention through RF signal, and it can also work in harsh environments. It's a NFC (near field communication), so the signal is rarely influenced by external factors and the location is more accurate. The reader is installed in the wall so it's secure from destroy. And, since the location and tracking people trapped is similar to food traceability, so we can use this technology in rescue instruction.

4 System Design

When disasters occur in public buildings, people trapped by their own, they will try to evacuate himself. Central control room use RFID-based networking technology to locate and track personnel trapped, and send trapped personnel spatial location, basic information and other related information to rescue workers, available to the implementation of rescue, avoiding untargeted "blanket search" to achieve "efficient rescue", and minimize the loss of property and personnel.

4.1 System composition

Basically, this system has three function modules: the first is construction geographic information subsystem; the second is location monitoring subsystem; the third is rescue instruction subsystem.

The main function of construction geographic information system is storing 3-D spatial map, including building vector diagram and layout for each floor. The target of the second function module is to locate people trapped and monitor their trend and crowd density. The last function module is to provide outside rescue team the position information of trapped people.

4.2 System structure

The structure of this system and information flow is shown as Figure 3:
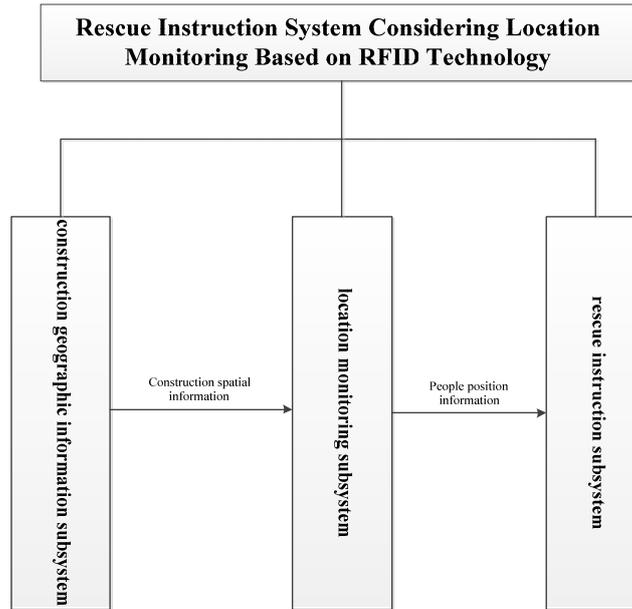
Figure 3   System Structure

The construction geographic information subsystem collects construction spatial information and sends it to location monitoring subsystem, this message combined with information of people position results from location monitoring subsystem, are transmitted to rescue information subsystem, then this subsystem sends information including information about position of people trapped in the building to fire command system for rescue instruction.

4.3 System application

4.3.1 Construction geographic information subsystem

This is the basic component of entire system. The main function of this subsystem is to store construction spatial information and the position of each RFID reader as reference substance to locate people trapped.

This subsystem needs following formation settings:

1) Import geographic information

To get people from their current position in the building, the subsystem must have detailed information on the construction of the building. So we can import 3-D map of building to the control center's database using GIS technology. The main geographic information concludes each floor's number and aisle distribution in a single floor. Basic principle of GIS is building a space coordinates system and locating an objective with a 3-D coordinate(x,y,h).The distance between two objectives can be calculated by distance metric formula. The actual movement of people can be also represented through continuous dots in the coordinates system. The following is an instance of transmission from building layout to roadmap in the coordinates system.
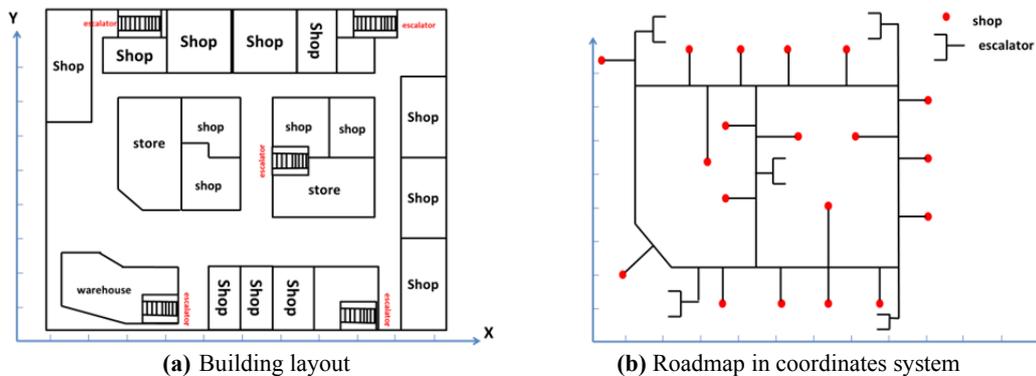
(a) Building layout   (b) Roadmap in coordinates system
Figure 4   Transmission from Building Layout to Roadmap in the Coordinates System

Figure 4(a) is G(x,y,h) represents layout in a single floor, once given the floor, h is confirmed. There is the distribution of each shop and what it looks like. But considering that each of them is an area, it's not convenient for computing. In the Figure 4(b) G'(x',y',h'), each room is conceptualized as a dot, and each road becomes a line. Their position is confirmed according to a plotting scale from G. GIS stores both of these two types of graph for better calculation and location.

2) Install RFID readers

In each floor, we should install RFID readers on the walls of aisles. Every reader is 3-5m far from another. At the same time, we should identify effective read range of the reader. As a result, several readers can locate a label together. Then, we should mark readers on the GIS map according their relative positions. Figure 5 is the distribution of RFID reader in an assumptive superstore.
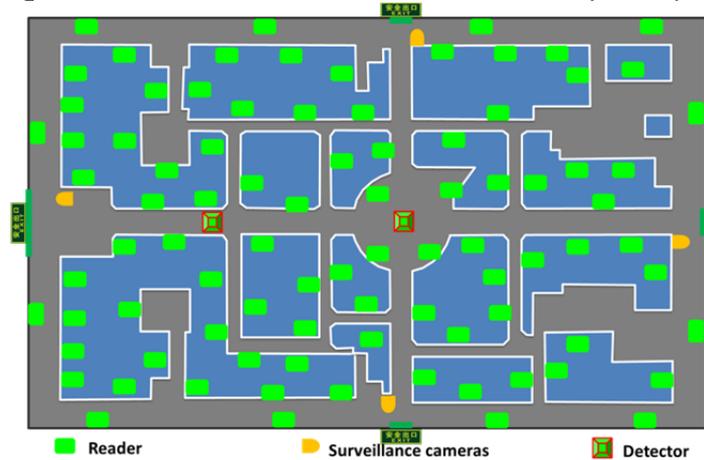
Figure 5   Map of RFID Reader'S Distribution

4.3.2 Location monitoring subsystem

This subsystem aims to monitor victims' location inside the building, to achieve this goal, we use a IOT (Internet of Things) technology ---- RFID Tags.

There is someone who raised an algorithm to locate electronic tag. Reza, who proposed using a network covering algorithm to estimate the position of the electronic tag under the conditions of the two-dimensional electron label positioning, that coverage is the ring, when conditions will be converted into three-dimensional space in two-dimensional electronic label positioning, covering area from the ring into a sphere. Either positioning methods are ultimately obtaining the coordinates of the location information of the electronic tags to study these locating method is applied in the evacuation of personnel to implement precise positioning have practical significance.

When a person enters into the building, he is required to wear a RFID tag. The information written into it concludes the man's age, sex, Physical characteristics, the floor's number he is. In Figure 6 every tag's code must be different from others. When disaster occurs and there are victims trapped in somewhere, the RFID readers on the wall can detect the tag on his body, and read the information stored in the chip, if he transferred to another floor, then the reader on that floor will update the information to change the floor number. On the GIS map, there will be a signal that the reader has caught a tag. Then we can mark the victim according to the reader's position on the map. Finally, we can find where he is inside the building relatively.
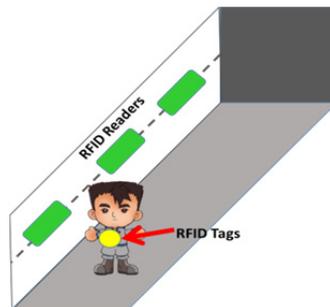
Figure 6   Installation of RFID Readers and People Wearing RFID Tag

4.3.3 Rescue instruction subsystem

This subsystem doesn't work alone, it works with fire system. To put it simply, it receives information from location monitoring subsystem and output information to fire system, realizing cooperation with fire system.

RFID background control center receives the information that electronic tag reader sends and feedback it to fire system, then fire system sends specific location information of trapped personnel to rescue workers through voice communication or video communication. Because it contains everyone's personal information, such as sex and age, so the rescue workers can determine the priority of rescue, then implement targeted search and personal rescue for trapped people based on the information, thereby avoiding the "blanket search" carried out within the buildings to improve aid efficiency. Since the trapped people in the face of sudden disasters panic, blindly following, etc., the position of staff is dynamic, rescue workers should take advantage of related communication equipment to receive victims' real-time position provided by the fire system to find that sleepy staff.

In the Figure 7, the top half shows where the people trapped actually are, the button half represent rescue instruction rescue workers received.
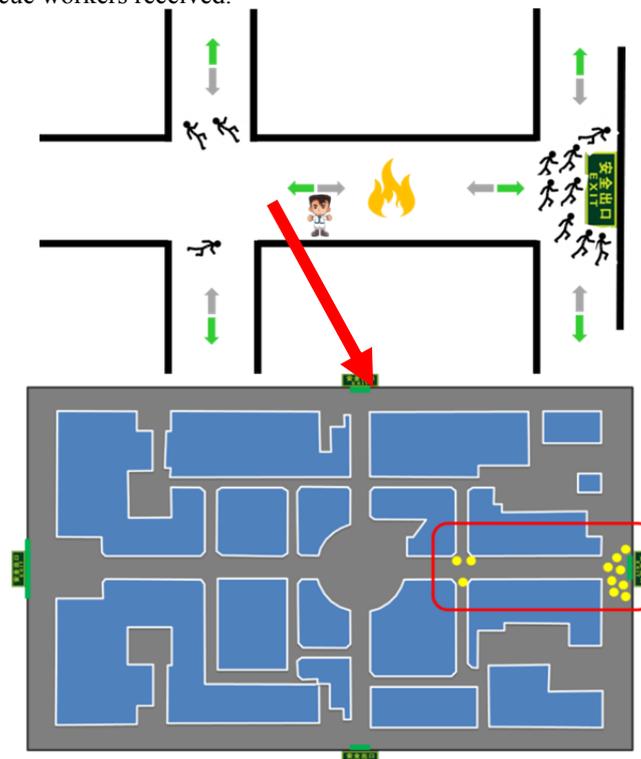
Figure 7   Rescue Instruction Rescue Workers Received

This system imports emerging technology (such as RFID and GIS) into evacuation system and rescue activities for the first time. The collaboration between these subsystems among this can clearly describe each step and task during system operation and solve inconvenient information interaction problem which firefighters are always faced while rescuing.

5 Conclusions

In this paper, we applied a new technology to location and monitoring method, and presented the design proposal of a new rescue instruction system involving this method. In the system, RFID technology was used to obtain the real-time information of people's position as well as regional crowd density, GIS transform the absolute location into relative position in the map of the building, and instruction subsystem transmit such useful information to rescue team. Compared with traditional single direction evacuation indicator sign, this more intelligent system could provide rescue team accurate action target, which is meaningful for promoting emergency rescue efficiency and save a lot of time and resources at the same time. In the future, we will focus on detail implementation plan of this system and the integration of with the firefighting system.

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An Empirical Study of Regional Differences of Express Logistics Services Capabilities

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Abstract: Express logistics plays a more and more important role in the development of regional economy. There are obvious differences in the express logistics service capabilities in different areas. Taking the Yangtze River Economic Belt of China as a sample, this paper utilizes grey correlation analysis and factor analysis to evaluate the express logistics service capabilities in 11 provinces of the Yangtze River Economic Belt in China. We screen out the comprehensive influence factors of regional express logistics service capabilities: the supply capacity of express logistics, the express logistics development potential, the supportability of information system and the infrastructure supporting capabilities. Fuzzy clustering analysis is utilized to divide the express logistics service capabilities of the Yangtze River Economic Belt of China into 5 levels. The results show that the express logistics service capabilities are stronger in the east region, at general level in midland and weaker in the western region in the Yangtze River Economic Belt.
Key words: Express logistics; Service capabilities; Evaluation system; Regional differences

1 Introduction

As a modern logistics industry, express logistics plays an increasingly important role in China's economy and social development. According to data released by the China Post Office, in 2015, the national express volume totaled 20.67 billion, and the express business volume ratio of east, middle and west was 82%, 11.2% and 6.8% respectively. This shows that express logistics service capabilities of China have obvious differences in different region. The differences of regional express logistics service capabilities will not only aggravate the imbalance of regional economic development, but also affect the stability of the entire region economy.

The logistics service capability is the ability to supply the required logistics service to the demand subject through the effective organization of all kinds of resources in the logistics system. The studies examined the composition of logistics service capability. Zhou Tai et al (2008) constructed the indictor system of logistics service capability, which contains the infrastructure supporting capabilities, the supporting capabilities of information system, the operation and management capabilities, and the support ability of development environment. Ma Shihua et al (2011) divided the logistics capabilities into the logistics element ability and the logistics operation ability, and had established the supply chain competition model based on these two kinds of ability. Michael Wang et al (2015) suggested logistics capabilities can be divided into flexible operation ability, innovation ability and process optimization ability. In terms of difference and evaluation of regional logistics service capabilities, Qi Shengda et al (2016) suggested the regional logistics service capabilities differed greatly, and which had a positive correlation with the level of economic development. Zhou Tai, et al (2016) regarded the regional logistics capabilities system as a gray system and used the method of grey clustering analysis to evaluate the logistics capabilities of the 12 provinces in Western China. In summary, in the research of logistics capabilities, the scholars lacked the study on the regional difference of express logistics service ability and the using of comprehensive evaluation method.

Based on the above views of scholars at home and abroad, with the Yangtze River Economic Belt of China as a sample, this paper intends to use grey correlation analysis to establish the key influence indictor system of regional express service logistics capabilities, and use factor analysis to screen out the comprehensive indicators of express logistics service capabilities. Then by means of fuzzy clustering method, we divide the area whose express logistics service capabilities are at the same level. This will help managers to understand the current situation and the difference of the express logistics service capabilities, and they can take effective measures to improve the express logistics service capabilities.

2 Construction of Express Logistics Services Capabilities Evaluation System

Though there are lots of indicators to measure express logistics service capabilities. Express volume is one of the major determinants, and can reflect regional express logistics supply ability.

According to relevant study results (Zhou Tai et al, 2008. Michael Wang et al, 2015. Zhou Tai et al, 2016. Liu Mingfei et al, 2011), this paper believes that the factors which affect the quantity of express including the development level of regional economic, the development level of regional logistics, the level of information and the level of infrastructure construction. In accordance with the scientific, operational and comprehensive principles, taking into account the reliability and availability of indicators, the indicators will be further decomposed into 15 secondary indicators. Specific indicators are as follows: First, the level of regional economic development contains GDP X_1, growth rate of local GDP X_2, gross industrial output X_3, total sales of wholesale and retail X_4, total retail sales of consumer goods X_5, disposable income of urban residents X_6 (Liu Mingfei et al, 2011). Second, the development level of regional logistics contains number of express outlets X_7, volume of railway freight X_8, volume of highway freight X_9, volume of air freight X_{10}(Qi Shengda et al,2016). Third, level of information contains number of internet users X_{11}, number of mobile phone users X_{12} (Zhou Tai et al, 2008). Fourth, level of infrastructure construction contains highway mileage X_{13}, railway mileage X_{14}, number of trucks X_{15} (Zhou Tai et al, 2016).

3   Evaluation Method of Express Logistics Service Capabilities Regional Difference

3.1 The application of grey correlation analysis to evaluation system

According to "Iceberg Theory", express logistics system is a gray system, and it is obvious uncertainty. Besides, many factors influence the capabilities of express service, whose relationship is complicated. Therefore, if we want to figure out the relationship between different indicators in this system and identify the key factors, we need to use the grey correlation analysis. Specific steps are as follows (Liu Sifeng et al, 2010): First, choosing the volume of express as the reference sequence, the influence factors are the comparative sequence. Due to the unit of index is different, we need to standardized the initial data. Second, reference sequence and comparative sequence which are standardized can be marked as $X_0(t), X_i(k)$.When $t=k$, the correlation coefficient between reference sequence $X_0(k)$ and comparative sequence $X_i(k)$ is as formula $L_{0i}(k) = \dfrac{\triangle_{\min} + \triangle_{\max}}{|X_0(k) - X_i(k)| + \rho\triangle_{\max}}$, $\triangle_{\max}$ and $\triangle_{\min}$ respectively represent maximum and minimum values in all kinds of individual moments of absolute difference in comparative sequences, ρ is resolution factor, normally ρ is $(0.1, 0.5)$. Third, correlation analysis is to compare the geometry relation of time series data. Calculating formula is $r_{0i} = \dfrac{1}{N}\sum_{k=1}^{N} L_{0i}(k)$, r_{0i} represents the correlation of comparative sequence i and reference sequence $0,N$ represents the length of comparative sequence.

3.2 Getting comprehensive factor by analyzing factors

By studying the internal dependence of the correlation matrix of multiple variables, the factor analysis is to find out a few of random variables which contain the main information of all the variables. In this paper, we use SPSS20.0 to analysis the predetermined indicator. Firstly, we take KMO test and Bartlett spherical test on the collected data to determine the suitability of factor analysis. Secondly, we will determine the correlation coefficient matrix and calculate the characteristic values of the variables, the contribution rate and the cumulative contribution rate. Finally, in order to get comprehensive influence factor of express service capabilities, we use the method of principal component analysis.

3.3 Fuzzy clustering analysis

In the express logistics service capabilities system, there is fuzziness in the capacity variance of different regions, which is suitable for using fuzzy clustering analysis method. Based on the grey correlation standardization data, each line of the normalized matrix is regarded as the fuzzy set of each object in the index set $X_i = \{\overline{x}_{i1}, \overline{x}_{i2}, \cdots, \overline{x}_{in}\}$, and $\overline{x}_{ij}$ indicates the membership degree of the index which belongs to X_i,and the similarity degree r_{ij} can be determined by Euclidean distance. The fuzzy similarity matrix can be calculated by the formula $r_{ij}(x_i, x_j) = 1 - c^{-1}\sqrt{\sum_{k=1}^{n}(x_{ik} - x_{jk})^2}$, In which, $c = max\sqrt{\sum_{k=1}^{n}(x_{ik} - x_{jk})^2}$,so we can get the similarity matrix R. The transitive closure method is used to transform R into a transitive matrix R^*, clustering fuzzy equivalent matrix R^* which meets the delivery. Given different confidence intervals $\lambda \in (0,1)$,when $r_{ij} \geq \lambda$,Sample x_i and x_j can be classified into one class, and different values correspond to different categories, then making the dynamic graph of fuzzy clustering.

4 Express Logistics Services Capabilities Regional Differences of Yangtze River Economic Belt of China

4.1 Perfecting evaluation indictor system by grey correlation analysis

The Yangtze River Economic Belt of China is the important support of the implementing the strategic of China's economic restructuring and development, including 9provinces and 2 municipalities. In this paper, we collected the data of the Yangtze River Economic Belt provinces, and choose express volume as reference sequence and other indicators as comparative sequences with DPS15.0 for the date processing.

According to the formula, the grey correlation coefficient and degree are calculated, and the ranking is carried out. The results of grey correlation analysis are shown in Table1.

Table 1   Rsults of Grey Correlation Analysis

Indicator Code	Index name	Correlation coefficient	Sort
X_4	Total sales of wholesale and retail	0.9440	1
X_{11}	Number of Internet users	0.9152	2
X_1	GDP	0.9123	3
X_6	Disposable income of urban residents	0.9097	4
X_9	Volume of highway freight transport	0.8987	5
X_5	Total retail sales of consumer goods	0.8974	6
X_{13}	Highway mileage	0.8846	7
X_{15}	Number of trucks	0.8516	8
X_{12}	Number of mobile phone users	0.8503	9
X_3	Gross industrial output	0.7452	10
X_{14}	Railway mileage	0.6845	11
X_7	Number of express outlets	0.6807	12
X_2	Growth rate of local GDP	0.5642	13
X_{10}	Volume of air freight	0.5479	14
X_8	Volume of railway freight	0.5074	15

From Table 1, we can see that total sales of wholesale and retail and express volume associated with maximum degree, indicating that wholesale and retail size can largely affect the express logistics service capabilities. Followed is the number of Internet users, GDP, disposable income of urban residents, highway freight volume, total retail sales of consumer goods, highway mileage, number of truck, number of mobile phone users at the end of year, gross industrial output. The correlation degree of these factors is more than 0.7, indicating that these factors affect the express business volume greatly, which play a promoting role in the regional express logistics capability. And there are 5 factors whose correlation degree is relatively small, including railways mileage, volume of air freight, volume of railway freight, the number of express outlets and growth rate of local GDP. In the express logistics service capabilities evaluation of Yangtze River Economic Belt of China, these factors are all positive correlation with the express business volume, thus we can choose them for evaluation system to make decision.

4.2 Comprehensive influence factor

In this paper, we select the ten indicators whose gray correlation degree is greater than 0.7 as the evaluation indicators system of regional express logistics capability. To screen out the Comprehensive influence factor, we chose Yangtze River Economic Belt of China as the sample and collected data in 2014.

Factor analysis requires a large sample size. We can use KMO test and Bartlett spherical test to judge whether the samples are suitable for factor analysis. When the KMO value is lower than 0.5, it indicates that factor analysis method is not suitable (Zhang Wentong, 2013). In this sample, the KMO value is 0.655, the Bartlett spherical test value is 0.000, less than 0.05, which indicates that it is suitable for factor analysis. According to the principle of cumulative variance is greater than 85%, it selected three common factors to explain the original variables, the cumulative variance contribution rate is 87.585%, as it is shown in Table 2.

Table 2　Variance and Variance Accumulation Contribution Rate

	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loading		
Factor	Total	% of Variance	accumulation %	Total	% of Variance	accumulation %
1	4.926	49.261	49.261	3.121	31.211	31.211
2	2.803	28.033	77.294	2.847	28.469	59.680
3	1.029	10.292	87.585	2.791	27.905	87.585

The original factor loading matrix was established with the 3 main factor components F_1, F_2, F_3. In order to make the common factor have a significant meaning, the orthogonal rotation designed with varimax and the initial factor loading matrix is obtained, as shown in Table 3.

Table 3　The Rotated Factor Loadings

Indicator Code	Indicator name	Main factor loading		
		1	2	3
X_1	Gross Regional Product	.940	.304	-.087
X_5	Total retail sales of consumer goods	.884	.447	-.031
X_{12}	Number of mobile phone user	.772	.561	.205
X_{11}	Number of Internet users	.175	.887	-.060
X_3	Gross industrial output	.372	.831	-.210
X_{15}	Number of trucks	.380	.752	.447
X_{13}	Highway mileage	.075	-.058	.915
X_6	Disposable income of urban residents	.309	.386	-.823
X_9	Volume of highway freight transport	.064	.142	.707
X_4	Total sales of wholesale and retail	.664	-.154	-.693
	Extraction Method: Principal Component. Rotation Method: Varimax with Kaiser Normalization			
	a. Rotation converged in 4 iterations			

The higher factor loading is, the higher the degree of interpretation of the principal component is. The results show that the main factor F_1 has larger loading in the level of regional economic development. So it can be named as express logistics development potential. The main factor F_2 has larger loading in the information level. So this ability can be named as supportability of information system. The main factor F_3 has larger loading in the infrastructure factor. Therefore, this ability can be named as the infrastructure supporting capabilities. In summary, the regional express logistics service capabilities contain express logistics supply capabilities, express logistics development potential, supportability of information system and infrastructure supporting capabilities.

4.3 Fuzzy clustering analysis

In order to compare the regional differences of express logistics service capabilities of the Yangtze River economic belt of China, this paper use the fuzzy clustering analysis method with DPS15.0 software to analyze the logistics capabilities of each province based on the results of factor analysis. Fuzzy clustering is used to deal with the fuzzy equivalent matrix, and the dynamic graph of fuzzy clustering is obtained by using the component connection method, as shown in Figure 1.
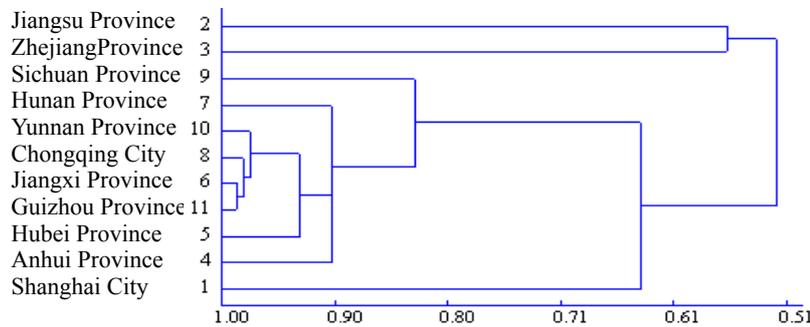
Figure 1　Dynamic Graph of Fuzzy Clustering

The logistics service capabilities differential distribution of the Yangtze River Economic Belt of China can be summarized through the fuzzy clustering graph, as shown in Table 4, the Yangtze River Economic Belt of China express logistics service capabilities can be classified into 5 types from the

strong to the weak. The express logistics service capabilities are relatively strong in type I and type II regions, including Jiangsu Province, Zhejiang Province and Shanghai city，and they are at general level in type III region, including Sichuan Province, Hubei Province, Hunan Province and Anhui Province. While, IV and V regions' express logistics service capabilities are relatively poor, including Chongqing city, Yunnan Province, Jiangxi Province, and Guizhou Province.

Table 4　Yangtze River Economic Belt of China Express Logistics Service Capabilities Differences

Capabilities	Type	Quantities	Regions
Stronger	I	2	Jiangsu Province, Zhejiang Province
Strong	II	1	Shanghai City
General	III	4	Sichuan Province, Hubei Province, Hunan Province, Anhui Province
Poor	IV	2	Chongqing city, Yunnan Province
Poorer	V	2	Jiangxi Province, Guizhou Province

5 Conclusions

This paper studied the express logistics capabilities regional differences of the Yangtze River Economic Belt of China through gray correlation analysis, factor analysis, and fuzzy clustering analysis. The results of the study show that its express logistics service capabilities difference is obvious from the east to west regions. Jiangsu Province, Zhejiang Province and Shanghai city's express logistics service capabilities are strong. Sichuan Province, Hubei Province, Hunan Province and Anhui Province's express logistics service capabilities are at general level. Chongqing City, Yunnan Province, Jiangxi Province and Guizhou Province's express logistics service capabilities are poor.

This paper examined the regional logistics service capabilities used comprehensive methods, and can provide a reference for future related research. It also has good practice meaning. Firstly, this study will contribute to the regional managers' understanding the influence factors of express logistics service capabilities and the differences with other regions and taking effective measures to improve the capabilities of express logistics services. Secondly, in order to promote the balanced development of logistics capability in all areas of China, the government should pay attention to the coordination of regional logistics development, and combine the logistics capability and the specific factors of regional logistics construction.

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Analysis and Suggestion of Factors Restricting the International Competitiveness of China's Publishing Industry

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Abstract: Although the international competitiveness of China's publishing industry has improved greatly, it is undeniable that although China's share of global publishing market has increased slightly in the increasingly fierce international competition environment, its overall development situation is still not optimistic. This paper analyzes the factors that restrict the international competitiveness of China's publishing industry from the aspects of industrial structure, policy environment, publishing enterprises and content products, and put forward some feasible measures for improvement accordingly.
Key words: Publishing industry; International competitiveness; Restricting factors; Suggestions

1 Introduction

According to the overall development of the current international publishing industry, the world publishing pattern is still dominated by the United States, the United Kingdom and Germany. Those major countries lead the basic trend and future direction of global publishing industry development. Especially in the increasingly competitive digital era of the global digital publishing market, they are showing a strong competitive edge and rapid development momentum, and are grabbing resources in the international market, by taking advantages of their influence and monopoly status (Andi Sporkin, 2013).

In recent years, although the international competitiveness of China's publishing industry has improved greatly, it is undeniable that although China's share of global publishing market has increased slightly in the increasingly fierce international competition environment, its overall development situation is still not optimistic. Compared with the developed countries, such as the United States, Britain and Germany, China's publishing industry still has the problems of limited scale, insufficient talent team building, low degree of marketization, low industrial concentration, enterprise structure and management level that need to be optimized, and a lack of competitive strength.

2 Factors Restricting the International Competitiveness of China's Publishing industry

2.1 Imperfect policy environment

Industrial development cannot be realized without a strong guarantee from the government to provide a good industrial policy environment, legal environment, institutional environment and other macro external environment. At present, the industrial policy, legal and institutional environment are not perfect, and the efficiency needs to be optimized. To be more specific, firstly, the construction and soundness of the industrial policy system is still inadequate. The implementation of specific policies, overall executions and supervisions need to be further strengthened. Secondly, imperfect industrial laws and regulations, a lack of implementation and supervision will hinder the healthy and stable development of market order, as well as deter standardization and order of production and operation. Thirdly, government's methods and actions to achieve industrial management still need to be optimized. Especially compared with the developed countries, apart from administrative measures, fiscal, taxation, investment, credit, finance, prices and other economic and legal means adopted by Chinese government are not adequate enough to achieve macro-control and indirect supervision of the whole industry, and there is a shortage of industry self-regulatory mechanism (Xu Chunsheng, 2008).

2.2 A lack of scale economy

With the deepening transformation of enterprises and the formation of the publishing groups, the structure and competitive situation of the publishing industry in China have somewhat improved, and the industrial resources have been optimized and utilized to a certain degree, starting to show the effects of scale economy. However, in general, concentration of China's publishing industry is low. The industrial organization structure immature, and the enterprises in the industry are still developing and competing in intensive and decentralized way, which will to a great extend restrict scale operation of the industry and intensive growth.

First of all, China's publishing enterprises upstream and downstream enterprises as well as relevant

industries face aggregation of low degree, and immature industrial organization structure. Compared with foreign large-scale publishing groups and media groups, the main business of our publishing enterprises is of single constitution, lacking in a clear grasp of industrial integration trends (Fang Qing, 2008). This indicates that China's publishing industry has not yet established a reasonable industrial network system, which largely restricts the effective application of industrial cluster effect and will hinder complementarities of resources as well as the upgrading of the industrial value chain.

Secondly, from the geographical distribution, China's current industrial base (park) are mainly located in Beijing, Shanghai, Tianjin and other eastern coastal areas like Zhejiang, Jiangsu and Guangdong. Industrial agglomeration in small and medium-sized cities as well as remote provinces is quite low. The industrial distribution global-wide and division of labor in core value link are far from optimistic. Regional distribution is clearly inconsistent.

2.3 Corporate management transformation is lagging behind

Although the transformation of the publishing industry has been completed in 2012, the overall management level of publishing enterprises in our country is still limited. This is mainly reflected in the following: First, enterprises generally have not yet formed a complete, efficient, scientific and sound corporate management system, including production management, product development, cost management, financial management, risk control, system construction, personnel, performance management and strategic management. Also, modern management mode of participating in international capital operation and overseas marketing management has not been established. Second, the enterprise does not actually establish a modern enterprise system.

Consequently, the scientific and maturity of the construction of the enterprise legal person system and the internal organization and management system is inadequate; the performance evaluation and incentive &restraint mechanisms are poor; headquarters of enterprises are still managed in a centralized and extensive way. Third, the market main body consciousness and management concept of enterprises' independently participating in the management mechanism system reform and innovation, system, technology, and product content innovation are obviously weak. Management information, technology, digital construction efforts are far from enough to support full integration and convergence of publishing resources and each value links within and between the whole industry.

2.4 Weak overall product competitiveness

Product strength directly determines the survival and development of enterprises. It is one of the core components of international competitiveness in the industry. As a knowledge-intensive and intelligence-intensive industry, the obvious weaknesses and relatively poor level of international competitiveness of China's publishing industry largely reflect on many problems: knowledge content of China's publishing products are generally low; there is a lack of content innovation; production efficiency and production technology level is limited.

To be more specific, firstly, the originality of product content is insufficient, as a large number of enterprises are blindly pursuing publication quantity and short-term economic benefits. The existence of China's copyright trade deficit also reflects the reality that China's purchase of copyright from foreign countries is more than the output and that published products are lacking in originality. Secondly, the digitized degree of products is limited. Lacking of full integration of digital content, form, technology innovation and marketing channels from aspects of production, management and distribution, the industry's digital transformation and development is largely restrained.

3 Strategy of Improving International Competitiveness of China's Publishing Industry

Since the goal of building a strong socialist country was clearly put forward by the 18th National Congress of the Communist Party of China, the cultural industry and the publishing industry which is embedded in it should shoulder the responsibility of going global, enhancing the overall strength of culture, improving the international influence of Chinese culture. Therefore, it is undoubtedly of great significance to effectively strengthen the international competitiveness of China's publishing industry.

The development of the industry cannot be achieved without investment from capital, manpower, knowledge, technology and other resources. Whether these resources can be used efficiently, optimized and upgraded to ensure the successful delivery of products lies in three major industrial entities, namely the government departments, industry associations and publishing enterprises. To be specific to China's publishing industry, the above three entities need to effectively achieve the optimization of product, industry and environment through content, technology, systems, management and other aspects of

innovation. Specific strategy recommendations are shown in Figure 1.
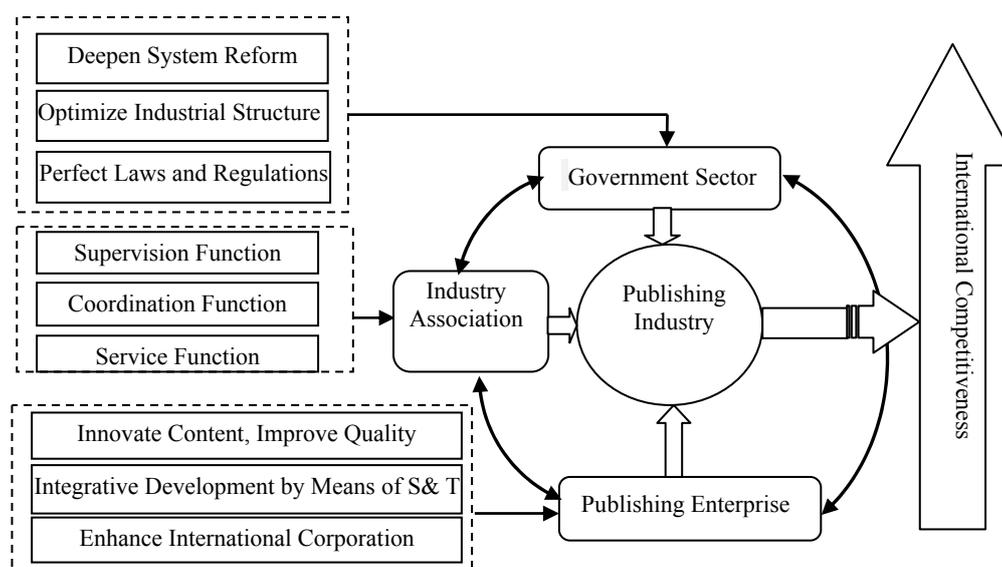
Figure 1　Strategy of Improving International Competitiveness of China's Publishing Industry

3.1 The improving direction of the government

The improvement of international competitiveness of the publishing industry is made by effective intervention and support from the government. In recent years, China has introduced a variety of cultural industry policies, publishing industry policies and regulations and departmental regulations. From the perspective of overall implementation, guidance and support on the publishing industry is gradually strengthened. It has created a good environment for the improvement of overall capacity and efficiency of international industry development, greatly boosting the dynamic upgrading of international competitiveness of China's publishing industry.

3.1.1 Deepen institutional reform

For government departments, the first step is to further deepen reform, continue to step up efforts to loosen constraints on the publishing industry, weaken our own management and intervention measures, so as to enhance market vitality in an all-round way. Specifically, the government should gradually realize and optimize its monitoring, regulation, support, and driving functions and improve the act of government by deepening institutional reform, strengthening the legal system, improving the policy system and improving the level of cultural opening. Therefore, it can provide a good external environment and the potential power for international development around the world.

3.1.2 Further optimize industrial structure

The current policies are conducive to improving the publishing industry's capital structure and investment and financing capacity. Along this line of thought, to overall improve the international competitiveness of our publishing industry, government must further perfect our basic management, content management and industry management, conduct in-depth exploration, promote special management unit system to encourage mergers and reorganizations of publishing enterprises across regions, industries and ownership to promote the cultivation of large-scale major publishing enterprises, improve the scale, intensive, professional level of the publishing industry, and provide a good external environment and potential power for the international development of publishing industry.

3.1.3 Perfect publishing laws and regulations

Relevant government should learn from the advanced experience of the publishing industry in the United States and the United Kingdom, accelerate the establishment and improvement of laws and regulations, strengthen the construction of legal system so as to realize the effective standardization and unification of the market act of publishing enterprises. Government also should accelerate the improvement of copyright legislation and the construction of related systems, industrial laws and regulations, and intensify against piracy infringement to create a good legal environment for the healthy development of industry and fair and orderly competition among enterprises (Yu Min, 2004).

3.2 Function transformation of the industry association

Compared with the foreign trade associations, China's publishing industry associations have not really become the representatives of industry interests and cannot effectively play the role of self-regulation. Therefore, the publishing industry association's focus is to take active measures to strengthen self-regulation of the industry, reinforce the communication between government and enterprises, so as to play a role of good supervisor, coordinator, service provider and to make efforts to improve international competitiveness of the publishing industry.

3.2.1 Supervision functions

To achieve sustainable and international development, the publishing industry requires a good industrial development environment - fair, standardized, stable and orderly market. The construction of this market order calls for not only the government's macro-control and the enterprise's own efforts, but also supervision and regulation of the associations.

Industry associations should give full play to their own self-regulation and control functions, play the role of a good industry monitor to create a good environment and order (He Jianfeng, 2002). At the same time, associations should study the industry market, digital, international development status, development trends and problems, formulate development goals and plans in accordance with national policies and plans, guide the industry into a healthy and orderly development in an all-round way.

3.2.2 Coordinating functions

Industry association plays a major role in industry development. It is generally composed of enterprises within the industry, and it is closer to the industry and industry enterprises than government at macro level (Zhang Shilan, 2010). The long-term absence of China's publishing industry associations results in the lack of effective platform and communication mechanism between the government and the publishing enterprises, which leads to the dis-junction of the policy and enterprise demand, a waste of resources and weak management.

First of all, relevant trade associations should strictly follow provisions of the law and its own rules and regulations to optimize competition and cooperation order of publishing enterprises. Second, associations should increase business communication and contact between publishing industry and other industries, especially with the associated industries, intensify strategic alliances among enterprises so as to comprehensively optimize the industrial network system, achieve the optimal allocation of resources and the maximum interests of all enterprises.

3.2.3 Service functions

Most foreign trade associations have dialogues with government on behalf of interests of the industry. They are also directly involved in legislation, serving the industry from the legal perspective to maximize benefits and create a good industrial environment (Zhang Shilan, 2010). The publishing industry association of China should optimize its service level through the effective integration of information resources, talents, channels, platforms and other industries from home and abroad as soon as possible. Specific measures are the following two aspects: First, through organizing business seminars, business training courses, organizations, vocational training for qualification examination, specialized training schools, lectures for popularizing the latest laws and regulations, exchange of experience of outstanding entrepreneurs, etc. Second, through organizing industry advocacy, planning exhibitions of superior products.

3.3 Self-improvement of publishing enterprises

Enterprise is the core force to enhance the international competitiveness of industry. Its competitiveness level will directly determine the strength of the industry's international competitiveness and it is also the major component of international competitiveness of industry.

3.3.1 Content innovation and quality improvement

As an important part of cultural industry, publishing enterprises should pay attention to their own cultural functions and social responsibilities. And build the correct ethical value standard with the help of the cultural function and thought transmission function which it carries, so as to create a good development atmosphere for the society, and make every effort to the shareholders, the consumers, the content providers, the technology developers, the natural environment and so on.

1) Improve product quality

Product quality concerns the life of enterprises. Publishing enterprises should give full attention to the optimization of product quality, strengthening awareness of product quality and innovation, enhancing cultural mission and social responsibility of cultural accumulation, dissemination and heritage, and continuously optimizing product quality to display cultural content, cultural taste, and to improve their content originality (Grantham, Bill, 2000).

2) Integrate excellent publishing resources

Although China has a long history of cultural essence and a wealth of knowledge resources, those advantages have not been efficiently exploited nor utilized. The degree of utilization of knowledge resources needs to be strengthened. As a knowledge-intensive industry, the development of publishing industry is inseparable from the efficient use as well as fully grasp of author resources and cultural resources by enterprises in the industry. Therefore, enterprises should effectively integrate domestic and foreign author resources and excellent knowledge and cultural resources from the international perspective, and protect product quality and originality from the source.

3.3.2 Utilize technology and achieve integrated development

With the constantly updated computer technology, modern communication technology, digital printing technology, network technology, streaming media technology and other high-tech, there are new changes taking place that are closely related to the publishing industry, including reading habits, creative methods, editing methods, production methods, distribution models and management tools, and these changes are also the future inevitable trend of international publishing industry. Publishing enterprises should realize the strategic role of technology on their own development and industrial transformation, increase investment in science and technology and R & D efforts, so as to achieve their upgrading and transformation with the huge driving force of technology.

3.3.3 Enhance international cooperation

International cooperation is an effective way, essential pass and important channel to enhance the international competitiveness of enterprises and the industry as a whole. As China's publishing industry have obvious deficiencies in the resource base, product quality, enterprise size, business management and industrial policy environment, China's publishing enterprises and their products are difficult to effectively enter the international market. Therefore, enterprises should extensively carry out international cooperation and exchanges, expand the scope and areas of cooperation, fully utilize international platform to integrate international resources to improve their international influence.

4 Conclusions

To enhance the international competitiveness of China's publishing industry is not only an urgent and important task, but also a long-term and complex system project. Only when the government departments, trade associations and publishing companies work together in a targeted way can they find their own priorities and eventually achieve the effective improvement of international competitiveness of publishing industry

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Research on Equity Concentration Influence to Operation Performance in Textile Industry Listed Companies

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Abstract: Whether or not equity concentration impacts company's operating performance, is always a hot topic of for both domestic and abroad economists, this article conducts a bunch of quantitative analysis tools to the actual financial data from the 62 listed companies in past three years in textile industry. A linear model has been setup between the data of concentration of shares, supported by combination of first big shareholder's data, top five shareholders' stock data, Z coefficient as well as HeErFen DE index and data of return on net asset which represents the business performance.   It concludes there is a positive correlation between the concentration equity and business performance: the higher the ownership concentration, the better operating performance. Some Suggestions and countermeasures are also put forward.

Key words: Textile industry; Equity concentration; Business performance; Quantitative analysis

1 Introduction

The relationship between the equity structure and operation performance is always catching attention of both domestic and abroad economist, among which the equity structure plays a critical role compared to the capital structure. In equity structure, concentration of shareholder is an importation indicator---it shows not only the first shareholder's percentage, but also the other big holder's situation, which will provide a solid database to decision makers

In recent years, with the continuous development of the economy, stock market becomes more and more active which calls economists attention to the relationship between equity concentration and corporate performance. n the recent disclosure of 2015 annual report, a trend of decrease of shareholders in public company is appearing, which means an increase of equity concentration and. The data showed that among 2827 listed companies, 800 decrease the number of shareholders, among which textile industry takes the first 3. Therefore, this article will use the data of textile industry companies to explore the correlation between equity concentration and operation performance

2 Overview of Current Existing Research

According to the previous research documents, there are 3 different views of the relationship between equity concentration and business positive correlation, negative correlation, u-shaped relationship.

Liu Mei (2016), who selected 50 companies in each area of competitive and monopoly company, draws the conclusion that equity concentration plays a positive impact to company performance in GEB. The higher concentration of shares, the better the business performance. While as Long Yudan (2015) and Ren Wei (2016), with a focus on family-owned pubic company, stated due to the natural big shareholder has a weakness of making decision, the concentration of equity decrease the company's performance. This is consistent with Laporta's conclusion also, a negative correlation existing between these two factors

In the point view of a u-shaped relationship, it can be also divided into U related and inverted u-shaped(n), Bai Chong'en (2005), as well as foreign scholar Morcketal (1988), is the representative of U-shape, which means positive impact to performance with higher concentration while. While on the other hand, Sun Yongxiang (1999), with Mcconnell and Servaes (1990), holds the opposite idea--they believe inverted U relationship is existing between the equity concentration and business performance.

The reason why people hold different conclusions of these two relationship is because different industry and companies will vary a lot. This article will focus on Textile industry and seeks the relationship between equity concentration and business performance, with more

suggestions being put forward in the end.

3 Research Design
3.1 Research Hypothesis
In above studies with different views on the relationship between the both, this article is based on the characteristics of the textile industry, with high competiveness and labor-intensiveness as well big liquidity. The big shareholder will conduct very strict supervision over management team to maximize their own interest and improve the business performance This also helps to improve the whole profitability of company.

Hypothesis 1: the first big shareholder shareholding relationship with enterprise's business performance are positively correlated;

hypothesis 2: the top five shareholders and corporate business performance are positively correlated.

According to the present situation of the textile industry and relevant information of the market economy, the balance of equity shareholder is positively correlated with operating performance It is also consistent with previous scholars and economist's conclusion. In order to avoid damage, the interests of small shareholders, the higher the enterprise's equity balance degree, the better control of business risk and better business performance.

Therefore, hypothesis 3: equity balance degree and enterprise operating performance were positively correlated.

3.2 Sample selection and the design of variable
According to the Taian database, as of late 2015, among 75 listed textile companies excluding ST type, and those without continuous data in past 3 years, finally leaves 62 active listed companies in the year of 2013,2014 and 2015 This article will use the tool of descriptive analysis firstly on the three years of data, and correlation and regression analysis use of ownership concentration index and profitability index, to draw the corresponding conclusions.

Table 1   Variable Description

explained variable	Return on equity	ROE	Net/net worth
Explanatory variables	The first big shareholder	CR1	The total amount of the first largest shareholder/equity
	The top five shareholders	CR5	The total amount of the top five shareholders/equity
	Z index	Z	The first big shareholders number of shares/the second largest number of shares
	H5 index	H5	The sum of the squares of the other top five shareholders
Control variables	The company size	SIZE	Total assets of the natural logarithm
	Asset-liability ratio	DAR	The total debt/total assets

3.3 Model establish
This article will adopt the method of least squares regression analysis and correlation, to studythe relationship between the two. According to the above description, return on equity, as explained variable, will indicate the degree of equity concentration CR1, Z coefficient, H5, H10 as explanatory variables, using SPSS software to analyze the collected data processing. The result is consistent with hypothesis, with following model:

Model 1: $ROE = C(1) + C(2) * CR1 + C(3) * SIZE + C(4) * DAR$
Model 2: $ROE = C(1) + C(2) * CR5 + C(3) * SIZE + C(4) * DAR$
Model 3: $ROE = C(1) + C(2) * Z + C(3) * SIZE + C(4) * DAR$
Model 4: $ROE = C(1) + C(2) * H5 + C(3) * SIZE + C(4) * DAR$

4 Empirical Analysis
4.1 Descriptive analysis
For 2013 to 2015, This article use spss22.0 software descriptive analysis tool on 186 companies' data from 2013 to 2015, with 62 on average each year. The results are shown in the

following table:

Table 2   Descriptive Analysis

Years		2013	2014	2015
sample size		62	62	62
CR1	minimum	0.063829	0.062831	0.005210
	maximum	0.802352	0.831791	0.873140
	average	0.375465	0.378715	0.385284
	standard deviation	0.172610	0.152183	0.158786
CR5	minimum	0.171304	0.184214	0.167192
	maximum	0.953241	0.952171	0.976311
	average	0.570149	0.571904	0.573781
	standard deviation	0.182304	0.174919	0.163893
Z	minimum	0.026382	0.016800	0.016800
	maximum	0.542379	0.571131	0.637100
	average	0.274931	0.263915	0.260430
	standard deviation	0.128934	0.127331	0.129811
H5	minimum	0.036188	0.030718	0.025738
	maximum	0.824321	0.624329	0.824329
	average	0.369216	0.328761	0.325761
	standard deviation	0.143707	0.129619	0.120619

The above three tables respectively describe the textile industry 62 listed companies in 2013, 2014 and 2015 of each variable count. Compared three years of data, you can see, the first big shareholder's stake in a slow upward trend, from2013 to 37.5464% in the last 2014 years of 37.8715% to 38.5284% of 2015 years. The top five shareholders' shareholding number also on the rise, from 2013 to 57.0149% in the last 2014 years of 57.1904% to 57.3781% of 15 years. As you can see, although each year the magnitude of the change is not big, but the overall trend is also on the rise. Return on equity from 13 to 15 years, it can be seen that as the growth of the year its return on equity shows ascendant trend. The coefficient of equity in rising year by year, from 0.3692 in 13 to 14 years of 0.3286 to 0.325761 the last 15 years,; In recent three years, the scale of the company in an upward trend, the scale has widened.

4.2 Regression analysis

Table 3   Regression Analysis

	Model 1			Model 2			Model 3			Model 4		
	B	t	Sig	B	t	Sig	B	t	Sig	B	t	Sig
constant	-13.71	-2.05	0.04	-14.84	-2.37	0.03	-3.31	-2.05	0.04	-3.31	-2.35	0.00
CR1	0.04	2.42	0.01									
CR5				0.04	2.41	0.02						
Z							0.04	2.02	0.01			
H5										0.24	2.12	0.03
DAR	-0.15	-10.00	0.000	-0.42	-9.80	0.00	-0.45	-7.00	0.00	-0.48	-8.04	0.00
SIZE	1.031	3.18	0.001	0.18	3.32	0.00	0.23	2.11	0.00	0.20	3.02	0.00

Table 4   Regression Analysis

	Model 1	Model 2	Model 3	Model 4
R^2	0.713	0.723	0.603	0.621
F	35.008	34.98	34.408	35.418

Model one, t value equal to 2.427, indicating that there was a positive correlation between the CR1 and ROE, and under the significance level of 0.05 the adjusted R2 is 0.713, F value is 35.008,

higher goodness of fit.

Model 2, the t value is equal to 2.407, indicating that there was a positive correlation between the CR5 and ROE, and under the significance level of 0.05 the adjusted R2 is 0.723, F value is 34.98, higher goodness of fit.

Model 3, t value equal to 2.02, shows that there is positive correlation between Z and ROE, and under the significance level of 0.05, the adjusted R2 is 0.603, F value is 34.408, higher goodness of fit.

Model 4, t value equal to 2.12, indicating that there was a positive correlation between the H5 and ROE, and under the significance level of 0.05 the adjusted R2 is 0.621, F value is 35.418, higher goodness of fit.

5 Conclusions

Textile industry is a very important part of manufacturing in China. The below suggestions will be put forward to improve its operation performance:

1) Based on previous data analysis, a positive correlation exists between the share concentration and business performance. Therefore, we shall improve the concert ration into a reasonable ratio to have a positive impact to its operation performance.

2) Balance of shareholders structure shall be advocated at the same time of increasing concentration. The reason for that is to avoid monopoly shareholder to manipulate the reports and abuse company's capital in some other personal area. Without supervision from the other parties, a risk of destroying the company's interest could happen. A restructure of shareholder to have more impacts from medium-minor shareholders will definitely help to improve business performance and efficient decision.

3) Introducing more outsiders, especially the organizational investors to join the board of directors in the company will also help to ameliorate the shareholders' structure. Compared to the traditional company who has its leadership as biggest shareholder, these organizational investors will take in more advanced management system and more resources to benefit the business operation. As of today's open financial environment, the textile industry shall take advantage of the policy to import more outside organizational investors.

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The Relationship among the Service Recovery, Self-Esteem and Satisfaction after Service Recovery in Online Shopping Environment

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Abstract: Due to the physical separation of buyer and seller, the physical separation of buyer and merchandise, and the perceived insecurity of the Internet in online shopping environment, different service recovery types may lead to different satisfaction especially facing different individuals. This proposed research wants to discuss the relationship among service recovery, individual's self-esteem and satisfaction after service recovery in online shopping environment.
Key words: Service recovery; Self-esteem; Satisfaction; Online shopping

1 Introduction

When different people purchase a product on the biggest shopping website "TAOBAO" in China, confronting the same product, the same service failure such as forgot to send a part and the same service recovery strategy, people's response is so different to believe. Even though someone has got the compensation, he still felt cheated and didn't trust the merchant anymore. But someone received the product's flaw and compensation pleasantly, and he still choose to trust the merchant based on his own knowledge and experience. So what factor causes this difference? The online shopping environment is different from the traditional face-to-face shopping, maybe it is more real or maybe it is more mendacious. Some scholar contributes the difference to the individual's emotion, some scholar contributes the difference to perceptions of procedural and interactional fairness, this proposal wants to discuss if the individual's self-esteem influence the satisfaction after service recovery and how?

Although the enterprise tries it's best to provide high quality service in the service delivery, it's difficult to avoid the service failure completely (Goodwin and Ross, 1992; Aurier and Siadou-Martin, 2007). According to service failure, western scholars put forward the conception "service recovery" and it becomes an important research area in service management. Actually when confronting the service failure, most of the customers won't go away easily and on the contrary they are looking forward to get compensation from the merchant (Berry and Parasuraman, 1991; Goodwin and Ross, 1992; Blodgett et al., 1997; Holloway and Beatty, 2003).

Although service failure and recovery issues have received considerable attention in the literature, these topics have received only limited attention in the context of online retailing. Specifically, we lack an understanding of the types of online service failures occurring, the success with which firms are recovering from these failures, and consumer reactions to the service failure/recovery encounters they are experiencing (Holloway and Beatty,2003).

The existing research on the relationship between the service recovery and satisfaction mainly study from the perspective of perception, few from emotion, seldom from the self-esteem. Del Río Lanza (2009) put forward that distributive justice, procedural justice and interactional justice all affect satisfaction, with procedural justice showing the strongest relative influence, as well as being the only dimension affecting the emotions. Negative emotions mediate the effects of justice on satisfaction with service recovery.

2 The Theoretical Development

2.1 Service recovery and online service recovery

Scholars have two opinions about the service recovery: on the one hand, service recovery is the response and the reaction after service failure (Bell and Zemke,1987);on the other hand, service recovery is the response and the reaction when service failure happens(Johnston,1995; Jinglun and FuXiang, 2001) ZhongWei Chen(2005) made the definition including the two aspects above: service recovery means the correction to possible failure or existed fault in service system and the compensation to the customer with the efforts of all the members in the organization in order to maintain the long term relationship with the customers and promote the service system.

Since the adoption of the Internet, we have witnessed an impressive stream of research addressing online consumer attitudes and behaviors and how the online service encounter may differ from the traditional offline encounter (Betsy, 2003). Preliminary research emphasizes that trust is especially crucial to establishing customer relationships in the online environment (Hoffman, et al., 1999; Milne and Boza,1999; Urban, et al., 2000). In fact, some argue that trust may be even more important online due to the physical separation of buyer and seller, the physical separation of buyer and merchandise, and the perceived insecurity of the Internet (Warrington, et al., 2000).

The recovery activities undertaken during the immediate and follow-up recovery phases take two forms: psychological and tangible (Miller, et al.,2000). Psychological recovery efforts make a direct attempt to ameliorate the situation by showing concern for the customer's needs. Two psychological techniques are recommended in every instance of service recovery: empathizing and apologizing. Tangible recovery efforts offer compensation for real and perceived damages The primary intent is to provide fair restitution for the costs and inconveniences caused by the service failure such as the product for free, refund, discounts, coupons and so on.

2.2 Satisfaction after service recovery

Kotler (2010) suggest that customer's satisfaction means a satisfied or disappoint feeling status when the customer compare the perceptual performance with the expectations. The most widely used model within the consumer satisfaction/dissatisfaction (CS/D) literature is the disconfirmation paradigm. Disconfirmation also has been advanced as a model for understanding customers' reaction to recovery. The disconfirmation paradigm holds that customers compare perceived product performance to expectations. Michael A. McCollough (2000) holds that satisfaction is a function of initial disconfirmation and recovery disconfirmation. Recovery disconfirmation is defined as the discrepancy between recovery expectations (expectations by the consumer regarding what the service provider will do given failure) and recovery performance (perceptions regarding steps taken by the service provider in response to failure). So the satisfaction after service recovery could be defined as the whole degree on satisfaction after the failure service and the enterprise's compensation. This satisfaction is different from the first time satisfaction when the customer receives the service firstly, and was called "the second time satisfaction" (Smith et al., 1999; McCollough et al., 2000; Harris et al.,2006).

According to Goodwin and Ross (1992), the satisfaction after service recovery is measured by three aspects: (1) the customer give a positive evaluation on the website's response to the service failure as a whole (2) the customer was satisfied with the method the website uses to the service failure (3) the customer was satisfied with the compensation the website provides to the service failure.

2.3 Service recovery and satisfaction after service recovery

Previous studies have investigated the impact of a proper service recovery on customer satisfaction (Blodgett et al., 1997, Smith et al., 1999 and Tax et al., 1998). Research suggests that satisfaction with complaint handling is strongly associated with both trust and commitment (Kelley and Davis, 1994) and can serve as an important mediator linking perceptions of fairness to post complaint behaviors and attitudes. Moreover, satisfaction with complaint handling can improve the evaluation of a service experience and increase customer retention (Technical Assistance Research Program,1986). Effective management of customer problems and relationship marketing are interrelated in terms of their focus on customer satisfaction, trust, and commitment (Achrol, 1991; Morgan and Hunt, 1994). Thus we put forward the hypotheses as follows:

H1a.Service recovery positively affects the customer's satisfaction after service recovery;

H1b.Tangible recovery efforts positively affect the customer's satisfaction after service recovery;

H1c.Psychological recovery efforts positively affect the customer's satisfaction after service recovery.

2.4 Self-esteem as a moderator between service recovery and recovery satisfaction

The existing research on the relationship between the service recovery and satisfaction mainly study from the perspective of perception, few from emotion. Del Río Lanza (2009) put forward that distributive justice, procedural justice and interactional justice all affect satisfaction, with procedural justice being the only dimension affecting the emotions. Negative emotions mediate the effects of justice on satisfaction with service recovery (Del Río Lanza, 2009).

Seldom scholars study the relationship from the perspective of self-esteem. Xiting and Xiong (1998) put forward that self-esteem also means self-worth. It is a term used in psychology to reflect a person's overall emotional evaluation of his or her own worth. It is a judgment of oneself as well as an attitude toward the self. Self-esteem is also known as the evaluative dimension of the self that includes feelings of worthiness, prides and discouragement. Nathaniel Branden (1971) defined self-esteem as "the

experience of being competent to cope with the basic challenges of life and being worthy of happiness." According to Branden (1971), self-esteem is the sum of self-confidence (a feeling of personal capacity) and self-respect (a feeling of personal worth).

By Orth (2012) suggested that self-esteem has medium-sized effects on life-span trajectories of affect and depression, small to medium-sized effects on trajectories of relationship and job satisfaction, a very small effect on the trajectory of health, and no effect on the trajectory of occupational status. He also suggested that self-esteem has a significant prospective impact on real-world life experiences and that high and low self-esteem is not mere epiphenomena of success and failure in important life domains.

Most scholars agree with this classification: High self-esteem and Low self-esteem.

People with high self-esteem believe "I am me. In all the world, there is no one else like me. There are persons who have some parts like me, but no one adds up exactly like me" (Satir and Watson,1975). People with high self-esteem believe "Are able to act according to what they think to be the best choice, trusting their own judgment, and not feeling guilty when others do not like their choice" and "Consider themselves equal in dignity to others, rather than inferior or superior, while accepting differences in certain talents, personal prestige or financial standing" (José-Vicente Bonet,1997)

A person with low self-esteem may show some of the following characteristics: "Heavy self-criticism and dissatisfaction" and "Hypersensitivity to criticism with resentment against critics and feelings of being attacked" (José-Vicente Bonet,1997). When given negative feedback, individuals with low self-esteem often take it personally, and can be devastated by it (Baldwin, M. W,1996).

Self-esteem is typically assessed using a self-report inventory yielding a score on a continuous scale from low to high self-esteem. Among the most widely used instruments, self-esteem scale (SES) scores each item on a ten- field's response system that requires participants to indicate their level of agreement with a series of statements about themselves(Rosenberg,1965). This study will adopt SES to measure participants' self-esteem. Based on above we put forward the hypotheses as follows:

H2a.If the customer has high self-esteem, tangible recovery efforts positively affect the customer's satisfaction after service recovery;

H2b. If the customer has high self-esteem, psychological recovery efforts negatively affect the customer's satisfaction after service recovery;

H3a.If the customer has low self-esteem, tangible recovery efforts negatively affect the customer's satisfaction after service recovery;

H3b. If the customer has low self-esteem, psychological recovery efforts positively affect the customer's satisfaction after service recovery.

The whole research model as figure 1.
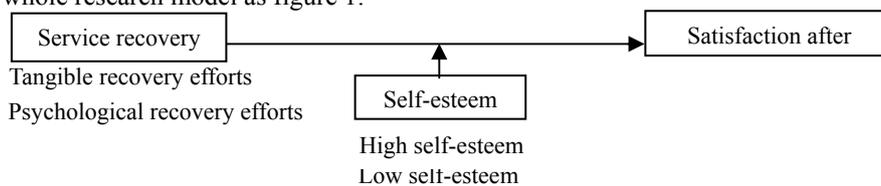
Figure 1   Research Model

3 Research Design
3.1 Measurement of variables

Trough related literature at home and abroad, we found out the most widely-used instruments to measure the moderator variable and the independent variable. What's more we will translate the scale into Chinese and modify it in keeping with Chinese language habit and the online shopping environment.

Service recovery strategy contains tangible recovery efforts and psychological recovery efforts, we will design it according to actual experiment and test in advance to justify.

The moderator variable "self-esteem" was measured as follow based on SES. It is a widely used 10-item self-report questionnaire assessing feelings and judgments about the self-rated on a 4-point scale.

If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

Scoring: SA=3, A=2, D=1, SD=0. Items with an asterisk are reverse scored, that is, SA=0, A=1, D=2, SD=3. Sum the scores for the 10 items. The higher the score, the higher the self-esteem.

Table 1　　Measurement Scale

1	On the whole, I am satisfied with myself.	SA	A	D	SD
2 *	At times, I think I am no good at all.	SA	A	D	SD
3	I feel that I have a number of good qualities.	SA	A	D	SD
4	I am able to do things as well as most other people.	SA	A	D	SD
5*	I feel I do not have much to be proud of.	SA	A	D	SD
6*	I certainly feel useless at times.	SA	A	D	SD
7	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8 *	I wish I could have more respect for myself.	SA	A	D	SD
9*	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10	I take a positive attitude toward myself.	SA	A	D	SD

The independent variable "satisfaction after service recovery" was measured as follow according to Goodwin and Ross (1992): 1) the customer give a positive evaluation on the website's response to the service failure as a whole; 2) the customer was satisfied with the method the website uses to the service failure; 3) the customer was satisfied with the compensation the website provides to the service failure.

3.2 Experimental design

3.2.1 Experiment 1

We select a merchant on TAOBAO website which supplies the e-books for kindle or other electronic reading tools. The reason for this chooses lies on two points: one is the merchant on TAOBAO website has the lowest operating costs and it is relatively easy to do experiment on the consumer and won't bring great influence to the business. The other is that the e-books have the lowest cost in China and the product's cost won't change with sales.

We will provide a famous e-book which its cover is perfect but its content is short intentionally. We will choose 100 consumers to do the experiment. After the consumer has got the e-book from the internet, we select 1/3 consumers randomly to give him a tangible recovery or psychological recovery or no respond. Tangible recovery contains the perfect e-book with its cover and content, what's more a coupons or refund. Psychological recovery refers to apologize for his mistake and sorry for the consumer's inconvenience taken by his error. No respond stands for nothing, neither answer the consumer nor give compensation. When all the recovery has been done, we give the satisfaction scale to the consumer to fill in and pay the consumer for coupons. We tell the consumers we just want to do a satisfaction survey, find out the problem and improve the service level. This experiment is to test the hypotheses H1a, H1b and H1c.

3.2.2 Experiment 2

We also select a merchant on TAOBAO website which supplies the e-books for kindle or other electronic reading tools. The reason for this chooses lies on two points: one is the merchant on TAOBAO website has the lowest operating costs and it is relatively easy to do experiment on the consumer and won't bring great influence to the business. The other is that the e-books have the lowest cost in China and the product's cost won't change with sales.

We will provide a famous e-book which its cover is perfect but its content is short intentionally. We will choose 200 consumers to do the experiment. After the consumer has got the e-book from the internet, we select 1/2 consumers randomly to give him a tangible recovery or psychological recovery. Tangible recovery contains the perfect e-book with its cover and content, what's more a coupons or refund. Psychological recovery refers to apologize for his mistake and sorry for the consumer's inconvenience taken by his error. When all the recovery has been done, we give them a questionnaire containing the satisfaction scale and the SES to fill in and pay them for coupons. The SES is just on the questionnaires' behind. We tell the consumers we just want to do a satisfaction survey, find out the problem and improve the service level. This experiment is to test the hypotheses H2a, H2b and H3a, H3b.

4 Analysis Plan

After we get the consumer's feedback, we would check the data's effectiveness and clean the unqualified questionnaires such as short of answer, or the answer is inconsistent and so on.

1) The reliability analysis, validity analysis and factor analysis. We will conduct the reliability analysis, validity analysis and factor analysis using the data from the two experiments. From the value of Cronbach's α, we could conclude the scale's internal consistency. Before the factor analysis, we

would conduct the test of Bartlett and KMO. We use factor analysis to test convergent validity.

2) The descriptive analysis. We will conduct the descriptive analysis based on experiment1's data and divide the data into three groups: the tangible recovery group, the psychological recovery group and the no respond group. We compare the three group's percentile values, central tendency and distribution.

3) The correlation analysis. We will conduct the correlation analysis based on experiment2's data. We would conclude the correlation between different variables according to the value of Pearson and N.

4) The regression analysis. We will conduct the regression analysis based on experiment2's data. We would conclude the regression effect according to the value of T and P.

5 Conclusions

This research aims to discuss the relationship among service recovery, individual's self-esteem and satisfaction after service recovery in online shopping environment. We develop the theoretical model, put forward the hypotheses, design 2 experiments to test the hypotheses, and put forward the data statistics and analysis plan. The likely contributions of the research lie on two points: one is that we research the relationship between the service recovery and satisfaction after service recovery in online shopping environment, not the offline shopping environment; another is that self-esteem as a moderator between the service recovery and satisfaction after service recovery.

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Manufacturing Management Innovation Based on Informational Software Selection

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Abstract: With the waves of Industry 4.0 sweeping the modern industry, manufacturing enterprises are facing greater opportunities as well as more challenges. How to innovate in management has become a major concern for modern manufacturing. To improve the management in manufacturing enterprises, informational softwares emerge in response to the needs of time. Whereas what still perplex enterprises managers are the appropriate selection and highly-effective usage of that. This paper is based on the method of MA-OWA and Rader graphs. A two-steps method is proposed to help manufacturing enterprises in informational management software and to ultimately improve the management innovation power.
Key words: Management innovation; Manufacturing innovation; Management informatization; Rader map

1 Introduction

As is known that no innovation will make the enterprise be eliminated by the market. Management innovation can be known as one of the latest management practices, process, or invention and application of skills, which is intended for helping obtain the objectives of the organization. (Xue Jie, 2011)

With the development and popularization of computer network technology, enterprise management is increasingly relying on informatization. In order to respond quickly to changes in the internal and external environment, the flexibility of adjusting production to marketing plan should ensure the smooth operation of capital flow, and improving economic efficiency and market competitiveness. On the other hand, the progress of management innovation also gives IT greater use of space, as well as more powerful processing capability. Enterprise informatization and management innovation are in a kind of dialectical relationship, closely related and indispensable. In the enterprise informatization construction, strengthening the management innovation of core significance is to achieve the perfect unity of efficiency and effectiveness. Informatization helps a lot in business efficiency whereas management innovation is mainly for the results. (Zheng Rong,2004)

The last five years of the National Enterprise Management Innovation Conference has emphasis the promotion and practice of the integration of enterprise informatization and management innovation. Apparently informatization has become the only way for manufacturing management innovation.

In the construction of the "Eleventh Five-Year Plan", "Twelfth Five-Year Plan" manufacturing informatization, China manufacturing industry informatization construction has gone through "Introduction and Enlightenment" stage, and then entered a new stage called "steady progress, in-depth application". And in "Thirteenth Five-Year Plan ", informatization will be more and more important. Integration of industrialization and information technology are moving toward a medium-high level of development. Advanced manufacturing industry will be developed a lot, and it will promote the production to be more flexible, intelligent, refinement.

Nowadays there are many informational software to help enterprise to obtain informatization thus achieve the management innovation. ERP is the abbreviation of Enterprise Resource Planning. It is based on the information technology combined with advanced management ideas. It breaks the accustomed boundaries existed between enterprises, as well as optimizes enterprises' internal resources in the supply chain, so as to consummate the operation mode in modern enterprises eventually. ERP system reflects rational requirements of resource allocation through the invisible hand of marketing. At the same time, ERP system can undoubtedly improve the business processes and promote the competitiveness of enterprises effectively. Obviously ERP system, if used wisely, will bring revolutionary changes to manufacturing management.

However, many enterprises made the mistake in choosing these own informational softwares. They do not have a deep analysis of the enterprise, so they cannot choose their own enterprise informatization software in accordance with their own requirement. They mistakenly believe that after buying the software, a lot of problems of enterprises can be smoothly and easily solved. But what they do not know is how to choose informatization software correctly. If so, it will only increase the cost of the enterprise, and cannot achieve the goal of income at the same time.

Many scholars have made a lot of research in terms of enterprise informatization software selection, and came up with some promising results. Some of them have proposed software evaluation matrix, Fuzzy Theory, TOPSIS, MA-OWA and other solutions. They emphasize more on theories rather than practical use, which leads to the tremendous numerous operation target, thus perplex the operation process. They need a team of experts to evaluate and screen repeatedly, therefore, this article embarks from the business point of view. On the basis of previous research, we select pattern step-by-step by using MA-OWA and Radar Chart to provide a convenient and flexible evaluation method for enterprise informatization innovation.

2 Optimization of Software Selection

2.1 Comparison of the enterprise management software

Existing information management software shows different features and advantages. In choosing their own software, manufacturing enterprises should start from the inner situation to make a rational choice. Some examples and characteristics of domestic ERP (Enterprise Resources Planning) soft wares are shown in Table 1.

Table 1　Examples of ERP

Software name	Development company	Development country	characteristic
SAP	SAP company	Walldorf, Germany	Integration, advanced nature, unity, integrity, openness
IBM	International Business Machines Corporation	New York, American	Strong database products,Complete solution,Comprehensive data management
QAD	QAD company	California,American	Flexible database configuration,build a virtual factory
Kingdee	Kingdee international software group	Shenzhen, China	Socialization, mobility, personalization
Inspur	Inspur company Limited	Jinan, China	High efficiency, low risk, internal control conveniently
Sunlike	Sunlike software group	Taiwan	Powerful function,high information integration,convenient operation

2.2 Optimization of software selection

Choosing a comprehensive and reasonable software or vendor is significant for enterprises as it can meet the practical demands and reduce the risk of projects during the process to some extent. Therefore, a wise selection of the software is considerably vital for enterprises to achieve success.

As mentioned, many related scholars have made a great contribution in the selection of information management software and put forward quite a few comprehensive programs. The study is based on a MA-OWA multi-weight analysis method and radar, which will be more intuitive to illustrate the performance of various ERP software and it is matching with the companies in practical application, in this way, this research will help the enterprise to achieve better economic benefits. MA-OWA is proposed by the American scholar Vager in 1988, which means a decision-making method is between the largest operator and the minimum. It is widely used in expert systems, fuzzy control and mathematical planning. (TORRA V., 1997; FILEV D, YAGER RR. ,1998)

MA-OWA is defined as：

$$\text{Assume } F: R^{a \rightarrow} R, \text{if } F(a_1, a_2, \ldots, a_n) = \sum_{j=1}^{n} \omega_j \cdot b_j \tag{1}$$

F is called the operator of n-dimensional OWA.

$$\omega = (\omega_1, \ \omega_2, \cdots, \ \omega_n)^T, \text{is weight vector associated with } F;$$

$$\omega_j \in [0,1], \sum_{j=1}^{n} \omega_j = 1, b_j \text{ ranks } j \text{ in the array} (a_1, \ a_2, \cdots, \ a_n).$$

Array $(b_1, b_2, \cdots, b_n)$ is ranked from small to large, then weighted by ω and get integration. It is noticed that there is no connection between b_j and ω_j, ω_j is only determined by the position j in the array. The major difference between OWA operator weights and ordinary weight lies in that the front one is based on the majority sets, which will avoid the result from severe influences of maximum or minimum value.(Cao Jie,etc, 2011)

Radar diagram is a widely used method in qualitative analysis of financial management, its greatest feature is intuitive, strong visibility. If is used in software selection analysis, it will help get a clearer judgment for the manufacturing enterprises.

The research divides the selection into two steps, including initial screening and precise selection.

Initial screening means selecting candidates from every single part of the software, which is in order to facilitate the following precise selection.

Manufacturing Category (divided by Product) is illustrated in Table 2.

Table 2   Manufacturing Category (divided by product)

01 Agricultural and sideline food processing industry	12 Education, art, sports and entertainment products manufacturing industry	23 Special equipment manufacturing industry
02 Food manufacturing industry	13 Petroleum processing, nuclear fuel processing industry	24 Automobile manufacturing industry
03 Wine, beverages and refined tea manufacturing industry	14 Chemical products industry	25 Transportation equipment manufacturing industry
04 Tobacco products industry	15 Pharmaceutical manufacturing industry	26 Electrical machinery and equipment manufacturing industry
05 Textile industry	16 Chemical fiber manufacturing industry	27 Electronic equipment manufacturing industry
06 Apparel industry	17 Rubber and plastic products industry	28 Instrument and meter manufacturing industry
07 Leather and footwear Industry	18 Nonmetallic mineral products industry	29 Other manufacturing industry
08 Wood processing industry	19 Ferrous metal smelting and rolling processing industry	30 Comprehensive utilization of waste resources industry
09 Furniture manufacturing industry	20 Non-ferrous metal smelting and rolling processing industry	31 Metal products, machinery and equipment repair industry
10 Paper industry	21 Metal products industry	
11 Printing Industry	22 General equipment manufacturing industry	

Manufacturing category (divided by production) is shown as Table 3.

Table 3   Manufacturing Category(divided by production)

1	Engineer To Project
2	Make To Order
3	Make To Stock
4	Repetitive
5	Batch
6	Continuous

In addition to these two classifications, manufacturing enterprises also have to take its size into consideration. According to the latest "Chinese Small and medium-sized enterprises designated standards "SME (small and medium enterprise) is divided as Table 4.

By the way of the three categories above, business executives and experts on information technology software respectively match score. The following equation is obtained according to Formula 1.

Table 4 Chinese Small and Medium-Sized Industry Enterprises Designated Standards

Trade name	Index name	large	medium	Small	microscopic
Industry	number of people employed	⩾1000	300-1000	20-300	<20
	business income	⩾400 million RMB	20-400 million RMB	3-20million RMB	<3million RMB

$$f\left(a_1, a_2, ..., a_n\right)_i = \sum_{j=1}^{n} \omega_j \cdot b_j \qquad (2)$$

$$F = \sum_{i=1}^{3} f\left(a_1, a_2, ..., a_n\right)_i \qquad (3)$$

Letters meaning:

i=1,2,3 ：Represents three classifications;

j=1,2,…,n ：Represents numbers of evaluation staff;

b_j ：Represents j-bit evaluators under the classification of the Match ratings;

ωi ：Represents the weighting factor corresponding to b_j；

F ：Represents the total score under three classifications of the software.

According to software scores, we choose the top 20% software to conduct the following precise evaluation.

Precise evaluation includes five aspects, which are suitability, system functionality, vendor characteristics, investment and project cycle time.(Qi Ershi, SongLi fu, 2011)

Suitability Evaluation: The suitability of the software is evaluated by the software system functional status, system software technology, supplier qualification and strength.

The systematic function evaluation: Including the evaluation of the completeness of features, operator-friendly software, operational stability, customization capabilities, reporting, extensions, system stability, system integration, easy maintenance.

Supplier evaluation: Including success stories, corporate foundation strength, service training capacity and technical support capabilities.

Investment Project Evaluation: It includes acquisition costs and maintenance costs.

Evaluation of the project cycle: How much times did it takes to effect the software project.

Precise screening can also be calculated according to Formula 1 MA-OWA.

When it comes to the practical applications, we can use radar map as an evaluation tool, in order to obtain more comprehensive data intuitive and improve the comparability of the degree of match.
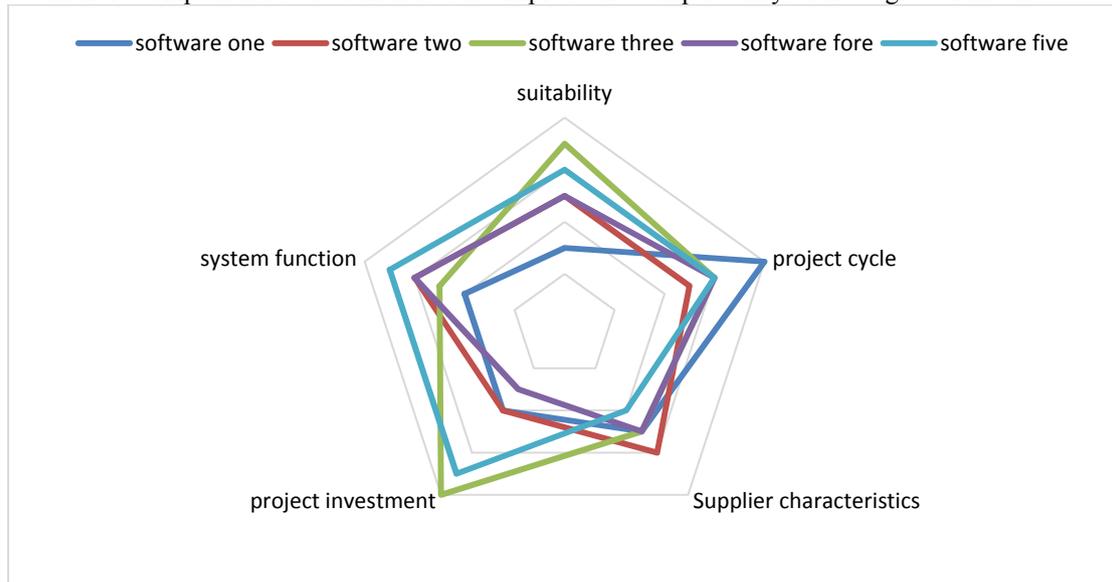
Figure 1 Rader Map of Enterprise Management Software Selection

As what we can see from Figure 1, the advantages and disadvantages of each software are distributed separately in this case, companies need to refer to the actual situation to adjust weighting coefficient, so that the model fit the enterprises more perfectly, ultimately in order to choose the most suitable software at an early stage.

3 Conclusions

The informatization of manufacturing management is not only the worldwide fashion trend, but also the requirement of the market. Because modern manufacturing requires more than the further liberation of the productive forces, the management mode tools to keep up with changing times also matter. This study starts from the enterprises management innovation achieved by the appropriate utilization of information software. But we have to understand that software cannot replace enterprise managers completely, and it is nothing but a highly-effective tool of the manager. That means if you want to do things so well, first make everything ready for you. Meanwhile it also gives some guidance in the selection of information software in manufacturing enterprises. Furthermore it proposes specific solutions based on the fuzzy theory and MA-OWA and adds more intuitive radar chart in in solving practical problems of the enterprises, which is fairly consultative. If the enterprise is a canoe in the turbulent trend of marketing, the information software is a plus, which, if used properly, can steer the boat thousands of miles away safe and sound to success.

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The Influence of Omni-Channel Retailing on Indonesian SMEs Online and Offline Business Operations

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Abstract: Omni-channel retailing is the newest business model, and it is fast getting its grasp in both national and international front. Omni-channel retail is commonly described as an entrepreneurial model that allows better customer experience from the online to offline (O2O) channels and where different enterprise channels are integrated. Small and Medium Sized Enterprises (SMEs) in developing nations have started picking up the modern business model to ensure a competitive advantage and Indonesia has not been left behind. The paper seeks to introduce the transition of the business from traditional perceptive to modern perceptive with a keen focus on the multi-channel to omni-channel retail in SMEs. The paper employs a research model to present the trends and challenges of omni-channel retailing in SMEs, which sets ups a discussion platform for the success of SMEs in omni-channel retail in Indonesia. From previous researches carried out through qualitative methods, the article reveals the digital transformation of consumers' needs and expectations which challenges the Indonesian traditional brick-and-mortar business models and will indubitably force SMEs to improve their digital O2O capabilities.
Key words: Omni-channel retailing; Online to offline; Mobile technologies; Social media; Indonesian SMEs

1 Introduction

E-commerce has taken the sales and marketing industry by surprise due to its explosive and dynamic growth. The current consumer has evolved in taste and preference influencing the marketer to devise ways to meet the evolving need. The current change in taste and preference has been attributed to the availability of information, communication and technology (ICT) infrastructures that are fast replacing the traditional means of buying and selling. Traditionally, the business trade required both the buyer and the seller to be in the same geographic location to exchange goods or services. The traditional business model also emphasized on creating business avenues with familiar agencies, a concept that has changed enabling business companies to share their profile through the internet and the interested parties are able to indulge in business. E-commerce has also grown in terms of retail business where consumers can find goods and products in online shops whereby they purchase through online bank accounts and have the goods delivered at their place of picking.

A report by Deloitte (2015) indicates that current consumers prefer buying products from online platforms because of the affordable prices and the convenience provided by the sellers. The online products are considered affordable because the middleman has been eliminated and the consumer can deal directly with the manufacturer or the prime marketer. Similarly, the convenience afforded by the access to products through mobile phones and other digital gadgets as well as simultaneous access to different stores eliminates the burden of carrying out physical shopping. In Indonesia, consumers in urban areas are increasingly adopting a digital lifestyle characterized by quick research and access to information, communication and collaboration, and a variety of ways to learn (Tabor & Yoon, 2015). Despite the various limitations faced by the country such as lower connectivity speed and unequality of Internet accessibility and development accros region, ATSI (2015) reported around 278 million mobile subscribers which exceed the 250 millions population. These data demonstrate the importance of the telecommnunication industry and the increased connectivity across the country.

Omni-channel retailing has currently emerged from the consumers' need of extensive shopping experience that allows for integrated shopping across all marketing channels. According to Leijnse, Brams, Kentridge & Van Der Oeve (2014), consumers all over the globe have modified their marketing behavior and have grown more adept at using the available technology to compare prices and quality of a product by browsing through the internet. This has influenced majority of the stores to open online websites and develop a platform where similar products can be viewed giving the consumer the power to choose a single product from a variety of similar products.

Omni-channel retailing, therefore, enables the customer to move from online shops to physical stores with

the help of a mobile device, laptop or a tablet in a single transaction. The concept of omni-channel retailing has developed from the multichannel retailing where the online stores were divided from the physical stores limiting access to both simultaneously. The omni-channel retailing involves comparing the markets offered through traditional marketing which includes catalogs, the web stores, social media and the offline avenues which include the brick-and-mortar marketing (Verheof, Nerslin & Vroomen, 2007). Eventually, consumer can browse through all the channels and buy offline or where they feel the prices, and the quality matches their preference. The action of going through different websites with the aim of shopping has been referred to as web rooming as an opposite term for show rooming which was a term used for the traditional visit to the showrooms (Nerslin, Grewal & Leghorn 2006).

To catch up with more developed country, Indonesia also seek to digitize companies' business models to ensure that they target and maintain the customers. The digitization process has been made possible by the availability of updated technology and the need for creating sales and distribution networks that are available online. Redwing Asia (2016) supports the sudden growth in e-commerce by Indonesia by indicating the major principles the nation has taken to merge in with the growth. Indonesia is striving to create a fully integrated business model that accommodates brick-and-mortar physical stores, web marketing, and mobile marketing. Secondly, the Indonesian markets are looking for ways to connect the in-store shopping with the online shopping trends to ensure that they have provided the consumer with adequate avenues to access product details and can easily make purchases. Redwing (2016) explains that majority of the SMEs retail companies in Indonesia have engaged with e-commerce specialists to ensure that they meet the multi-channeling process. The third principle that has been adopted by Indonesia markets is enhancing community engagement where the local retailers have opened chat apps and social media accounts to interact with consumers who want to engage directly with the retailers. This has promoted the business ideology of Indonesia markets where retailers are able to understand the consumer preference and behaviors (Blázquez, 2014).

2 Literature Review
2.1 Review of indonesian smes
The concept of e-commerce is not only affecting large firms with extensive range of products and services, but its effects are felt and affecting the small and medium-sized enterprises (SMEs). Over the last decades, the growth of SMEs has been significant in improving the economic status of the local communities and the government in any given region. The European Commission defined Small and Medium sized enterprises as business firm that has a few staff and personnel numbers as compared to other big companies (Airaksinen, Luomaranta, Alajääskö & Roodhuijzen, 2015). SMEs can be classified by size of the enterprise, staff headcount, and financial turnover. The SMEs have the ability to expand and prevail in conditions that may seem fragile for larger enterprises because they are most times considered for financial grants and do not require expensive innovation. The primary focus of encouraging the creation of multiple SMEs is so that they can provide chances for employment promote economic growth and innovation and provide a platform for social integration (Airaksinen, Luomaranta, Alajääskö & Roodhuijzen, 2015).

In Indonesia, the presence of SMEs has increased over the past two decades with the majority of the population converting their financial assets to small enterprises. SMEs Indonesia are described as those businesses with staff headcount of 5-19 individuals and have a financial turnover of less that RP 200 Million (Kartiwi, 2006). The government and other relevant bodies in the nation have encouraged the growth and development of SMEs because they aim at reducing poverty and improving the economic crisis that has weighed down the country since 1997. According to Triandini, Djunaidy & Siahaan (2013), all three categories of SMEs represented 99% businesses in Indonesia and have employed above 95% individuals thus providing the largest labor force in the country. SMEs in the country also contribute significantly to the Gross Domestic Product (GDP) of the country from its revenue in exports. Therefore, the current standing of the SMEs in Indonesia makes e-commerce a crucial topic of discussion in analyzing both its positive and the negative impacts.

E-commerce is directly intertwined with omni-channel retailing where the use of internet through the web and social media is a critical requirement in ensuring sales. A majority of nations in South East Asia continent are still struggling to adopt the marketing technology. This is mostly due to high poverty levels and lack of adequate infrastructure that facilitates the availability of internet use. Indonesia is among the nations in South East Asia that are struggling to rise above the known trends of delay in adopting information systems in the organizations. This is because the majority of citizens lack

computers and laptops. However, a wider population have direct access to mobile phones which they constantly use to research for products in the online market. Using the mobile devices, the consumers in Indonesia are able to analyze the quality of a product and the variety of a product before buying it in stores.

The Indonesian retailers, who are mainly segregated in different SMEs, have discovered this fact and are now more than ever striving to ensure that the consumer can have direct access to their products both in stores (offline) and online (Martlay & Addis, 2005). Studies indicate that a significant percent of the SMEs in Indonesia are family owned and therefore run by family members (Li, She, Chin, David & Mei, 2011). A study carried out by Triandini, Djunaidy & Siahaan (2013) explain that the most appropriate models to study the SMEs retailers behavior towards e-commerce and omni-channel retailing is the Technology Acceptance Model (TAM) followed by theories like Innovation Diffusion Theory (IDT) and Theory of Planned Behavior (TPB). TAM provides system values that explain the users, in this case, retailers acceptance of technology as part of their life, while analyzing the behavior towards the technology as well as the attitudes (Pantano, 2015). IDT applies where the retailer analyzes the complexity, compatibility, trialability, relative advantages and observability of the omni-channel model that is likely to work (Long, Lan & Duong, 2011). The TPB is closely related to technology acceptance model where behavior and intentions influence the success of adaptation of information systems.

2.2 From multi-channel to omni-channel retailing

Nerslin, Grewal and Leghorn (2006) explain multi-channel retailing as avenues where firms and customers interact with a defined design that involves coordination, deployment and evaluation of the communication channels. The interaction between the business and the customers occurs with an aim of enhancing the customer experience by incorporation consumer retention, deployment and acquisition strategies. Multichannel retailing is highly influenced by the customer through their experiences, preferences and perceptive. These factors affect how multi-channel retail operates and how it strategizes its objectives and marketing milestones.

The omni-channel retailing scope is faced with major factors that influence its success and influence its implementation. These factors include understanding the consumer behavior and channel allocation in order to tap into the sites that the consumer is most likely to indulge in while shopping and therefore avail the products and resources that meet the customer standards. This is particularly true due to the need of identifying the shopping experience of the consumers. The challenge in omni-channel retail comes when the retailer is unable to identify the complete shopping experience especially in brick-and-mortar stores where the consumer is not obliged to provide personal information (Ridgby & Leidingham, 2005). Finally, coordinating channel strategies includes managing the design, objectives, and deployment of the channels to create synergies. This involves strategizing whether the available channels can be integrated to enhance the shopper experience as well deciding whether to segregate the shopping experience making the buyer stick to a single channel throughout the shopping activity (Peter, Verheof & Kannan, 2015).

Multi-channel retailing has provided an excellent and advanced avenue for shoppers to enjoy their searching experience and has also influenced the advancement of shopping experience according to the customers' preference. This has given birth to omni-channel retailing where retailers are attempting to synchronize all channels by integrating the concepts. The omni-channel retailers have over the decade sought to make the shopping experience for the shoppers short and easy to maneuver in order to increase sales and credibility (Fenwick, et al. 2013). Omni-channel requires that the five most common factors work seamlessly to promote the success of retailing. The factors include store fulfillment, warehouse inventory management, order management and network inventory management, workforce management and channel agnostic return management (Fenwick, et al. 2013).

Store fulfillment requires that the retailer is able to reach the consumer through convenient means and that the consumer has a direct remote access to the warehouse. Its success is guided by having a framework that involves pick-up from store capabilities, online buying, and purchases, store to store transfers shipment claims and available return policy. Store inventory management expects that a consumer will get what they purchased through online means once they come for pick up. This is managed by constantly updating the store inventory to ensure everything sold online is in stock. Channel integration requires that the omni-channel has an available workforce that is integrated into all its activities to provide a smooth running for the products once an order is placed especially during promotions and peak seasons. Finally, having a credible and reliable return policy ensures greater success for the omni-channel business trend. Retailers on the omni-channel should always ensure that

they meet the consumer need and this also applies where the consumer is not satisfied with the order goods or products upon delivery. An easy and fast return policy ensures that the customer is happy and increases the chances of positive reviews.

3 Omni-Channel Retail Necessity for Indonesian SMEs
3.1 Evolving indonesian consumers

Indonesian consumers are fast changing their shopping perspective by engaging more in ICT models through spending more time on the internet. Digitization is taking the place of old traditional means of communicating, living and shopping. Majority of the citizens in Indonesia have focused on acquiring news from online platforms since the digitization of the media, and this has fueled more traffic to the websites where commercial advertisements appearing as pop-ups are frequent (Kuskridho, 2014). The digitization of the news has created a platform where the citizens can start discussions and raise the issues that appear to be of concern through social media. Current studies indicate that majority of young people are immersed in the practice of using smartphones as a means of keeping in touch with the world. The other population of older people and people with lower income use phones that have limited or no access to the Internet. Majority of the population in Indonesia depends on phones to acquire the information they need and therefore hardly require a PC to access the internet (UNICEF, 2012; Puspitasari & Ishii, 2015).

Through the advancement in mobile networks, cloud infrastructure, social media, and specialized websites, consumers are increasingly gaining access to more channels and flexibility of information, and having more power on how they want to engage with the companies they do business with. However, the concept of web accessibility between the poor and the affluent, as well as the educated and the less educated, creates a digital divide. Such a digital divide can be translated in the trends in online shopping as well as the ability to create offline to online channels. Currently, the changing ethics in ICT and the influence of digital divide has led to clustering of a consuming class that is ready to indulge in shopping because they have a higher purchasing power (Razdan, et al. 2013). According the McKinsey report (2013), the Indonesian consuming class accounted for 55 million in 2013, and expected to grow to 85 million in 2020, adding about 5 million new consumers each year. However, while urban consuming class have higher expectations for the services and products they receive from companies such as more personalized shopping experiences or the speed of response to their query or issues, lower income consumers are still relying on traditional retailers stores.

This has led to the need for retailers to increase their supply capabilities in order to tap into the upcoming class of shoppers. The change requires the retailer to modify the business practices to allow for better and engaging shopping experience thus the need to convert from brick-and-mortar to digital and online stores. Razdan, Das and Sohoni (2013) points out that majority of urban shoppers in big cities like Jakarta prefer to use multiple channels while shopping where they get a variety of products from different stores. Furthermore, in their research, Patrali & Archana (2016) reveals consumers' preferences to online store when it comes to expressive and functional goods compare to physical retail stores. Therefore, the traditional retailers are expected to upgrade the buying experience by creating omni-channels that enable the customers to acquire maximum benefits of shopping from a single point or location.

3.2 Digital transformation of brick-and-mortar indonesian retail stores

The omni-channel retail requires that consumers have continued access to different channels despite using different gadgets. This calls for various channels and SMEs to adopt an information system that accommodates consumer needs that come by when shopping and making comparisons. Nugroho (2015) explains that the adoption of technology in Indonesia is affected by four main factors which include optimism, innovativeness, discomfort and insecurity. The factors of discomfort and insecurity come into play when they inhibit the level of readiness towards adopting technology in business. The other factors of innovativeness and optimism affect the business platform by contributing to the measure of readiness in the use of technology. However, despite the emphasis on the importance of technology, the majority of the SMEs in Indonesia find the emphasis irrelevant and fail to recognize the need of adopting or upgrading to online channels. The lack of conviction to upgrade engraves a risk factor for business loss of competitiveness and a notable decline in markets, especially when the consumers fail to acquire a defined and modern taste of technology in business. It is noted that 66% of SMEs business owners view technology as a less valuable tool for business while only 18% acknowledge the impacts of integrating technology and business (Nugroho, 2015).

The risks associated with modern and online shopping seem to be another contributor to the delay in adopting omni-channel retail. As much as Indonesians appear among the top nations in the world to use social media and online stops, there are grave concerns on engaging the internet by providing private details. Therefore, the Indonesian shoppers are always weary of carrying online shopping especially when it comes to questioning the quality of the product and payment methods. Such concerns force the retailers to adopt highly integrated programs that are difficult to hack and ensure that the goods advertised are of high quality (Razdan, et al. 2013). The SMEs can also engage in the social media platforms to address the consumer concerns about the channels being used and the quality.

The online to offline (O2O) business concept is fast taking roots in Indonesian business models. The upcoming businesses and SMEs prefer to have strategically placed warehouses and an online team that responds to client requests, questions, and orders. Retailers in Indonesia have discovered that the current active shopper prefers browsing for products through online platforms and purchase through the same platform. It is, therefore, essential that the retailers understand the need for reliable business channels that promote more business opportunities, ensure consumer privacy and have adequate supply to consumers throughout the nation. Despite the slow growth among Indonesians concerning use of technology, there is hope among the retailers who have decided to embrace technology and information system. The offline or the brick-and-mortar shopping may never end but the integration of both online to offline is likely to displace some value in the traditional shopping.

Omni-channel retailing in Indonesia SMEs is slowly picking its pace from the consumers' needs to be connected to different channels without traditional difficulties. This has influenced the change of decision-making strategies employed by SMEs in order to incorporate the new changes in the marketing fronts. Samiaji (2012) explains that use of the internet is crucial in ensuring successful set up of omni-channel retail avenues. This is because majority of consumers check the product description on the web before making actual purchases and most times rely on the information gathered from the website to make the final decision. The online avenues also indicate the availability of the product and which stores have the product in their inventory. To make the omni-channel experience complete the consumer needs to have access to both the online and offline stores at hand before making the final purchase decision. The purchase decision needs to be available in both the online and offline avenues where the customer can make an order and pay through online access or book an item and pay for it using offline means and ultimately have the product delivered (DEPKOP, 2005). The idea of encouraging omni-channel retailing is to ensure that the customer does not have trouble moving from one retail channel to another, rather can access all the channels simultaneously (Shia, Chen, Ramdansyah & Wang, 2015).

Omni-channel retailing, therefore, influences the success, development and growth of SMEs as well as online and offline operations in various ways. The following context hopes to discuss different areas in which the omni-channel retail affects the operations of SMEs.

3.2.1 Technological factors

The success of omni-channel is dependent on the availability and use of technology. The use of technology is translated to organization and individual uses which are influenced by perception, experience, and attitude. Therefore, a positive outlook to the adoption of technology among the management team makes it possible for the organization to set aside financial, managerial and technical resources to aid in adoption of omni-channel. This includes setting aside employees who are tech savvy and who are able to monitor the consumer searches and relay the information to the in-store management (Morteza, et al. 2011). The presence of technology in Indonesia markets has influenced the SMEs to learn and integrate their activities to meet consumer demands.

3.2.2 Environmental factors

The current trend of business ensures that business platforms around the globe are linked, and therefore the consumer preferences are influenced by different factors. The environmental factors include competitors, customers, suppliers, external support systems. The mentioned environmental factors influence Omni-channel retailing and thus, its adoption requires consideration of all the factors individually. SMEs need to be aware of the suppliers' expectations and returns in order to establish direct links that will enable the consumer to access their products with ease both online and offline. Similarly, the existing SME markets need to analyze the actions taken by their competitors to ensure they are on the same level without the risk of losing the markets. Therefore, omni-channel retail has modified the traditional concepts of trade and incorporated it to the global view making the current small sized business to aim for better and extensive markets (Duan, et al. 2012).

3.2.3 Organization factors

These are the characteristics of the enterprise that influence how measure and practices are adopted. The omni-channel retail requires availability of technology, human resources, skills, financial resources and firm size (Creswell, 2003). All these pointers need to be synchronized to achieve a successful business model that is likely to boost profits and keep up with the competition. The integration of the mentioned factors ensures that the SME has adequate staff members who are able to monitor sales and demand, appropriate technology model that runs throughout and can be easily updated when the customers increase, viable business links that ensure product stock and proficient customer services that aim to retain and attract more customers.

3.2.4 Individual factors

A majority of SMEs are run by a single manager who oversees and allows for the activities taking place within the firm. Therefore, the success of attaining profitable omni-channel retail entirely depends on the manager's perception, attitude, culture, and behavior. The fact that omni-channel requires a direct link across different channels requires the manager to be flexible to the risk of sharing information and bending to meet the customers' demands as influenced by season and preference. The business owner also has to be innovative and willing to learn more about information systems and technology in order to guide and lead his or her team towards successful omni-channel retail. The individual factors are critical since they influence how the employees perceive change or customer experience, and they affect the success of the SMEs (Nguyen & Waring, 2013). Most of the SMEs in Indonesia and other developing nations have been declared almost bankrupt in situations where the owner is stiff to change and has led to loss of customers.

4 Conclusions

It is clearly noted that majority of the developing nations are struggling to keep up with the developed countries when it comes to technology and business advancement. Indonesian consuming class is evolving with the introduction of cheaper and developed digital technologies that allow them access and share information faster, and seek for more modern channels and customized shopping experience. However, strategic efforts to improve the business trade have enabled some of the flexible small and medium sized businesses to proliferate on the global markets. Despite the SMEs not reaching some international platforms, the ones that have incorporated technology in their day-to-day activities have had some success in integrating various channels that have enabled to tap in to more customers across the regional and national scales. Omni-channel retailing is not an easy project to take up especially for micro to small firms because it requires expertise that most times increases expenditure and increases the firm size. Therefore, the SMEs are often advised to ensure they use adequate strategies instead of trial and error methods that may cost the enterprise unnecessary expenses and losses.

It is advisable for the SMEs to adopt practices that have been declared successful by other firms in developing nations in order to minimize the strain caused by adopting strategies of the companies in the advanced countries. This is because both regions serve different bases of customers and the customer taste of the individuals in the developing nations may not have evolved as that of the customers in developed nations. Similarly, adopting strategies used in developing nations may cause a firm to spend more finances than necessary when trying to imitate the complex models and this can ultimately lead to business closure. The growth of Indonesian SMEs is noted to increase as influenced by the increasing numbers of internet users and this places the nation and other companies in a position to incorporate omni-channel retailing as the consumer shopping preference is expected to change.

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Research on Marketing Strategy Innovation of Health & Medical APP under the Background of the Mobile Internet

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Abstract: With the rapid development of mobile Internet, Health & Medical APP provides more convenient services for consumers' medical treatment, health care and so on. Compared with other mobile phone software, Health & Medical APP is unique and related to the safety of consumers. The existing internet marketing strategy cannot satisfy the needs of survival and development of enterprise better. Combined with health & Medical APP marketing status and characteristic, this paper explores Health & Medical APP existing Marketing problems and proposes the corresponding marketing innovation strategies.
Key words: Mobile internet; Health & Medical APP; Marketing problems; Innovation strategies

1 Introduction

The rapid development of mobile Internet is changing people the way of manage health behaviors as well as communicate with others and entertainment habits. Mobile health is the future trend of medical information, it will be more rapid, efficient, reliable and accurate. Health &Medical APP main functions focused on helping the patients' health self-management, disease prevention and chronic disease management.

Now the development of medical App in China is still in the start stage, Chunyu Doctor, Quickly Asked the Doctor and Fitness, etc already have achieved a better development, they all become more well-known with accurate positioning in the Chinese market. In addition, due to environmental, smog, water quality and other factors, human pay more and more attention on their own health problems, plus with the increasing pressure of life, eating disorders, staying up late, lack of exercise and other habits make most of us in the state of sub-health. The development of health & medical APP has prompted more and more people start moving up. Different health & medical App has different marketing, this article is about to explore and analysis how to make full use of this kinds App and the problems related to the application to make more people know and use health & medical App, and also to provide reliable direction for the APP marketing staff and then to meet users' wide demand of health and medical care.

2 Literature Review

Mobile Application (also called Mobile App, App) refers to the design and application software used in smart phones, tablet computers and other mobile devices. Most of them are free, some other are not (Liu Feng,2014). APP Marketing refers to the application of marketing, in this article, especially means that through platforms like smart phones, computers and other mobile devices to be oriented and accurately transmit individual and instant information to the target customer, then through interaction with consumers to achieve the purpose of marketing communication.

Mobile marketing has powerful data as its support, it can convey the information to the consumers quickly and accurately and achieve the goal of one-to-one Marketing. Compared with the traditional marketing, mobile marketing has lower cost, sustainability, without the limitations of time and space, precise marketing, interactive and comprehensive, etc.

Different kinds of mobile software have different models, according to the products and services, the mobile phone APP marketing modes are also different. APP marketing mainly include three kinds of models: advertising, user participation and shopping website transplantation (Wang Ning,2015). The advertising mode and user mode are now more mature and familiar. Advertising refers to through clicking on the ads automatically entered into the default link and then to achieve the effect of marketing. User participation model is positioning itself in line with the business applications published to the App Store for users to download, user-friendly and intuitive understanding of the business or product information. This marketing model not only has strong practical value but also includes interactive features.

Some authors considered that mobile medical technical support and training have no effect on the users' expectations and desired ease of users, mobile APP should focus on restrictive privacy and

security, system and source quality and the mobile device factor (Jen-Her Wua,b, Shu-Ching Wanga, Li-Min Lin ,2007).   Health & medical APP can be divided into two main features "Health- Home Care" and "Safety-Information flow"(Lourdes Martína,2011). Health& medical APP should be more humane and character, especially considering older habits. For example, adding "personal preference", "learning and re-education", using presentations and demonstrations; perfect APP laws regulate and pricing other factors. L.H. Iwaya thought that although the development of mobile medical development rapidly,there are still many untapped areas such as medical companionship, medical knowledge self-improvement and decision support systems (L.H. Iwaya ,2013).The improvement of mobile technology would have a significant impact on health care mobile , it need to be improved in two ways: 1) improve the ability of information processing and information diagnosis technology; 2) the communication of medical specialist information. These two aspects of the technology play an important influence in improving the user's consciousness of monitoring and alert their medical health (Upkar Varshney,2014). At present, the research about health & medical APP in china is less, only few scholars have studied the mobile medical.   Health & medical APP consumer can be segmented into two groups: preventive care and medical cure, founded out that preventive consumers are more concerned about APP preventive ability and the characteristics of APP, and medical healed consumers concern treatment, service and reliability of sources of information of APP (Wang Lei, 2015). Health &medical APP also can be classified into three categories: fitness classes APP, health tools APP and mobile medical APP (Gong Qiong ,2014).

As mentioned in the literature review above, the article study Health &Medical APP is less, the current also has no research specializes in Health &Medical APP marketing strategy. Most have explored Health &Medical App consumers' use condition and behavior or just explored the marketing strategies of mobile APP. From the perspective of marketing this article study health & medical APP features, effect, existing problems and future development strategies, So the main innovation of this article is specializing in Health &Medical APP analyze the existing problems and the future development of innovation strategies.

3 Development Situation of the Health & Medical APP
3.1 The status of the health & medical APP
With the development of mobile Internet, the demand for health care is no longer confined to the sick seeking treatment stage, but tend to use mobile devices to monitor their own health status whenever and wherever they want. Health & medical APP show rapid growth in the state. More and more users expect widespread use of mobile medical technology to improve their own overall health management methods in the future. At present, China's health & medical APP market is still in the start stage, there are only few part that can really create value, most applications have become useless. In contrast, the health & medical APP markets in other countries are more developed, they have more than 100,000 kinds of mobile medical APP approved to enter the commercialization stage. Currently the most profitable APP is related to medical service and target users which are mainly used by the patients with chronic diseases.

3.2 The degree of specialization of health &medical App is low
Health & Medical APP are different from the social entertainment APP, they are related to human life and health so we should put their authenticity and professionalism in the first place, it is necessary to ensure the needs of the users of the software. It can rely on doctors, pharmaceutical industry professionals to ensure its content, also can offer the function to communicate with national quality hospital or medical professionals face to face. At present, most of the health & medical APP users' motivation in China is low, the main reasons are the following: they lack of trained medical professionals so the users just can use a few simple, routine basic functions, they have no appropriate supporting program interventions for the complex issues and users are too confused to try some existing programs.

3.3 The range of customer is limited
The users of currently health & medical APP main are young, there are two main reasons: Firstly, young people use their smartphones frequently more than the old, which are not yet familiar with the smartphones. secondly, the professionalization of the current health & medical APP should be improved, the elderly disease is usually complex and the cause hard to find out so that the APP function cannot meet their needs. In addition, different health & medical mobile software classification is relatively

simple, for example slimming, healthy eating, pregnancy, diabetes, stroke detection and so on, they all classified by a series of problems existing phenomena.
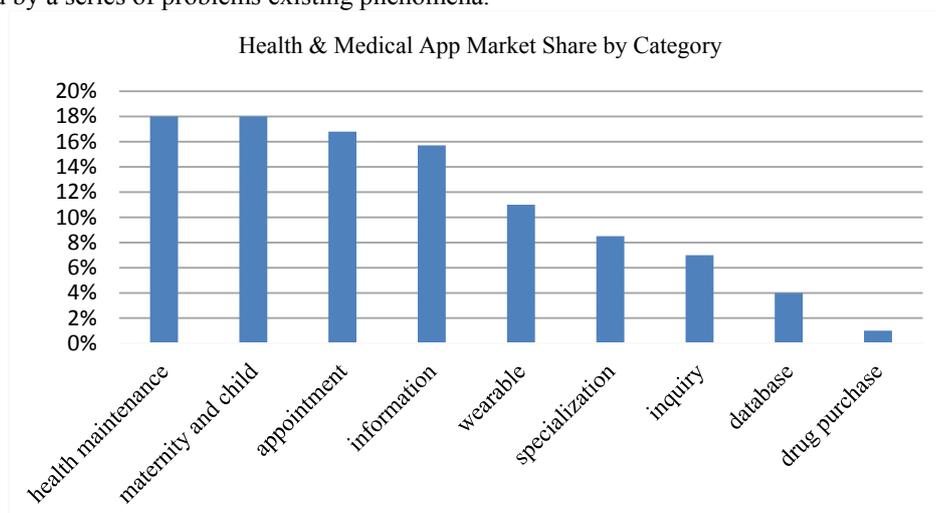
Figure 1   The Market Share by Category of Health & Medical App

It can be seen from the figure above, the market shares of three categories of health maintenance, maternity and child and appointment are larger, these three together accounted for more than half of the total share. Therefore, "heavy vertical" applications are much more favored by customers than similar applications, it is one of the directions of all kinds of APP applications' efforts to form a closed loop online and offline through market segmentation and customer segmentation.

3.4 The way health & medical APP diagnose is single

In the past few years, health &medical APP mainly provide advice via chat, pictures, etc, there are certain problems in this way. First of all, ordinary users lack knowledge so their description may exist problems or incomplete. On the other hand, it is not sufficient to establish a good relationship of trust between professionals and users through the mobile phone inquiry.

3.5 Mess environment and without helpful supervision

At present, health& medical APP not included in the scope of government oversight, there was no effective legal means to monitor the health & medical APP development either. Now the health medical market in China was confused, it explores answers about difficult questions through online search   ,the quality and authenticity of the content of their answers are not guaranteed. For some obscure areas of professional research, some criminals use APP set up false rumors, which greatly limits the future development of the APP in China.

4 Suggestions for Health & Medical APP Marketing Strategy Innovation

4.1 Professionalization and reliability are two basic factors for the health & medical APP

Professionalization and reliability are two important factors for the health & medical APP. Unlike others APP, health &medical APP relates to the major issues of life and physical safety, so in the marketing process it should pay more attention to these two points. It should devote itself to enhance the professional guides and professional guidance tools, and actively cooperate with the large specialized hospitals, pharmacies and other institutions to establish a good doctor credit system and comprehensive intelligent mobile search databases. Such as: ensuring guidance professional, Health Tap's latterly invite 65000   good reputation practitioners to review, organize, classify and rank the relevant health APP content; different doctors can answer and certify the same question so to avoid single specialist making mistakes; make full use of modern high-tech means, such as: video, infrared, VR (that is virtual reality) and other test means to increase contact time between guidance personnel and consulting personnel to make guidance people better understand the specific situation and give right advice.

In addition, health & medical APP has broad market prospects, there exists great difference among consumers, APP marketing should subdivide its customers, explicit the position of their products and services, dig customers' needs and act according to actual circumstances and precise localization then can achieve success.

4.2 The adoption of the viral marketing

Viral marketing can also be referred to as one kind of Word of Mouth Marketing, which spread among groups mainly relies on the user's reputation, it is a method frequently used in network marketing. Consumer's trust is the initial premise for the health & medical APP so health &medical APP marketing should pay more attention to word of mouth marketing. When public recognize the applicability and advantages of the software they will introduce it to their loved, friends, colleagues and so on. Thus through communication and interaction between users, information will spread rapidly and health & medical APP can quickly be extended to obtain more trust and attention.

4.3 The creation of product image

The core of App marketing is making sure users to establish an effective emotional association with the product, especially for the internet virtualization products, they need much more user's emotion and trust than other products. Now the problem of homogenization about health & medical APP is serious, plus with the intense competition in the market, marketers should focus on the uniqueness of products to attract the attention of customers, health & medical APP can also offer some free activities, free checking and other public welfare activities to broadcast themselves then to improve product visibility and reputation. Such as providing free physical examination for the elderly over the age of 60, explaining knowledge freely to community resident and offering knowledge lectures through the network for the obese or pregnant mothers and so on.

4.4 The expansion of marketing channels

In the process of Marketing we should integrate different kinds of marketing methods to maximize the marketing effect. Traditional marketing and internet marketing they all have their own advantages, so we should combine with traditional marketing methods such as television, newspapers, magazines and so on in health & medical APP marketing process, we can also give full play to its own features: targeted, interesting and richness to use pictures, music, video and many other ways as well as high-tech technologies, such as the popular fingerprint to unlock, IRIS, Voice Print and Holographic Projection technology to enrich the health & medical App. In this way not only can bring users a breakthrough experience, but also can enhance product image and promote product promotion.

4.5 The multiple safeguards for the health & medical APP

The development of health & medical APP in American has already became quite mature, the US Food and Drug Administration had included health & medical App into the control range. While the development of health & medical APP in China is just starting, China should strengthen social and self-monitoring mechanism and punishment mechanism in both government and law to protect the rights of consumers. For example, when errors in App leading to consumer misdiagnosis or harm, it should be compensated according to the actual situation. It can also establish user rights forum center so customers can exchange their experience with the professionals or give their feedback online.

5 Conclusions

With the rapid development of mobile Internet, mobile marketing is becoming mainstream model of business development. Meanwhile its development is still facing many opportunities and challenges. If health &medical App want their marketing and marketing value to be accepted by complex consumer and achieve their marketing goals, they should combine online and offline together reasonably, develop appropriate marketing strategies, focus on brand establishment and consumer demand, make the development of mobile products much more personal and function diversified, what's more, it's important to enhance the according software safeguards measures. The innovation of this paper is exploratory study the innovative marketing strategies of health & medical App, which provide advance reference for the health & medical App development and broaden its development prospects. After all, health & medical APP is a tool for people's health and medical services, and its future development is inseparable from the human demand. The development of health& medical APP in China is just starting, there are many influence factors in the process of future development and marketing, which can do some further exploration.

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Frustration Towards Franchisee Community Decrease Commitment within Franchisor in Malaysia

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Abstract: Franchising industry at Malaysia since the early 1990s has been widely accepted as an effective means to start and expand businesses.   The franchise system, however, is not a guarantee for success in business, as it nonetheless depends on a cordial relationship between both parties namely, the franchisor and the franchisee.The success and failure of any franchise business are closely related to both the franchisor and franchisee. Frustration with franchisor could be considered as a factor that contributes to franchise failure, such as problem in fulfilling and following rules and regulation from the franchisor.This paper attempts to explore frustration towards franchisee community within an academic setting and examine the key factors and intention in franchising netwotk at Malaysia . The success and failure of any franchise businesses are closely related to how far both, the franchisee and franchisor, fulfil their responsibilities in maintaining a good trust in franchising business community. The study utilized a qualitative research approach that comprised to focus group, face to face interview and semi-structured interview to gain better understanding of the study contact. The respondent local franchisor franchisee and from Malaysia Franchisor Association (MFA) . About 20 selected which involved observation and interview sessions. This study is limited to the Malaysia retail franchisor sector. Future research can expend the framework to examine the services, franchising industry or to include additional factors that affect the franchisor's competences.
Key words: Franchisee; Franchisor; Franchising industry; Frustration of franchisee; Face-to face interview; Semi-structure interview

1 Introduction

Business has been one of the most interesting and economical jobs in the world. The world had witnessed that with business, it can conquer the economy and the world. It has been affecting our lives such in lifestyle, family economy, our routines and social. Business is a wide aspect to be considered in this paper. We should understand that in business it has entrepreneurship which make business is a serious job. With entrepreneurship activity going wild all around the world, born entrepreneurs that running down the business.

In entrepreneurship, franchising business is one of its kind in a business world. In the business, exist franchisor and franchisee. This term has its own typical system format, Franchisor refer to a company or an individual who give chances to the Franchisee to engage in their developed business but followed their own regulations such as trademark, brand names, regulations and the provision of intangible assets (Dant, et al,2013). In a bigger vision, Franchisor had the authorities to eliminate its franchisee as they had the right. Franchisor also manage the standards, decide the performance level, economic efficiencies of the company and misuse royalties (Baucus, et al,1996; Lussier, et al,1995)

Franchisor-Franchisee relationship plays a major role in entrepreneurship business. The system required a successful relationship to lead to a well-being business that the two sides were doing. These individuals relationship is construct while acting on the franchising industry and effect the company growth outcomes.   It also shows a relationship, trust and improved business quality between this two sides, franchisor and franchisee (Abdullah, et al, 2008; Dent, et al, 2013; Dant, et al, 2013; Hizam-Hanafiah, et al,2014; Weaven, et al, 2009)

As franchising industry required a high level of trust and commitment in the individual. A good relationship between individuals can sustain a long term in aspect of business relationship. To conceptualize this two term, relationship commitment is defining as a much hardwork required to comply the business by ongoing relationship between individuals, franchisor and franchisee, seems

important (Harmon,et al,2008; Hizam-Hanafiah, et al,2014). A bad decision- making process between this two sides can bring frustration either by franchisor nor franchisee. Much literature has been doing research on the failure of these two individuals and the factors that contribute to it without considering the aspects of frustration between this both individuals (Scott Weaven, et al,2010).

So, in this paper, research has been done to determine the frustration level of franchisee community towards the franchisor in many aspects. It also discussed on the decision-making process between the franchisor and franchisee in attend and make a business relationship commitment as a successful business.

2 Literature Review

The news agency, Bernama in Malaysia reported on the 8th September 2015 mentioned that 30 franchisees were facing problem in franchising industry mostly having problem in financing and faced banckruptcy due do not being able to service and pay their loan between RM100,000 to RM400,000. From the articles also mentioned that the franchisees became victims of the franchisors involved.

To answer the research question, the commitment and the aspect of motivation, personality relationship and trust of entrepreneurs ethics should be recognized. The relationship perceived within franchisee and franchisor by these two parties has also been done research and review through some journals. Therefore, a review on the personality, motivation, relationship and commitment of entrepreneur has been done to made a wide view for this paper (Abdullah, et al,2008).

Recent research has classified failure and frustration of franchisee business in Malaysia are 8 factors which are: 1) poor service of franchisee, 2) attitude, 3) greed of franchisee, 4) mismanagement in cash flow, 5) conflict with franchisor, 6) choosing bad location, 7) financial problem and 8) problem in pay back to franchisor. Furthermore it was also found that franchisees failed due to lack of entrepreneurial skills and mismanagement. (Mohd Amy Azhar 2011) identified that bumiputra entrepreneurs lack of business networking among business community compared to non bumiputra franchisees (Harif M.A, et al,2011).

According to many in the field mentioned that, the Agency Theory was used as an inspiration to the franchising system. Agency theory examines the relationship between franchisor and franchisees in the franchising industry. The franchisor (one party) was involves in the relationship of an agency to assigning work to franchisee (third party) and the researcher (Eisenhardt, 1989) added that franchisee delivered different way to work. In this situation, a good relationship within franchisor and franchisees especially franchisees must not forget that the franchisee business that they started is their business using franchisor trade marks and business plan. Therefore franchisees need to be accountable for what has happened in the business that they will run for it (Lafontaine, et al,1997; Lafontaine,1992)

The franchisors' effort necessity support sakes with the level of incentive and assurance delivered (Lafontaine, et al,1997). The bunch of researchers highlighted that, the context of this study, good relationship and trust within franchisee and franchisor are needed and evident to success (Harmon, et al,2008; Prince, et al,2009; Davies,et al,2011; Davis, et al,2004). Furthermore, faith and satisfaction is a major factors achieving business strategies concerning the achievement of reaching franchisee confidence level, aim similarity and subsequent pleasure in the franchise rapport. It is also supported from Screening Theory that explanation the royalties, fees and specific investment attracting competence towards franchising system (Dnes, 19920; Dnes,1993)

This discrepancy could be attributed and found that 80 per cent of franchisees failure was caused by a failure to adhere to operating systems (Frazer,2012; Frazer,2007; Frazer,et al,2007). The daily news "Harian", (2009) reported a total of 30 entrepreneurs under the bumiputera franchise financing might be bankrupt due to the occurrence of disputes and injustices by the franchisor. Yet another statement in the franchisor deny the situation and is of the opinion that the weakness of franchisees more contributes to business failure rather than due to the weakness of francaisor (Frazer,2007).

3 Theoretical Development

Franchising has been determined to be a change agent such as social and economic development of infrastructure in term of human resource, market structure, competition and service quality (Alon L, et al,2015; Anwar S.T, et al,2011; Tuunanen, M.,&Hoy,2006). As many franchisee communities are owned by independendent franchisees as small entrepreneurial business units. (Paswan, et al,2004; Hompson,et al,2006). It is also highlighted that, the further finding discusses the relationship of franchisee as a dependent, lawfully, carefully and operationally (Davies et al,2011).

Franchising primarily as a strategy for extending distribution channels through increase outlet or branches in various demographic (Julian, et al,1995; Justis,et al,1986) . Thus, franchisors theoretically, there are four reasons why people engage in franchising industry. The first is to become owner of a new business and accomplish objectively. According to the researchers (Hodge,et al,2013; Hoffman,2004; Stokes,et al,2010; Thompson,1992; Tsang, S.,et al,2013; Vinturella,1999) mentioned that, the aspect which measured as a vital aim is to encourage the individual to begin the business by using the other parties business strategy and knowledge .At the same time save time, money and what business do they wants to be operate. Supported by other researchers described that, this reason was play an important rules than money for franchisee community to take over the business in the method where they want (Altinay,et al,2014; Altinay,et al,2005; Anwar,2011)

The following area is related with financial and monetary substances. The evidence from this study supported by some researchers mentioned that, the key inspiration of fresh franchisee is the chance to earn more money, (Hizam-Hanafiah,2014; Klein,2016), but other researchers added that, this encouragement is a minor aim for franchisee.Self –satisfaction is a following aim in the field. The fresh franchisee assumed that the self- satisfaction which gain by their experience is more important and the scholar added that, satisfaction and liberation are more important than money(Moore,2004).

Family is one of the aim in this field. The scholars added that, family subtances is playing an important in business field(Surinder Tikoo,2005). Research articles generally clarified that, of the following components mentioned that, there are benefit to become a businessman because each family members will get an opportunity to work in the company and can increase the financial (Hodge,et al,2013; Hoffman,2004; Tikoo,2005; Weaven,2009).

The other aims are measured as minor than the previous four franchisee aims mentioned by the number of authors above. A bunch of researchers are making differences such as involment with public, tax benefits, responsible with own self and find a chance to make an achievement (Scarborough,2003; Hodge,2013; Hoffman,2004; Tikoo,2005; Thompson,1992).

The four main aims (authonomy, financial and monetary substances, intrinsic rewards/ self-satisfaction and family) are occur in both theoretical and observed discussion in franchising community aims. These four aims are selected as an aim for the franchisees to accomplish in their business understaking. There are other aspects also involved in the study likes "push motivations", "role" and other aspects as entrepreneur's aims but the observation studies show these aims are not a main in the field. (Scott Weaven, et al,2010)

4 Methodology

Exploratory research is undertaken to identify the major causes of franchising conflict Face –to-face interviews are conducted at Malaysian Franchise Association (MFA) and PNS (Perbadanan Nasional Berhad) including franchisor and franchisee with 20 participation owners in various industry ,to draw upon their considerable experience in the sector. The main objective from the interview to find are:

● To examine a deeper insight and understanding into issues (frustration) toward franchising system among franchising industry in Malaysia

● To identify and provide a better understanding about franchisor competencies among franchisee's

● To determine HOW franchising industry leaders overcome the confident level towards the system.

Taken together, these results suggest, the sampling design for the interview should be reliable with the objectives of the research study, semi structure interview and non-probability sampling may give a better alternative from the participate (Davis,2004). A few researchers described that, the finding was stess on a non- probability employee as a sampling technique, the individual of the population didn't provide equal opportunities or predetermined option of being designated as a members of the sample. These results would seem to suggest that with some supported evidence that, "the inability to specify a sampling frame may dictate the use of one or a number of non-probability sampling techniques" (Jackson,2008; Sekaran,2003).

Three factors need to determine through the selected respondents. The primary factors are the respondent of this finding should be the proprietor or one of the owner of the franchise companies. The second factor are franchisor and franchisee should be active in the business not a sleeping partners ([8], [9]). Other researchers also mentioned that, the following aspects was focusing by franchisee where spend minimum one year to run the business (Morrison,1996; Strutton,et al,1995)

5 Finding and Discussion

Profiles of successful in franchising industry arguably help to bridge the perceived gap between franchisor and franchisee (Margarita Fernández Monroy Lucía Melián Alzola,2005). Franchisees communicated "a lot less stressful" the business differences are always connected with the business. In addition, the central study was "it is better having a good relationship with them (franchisor) than not". When asked about issues on frustration on both side, almost they answer: my brand is too young, not so established to be franchises out, do not have quality people to take over franchisor business, franchisee fees or ongoing royalty, franchisor confident level to franchisee shall be able to generate sufficient income, franchisor afraid of the legalities and shall lose their reputation if franchisees unable to operate their original business.

One of the factors in increasing the frustration level of franchisee towards the franchisor is lack of trust in franchisor-franchisee relationships. The business rapport was giving difficult commitment to the franchisee and to communicate with the franchisor through lack of trust. One franchisee said that, "There probably would be an element of trust if there was a relationship, but there is no relationship."

Furthermore, the faith and respect are the most important which apply in all the relationship, in the further investigation, the application said that "too much at the beginning", and also too much of the faith in the context. However, the faith will gradually reduce, because of that the franchisor was use some opportunities for further undertaking and followed by the franchisee opinion that hey belief "they don't care" (Md. Isa,2012).Franchisors must not over-sell their promises during the marketing of their franchise business. Otherwise, it would be difficult for the franchisor to honor every service that is documented within the franchise agreement. Another important factor is that franchisor's policies must be fair and take into account franchisees interests(Hodge,et al,2013).

6 Recommendation for Future Research

Here are few recommendations for the further research, through the current study and their implications based on the insights and experiences. There are some franchisee findings was applying in other countries and respondents with the same type of questionnaire. This can broaden the space of the current study, enhance the overview of the outcomes and it improve the validity and reliability of from respondent. Next, new research in the future would be on the effects in increasing frustration level of the franchisee towards the franchisor. If the sampling frame can be established in the future, probability sampling is chosen, as it imitates the features of the population and it is harmless to simplify from that sample to that population. The future finding should be employ a larger sample frame to simplify the study finding and if it is impossible to establish the sampling frame. The qualitative data was suggested for the further study. The positivist method and social constructionism method are deliver original information on the similar topic substance and it also involve the ontology, epistemology and axiological in the matter too.

7 Conclusions

This paper explores the factors in increasing the frustration level of franchisee towards franchisor. This issue emerges because the franchisor does not 'take care' their franchisee well. One of the ways to solve this issue is the franchisor needs to treat their franchisee well because franchisee is a person or individual who purchased a business from the franchisor. This franchisee is the person who could help the franchisor to expand their business. Other than that, the franchisor needs to help the franchisee in developing their business by helping them in negotiating deals with the supplier. This can reduce the operating cost and to provide ideas and system for enhancing productivity. This also could help the franchisee to build a trustworthy relationship with their own franchisor.

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Globalization and Green Supply Chain Management: Role of Multinational Companies in Pakistan: An Institutional Theory Perspective

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Abstract: Businesses today are operating in truly global environment and global supply chain management has become a strategic tool to be competitive. With increasing awareness of environmental protection across the world the green trend of conservation of the resources and protecting the environment is overwhelming and these drivers have exerted pressure on organizations to improve their environmental performance. Successful participation in global markets requires MNCs to organize domestic green supply chain management practices. This paper has employed a case study approach with an institutional theory perspective to identify driving forces for MNCs in South Asian developing countries like Pakistan to adopt and implement green supply chain management practices. Detailed interviews from 14 employees of two different MNCs revealed identical results. In Pakistani environment normative pressures from customers, suppliers and consumer pressure groups have significance impact on decision making regarding green supply chain management while no importance given to coercive and mimetic pressures. It is also revealed that MNC's could be a major source of diffusion of green practices into less aware and resourced local suppliers from a global supply chain perspective. Some limitations and future research directions has also been presented.
Key words: Globalization; Multinational corporations; Green supply chain management; Pakistan

1 Introduction

Technology has converted this world into a global village in reality. This global environment for business has created a lot of opportunities along with many challenges for multinational corporations (MNC's). They have to consider whole world while taking any strategic level decisions, as they are the major beneficiaries(Márquez, 2014).Environment degradation in high manufacturing countries has become a matter of highest concern and MNC's are under special scrutiny in this regard. MNC's cannot ignore the external factors such as economic trends, technological innovation and competitive situation in other countries but now they also have to handle environment friendly concerns as their top priority. They also need to take care of government legislations, non-government organizations (NGO's) and consumer pressure groups. Companies are going truly global with increasingly focus on improving their supply chain management (SCM). Companies have changed the ways in which they manage their operations and logistics activities. Changes in trade, the spread of modernization of transport infrastructure and intensification of competition have elevated the importance of global supply chain management for MNCs(Wu, Dunn, 2012).

Along with globalization becoming a reality we are also witnessing now a day that instead of companies these are supply chains which are competing with each other. SCM has evolved as a true strategic tool to compete in highly intense global competition of reduced cost, time to delivery and high quality for almost any type of product(Dubey, Gunasekaran, 2016). The biggest challenge for top managers is to design and operate these globally dispersed but highly connected networks of suppliers and customer to be truly sustainable with respect to environment. Many stack holders are raising their concerns with respect to environmental erosion due to increasingly high manufacturing levels and they demand environment friendly business decision making at all levels(Khor, Udin, 2016).

With increasing awareness of environmental protection across the world the green trend of conservation of the resources and protecting the environment is overwhelming and these drivers have exerted pressure on organizations to improve their environmental performance (Zhu and Sarkis, 2006). In developing countries this globalization factor has increased the awareness about improve environmental performance instead of local pressures(Hervani, Helms, 2005).Successful participation in global markets requires MNCs to organize domestic green supply chain management (GSCM) practices.

Finding ways to become more efficient supply chain members is becoming the basis for improved green industries in developing countries(Tiwari, 2013).

To understand how to make socially constructed and accepted business decisions we need strong theoretical support. Institutional theory can be the best choice to explore external influences on organizations for making decisions regarding GSCM(Sarkis, Zhu, 2011). From a GSCM perspective, institutional theory can help explain why organizations are motivated to adopt GSCM practices. Thus, the objective of this study is to use institutional theory to understand what drives MNC's to engage in GSCM practices.

To achieve this objective this study is presented as follows. First, relevant literature for globalization and MNC's, GSCM, Institutional Theory and environmental initiatives of MNC's in developing countries is reviewed. Next, research method and profile of case companies is presented. Then discussion on case findings along with future implications and conclusions is discussed. This study's contributions include:

● Respond to the call for research on theory building for supply chain management in general and green supply chain management in particular by using some theoretical lens (Jabbour and de Sousa Jabbour, 2016).

● Use of case study research in operations management and supply chain management field to explore areas with in depth knowledge (Eisenhardt and Graebner, 2007).

● Use of institutional theory to understand and implement green supply chain management (Sarkis, Zhu, 2011).

● Find out what are the driving forces for MNCs in South Asian developing countries like Pakistan to adopt and implement various green supply chain management practices?

2 Literature Review
2.1 Globalization, MNCs and environment
Present business environment is truly global in nature. From small new start-ups to large MNC's everyone is directly involved and facing challenges of different cultural, financial and technological dimensions. This high speed bandwagon of globalization has created another biggest challenge of environmental degradation and MNC's are the prime suspect for this. Manufacturing activities of large corporations are considered to be source of environmental degradation and depletion of natural resources(Kumar, Jain, 2014). The environment is one of the key elements for MNC's as it provides energy resources and raw materials for their industrial activities. Therefore, these are MNC's who can impact negatively by producing greenhouse gases, emission of hazardous and toxic substances or they also can impact positively by financing research and producing new environment friendly technologies and management practices and making sure their diffusion to less resourced global supply chain partners. In this way MNC's through their state of the art technologies and R&D capabilities are in a better position to improve environmental conditions(Márquez, 2014).

Globalization has increased the influence of regulation and customers in countries from which foreign investment is originating or that are destinations of exports from developing countries. Empirical evidence shows that MNCs in developing countries are motivated by regulatory and market pressures from customers, investors and NGOs in countries where there major markets are located(Khanna and Liao, 2014). International trade also strengthen the rate at which economic growth contributes to environmental improvements (Frankel and Rose, 2005). Globalization is not only creating incentives for MNCs to be more environmentally responsible but it is also creating pressure within the vertical supply chain for upstream manufacturing firms to be environmentally responsible.

2.2 Green supply chain management (GSCM)
Green or sustainable supply chain management is defined as the strategic, transparent, integration and achievement of an organization's social, economic and environmental objectives in the systematic coordination of key inter-organizational business processes for improving the long term performance of the firm and its supply chain partners (Ageron, 2011). In other words responsible environmental and social behavior must be promoted for the benefit of the entire supply chain (Testa, 2010). Previous research highlights the importance of purchasing function, material choices, vendor certification, transportation and warehousing process affecting the environment negatively or positively(Pagell, 2010; Tan, 2010; Varma, 2010). Today's global supply chains are independent but highly connected, so any individual practice harming the environment can have huge effects at global level. At the same time more sustainable supply chain could be a source of high benefits for all global partners in the supply chain(Wu, Dunn, 2012).

2.3 Institutional theory

Organizations need a trigger to initiate some sort of change process. Institutional theory is one of the tools to understand different types of external factors that force any organization to initiate or adopt any new set of activities or processes(FIELDS, Dimaggio, 1983). Organizations are part of a social system with its own specific culture and values other than having system for production. Organizational decisions are based upon a set pattern of cultural values, norms and behaviors under the influence of external environment which ultimately shapes an institutionalized way of doing business under certain conditions. When all organizations within the same industry adopted same kind of institutionalized practices, it leads to an attempt of being legitimize them(Glenn Richey Jr, Williams, 2009).

Environmental standards force organizations to be just like each other in their routine business activities and this process of becoming same is called isomorphism and this process made them legitimized in the eyes of society. Organizations achieved this isomorphism due to the three kinds of external pressures normative, coercive and mimetic (FIELDS, Dimaggio, 1983).

Normative pressures have their roots in cultural values and norms. Organizational decision making is based upon ethical and moral obligations towards society. Different sources creates such pressures including but not limited to educational institutes, trade associations, industry groups, NGO's and consumer groups which can guide and force the organization to adopt specific norms and behaviors(Glenn Richey Jr, Williams, 2009; Scott, 1987). Competitors, customers and suppliers are some of the examples in creating pressures to focus on green manufacturing practices. Demand for greening of overall processes from customers and other supply chain partners become so obvious to MNC's in developed countries that it is becoming an order qualifier instead of an order winner.

In today's global supply chains every organization is dependent upon other business partners as well on government regulating agencies as well. Coercive pressures can be exerted through formal and informal ways by those organizations holding power(Delmas, 2002). Environmental regulating agencies of government are prime example of powerful groups which can exert pressure on the organization to change their way of doing business(FIELDS, Dimaggio, 1983). These pressures could be to self-regulate through the platform of trade unions, offering some incentives by joining or applying some environment related processes or enforcing certain penalties for not fulfilling the regulatory requirements. Developed countries have high level of such pressures and a proper mechanism to enforce environmental laws but in south Asian developing countries like Pakistan regulatory laws are not up to international standards and their enforcement is even in weaker state.

Benchmarking other organizations in the same industry and following the footsteps of successful companies by mimicking their processes or practices are the basis of mimetic pressures(Sarkis, Zhu, 2011; FIELDS, Dimaggio, 1983). Highly uncertain environment, lack of cutting edge technologies and absence of clear strategic path to achieve organizational goals is the root cause of such pressures. Companies do not pursuing innovative products and ways of doing business mostly comes under the unforeseen situations and when they don't feel themselves competitive enough to devise some dynamic strategy, they look into outside environment and try to copy those policies of successful companies which they though legitimate and good enough to lead them out of the crisis(Glenn Richey Jr, Williams, 2009). Globalization has created many opportunities for the firms to learn from experiences of other organizations operating in some other parts of the world. MNC's are the best source of transferring such environmental experiences to those partnering in supply chain especially in the developing countries.

2.4 Environmental initiatives of MNCs in developing countries

Role of MNC's with respect to environment in developing countries is litigious in nature. Some believe that MNC's have used the developing countries land and atmosphere to pollute and make products for developed countries. These companies have used their money and power to get benefit of non-existent environmental legislation and moved all of their plants to such locations(Christmann and Taylor, 2001). On the other hand, there are arguments in favor of MNC's that they have the technology and resources to mitigate environmental issues. By moving to those developing countries they not only increased employment opportunities but also transferred technologies, process and even introduced self-regulated green initiatives which were much above the levels of local legal requirements. MNC's not only transferred technology and environmental knowledge to their subsidiaries but also educated to their local suppliers and customers.(Khanna and Liao, 2014).Moreover the role of MNCs in diffusing proactive environmental management system in developing countries is mixed as some of the studies provide evidence of this and other studies show little role of MNCs in such initiatives (Qi, Zeng, 2011).

3 Research Methodology

In order to understand how GSCM practices are implemented by MNCs operating in global supply chains, a case study approach has been adopted. According to Eisenhardt and Graebner (Eisenhardt, K.M. M.E. Graebner，2007), case research is a theory building approach that is deeply embedded in rich empirical descriptions of particular instances of phenomenon of interest based on variety of data sources. Case study approach typically answers research questions that address how and why in unexplored research areas. The results from case study research cannot be subject to statistical generalization or theory testing, but rather case studies can be used to generate theoretical constructs, propositions or midrange theories(Eisenhardt, 1989; Yin, 2003).

The case companies were approached by establishing contact with persons responsible for managing the supply chain. A semi-structured interview guide was used for in-person interviews. The guide contained a number of topics that each included a number of related questions. Each question in the interview guide had been formulated as broadly as possible to allow the interviewees to tell what they had observed, felt and done in relation to the research topic. In each interview there was also room for discussing issues that were not covered by the interview guide but which the interviewees found relevant.

Company A is a multinational food and beverage corporation involved in the manufacturing, marketing and the distribution of grain based snack foods, beverages, and other products. The company is considered as primary competitor in the beverages market and in business in more than 190 countries. On worldwide basis the company's current product line includes several hundred brands generating $108 billion in cumulative annual retail sales. Company B is a manufacturer of paint and related products. The company is having its production facilities and suppliers in many countries across the globe. The company has diverse and comprehensive range of products and is dealing with local as well as international suppliers and customers.

4 Findings and Discussion

Semi structured interviews were conducted by the team of researchers. A total of 14 interviews conducted where respondents include supply chain head, operations, logistics and marketing managers along with randomly selected three workers from the plant in both case companies. Workers were chosen to check the alignment between management claims and their actual application. Each interview lasted from 30 to 60 minutes.

The organization A feels responsible toward the creation of a healthy society as well as serving its customers in the best possible manner. The business decisions are made keeping in view the real challenges of climate change, resource depletion and water shortages. The company considers a healthy, secure and sustainable agricultural supply chain to be critical to protecting the well-being of the communities and meeting the expectations of its stakeholders. The company's global strategy on environmental sustainability is to minimize the use of energy and water, to minimize the packaging and waste, and to reduce the carbon foot prints.

For company B, sustainability is a part of corporate mission and vision of the company. The imports of the company are nearly 80%, therefore the company is a part of different agreements related to quality and environmental issues. International standards apply while importing materials. Company is also having technical collaboration with some international customers regarding sustainability and the customers of the company do sustainability checks for certain products. Local corporate customers also require high level of environmental checks in which certain certifications are the basic criteria to be a supplier.

With respect to institutional pressures both companies have almost identical responses. Both companies especially company B are following very strict environment protection mechanism which is much above the government regulatory requirements. Similarly, they are the market leaders in their respective industries and instead of copying others they are the benchmark for rest of the industry. Their competitors both local and multinational companies are trying to mimic them. It is the normative pressure which they feel to some extant in their own domains. Company A having presence in almost every country of the world cannot afford to link its name with any environment harming activity. As in today's highly active social media, the news will be circulated around the globe within no time. A malpractice in Pakistan can harm their business in the developed world though might not hurt them in Pakistan. Similarly to fulfill the requirements of some local and international customers and suppliers company B feels pressure to streamline all of its processes with respect to environment.

Problems these companies are facing in transforming whole supply chain into a green one is the lack of awareness, resources and willingness of many of the suppliers. Many SME owners in the supply chain are not properly educated to understand and disseminate further to their employees about the safety processes and guideline provided by these companies. Poor road infrastructure also a big hurdle to achieve their environmental targets as trucks needs to spend more time on roads, spending higher amount of fuel and increased wastage of raw material and fresh goods. Lack of regulations and poor implementation of those laws due to corruption and negligence is another area of concern. Many local suppliers are working without proper environmental safety equipment and processes but they can produce all government bodies approved certificates and documentary evidences which actually they have not earned but purchased. Above all even some times management in these companies also focus more on cost savings than any other thing. As one of the supply chain head stated "although we are a multinational company with a highest focus on environment but still people working here are locals and they do sometimes put everything on the backside and pressurized us to save cost". For some long term initiatives top management commitment to stick with environment friendliness is also required in these MNC's in Pakistan.

5 Conclusions

This study was an attempt to find out what are the driving forces for MNCs in Pakistan to adopt and implement GSCM practices. For this a case study approach and institutional theory perspective was adopted. Both companies have revealed almost identical results which show that in Pakistani environment it's the normative pressures from customers, suppliers and consumer pressure groups are of highest concern. Coercive and mimetic pressures are not of that much importance for them. In the absence of up to mark local legislations its moral obligation of MNC's to not only use higher standards for themselves but also diffuse the learning and technology to their supply chain partners, if they have to export their products to some developed countries.

Also on global market economy stock listed responsible companies are expected to be transparent and manage their reputation. Transparency calls for responsibility and cooperation of all players in supply chain. Environmental standards apply for all operations everywhere and throughout the supply chain. The most uniformly successful way to promote improved environmental performance is through the supply chain. This study of MNCs has demonstrated that buyer- supplier collaboration on environmental issues results in better economic and environment incentives for both. Lessons from these experiences should be examined and disseminated to improve business and environmental management practices.

As this study involves only two MNC's from different industries, so results cannot be generalizable. In future, a comparative study of MNC's from same industry and a longitudinal approach can also be applied to study short and long term effects of applying GSCM practices. Also, case studies of same companies or same industries from different developing countries can be conducted to get more in depth knowledge and make results more generalizable.

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Modeling the Optimization of Vehicles Allocation for Synergistic Operation of Multiple Freight Transportation

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Abstract: For the coordinated development of national comprehensive transportation, the effectively vehicles integration of multiple transportation modes becomes especially important. This paper analyzes the synergistic ways of multiple transportation modes. The core problems in vehicles allocation optimization are discussed. For the synergistic way of multimodal transportation, a vehicles allocation optimization model is proposed. For the synergistic way of multi-mode combination transportation, a selection model based on LOGIT-Entropy method is proposed. The models raised in this study provide a theoretical basis and decision making for vehicles allocation optimization of multiple synergistic freight transportation modes.
Key words: Vehicles; Allocation optimization; Multiple; Transportation modes

1 Introduction

For a mature freight transportation system of multiple synergistic freight transportation modes, reasonable division of labor between the various modes of transport, balance of capacity allocation is particularly important. More and more experts focus on vehicles allocation optimization for multiple synergistic freight transportation modes.

Yasaman(Yasaman Kazemi, Joseph Szmerekovsky,2015) proposes a deterministic mixed integer linear programming (MILP) model for downstream petroleum supply chain (PSC) network to determine the optimal distribution center (DC) locations, capacities, transportation modes, and transfer volumes Lei and Church(2011). incorporate the greedy-like behavior of drayage companies in designing their network. Meng and Wang(2012) include different stakeholders and investment budget limits, and suggest a joint U-shaped transportation cost function. Vasconcelos, Nassi, and Lopes(2011)study the cost reduction of adding a hub to the existing network, which they calculate by the percentage of loads moving through the new hub. Lin and Lee(2010) incorporate competition in their hub location problem, and maximize profit of all carriers. Gelareh, Nickel, and Pisinger(Gelareh, S., & Nickel, S ,2011; Gelareh, S., Nickel, S., & Pisinger, D,2010; Gelareh, S., & Pisinger, D,2011)address the competition between an existing dominating operator and a newcomer liner service provider which tries to locate their hub in a way to maximize the number of attracted customers. Inclusion of cooperation and competition, and studying the role of individual decision makers merit more attention in the network design and its cost calculations. Bektas, Chouman, and Crainic(Bektas, T., Chouman, M., & Crainic, T ,2010; Bektas, T., & Crainic, T ,2008) compare arc-based and flow-based decomposition methods in solving small sizes of their non-linear problem, and show that despite the fact that the arc decomposition has a better convergence, it takes more time compared to flow-based decomposition. Zhu, Crainic, and Gendreau(2011) compare the performance of their hybrid algorithm with a state-of-the-art solver for small to medium sizes of a randomly generated data set. They show that their algorithm outperforms in computational time and even solution quality when instance size grows.Sarkar and Majumder(2013)studied a two echelon facility location model and added product types and transportation modes as dimensions to the model and developed a separate objective function in each step. They investigated the variations between each of the objective functions and showed that the increment or reduction of costs depends on the type of dimension used. a full review of recent literature in multimodal transportation considering all levels of decision making can be found in Steadied Seifi (2014).

2 The Synergistic Ways of Multiple Transportation Modes

In the freight services network of multiple transportation modes, in order to meet the freight transportation demand and to achieve the coordinated development for multiple transportation modes, the distribution of vehicles is unbalance, that is the vehicle numbers for each transportation mode are different. vehicles allocation optimization for multiple synergistic freight transportation modes can improve the quality of transport services of goods, avoid vehicles' excess or shortage.

The synergistic ways of multiple transportation modes including multimodal transportation and multi-mode combination transportation. In multimodal transportation, several transportation modes participate in a freight transport route, with one transportation mode connecting with other mode. As is shown in figure 1 a) .The multi-mode combination transportation refers to a combination of a plurality of single-mode direct transportations. As is shown in figure 1 b).

a) Multimodal transportation

b) Multi-mode combination transportation
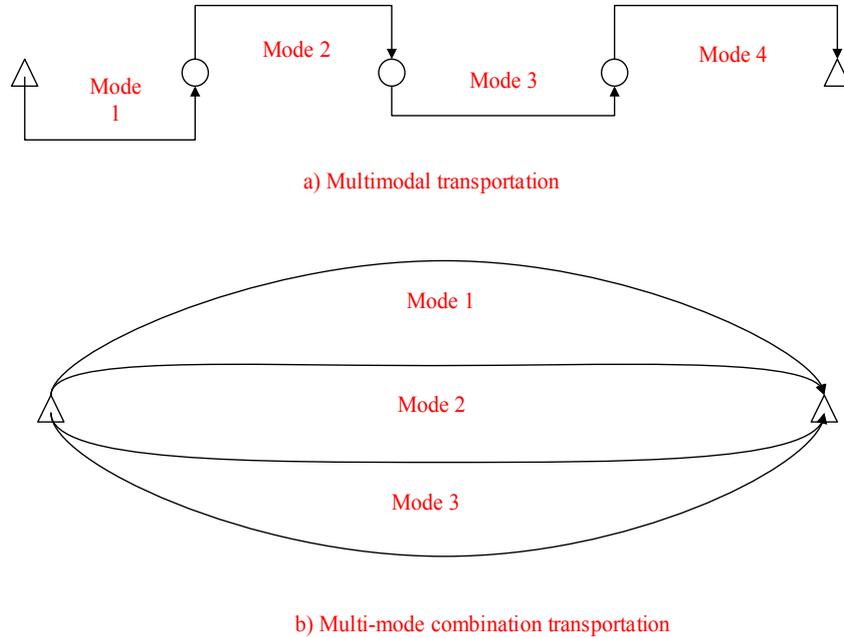
Figure 1   The Collaborative Ways of Multiple Transportation Modes

The core problem for vehicles allocation optimization in multimodal transportation is the connection between different transportation modes; the core problem for vehicles allocation optimization in multi-mode combination transportation is the selection of transportation mode. Thus, different vehicles allocation optimization models are proposed. This paper proposes a synergistic optimization model for multimodal transportation and a transportation mode selection model based on LOGIT-entropy method for multi-mode combination transportation.

3 Vehicles Allocation Optimization for Multimodal Transportation
3.1 The synergistic requirement of vehicles allocation for multimodal transportation
The synergistic requirement of vehicles allocation for multimodal transportation includes the departure interval matching requirement of connected vehicles, transport capacity matching requirement of connected vehicles, and the requirements of vehicle loading rates.
3.1.1 Vehicles' departure interval matching requirement
In multimodal transportation network, the freight flow and the vehicle capacity is different by transportation mode. In the same freight transport route, the departure intervals for different transportation mode have large difference. The great difference of vehicles departure interval will lead to long residence time and cargo accumulation. In order to ensure the departure interval synergistic for multimodal transportation, we hope the vehicles departure interval the closer the better.Suppose G_i is the vehicle's nominal capacity of the its transportation mode; G_j is the vehicle's nominal capacity of the jth transportation mode; h_i^l is the vehicle's departure interval of the ith transportation mode; h_j^l is the vehicle's departure interval of the jth transportation mode which connected with the ith transportation mode.Usually, $\dfrac{G_j}{2G_i} < \dfrac{h_i^l}{h_j^l} < 2\dfrac{G_j}{G_i}$.

3.1.2 Vehicles' capacity matching requirement
Operational plan is made based on the transportation mode's freight demand. In the premise of the

same or similar vehicles' departure interval, affected by transit node split and new cargo flows generated, the vehicle's capacity of different transportation modes may be inconsistent. Thus, vehicles' capacity matching is also very important. Suppose a_{ij}^{lk} is the freight transportation demand on route l in direction of k from the ith transportation mode to jth transportation mode; b_j^{lk} is the residual transportation capacity on route l in direction of k of the jth transportation mode, and $b_j^{lk} \geq a_{ij}^{lk}$, the surplus capacity to respond to the emergence of a new temporary freight flow, so $b_j^{lk} \geq a_{ij}^{lk} + \alpha$.

3.1.3 Vehicle loading rates requirement

Vehicle loading rates η are relevant to vehicles' departure interval, which is determined by numbers of vehicles. Usually, the local governments or vehicle operating companies would make a lowest criterion of vehicles' departure interval to satisfy the freight service level. However, low vehicle loading rates will lead to high operating costs. Thus, the vehicle loading rates should be within a reasonable range $[\eta_{\min}, \eta_{\max}]$, $\eta_{\max}$ refers to the maximum load level.

3.2 Modeling the optimization of vehicles allocation for multimodal transportation

In making vehicles allocation optimization programs for multimodal transportation, the operating costs must be considered as an important indicator. To simplify the research, minimizing vehicle number can be regarded as optimization objective. Suppose n_i^l is the vehicle number of the ith transportation mode in route l; $m_{i-\sec tion}^l$ is the maximization freight flow; $t_{criterion}^l$ is the lowest criterion of vehicles' departure interval.The vehicles allocation optimization model for multimodal transportation can be established as follows.

$$\min f = \sum_i n_i^l$$

$$\text{s.t:} \begin{cases} n_i^l \geq \dfrac{m_{i-\sec tion}^l}{G_i} \\[2mm] \Pr\left\{\dfrac{G_j}{2G_i} < \dfrac{h_i^l}{h_j^l} < 2\dfrac{G_j}{G_i}\right\} \geq \delta \\[2mm] b_j^{lk} \geq a_{ij}^{lk} + \alpha \\[2mm] \max(h_i^l = \dfrac{60}{n_i^T}) \leq t_{criterion}^l \\[2mm] \eta_{\min} \leq \eta_i^l \leq \eta_{\max} \end{cases}$$

the first constraint represents the vehicle capacity of the ith transportation mode must meet freight transportation demand; The second constraint represents the probability to meet the vehicles' departure interval matching requirement should be more than δ;The third constraint represents that when any vehicle transit in direction k on route l, the transportation capacity can meet the transportation needs; the fourth constraint represents the vehicles' departure interval can meet the lowest criterion; the fifth constraint represents the loading rates to meet the requirements of the vehicle loading rate.

4 Modeling the Transportation Mode Selection Based on LOGIT-Entropy Method for Multi-Mode Combination Transportation

In transportation mode selection for multi-mode combination transportation, the main factors affecting freight transportation mode selection should be take full account of, including transport costs, transport time, transport convenient, transportation safety. Based on random utility theory, the transportation mode selection behavior can be analyzed. Single LOGIT model does not reflect the weight difference which affect freight transportation mode selection, therefore, this paper established a

transportation mode selection model based on LOGIT-entropy method for multi-mode combination transportation. The entropy method is integrated into LOGIT model, which can reflect the weights difference of factors.

4.1 The transportation properties weight based on entropy method

Entropy method is an objective method of empowerment, to avoid human interference factors. Each transportation property's weight is calculated by information entropy depending on the degree of indicator variation. For a transportation property, the larger of the value of information entropy the larger of the variation degree, the greater weight in the comprehensive assessment. Thus, the entropy method can be used to determine the weight of transportation properties. The procedures are as follows:

4.1.1 Standardized of evaluation indicators

Suppose there are n transportation properties, m evaluation indicators. Using the formula

$$p_{jk} = r_{jk} \bigg/ \sum_{j=1}^{n} r_{jk}$$ to standardized evaluation indicators, the transportation properties evaluation

matrix is $P = (p_{jk})_{m \times n}$, in which r_{ij} refers to the kth evaluation indicator of jth transportation property，

p_{jk} refers to the evaluation value after standardized.

4.1.2 Calculate the entropy value of the kth evaluation indicator e_k

The entropy value of kth evaluation indicator is $e_k = -\ln(n)^{-1} \sum_{j=1}^{n} p_{jk} \ln p_{jk}$.

4.1.3 Calculate the entropy weight of the kth evaluation indicator w_k

The entropy weight of kth evaluation indicator is $w_k = \dfrac{1 - e_k}{\sum_{k=1}^{m} (1 - e_k)}$.

4.1.4 Calculate the jth transportation property weight W_j

For a transportation property, accumulate all the indicators value, the jth transportation property

weight is $W_j = \sum_{k=1}^{m} w_k p_{jk}$.

4.2 Modeling Transportation mode selection: LOGIT

LOGIT model is simple and practical,which is widely used in economic, transportation and other fields. The LOGIT model for multi-mode combination transportation is as follows:

$$P_i = \frac{e^{V(i)}}{\sum_{i=1}^{N} e^{V(i)}}$$

Where：

P_i :refers to the probability of the ith transportation mode

N :the number of transportation modes

$V(i)$:utility function, composed by a variety of service features, service features here include cheap, fast, convenience and safety.

$$V(i) = -\ln(\sum_{j=1}^{M} W_j S_{ij})$$

Where:

S_{ij}: refers to the jth transportation property value of the ith transportation mode.

W_j:the weight of the jth transportation property.

5 Conclusions

This paper analyzes the synergistic ways of multiple transportation modes and the core problem in vehicles allocation optimization for each way. This paper proposes a vehicles allocation optimization

model for multimodal transportation and a transportation mode selection model based on LOGIT-Entropy method for multi-mode combination transportation. In the future we plan to develop some scheduling algorithms as well as to extend this model to cover other real-world situations.

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A Study on Evaluation of Monitor and Line Monitor's Management Training Effect Based on the Theories of Six Sigma Management

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Abstract: Based on the theories of six sigma management and evaluation of employee's training effect, this thesis aims at studying the evaluation system of line monitor's management training effect in W company by DMAIC process analysis. On account of the company's status quo and through the method of SIPOC diagram, the thesis redefines the problems, evaluation process and overall goal of the existing system in the first place. Data collection is made by the logical tree analysis and internal questionnaire, then it calculates the process ability of critical processes in Minitab. In combination with the calculation outcomes and process matrix analysis, it confirms the key factors which impact the assessment system, namely the multi-level evaluation index system and the obvious evaluation methods which takes the production task into account. In conclusion, in consideration of all the factors, the system is redesigned from the point of evaluation goals, index system, evaluation methods and results application.
Key words：Six sigma management；DMAIC process；Evaluation of employee's training effect；Monitor；Line monitor

1 Introduction

In each link of enterprise staff training, training effect evaluation is an important part and can provide guidance and reference for the development of the follow-up training and application of results. The general evaluation process includes the establishment of evaluation system, the implementation of feedback, the application of results, etc. After China joins WTO, the automobile manufacturing industry develops in a high speed. Economic globalization has made China face with lots of competitors from the automobile manufacturers around the world. Therefore, it is important for domestic automobile manufacturing enterprises to attract outstanding talents, training and develop their human resources value so as to face fierce competition for talents.

A lot of researches on Six Sigma have been carried out in China. The DMAIC model of Six Sigma management has been used to analyze the training problems of human resources management（Matao，2007）. There is also research on the relationship between six sigma management and staff training (Xiefei, 2007). The Publication of vision of Six Sigma (M·Harry, 1998) recommended Six Sigma management methods to the people. Over the years, many foreign researchers have conducted in-depth research about the model in aspects of the organizational structure, cultural change, and the implementation (Liufeng, 2010).

The first time that Six Sigma Theory had been used in human resource management is the beginning of the end of the last century, it was Motorola that had innovated the theory. At present, six sigma management has been applied from the electronic industry and the general manufacturing industry, into the service industries such as banking, insurance and e-commerce and so on. Although six sigma management has already been utilized in China, its application in the evaluation of enterprise training effect is still less.

For the enterprise, training effect evaluation based on six sigma management can improve the quality of enterprise's training effect, the internal and external customer's satisfaction and the quality management in primary level. For the employees, the use of six sigma management tools facilitates the effectiveness of enterprise's training evaluation, maintain the actual benefits and help to promote the skills of employees.

2 Theoretical Background
2.1 Monitor and line monitor

For the current studies, there is no exact definition of the monitor or line monitor in the production line and workshop. Combined the concept of managers in primary level and the characteristics of production manufacturing enterprises, this paper define the monitor or line monitor as a kind of primary managers who undertake the tasks of management in the workshop or production line, they directly command and supervise the employees, materials, equipment, operating methods, production

environment and other factors of production line, thus help achieve management objectives of the enterprise. However, monitor or line monitor are different from the primary managers, their level is lower. They directly command and supervise the staff of production line, so their management level in the enterprise is relatively low, but their importance cannot be ignored.

2.2 Six sigma

Sigma (σ) is a Greek letter used in statistics, it is the standard deviation of mean value and aims at reducing the number of defects in products and production processes, thus to prevent product variation and improve product quality (Alexandra Tenera, 2014). The six sigma means "six times the standard deviation", it represents the number of non-good parts per million (Parts per million, PPM) is less than 3.4 (Yu K.Ueng R,2012).

2.3 Six sigma management

In order to reduce the operating costs and improve the internal and external satisfaction of customers, six sigma management is focused on the pursuit of zero defect in the production process and lower product risks so as to reduce the cost and improve the productivity and market share (Guo Yi,2011). As a statistical evaluation method, six sigma management emphasizes the management of the enterprise which considers

3 DMAIC Process

3.1 Define

3.1.1 Problem definition

As for the monitor and line monitor's management training effectiveness evaluation in W company, this paper defined the problems to be solved as follows, lack of systematic training effect evaluation; the evaluation indicators are not scientific nor targeted; evaluation methods are monotonous and usually cause conflicts with production tasks when put into practice; the motivation of results application is not strong enough.

3.1.2 Process definition

As is shown in Figure 1, this paper definite the management training effectiveness evaluation process in W company through SIPOC diagram. The key elements of this process are input variables, output variables and the range of process (Tang Jiawen,2014).

3.1.3 Target Definition

Once the objects are determined, we need to ascertain targets for improvement. The improvement objectives generally include qualitative and quantitative targets. In long term, qualitative objectives will promote the evaluation of training effect for enterprises through affirming what kind of measures are to be taken, which contributes to better organizational outcomes. Quantitative targets are often shown as quantitative indicators. Compared to the current evaluation level of W company at present stage, it is an expected level.

Supplier	Input	Process	Output	Customer
Production Supervisor Trainer HR department EHS department Finance Department Project department	Trainee Training time Training venue Materials Production facility	Employee' in involvement training ↓ Fill the evaluation questionnaire ↓ Compute the questionnaire results ↓ Practical evaluation of manager ↓ Integrative computation of theoretical, practical and attendance scores ↓ The evaluation of trainee is done ↓ Evaluation in trainer and organizational level ↓ Application of evaluation results	Theoretical score Practical score Attendance score Training organization Teaching evaluation of trainer	Minitor and line monitor HR training team trainer

Figure 1   The SIPOC Process

　　Based on the preliminary investigation and analysis in definition stage, this paper identified the main targets, namely assessing the effect of monitor and line monitor's management training in W company: evaluation system must be reconstructed; constructing multi-level training effect evaluation index system; select the appropriate evaluation method to evaluate, and apply the evaluation results reasonably.

3.2 Measure

3.2.1 Decomposition of training effect evaluation

　　As is known to all, the training effect evaluation is comprehensive and includes many aspects. Therefore, for further refinement and analysis of the evaluation, this study chooses logic tree (Xie Fei,2007) method to export little Y that affects the evaluation process, namely evaluation index selection, evaluation method options, implementations and application of evaluation results.
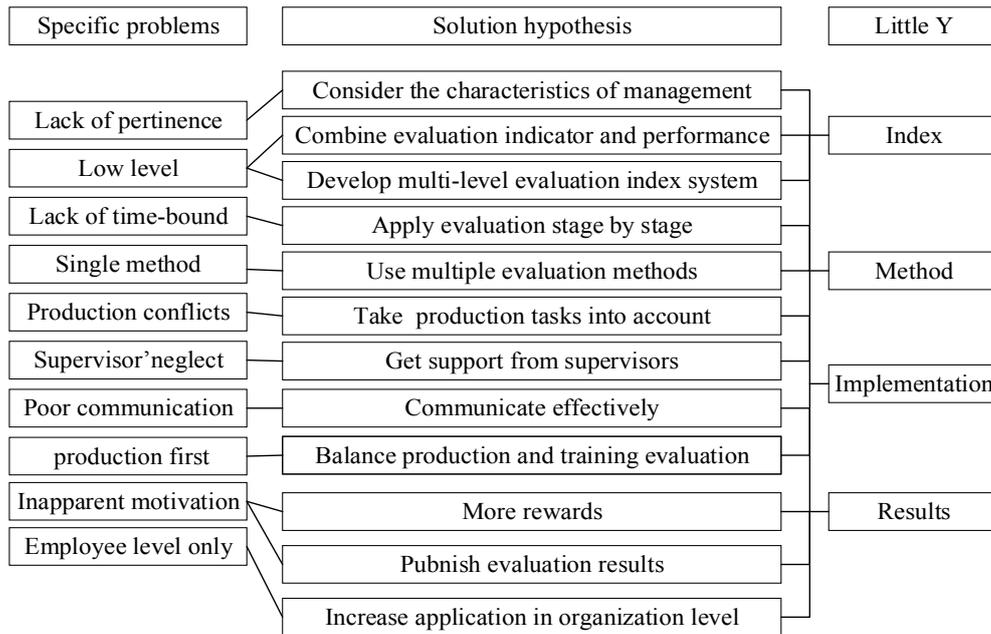
Figure 2　The Logic Tree Analysis

3.2.2 Assess current level*s*

　　When little Y are determined, we need to survey the current level of Little Y in W company. Targeted questionnaires were conducted and this study measured the current level of each little Y through Minitab software. Results are shown below and reports are displayed in Fig 3 to Fig 6.

Table 1　Current Level of Little Y in W Company

Main KPI	Sub KPI	Current Level
Evaluation effects	Index	1.64
	Method	0.87
	Implementation	0.94
	Results application	0.88

3.2.3 Set target levels

　　This paper selected C_p as the process capability of little Y and the target level of each little Y for W company is exhibited below.

Table 2　Target Level of Little Y in W Company

Main KPI	Sub KPI	Current	Target
Evaluation effects	Index	1.64	2.46
	Methods	0.87	1.305
	Implementation	0.94	1.41
	Results application	0.88	1.32

What is more, the target level is 1.5 times the current level. Overall, the higher the value of C_p is, the higher the level of process capability is, as is shown in Table 3.

Table 3   Explanation of Cp

Value Range	Explanation
Cp<1	Lack of process capability
1=<Cp<1.33	Process capability is not enough
1.33=<Cp<1.67	Adequate process capability
Cp>=1.67	Surplus of process capability
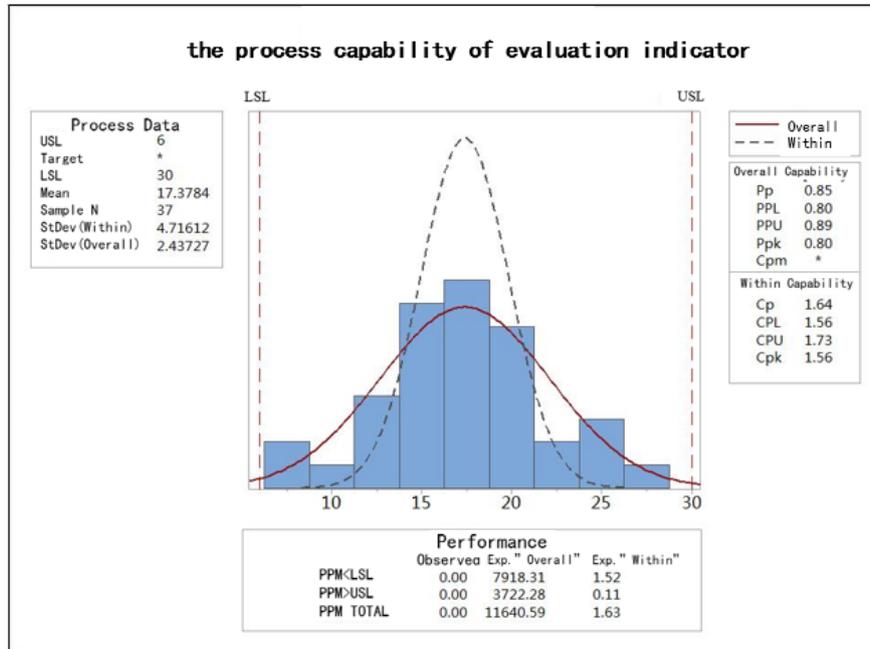
Figure 3   The Process Capability of Evaluation Indicator
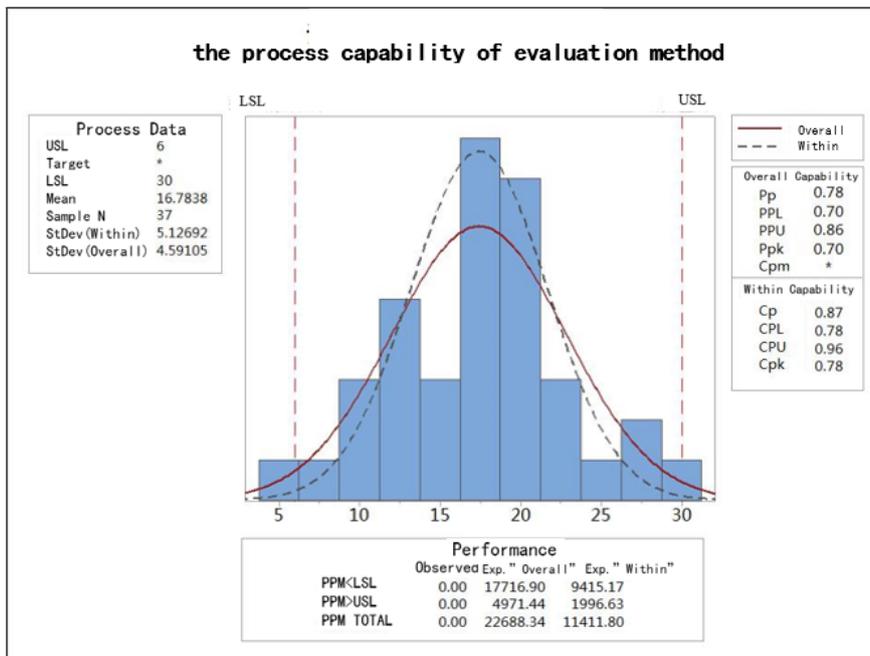
Figure 4   The Process Capability of Evaluation Method
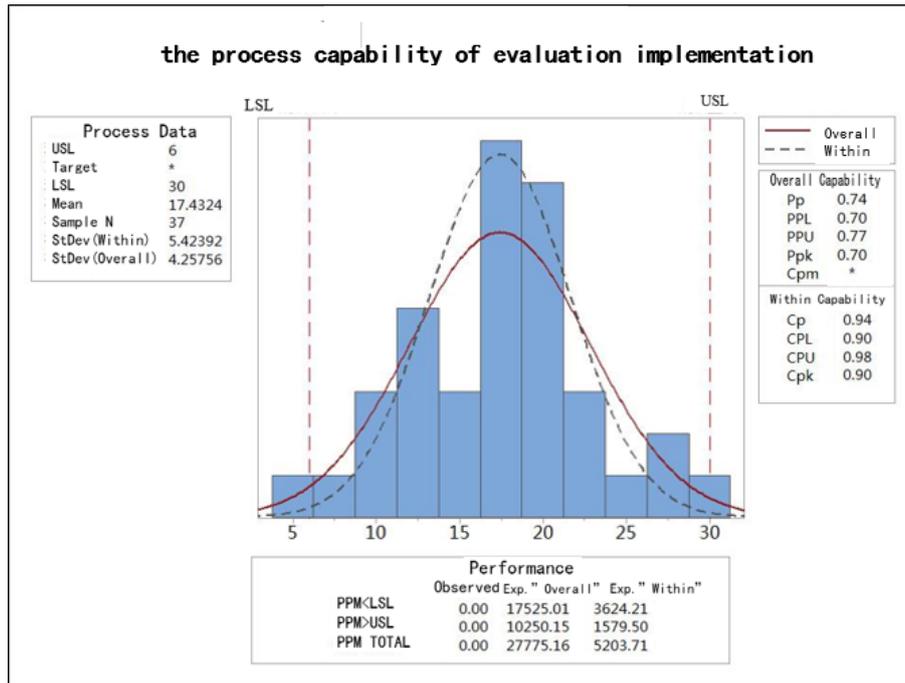
Figure 5   The Process Capability of Evaluation Implementation
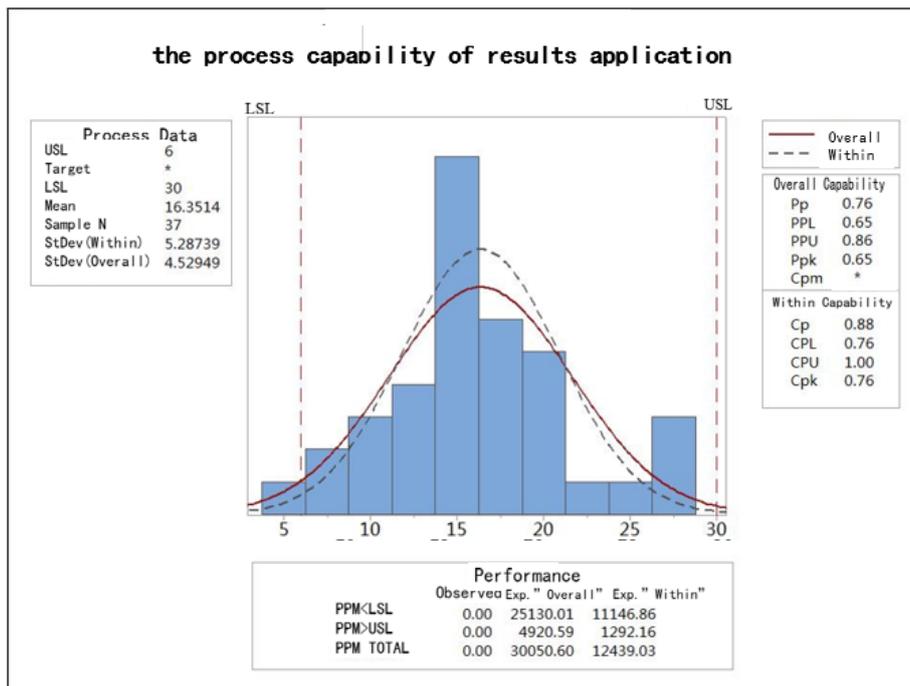
Figure 6   The Process Capability of Results Application

Through the analysis of logic tree, we obtain nine factors that affect the effectiveness of the training evaluation which are shown as follows: targeted evaluation indicators, multi-level evaluation indicator system, time of evaluation; diversified evaluation methods, balance the evaluation and production task, supervisor's attention and support, effective process communication, the application of the evaluation results is high motivated, wide application level of evaluation results.

Based on the method of Matrix analysis (Yang Bing,2015), this paper found out the correlations between each process factor and selected the lethal factors according to the Pareto principle, the analysis process is shown below.

Table 4　Matrix Process Analysis

Factor Process	F1	F2	F3	F4	F5	F6	F7	F8	F9	Total
P1	3	9	1	1	9	3	1	3	9	39
P2	3	3	1	3	3	3	1	9	3	29
P3	9	9	9	3	9	3	1	3	3	49
P4	9	9	3	9	9	1	3	1	1	45
P5	3	9	9	9	9	9	9	3	1	61
P6	1	1	3	1	3	9	9	3	1	31
P7	1	1	9	1	3	3	3	3	1	23
P8	1	9	1	3	1	1	1	3	3	23
P9	1	3	1	3	3	1	9	9	9	37
P10	31	53	37	33	50	33	37	35	31	338
Rate	9.2%	15.9%	10.9%	9.8%	14.8%	9.8%	9.5%	10.9%	9.2%	100%

In this table, P1 to P10 represents the process of the evaluation, F1 to F10 are the factors that affect the process mentioned before. Moreover, if the relationship between process and factors are highly related, then it will be given 9 scores, 3 points is given if less related and the low correlation will only get 1 point.

Therefore, this study found that F2 (multi-level evaluation indicator) and F5 (balance the evaluation and production task) are the lethal factors.

3.3 Improve

According to the analysis results mentioned above，the main task of improve stage is to improve the training effect evaluation system and formulate implementation plan.

3.4 Control

The main task of control stage is to maintain the improving, and keep training effect evaluation process in a stable state(Kun-TzuYuR, Ren-Gen Ueng, 2012; Wang Fang, 2012; ChiaJou Lin, et al, 2013; Roxanne M, 2011; Lateef Ur Rehman Ateekh-ur-Rehman, 2012), which includes establishing the evaluation process control plan, namely evaluating the process of training effect evaluation system after the implementation of the improved scheme is done. In the process, trainers should firstly make establish the process control plan and accumulate enough experience in different management training effect evaluation cycle, thus they will find further improvement opportunities. In addition, continuous process monitoring is also needed. Training organizers must develop contingency plans as well as improvement measures, set up a working group to deal with sudden variations and carry out continuous process monitoring when facing with the emergency.

4 Conclusions

4.1 Practical implications

The findings of the present study have several practical implications for W company as well as companies that are similar to W company. On the one hand, trainers must construct a multi-level evaluation indicators system according to the characteristics of monitor and line monitor in W company.

On the other hand, considering that monitor and line monitor are primary supervisors, thus the evaluation methods and implementation measures mustn't conflict with production task. Therefore, the study suggests trainers nimbly select the time and place of evaluation, seek support from their superiors actively and determine the person among monitors who are responsible for the evaluation task.

4.2 Limitations

Firstly, the research conclusion is not widely used. As for the analysis of the training effect evaluation process, this paper only made the internal investigation in W Company. Therefore, the conclusion can only be applied to W company's training management.

Secondly, the subjective factors of qualitative analysis are difficult to avoid. In this paper, many qualitative analysis processes such as SIPOC process analysis, logic tree analysis and matrix analysis are done by individuals. Limited to the personal experiences and knowledge accumulation, the objectivity of the study needs to be improved.

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Cyberspace and the Identity Matter

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Abstract: Cyberspace is a new stage of technological evolution and science production in human life which has gone along with human civilization evolution and has created specific cultural and civilizational structure. This space has provided new and pristine areas for human and has affected all aspect of his life and social interactions. Cyberspace actually contains online computer networks in which users exchange with each other at the moment. Internet is the founder of this new World Wide Web development. Internet as a post-modern media has created a new territory in which certainty and integrity has replaced by fragmentation and diversity. The authors have explained the impact of cyberspace on identity by descriptive and analytical approaches in this paper. From this perspective, cyberspace has proposed a new path to the plurality of identity within society and even more within individual identity by creating multiple identification references.
Key words: Communication; Internet; Cyberspace; Identity; Post-Modernism; Plurality of identity

1 Introduction

Nowadays the world has taken a new shape based on technological development and expansion. The impact of this development is visible in each social aspect. Today technology by creating changes in communities has caused ease in one hand and made complexity in the life of human society on the other hand. Human access to the modern communication and information technologies that initiates the age of Globalization is the founder of this change in its strict sense. This new system observes the rise of community system by which the transmission and distribution of information from one point to another is possible. These systems have been able to overcome the space and time factors by their capabilities. Media are not simply the communicational tool in the sphere of social relations. They even affect the public knowledge and understanding of the world. It means that Media are the creator of expand individual knowledge and social structure and also that of the content. Media do not work as a mirror to reflect reality anymore. They rather affect the social construction of reality.

Thus, these are media which form our image of reality in the present age. Media affect the human interpretation of reality by a system of visual, written, and oral signs. Image, speech and writing had been the center of philosophical disputes during twentieth century. Components also have affected the human understanding of time and space both in print media and on radio and television. This condition has become more complex by appearance of global data network or Internet and consequently space and time has been redefined. The main achievement and outcome of internet for the social interactions area is the rise of cyberspace. The appearance of this modern space has given a new definition to communication and created transformation in social relations. Overcoming the locational factor of space and time in this new geography has led to the disruption of discipline and traditional proportion of location to the space and time. Connecting and communicating in a space beyond the specific geographical area and location has become possible. There is no certainty and integrity in this new space while it is full of fragmentation, diversity and rupture. This new area is called as a post-modern territory. In this perspective cyberspace is a tool to create a space which is different from the real space in which as castells says we face the space of flows timeless time. In this new situation we are witnessing an ontological rotation of the total supposed knowledge to the realization of data dispersion. This new area is the area of possibilities in which we are facing the plurality of sources in social interactions. This paper will discuss about the effect of internet and cyberspace on identity construction.

2 Theoretical Principles

The theoretical principles of this paper are derived from Douglas Kellner, Jacques Lacan, and Stuart Hall theories respectively.

Douglas Kellner in his article "popular culture and the construction of postmodern identities" argues about three transition process in identity issue. These three stages are:

1) Pre-modern identity: in pre-modern communities, the identity has a social nature, but uncertainty and conflict do not affect it. Individual identity is stable since the ancient myths and systems of pre-defined roles define and describe this identity. You are the member of an ancient kinship system.

Your thought and behavior is surrounded by a worldview framework and your destiny is more or less specified. Therefore, there is no need to doubt about your position in the world. The identity is basically not in question.

2) Modern identity: identity faces crisis in the modern era for the first time. The individual identity likewise pre-modern cultures remain based on personal relationship with others. This identity holds its stability to the certain extent, but its trends and impacts starts proliferating. In pre-modern communities your position in tribe was clear, while in modern communities you take a wider set of social roles. Thereupon you can gradually choose your identity rather than being born with it. You may anguish about your real identity and ask about your responsibilities in life step by step. You will require achieving an approved and stable identity based on this new self-awareness about who you are, who you can be, or who you should be. You may be concern that your identity is unstable, fragile, or wrong. In short, the identity is in question.

3) Post-modern identity: social life becomes more complex and faster compared to modern era and its requirements increase. More possible identities are presented. Since the community fragments gradually we should undertake several roles which are expanding rapidly.

Some theorists note that how the "ego" has been lost by the modernism impact, following the consumerism, mass culture, and further bureaucratization of life. Some other theorists like Foucault state that the stable and integrated ego has been an illusion. Lacan believes that identity is relative because it is constructed by interaction of person with his surrounding environment which reflects him. This approach involves the idea of difference in the process of identity formation. If identity has a relative nature, then a structure that we live within it, will determine our identities. Since the social and individual structures are changing and evolving, so the identity could not be a stable and constant subject. It is a process that never reaches the perfection. Thus, not only it is changing permanently, but also it can never be integrated.

According to Stuart Hall, post-modern discourse argues that the identity is not stable necessarily or constantly. It is variable and dynamic carnivals that always form and reform by surrender cultural systems in which we are representatives or audiences. In the sphere of this discourse, the identity is seen historically rather than biologically. Human is the subject of several identities in different times (Hall, 1996).

As it is mentioned the identity is not integrated in post-modern era anymore, it is even fragmented and multiple. What makes this above mentioned theoretical principles applicable in this paper is that the identity gets plurality in cyberspace. This function is described in below.

3 Globalization and Internet

The use of word "Globalization" began since 1944, but its term was used in two books which were published in 1970. The first book was "War and Peace in The Global Village" by Marshall Mcluhan and the second one was written by Brzezinski the former head of the American National Security Council during the presidency of Reagan. The first book discussed about the development of communication means and focused on their role in conversion of universe into the unique global village, while the second book discussed about the role of United States in world headship and its presentation of comprehensive sample of modernism. Most of the political and economic agreements after two world wars which were performed among the countries and were the ground for the international integration and cooperation, were the forefront of a phenomenon which is called "Globalization" nowadays. However amazing growth of technology in some issues like transportation, telecommunication, and moreover in informatics revolution in the 1980s which made a high position for computer industry and consequently the development of internet and information explosion represented the "Globalization" as the inevitable process to everyone more than all reasons.

Although Globalization is a common concept in scientific, pseudoscientific, and political fields and is the important part of remaining heritage for the new millennium, but still does not have any clear definition. There are different and even antithetic definitions about this process in various and numerous literature relative to culture, economy and politic in the contemporary world and there are no hopeful signs in achieving relative consensus about the conceptualization and definition of this word.

There is no Consensus on the exact definition of Globalization or the effects on our life and behavior among scientists. There is a blank paper instead of the first part about the nature of Globalization in the book "Global Social Change: Historical and Comparative Perspectives' (Chase 2006).

This ambiguity, difference, and additional contradiction in Globalization definition have rooted in several factors. One of these factors is multi-dimensional quiddity of this phenomenon or process.

David Harvey believes that time and space becomes more common based on some developments and inventions, so that a process began which is still ongoing. He called this process as "time-space compression" in which the time could be organized in such a way that increase or decrease space restrictions. In fact, the time-space compression is about reducing time and lowering space (Waters, 1995).

In Wallerstein opinion the modern world system is the first social system with global range. The economic logic of this system turns the worldwide to the place of endless accumulation of capital and creates an international division of labor gradually. This globalization of capitalism is associated with a kind of universal inequality. The modern world system includes three points: center, Periphery, and semi-periphery.

Thus today we can distinguish between two types of definitions about Globalization. One type considers globalization as the blossoming of global communications based on the developments of technology and Telecommunication infrastructures. Fore features and basic concepts could be identified in this type:

1) Time- space compression
2) The increase of information's speed and volume.
3) Free and uncontrollable exchange of information.
4) More interdependency.

In other type of definition which is based on economic and commercial view to the process of Globalization, the economic interdependence is highlighted. By the abovementioned types, the author considers Globalization in its modern sense as the product of information revolution. In this regard the impact of Internet is important in present process of Globalization. The main reason to choose this subject for the paper is that nowadays Internet and cyberspace are as global phenomena. Internet and Globalization are concurrent more than any other words. Among the several impacts of Internet its influence on creation of cyberspace and its relationship with the identity is important in this paper (Kennedy, 2001).

4 Internet as a Post-Modern Media

The second half of the twentieth century witnessed the emergence of a new kind at least in appearance. At first it was about the world government and then it turns to global village rapidly. After visualization of a world leading machine the time of informatics Revolution arrived in which whole society must be changed. Then World Wide Web was discussed in order to change the life. Communicational highway replaced by Internet. Finally, the cyberspace namely visual world emerged that was against the real. The origin of the Internet is essentially rooted in the Cold War era. In 1960th the concept of decentralized computer network was raised among the United States of America's military strategies and its allies. That idea argued the computer network could act as supporter for telecom infrastructures in terms of nuclear attack. In 1968 the Council of American Survey Research Organizations (CASRO) decided to use this network in a project related to the Pentagon. The Internet has been changed and experienced several transformations since fifty years ago. Nowadays Internet is turned to the world web which passes the geographical borders and creates new spaces in which the traditional concepts of time and space are pointless. The advent of the World Wide Web as one of the most prominent information and communication technologies shows the technological progress of modern man who his role in creation of social changes and especially in value changes is unavoidable. In order to these changes we are witnessing the emergence of symbolic realities in this new cyberspace.4Nowadays modern information-communication technologies have given speed and depth to the social changes to the extent that they have conquered the most stable areas of human life namely culture and have put the communities in exposure of serious cultural changes. A change that is known as the most serious cultural change in Barlow's opinion (Whittle, 1997).

By this introduction the authors consider Internet as a post-modern media. Studying the effects and outcomes of Internet within society, culture, and politic is a way to verify this theory. In modern perspective Internet is just a tool for communication and information publication globally, while in post-modern perspective it is an opportunity to create a different space compared to real world, namely cyberspace. As it is mentioned post-modernism is a state of knowledge distribution. This situation includes an ontological rotation of the total supposed knowledge to the realization of data dispersion.

Internet makes it possible for people to face with experiences which regularly have been removed from the routine cycle of life order. It also provides people by new experiences through the exchange of experiences, challenging on many of the concepts and interpretations of life, and mutual questioning. In this regard it creates a placeless social relationship, has opened customs and several ways of life in front of our cultural horizons, and provides a new understanding of the world as a significant social, cultural, and moral.

Internet converts the cyberspace to the area of mere possibility by online browses. Wisdom which is the motto of enlightenment age becomes as a possible space. Vertical hierarchical order is broken and horizontal one is emphasized. This is a rotation to the decentralized network of communications.

Internet provides a space for people who are not able to create a space in order to communicate socially and culturally, or have problems in production and creation of these spaces. Internet as a virtual sphere is a mixture of three different elements: material, symbolic and individual experience. So it is not just an electronic tool with new capabilities to make digital messages, but beyond that cyberspace is the product of digital revolution that provides a modern image of universe, changes social values, and establishes possibilities in order to show oneself against another.

5 Cyberspace

What we have today of cybernetic space is because of the emergence and spread of interface computer communications as one of the most important achievements of the new information - communication technologies. These achievements give a new definition to the communications and change the social interactions. Physical presence was considered the characteristic spot of interaction and relation until now, relationship implicitly showed interpersonal relationship that could be continued despite the physical distance. While undoubtedly both sides of the conversation in telecommunications which is the previous generation of today computer technology communicate without any visitation. This subject is applied to the even rarer case of physical communication like cybernetic spaces as a product of interface computer communications (Riva,1998).

Nowadays any related matter to the lifestyle and thought of new information technology is considered as "cyber industry" and the computer space that creates a virtual geographic area is called cybernetic space or cyberspace. Cyberspace is a subjective world of information and electronic networks which is accessible through the Internet. This space is often compared with endless border spaces. Cyberspace is not an unknown and borderless area, but it is a defined, bounded one which contains certain components. David Bell defines cyberspace in a different way: we can define cyberspace by hardware perspective. For instance, {it could be defined as} a global network of computers that are connected by telecommunication infrastructures and provides various forms of interaction between distant actors. Cyberspace is the total of all those nodes and networks (what is it?). In other words, based on a definition with symbolic metaphor, cyberspace is an imaginary space between computers in which people can create new identities and new words (what does it mean?). The ways through which we experience cyberspace show the intersection between the material and symbolic elements which have different values based on experience type (what does it do?) For Benedikt cyberspace is a subjective common geography which is made in around consensus, transformation, law, and Experience. It is a land of data and lies, subjective materials and memories, millions of voices and silent eyes, invisible concert of search, sharing dreams and observing simplicities (Benedikt, 1991).

Virtual or cyberspace depicts virtual words that are raised from science fiction. However, this space has become as a part of the most people's daily life.

Cyberspace in fact is an area which includes online computer networks in which users exchange information at the moment. This space has its own culture that is created among its users. This communication not only forms social relationships, but also provides an area for social relationship to hold; an information system in which reality itself (material and symbolic presence) has been overwhelmed in virtual context and realistic world. The things that appear on the screen are not just images that reflex the experiences, but they are becoming experiences themselves (Turkle, 1996).

Cyberspace has a unique and distinctive characteristic such as placeless, timeless, pure industrial, no limitations to civil law based on the nation-states, having a post-modern epistemology, simultaneously accessible, being over the space and having new cultural, ideological, commercial and political aspects.

6 Identity

The old question of 'who am I?' shows the basic need: the need to know about identity that never

leaves human. The social institution which is responsible to answer this question is one of the main issues of sociology. This eternal and even everlasting question is called identity by western modern sociologists, while it is denied by post-modern scholar (Eliot, 2005).

Identity refers to characteristics that identify the person. The word "Identity" is obtained from Latin word "Identity" and its root is "Idem" which means similar or identical. This word is equal to "howa" in Arabic language which means he. It is actually about considering or applying itself. Thus the identity of everything expresses the essence of its identity and. However, the identity shows both the Uniqueness and individuality and also fundamental differences that distinguish one person from all others. Therefore, the word "Identity" is used in two apparently different meanings: 1- absolute consistency and uniformity; 2- the distinction which includes stability and continuity over time. So this concept is necessarily defined by two opposites: Similarities and differences. The claim that something or someone has special identity means that thing or person like others has character and it also has its own distinct identity and character. To put it more clearly identity means to have the same quality in nature, composition, and essence and also similarity in all times and all situations. However, having identity or being unique has two different dimensions: being the same as others in its level and being the same as itself during the time (Hekman, 1999).

Identity is negotiable from both psychological and sociological perspectives. Erik Erikson was the first psychologist who considered identity as the most important factor in personal development in adolescence and introduced it as a vital step towards a happy and productive life. Erikson believed that successes in life and achieving the goals and human ideals in adulthood are related to identity formation which is formed in adolescence and young ages. In psychological perspective of many characters' theorists identity is initially made by individual and personal emotions and desires. Based on this idea, identity is a sense of personal distinction, personal continuity, and personal independence. Therefore, the subject of identity is the same as personality in one sense. So identity is the sense of human about the continuity of his mental life and the sense of unity in the face of changing external circumstances which he always feels in his mental state. On the other side social psychologists and sociologists emphasize on this reality that the sense of personal identity is formed by the dialectic between the individual and society. They more or less accept that identity regularly appears in attitudes and feelings of people, but its formational context is social environment. Social identity which appears in personality is meaningless without the consideration of individuals' social world. People are unique and varied, but their personalities are socially made by different stages of socialization and interaction through social community. Generally, identity must be recognized as a social and cultural phenomenon, because a newborn baby knows himself and becomes aware of his presence from the beginning through the education and the social and cultural environment he lives within. Perhaps it can be said that a child experiences the world for the first time from his family perspective and consequently the culture which he was born in. since there is no other people, ego could not be established. Thus identity is a social issue which means that a person finds the definition of himself in social environment whether in small circle of family or later in friendship, professional, and etc. groups. He becomes aware of himself by contacting with others and learning from them and he also forms his identity within interaction with people. In fact, as Durkheim believes no child is born in a vacuum, so his roles and responsibilities will be transferred to him through education, habits, and beliefs from the start by being in a social environment.

In George Herbert Mead sight as the pioneer of social identity theory everyone forms his identity or his own self through the organization of personal attitudes of others in the form of organized social and group attitudes. In other words, Self-image that is made by a person and the sense that he feels about himself reflexes the attitude that people have towards him. Tajfel joins social identity with group membership and considers this recent item to have three elements: cognitive element (being aware of belonging to a group), Value element (assumptions about the positive or negative consequences of group membership), and emotional element (sentiment towards the group and towards other people who have special relationship with the group). Accordingly, in Tajfel perspective social identity is that part of a person's perception of self-awareness which comes from his awareness about the membership in social groups along with value and emotional significance attached to that membership (Tajfel, 1979).

Therefore identity is not restricted to natural, intrinsic, and biological aspects. It is also a historical issue which is made by dialectic of the individual and society. Thus identity is not an inherent and predetermined subject, but it is a subjective historical reality that is always determined in the context of the social and cultural relations. Hence there is a mutual interaction between identity and social life. The processes of forming social identity are determined based on social structure in one hand, while identity

which is affected by social relationship responds to the social structure on the other hand.

Therefore all identities are fabricated. Since we believe that identities are established as subjective realities through the historical processes, then there should be the interests to make and process it. In other words, because identities are developed in social context and framework, then every society has to provide interests for its members in order to enable them in creating their own social identity and personality and also making a meaningful life.

The most effective and significant resource that enforces this special action and enables the member of a complex to give meaning to their lives and establish their own dignity is the location aspect of space and time. Both space and time are dominated by location.

As it mentioned above, having identity primarily defined as being unique and different, stable and constant, and belonging to community. Everybody knows himself as an identical person when is sure about his uniqueness, continuity, stability, and belonging to community. Location is the most essential factor that provides the human identity requirements.

Location simultaneously provides the need of social distinction by making possible objective boundaries through the geographical features such as rivers, mountains, sea, etc.and facilitates identification by strengthening the natural, social, and cultural boundaries. These borders were more or less the same in traditional societies and they reinforced each other. Even the political and national borders which were consistent with Location and territorial borders achieve more ability of identification.

Location is not only limited to borders and renewable, but also stable and durable. Hence, by providing the need of stability and continuity it is considered as a vital base in supplying identity. Several ideologists argue that human senses stability and continuity during the time when he has stable and sustainable references and resources. Location and land are the best providers of such references and grounds. Location creates a stable world by its certain aspects of fixed components, while space and time provides an indeterminate and without center for people.

Thus location- based space by its differentiation and renewal in one hand and location -based time by its creation of constancy are the main sources of identity forming.

7 Cyberspace and the Identity Matter

As it is mentioned before, identity does not have just natural, intrinsic, and biological aspects, but also it is a historical issue which is made over time and then it is stabilized. This stability is not certainty, so the national identity is fabricated. Several sources are used to create national identity in each society. The capability of space to be restricted in borders provides the possibility for all members of a complex to understand their identity significantly by the sense of differentiation, stability, and belonging to the determined geography. Time also causes members to be sure about the Continuation of their social identity. Identity is based on continuity and continuity is defined in time frame. Thus location- based space by its differentiation and renewal in one hand and location -based time by its creation of constancy are the main sources of identity forming. Therefore identity is placed in such a place-based and context –based time and space.

In the nature of this location character the solidarity and cohesiveness are evident but not in the sense of certainty and integration. The location is important because the inside-outside interaction which creates identity is placed in a land or location frame. On the other hand, time is also framed and located. The importance of time is because of its role in continues of identity. Social continuance required an assumed significant past. The past is an essential source in interpretation of here and present and anticipation of future. The past individually is defined as memory and collectively as history. But none of these definitions are real and both of them are fictitious. Accordingly, in traditional communities the past was respectable and symbols were valuable because they contained the experiences of generations, immortalized them and were the tools to manipulate time and space in order to put the specific action or experience in continual frame of past, present, and future. The importance of location in space is based on its restriction function. Space means everywhere, but location is a determined place. The imagination of everywhere is harder than that of specific place. Location has content, while space is a kind of vacuum. So an empty space like a geometric concept can easily be imagined. The location has two dimensions, while space has three dimensions. Location is restricted to borders, but space is endless and without center. Thereupon the restricted character of location makes stability and continuity. The capability of restriction in borders creates the sense of belonging by itself. Restriction to borders provides coherence and internal consistency by means of distinction between different "us". Space was

not districted from location in traditional communities, but it was consistent with location. That was because the location aspect of social life was under the control of "presence" or local activities for most of the people and in most. Psychologically the sense of continuity is linked to the time. This individual identical need is provided when the person feels the stability during his life time despite environmental changes and personal growth.

Factually the unity of person depends on the unity of the time and having identity in one aspect means a sense of continuity in time. Identity requires continuity. This continuity is reproduced over the time. There is change and evolution in the nature of this continuity. Thus when we face with changes we should find an instrument in order to form these changes and time is the best instrument in this regard. Time is a subjective concept. This is a thing that is discovered by our mind to determine the chain of developments and changes. So the human understanding of events relies on the subjective phenomenon, namely time. Time is occurred in location, because events should happen in a place and that place is location. So we could not distinguish between time and location. Time was consistent with location in traditional communities. Calculating the time was limited to its relationship with location for many people. Until the invention and wide dissemination of mechanical clock it was impossible to determine the time of a day without reference to the location context and specifically the natural place-time signs. Accordingly, for example determining sunrise, sunset, and evening or the time according to sundial not only were inaccurate signs, but also have intrinsic link with the place where they were used in. In this kind of situations people could easily recognized their past and connected it to the present in order to achieve a sense of continuity, individual stability, and collective stability. Location-based time was a linear time that the person and society consciously and jointly experience its passage. Therefore, that was not hard to ensure about continuity and existence of common past in traditional communities based on location character of time. Time well did its special activity of identification.

So under these terms, both space and time were located-based because of the Link and conformity between space and time based on location. Thus space and time were not considered without the location. The author believes that pre-globalization world relatively was a stable and sustainable reference by these characteristics since it provided the sense of distinction, continues, and belonging to an identity for the members of a group.

Nevertheless, cyberspace has broken the traditional order and the proportion of location to the space and time furthermore; a cyberspace which represents post-modern status. In this virtual situation we are facing with the time-space compression as Harvey defined. In this new space nothing is predetermined and certain, everything is unstable and changing. Time and space are separated from location in cyberspace and creates a new synthesis. In this regard an image of time is formed that does not have any relation with location. We have mixture of times in here in which genres combine together and timely become Simultaneous in a flat horizon that has no first or end point nor order. When space is evacuated of location, then all areas lost their cultural, historical, and geographical meanings and are included in functional network or visual collages which create the space of streams instead of locations' space. In this new communicational system by which the programming of the past, present, and future within the united connection message is possible, time has no more meaning. Streams' space and timeless time are material foundations of a new culture.

This phenomenological compactness and evolution turns the time from a linear and chronological issue to the endless present. The world is compressed in a flat and undifferentiated space structure and a momentary world is emerged. The link between a common past and common present disappears and the traditional order which is based on exclusive locations, signifying, and identity maker continuities   is destroyed. In such a world neither space can provide the human need of distinction and continues nor can time. If the theme of identity is formed by collective memory, then this collective memory will be continuously based on the time. If the cyberspace process creates a timeless world, it will destroy one of the main sources and instruments of identification. Thus there are facilities for individuals in cyberspace that open a path to the plurality of identity in society and within the individual by weakening the stable references of identification.

Cyberspace and the possibility of simultaneous and countless communication is the origin of instantaneous cultures and consequently leads to the rise of heterogenetic identities which are created in limited periods and disappear quickly by the emergence of new identities. Electronic communication's features of the virtual space provide a different condition from real and face-to-face contacts for users. Speed, anonymity, and fluidity establish a same and similar space regardless of the identity requirements that is prone to different experiences for its users.

Previous identities which are created by real world in interaction with virtual space found new

identities that will have the capabilities of extensive contradictions between the life, culture, and identity in the real and virtual world.

Cyberspace makes it possible for people to face with experiences which regularly have been removed from the routine cycle of life order. It also allows people to change their lifestyle and achieve new experiences through exchanging experiences, challenging main concepts and interpretations of life, and mutual questioning. In this regard it provides customs and several means and methods for cultural horizons of people and creates a new understanding of the world as a meaningful social, cultural, and moral structure along with location removal from social relations.

Cyberspace creates a situation which is called "cultural supermarket" in "Gordon Mathews" literature. He compares the function of digital communication equipment with supermarket. Just like a person who fills his trolley by several products in supermarket, internet networks and the like offers to its customers several packages which include all sorts of cultural values and trends.

The side effect of this cultural supermarket immediately is reflected in the emergence of multiple identities. Diversity and multiplicity of identity is growing. This trend in its most acute form appears as a patch which is the product of human uses of the non-restricted sources provided by cultural communication.

8 Conclusions

The authors have studied the effects of cyberspace on the identity by Conceptualization and framing virtual space in this paper. The realization of cyberspace or virtual space is the main and crowning achievement of internet for social interaction arena.

Cyberspace is an environment in which users exchange with each other at the moment through the online computer networks. This space has its own culture that is created among the users. This communication constructs social relationships and provides a ground for social relation to be held; an information system in which the reality itself is drawn in virtual context and realistic world. The things that appear on the screen are not just images that reflex the experiences, but they are becoming experiences themselves.

This new territory which is presented by internet is a post-modern territory. It is because that internet is a post-modern instrument itself. This new field is the field of pure possibilities. Vertical hierarchical order is broken and horizontal one is emphasized. The person becomes decentralized and multilayered. Disruption of discipline and traditional proportion of location to the space and time are the most important characteristic of this new space. Time-space compression makes the interactions possible beyond the geographic area and specific location in this space. By this features Internet has conquered the most stable areas of human life. One of these areas which is strongly affected by Internet is "Identity".

The author believes that the identity is a historical and fabricated issue. Located-based time and space are the most important factors and resources of identification for this phenomenon. Space by its capability to restrict in borders provides the sense of distinction in one hand and time ensures people about the continuity of their national identity on the other hand.

However, this paper claims that cyberspace challenges the traditional order of identity that was based on local-based time and space and their compliance to each other by evacuating the space and time from location and creating momentary world. Thus it has undermined one of the main sources of identification. This new space creates the status of plurality of identity through the creation of new identification references and sources. This leads to the plurality of present identities in society and movement of community to the cultural pluralism. It also makes individuals to experience plural and multiple identities inside themselves.

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The Drawback Regime in Brazilian Exports

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Abstract: This study is intended to evaluate the profile of publications in renowned Brazilian journals on the subject "Drawback", a special customs regime that encourages exports in the national territory. For this purpose, a bibliometric research was carried out, without specifying time, in renowned journals within CAPES, distributed in classifications ranging from Qualis A1 to C. For the conclusion of the data analysis, the quantitative and descriptive method was applied, by monitoring data obtained from a longitudinal range, for an indefinite period. Our results evidenced the low availability of Brazilian publications consistent with the topic Drawback, being most of them specific to a particular niche market (capital goods or case studies), with qualitative and quantitative approach, without detailing what is this about or how to apply it. This study suggests an opening for new academic works that address the relevance of the Drawback regime, to stimulate domestic companies to adhere, also in view of the drop of 9.5% of Brazilian exports under the regime in 2015.
Key words: Drawback; Export; Internationalization

1 Introduction

Drawback represents a special customs regime which encourages exports, applied to import of raw materials, inputs, parts or components of products that may be exported.

The purpose of this exporting operation is to ensure the lowest cost of the goods to be sold to the international market, improving the standards of quality, reliability and safety required by international purchasers, while allowing more competitive markets, companies with more modern and improved products and advantages from tax benefits in export arrangements.

According to Castro, the Drawback regime, established at first by Decree-Law No. 37, in 1966, for characterization and encouraging of exports, is accepted by international trade rules, and should not be understood as allowance from its general scope nature, not discriminating industrial segments, qualification of favored party or the destination of the final product (Castro, J.A ,2003).

It is internationally known as "improvement", according to the Simplification and Harmonization of Customs Procedures – the Kyoto Convention, of 1974 – and the Amendment Protocol, from 1999, the revised Convention (Assumpção, R.M ,2007).

The term "Drawback" is used abroad only for purposes of return of taxes on imported goods, incorporated into the exported product when its manufacturer had originally collected the corresponding taxes. In Brazil there are three Drawback modes, that will be detailed in this study. Namely: Integrated Suspension Drawback (Integrado Suspensão), Exemption Drawback (Isenção) and Restitution Drawback (Restituição).

Brazil, although has exponentially increased its export operations over the last decade, is still considered a relatively deficient country in business development for international trade, either from the lack of knowledge of the Drawback regime or lack of government initiative to encourage this practice to Brazilian companies, so as to develop top quality products and high technology globally.

In this context, this study aims to investigate the profile of Brazilian journals regarding the Drawback regime, in order to encourage the Brazilian academy to disseminate more studies on this topic in Brazil, an issue significantly widespread in other countries.

The reason for this study is to encourage the Brazilian academy to promote more research that emphasize the application of Drawback on exports, so as to stimulate national and multinational companies to take advantage of this benefit and leverage their sales, becoming internationally present, acquiring inputs at competitive prices and promoting exports with an attractive margin of sales.

Exports under the Drawback regime had a decrease of 9.5% by comparing 2015 to 2014, totaling an annual amount of US$ 48.3 bi (Ministério do Desenvolvimento da Indústria e Comércio Exterior).

2 Theoretical Reference
2.1 Structure of the Brazilian foreign trade

Currently we can say that the word "decentralization" is the basis of the Structure of the Brazilian Foreign Trade. That is to say that there is no specific body for such activity. Its shape, in turn, is given by areas of expertise such as Financial Policy and Foreign Trade Policy, among others.

Assumpção sets a new administrative structure of the Brazilian foreign trade:

The new structure consists of a range of institutions that take part in the whole process of international trade. Each institution operates differently from the others: some of them would play a normative function, others an executive and supervisory function, while others would just ensure the stability of the system. Regardless of the goal, all institutions are part of the same project, influencing the structure of the Brazilian foreign trade. (Assumpção, R.M ,2007)

As the most relevant body, since closely related to the Brazilian Presidency, we can highlight the Chamber of Foreign Trade – CAMEX. This organ was created due to the events outside Brazil, which demanded quick, decisive responses. In addition, no measure can be taken without the consent of this organ. CAMEX is composed of the following Ministries: MDIC (Ministry of Development, Industry and Foreign Trade), Civil House, Foreign Affairs, Finance, Agriculture, Planning and Land Development.

In this sense, our study is directed to the Foreign Trade Secretariat – SECEX, which assists the Ministry of Development, Industry and Foreign Trade – MDIC. This office is responsible for standardization, supervision and management of foreign trade activities. SECEX is structured on the following departments: DECEX (Department of Foreign Trade), DEINT (Department of International Negotiation), DECOM (Department of Commercial Defense) and DEPLA (Department of Planning and Development of Foreign Trade).

DECEX is responsible for implementation of regulatory procedures, such as licensing of goods, imported or exported, as well as management of the SISCOMEX – Brazilian Foreign Trade System. This Department conducts all Drawback activities.

2.2 On the customs regime - drawback

Drawback can be defined as a special customs regime, mainly intended to allow exemption, suspension or refund of import taxes. This regime aims to make domestic goods more competitive for export through reduction of its final price (Ashikaga, C.E.G, 2006).

"Drawback can be defined as an advantage to export, initially presented as an import benefit" (Bock, C ,2014).

The Drawback regime is backed by the Ordinance SECEX No. 10, of May 24th 2010, which grants benefits on:

1) Transformation: changes in raw material or intermediary product, or a new product.

2) Enhancement: improvement, amendment or finishing of the product.

3) Assembly: combination of products, parts or components, resulting in a new product, with similar tax classification.

4) Renovation or Reconditioning: reuse of used product and/or reusable part of a discarded product intended to restoration/renovation.

5) Packaging or Reconditioning: Change in the appearance of the product through its packaging.

It is worth mentioning that the Drawback Regime may be also granted to goods for processing within the Country; raw material and semi-processed products; parts, components, devices or machinery; animals; other products exclusively intended to export.

Since the regime aims to boost exports, the Ordinance No. 10, of 5/24/2010, states that all goods imported under the Drawback regime are not subjected to similarity examination or obligation of transport by ship with the Brazilian flag.

On the other hand, the Drawback incentives include:

1) Import Taxes (II): Taxes on foreign goods, that is, of external origin, travelers luggage and goods sent as gifts or samples. Nationalized goods exported, as well as domestic products returning to the country are also classified as foreign goods, and so, taxable.

2) Tax on Industrialized Products (IPI): Tax on industrialized products, of foreign origin.

3) PIS: Social Integration Program, from which most legal entities pay the PIS according to their presumed profit. The PIS may be cumulative or non-cumulative.

4) COFINS: the Tax for Social Security Funding, likewise PIS, can be either cumulative or non-cumulative.

5) Tax on Goods and Services of Transportation and Communication (ICMS): Tax on trading of goods and services.

6) Additional to Freight for Renewal of the Merchant Marine (AFRMM): tax on cargo unloaded in a Brazilian port, with the percentage of 25% on the freight value. Charging, in turn, is made by the Merchant System.

For Castro (2003), the advantages for companies that benefit from the Drawback regime can be listed in five key points: i) tax aspect – reduction of tax charges; ii) financial aspect – reduction of financial costs; iii) final price aspect – comparison of prices in the domestic and external market; iv) quality aspect – comparison of domestic and external qualities and; v) international negotiation – requirements of the importer.

According to Posseti (2005), the Drawback regime is related to suspension, exemption or reimbursement of taxes on goods intended to an exportable (or exported) product. The purpose, in turn, is the same, based on the reduction of charges on goods that will be exported.

Application, reduction or increase of costs:

Luz (2005) assigns to the Drawback regime the following special operations which allow combination of multiple operations or specific operations for certain sectors (Luz, R ,2007):

- Integrated Suspension Drawback: This mode is intended to suspend the following taxes: IPI, PIS and COFINS (domestic market) or II, IPI, ICMS, PIS, COFINS and AFRMM (import). In this sense, the beneficiary is allowed to use domestic inputs, or even imported goods for the manufacture of a new product, since this product is intended to export. These goods may be raw materials, supplies, agricultural products, parts or components to be integrated to products intended to the foreign market.

Also, according to the Ordinance No. 10, the Suspension mode includes the use of these goods in repair, creation, cultivation or extractive activity for the product to be exported. Other application would be the so called "intermediate manufacturer". That means suspension of taxes for the manufacture of intermediate products, since they are to be directly supplied to the exporting industries with the sole purpose of export.

In Suspension mode, the maximum period for the imported good to remain in the country without taxation is two (2) years, except in case of goods intended to production of capital goods with long manufacturing cycle, for which the maximum period is five (5) years.

In addition, all taxes on import are suspended until proof of export committed in the Concessionary Act. Partial or total default of this commitment will lead the importer to payment of taxes, with monetary correction and interests, from the date of the taxable event proportional to unproven amount (Araújo, A.C.M.S. & Sartori, A ,2004).

Both for imports and for enjoyment of national purchases intended to export, they should not be shipped before the granting of the Concessionary Act. The Concessionary Act is similar to a "bar code" issued on behalf of the company, either commercial or industrial, which characterizes or implies that a given batch/quantity grants the beneficiary acquisition of imported and/or domestic products, with all advantages of the Drawback regime, according to its mode. This Concessionary Act may be regulated/determined on the Internet, in the MDIC website   (Ministério do Desenvolvimento da Indústria e Comércio Exterior).

In case of import of good, the benefit of the Concessionary Act should be clearly described in the LI (import license), and the DI (import declaration). At the end of this phase, the good is ready to be exported.

For purposes of internal control, a DANFE or NF (local invoice) is issued, and the number of the Concessionary Act should be included in the corresponding form, as well as the veracity of the CFOP. Once the export process for the good is started, both the RE (export registration) and the DE (export statement) should be formalized.

We can consider that the Drawback regime demands special designations from different bodies. Namely:

1) Foreign Trade Secretariat (SECEX): assignments on concession and closing of processes (concession, monitoring and closing of concessionary act)

2) Secretariat of the Federal Revenue of Brazil (SRF): responsible for suspension of imports and authorization of exports. It also takes part in the concessionary act process, after its closing, by conducting checking and assessment.

3) State Treasury: Applies suspension and confirms the closing by DECEX.

4) Merchant Marine (AFRMM): Applies suspension of taxes and follows the closing by DECEX.

Exemption Drawback: This mode is mainly intended to Inventory Replenishment. That is, allows the beneficiary to skip import taxes, since this replenishment is intended to processing, manufacturing, complementation or packaging, in quantity and quality similar to the previous one, in export. The

beneficiary may be exempted from: II, IPI, PIS, COFINS and AFRMM.

For this exemption to be applied, the beneficiary shall evidence that the new good has similar purpose of the acquired one, in which the total value of the "current good" is limited to the previous good.

To apply for the Exemption Drawback, the applicant should submit a form, that will be confirmed through the "proof report". Then, the next phase is the approval of the Concessionary Act, which is sent by Banco do Brasil S/A. For imports in the Exemption Drawback mode, this benefit should be clearly presented, both for the LI (import license) and the DI (import clearance).

Restitution Drawback: In this mode the beneficiary may refund the taxes on import of goods. For this restitution, the beneficiary should evidence that the goods imported were actually integrated to exported products. The following taxes may be refunded: IPI, PIS COFINS and AFRMM, and the Secretariat of the Federal Revenue of Brazil will be responsible for granting the tax credit.

Assumpção comments on small businesses:

Micro-companies and small companies which opt for the Simple Tax Regime shall not benefit from the export tax Drawback regime. For the other cases, the Drawback can be requested in one of the three modes – Suspension, Exemption and Restitution. (Assumpção, R.M ,2007)

3 Methodological Procedures

This research can be classified as descriptive and bibliometric, obtained from a longitudinal range for data collection, for an indefinite period. Only national publications were included, selected from the journals Qualis between A1 and C, through SPELL and SCIELO.

Table 1   List of Journals

Magazine	Qualis
ABEPRO - Produção	B2
BBR - Brazilian Business Review	B1
Desenvolvimento em questão	B2
FACES - Revista de Administração	B2
Gestão & Regionalidade	B3
Organizações Rurais & Agroindustriais	B1
RAI	A2
RAM - Revista de Administração Mackenzie	B1
RAMED - Revista de Administração	B3
RAU - Revista de Administração da Unimep	B2
RAUSP	B2
READ - Revista Eletrônica de Administração	B3
REGE - Revista de Gestão USP	B3
Revista Administração em Diálogo - RAD	A2
Revista de Administração	B3
Revista de Administração Faces Journal	B2
Revista de Administração UFSM	B3
Revista de Ciências da Administração	B2
Revista de Gestão e Tecnologia	B3
Revista de Negócios Blumenau	B2
Revista de Negócios Studies	B2
Revista de Pequena e Micro Empresa	B3
Revista Eletrônica de Negócios Internacionais ESPM	B3
Revista Eletrônica de Sistema de Informação	B3
Revista Ibero-Americana	B2
Revista Interface	B1
Revista Pensamento Contemporâneo em Administração	B3
Revista Pretexto	B3
Revista Sociedade, Contabilidade e gestão	B2
TAC - Tecnologias de Administração e Contabilidade	C

Source: Research data (2016)

Bibliometrics is a quantitative methodology that uses statistical and mathematical elements for findings based on numerical indicators.

As conceptualized by Pritchard (1969), bibliometrics reflects the sum of numerical studies that, together, aim to quantify the processes of written communication (Pritchard, A,1969).

The use of bibliometrics in this study resulted from the need to measure the impact of publications on the subject Drawback, for dissemination of academic information.

The search for articles was through the keywords Drawback, Internalization and Export, presented in the title of the publications selected.

After the research in the abovementioned journals, 12 articles addressing the subject were found. The publications were read thoroughly, with the purpose of determining the year when the articles were created, the authors' names and universities, types of study and ultimately their methodologies.

Both the survey and the analysis of the data were developed over May and June, 2016, by means of the Microsoft® Excel 2013 Software, which held the quantitative and qualitative analysis of this study.

4 Analysis and Discussion of Results

The first investigation of the data sampling, which resulted in 12 articles, was the analysis of related titles, year of publication and their authors.

Table 2   List of Articles Studied

Title	Year	Author
The decision to internationalize	2011	Nadia Wacila Hanania Vianna, Sheila Regina Almeida
The influence of Drawback in logistics activities in companies of mechanical capital goods	2012	Roberto Giro Moori, Sussumo Tatenauti Konda, Odair Oliva de Farias, Tatiana Mayumi Moori
Learning and adapting operations to implement export strategies in micro and small enterprises	2011	Teodoro Malta Campos, Edmilson de Oliveira Lima.
Developing an evaluation system to improve efficiency, effectiveness and governance in the public sector: the case of the grants program for exporting companies in Brazil	2014	Frederico Lustosa da Costa, José Cezar Castanhar, Daniela Gomes Castanhar Reyes, Gustavo de Oliveira Almeida
Brazilian exports: benefits and barriers in the business perception	2016	Jorge Carneiro, Constanza Bianchi, Renata Maria Gomes
Factors influencing the export firm strategies	2015	Caroline Mendonça Nogueira Paiva, Juciara Nunes de Alcântara, Evandro Marcus Cintra, Cristina Lelis Leal Calegario.
Corporate governance and internalization: an analysis of the effects on Brazilian companies	2014	Luzélia Calegari Santos Moizinho, Rogério Borges Borsato, Fernanda Maciel Peixoto, Vinícius Silva Pereira
Made in Brazil: the impact of the Brazilian logistics infrastructure in export operations	2011	Flavia Braga Chinelato, Diogo Batista de Freitas Cruz, Fabrício Ziviani
Learning as an explanation of export development	2011	Ângela França Versia, Sérgio Fernando Loureiro Rezende
The level of internationalization of Brazilian companies: a study on export markets and the size of the export companies	2014	Lúcia de Fátima Lúcio Gomes da Costa, Miguel Eduardo Moreno Añez, Max Leandro de Araújo Brito, Cândida Barreto
The Drawback in international logistics operations	2012	Roberto Giro Moori, Mauricio Henrique Benedetti, Sussumo Tatenauti Konda
Drawback for capital goods companies	2011	Roberto Giro Moori, Sussumo Tatenauti Konda, Roberto Gardesani

Source: Research data (2016)

Board 2 shows that the Drawback matter in exportation practices is a relatively new topic of research with limited spread, that is, few studies aiming at applying the regime to Brazilian exports have been made.

The number of articles published each year is presented in Table 1, since the establishment of

Ordinance SECEX No. 10, May 24th, 2010, which governs the regime.

Table 3   Number of Publications

Year of Publication	Number of Articles	Frequency
2011	5	41.7%
2012	2	16.7%
2014	3	25.0%
2015	1	8.35%
2016	1	8.35%
Total	**12**	**100%**

Source: Research data (2016)

It can be noted that there was no study addressing Drawback effectiveness in Brazilian exports in the year when Ordinance SECEX No. 10 was established, i.e. May 24th, 2010. This topic was more broadly and thoroughly investigated in the following year, after the publication of 10 articles between 2011 and 2014. On the other hand, from 2015 to 2016, there was an exponential decrease of articles on the subject as only 2 articles regarding this matter were published. This can be explained by the increase of exports from 2011 to 2014 and the sharp decline of exported goods under Drawback regime in 2015, according to information disclosed by the Brazilian Ministry of Development, Industry and Foreign Trade in 2016.

Table 2 shows in details the names of the journals regarding the 12 articles selected, the number of articles published by each magazine and their frequencies.

Table 4   Magazines x Frequency List

Magazine	Number of Articles	Frequency
BBR - Brazilian Business Review	1	8.3334%
Desenvolvimento em Questão	1	8.3334%
Gestão & Regionalidade	1	8.3334%
RAI	1	8.3334%
RAUSP	1	8.3334%
Revista Administração em Diálogo - RAD	1	8.3334%
Revista de Ciências da Adminstração	1	8.3334%
Revista Eletrônica de Negócios Internacionais ESPM	1	8.3334%
Revista Ibero-Americana	1	8.3334%
Revista Interface	1	8.3334%
Revista Pretexto	1	8.3334%
TAC - Tecnologias de Administração e Contabilidade	1	8.3334%
Total	**12**	**100%**

Source: Research data (2016)

Table 5 data shows that there are no articles on such topic over 2011 to 2016. The participation of the 12 articles selected was respectively 8.3334% in 12 different journals.

Table 6 shows the distribution of articles rated by Qualis and their frequencies.

Table 5   Paper Title x Qualis List

Paper Title	Qualis	Number of Articles	Frequency
Learning and adapting operations to implement export strategies in micro and small enterprises	B2	4	33.3%
Factors influencing the export firm strategies			
Corporate governance and internalization: an analysis of the effects on Brazilian companies			
Learning as an explanation of export development			
The decision to internationalize	B3	3	25.0%
The Drawback in international logistics operations			
Drawback for capital goods companies			
The influence of Drawback in logistics activities in companies of mechanical capital goods	A2	2	16.7%

Made in Brazil: the impact of the Brazilian logistics infrastructure in export operations			
Developing an evaluation system to improve efficiency, effectiveness and governance in the public sector: the case of the grants program for exporting companies in Brazil	B1	2	16.7%
The level of internationalization of Brazilian companies: a study on export markets and the size of the export companies			
Brazilian exports: benefits and barriers in the business perception	C	1	8.3%
Total		**12**	**100%**

Source: Research data (2016)

It can be noted a prevalence of published articles on the Drawback subject in Qualis B2 journals, making up 33.3% of the publications. In the second place, the articles were rated in Qualis B3 journals, making up 25.0% of the articles; in the third place, Qualis A2 and B1 were listed, making up 16.7% of frequency respectively. In turn, one single Qualis C article appeared in the list.

Table 6 displays an analysis of the articles regarding their methodologies.

Table 6   Type of Research x Frequency

Type of Research	Number of Articles	Frequency
Qualitative	2	16.7%
Quantitative	10	83.3%
TOTAL	**12**	**100%**

Source: Research data (2016)

Table 6 data shows that 83.3% of the publications investigated are concentrated in the quantitative methodology category, and only 16.7% were listed as qualitative research. While selecting the articles, no mixed-method research, i.e. quantitative and qualitative research, was found.

5 Conclusions

This article aimed at verifying how Drawback is addressed in Brazilian publications as well as determining the profile of Qualis A1 and C publications in domestic journals which cover the Drawback matter.

The relevance of this study to the growth of the Brazilian international trade, economy boost, creation of new employment opportunities and greater visibility for national products worldwide is positively summarized by the Brazilian Ministry of Development, Industry and Foreign Trade, which recognizes the Drawback regime as a means of preserving companies cash, insofar as, upon the export of the final product, the suspension of taxes turns into exemption, thus avoiding the payment of taxes which creates further right to credit (Ministério do Desenvolvimento da Indústria e Comércio Exterior).

"For each dollar imported under the regime, Brazilian companies export six dollars. This information alone shows the relevance of Drawback to aggregate value and increase Brazilian export competitiveness"(Ministério do Desenvolvimento da Indústria e Comércio Exterior).

The purpose of this study has been achieved as this bibliometric research demonstrated a great lack of publications aimed at the Drawback subject in the Brazilian academy from 2011 to 2016; in addition, the few authors and magazines which developed articles about the regime were listed in details in this research with information regarding time, Qualis, approach of the subject, frequency and the methodology applied.

According to the results of the research, the articles on Drawback were mostly intended to capital assets and had a quantitative approach. The few Brazilian articles on the subject over the past five years have confirmed the need for studies in this matter.

It is therefore suggested further articles that thoroughly address the subject and the ways of applying the regime, as an encouragement to companies seeking to stand out and make profits in the foreign market, thus increasing the representation of Brazilian exports to over eleven per cent of the Gross Domestic Product (GPD).

Furthermore, in view of the information disclosed by MDIC about the 9.25% decrease of exports under Drawback regime in 2015 compared to 2014, new publications addressing the effectiveness of Drawback in Brazilian exports would produce material results to Brazil from academic, social and professional perspectives.

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Comparing and Identifying the Similarities and Differences of Global Project Management Philosophies

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Abstract: All projects need management to achieve project goals. This research aims to review global project management philosophies and find out the similarities and differences of global project management philosophies. Various modern types of project management standards are being reviewed namely Project and Program Management (P2M), Association for Project Management Body of Knowledge (APMBOK) and Project Management Body of Knowledge (PMBOK), International Project Management Association (IPMA), Projects in Controlled Environments (PRINCE2) and Australian Institute of Project Management Standards (AIPM). The three approaches that used to determine the similarities and the similarities are critical review, interview visitation and questionnaire analysis. The research proved that most of the companies have more than one project management philosophy methods.
Key words: Project management similarities; Project management differences; Critical review; Interview visitation; Questionnaire analysis

1 Introduction

In traditional project management, the long partnership and trust are the strengths of project management. It is the common basic practice to clearly state the contractors' roles. The difference between the traditional type project management and contemporary type project management is that, contemporary type applicants have to plan by themselves not only the total lifecycle plan, but the solution itself by following the instructions.

There are several of project management standards widely used globally. The most common and well-established United States (US) method, the Project Management Body of Knowledge (PMBOK), has been adopted in many organizations around the world, including in Japanese organizations. The Japanese has also generated their own approach to project management, namely Project & Program Management (P2M) and Kaikaku Project Management (KPM). Japanese companies have started investing overseas especially in Asia, particularly in Malaysia, because of lower start-up costs and cheaper manpower resources. Some of the organizations are subsidiaries of their parent companies in Japan, while others are joint ventures with local companies. It is of interest to find out whether these overseas-based Japanese companies are being managed according to the original Japanese system, or whether the management has been localized to fit in with the country's culture with non-Japanese management practices. Different organizations apply different project management methods.

This research is intended with an objective to review global project management philosophies and find out the similarities and differences of global project management philosophies in Malaysia-based Japanese companies and those Japanese-Malaysia joint ventured companies. There are three methods used for this research study, namely, critical review, interview visitation and questionnaire survey. Throughout the process of analysis, the effect/output on the applied philosophies was identified. The comparison among the global project management philosophies is shown in table form, which can be easily understood.

2 Methodology
2.1 Framework of methodology
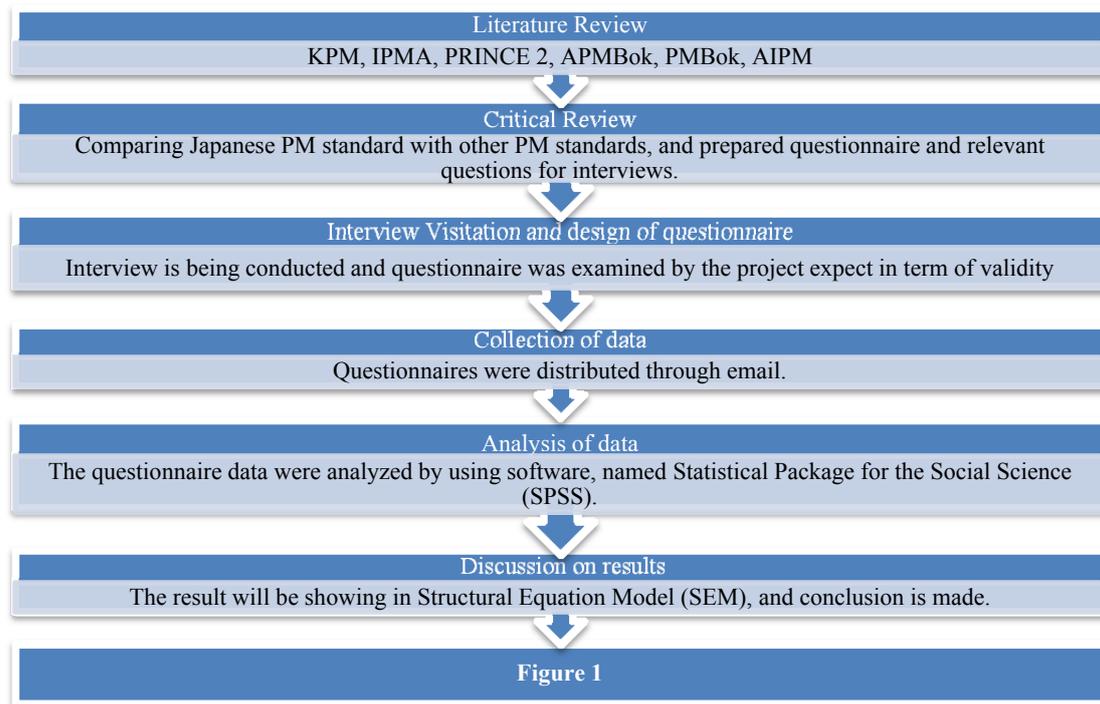
Figure 1   Framework of Methodology

Figure 1 shows the flow chart of the methodology for this research study. The research data is collected through interview visitation and also questionnaire survey. The questionnaire was pre-designed and was proofread during the interview visitation by the project manager. Necessary changes were made on the questionnaire based on the inputs by the project manager.

2.2 Critical review

Journals from P2M, KPM, IPMA, PRINCE2(R. Max Wideman, 2002), APMBok (Mike Bresnen, 2016), PMBok and AIPM (GAPPS, 2006) were studied and reviewed to gain information related to the objectives of this research. The purpose of critical review on journals is to understand those methods and find out the similarities and differences among the methods. By conducting critical review on journals and published articles, relevant information is captured thoroughly. The questionnaire and interview questions were set based on the information gained from critical review.

2.3 Interview

Interview visitation is one of the main information sources for this research. The interview is conducted with the managers from Malaysia based Japanese companies (John L). Interview visitation is a preliminary study to find out the types of project management philosophy that is being applied in the organization and how Japanese companies based in Malaysia manage their projects. Interview is an alternative way to obtain extra information. The interviewer can control the interview circumstances to get the data that is relevant to the research. Interviewer has the opportunity to explore the research data in more details. In other words, interviewees are also given the opportunity to elaborate more on the research topic. Semi-structured interview gives a lot of flexibility to the research purpose. During the interview, data is recorded by taking down notes and taking pictures of the data being presented by the interviewees. Subsequently, the data collected is summarized and restructured to help in the amendment of the questionnaire survey(Kathleen).

2.4 Questionnaire survey

The questionnaire survey method is being used to collect the data for analysis. The information and ideas obtained from the critical review were used to design the questionnaire (GAPPS, 2006). During the interviews with project managers, the experienced project managers were requested to proofread the pre-designed questionnaire, as to give comments and inputs, if any, to enhance the questionnaire. This is to examine the quality and validity of the questions. The relevant comments were utilized to restructure the questionnaire before distribution.

2.5 Data collection and analysis

A list of Japanese based companies is gained from Jetro (Japanese External Trade Organization), Malaysia. The companies are mainly from manufacturing industry, F&B industry, construction industry and government related industry. Questionnaires were distributed accordingly to the companies through email. A total of 200 questionnaires were sent by email. Email and telephone calls were launched as to remind the return of completed questionnaires and further explanation on the purpose of the questionnaire. The data is collected through email(Chinho Lin).

The data is analysed by using the statistical analysis software SPSS (Statistical Package for Social Science)(Dubem I, 2012). Six types of analysis were carried out(Tung-Tsan Chen,2010; Dubem I, 2012). Firstly, description analysis was done to generate the demographic characteristics of respondents. Secondly, Cronbach's alpha coefficient was analysed to check the consistency and reliability of the data. Thirdly, t-test was done to find out the mean scores of the data. Subsequently, a chi-square test was carried out to measure the agreement level among the respondents. Next, the Kruskal-Wallis test was carried out. This test is to find out the differences among two or more independent variables. Lastly, regression analysis was studied to find out the parameter of project management that lead to the success of the project.

3 Results and Discussions
3.1 Results of critical review
After studying the project management philosophies, the similarities and differences among the project management philosophies are determined (Low Foon Siang,2012). The similarities and differences are arranged in five categories. There are namely project planning developments, progress management, product acceptance, project transition and project evaluation. These five phases have to be conducted by following the sequence. The five phases are actually the flow of a project. There are total 33 of components in these five categories. Each component may belong to more than one project management philosophies.
3.2 Results of interview
The interviewees are the senior manager or head of division of the company who has project management experiences of more than five years. The results are kept anonymous to protect the confidentiality of the companies. One company from the manufacturing field has been interviewed. There are altogether six big questions being asked during the interview. Those are as follows:
1) The company background
2) Project Management practiced by the company.
3) Phases and stages involved in the project management
4) Characteristic in the phases
5) Localize the project management method.
6) Knowing of other project management methods.
Throughout the interview, the code of semi-structured interview is being applied. This is to make sure that the results of the interviews can be obtained with high consistency (John L.).
3.3 Results of questionnaire survey
The results of questionnaire survey were being analysed by using Statistical Package for Social Science (SPSS) (Dubem I, 2012). By conducting the analysis on the data gained from the questionnaire, the results can be read in a clearer and structured way. The readers can have a clear idea by refereeing to the analysis done by using SPSS. There were a total 36 completed questionnaires being collected. Table 1 shows the distributions of the company types.

Table 1   Distributions of the Company Types

Industry	Frequency	Percent	Valid Percent	Cumulative Percent
Automobile	4	11.1	11.1	11.1
Manufacturing	23	63.9	63.9	75.0
Construction	3	8.3	8.3	83.3
IT	2	5.6	5.6	88.9
Other	4	11.1	11.1	100.0
Total	36	100.0	100.0	

Table 1 shows the manufacturing companies contributed the most in the survey, which is 63.9 percent.

Cronbach's alpha coefficient was analysed using SPSS. The question of reliability rises as the function of scales is stretched to encompass the realm of prediction. The Cronbach's alpha coefficient for this whole set of data is **0.871**. This value exceeds the minimum value of reliability which is 0.7, showing that the data gained had good reliability and consistency (Joseph A, 2003). Thus, further analyses can be proceeded.

A total of 33 project management methods were being analysed to find out the mean score in different phases. The first ranking method was 'Product characteristics are agreed by related stakeholders and documented'. This method was actually applied to two project management philosophies which are P2M and Prince2. While, the second was 'Transition activities are planned and conducted', this method was applied to AIPM and Prince2. The third was 'A shared understanding of desired outcomes is agreed among the stakeholders' which was applied in P2M. Based on the results, even though the companies were mostly Japanese based, but the companies were practicing some method which was not included in P2M/KPM. This also showed that the Japanese based companies are not solely practicing Japanese based project management, but also applying other project management methods.

The purpose of chi-square test was to find out whether there is relationship between the project management method with the different industries (food & beverage, manufacturing, automobile, etc) and different company types (local, joint venture and foreign based). In this research, the hypothesis H_o with p value $<=0.05$ was set to imply results that exhibit significant relationship. H_A with p value $>=0.05$ was set to signify that the outcome has no significant relationship. The gained chi-square test result was 0.288, and the H_o was being rejected. This shows that the project management methods have no significant relationship between industries and company types.

The purpose of Kruskal-Wallis test is to find out whether there are any differences on methods usage among the industries namely, automobile, manufacturing, construction, information technology (IT) and others (Elvar). Ho with p value $<=0.05$ was set to be having significant differences. H_A with p value $>=0.05$ was set to be having no significant differences. From the results, there were only 13 out of 33 methods having the p value $<=0.05$, which indicates that these 13 methods have significant differences, while the remaining 20 methods (61% of the 33 methods) do not have significant differences. Therefore, the test failed to reject H_0, which implies there is no significant differences on method usage among industries.

Regression analysis was carried out to find out the relationship between the 33 project management methods and the satisfaction rate. Regression analysis is the analysis between the dependent value, i.e. the satisfaction rate and the predictor value, i.e. the project management methods (Astrid Schneider). The results on the satisfaction rate based on the questionnaire outcome are shown in Table 2.

Table 2　The Results on the Satisfaction Rate

Satisfaction	Frequency	Percent
Strongly　not satisfied	0	**0**
Not Satisfied	8	**22.2**
Neutral	16	**44.4**
Satisfied	9	**25**
Strongly satisfied	3	**8.3**
Total	36	100

R-square value is the amount of variability in the satisfaction rate. The R-square value of this research was 0.91. This means that the total of 33 project management methods contributed 91% percent of changes in the project satisfaction, with the remaining of 9% contributes from other factors The H_o with p value $<=0.05$ was set as project management method that contributed special effects to the satisfaction. H_A was set as project management method that did not contribute special effects to the satisfaction. Based on the regression analysis of this research, all of the 33 methods have a p value larger than 0.05 (p>0.05). Therefore, meanwhile all methods did contribute to the satisfaction rate; there was no specifically one method that signifies special influence on the satisfaction rate. Meanwhile, by referring to the coefficient-B, the satisfaction rate changed based on the unit changes of the predictor value. For example, the 'Stake holder's decision' has a coefficient-B value of -1.477. This indicates that this method particularly caused the satisfaction rate to decrease by 1.48% with every increase of one unit of Likert scale. The result is shown in Table 3.

Table 3　The Result of the Satisfaction Rate

	Unstandardized Coefficients B	Sig (P value)
Stake holder's decision	-1.477	0.899

4 Conclusions

The Japanese companies in Malaysia are practicing more than one project management philosophies. Most of the companies have adapted to the dynamic environment by using more than one project management philosophy methods. Furthermore, the project management method has no significant relationship between industries and company types as per the results from the statistical analyses. The company types and industries are not determining the usage of the project management methods. Subsequently, the research has shown that the usage of project management methods are not significant different among the industries. Most of the industries practice almost the same project management methods. Lastly, there is no particular project management method that contributes special effects to the satisfaction of project managers. All the project management methods contributed to the satisfaction rate.

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Autonomy and Creativity of Home-Based Professional Teleworkers: The Mediation Role of Intrinsic Motivation

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Abstract: Organizations increasingly introduce home-based telework for professional employees. While telework schedules are widely adopted in organizations, their impact on creativity has not been incorporated. Following this gap, the objective of this paper is to develop a conceptual model to explain the creativity of home-based professional teleworkers. In the light of Self Determination Theory (SDT), researchers hypothesized that high level of autonomy experienced by home-based professional teleworkers should lead to their creativity through the intrinsic motivation. This study makes novel contribution to the existing literatures by integrating the two fields of telework and creativity. Further, the model can be empirically tested in future research.
Key words: Telework; Autonomy; Intrinsic motivation; Creativity

1 Introduction

Alvin Toffler, the famous futurist once declared "work is not necessarily going to take place in offices or factories. It is going to take place everywhere, anytime" (Morgan, R. E.,2004）. This has become a reality since the traditional boundaries of working has been changed as the advances in information communication technology (Felstead, A,et al,2005; Wheatley, D.,2012). Today, work has become increasingly unbound and performed at home (Felstead, A,et al,2005; Wheatley, D.,2012). The terms telework, telecommuting are often used to describe home based work (Bailey, D . E., & Kurland, N. B,2002). However, there are some issues on the definitional clarity of the term telework or telecommuting. Thus, in this study the meaning of telework is surrounded the Fulton's(Fulton, C.,2002) definition of "working regularly from home using telecommunication technology" (P. 209). Further, Bailey and Kurland (Bailey, D . E., & Kurland, N. B,2002) also disentangle the meaning of telework as which employees work outside the work place hence often at home, using communication and ICT(Bailey, D . E., & Kurland, N. B,2002). Part time employees, senior managers, and administrative staff have been found to be more appropriate with telework (Coenen, M., & Kok, R. A. W.,2014). Teleworkers are often represented as professional and managerial workers (Schwarz, H.,et al,1999). Home based telework is relatively common among managerial and professional workers since they seek less control and supervision. Hence, home-based professional teleworkers have been considered in this research owing to the growing popularity of their work.

Creativity has become salient in organizations to adapt, grow, and gain competitive advantage (Nonaka, I.,1991;(Shalley, C. E., & Gilson, L. L.,2004; Shalley, C. E.,2004). Thus, a crucial task of contemporary organization is to create and maintain a creative workforce (Ong, H. L. C., & Jeyaraj, S.,2014). In this point defining the term creativity is worth since the creativity is attributed to artistic work. "The art bias implies what is essentially a myth, for example, namely that only the arts have a monopoly on creative"(Runco, M. A.,2015). Creativity refers to production of novel and useful ideas by an individual or collection of individuals (Madjar, N.,2002; Shalley, C. E.,2009). Even though, organizations attempt to foster creativity through various strategies such as restructuring, selecting most appropriate individuals and training programmers those are often unsuccessful (Taggar, S.,2002). As a result research into creativity has burgeoned in recent years(Joo, B. K.,2013). However, even after deep investigations, "creativity is something we desperately need, but we do not know how to get it, and we are not really sure what it is"(Glăveanu, V. P..2011). In particular, individual creativity has become a challenge to organizations (Perry-smith, J. E.,2006).

Creativity is important not only for organizations but also for the individual employees (Perry-Smith, J.,2003). "Particularly for the professional worker who uses unseen and unobservable inputs like intellect, the ability to incorporate unique and effective twists should help him or her stand out from the crowd" (Perry-Smith, J.,2003). Although there are many researches examined creativity within the organizational boundary, creativity has hardly been investigated beyond the boundary of

organizations (Zhou, J., & Shalley, C. E.,2003), while such work schedules growing in organizations. Addressing this gap, the objective of this paper is to develop a conceptual model to explain the creativity of home-based professional teleworkers grounding on the theoretical insights of Self Determination Theory (SDT).

The rest of the paper is organized as follows. First, it theorizes the relationship between job autonomy and creativity of home-based professional teleworkers being based on the theoretical lens of the Self Determination Theory. Second, it argues the direct relationship between autonomy and creativity of home-based professional teleworkers. Third, it shows the intrinsic motivation as a mediator of the relationship between autonomy and creativity of the home- based professional teleworkers. Finally, it ends with a brief conclusion.

2 Theoretical Background and Hypotheses
2.1 Self determination perspective and creativity of home-based professional teleworkers
The Self Determination Theory (SDT) as it exists today emerged as a result of the pioneering work of Deci & Ryan early in the 1980s. Principally, SDT is a theory of motivation which has been applied to explain the impact of the work environment on motivation to do something(Deci, E. L.,2008). SDT differentiates between intrinsic and extrinsic motivation(Ryan, R. M.,2000). "Intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome" (Ryan, R. M.,2000). SDT recognizes the importance of intrinsic motivation. Intrinsic motivation helps to engage in exploratory and curiosity driven behaviors without having any external rewards (White, R. W., 1959). "Self-Determination Theory is specifically framed in terms of social and environmental factors that facilitate versus undermine intrinsic motivation" (Ryan, R. M.,2000). Further, autonomy is considered as a critical job related environmental factor that required for intrinsic motivation (Ryan, R. M. ,2000) as it provides opportunity for self-direction (Zuckerman, M.,1978). SDT postulates that need for autonomy is essential for the inner motivation in order to perform an activity (Ryan, R. M.,2000). In particular, intrinsic motivation causes for creativity (Ryan, R. M.,2000). Hence, SDT helps to theorize a relationship between autonomy and a behavioral outcome through the intrinsic motivation.

2.2 Autonomy and creativity of home -based professional teleworkers
The general meaning of autonomy is employees' freedom associated with their task accomplishment (Sia, S. K.,2015) Telework provides more opportunities for freedom with flexible work schedules (Coenen, M., & Kok, R. A. W.,2014). Unlike clerical workers, aligning with job enrichment perspective professionals experience more autonomy while working at home (Olson, M. H. ,1984). Also, Baruch (Baruch, Y.,2001) identifies ability to satisfy the need of autonomy as an advantage of a teleworker. Telework can be seen as an extreme movement which facilitate control and freedom (Chris, G.,2001). Overall, teleworkers perceive a greater level of autonomy than that of non-teleworkers (Gajendran, R. S.,2007).

Job autonomy is a key determinant of creative work involvement (Volmer, J.,2012). When employees receive autonomy it makes a relaxed mind within them which helps to be more creative (Sia, S. K.,2015). Amabile(1983); Amabile, Conti, Coon, Lazenby, & Herron(1996) through their componential theory of creativity proposed that the autonomy in working environment burgeon employees' creativity. Findings of Oldham, Cummings (1996) also showed the positive relationship between employees' job related autonomy and their creativity. Study of Zhou, J. (1998) echoes these idea of autonomy work environment generates more creative ideas within employees. Also, psychological empowerment has been found to be a determinant of creativity (Sia, S. K.,2015). The above argument leads to the development of the following hypothesis.

H1: The greater autonomy experienced by home- based professional teleworkers will have a positive relationship with their creativity.

2.3 Mediation role of intrinsic motivation in the relationship between autonomy and creativity of home- based professional teleworkers
Telework has become an important mechanism of achieving high level of motivation among employees (Chris, G.,2001). Autonomy provides key ingredient for the need of intrinsic motivation (Deci, E. L.,2008; Ryan, R. M.,2000). Job design has been recognized as an important determinant of employees' intrinsic motivation and creativity(Amabile, T. M. ,1996). In particular, when employees perform challenging jobs while in the absence of external control and interferes they tend to be more excited and interested in completing those(Amabile, T. M. ,1996). Psychological empowerment leads to manifestation of intrinsic task

motivation (Joo, B. K.,2013). Contemporary forms of working enriched with job autonomy, positively related to intrinsic motivation (Van Yperen, N. W.,2016). Confirming this view a meta-analysis also prove that job autonomy is positively related to intrinsic motivation (Humphrey et al., 2007).

Amabile's(Amabile, T. M.,1983; Amabile, T. M. ,1996) comonential theory, which is conisidered as a dominant model of creativity emphasizes the intrinsic motivation perspective is more related with creativity (Zhou, J., & Shalley, C. E.,2003). Though, intrinsic motivation is considered as an important predictor of creativity, little research investigated the mediation role of intrinsic motivation in between contextual factors and creativity (Zhou, J., & Shalley, C. E.,2003). As explained in the above and the theoretical insights of SDT, intrinsic motivation should be a mediator between autonomy and creativity. This leads to the development of the second hypothesis.

H2: Intrinsic motivation will be a mediator in the relationship between autonomy and creativity of the home-based professional teleworkers

The above explained network of relationship between autonomy, intrinsic motivation and creativity of professional home-based teleworkers based on Self Determination Theory is illustrated in the figure 1.
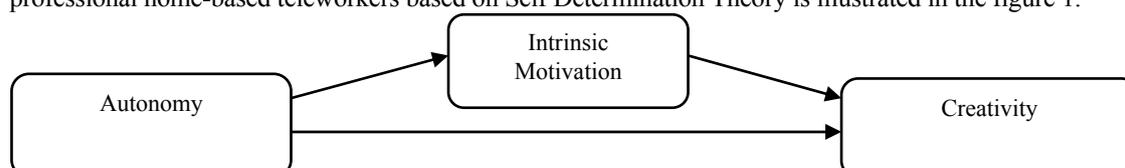
Figure 1   The Conceptual Model

3 Conclusions

The aim of this study was to explain the creativity of home-based professional teleworkers. In order to achieve this objective, article has presented a theoritical model of the creativity of home-based professional teleworkers being based on the Self Determination Theory. It first, argued the direct relationship between autonomy and creativity of the home-based professional employees. Second, it showed intrinsic motivation as the mediator in the relationship between autonomy and creativity of the home-based professional teleworkers. This research has implications for both future research and practice. First, this model can serve as a basis for subsequent empirical research. All of the constructs included in the mdel can be measured through available validated and reliable mesurement instruments. From practitioners perspective, once the model is tested it can be used as a source of recommendation for companies that employ teleworking for professional employees. As organizations looking forward for creativity of professional employees, home based telework may provide the seeds in attaining that.

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Study on Management Model Innovation of Huge Petrochemical Engineering Building Project

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Abstract: The petrochemical industry is very important to any country in the world. Facing challenges of systematic risk, time, quality, time constraints, lots of project stakeholders, project management standards in huge petrochemical project building process, project manager should to refine advanced management ideas, build a new management model of huge petrochemical engineering building project. It has important significance on the development of China petrochemical industry.
Key words: Petrochemical engineering building project; Management model; Project management

1 Introduction

Petrochemical industry provides a lot of necessities of life for the people, provides a large number of raw materials for industrial production, is one of the basic industries of the national economy. Life provides a number of basic raw materials. China's petrochemical industry started in the early days, Soviet-built 156 key projects have 8 a petrochemical project. And other advanced enterprise culture of Daqing oil field generations petrochemical technical staff. However, with the rapid development of science and technology, new products, new materials, new techniques, new equipment development of blowout, petrochemical industry is the constant technological innovation (Qiyan W, Xiaoling Z, Hongbo L, etc ,2015). As the world's factory and has 13 million population of the country, huge demand for all kinds of industrial raw materials and consumer goods, the traditional petrochemical industry of the manufacturing system has been unable to meet the rapid development of the national economy. In this context, to PetroChina, Sinopec and CNOOC as a representative of China's petrochemical enterprises have carried out a large number of construction, reconstruction projects in order to expand the scale of production, improve product quality, optimizing the production processes, processes of new products as well as to reduce environmental pollution and other purposes (Jia Jianguo, Yang Yu, Liu Aijun ,2011). By 2015 years, Petro-chemical industrial output value has exceeded 14 billion yuan, enterprises above the designated size reached 27000 families. Industry leader in petrochemical projects in recent years: The Xinjiang dushanzi petrochemical company 1000 tons / year refinery and 120 tons / ethylene expansion project God huaning coal group 167 Million tons / Methanol and 50 Million tons / Year pp coal-based olefins project; Chongqing medical group 40 Million tones / Year MDI, 80 Million tones / Methanol and 65 Million tones / Years of integration projects such as acetate.

The present situation of petrochemical engineering construction in our country. With China's accession to the WTO since, petroleum and chemical industry have greater impact, according to the domestic and foreign market demand, of petroleum and chemical products in quality and variety requirements are higher and higher, some of the old equipment, old equipment and old technology cannot meet the requirements of technology development and quality of new products, some need to be removed, and some need to change, the construction of equipment renewal and new device, the petrochemical company every year to put in a lot of funds for technological transformation, improve production technology and expand the scale of production, to enhance the overall competitiveness of enterprises.

In recent years, especially after 2005, many provinces in the country, PetroChina, Sinopec and CNOOC are in actively and vigorously expand or new refinery and chemical plant, in the coming days, some small refineries will be eliminated gradually, more and bigger tens of millions of tons of oil refining device are under construction or planned, enterprise benefit to economies of scale to reflect is more international competitiveness.

Large petrochemical projects in the course of construction, project planning, technical design, construction and operation of the system aspects, the required investment, involving many stakeholders, professional and technical, installation of strong association, construction period long, high risk, high quality requirements. This determines the type of project risks, and the General staff lacks in technical ability and practical experience, makes the introduction of professional project management advisory service projects.

2 A Comparison Between Typical Project Management Modes

Construction project of science and technology with the development of more complex, larger scale projects possible. Project management began in World War II United States Manhattan project, gradually applied to all kinds of projects. Traditional management cannot meet the scale of large construction projects, in 60 of the last century, modern project management system matures, some advanced methods of management, tools, tools have to be verified in practice. Specializing in project management and technical services consulting business also began to appear. Now, most of the large projects are engaged in the world of project management company, provides professional and technical services. China first introduced modern project management techniques in 1984 year of lubuge hydropower station project. Efficient construction of the project, construction management system in our country, labor efficiency and Division has had a significant impact in terms of costs, setting off a boom of the study and practice of project management theory. Following modes of project management consulting company involved in specific projects, as well as the scope of its application in practice, and the advantages and disadvantages.

2.1 DBB mode

DBB Mode that is Design-Bid-Build, Referring to projects by design ─ Tender ─ A model for construction management in phases. Characterized in the previous phase is completed, before they can carry out the next stage. DBB mode, owners keep the ownership of the project, its contract signed directly with the design, construction, and its co-ordination role in the management of specific projects. But this mode of construction cannot affect the design (Kang Xiangping, Guo Hongying ,2010). DBB mode is the most classic and the most common mode of project management and its wide scope, management system, collaborative methods mature. DBB mode, the landlord must have a wealth of experience and projects in the process of building a lot of human and material resources. In addition, due to the design and construction of an independent bid, is not conducive to mutual learning and communication, tend to increase subsequent design changes, project construction period delay and so on.

2.2 CM mode

CM Mode that is Construction Management and construction management. This pattern to the construction phase of the project to control the starting point, the whole project is split into independent multiple subprojects and subparagraph tenders, designs, construction of building the whole project. Split phase of the project using the fast-path method. In the construction phase of the project, defined interfaces between projects, interior design, procurement and construction of the project the full interface. CM pattern is a "design and construction" construction method. Road-building in the use of such models.

CM Mode, the project management company based on actual experiences, involved early in project design work, strengthen the design and the construction site of the Association, can effectively reduce the project changes. Every project is relatively independent, parallel construction, greatly reducing project time. But at the same time project management companies to undertake large projects management, faces enormous challenges, requiring higher qualifications. Owners need to fully trust the project manager and project manager full authority.

2.3 The BOT mode

BOT Mode that is Build-Operate-Transfer Means building ─ Operation ─ Transfer mode, which originated from Government-led infrastructure projects. BOT mode from Government project construction costs in the commercial capital, by financing the construction and management of the market related projects. In BOT mode, the Government signed contracts with commercial companies, by commercial companies are responsible for financing, design, procurement and construction. After the project is completed, a business contract with project facilities during the franchise period property, rights, and maintenance work. Commercial company in accordance with the license fees on public officers on the use of facilities of the project. After the expiry of the licence, government ownership of project facilities. Through investment and construction, quotation, and achieved operating income of the last transfer of property rights. In General, the BOT project of low cost, but a longer concession period. BOT pattern apply some natural monopoly, a less competitive and stable project. Railways, roads, subways, bridges, tunnels, ports, airports, water supply and drainage system and other projects can use this kind of project management. Huge investment in such projects, the long construction period, but stable, able to attract commercial capital, and for the Government to save a lot of expenses.

2.4 The PMC mode

PMC Mode that is Project Management Contractor, also known as the project management contract model. PMC mode, the project owners to employ some qualified project engineering manager, manage the entire construction process on their behalf. Was employed by the company called project management contractors, also known as PMC. PMC at the owner's full authorization of the scoping, technical design, construction to completion, management throughout the project life cycle.

PMC Mode, the owners of the major decisions on major issues in the work is part of the project, and therefore does not require too much staff, leaving only a few policy makers. And projects a lot of routine work, coordinated by PMC is responsible for. Accordingly, the owners choose PMC Shi must investigate alternative companies with rich experience in project management, with appropriate management methods and technical means, is there a reasonable knowledge structure of human resources. But in this mode, the project management costs. PMC model applies to owners of their project management with less experience, lack of the necessary technical means and human resources, and the project as a whole huge investment and technology integration difficult, facilities and equipment.

2.5 EPC general contract mode

EPC Mode that is Engineering-Procurement-Construction Design - Purchase - Construction general contract mode. Generally refers to one or more contractors on the overall project design, procurement, until the completion of the whole process of construction general contract management. EPC mode, the owners of the project goals, after the technical requirements, investment constraints, entrust certain qualified EPC contractor managed the whole project. EPC contractor's work is divided into engineering, procurement and construction of three parts, and responsible for the construction of the entire project. Owners during the construction phase, only a clear boundary, planning, management and control of engineering principles, supervision project goals to achieve little. EPC contractor and owner of such functions, and determine mutual rights and responsibilities of the contract relationship. EPC contractor also known as the general contractor, which will be based on the nature of the work, some items can be tasks to two contractors, subcontractors are generally not signed a contract with the landlord, but by the general contractor responsible for the owner (Yanwenzhou ,2001). EPC mode typical organizational structure figure 1.1 below.
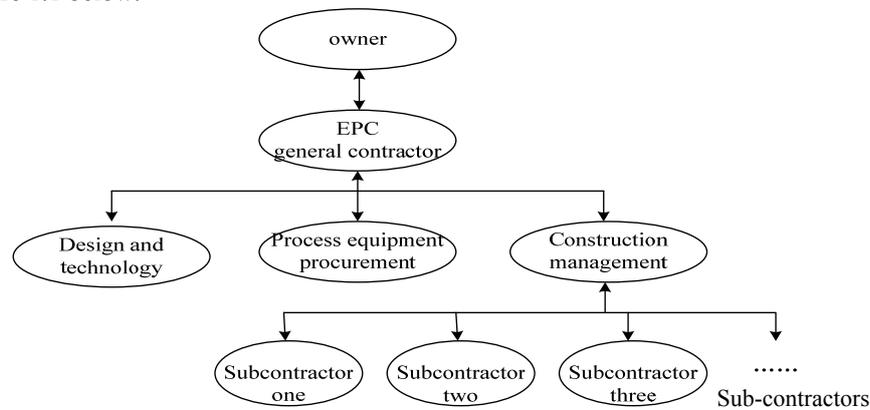
Figure 1   EPC EPC Diagram

In addition, the derived therefrom are E+PC modes, namely, procurement and construction contract, design single row; E+P+C mode, design, procurement and construction contracting model.

2.6 The PC mode

PC mode that is, Project Controlling, project controlling model. In PC mode, the owners deploy staff composition of the lead agency for the whole project, according to various engineering information, overall planning and implementation of the construction project as a whole. By means of destination management, development of human resources, risk, cost, schedule and quality plan, forming an effective project objectives control mechanism. By means of data analysis, collection, analysis, project construction of many kinds of information flow and material flow in the process of coordinating and controlling the actual construction. By forming the total made up of Senior Adviser to the prosecution, to handle projects of all kinds of information, and to control the reporting controls in the form of projects and processes. PC mode for large projects, project controlling as a decision support only the implementation status of the owners judgement and adjustment of all is not involved in the

implementation process. PC mode normally and EPC, andPMC as they mix both owner's control and oversight of the project, and ensure a high level of project implementation management (Mao R. L, Ismailb S, Hussainic M ,2014).

Comparative analysis of these patterns are shown in specific engineering practices should be combined with project feature, the owner, control resources, investment preference, select the appropriate management mode.

Table 1   Comparison of Project Management Mode

Pattern name	Advantages	Disadvantages	The scope of
DBB Mode (Design - Tender - Build mode)	Rights to three parties involved in the project, assign clear responsibilities and interests; Management maturity.	The long construction period; Owners large amount of resources; Frequent design changes, coordination difficulties.	Smaller, relatively simple technology, and projects the duration is not strictly required.
CM Model (Construction management mode)	Short construction period; Reducing design changes during construction.	CM Unit requires high qualifications and credibility; High requirements on the quality of employees.	Higher risk projects design changes; For time critical construction projects; Total project scope and scale could not be accurately determined pricing of construction projects.
BOT Mode (Construction - Operation - Transfer mode)	Reduce the financial burden of the Government; The Government can avoid the risk of a large number of items; Project rate of return clearly; To improve operational efficiency.	Length of the project period; High bid costs; Financing difficulties; Mechanisms not flexible; During the term of the concession that the Government could lose control of the project.	The long construction period, a huge amount of investment in infrastructure and construction projects, such as power plants, roads, airports, and so on.
PMC Mode (project management contract model)	To improve project management level; Save project investment; To streamline the management of clients ' bodies.	Role of the project management company limited; Easy management issues; Lack of industry self-regulatory standards; Lack of senior management personnel.	Investment and large, complex technology projects; Owner's own capacity and limited resources or a lack of experience in project management; Owners of low asset-backed.
EPC Patterns (design - procurement - construction mode)	Owners bear the risk; Owners reduce administrative interface, management is relatively simple.	Able to assume EPC Small number of contractors for large projects; Project, quality depends on the contractor's experience and level of benefits; Project cost is relatively high.	Larger, longer duration, considerable technical complexity of projects, such as factories, power plants, oil development and infrastructure.

3 The Analysis of Characteristics of Huge Petrochemical Engineering Building Projects

Compared with common projects, huge petrochemical engineering building construction projects have posed higher demands and challenges to builders in many respects.

First is the high degree of system integration. Modern petrochemical industrial integration with high, high associated upstream and downstream products, high level of resource utilization, showing a device number, monomer scale of technical characteristics. Major petrochemical project is not just a single species production, but construction project throughout the product chain, such as Chongqing medical group MDI project building a total 17 sets of production equipment, covering the MDI, andPVC, nitrobenzene and aniline, Acetylene, Chloroprene rubber, synthetic ammonia, nitric acid,

methanol, formaldehyde and chlor-alkali products. In the course of project construction, once a link problem, can easily lead to knock-on effects for the whole program, must be coordinated from the angle of overall optimization of the construction of the subsystem (Wang Tingjun, 2008).

Second is the long construction period. Huge petrochemical engineering building projects can be divided into research, advanced research, detailed design, construction, commissioning, production and so on. The long construction period, but taking into account factors such as government approval process and key equipment manufacturing cycles, the actual construction period of tension.

Third, high technical content. Petrochemical products in the production process inevitably produce highly corrosive, strong volatility and other dangerous substances, modern petrochemical construction projects focus on building quality on the one hand, on the other hand are early in the design process using high standards, high degree of automation of process equipment.

Four is immense investment. For example, mentioned above, the Xinjiang dushanzi project investment of 300 billion yuan, God huaning coal group of coal-based olefins project investment of 350 million Yuan, Chongqing medical group of MDI projects investment of 400 Billion. Large petrochemical construction projects invested 50 billion yuan, on the project's cost control, risk management, presents a major challenge.

Five is the project subjects are in numerical. Project stakeholders are: owners, primarily responsible for project investment and project called design, primarily responsible for project technical program development; supervision, primarily responsible for project implementation monitoring contractor, is responsible for the implementation of specific projects. But that contains multiple installations of major petrochemical projects in the construction of a single appliance can be treated as a single project, generally have their own owners, design, supervision and construction. Generally composed of large enterprise groups (such as PetroChina, Sinopec, etc) all secondary companies undertake to construct the device project. In the course of project implementation, you need to consider management issues between multiple owners, need to coordinate the technical interfaces of different design problems and optimize the overall technical solutions, administrative rights on the need to define more than one supervisor, need to be the construction side of the construction of the optimal allocation of resources.

Six international cooperation. Large-scale construction of petrochemical engineering construction projects often take the form of joint ventures, in part because of the large investment, and partly because Europe and the petrochemical Enterprise controls the 80% more advanced technical patents, compared with the international advanced level, and technology in petrochemical industry in China is still very weak. Such as Chongqing medical group of MDI projects major joint investment with the BASF company in Europe, Germany Linde in syngas separation unit-building, United States Mr Lake, the company involved in the construction of air separation plants, France Dalkia company participation in building island unit, United Kingdom AMEC provided project management consulting services (Kang,2011).

Seven is the deep government involvement. Petrochemical industry related to people's livelihood, consume a lot of resources on eco-environment and socio-economic impacts, environmental assessment, resources, construction of basic industries, immigration, construction, project supervision plays an important role. Government is deeply involved in construction, to fast forward the program process (Xie Jiaping, Kong Lingcheng , JI Wei ,2009).

Eight is the strong management regulation. Large petrochemical construction projects with internationally accepted norms, procedures, technical standards, such as the quality management system andHSE system, to ensure the smooth completion of the project.

Large petrochemical engineering construction project of eight a features for antibody following: features a requirements must and manpower planning, and coordination the subsystem construction; features II, and three or four requirements in construction process in the reached expected of time, and quality, and cost requirements; features five, and six or seven requirements in construction process in the coordination internal the project subject, and foreign company and the Government relationship; features eight requirements construction process in the must established international passage of quality management system. In the practice of huge petrochemical engineering building projects, using sophisticated project management mode and adjusted according to the characteristics mentioned above and innovation, are key to ensuring project implementation.

4 Innovation of Large Petrochemical Engineering Construction Project Management Pattern
4.1 "IPMT control +EPC composite" model

IPMT (Integrated Project Management Team) was set up in project management "integrated project management team", also known as the integrated project headquarters or headquarters. IPMT has several PMT (Project Management Team) which means that the project management team, also known as owner's headquarters or headquarters. Great investment determines the financial risk of a single owner-led construction, joint investment in building large petrochemical projects by many enterprises. Model in the integrated management of multiple owners, difficulty of optimization of the system is huge. Therefore, multiple owners of a group, such as PetroChina, Sinopec, CNOOC, facilitate the overall coordination. Form IPMT when led by the group, each owner is represented, with project management contractor (PMC), the overall programme design, general supervision company as well as a variety of other advisory or consultative bodies. Through the integration of efforts, on the organizational and technical realization of overall control of the project and system optimization. Group II-Enterprise and enterprise project, is the owner of the project.

"EPC compound" is in the implementation phase of the project, the specific needs of each project and the owners of the actual capacity, flexibility in design, procurement, building relationships between the three. You can select Design procurement construction contract (EPC) pattern or design, procurement, construction of two contracts (E+PC) pattern or design, procurement, construction (E+P+C) in three contract mode as the mode of construction. EPC composite mode's main objective is to ensure the engineering quality and progress under the premise, maximize the owner's power to save construction costs.

4.2 "IPMT control +EPC composite" model of organization structure

"IPMT control +EPC composite" pattern construction project management organizational structure shown in the following figure. According to the system is highly integrated feature, management norms established IPMT coordinate each subproject relationshipIPMT departments and PMT functions belonging to matrix management; according to the long construction period, with high technical content, characteristics of construction investment, IPMT Engineering Department, Technology Department, Ministry of finance the overall project progress control ; According to project many features for clear butt sector; according to the characteristics of a special liaison group for international cooperation is responsible for communicating with foreign investment projects; according to Government-deep features, composed of the competent government agency teams leading group, for the policy support and public services.
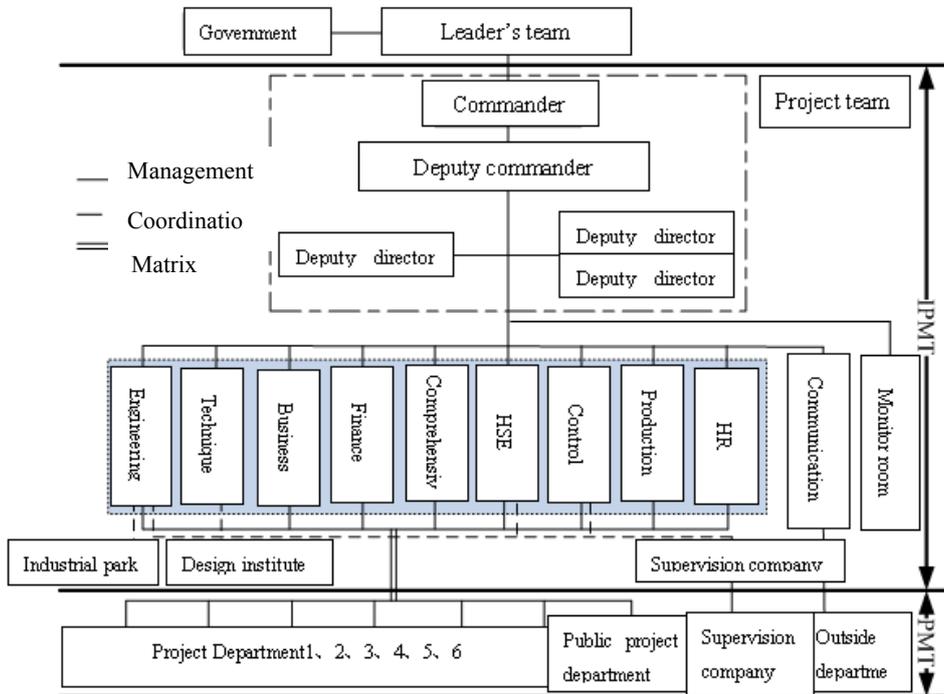
Figure 2   "IPMT Control +EPC Composite" Modes of Management Structures

Organizational structure is divided into two layers: A Government integration under the leadership of the leading group on the first project command (IPMT). It consists of Engineering Department, technical department, approved by the Ministry of Commerce, Ministry of, comprehensive Department, financial Department and the Department of field and other functional departments, performing project management functions on behalf of the Chinese owners. An owner on the second command (Project Management Team, PMT). Owners command in the project implementation stage win the headquarters and managed its one or more subproject, their headquarters is responsible for business integration project. IPMT of the owners of the parent company drawn and with professional qualification PMC formed; PMT formed by the owners, owners according to their ability and features select EPC mode (Pícha J, Tomek A, Löwitt H,2015).

On the framework of the Organization adopted a "small command service" levels of operation. The so-called "small headquarters," refers to small government and owners of enterprises drawn out only a small number of soldiers forced integration project command with the landlord, the second refers to the headquarters management than common sense of the scope of project management Department has reduced, more is responsible for the coordination and decision-making on key issues of management. "Service" refers to projects take full advantage of the Government, the overall design, EPC contractors and consultancy expertise, use of social resources to complete the project.

4.3 "IPMT control +EPC composite" mode operation mechanism

"IPMT control +EPC composite" run mode according to the following principles: the first principle is the center of gravity moves down, PMT building work on their respective projects, is a subject of law and implementation of the contract responsibility, IPMT is responsible for decisions on important matters and integration work. Approval followed by permissions, PMT only authorized Professional decisions exceed mandates required by procedures, IPMT or company agrees to perform. Finally dispersed the principle, dealing with common issues, such as coordination of overall design, detail design (to be Cheng Da), bulk / key equipment, hoisting large equipment, material management, IPMT uniform decisions.

"IPMT control +EPC composite" mode functioning the biggest challenge is how to deal with the many stakeholders, clear all rights responsibilities. There are two main kinds of coordination: administrative and contractual constraints. Administrative Committee on coordination by the Government or group of coordinated relations between the owner companies. Contract is mainly in the form of signed contracts explicit relationships between different legal subjects. The petrochemical engineering construction owners generally belong to a group, the Administrative Committee on coordination is relatively easy. But PMC contractors, design institutes, EPC contractors, construction, supervision and other need to clearly determine the powers and responsibilities of the contract. Of interface management in contract of the stakeholders of the program through the relationship in a contract and the parties in the overall operation of the project, ensure the smooth progress of the management model.
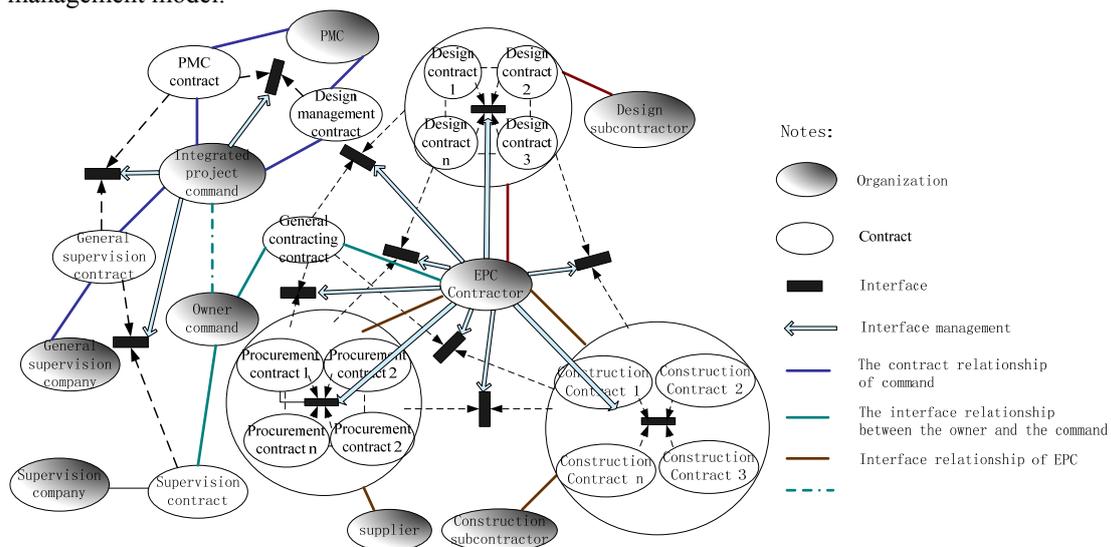
Figure 3   "IPMT Control +EPC Composite" Modes of Interface Management of Contracts

The figure shows that, IPMT and project management contractor PMC contract, who is responsible for management of the entire project coordination, especially progress and other aspects of cooperation between the various subprojects; IPMT general supervision contract with the management company by the General management company on behalf of IPMT pair project supervision company supervision and examination. However, in specific cases, supervisor general supervision may be specific projects, at which point its supervision of specific projects in accordance with contract owner with the EPC contractor for turnkey contracts, who is responsible for the plant construction project. EPC contractors through their own technological design, signed with suppliers procurement contract, will be part of the project to secondary contractors for specific building owner supervision contract with the management company, supervising company in total under the supervision of the company's management is responsible for the project management (Tseng C.H, Chu H.W,2004).

4.4 " IPMT control +EPC composite "pattern analysis of advantages and disadvantages

"IPMT control +EPC composite" model fully considers the petrochemical engineering construction project status, in the implementation phase of the project has the following advantages:

First, ensure unified leadership, sharing the risk. IPMT overall control and coordination roles meet the fundamental requirements of the major petrochemical project. Meanwhile, project implementation stage "small command service" model and IPMT exert the advantages of integrating external resources, allocation of project risks.

Second, make full use of government resources, promote the process. Project implementation stage, the Government still plays a large role, such as railways, docks, roads and other auxiliary facilities with related departments such as transport, environmental protection and security coordination. The strengthening of the role of Government to Government coordination of external advantages, speed up the process.

Third is the owner's responsibility, motivate. Due to specific project management responsibility to the owners, IPMT and a clear division of labor between the owners, full authorization to the owner in this way helps to improve the owners ' initiative and creativity, and to give full play to the owners and the owners own the project management personnel.

Four is to take full advantage of owners of resources, reduced construction costs. Taking full account of the different owners in the technical capacity, financial capacity, persons on the basis of differences in skills, managerial ability, engineering construction mode of EPC patterns, so owners can choose the conditions are familiar with the traditional construction patterns, which is conducive to fully tap the potential owners, improve all EPC and of the high cost of (Du Jun Jie ,2015).

Five different bodies of work are a clear division of labor is clear. Although the project implementation stage introduces a number of services, but the mode of operation of services at Headquarters more clear division of responsibilities with the owners, different service functions at the same level also form a complementary relationship, so clear interface between different bodies of work.

Six, helps to save administrative costs. PMC introduction of cost management will increase, but the patterns in the PMC are positioned as in command under the authority of the MDI project for overall coordination and control, does not directly manage the individual projects, related management costs were greatly reduced.

Seven is beneficial to the project management and the cultivation of talents. The working model and not too much reliance on PMC and the EPC, although this increases the workload of headquarters command with the owners, but the owners cultivate a large number of project managers with practical experience, the follow-up project construction is very important (Guo Yurong,2010).

Eight is to improve the IPMT of asymmetric information. By introducing a variety of service organizations, IPMT through multi-channel access to project information. Analysis and comparison of information through different channels, can effectively solve large-scale projects, problems of asymmetric information by various stakeholders.

Restricted by various factors, "command control +EPC composite" pattern in the implementation phase of the project has the following disadvantages:

First IPMT between owners and non-contractual relationship is the key link of administrative relationship. Specific project management responsibilities will be handed over to the owners relied on is not a contract but rather administrative authority and the administrative authority does not have the substantive claims in contract mechanism and, therefore, this may affect the implementation of responsibility.

Second PMC responsibilities is not easy to define, the effect may be limited. PMC is defined as a lightweight PMC management cost savings, but fewer management obligations it will accordingly, it cannot be clearly defined responsibilities, which is not conducive to playing PMC 's role in the project.

Third, the high requirements on the supervision work. Supervision of company is defined as a large, relative to the traditional sense of the supervision company expanded its functions – part of management. Supervision of this aspect will bring the company's management evaluation difficult question, on the other hand higher requirements on chemical supervision company project management skills.

4.5 "IPMT control +EPC composite" pattern of practice

Practice of construction of major petrochemical projects in China with less experience, through the introduction of external capital and the introduction of advanced fossil technologies and advanced management techniques. In the 90 's of the last century, petrochemical engineering management mode is still dominated by foreign parties, "PMC+EPC" mode, such as the Yangtze - BASF integrated project (referred to as YPC). Starting from Shanghai Secco project, China's petrochemical projects builders began to explore with Chinese characteristics "IPMT control +EPC composite" model, and success. YPC project planned 60 million ton / year ethylene production capacity, Secco project planned 60 million ton / year ethylene production capacity, planned a total investment of 208.28 million, actual investment 204.78 billion; construction period of 36 months project management cost 10.8 billion; engineering commissioning successful site continuous safe man hours to 1700 hours. Secco project planned 90 tons / year ethylene production capacity, actual investment of 198.59 billion; construction period is 26 months project management cost 7.5 billion; the same is engineering a successful commissioning project site continuous safe man hours 1700 hours. The successful management experience rapid promotion in the industry.

5 Conclusions

Petrochemical industry provides a lot of necessities of life for the people, provides a large number of raw materials for industrial production, is one of the basic industries of the national economy. Life provides a number of basic raw materials. It has important significance on the development of China petrochemical industry.

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Impact of Personal Innovativeness of Information Technology on Intention to Use Social Networking Sites

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Abstract: This study empirically investigates the impact of personal innovativeness on Intention to Use (IU) Social Networking Sites (SNS).The theoretical perspective of Technological Acceptance Model (TAM) and Personal Innovativeness of Information Technology (PIIT) were used to explain the relationships developed in the study. This research is descriptive in nature and based on primary data collected through a self-administered questionnaire, administered to a sample of 216 undergraduates in Sri Lanka. Findings reconfirmed the relationships in original TAM, enabling to use TAM in SNS context. Further, we found PIIT is significant in predicting IU SNS. Theoretical and practical implications of these findings and directions for further research are discussed.
Key Words: Social Networking Sites (SNS); Personal Innovativeness of Information Technology (PIIT)

1 Introduction

The recent revolution of Information technology has diffused Social Media widely among the human beings. This has created ample of opportunities to marketers, to communicate with their global customers while provoking researchers to do research on social media.Kaplan and Haenlein (2010) have categorized social media into six categories by considering social presence/media richness and self-presentation/self-disclosure as follows. Blogs, collective projects (Wikipedia), social networking sites (Facebook), content communities (You Tube), virtual social worlds (Second Life) and virtual game worlds (Word of Warcraft). Current study focuses only on SNS.

TAM is one of the well-researched models and was developed to predict how individuals adopt and use new ITs. This model explains that, intention to use IT depends on two beliefs: Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU) (Venkatesh & Bala, 2008). Since SNS is a new technology, scholars have used TAM to understand the acceptance of SNS by individuals (Acarli & Sağlam, 2015; Choi & Chung, 2013; Rauniar, Rawski, Yang, & Johnson, 2014).User will consider how easy it is to use SNS and to what extent it supports to achieve their SNS related needs when accessing the SNS(Rauniar et al., 2014). Therefore, we use TAM as the main theoretical framework to describe the IU of SNS. Consumer innovativeness is significant in accepting internet based new technologies (Aldás-Manzano, Lassala-Navarre, Ruiz-Mafe, & Sanz-Blas, 2009; Ratten, 2014). Therefore, current study incorporates PIIT to the TAM. We have selected only one SNS called Facebook, since it is the largest multilingual SNS   (Grosseck, Bran, & Tiru, 2011) and most interested SNS among researchers due to its high usage and technological feasibility(Ellison, Steinfield, & Lampe, 2007).Further, it is the most famous SNS among young Sri Lankans who will be the   next generation of mass consumers.

A momentous body of research in technology acceptance has gathered evidence, supporting the importance of PEOU and PU in acceptance of SNS. Although there is a large body of research on these constructs, very little work has been done to understand the impact of PIIT on acceptance of SNS. Social media is one of the most powerful innovative media in the century(Lee & Ma, 2012) and PIIT is significant in accepting innovative technologies. Thus, we argue that there should be a considerable impact of PIIT on SNS acceptance and this will be worth exploring.

This study attempts to present an in-depth study with the objective of developing comprehensive model to understand the IU, SNS based on TAM. In order to achieve above objective, we incorporate a new construct to TAM called PIIT and examine the impact of PIIT on IU, SNS.

The rest of the paper is organized as follows. Section I is the development of the conceptual framework by focusing on the rationale of the constructs and hypotheses development. Section II includes the methods used in the study. Validity and the reliability of the constructs are discussed in this section. Following methodology, data analysis and findings are presented with the answers to the research questions. Finally, discussion and conclusion are presented with the managerial implications and directions for future research.

2 Theory, Hypothesis Development and Conceptual Framework

2.1 SNS

SNS are "Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system"(Boyd & Ellison, 2007, p. 211).According to Kim, Jeong, and Lee (2010, p. 216) SNS are "Web sites that make it possible for people to form online communities, and share user-created contents" . Further,   it can be identified as "online communities that focus on bringing together people with similar interests or who are interested in exploring the interests and activities of others"(Marcus & Krishnamurthi, 2009, p. 59).These online networks have different objectives such as friendship-oriented SNSs (Facebook) ,professional-oriented SNSs (LinkedIn)(Shneor & Efrat, 2014) and they do not rely upon face to face encounter as it was in traditional social networks. In SNS some friends are second-order friends (friends of friends) or more than that, sometimes they have never met or not have any idea to meet(Clemons, 2009).

2.2 TAM

There are a number of theoretical models used by scholars to study user acceptance and usage behavior of new technologies. However, TAM is the most widely applied model in this regard (Venkatesh, 2000) and it is a valuable instrument for predicting intention to use information systems(Szajna, 1996). TAM model was developed by Davis (1986) based on the theoretical foundation of the theory of reasoned action (TRA)   (Fishbein & Ajzen, 1975). TRA explains general human behavior while, TAM particularly explains the determinants of computer acceptance (Davis, Bagozzi, & Warshaw, 1989).According to TAM   PEOU,PU   are the   basic antecedents for developing   Attitudes toward technology (A) , Intention to Use (IU) and   finally actual usage (AU) of technology(Choi & Chung, 2013). PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance(Davis, 1989, p. 320) and PEOU, in contrast, refers to "the degree to which a person believes that using a particular system would be free of effort"(Davis, 1989, p. 320).Venkatesh and Davis (1996) analyzed the antecedents of PEOU, without A (Rondan-Cataluña, Arenas-Gaitán, & Ramírez-Correa, 2015)

Over time, the TAM model has been changed twice as TAM2 (Venkatesh & Davis, 2000) and TAM 3 (Venkatesh & Bala, 2008). TAM 2 includes social influence processes and cognitive instrumental processes (Rondan-Cataluña et al., 2015). TAM 3 came up with antecedents of PEOU.   Rauniar et al. (2014) have modified the TAM to explain the acceptance of social media technology and came up with a model called revised TAM. It includes more constructs relevant to social media acceptance (critical mass, capability, perceived playfulness and trustworthiness).

2.3 TAM and SNS acceptance

In order to be compatible with social media, general definitions given to the constructs in TAM changes as follows. PU can be defined as the "extent to which the social media user believes that using a particular social media site helps to meet the related goal-driven needs of the individual"(Rauniar et al., 2014, p. 10) and   PEOU as the "degree to which the social media site is free of effort"(Rauniar et al., 2014, p. 11). PEOU is a leading antecedent in explaining PU in accepting personal computers (Igbaria, Zinatelli, Cragg, & Cavaye, 1997)**.**Liu (2010)added empirical evidence to prove positive relationship between PEOU and PU of wikis usage.The higher the consumer PEOU, the greater the PU of SNS (Pinho & Soares, 2011). According to Qin, Kim, Hsu, and Tan (2011)PEOU has a significant positive influence on the PU of SNS.Rauniar et al. (2014) also highlighted that   PEOU of social media site is positively related to PU. As per Choi and Chung (2013) PEOU was a fundamental determinant to PU of SNS.

PU is a key determinant of user's IU computers(Davis et al., 1989)**.** Liu (2010) concluded that PU of wikis has significant direct impact on IU. PU of social media is positively related to the IU of the social media site(Rauniar et al., 2014). Choi and Chung (2013) mentioned that PU has robust effects on IU of SNS .PU has a significant positive influence on the IU of SNS(Qin et al., 2011). However, a contrasting finding was introduced by Pinho and Soares (2011) that, there is no such relationship between PU of SNS and IU of SNS.

As per best of our knowledge, very few studies have examined the acceptance of SNS from TAM point of view. Based on the associations proved in the TAM for social media model, we propose the following hypothesis for SNS.

Hypothesis 1:   PEOU of SNS is positively related to PU of SNS

Hypothesis 2:   PU of SNS is positively related to IU the SNS

2.4 Personal innovativeness and technology acceptance

PIIT is a vital concept for understanding   the acceptance of information technology, and it can be defined as the , "*the willingness of an individual to try out any new information technology*"(Agarwal & Prasad, 1998, p. 206).Parasuraman (2000, p. 311) Identified it as a "*tendency to be a technology pioneer and thought leader*". As per Schillewaert, Ahearne, Frambach, and Moenaert (2005, p. 326), it is predisposition or attitude describing a person's learned and enduring cognitive evaluations, emotional feelings and action tendencies towards adopting new information technologies. Based on previous definitions, willingness of users to try SNS as a new media will be considered as "PIIT" in this study.

Joo, Lee, and Ham (2014) pointed out that PIIT has significant effects on PEOU of the technology. According to   van Raaij and Schepers (2008), it has a positive impact on PEOU of the system.Lewis, Agarwal, and Sambamurthy (2003)reported that PIIT has a significant positive influence on individual beliefs about the ease of use of a technology. Further,   Schillewaert et al. (2005) provide evidence to prove same relationship with a sample of salespersons

Hypothesis 3: **PIIT is positively related to PEOU of SNS**
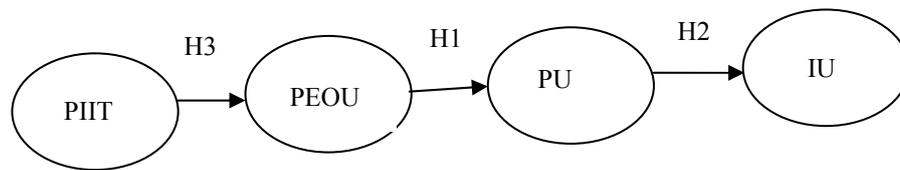
Figure 1   Conceptual Framework

3 Methodology

3.1 Data collection and participants

For the empirical study, 400 questionnaires were distributed among selected students in the lecture rooms and completed questionnaires were collected on the following day. These students were full-time students at a state university in Sri Lanka. Self – Administered questionnaire, containing closed ended questions, was used as the data collection tool. First section consisted questions to measure the main constructs with Likert type scale questions where respondents had to make their level of agreement such as, Strongly Agree, Agree, no idea, Disagree and Strongly Disagree. Scores of 5, 4, 3, 2, and 1 were assigned respectively for above mentioned categories. Questionnaires were in English. However, only 251 questionnaires were submitted and 35 questionnaires were dropped due to the incomplete answers. Finally, 216 questionnaires were used in analysis resulting in a response rate of 54% (217/400). Next section of the questionnaire consisted of questions related to demographic factors.

From total sample 42.4% were male and 57.7 % were female students. Majority of the students (46.3%) are using Internet less than one hour per day. Further, 51.4% respondents have more than 3 years' experience with the social media sites. Moreover, 25.5% have 101- 250 social media friends and 35.2 % respondents use social media 0-2 hours per week.

3.2 Measures

All constructs in the study involved multiple items. Content validity of the study was assured thorough literature review and expert opinion (academics, industry researches). Further, a pilot survey was conducted to test the questionnaire.   All items included in the questionnaire were suitable for further proceeding.   Measurement scales used in the current study were adopted from past studies including   PEOU (Rauniar et al., 2014), PU (Choi & Chung, 2013; Rauniar et al., 2014), IU (Choi & Chung, 2013) and IU(Agarwal & Prasad, 1998) .   Since the study adopted scales from number of previous studies, factor analysis was done to verify the underlying structure of the variables before it proceeds with further analysis.

4 Results

PLS was used with SmartPLS 3 software to test hypothesis and estimate path models involving latent variables which is observed through multiple indicators. Reliability and validity were ensured by cronbach's alpha, composite reliability (CR), factor analysis, and average variance extracted (AVE). Coefficient alpha is the widely used reliability coefficient in social-science research (Green, 2003[35]). As shown in Table 1 all alpha values are above 0.7 for all constructs indicating good internal consistency of the items in the scale (Gliem & Gliem,2003). Further; composite reliabilities of the five scales are higher

than 0.7 which is satisfactory level.

Table 1   Properties of Measurement Constructs

Construct	Items	Measurement Variables	Loadings	Mean	SD	AVE	CR	α
PEOU				3.45	0.67	0.562	0.793	0.716
	PEOU1	Facebook is flexible to interact with	0.793					
	PEOU 2	I find it easy to get Face Book to do what I want to do	0.745					
	PEOU 4	I find Face Book easy to use	0.708					
PU				3.50	0.66	0.551	0.786	0.794
	PU2	I find Facebook useful in my personal life	0.772					
	PU3	Using Facebook enhances my effectiveness to stay in touch with others	0.695					
	PU4	Using Facebook makes it easier to stay informed with my friends and family	0.757					
IU				3.32	0.76	0.570	0.797	0.729
	IU1	I will continue to use Facebook in the future	0.875					
	IU2	I will continue to increase my use of Facebook	0.730					
	IU2	I will continue to use Facebook whenever possible	0.642					
PIIT				3.38	0.70	0.605	0.820	0.795
	PIIT1	If I heard about a new information technology, I would look for ways to experiment with it	0.856					
	PIIT2	Among my peers, I am usually the first to try out new information technologies	0.69					
	PIIT4	I like to experiment with new information technologies	0.779					

Note: All items shared a common prompt: ''Indicate how much you agree with each option by marking the appropriate response'' and were measured with a 5-point Likert-type scale ranging from ''Strongly Disagree'' to ''Strongly Agree.''

Convergent and discriminate validity were ensured by factor analysis since it is widely used method for this purpose. Factor analysis provides the tools for analyzing the structure of the correlations with many variables and highly correlated variables are called as factors (Hair, 2006) Kaiser-Meyer-Olkin (KMO) value measures the sampling adequacy for factor analysis. If it is in the .90s— marvelous, in the .80s — meritorious, in the .70s — middling, in the .60s — mediocre, inthe .50s — miserable, below .50 — unacceptable (Dziuban, Charles &Shirkey, Edwin,1974). Bartlett test of sphericity is "statistical test for the overall significance of all correlations within a correlation matrix factors" (Hair, 2006). KMO value was .815 and Bartlett's Test of Sphericity was significant in giving evidence that the data were generally appropriate for factor analysis. Table 1shows all factor loadings are at a higher level and lowest value was 0.642 which is higher than satisfactory level. Further, AVE for all scales were higher than 0.5 (Table 1) which is the minimum level recommended by Fornell & Larcker (1981).

Standardized parameters for the research which were obtained by bootstrap simulation were used to test the hypothisis. The results from the PLS indicate that three hypotheses were supported by empirical evidence, at p<0.05 significant level (Table 2). The first hypothesis suggested that there is a positive relationship between PEOU and PU. The Path coefficient of 0.501was found to be statistically significant at p<0.05. Second hypothesis was   PU of SNS is positively related to IU the SNS, which was supported at 0.05 significant level (β.401) at p<0.05. Third hypotheses were supported with standardized coefficient values of 0.254.

Table 2   Summary of Hypotheses Testing Result

* Significant at 5% for the two-tailed test (>1.96).

Relationship		Hypotheses	t-Value	Path coefficients	Conclusion
PEOU →	PU	H1	8.944*	0.501	Supported
PU →	IU	H2	6.691*	0.401	Supported
PIIT →	PEOU	H3	3.060*	0.254	Supported

5 Discussion

This research examines the impact of PIIT in IU of SNS among undergraduates. As explained, the TAM by itself may not be good in explaining the SNS acceptance that became a revolution in past decade. Revised TAM for social media developed by Rauniar (2014) has not considered PIIT despite the fact that it is an essential human feature in accepting new technology. As such, this study incorporates PIIT to the main constructs in TAM based on revised TAM for social media.

Our first hypothesis which assumes that there is a positive relationship between PEOU of SNS and PU of SNS has been proved by empirical evidence. This finding is concurring with Rauniar (2014) which assume same relationship in revised social media model and number of other scholars such as Liu (2010), Qin et al., (2011) proved with different technologies. Then we assume positive relationship between PU of SNS and IU SNS. There was sufficient evidence to accept this hypothesis supporting Rauniar (2014) in a developing context. Further, this finding is in agreement with some previous studies (Davis et., al 1989, Liu ,2010, Choi & Chung 2013). Our third hypothesis assume positive relationship between PIIT and PEOU that originally incorporate to the social media acceptance model was proved supporting Joo et., al (2014), Van Raaij&Schepers (2008) and Lewis et., al (2003).

6 Conclusions

Based on empirical evidence, current study contributes for the development of social media literature in the area of SNS acceptance. As explained earlier data were collected in new context which is a lower middle income country with a 20,639,000 population[1]. Currently there are 4.79 million internet users and 2.80 million active social media accounts and its penetration is 14%[2].

This is the first study which incorporates PIIT to the social media acceptance model through adopting scales from existing literature. Indicators were validated through proper validity and reliability techniques providing an opportunity to replicate them in future studies. This is a significant contribution for social media theory and future researches. Result reconfirmed relationship in original TAM (H1, H2, and H3) and revised TAM for social media (Rauniar, et.al (2014) enabling to use TAM in social media context. However, we found that PIIT is significant in predicting PEOU of SNS. If users are less in PIIT then they will not perceive SNS as an easy medium for their communication activities. This means they still rely on traditional communication mediums.

In this study, we developed a comprehensive model to understand the acceptance of social media among young adults (undergraduates) in a developing context. Along with the development of technology, most Sri Lankan companies tend to use social media marketing strategies to communicate with their customers. In order to get maximum benefits from social media, marketing managers should have a clearer idea about the advantages and disadvantages of it. For these reasons, we hope that findings of this study will be a useful guideline for both academics and practitioners.

Though, the findings include valuable insights about SNS acceptance, there are some limitations. The participants of this study were students from a single faculty which represents a sub-culture;

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[2] Wearesocial, [I]. Retrieved on 12th March 2016 from http://wearesocial.com, 2016

therefore, they may hold similar norms and beliefs. It is important to study norms and beliefs of that group to conduct a deep study. This will help to get an understanding of how it affects their SNS acceptance. Even though SNS is a global phenomenon, it is constrained by local conditions such as culture (wijesundara, 2014). As such future, researchers' can use this model for cross cultural comparison. There are many SNS such as LinkedIn, Twitter, we chat and Face Book. However, in this study, we selected only the Facebook. In order to get deeper knowledge about SNS, it better to study this model with other SNS. Only young adults were recruited as our respondents although other demographic groups are also growing fast. Future studies should take in to account of more age groups since age can be important factor in accepting SNS.

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Simulation Research of Regional Logistics and Economic Development of Wuhan Based on System Dynamics

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Abstract: Development of logistics industry is a major indicator used for measuring the economic development level and modernized level of a region, and also is one of basic power to promote the development of regional economy. On the basis of system dynamics and combining with the related data about Wuhan in terms of economic and logistics from 2006 to 2013, the paper makes analogue simulation on the problems of logistics and economic development of Wuhan through SD model, and conducted the test analysis with Vensim PLE software. Finally, the paper concludes that the economic development of Wuhan stimulates the growth of the logistics demand, but insufficient supply capacity will cause economic barriers. The supply and demand balance of logistics, therefore, not only promote the coordinated development of economy, but also propose effective ways and thinking for the development of the logistics system.

Key words: System dynamics; Regional logistics; Regional economy

1 Introduction

Regional logistics is an important component of regional economy and its industrial added value is part of added value of regional gross domestic product (GDP). In regional economy, the development of logistics industry profoundly influences the technical renovation and upgrade of other industries (Poreddy,2016; Hsu,2016). Besides, the development of the regional logistics also affects regional economic in turn. They are closely linked and interact with each other (Chow,2007; Trappey,2011; Oumer,2006). Therefore, to clarify the mutual relation between regional logistics and regional economy and summarize the function mechanism of the regional logistics to regional economic is of great significance for the harmonious development of regional economy and regional logistics.

A lot of scholars at home and abroad have researched and analyzed the relationship between the regional logistics and regional economy. From the aspect of costs and benefits, smooth logistics management can promote the development of economy, while urban traffic congestion can inhibit the local economic development (Rienstra, 2010; Weisbrod, 2013; Kopits, 2015). Large logistics enterprises can promote the vitality of market logistics system, because they can reduce the logistics cost, improve logistics efficiency and enhance the development of the whole logistics industry through their own internal adjustment and change (Cooper, 1997). From the perspective of the government, scholars have emphatically analyzed the important factors such as government subsidies, facilities financing, transportation and regional trading rules, global production and distribution network in the enterprises tax law (Bloemhof, 1997). For the point of view of research methods, many scholars use DEA model to study the efficiency of regional logistics (Zhang Cheng, 2000; Fan Yuejiao, 2007; Liu Ping, 2015). Liu Weilin (2011) conducts model design and simulation demonstration on the dynamic relationship between regional logistics system and regional economic growth and coupling structure with the method of complex system, by taking Tianjin Binhai New District as a case. Mr. Liu thinks moderate advance of logistics can slow regional economic growth in the short term, but can significantly increase regional economic growth in the long run. From the perspective of the exploratory spatial data analysis, Fan Yuejiao (2012) establishes spatial econometric model and executes specific quantitative inspection and analysis on the relationship between the two. Since the regional logistics system is non-linear, the theory and method of linear system used to describe the regional logistics system it is difficult. Besides, due to the multiple feedback and the long time lag in the regional logistics system, it could hardly master and track the development and changes in the social system by means of intuitive experience. Accordingly, using system dynamics to study large complex systems is reasonable and can be helpful to construct non-linear, multiple feedback and long time-delay dynamic model based on the causality of the social system.Based on the characteristics of system dynamics tools, the paper built the model that is as close to the reality so as to simulate the relationship between logistics and

economy of Wuhan, and found the suitable path for the coordinated development of regional logistics and regional economic through studying the impact brought by the different industrial policy changes to the system as a whole.

2 Analysis of System Dynamics of Logistics Industry of Wuhan and the Industrial Structure

2.1 System dynamics model of logistics of Wuhan and industrial structure

The relationship between logistics industry and industrial structure of Wuhan is an integrated complex and open system: logistics industry is a part of the industrial structure and its development is under the restriction of the other industries; at the same time, logistics industry plays important roles in promoting economic development and adjusting industrial structure. There are internal factors including people, government and environment in the system, and they are dynamic and mutually influence. The system dynamics structure model of relation between logistics industry and industrial structure of Wuhan is shown in Fig 1:
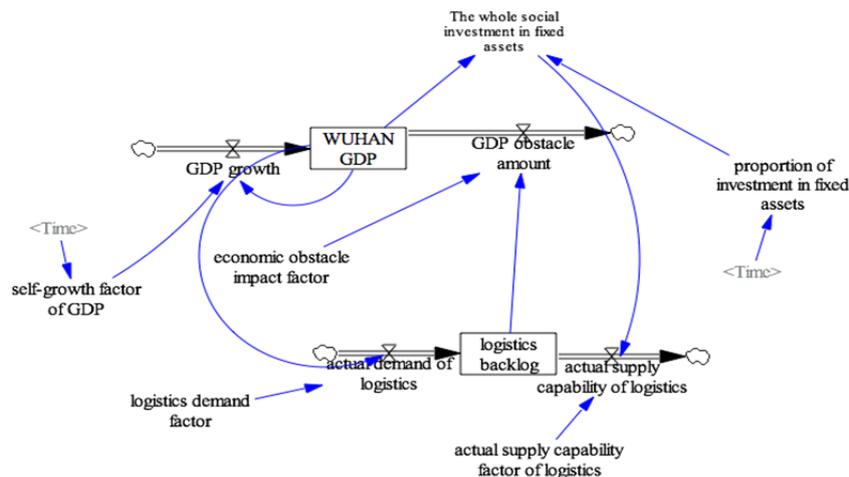
Figure 1   System Dynamics Structure Model of Logistics Industry and Industrial Structure of Wuhan

In Figure 1, the level of economic development is measured with GDP of Wuhan. GDP is the best indicator of economic conditions. The main influencing factors of GDP growth include investment degree, labor and technology progress. Economic obstacle is used to denote the obstacle degree of logistics industry development to economy and it is mainly affected by economic obstacle factors and logistics backlog. When the growth of the actual demand of logistics is faster than supply capacity, logistics backlogs will emerge. Poor logistics supply capacity will severely hinder the development of economy.

2.2 SD equation and parameters description

According to the Figure 1, the correlation between the variables in the model was determined; the equation and parameters were expressed with the following index data.

1) Wuhan GDP = INTEG (GDP growth - GDP logistics obstacle amount, initial value).

2) Self-growth of GDP = GDP * self-growth factor of GDP.

3) Self-growth factor of GDP = the table function of self-growth factor of GDP.

4) Logistics obstacle amount= logistics backlog*economic obstacle impact factor.

5) The whole social investment in fixed assets = WU HAN GDP * proportion of investment in fixed assets.

6) Logistics backlog= INTEG (actual demand of logistics – actual supply capability of logistics, initial value)

7) Actual demand of logistics= GDP of Wuhan * logistics demand factor.

8) Actual supply capability of logistics= the whole social investment in fixed assets* actual supply capability factor of logistics

9) Determination of other parameter values. According to the data statistics of the impact logistics of Wuhan in recent years on its national economy, it was assumed that economic obstacle impact factor was 0.015; according to the domestic economic environment, it was assumed that 80% of logistics

demand generated by economic level was converted to the actual demand; the conversion factor of logistics demand was 0.8; logistics supply capacity factor was 0.7; the logistics demand coefficient was 0.13.

10) Self-growth factor of GDP and table functions. Self-growth factor of GDP denotes the growth rate of GDP of the current year relatively to the previous year under natural conditions. According to the GDP of Wuhan, the growth rate of GDP from calendar year of 2006 to 2013 was calculated, as shown in Fig 2.
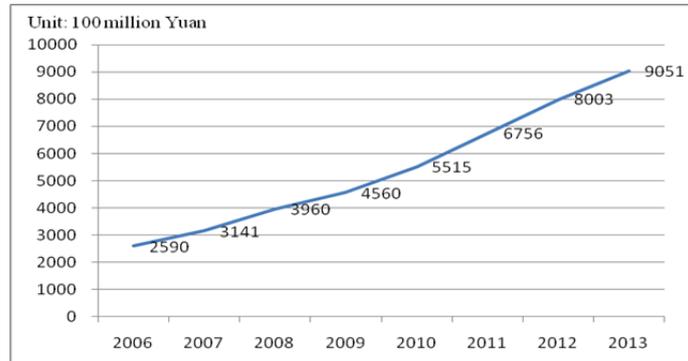
Figure 2   GDP Growth of Wuhan from 2006 to 2013

In recent years, the growth rate of GDP of Wuhan has been 10%~25% and showed an overall rising trend. Because the economic obstacles to the logistics restricted the GDP growth, the actual growth rate was slightly lower. GDP growth factor of Wuhan was set: GDP growth factor = WITH LOOKUP (TIME, [(2006, 0)-(2020, 1)], (2006, 0.21), (2007, 0.2), (2008, 0.15), (2009, 0.2), (2010, 0.22), (2011, 0.18), (2012, 0.12) and (2013, 0.12)).

11) Factor of proportionality of investment in fixed assets. By referring the data of Wuhan from 2006 to 2013, a table function was established and the GDP of Wuhan was set as the independent variable, and the coefficient of investment in fixed assets was set as the dependent variable. Factor of proportionality of investment in fixed assets = WITH LOOKUP (TIME, [(2006, 0)-(2020, 1)], (2006, 0.5), (2007, 0.5), (2008, 0.56), (2009, 0.65), (2010, 0.68), (2011, 0.62), (2012, 0.62) and (2013, 0.66)).

2.3 SD model simulation and analysis

The change tendency of the GDP of Wuhan was analyzed by changing the economic obstacle factor value. The economic obstacle impact factor in Scheme 1 was 0.015; the economic obstacle impact factors in Scheme 2 and Scheme 3 were set as 0.02 and 0.03 respectively. GDP simulation results were shown in Fig 3.
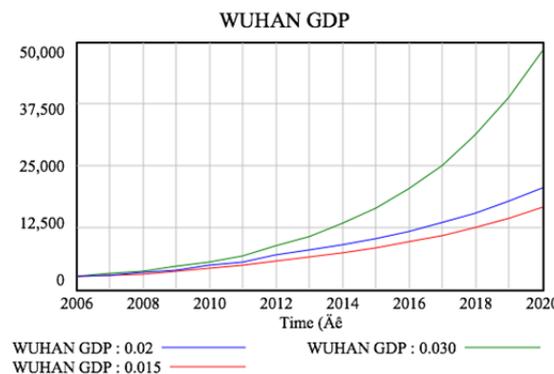
Figure 3   Simulation Results of Different Economic Levels on GDP of Wuhan

According to Figure 3, the simulation results of Scheme 2 had the minimum actual deviation, while the GDP that economic relevance correspond to in Scheme 1 and Scheme 3 had relatively large deviation. Therefore, the correlation coefficient of scheme 2 was more in line with the actual situation and then the economic obstacle amount was adjusted to be 0.02. Similarly, by assuming other variables constant, the conversion factor of actual demand of logistics was changed on the basis of the scheme 2. The results showed that the logistics industry could create more economic value and the biggest GDP, or

have the best effects on the economy of Wuhan and promote the economy to the greatest degree when the entire ability of logistics demand, was satisfied.

3 Conclusions

1) Increasing the proportion of investment in logistics fixed assets can promote logistics supply capacity which means the development of logistics playing a positive role in promoting economic growth. At the same time, it should be noted that such initiatives will likely lead to an oversupply situation in the future for a long period of time, or even result in idle and waste of resources. Therefore, it is significant to grasp the investment proportion of logistics fixed assets. At present, Wuhan logistics demand has developed rapidly. The development of economy can greatly promote the actual demand of the urban logistics, and also enhance the urban logistics supply capacity. Thus, to increase the investment in fixed assets can better improve the logistics supply capacity and reduce logistics backlogs.

2) When all ability of logistics demand is satisfied, logistics industry will create more economic value, and the largest GDP. In order words, it will have the best effect on economy of Wuhan and the most greatly promote the economy of Wuhan.

3) Currently, Wuhan has had a certain scale and system of logistics infrastructure, but there is a certain space for improvement and it urgently needs to strengthen the efficiency of logistics infrastructure. In addition, Wuhan needs to improve logistics technology, especially logistics informationization level. Besides, the system involves many parameters and the change of some key parameters will greatly change the running of the system, so people should further study relevant quantitative indicators and improve the effect of the simulation in the future researches.

Acknowledgement

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Man-Hour Comparison Between Two Methods of Agile and Waterfall in IT System Development

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Abstract: There are two IT system software development methods named Waterfall and Agile. By the Waterfall, software making starts after all requirements definition of the system is completed. By the Agile software making starts when one of the functions is completed in the system requirements definition. Use of the Waterfall is, but the Agile is sometimes used recently. There is very few research about the man-hour comparison between the Waterfall and the Agile. In this paper, man-hour of the Waterfall and the Agile is compared taking into account the man-hour reduction in the system requirement definition and the man-hour increase in the software making for the Agile. As a result, followings are made clear that 1) The Agile development is advantageous in the case of man-hour reduction in the requirements definition > rework man-hour. 2) In other cases, Waterfall is advantageous. This result surely gives the guideline for the selection of the Waterfall and the Agile.
Key words: IT system; Software development; Agile; Waterfall; Man-hour

1 Introduction

Reduce man-hours in IT system development is an extremely important issue. System development processes consist of those for a system requirements definition and for software development.

1) In a system requirements definition phase, engineers are assigned so as to complete a definition process adequately.

2) In a software development phase, software engineers are assigned so as to complete software development adequately.

There are two major development methods named Waterfall and Agile. In the Waterfall method, the number of engineers assigned for the system requirements definition does not change until the definition completion. As the system requirements are completely defined, software development proceeds very smoothly. In the Waterfall, long time requirements definition causes an increase in man-hours as the initially assigned engineers engage the whole definition process.

In the Agile method, when some requirements definition is completed, software development starts to realize the function whose requirements definition is completed.

Hence, the number of the engineers for requirements definition can be reduced resulting in a man-hour reduction. However, the software developed in advance are sometimes subject to be required to modify by the software developed later. This results in a man-hour increase.

Which is better to reduce man-hours, the Waterfall of the Agile?

To answer the above question, it is necessary to compare man-hours quantitatively between the two.

Up to now, no report can be searched among the preceding research works.

This paper aims to formulate and calculate the man-hours in two methods and to compare the man-hours between the two.

2 Preceding Research Work

The research with which Waterfall and Agile were compared are as follows.

Balaji et al. describe about Waterfall and Agile and analyzes the pros and cons of comparing two software development modelling (S. Balajiet al,2012). The major pros and cons of Waterfall are follows. Pros: requirement is clear before development starts and Cons: the problems with one phase are never solved completely during that phase. On the other hand, Agile are follows. Pros: The most important of the advantages is the ability to respond to the changing requirements of the project and Cons: If it is large, it becomes difficult to judge the efforts and the time required for the project.

Austin highlights, describes and compares both methods of CMM and Agile software development in the fictional company in the Harvard Business Scholl case (R. D. Austin,2007). He explains that

CMM proponents point to the fact that some of the best software organizations in the world use it on their most important projects. On the other hand, Agile advocates suggest that there is a management movement as much as it a development strategy. The keys to Agile are collaboration and commitment in the development team.

White reviews several system dynamics models of the requirements process from the literature(A. S. White,2013), especially the model of Andersson and Karlsson (C. Andersson,et al,2001). He proposes a new control-theoretic model of requirements gathering that is devised using the Software Test Model of Cangussu (Ä. W. Cangussu,et al,2002) as a framework. His result shows that the model can be used to predict an estimate of the possible number of requirements that could be devised for the project. His model can be used to operate in Waterfall, iterative or incremental (Agile) modes by suitable choice of parameters, such as the total number of requirements set at each stage and the number of staff involved.

Indicated above, there are no report which quantified and compared the man-hour of Waterfall and Agile.

3 Formulation and Calculation of Man-Hours
3.1 Setting of prerequisite
Prerequisites are clarified for the formulation and calculation of man-hours as in the following.

1) The IT system development man-hours are defined as the sum of those for the system requirements definition and for the software development.

2) The IT system consists of plural functions.

3) The number of engineers assigned for the requirements definition is as follows.

a. In the Waterfall, the number of engineers does not change from the beginning to the end of the requirements definition,

b. In the Agile, the number of engineers is reduced every time when one of the requirements definition is completed.

4) The software development starts after the full completion of all of the requirements definition in the Waterfall. In the Agile, it starts partially from the software whose requirements definition is completed.

3.2 Man-hour formulation
Here are symbols used in this section.

N: Number of the system functions to develop

R: Total man-hour spent for the completion of requirements definition in the Waterfall

K: Number of engineers assigned for requirement definition

L: Hours spent for requirement definition completion

I: sequential number of system function, $1 \sim n$

Ri: man-hour spent for the requirements definition of the system function i

Di: man-hour spent for the software making of the function i

P: total man-hour spent for the completion of requirements definition in the Agile

rt: development rework rate

3.2.1 About the waterfall

1) Man-hour for the requirements definition

The number of the functions to be developed was labeled as N. The man-hours (Ri) necessary for requirements definition were expressed as: R1, R2, R3, - -, Rn.

About R: the total requirements definition man-hour

$$R = \Sigma Ri \tag{1}$$

Also About R: the total requirements definition man-hour

$$R = K * L \tag{2}$$

2) Man-hour for the software development

Development man-hours (Di) were calculated after the requirements were defined, and were expressed as: D1, D2, D3, - -, Dn.

About D: the total development man-hour

$$D = \Sigma Di \tag{3}$$

3) Total development man-hour

Normalization of R values was conducted assuming a requirement-definition man-hour (R1) equal to 1. D values were rather normalized against a development man-hour (D1) of 3.5. Consequently,

man-hours of requirements definition and development were found to be in the range of 0.6 - 1.4 and 1.5 - 5.5, respectively. Man-hours of requirements definition were defined as the man-hours needed during the "requirements definition phase". Man-hours of development referred to the man-hours needed for basic system design, program design, programming and the program unit test phase.

The sum of the man-hours of Waterfall are calculated based on the following equation:

4) Total development man-hour

Normalization of R values was conducted assuming a requirement-definition man-hour (R1) equal to 1. D values were rather normalized against a development man-hour (D1) of 3.5. Consequently, man-hours of requirements definition and development were found to be in the range of 0.6 - 1.4 and 1.5 - 5.5, respectively. Man-hours of requirements definition were defined as the man-hours needed during the "requirements definition phase". Man-hours of development referred to the man-hours needed for basic system design, program design, programming and the program unit test phase.

The sum of the man-hours of Waterfall are calculated based on the following equation:

$$\sum_{i=1}^{n} Ri + Di \tag{4}$$

3.2.2 About the agile

1) Man-hour for the requirements definition

Let us take the 1st requirements definition man-hour to be K x L/N,

the 2nd requirements definition man-hour as (K - K/N) x L/N,

and the 3rd requirements definition man-hour as (K-2K/N) x L/N.

Every time one requirement definition ends, personnel are reduced. In this study, it is assumed that the requirements definitions for the man-hour of one function or a collection of functions are equivalent. In addition, it is developed from the function of solidified requirements, and there is no change in the requirements for the development that has been started, since it has already been verified.

From the above concept, the total requirements definition for man-hour of Agile development is the following equation:

$$(K - (i-1) \ K/N) \ * \ L/N \ (i=1, \ 2, \ 3, \ \ldots, \ N) \tag{5}$$

About P: man-hour spent for the completion of requirements definition in the Agile

$$P = \frac{\sum_{i=1}^{n} \left(K - \frac{(i-1)K}{N} \right) xL}{N} \tag{6}$$

2) Man-hour for the software development

Next, the necessary cases for rework in Agile development are listed as follows, while their countermeasures are considered:

①Rework is considered as the mutual use between the developed modules

Based on the above concept, the calculation method of rework of man-hour has to be examined, in which the design changes to the pre-developed modules by the definition of the other user requirements occurs after the development has been started as a user requirement has been defined. A module is a collection of programs to be developed. The Agile development man-hour in this case is calculated as the rework man-hour in consideration of the mutual use of the inter-developed module rather than a change of requirements. As shown in Table 1, the mutual design change percentage is given as a development rework rate a = 0 ~ 100% in the development man-hour Di = (D1, D2, D3, -, Dn).

a. Definition of rework rate rji

This rework rate is considered in i-th development rework rate that influenced by subsequent j-th software development.

b. Man-hour of development rework

For rework man-hour, the development man-hour is considered as Aij, in which j-th Agile development influences the i-th single Agile development man-hour Dii, so the rework man-hour for the i-th development man-hour is considered to be the following equation:

$$Aij \ (j = 1 \ \sim \ i-1, \ i + 1 \ \sim \ n) \tag{7}$$

For convenience, Aij occurs equally in all development stages of the requirements and is also calculated as following equation:

$$Aij = Di \ * \ rt \tag{8}$$

c. Total development man-hour

The sum of the man-hours of Agile are calculated based on the following equation:

$$P \ + \ \Sigma Aij \tag{9}$$

Table 1   Calculation Method of Rework Man-Hour in Agile Development

Items							Total man-hour
Number of functions (N)	N=1	N=2	N=3	·	·	N=n	
Number of requirements (Ri)	R1	R2	R3	·	·	Rn	
Man-hour of requirements definition	1	0.6-1.4	0.6-1.4	·	·	0.6-1.4	$\sum_{i=1}^{n} Ri$
Number of development (Di)	D1	D2	D3	·	·	Dn	
Man-hour of development	3.5	1.5-5.5	1.5-5.5	·	·	1.5-5.5	$\sum_{i=1}^{n} Di$
Total man-hour of Waterfall (Ri+Di)	4.5	2.1-6.9	2.1-6.9	·	·	2.1-6.9	$\sum_{i=1}^{n} Ri + Di$
Development rework rate (rt)	←──────── Rework ────────→						10%-100%
Rework man-hour (Aij)	D1*rt	D2*rt	D3*rt	·	·	Dn*rt	ΣDi * rt

As explained above, normalization of R value was conducted assuming a requirement-definition man-hour (R1) equal to 1, and ranged from 0.6 to 1.4. Normalization of D value was also conducted assuming a development man-hour (D1) equal to 3.5, and ranged 1.5 to 5.5. To date, almost no research has been conducted regarding to those value normalizations. These normalized values can be set freely in a simulation tool to be described later. In this study, we assumed these values from the empirical observation of the past (S. Komai,et al,2011)-(S. Komai,et al,2014).

②Rework for program error corrections discovered by system test

The systems test in Waterfall is generally conducted after the development, but the system test in Agile is conducted several times for every collection of requirements, and provides feedback with efficient improvements to the development work with the obtained knowledge or experience (H. Kniberg,2013). Regarding efficiency, the system test man-hour is added to Table 1, and it is possible to expand and consider in order simulating. However, the digitization of knowledge and experience are very difficult. When analyzing data while grasping the actual testing man-hour from many cases, it seems possible, and is considered as future work.

③Rework about compatibility of the middleware

This is the rework of the wasteful man-hour for the partially advanced development. It has been revealed that the usage of the middleware is improper as progress of requirements definition, and change to new middleware forms as the development progresses using the middleware. Since the development does not start until the requirements definition is completely settled in Waterfall, the wasteful development man-hour about the change of the middleware does not occur. However, a redo of the requirements definition about change in the middleware occurs equally. In addition, it is a difficult issue about the judgment and the timing, where the usage of middleware is improper. This point is also made an issue for future study.

The possibility of the following rework is said that all Waterfall is similar.

④Rework in the case of the rework above-mentioned 2) affects the other applications in development.

This occurs in the case of the association between subsystems is high and dividing the development team for each of the subsystems. Moreover, this is the rework which occurs under the conditions to develop it by more than one development team at the same time to one requirements definition.

⑤Rework to the requirements definition that has been discovered in the basic system design

⑥Rework for program error discovered on a program unit test

⑦Rework for program error corrections discovered on the user acceptance test

⑧Rework for program quality requirements improvement pointed out on the user acceptance test

⑨Rework for quality requirements improvement related program design, basic system design, and requirements definition

⑩Rework for program error corrections discovered in system test after a vendor offered middleware substitution for a middleware malfunction correction

⑪Rework between the middleware and application

As for the behavior when application (program) gives the middleware a parameter, the following two points are considered a parameter error.

It is included in a programing man-hour where middleware checks it and returns it to a programmer as an error b Mistake of the parameter Program error is often not found in the program unit test because middleware returns the wrong data when a programmer gives the middleware a wrong parameter. Therefore, it is discovered as a program error in the system test, user acceptance test, or the operational phase.

3.3 Calculation results

Therefore, rework man-hour of Agile development was considered the contents examined by the above item 4.5.1, then the following parameter were set in Agile Waterfall Simulation Table-I (AWST-I), which was built based on the manner of thinking explained by the above and a calculation result is gained.

N: number of functions = 60

R2 or later: the second and subsequent requirements definition man-hour = 1

D2 or later: the second and subsequent development man-hour = 3.5

rt: development rework rate = 12%

Table 2　Agile Waterfall Simulation Table-I

BJ17　=IF(BJ9<=C2,BJ9*C5*C6*C4,"")

A	C	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK
N	60														
R	1														
D	3.5														
a	0.4														
b	0.3														
K (Man Power)	15														
L (Month)	4														
Ni	1	48	49	50	51	52	53	54	55	56	57	58	59	60	
Ri	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Σ (i=1)ⁿ Ri	1	48	49	50	51	52	53	54	55	56	57	58	59	60	
Di	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Σ (i=1)ⁿ Di	3.5	168	171.5	175	178.5	182	185.5	189	192.5	196	199.5	203	206.5	210	
Ri+Di	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Σ (i=1)ⁿ Ri+Di	4.5	216	220.5	225	229.5	234	238.5	243	247.5	252	256.5	261	265.5	270	
Hand over	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	
Σ (i=1)ⁿ Aij	0.42	20.16	20.58	21	21.42	21.84	22.26	22.68	23.1	23.52	23.94	24.36	24.78	25.2	
Dit	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	
Σ (i=1)ⁿ Dit	3.92	188.16	192.08	196	199.92	203.84	207.76	211.68	215.6	219.52	223.44	227.36	231.28	235.2	
Total	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	
Σ (i=1)ⁿ Total	4.92	236.16	241.08	246	250.92	255.84	260.76	265.68	270.6	275.52	280.44	285.36	290.28	295.2	
(Nmax−N)*(Ri+Di)	265.5	54	49.5	45	40.5	36	31.5	27	22.5	18	13.5	9	4.5	0	
	60	13	12	11	10	9	8	7	6	5	4	3	2	1	
	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
Agile manpower	1	0.2167	0.2000	0.1833	0.1667	0.1500	0.1333	0.1167	0.1000	0.0833	0.0667	0.0500	0.0333	0.0167	
Σ agile manpower	1	29.2	29.4	29.58333	29.75	29.9	30.03333	30.15	30.25	30.33333	30.4	30.45	30.48333	30.5	
(K - (i-1)K/N) x L/N	1	0.2167	0.2000	0.1833	0.1667	0.1500	0.1333	0.1167	0.1000	0.0833	0.0667	0.0500	0.0333	0.0167	
Σ Agile manpower	1	29.2000	29.4000	29.5833	29.7500	29.9000	30.0333	30.1500	30.2500	30.3333	30.4000	30.4500	30.4833	30.5000	

Based on the above results, in the case of the requirements definition, man-hour Waterfall is 60 man-months, requirements definition man-months of Agile becomes 30.5 man-months, and man-months reduction in the requirements definition of Agile: the 60-30.5 = 29.5 man-months. On the other hand, the Agile rework man-hour in this setting value is 25.2 man-months. Thus, from this result the Agile development is advantageous to the extent that it holds the "man-hour reduction in the requirements definition > rework man-hour."

The above Table 2 Agile Waterfall shown in Simulation Table-I (AWST-I) was created to determine the suitability of Waterfall or Agile. Next, new table is created in which the number of functions is set in a constant, and R2 or later 0.6-1.4 (0.1 increments), D2 or later 1.5-5.5 (0.5 increments), and rt 10% -100% (10% increments) are set for changing by 8100 lines shown Table 3.

In this table, the calculation results are obtained as below in the range of the following settings.

R2 or later: the second and subsequent requirements definition man-hour = 1

D2 or later: the second and subsequent development man-hour = 3.5

Table 3 Agile Waterfall Simulation Table-II

N	R1	R2	ΣRi	D1	D2	ΣDi	Σwaterfall man-hour	a	b	ΣRij	ΣRi-ΣRij	ΣAij	ΣAgile man-Hour)	Agile - Waterfall Man-hour
60	1	1.0	60.00	3.5	3.5	210.00	270.00	10%	80%	30.50	29.50	16.80	257.30	-12.70
60	1	1.0	60.00	3.5	3.5	210.00	270.00	10%	90%	30.50	29.50	18.90	259.40	-10.60
60	1	1.0	60.00	3.5	3.5	210.00	270.00	10%	100%	30.50	29.50	21.00	261.50	-8.50
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	10%	30.50	29.50	4.20	244.70	-25.30
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	20%	30.50	29.50	8.40	248.90	-21.10
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	30%	30.50	29.50	12.60	253.10	-16.90
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	40%	30.50	29.50	16.80	257.30	-12.70
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	50%	30.50	29.50	21.00	261.50	-8.50
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	60%	30.50	29.50	25.20	265.70	-4.30
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	70%	30.50	29.50	29.40	269.90	-0.10
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	80%	30.50	29.50	33.60	274.10	4.10
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	90%	30.50	29.50	37.80	278.30	8.30
60	1	1.0	60.00	3.5	3.5	210.00	270.00	20%	100%	30.50	29.50	42.00	282.50	12.50
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	10%	30.50	29.50	6.30	246.80	-23.20
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	20%	30.50	29.50	12.60	253.10	-16.90
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	30%	30.50	29.50	18.90	259.40	-10.60
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	40%	30.50	29.50	25.20	265.70	-4.30
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	50%	30.50	29.50	31.50	272.00	2.00
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	60%	30.50	29.50	37.80	278.30	8.30
60	1	1.0	60.00	3.5	3.5	210.00	270.00	30%	70%	30.50	29.50	44.10	284.60	14.60

The man-hour calculation results of Waterfall are:

Total Requirements Definition man-hour of Waterfall = 60 Man-months

Total Development man-hour of Waterfall = 210 Man-months

Total software development man-hour of waterfall = 270 Man-months

The man-hour calculation results of Agile are:

Total Requirements Definition man-hour of Agile = 30.5 Man-months

Rework is increased depending on Development work change rate (a) x Development work influence rate (b) from 2.1 man-months to 210 man-months.

The graph is created from the above calculation result as follows.
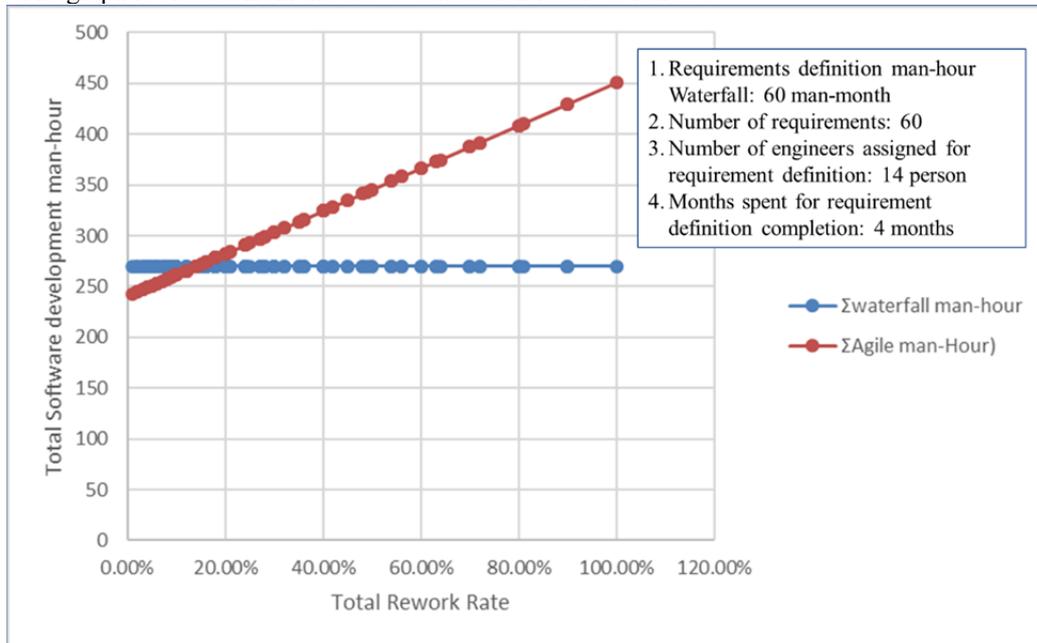
Figure 1 Man-hour Comparison of Waterfall and Agile

4 Discussion

4.1 Conditions that Waterfall is advantageous

A parameter in Table 2 was changed, and the condition that Waterfall becomes profitable was examined. If the Waterfall is advantageous, it is in the range that holds true man-hour reduction (29.5 man-months in Table 2) = < total rework man-hour in the requirements definition of Agile. The following list presents the conditions.

5.1.1 Condition 1: In the case of fixing requirements definition man-hour and development man-hour, then setting rt: development rework rate highly.

For example, Waterfall becomes advantageous in the case of Agile rework man-hour becomes 33.6 man-months for rt: development rework rate = 16%.

5.1.2 Condition 2: In the case of fixing rt: development rework rate, then setting development man-hour of D2 or later highly

For example, Waterfall becomes advantageous in the case of Agile rework man-hour becomes 32.4 man-months for development man-hour of D2 or later = 4.5.

5.1.3 Condition 3: Hybrid type of above condition 1 and 2

For example, Waterfall becomes advantageous in the case of Agile rework man-hour becomes 36 man-months for the development man-hour of D2 or later = 4, rt: development rework rate = 12%.

4.2 Validation of IT system development methods

The results shown above were validated by using three advanced IT system development methodologies. Waterfall and Agile man-hour calculations were examined. Parameters related to the estimation of man-hour based on a development scale are listed in table 3.

Table 3   Parameters Influencing Man-Hour in IT System Development

Parameters	System 1	System 2	System 3
K: personnel number of requirements definition	2	2	17
L: period of requirement definition (month)	1.1	3.5	6
N: number of functions	3	11	102
Requirements definition man-hour (R2, R3, ---, Rn)	0.6	0.6	1
Development man-hour (D2, D3, ---, Dn)	2	2	5
Development rework rate (rt)	6%	12%	12%

4.2.1 Validation of System 1

When parameter N=3, R2 or after = 0.6 or D2 or after = 2, rt =6% are given to AWST, requirements definition man-hour = 2.2 man-months (K = 2 men * L = 1.1 months) and the development man-hour is 6 man-months of Waterfall. On the other hand, the rework man-hour of Agile is 0.36 man-months, and requirements definition man-months of Agile are 1.47 man-months. From the result, man-hour reduction in the requirements definition of Agile is 2.2 man-month - 1.47 man-months = 0.73 man-month > rework man-hour of Agile is 0.36. Thus Agile development becomes advantageous.

4.2.2 Validation of System 2

When parameter N=11, R2 or after = 0.6 or D2 or after = 2, rt =12% are given to AWST, requirements definition man-hour = 7 man months (K = 2 men * L = 3.5 months) and the development man-hour is 22 man-months of Waterfall. On the other hand, the rework man-hour of Agile is 2.64 man-months, and requirements definition man-months of Agile are 3.82 man-months. From the result, man-hour reduction in the requirements definition of Agile is 7 man-month – 3.82 man-months = 3.18 man-month > rework man-hour of Agile is 2.64. Thus Agile development becomes advantageous.

4.2.3 Validation of System 3

When parameter N=101, R2 or after = 1 or D2 or after = 5, rt =12% are given to AWST, requirements definition man-hour = 102 man months (K = 17 men * L = 6 months) and the development man-hour is 510 man-months of Waterfall. On the other hand, the rework man-hour of Agile is 61.2 man-months, and requirements definition man-months of Agile are 51.5 man-months. From the result, man-hour reduction in the requirements definition of Agile is 102 man-month – 51.5 man-months = 50.5 man-month > rework man-hour of Agile is 61.2. Thus Waterfall development becomes advantageous.

5 Conclusions

This work elaborated on the characteristics of two development methods: Waterfall and Agile. The methods were compared by estimating the total man-hours associated with both. In a nutshell, the

following conclusions were made:

1) Agile development was found to be best described as a method that allowed design and software development to proceed in the order that the system requirements are established.

2) Waterfall development was found to describe a process whereby system design and software creation commenced after all requirements were defined.

3) The rework associated with Agile was enumerated comprehensively. Countermeasures were considered; and rework was found to result primarily from concomitant processes as modules were contrived.

4) An Agile-Waterfall simulation table was built, in which rework man-hours were integrated. This enabled the alteration of this parameter, along with the sum of development man-hours to compare the two methodologies with confidence.

5) The results showed that Agile development was advantageous provided that the reduction of man-hours in the requirement-definition phase exceeded rework man-hours. In cases whereby rework man-hours were too many, Waterfall was found to result in fewer man-hours overall.

The findings of the present work could serve as an invaluable guide for engineers to select the proper development methodologies for various systems.

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Ranking Critical Success Factors for Sustaining Total Quality Management Implementation in Sudan

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Abstract: Sudan is in the process of transforming its industry to be globally competitive. One of the efforts needed is in enhancing its quality programs through continuous improvement and total quality approach. This study aims to rank the several critical success factors (CSF's) for sustaining TQM implementation in Sudan. The main objective is to identify major criteria to be considered in sustaining of total quality management implementation among Sudanese companies. In this study a comprehensive literature review was done to determine the critical success factors and to develop initial CSFs hierarchy model for sustaining total quality management implementation in Sudan. Analytic Hierarchy Process (AHP) is used for evaluating and ranking the determined CSF's. The findings of study highlight some key barriers affecting the sustainability of TQM implementation and proposes conceptual model using AHP approach for sustaining TQM implementation in Sudan.
Key words: Total quality management; Critical success factors; AHP; Sudan

1 Introduction

Total quality management (TQM) is a management philosophy that empowers every member of the organization. TQM encourage each individual to participate, contribute and offers to present suggestions for improvement. It is intended to promote continuous and sustained improvement in quality and performance, and develops an attitude of quality culture (Talib et al., 2012). TQM address overall organizational performance and recognizes the importance of processes (Seetharaman et al., 2006). For TQM to be successfully adopted by an organization there needs to be a perceived need for change in that organization. From past few decades, TQM has been extensively discussed in the literature and can be seen as a management philosophy characterized by its principles, practices, and strategies that emphasizes upon continuous improvement in quality, increased involvement of employees, commitment of top management, employee empowerment, teamwork, benchmarking, leadership, rewards and recognitions, feedback and relationship with suppliers (Dean and Bowen, 1994; Rönnbäck and Witell, 2008).

TQM has been studied by a few researchers in Sudan. Most of the research   in Sudan has focused on describing the implementation, importance, and effect of TQM in various sectors. Faysal Bashir (2010), attempt to investigate the impact of implementing quality management system (ISO 9001) on the improvement of institutional performance in Sudan Customs Authority through the examining the nature of relation between the application of quality management system and the improvement of institutional performance, the study proves the positive relationship between QMS implementation and institutional performance. Omer Abd Allan (2013), conduct study on QMS in Holy Quran and Sunnah and its Implementation using a case study views and opinions of staff members in Sudanese Universities. There is a lack of study relating to the critical success factors effecting the effectiveness and continuous improvement of TQM implementation in Sudan. Critical success factors (CSFs) are those few things that must go well to ensure success, those areas in an organization which help to provide satisfactory results and ensure the organizational competitive performance, (Zmud and Pun et al 1984, Joyce and Green, 2006). According to Horng and Huarng, (2002) CSFs are those key factors that must be analyzed by the organization or those areas that will help to yield greatest competitive influence. Specification and measurement of the critical factors of quality management permit managers to obtain a better understanding of quality management practices and allow researchers to proceed with the task of developing and testing theories of quality management, and to examine certain hypotheses concerning quality management. (Badri and Masood A, 1995).

Although some surveys, group discussion events and official reports conducted by some Sudanese companies and quality and excellence experts have identified barriers and critical success factors facing implementation and continual improvement of TQM in Sudanese companies there is no existing research taking a holistic view to determine, prioritize and ranking the critical success factors for sustaining TQM implementation in Sudan. This study aims to rank the several critical success factors (CSF's) for sustaining TQM implementation in Sudan. The main objective is to identify major criteria to be

considered in sustaining of total quality management implementation among Sudanese companies. Figure.1 illustrates all the factors and sub factors identified by the comprehensive literature review for sustaining TQM implementation in Sudan.
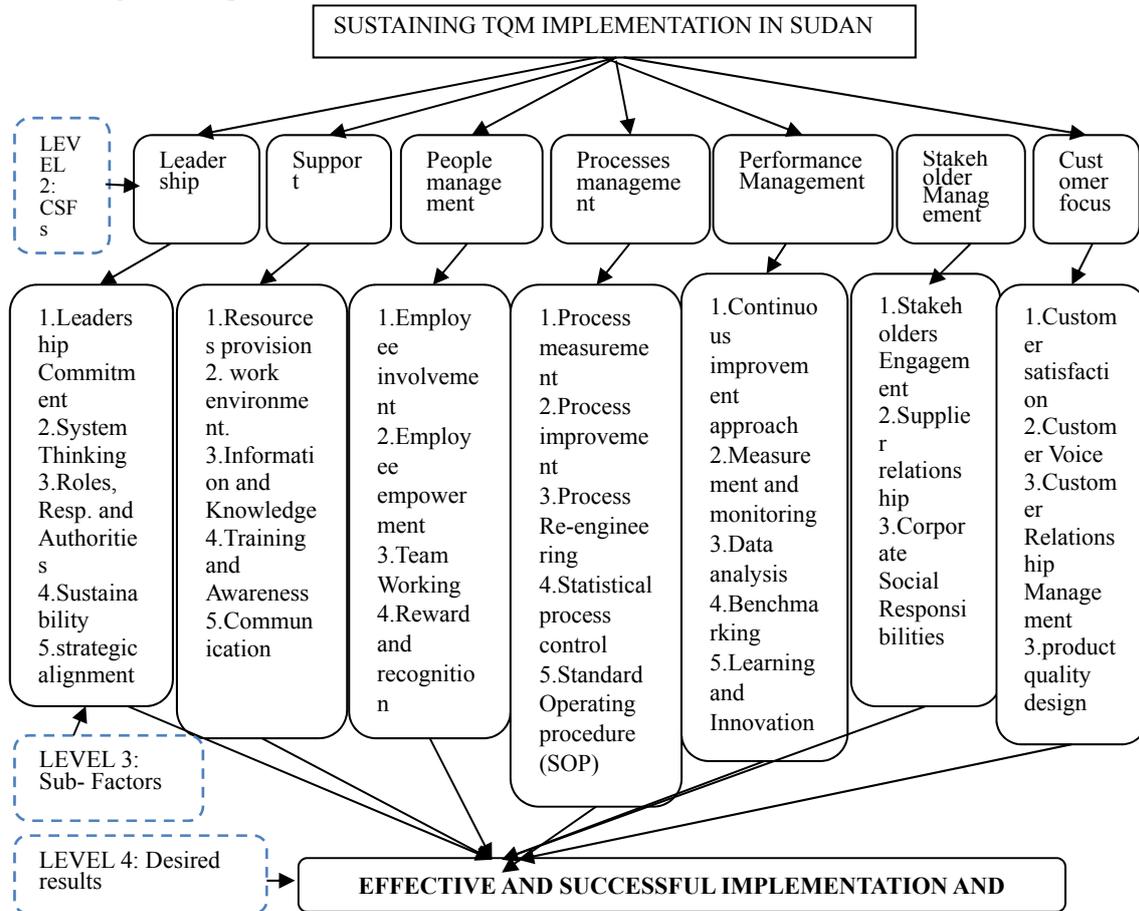
Figure 1　The Factors and Sub Factors For TQM in Sudan

2 Methodology

There are currently three major research paradigms in education (and in the social and behavioral sciences). They are quantitative research, qualitative research, and mixed research (Tashakkori and Teddlie, 2003). The difference between qualitative and quantitative methods is generally described in terms of the type of data collection: the quantitative method involves numerical data and statistical analysis while the qualitative method collects descriptive data for interpretation analysis. The qualitative method focuses on patterns of inter-relationships between a previously unspecified set of concepts, while the quantitative way narrowly looks through a specified set of variables (Brannen, 1992). Mixed method studies combine qualitative and quantitative approaches within different phases of the research process. It would neutralize the biases of any single method, provide insight into different levels or units of analysis enhance the research validity since it provides the opportunity to corroborate findings from different perspectives (Tashakkori and Teddlie, 1998, Denscombe, 2003). The qualitative method will direct the quantitative method and the quantitative method gives the feedback into the qualitative discussions for further validity improvement. The research process in this study therefore included mixed method studies for qualitative and quantitative approaches within different phases to ensure the accurate and precise research process. Table 1. Outlines the research process.

This study involved reviewing and understanding the concept of continuous improvement, and identifying critical success factors, through a study of theories and research in this area. The author employed various methods in an attempt to determine CSFs and continuous improvement methodologies. Literature review was employed and questionnaires was developed and Delphi method was used to collect empirical information and data and to obtain experts judgment by consulted experts therefore the experts

from different fields from Sudan were selected.

Table 1   The Research Process

Research Activities	Research process	Research method(s)
1. To determine critical success factors and barriers for sustaining total quality management implementation in Sudan.	Phase 1	• Literature studies • Content analysis • Related Print media • Academic and trade journal, • Delphi Technique (Round one and two)
2. To identify major criteria to be considered in sustaining of total quality management implementation in Sudan	Phase 2	• Delphi Technique (Round three) AHP

The Delphi process is a 'structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback' (Ziglio, 1996, p.3). A key characteristic of the method is its use of experts, whose responses remain anonymous throughout a series of iterative questionnaire rounds. The controlled feedback during these rounds includes details of the collective group opinion, and it allows experts to either retain or amend their earlier opinions in light of information about other experts' views. McKenna (1994) describes Delphi as a multi-stage process, built around iterations. Van Zolingen and Klaasen (2003) discuss that through iteration, data collection and feedback continue until a stability of responses has been reached. Brockoff (1975) reports that whilst the number of rounds is variable, Delphi studies seldom go beyond two iterations (3 rounds).

Table 2   The Previous Researches Using DHP

Authors	Focus Area	Approach	Purpose of the study
Sarathy, (2013)	TQM	Questionnaire survey and AHP methodologies	Determining the important factors that influence the TQM practice in real estate industry.
Koilakuntla et al., (2012)	TQM	Analytical Hierarchy Process (AHP)	Estimation of TQM factor ratings.
Chan and Chen, (2009)	TQM	Analytical Hierarchy Process (AHP)	This study aimed to develop TQM measurement model for the biotechnology industry in Taiwan to enact quality improvement.
Manish Kumar Sagar and Amit Singh Tomar, (2014)	TQM	Delphi/AHP	The purpose of the paper is to rank and review the various critical success factors (CSF's) of total quality management (TQM) in favor of Indian manufacturing industries for improving product and process quality.
AlirezaYazdani, Mohammad Ali Soukhakian, Mohammad Reza Mozaffari (2013)	Total Quality Management	Delphi/AHP	The research aims to answer two main questions: 1. What critical success factors in the implementation of Total Quality Management are proposed in Pars Oil and Gas Company? 2. What is the priority of critical success factors in the implementation of Total Quality Management based on different levels of management`s perspective?
Nilda Tri Putri, Sha'ri Mohd. Yusof and Dradjad Irianto, (2011)	Quality Engineering	Delphi/AHP	The paper aims to present the critical success factors (CSFs) and to develop a self-assessment tool of quality engineering (QE) implementation for Malaysia and Indonesia automotive industries based on the CSFs identified.

AHP is a multi-criteria decision-making method that uses a hierarchical structure to solve

complicated, unstructured decision problems, especially in situations where there are important qualitative aspects that must be considered in conjunction with various measurable quantitative factors, AHP has been applied in different fields such as management, engineering, industry, education, etc. (Kamal and Al-Harbi, 2001). (AHP) proposed for the first time by Thomas L. Saaty in 1970. This method is based on the pair-wise comparisons and is capable to examine different conditions. Since AHP is simple and comprehensive, it is the subject of current research and development efforts (Saaty, 1991). Analytic Hierarchy Process (AHP), since its development, has been a tool at the hands of decision makers and researchers; and it is one of the most widely used multiple criteria decision-making tools. Many outstanding works have been published based on AHP: they include applications of AHP in different fields such as planning, selecting a best alternative, resource allocation, resolving conflict, optimization, and numerical extensions of AHP (Vargas, 1990).

In this study, DHP, which have commonly been used to mean the same class of models, is the chosen approach, because CSFs is a discrete decision, where there is a discrete set of alternatives and in which each can be described by some criteria. Thus, a DHP for selecting CSFs and CI methodologies would attempt to develop an integrated framework for continual improvement by providing a step-by-step process. Table 2 show the previous researches using DHP

3 Ranking the Critical Success Factors

The DHP processes used in this study consists of three rounds of survey conducted with nine industrial and academic experts consisting of practitioners and academics with more than six years of working experience and research in TQM field. In the first round the panel of experts was asked to validate the factors of the preliminary theoretical framework of CSFs which attained from literature review in order to obtain further study by expert's panel. Semi- structured interview was conducted with selected experts. This interview aims to collect data for round 1 DHP method. The main objective of the second round of Delphi technique is to obtain the consensus amongst the experts in terms of the final AHP model of CSFs for effective implementation of TQM and continuous improvement. The experts' panel were asked to review the revised AHP model, after adjustments and changes were made to the model (figure 1), using e-mail and visit with interview. All the experts participated in this round and agreed with the revised hierarchy model of critical success factors for effective implementation of TQM and continuous improvement.

In the last round of Delphi technique, the expert panel were asked to determine the relative scales of a given list of critical factors and sub factors affecting the implementation and continuous improvement of TQM in Sudan in a pair-wise fashion. The pair-wise was constructed by using Saaty (1988), point scale and score. All expert panel members were participated in this round. The participants assessed the pairwise comparison among seven CSF and related thirty-one factors as output of Delphi round one and two, and lastly a series of judgment matrices for the critical factors and sub factors were attained. To conduct Delphi round three, the importance weight or relative weights to critical factors and sub factors were calculated. A pair wise comparison matrix was developed to calculate "weights" which involved the relative significance among the criteria in the second level of the hierarchy. Expert choice software used to determine the ranking of critical factors and sub factors. By using this software, the researcher can obtain the local and global priority weight. The local priority weight is relative to the parent elements, whereas global priority weight is relative the goal.

The local weight is the priority of an element related to the preceding element and it is first calculated. Meanwhile, the global weight of each element related to the goal of sustaining TQM implementation in Sudan was calculated by multiplying the local weight of an element by the weight of its preceding element. Tables 2 shows the normalized local weights of judgment and ranking for criteria and sub criteria form expert panel. After that the consistency ratio (CR) was calculated to measure how consistent was the judgment given by experts' panel. CR indicates how consistently respondents compared criteria. According to Saaty (1987) who developed the AHP, a CR of .10 or less is considered acceptable. As illustrated in Table 4.4, overall pairwise comparisons were consistent (CR= .044). This means that the overall consistency of evaluator judgments falls within the Saaty (1988) suggested ratio of 0.10

Table 3 Normalized Local Weights of Judgment and Ranking for Criteria

TQM implementation and continuous improvement (CR= 0.044)	Weights	Ranking
Leadership	0.386	1
Support	0.036	7
People Management	0.083	5
Process Management	0.158	3
Performance Management	0.208	2
Stakeholder Management	0.047	6
Customer Focus	0.083	4

Table 3 summarizes the priorities of criteria for categories and sub-categories. The geometric mean was then used to synthesize the assessment of each evaluator. The results form geometric mean of evaluators was combined into judgment matrixes of pair wise comparison. Appendix C shows the judgment matrices and evaluation results. As per findings, the consistency ratio for these matrices falls under 0.10, which means that the results are within the acceptable level of 0.10 according to the consistency ratio.

Table 4 Normalized Local Weights of Judgment and Ranking for Criteria and Sub Criteria Form Expert Panel

Level 1	Weights	Level 2		Weights	Ranking
Leadership	0.386	-	Leadership Commitment	0.479	1
		-	System Thinking	0.165	2
		-	Roles, Resp. and Authorities	0.130	4
		-	Sustainability	0.084	5
		-	strategic alignment	0.142	3
Support	0.036	-	Resources provision	0.068	5
		-	work environment	0.107	4
		-	Information and Knowledge	0.291	2
		-	Training and Awareness	0.387	1
		-	Communication	0.146	3
People Management	0.083	-	Employee involvement	0.487	1
		-	Employee empowerment	0.065	4
		-	Team Working	0.283	2
		-	Reward and recognition	0.165	3
Process Management	0.158	-	Process measurement	0.252	2
		-	Process improvement	0.292	1
		-	Process Re-engineering	0.058	5
		-	Statistical process control	0.252	3
		-	Standard Operating procedure (SOP)	0.145	4
Performance management	0.208	-	Continuous improvement approach	0.439	1
		-	Measurement and monitoring	0.111	4
		-	Data analysis	0.074	5
		-	Benchmarking	0.133	3
		-	Learning and Innovation	0.242	2
Stakeholder Management	0.047	-	Stakeholders Engagement	0.684	1
		-	Supplier relationship	0.205	2
		-	Corporate Social Responsibilities	0.111	3
Customer Focus	0.083	-	Customer satisfaction	0.399	2
		-	Customer Voice	0.405	1
		-	Customer Relationship Management	0.119	3
		-	Product quality design	0.077	4

The following section discusses relative weights of each criterion for categories and sub- categories based on priorities calculated. Table 4.6 shows the ranking of the critical factors based on local weights.

Level Two: For main categories of CSFs, Leadership (0.386), is the most important factor, followed by Performance Management (0.208), Process Management (0.158), Customer Focus (0.083), People

Management (0.083), and Stakeholder Management (0.036) based on global weights calculation the results show that the most important sub factors effecting the implementation and continuous improvement of TQM in Sudanese companies were Leadership, Performance Management and Process Management. It is observed that Customer Focus (0.083), People Management (0.083), get same weights and placed at the fourth and fifth rank, This may indicate that evaluators do not agree with which one is more important than the other, followed by Stakeholder Management (0.047). Meanwhile the least influential factor is Support (0.036).

Table 5 The Ranking of the Critical Factors Based On Local Weights

Criteria	Weights	Ranking
1. Leadership	(0.386)	1
2. Performance Management	(0.208)	2
3. Process Management	(0.158)	3
4. Customer Focus	(0.083)	4
5. People Management	(0.083)	5
6. Stakeholder Management	(0.047)	6
7. Support	(0.036)	7

Table 6 Summary of Ranking from 31 Sub Factors Based on Local Weights

Criteria	Priority
Leadership (CR= 0.027)	
1. Leadership Commitment	0.479
2. System Thinking	0.165
3. strategic alignment	0.142
4. Roles, Responsibilities. and Authorities	0.130
5. Sustainability	0.084
Performance Management (CR= 0.011)	
1. Continuous improvement approach	0.439
2. Learning and Innovation	0.242
3. Benchmarking	0.133
4. Measurement and monitoring	0.111
5. Data analysis	0.074
Process Management (CR= 0.015)	
1. Process improvement	0.292
2. Process measurement	0.252
3. Statistical process control	0.252
4. Standard Operating procedure (SOP)	0.145
5. Process Re-engineering	0.058
Customer Focus (CR= 0.017)	
1. Customer Voice	0.405
2. Customer satisfaction	0.399
3. Customer Relationship Management	0.119
4. Product quality design	0.077
People Management (CR= 0.034)	
1. Employee involvement	0.487
2. Team Working	0.283
3. Reward and recognition	0.165
4. Employee empowerment	0.065
Stakeholder Management (CR= 0.017)	
1. Stakeholders Engagement	0.684
2. Supplier relationship	0.205
3. Corporate Social Responsibilities	0.111
Support (CR= 0.017)	
1. Training and Awareness	0.387
2. Information and Knowledge	0.291
3. Communication	0.146
4. work environment	0.107
5. Resources provision	0.068

Leadership: Leadership commitment was the most important criterion, the next most important

criterion for leadership is, system thinking, followed closely by strategic alignment and roles, responsibilities and authorities, sustainability was least important.

Measurement, Analysis and Improvement: For measurement, analysis and improvement, continuous improvement approach was the most important criterion followed by learning and innovation. Benchmarking, measurement and monitoring received the next highest importance ratings. Data analysis was least important for.

Process Management: With regard to process management, Process improvement is the most important sub factor. Process measurement, Statistical process control were the next most important criteria with their priorities similar to each other. This indicates that relative importance of these two criteria for process management are similar. Followed by Standard Operating procedure (SOP). Process Re-engineering was least important.

Customer Focus: For the customer focus category, customer voice and customer satisfaction were two major criteria for customer satisfaction, subsequently customer relationship management and followed by product quality design.

People Management: With respect to people management, employee involvement is the most important sub factor. Followed by team working and reward and recognition, employee empowerment was least important.

Stakeholders Management: For stakeholder management, stakeholders' engagement, is the most important sub factor, followed by supplier relationship and corporate social responsibilities.

Support: Regarding to support, Training and Awareness and Information and Knowledge are the most important two sub factor, the priorities of Communication and work environment indicate that these criteria were less important for support, compared to other criteria. Resources provision was relatively unimportant compared to other criteria in the support category. Table 5shows the summary of ranking from 31 sub factors based on local weights.

The results of global weights calculation for 31 sub factors in Table 6 show that the ten most important sub factors are leadership commitment, continuous improvement approach, system thinking, strategic alignment, learning and innovation, roles, responsibilities and authorities, process improvement, employee involvement, process measurement and statistical process control.

Table 7   The Ranking of the Sub Factors on Global Weights

Sub Factors	Global Weights	Ranking
Leadership Commitment	0.185	1
Continuous Improvement Approach	0.091	2
System Thinking	0.064	3
Strategic Alignment	0.055	4
Learning and Innovation	0.050	5
Roles, Resp. And Authorities	0.050	6
Process Improvement	0.046	7
Employee Involvement	0.040	8
Process Measurement	0.040	9
Statistical Process Control	0.040	10

4 Conclusions

After the validation through Delphi hierarchy process methodology, the seven factors and thirty-one sub factors have been proposed to be critical to the effectiveness, continuous improvement and sustaining in Sudan. Based on all experts the three most critical factors to achieve effective and continuous improve TQM implementations in Sudan are:

1) Leadership (with its sub factors i.e. Leadership Commitment, system Thinking, strategic alignment, roles, responsibilities and authorities and sustainability),

2) Performance Management (with its sub factors i.e. continuous improvement approach, learning and Innovation, benchmarking, measurement and monitoring and data analysis),

3) Process Management (with its sub factors i.e. Process improvement, process measurement, statistical process control, standard operating procedure (SOP) and process re-engineering).

In this study, comprehensive CSFs criteria for sustaining TQM implementation in Sudan were collected and structured into an AHP criteria model in the form of a hierarchy, based on judgment of panel of industrial and academic Sudanese experts. The top level of the proposed hierarchical structure was Sustaining TQM implementation in Sudan, which is to provide effective and successful implementation

and improvement of TQM in Sudan.

At the next level there were seven main factors which are: 1) leadership, 2) Support 3) people management, 4) process management, 5) performance management, 6) stakeholder's management, and 7) customer focus. Based on AHP, relative priorities of factors, sub-factors, and criteria were determined using a pairwise comparison. Leadership was the most important factor in achieving sustained TQM implementation goal, followed by performance management and process management. Hence these three factors must be considered as a main element of proposed framework for sustaining TQM implementation in Sudan. People management and customer focus get the same raking at fourth rank there for people and customer involvement can considered vital factors for supporting TQM suitability in Sudan. Unexpectedly the support gets the least ranking and under the supporting the work environment and resources provision get the lowest ranking base on global weight calculation, this indicate that the provision of required resources has little or no affect in sustaining TQM implementation.

In the third level there are sub-factors for every main factor. Under Leadership there are leadership commitment, system thinking, roles, resp. and authorities, sustainability and strategic alignment. By using the AHP methodology it was found that the leadership commitment most important sub-factor in sustaining TQM implementation in Sudan under leadership category, system thinking and strategic alignment.

The results also show that the four most critical sub factors to sustain TQM implementation in Sudan are leadership commitment, continuous improvement approach, system thinking and strategic alignment. Base on the result we can conclude that the leadership commitment, measurement and monitoring, continuous improvement, system thinking and learning and innovation can play important role in sustaining TQM in Sudan. This support the opinions of experts that the lack of measurement, monitoring and simple and practical approach is one of key barriers affecting the sustaining of TQM implementation in Sudan. Meanwhile corporate social responsibilities, work environment and resources provision were the three least important factors for sustaining TQM Implementation in Sudan. It also indicates the importance of focusing of continuous improvement projects and events that support the strategic alignment and achieving sustainable excellence. This supported by Process improvement, Process measurement and Statistical process control which were most important for process management.

Customer Voice and Customer satisfaction was the most important criterion under the customer focus. Employee involvement and Team Working was the most important criterion under the people management. Stakeholders' engagement is important sub-factor under stakeholder's management. All These results reflect the importance of listening to customer voice, involving of people and engaging of stakeholders in sustaining TQM implementation in Sudan.

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The Evaluation of Investment Decision Making with Knowledge & Technology Rankings and the Sand Cone Model

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Abstract: The main focus of this paper is to study the uncertainty in the investment decision making and to clarify how knowledge and technology affect it. The research was conducted in a local Finnish energy provider related to the renovation of its energy distribution networks. The Analytic Hierarchy Process was used to determine and weight the investment decision criteria. Then these criteria were inserted to the sand cone model in order to see their relative importance. Furthermore, the knowledge and technology rankings were used to calculate the variability coefficients i.e. the uncertainty which questions the decision making and could be seen also as so called collapses in the sand cone. The source of the collapses in the case company was determined to be the uncertainty over future technologies. From this a conclusion can be drawn that the company relies a lot on basic technology in securing its operations and that the knowledge and technology is essential in the investment decision making. Also some further steps can be defined based on the results.

Key words: Investment decision making; The sand cone model; Knowledge and technology (K/T) rankings; The Analytical Hierarchy Process; Uncertainty management

1 Introduction

The growing role of technology brings many opportunities as well as threats to companies. Technology can be seen as a source of business development, growth, profit and competitiveness. On the other hand, it also demands a lot from the companies. They must be able to continually adapt to the technical requirements of the market. Since technology has been linked to the possibility to achieve a competitive advantage the recommendation for the decision maker has been to integrate this opportunity to the strategy. The idea of competitive advantage or more precisely the sustainable competitive advantage (SCA) has been connected to Porter's work in the 1980's and in 1991 Barney determined it as an implementation of a value creating strategy that is not implemented nor successfully duplicated by the competitors (Takala, et al, 2013).

The sustainable competitive advantage also requires knowledge and intellectual capital as the primary bases of core competencies. In order to achieve sustainable competitive advantage knowledge must be spread within the firm since without it remains a property of few and will therefore have a limited impact on value creation. Obviously there is always a risk that the knowledge spread within a firm spreads also to other firms. Therefore in order to achieve sustainable competitive advantage knowledge, skills and resources should be relative easy to share inside the firm but difficult for other firms to copy. This kind of tacit knowledge is information that is "difficult to express, formalize or share". It is clear that tacit knowledge has a lot to do with experience and is related to the work of experts. Also organizational routines are an important part of tacit knowledge and one major part of these standardized operating procedures and roles in the companies is the decision making(R. Lubit ,2001).

This study was conducted as a part of the MittaMerkki research project comprising the University of Vaasa and VTT as research partners and a local Finnish energy provider as a case company. The aim of this research was to study how the technology and knowledge affect in investment decisions and how much they can cause uncertainty in the decision making. Furthermore the differences between the three departments/product areas of the case company were analyzed thoroughly. According to Takala and Uusitalo the emphasis has shifted significantly from the traditional risk management towards uncertainty management (Takala,2012). This is a trend in which also this paper aims to deliver.

2 Research Methodology

2.1 Theory and models

In order to implement SCA the critical attributes in resource allocation must be detected. This can be done through the sense and respond methodology (S&R). The knowledge and technology factors (K/T) are inserted to the S&R in the form of a requirement section in which the respondent has to evaluate each S&R questionnaire attribute in terms of basic, core and spearhead technologies. In other words, each attribute is divided based on these three technologies so that the sum of the technologies equals 100%. Basic technology refers to commonly used technologies that can be purchased or outsourced. Core technology is the current competitive technology in a company and the term spearhead is related to future technologies. The importance of these three different technology levels is the knowledge that they require. This affects a lot in the strategy implementation and furthermore to the success of the technology-based businesses (Takala, et al, 2013).

The sand cone model illustrates the studied object by showing its hierarchies as well as the relative importance and relationships of the sub-objects (Takala, Leskinen, et al, 2005). Since the origal model sand cone has been developed and used successful for example with the Finnish Air Force (Takala, Leskinen, et al, 2005). One major strenght of the sand cone is that it can be used for many purposes as well as with many different attributes and for example in the research of Saufi, Rusuli, Tasmin and Takala the sand cone model has been used to study Knowledge management in the Malaysian university libraries (2012). In the developed model of Takala from 2002 the Analytic Hierarchy Process is used to derive the relative importance percentages determining the levels of the sand cone model (Takala, Leskinen, et al, 2005). The idea of the Analytical Hierarchy Process is to give a method of scaling that evaluates tradeoffs between different criteria such as cost, create measures for the entities for which there are normally no measures and then to use these entities in the decision making (Saaty,1980).

Also in this study the AHP was used to weight the four selected criteria of investment decision making before being inserted to the sand cone model. After this the uncertainty is determined with the help of the aforementioned knowledge and technology rankings (K/T) from which variability coefficients are calculated using the following equation (1).

$$VarC_{C1,C2,C3,C4} = \sqrt{\sum_{\substack{C1,(C2,C3,C4)\\i=B,C\,SH}} \left(\frac{std_i}{mean_i}\right)^2} \tag{1}$$

After the calculations the variability coefficients are inserted to the sand cone in the form of risk that can cause collapses in the sand cone layers. These collapses might happen due to the different technology and knowledge requirements of the different departments which are competing from the same investment budget. In addition a figure can be calculated from the variability coefficients determining the amount of T&K affected risk in each department. This figure is called T&K – uncertainty and it describes how much in generally the department "falls" under its competitive range when the T&K risk estimate materializes. The equation for the T&K–uncertainty is illustrated below (2).

$$T\&K - uncertainty = \sqrt{\sum_{i=C1,C2,C3,C4} VarC_i^2} \tag{2}$$

Dept. A, B and C

All in all the end result would look as in the figure 1 below. The variability coefficients are pictured with the darker shade of grey in the sand cone layers and the accurate percentage values are illustrated always next to the criterion in question. Right to the cones are then presented the T&K –uncertainty figures as well as the graphical illustration of the possible collapse of the department's sand cone.
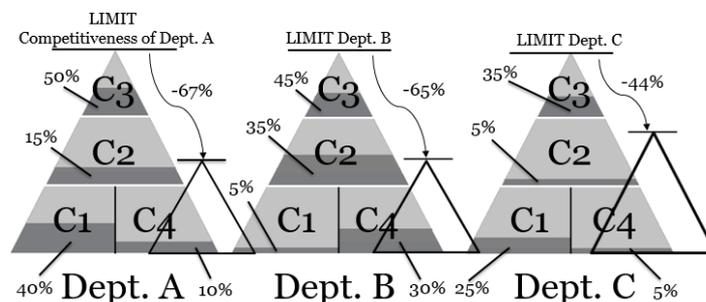
Figure 1   The T&K -uncertainty and the Sand Cone Model (example)

2.2 Case company and data collection

This study was conducted in cooperation with a Finnish energy group which operates as a local

electricity, water and district heat provider. With its subsidiary companies it produces, sells and distributes the electricity, water and district heat. However this study concentrated solely to the subsidiary distribution company and to its evaluation of energy infrastructure investments.

The data collection was started with the selection of the investment criteria and by weighting the criteria with the AHP method. After this the knowledge and technology rankings were gathered with a questionnaire specially designed for this study. In this questionnaire each criterion is divided according to the three technology categories so that the sum equals 100% in both the department and the criterion in question. The interviewees consisted of the company's executive board and some experts from each department. The board members answered for every department and the experts on behalf of their own department. Before answering at least one example to each of the three technology categories (basic, core and spearhead) was named as well as the time perspective utilized.

3 Analysis Results

Based on the results the following variability coefficients (figure 2) were determined for the case company. As can be seen from the figure department C has the highest variability in every criterion. Furthermore, only one criterion (C4) had lower variability than 1 in all the departments. Altogether it can be said that there is uncertainty in the investment decision making of the case company.
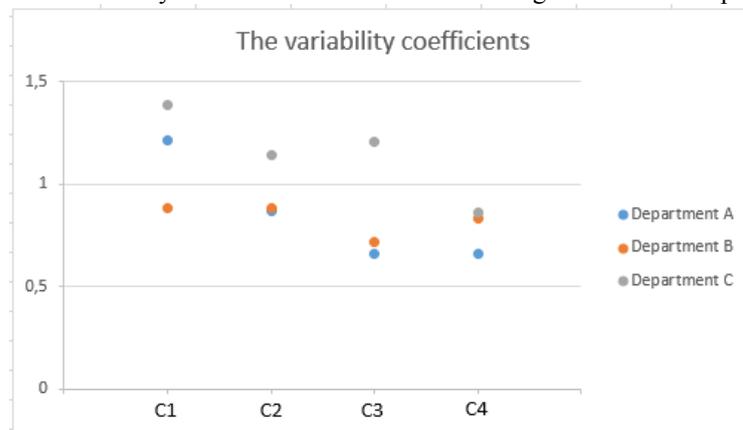
Figure 2   The Variability Coefficients of the Case Company

When inserted to the sand cone model the variability coefficients are illustrated in the form of collapses (figure 3 below). Those criteria with over 100 percent variability question the investment evaluation based on that criterion. Although there are small differences among the uncertainties of different criteria in different departments the big picture can be seen from the T&K-uncertainty figures next to the sand cones. As can be seen the T&K-uncertainty is over 100 percent in each department. This puts the investment evaluation under question as well as the comparison of different departments.
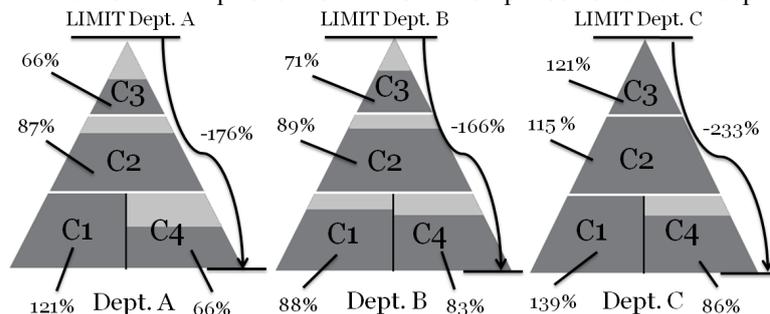
Figure 3   The Sand Cones of the Case Company

Furthermore was studied which part of the basic, core and spearhead classification causes the variability in the departments. The reason is clear as can be noticed from the next figure. The spearhead technology and –knowledge is the main source of the uncertainty. It can also be pointed out that even the core technology gets high variability in every department but still much smaller than the spearhead. Therefore a conclusion can be drawn that the company bases its technology and knowledge management

mainly on basic technology. This is not necessarily a bad thing since it can be seen also as a way to secure the distribution of energy to the customers. Moreover, the amount of spearhead technology can be quite small compared to the basic technology which illustrates the low uncertainty over basic technology as a reasonable and positive outcome.
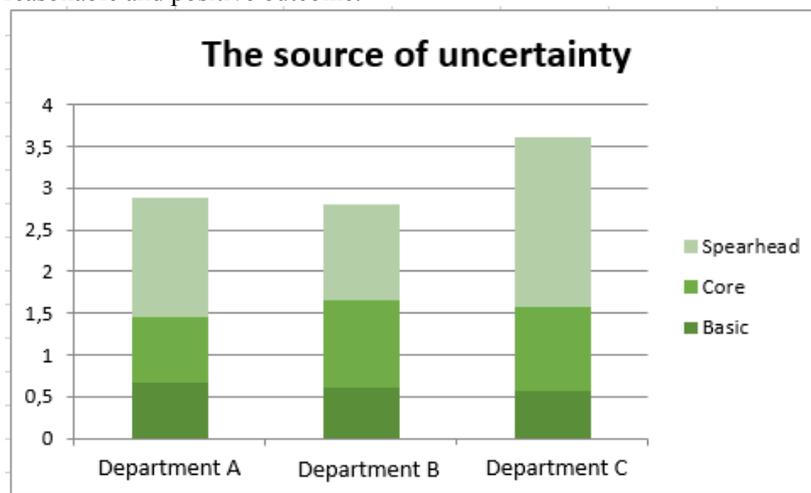
Figure 4   The Source of Uncertainty in the Case Company

4 Discussions

Although the results seem rather clear feedback from the case company is required especially for determining the reasons behind the uncertainties. This feedback will be organized in the form of interviews that would include 1-2 experts from each department. Furthermore, the market-based validation of Kasanen, Lukka and Siitonen would be followed (1993). There are two possible ways to proceed. With the first one, conclusions would be made about the results based on interviews where the interviewees would analyze the results, reasons behind the results and how the results might appear in practice. This option is called the weak market test in which also the experts' willingness to apply the results in decision making would be figured out (Kasanen, Lukka and Siitonen,1993). The other option is to use the semi-strong market test in which the results should be adopted in the company (Kasanen, Lukka and Siitonen, 1993). In this case it would mean to clarify whether there is any data from some project or in one of the departments that would support the results of the study.

5 Conclusions

The main finding of this study is that there is uncertainty in the case company's investment decision making. From the department sand cones can be concluded that there are many layers in which the risk of collapses is over 100 percent and so the investment decision making based on the criteria in question is challenged. Furthermore, the T&K –uncertainty figures underline this conclusion and question also the comparison of the departments. It is also illustrated that the main source of the possible collapses is the uncertainty over spearhead technology. From this a conclusion can be drawn that the case company leans on basic technology in securing its distribution operations. All in all from the big picture can be argued that knowledge and technology is essential in the investment decision making and as revealed in the discussions more information is needed to detect the reason behind the uncertainty and for example to figure out what the future (spearhead) technologies demand from the case company.

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Cost Efficiency and Its Determinants in the Eight Islamic Public Banks in Indonesia

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Abstract: The present study was conducted to estimate cost efficiency of Islamic Public banks in Indonesia by using data envelopment analysis (DEA); rank the banks according to their highest and lowest cost efficiency, and to determine the cost efficiency determinants by defining bank specifics and macroeconomics factors. It covers quarterly data of 2011.1 – 2014.4 periods from Indonesian central bank website of the eight Islamic public banks that were selected as the sample of observation. The results revealed that Bank Victoria Syariah performs the best with the average score of 59.7%, while Bank BRI Syariah performance was lowest with an average score of 11.1%, in term of cost efficiency among all the Islamic public banks in this study.Net operating income, size, and GDP growth rate were found negatively impact and are statistically significant to cost efficiency, while capital adequacy ratio has a positive impact and are statistically significant to cost efficiency.
Key words: Cost efficiency; Bank specifics; Macroeconomics; Data envelopment analysis; Islamic public banks

1 Introduction

The functioning of Islamic banks is similar to conventional banks that mediates and beadle the money of customer. The two banking types differ in sharing profit and loss between the Islamic banks and the depositors, while conventional banks practice the interest rate system. The mutuality of ownership is introduced by the Islamic banking system that the customers of Islamic banking as the depositors have the right of ownership(Dar & Presley 2000). The transactions in Islamic banks that are administrated without involving elements of riba that makes the main dissimilarity from conventional banks, it is mentioned in Quran, the Muslim's holy book, regarding the prohibition of riba. Ribaisusury or excessive interest that insisted the debtors during the maturity date on imposing failure of payments and wants to roll it over (Kamarudin et al. 2014). Typically, fixed price that added the margin of its profit in advance is commonly known as Islamic banks basis, namely buying and selling principles (Khir et al. 2008)

During the past twenty years, the performance of Islamic banks in Indonesia has shown good performance rather than conventional banking as one of national financial system (Zuhroh et al. 2015). The total assets growth of Islamic banking in Indonesia from 2010 to 2014 is 100 trillion IDR to 279 trillion IDR or with its compound annual growth rate (CAGR) as 29.2%. Comparing to other Islamic banking systems in other countries, it indicates higher significant growth recorded since Islamic banking in Indonesia started with low capital in the beginning of the period. However, the total asset growth of conventional banks is even lower with CAGR for 16.9% on the same period (2010-2014).Explicitly, the Islamic financial industry in Indonesia is left behind of its counterpart, conventional banks, as the market share is only 4.7% from the overall total assets of banking industry in Indonesia. Indonesia financial services authority developed and launches the roadmap of the coming five years, in 2023, to boost up Indonesian Islamic banking market share to 15%. Indonesian government support the target to be the center of Islamic banking globally and prevent from the negative impacts of unstable economic situations(Schaar 2015).

Hence, the operational efficiency for Islamic banking is needed since the improvement of bank efficiency will improve the ability of bank to provide higher return to depositor. Moreover, customers would rely on an efficient bank because the more efficient bank tend to have lower service expense with better service to the customer (Fries & Taci 2005). During the last decade, it has been becoming focus of the study to ensure the future sustainability, especially in competition era by assessing the efficiency of banking sector as the most important thing (Zuhroh et al. 2015).As the banks improve their competitive advantage, the banks will be more efficient. Besides the role as financial intermediary, cost efficiency has its crucial role in understanding the environment of its market in which the foreign banks and the other financial intermediaries may become more competitive by fulfilling its cost efficiency(Allen & Rai 1996). Although there have been many researches done before, the study of Islamic bank efficiency is

still in infancy, particularly in Indonesia. Additionally, it is rare to find the rank of Islamic public banks in Indonesia based on the level of efficiency. To fill the gap of the literatures, this study therefore examine the case of Islamic public banks in Indonesia to provide new contribution as an evidence by using a non-parametric approach based on data envelopment analysis (DEA) in measuring cost efficiency and its determinants by using panel data regression.

2 Literature Review

The study of bank efficiency by utilizing frontier analysis approaches of Islamic banks have been researched many years ago in different countries (Havidz & Setiawan 2015; Sufian 2007; Yudistira 2004; Hassan 2006; Sufian et al. 2008; Rahman & Rosman 2013; Zuhroh et al. 2015). The techniques of frontier efficiency represent the best practice to measure performance evaluation as well as its inefficient strategy. Non-parametric approach is employed in this study, known as data envelopment analysis (hereafter is shorten as DEA). An effective tool to identify the frontiers had been proved for efficiency evaluation is firstly introduced by Charnes et al. (1978)which commonly used among the researchers (Zhu 2009).

Yudistira (2004)performed a research on technical, pure technical, and scale efficiencies by utilizing DEA. The results suggest that the inefficiency is just lower at 10% across 18 Islamic banks indicating when it is compared to conventional counterparts. The scores of efficiency are taken to be regressed on its environmental variables by focusing on overall technical efficiency on the second stage. It reveals that an encouragement of M&A should be taken since the Islamic banks of small up to medium class were dealing with inappropriate scale economies. Rahman & Rosman (2013) measured the efficiency scores using DEA based on intermediation approach of 63 Islamic banks. The technical inefficiency is driven by inappropriate scale operations among the Islamic banks. On the other words, pure technical efficiency scores are higher than scale efficiency which indicates a controllable of banks' management in controlling the costs as well as maximize outputs in a given inputs. Furthermore, the researchers used bank specifics ratio (profitability, capitalization, and size) and macroeconomic factor (GDP per capita) to find its determinants by applying ordinary least square of panel regression. The economic condition of a country determined as the main factor of Islamic banks efficiency. A positive impact of capitalization on efficiency is proved. Meanwhile, Islamic banks size indicated negative and significant impact on scale efficiency as well as negative impact of profitability on efficiency. Havidz & Setiawan (2015) estimated the three efficiency measures of overall technical, pure technical, and scale efficiencies in the fourth Indonesian Islamic banks. Bank Muamalat Indonesia, Bank Mega Syariah, and Bank Syariah Mandiri deal with scale inefficiency as overall technical inefficiency main source, while Bank BNI Syariah may deal with inappropriate management as the dominant source of overall technical inefficiency. The second stage of regression indicates significant impacts proved by operational efficiency ratio (OER), return on assets (ROA), and inflation rates on efficiency.

Isik & Hassan (2002) further analyzes the measurement addressing cost efficiency investigates input and output efficiency in the Turkish banking industry during 1988-1996. Technical inefficiency dominated the main source of inefficiency as compare to allocate inefficiency. The impact of bank size to efficiency is negative as the relationship is analyzed on the second stage. Bader et al. (2008) measures and compares the cost, profit, and revenue efficiencies in the 43 Islamic and 37 conventional banks started from 1990 to 2005. It is suggested that the overall efficiency results have no significant difference when it is compared between conventional and Islamic banks. Kumar (2010)analyzed the cost efficiency trends from 1992/93 until 2007/08 as it is known as the period of post deregulation in the public sector of Indian banks by defining the components as well. The findings indicate that technical inefficiency mainly drives the cost inefficiency. The regression model is estimated and found that there is no statistical significant impact of banks size in all models of regression and only two regression models of profitability indicating statistical significant and positive. Zuhroh et al. (2015) aims in several objectives of study that applying stochastic frontier approach to estimate cost efficiency of Islamic banks, determine the source of cost inefficiency, and analyze the influence of the competency of managers and several variables on cost efficiency. It is conducted in full-fledged Islamic banks of Indonesia, totally 3 and listed conventional banks on the Indonesia Stock Exchange (IDX), totally 19 from 2004.03 – 2010.4. It is revealed that allocate inefficiency dominantly caused the cost inefficiency and the average cost of conventional banks is higher than Islamic banks. Asset has negative impact and significant on efficiency as well as negative impact and statistically significant of NPL on efficiency. It proves that LDR has positive impact and significant on particular frontier.

Based on the literature above, it shows there are several studies about efficiency measurement in the banking industry and variously applying technical, pure technical, scale, cost, profit, and revenue efficiency. This study focuses on cost efficiency as it measures how close the bank's cost to its best practice of bank's cost to produce the same output by the same conditions. The range score of cost efficiency over 0 to 1, in which firm's best practice equals to one within the observed data (Berger & Mester 1997). In order to determine the cost efficiency, regression is conducted on the second stage by measuring bank specifics and macroeconomics environment. The efficiency studies have been researched world widely. However, there are still few studies in the banking industry of Indonesia especially Islamic banking as it is needed in-depth and ongoing study on Islamic banking literature that related to the efficiency frontier. This study may contribute in giving the ranks of Islamic public banks in Indonesia that provided as a reference.

3 Research Methodology

3.1 Data collection method

The evaluation of efficiency of Islamic Public Banks in Indonesia is based on secondary data that is published quarterly on the website of the central bank in Indonesia, named *Bank Indonesia* which consists of foreign exchange and non-foreign exchange banks. The data compiled from balance sheet, income statement, off balance sheet and financial ratio calculation in the period of observation 2011.1 – 2014.4.   There are four foreign exchange banks and all the data are complied with the objective of the study. However, there are only four out of six non-foreign exchange banks that fit the required data in this study. Hence, the overall samples are eight Islamic public banks in Indonesia.

3.2 Model of the study

This study employs intermediation approach by using input-oriented. Zhu (2009) has developed the DEA Excel Solver to solve the cost efficiency model with the range score within 0 and 1, that summarized by Zhu as:

$$\min \sum_{i=1}^{m} p_i^o \tilde{x}_{io}$$

Subject to

$$\text{CRS} = \qquad \sum_{j=1}^{n} \lambda_j x_{ij} \leq \tilde{x}_{io} \qquad i = 1,2,\ldots,m; \qquad (1)$$
$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq y_{ro} \qquad r = 1,2,\ldots,s;$$
$$\lambda_j, \tilde{x}_{io} \geq 0$$

Where p_i^o is the unit price of the input i of DMU_O. The DMU may vary one another based of the price data. The cost efficiency of DMU_O is defined as:

$$\frac{\sum_{i=1}^{m} p_i^o \tilde{x}_{io}^*}{\sum_{i=1}^{m} p_i^o x_{io}} \qquad (2)$$

After obtaining the cost efficiency scores, the second stage of analysis is held by regressed the determinants of efficiency with the equation as follows:

$$\text{CE} = \alpha_{it} + \beta_1 \text{NOI}_{it} + \beta_2 \text{CAR}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{OER}_{it} + \beta_5 \text{GDPgrowth}_{it} + \beta_6 \text{INFrate}_{it} + \varepsilon_{it} \qquad (3)$$

CE   : Cost Efficiency
β   : coefficient of independent variable
NOI   : Net Operational Income
CAR   : Capital Adequacy Ratio
SIZE   : Total assets of a bank (Log TA)
OER   : Operational Efficiency Ratio
GDP growth   : Gross Domestic Product growth rate
INF rate   : Inflation rate
ε   : error terms
i   : number banks in total
t   : number observations for each bank in total

4 Empirical Results and Discussions

4.1 Cost efficiency of Islamic Public Banks in Indonesia

There are three variables of input employed; labor, total funds, and fixed assets, with three variables of output; total financing, off-balance sheet items, and other earning assets. Further, input prices are required to conduct the cost efficiency, such as; labor price, funds price, and fixed assets price. As the cost efficiency scores are obtained, we further give the bank's rank by defining the average scores of its efficiency from the whole periods, as below:

Table 1 Average Rank of Cost Efficiency

Ranking	Islamic Public Banks	Mean
1	Bank Victoria Syariah	0.597
2	Bank BNI Syariah	0.548
3	Bank Jabar Banten Syariah	0.436
4	Bank Muamalat Indonesia	0.421
5	Bank Syariah Bukopin	0.256
6	Bank Syariah Mandiri	0.228
7	Bank Mega Syariah	0.226
8	Bank BRI Syariah	0.111

Based on table 1, it reveals the rank of Islamic public banks in Indonesia based on the average cost efficiency score. Bank Victoria Syariah performs the best among other banks in this study, in which the results show that it achieves as highest rank in the eight quarter with the average score 59.7%. By utilizing the 59.7% of resources employment, it is expected to produce outputs in the same level of inputs when it is not producing on the current location other than its frontiers. More resources are needed for 40.3% since more cost is spent to produce efficiently the same outputs averagely. On the other hand, Bank BRI Syariah indicates as the least efficient among all banks in this study with the average score of cost efficiency only 11.1%.

4.2 The determinants of cost efficiency

Dependent variable is obtained from the scores of cost efficiency to find its determinants by employing panel regression. The result of Hausman test reveals that the p-value is bigger than 5 percent hence the study used random effect. Prior to the regression, it is found that there is no multicollinearity issue among the independent variables thus the regression could be further studied.

Table 2 Determinants of Cost Efficiency

Variable	Coefficient	Std. Error	t-Statistic	Prob.	R-squared	0.3785
C	6.9966	2.0067	3.4867	0.0007	Adjusted R-squared	0.3477
NOI	-0.0066	0.0024	-2.7135	0.0076	S.E. of regression	0.1769
CAR	0.0045	0.0011	3.8838	0.0002	F-statistic	12.2819
SIZE	-0.0754	0.0362	-2.0836	0.0393	Prob(F-statistic)	0.0000
OER	-0.0034	0.0027	-1.2285	0.2216		
GDP	-1.0012	0.3546	-2.8232	0.0056		
INF	-0.0064	0.0058	-1.1068	0.2706		

Based on table 2, it indicates that out of six, there are four independent variables have significant impact on cost efficiency. Net operating income (NOI) is significant on one percent level with negative impact on cost efficiency; capital adequacy ratio (CAR) is significant on one percent level with positive impact on cost efficiency, banks size is significant on five percent level with negative impact on cost efficiency, and GDP growth rate is significant on one percent level with negative impact on cost efficiency. It indicates that this study supports the results of Rahman & Rosman (2013)that capitalization has positive impact, while size and profitability have negative impact on cost efficiency. Additionally, GDP growth rate is the main determinants of bank efficiency. Adjusted R-squared is 0.3477 that indicates 34.77% the variation of independent variables could explain the dependent variable; meanwhile the remaining 65.23% may be determined through other factors which excluded in this study. F-statistic and p-value indicate as good model for analysis, hence the results are reliable.

5 Conclusions

There are eight Islamic public banks in Indonesia, which were taken as the sample of this study with quarterly data from 2011.1 to 2014.4. It employs non-parametric and its efficiency scores are regressed to find its determinants. Data envelopment analysis is used as non-parametric approach by assuming cost efficiency in measuring the best practice of the cost of banks by maintaining the same condition in producing the same outputs. The Islamic public banks are expected to minimize the cost in order to achieve higher profit. The average score of Bank Victoria Syariah as the most efficient banks among other Islamic banks in term of cost efficiency is 59.7%, while Bank BRI Syariah which is the most inefficient bank with the average score 11.1%.

There are three determinants that indicate negative impacts on cost efficiency, such as net operating income (NOI), size and GDP growth rate, while capital adequacy ratio has positive impact on cost

efficiency. Due to time limitation and specific scope of case in Indonesia, the authors may recommend for further research to broaden the study as comparative study among countries as well as among Islamic and conventional banks. Bank efficiency study may also measure the profit and revenue efficiency to capture better understanding from various measurements of efficiency. The determinants of bank efficiency may find the impacts from other bank specifics and corporate governance aspects as well.

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Decision Support Capabilities of Enterprise's Management Information Systems: An Empirical Study

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Abstract: In this paper a quantitative analysis of MIS use contributing to development of decision support capabilities is performed. The findings of the study explain why certain decision supports capabilities are generated determining the relationship between uses of MIS decision support capabilities. Additionally, the moderating effects of information content quality and information access quality are tested. Finally, by identifying the levels of decision support capabilities and MIS use in Saudi Arabia companies, valuable insight is provided for local businesses on how to achieve IT capability and competitiveness. This paper provides clear insights in the role of MIS and its consecutive importance in maintaining the activities of decision support systems. Our model demonstrated that all of the variables had significant and relevant impact and correlation with the use of information systems. All of the hypothesized relationships: that use of MIS positively impacts on problem definition in the decision support processes, the speed of problem identification in the decision support process, decision making analysis in the decision support process, decision quality in the decision support process, decision speed in the decision support process, decision maker's satisfaction in the decision support process exhibited relevant significance. The outcomes of the paper can be beneficial for business executives in terms of simplifying their day to day decision making process based on the timely and relevant information. Management Information systems also ensures the information quality and speed of the decision making process which can be valuable asset for the business managers.
Key words: MIS information access; Information quality; Decision making; Decision quality

1 Introduction

An unprecedented and clandestine predicament has emerged from the congruence of new technology and increasing volume of data (Oh, 1998). The natural consequence of cheap storage and high-speed connectivity has created the strategic tendency for organizations to a mass data for the sake of extracting collective knowledge (Leidner and Elam 1994, Alalwan, 2014). Yet, as the information content becomes increasingly complex and dispersed the ability to utilize this information for quick and effective decision making declines. One strategic approach to realize business value from the cumulative content assets is to employ appropriate decision support (DS) technology (Mead and Kennett, 2007). DS technology offers a means to structure, to filter and analyze information in order to reduce uncertainty and increase efficiency in the decision making process. Traditionally, DS technology encompassed tools such as decision support systems (DSS) expert systems (ES), executive information systems (EIS) and group decision support systems (GDSS). More recently, newer technologies have emerged that are designed more specifically around the problem context of organizational data and include systems that support knowledge management and generation. Management Information Systems (MIS) are widely used in big corporations to collect organize, filter and present data, resulting in more effective decision-making. Through use of MIS, individuals shape the way how they make decisions. In our study, we posit that utilization of MIS in the decision-making process impacts the decision support capabilities of systems. The use of MIS develops speed, quality, and other features of decision-making (Jarupathirun and Zahedi 2007). Moreover, improvement in decision-making is aimed to ensure customer satisfaction and good business results. All MIS strategies should therefore be tailored in a way that the all business goals are achieved. The main problems that the study aims to solve are: how the use of information system contributes to the development of decision support capabilities. Research gaps as the existing studies have failed to quantitatively evaluate the factors that lead to development of these key capabilities. With knowing that use of information systems leads to developing of certain capabilities, management can argue for implementation of such system.

2 Literature Review and Research Model Development

While some previous studies have discussed the strategic capabilities of MIS, to the best of our knowledge no published research has assessed the impact of MIS on decision support in an

organizational context of Saudi Arabia. Specifically, we know of no research that has been conducted to determine the extent to which MIS use enables decision makers to recognize problems, explore possible solutions, and improve decision making speed. To address this research gap we develop a conceptual model that combines the sequential decision making framework of Mintzberg et al. with the content stewardship activities of MIS identified by Smith and McKeen. We use this conceptual model as the basis to formulate our hypotheses, and our research model to analyze the effect of MIS use on problem definition, speed of problem identification and decision making, decision quality, and decision satisfaction. The importance of decision maker is found to be crucial in maintaining the activities of decision support systems. The solutions provided by decision support systems is considered as being vital in ensuring efficiency of work by reaching high level of employee satisfaction. Besides providing flexibility and automated work conditions, decision support systems are becoming popular for improving organizational efficiency. In this regard, Power (2002) and Ghazi (2016) highlighted that making decisions is an essential part of working especially in the organization. Improving financial performance is considered as a main priority for most companies therefore decision support systems contributes to the operations of the firm through better exploitation of business opportunities. One of the most efficient ways of making decision is ensured through Management information system (MIS), which was conducted to collect manual data previously. The underlying idea behind MIS is to maximize the constant flow of information to the management which will be later used for decision making purposes. Uma (2009) provided some examples of decisions which are reached with the help of decision support systems including those such as merger acquisition, expansion of the plant and new product development. Thus, it is necessary to shed more light into how management information systems ensure the quality of decisions made by DSS. Review of the previous literature (Alalwan,2014; Ghazi, 2015; Oh ,1998;Jarupathirun and Zahedi 2007; Mead and Kennett, 2007;Leidner and Elam, 1994;Sanders and Courtney, 1985 resulted in identification of the following important variables including impact on problem definition, speed of problem identification, decision making analysis, decision quality, speed of decision making and decision maker satisfaction Through a detailed review of all factors belonging to the scope of capabilities the factors that are most conducive to creating a most favorable decisions have been determined. The research model represents the possible generation of decision support capabilities as an outcome which, is significant for organizational performance. Therefore, a relationship between use of MIS and problem definition, speed of problem identification and decision making, decision quality, and decision satisfaction has been hypothesized. Decision support capabilities have implications for success of decision-making. In our model, however we are assessing for which capability is MIS use more beneficial. Therefore, a link of MIS use with decision-support capabilities is tested.
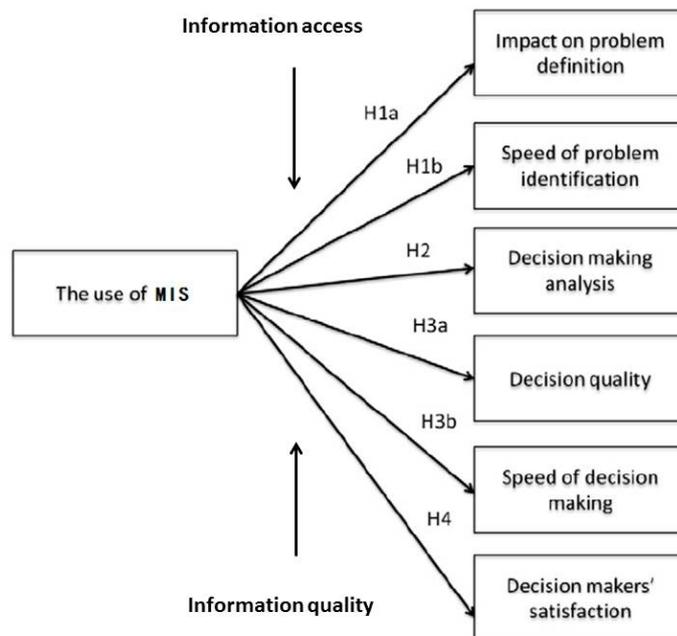
Figure 1   Research Model

The hypothesized relationships are:

H1a The use of MIS positively influences impact on problem definition in the decision support process.

H1b The use of MIS positively influences speed of problem identification in the decision support process.

H2 The use of MIS positively influences decision making analysis in the decision support process.

H3a The use of MIS positively influences decision quality in the decision support process.

H3b The use of MIS positively influences decision speed in the decision support process

H4 The use of MIS positively influences decision maker's satisfaction in the decision support process

H5 Information content quality has a moderating effect on the relationship between MIS use and decision support capabilities

H6 Information access quality has a moderating effect on the relationship between MIS use and decision support capabilities

3 Research Methodology and Results

This particular survey used closed-ended questions and a Likert-scale, meaning that the questionnaire displayed first, for multiple choice questions, and allowed us to estimate the percentage of people who responded to the questionnaire in a specific way, after which matrix questions were used for rating or ranking answer choices which included a weighted average so we could see which answer is picked most often. The questionnaire which was constructed to determine the employees' usage of the management information system of employees of manufacturing companies in Saudi Arabia was divided into two different sections. The goal of the questionnaire survey was to test the use of management information systems by employees in manufacturing companies in Saudi Arabia. It also attempted to capture an overview of the current level of management information systems in the overall industry in Saudi Arabia. The questionnaire was composed in the English language for scales pertaining to previous studies and research, which was then translated into Arabic, validated by experts and with the vocabulary adapted to this specific context of the study, administered to employees of manufacturing companies in Saudi Arabia, but to those factories using the management information system.

Table 1   Questionnaire Variables and Their Source

Questionnaire variables	Adopted from:	Original Source
Management Information system	Alalwan (2014)	Zain et. al (2005)
Impact on problem definition	Alawan (2014)	Oh (1998)
Variable Decision	Alalwan (2014)	Leidner and Elam (1994)
Speed of problem identification	Alalwan (2014)	Leidner and Elam (1994)
Decision making analysis	Alalwan (2014)	Leidner and Elam (1994)
Information Quality	Alalwan (2014)	Mead and Kennett (2007
Decision Quality	Alalwan (2014)	Jarupathirun and Zahedi (2007)
Decision maker satisfaction	Alalwan (2014)	Sanders and Courtney (1985).
Information access	Alalwan (2014)	Mead and Kennett (2007),

All the variables of the research model were measured with scales that were adopted from prior studies. Altogether nine variables of the research model were measured. All the utilized scales exhibited sufficient level of reliability exceeding the level of 0.7 in all the studies that the scales were taken from. Language and vocabulary changes were made in order to fit the context of our study. Furthermore, the translation was made to the Arabic language. Information access was analyzed in prior studies performed by Mead and Kennett (2007), which was a combination of multiple scales adopted from previous research. The survey was conducted in large manufacturing companies, since it was important that these companies have a large and adequately developed IT and IS sector, to ensure reliability and authenticity of the obtained statistical results. The questionnaire was sent to 560 people, 320 individuals completed the questionnaire and because of the missing values, 208 questionnaires were taken into consideration and could be further analyzed. The return rate was 57.1%, and the response rate was 37.1%. 48.2% of the employees were between the age of 24 and 35 and 29.9% were between the age of 35 and 44. Less than 2% of the entire interviewed population was over the age of 55. The present study

attempted to determine whether the use of management information systems leads to certain decision-support capabilities. Moreover, we wanted to find out how the information content quality and information access quality moderate the impact on these capabilities. The variables which were analyzed were: use of IS system, impact on problem definition, problem identification speed, decision-making analysis, decision quality, decision-making speed, decision makers' satisfaction, information content quality, and information access quality.

The R Square indicates how much of the variance in the statistical analysis is explained by the predictor variables: satisfaction, problem identification speed, information access quality, decision-making analysis, impact on problem definition, decision quality, information access quality, decision-making speed in correlation with the influence on the dependent variable, use of information systems. The moderating effect of information access quality and information content quality was also measured. In the multiple regression analysis section, we also checked if the significance value was less than .05 in order to obtain if the findings were statistically significant. In the multiple regression interpretation, F value is also exhibited as the relevant degrees of freedom. In our present study, we tested the hypothesized relationships between the proposed variables and the corresponding variables. Our model demonstrated that all of the variables had significant and relevant impact and correlation with the use of information systems. All of the hypothesized relationships: that use of MIS positively impacts on problem definition in the decision support processes, the speed of problem identification in the decision support process, decision making analysis in the decision support process, decision quality in the decision support process, decision speed in the decision support process, decision maker's satisfaction in the decision support process exhibited relevant significance.

Table 2   Regression Analysis Results

Dependent variables	R square	F value	Significance
Decision maker's satisfaction	,466	15,335	,000*
Speed of decision making	,419	12,717	,002*
Decision quality	,429	13,225	,000*
Decision making analysis	,312	7,965	,017*
Speed of problem identification	,409	12,191	,000*
Impact on problem identification	,329	8,625	,002*

*p value is significant at <.05
*Independent Variable: Use of IS system

4 Conclusions

The research attempts to determine whether the use of management information systems leads to certain decision-support capabilities. Additionally, we want to find out how the information content quality and information access quality moderate the impact on these capabilities. The research contributes to empirically based knowledge concerning management information systems in large companies. The contributions of the current study lie in the fact of accomplishing subsequent objectives: Identification of the exact value of MIS use for each factor of decision support; Determining the value of information quality for MIS use – capabilities relationship; Getting more insight into decision support capabilities, level of MIS use for a specific sample of companies in the service sector and Building foundation for creating an MIS that would bring effective management results

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The Impact of Capital Expenditure on Corporate Earnings in Developing Financial Markets

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Abstract: This paper examines the relationship between earnings and capital expenditures for the firms listed on five ASEAN markets during 2000-2014. The sample period is categorized into investment period (2000-2007) and the performance period (2008-2014). Portfolios are sorted based on capital investment ratios estimated from the investment period to test the relationship between capital expenditure and earnings. The results contradict traditional view that suggested positive association between capital expenditures and future earnings. Among other factors, over-investment by the managers was found to be the main reason that negatively affect earnings.
Key words: Capital expenditure; Corporate earnings; Developing financial markets

1 Introduction

Firms made decisions about the capital on the basis of investment needs. The decisions related to capital budgeting such as, plant expansion, equipment replacement, instalment of machinery etc. are known as capital expenditure (C. H. Jiang, H.-L. Chen, and Y.-S, Huang, 2016). The purpose of expanding investment is to increase earnings. The management invest capital in optimal NPV projects that help the firms to increase their earnings. Thus, the traditional view about the capital expenditure suggests positive relationship with the firm earnings. But sometime entrenched managers invest capital in the wasteful projects which effect the firm earnings negatively (R. La Porta, 1998; A. a. K, 2005; L. Fresard and C,2008).

Studies have shown mixed evidences on the relationship between capital expenditure and the firm earnings. Firms with higher ratios of capital expenditure have higher abnormal returns in that current-period as argued by Callen, Livnat(J. Callen, J. Livnat, and S. Ryan,1996). By controlling for industry differences, Lev and Thiagarajan (1993) found that the values are high for the firms that have high capital expenditures. Some other studies are not found to be conclusive as the evidence by Echevarria (1997) on the data of 500 industrial firms over the period 1971-1990 showed that the financial performance of the sample firms varies widely. They further found that only a single quarter of the sample firms have shown increased profitability in the performance period 1981-1990, although huge investment was done to upgrade manufacturing and operating facilities from 1971-1980. The study by Kim(2001) on a sample of manufacturing firms in the USA making 515 observations per year over the sample period 1976-1989, showed no linear relationship between capital expenditures and future earnings for the overall sample. On splitting the sample firms into winners and losers he found a positive relationship between capital expenditures and future earnings for winner firms while negative relationship between capital expenditures and future earnings for the loser firms.

The aim of this study is to test the traditional view that there is positive impact of capital expenditure on firm earnings. Studies in the past have addressed this issue mainly in the developed financial markets. The only study by Jiang(2016) have discussed this issue in developing context. The results of our study are contradictory to Jiang (2016) as they have supported the traditional view but in this study we have found the negative impact of capital expenditure on corporate earnings. Our results support the agency view of capital investment on the wasteful projects by the management which is inconsistent with Jiang (2016) results. The next section provides a brief literature review followed by methodology. Section 4 provides the empirical results and last section provides the conclusion.

2 Literature Review

Two major schools of thoughts describe the relationship between capital expenditures and firm earnings. The phenomenon is related to the use of free cash-flow on the capital expenditure by the managers. First school of thought is related to convergence of the interests between shareholders and managers. The managers use the free cash in the positive NPV projects, predicting the positive relationship between the capital expenditure and corporate earnings (J. Davis, F. Schoorman, and L.

Donaldson, 1997). On the other hand, Jensen and Meckling(1976); Jensen(1986) and Harford (1999) gave opposing view by arguing that in cash-rich firms, managers are more likely to invest cash in acquisitions and these acquisitions results in poor performance, supporting the agency cost hypothesis. Some authors for example, Mikkelson and Partch(2003) argued about the conflicts of interests among managers and shareholders on the investment and did not found any evidence for decrease performance. Other than agency perspective authors have found some other factors that effected the firm earnings. Customers' nature related to the taste, preferences of the brands and unexpected changes in competitors about supply conditions may also effect demand conditions which leads to increase or decrease of firm earnings (D. P. Echevarria, 1997). Chung, Firth(2005), Dechow, Richardson (2003) and Nelson, Elliott (2002) have discussed the role of earning management in the firm to increase the performance. Lobo and Zhou(2001); Richardson(2000) and Tendeloo and Vanstraelen(2005) have argued about the agency perspective of earning management and their impact on earnings and DeFond and Park(2001) and Xie (2001) provide the evidence of earnings management impacts on information asymmetry and financial markets.

The decisions and the strategies made by the management about the investment of capital expenditure effects firms' earnings. The operating performance will increase if the management of the firm invest capital in the optimal NPV projects. The investors in the US prefer reduction in the capital expenditure for the reason that lower capital expenditure will produce higher distributed dividends in the future, as argued by Titman, Wei(2004). Gompers, Metrick (2003) compares well-governed US firms with the badly governed firms. They have found that the firms with well monitoring over the management were engaged in less capital expenditure and less acquisitions. They have showed that the firms operating under strong monitoring spend less on the capital expenditure that increases the firm's earnings.

More recently, Jiang(2016) have studied the data of 357 manufacturing firms listed on the Taiwan Stock Exchange from 1992-2002 to investigate the relationship between capital expenditures and corporate earnings. They have divided the sample period into capital investment period and performance period because it took long for manufacturing firms to do planning and implementation of capital expenditure. On ranking the firms based on capital investment ratio estimated from the investment period, they make portfolios to test the relationship. The results of Jiang (2016) study showed positive relationship between capital expenditures and future corporate earnings even after controlling for current corporate earnings.

3 Methodology

Data of 696 listed firms from the manufacturing sector on ASEAN stock markets were obtained for the period 2000-2014 from Thomson Reuters Database. The study focused on the manufacturing sector because of the difference related to the capital expenditures and firm's earnings from retail, agricultural, financial and utility firms. The other reason is that the ratios of capital expenditures are higher in manufacturing sector than any other sector. The initial sample consisted of all manufacturing listed firms on five-ASEAN stock markets (Malaysia, Indonesia, Singapore, Thailand and Philippines). But due to the non-availability of data for all the firms, the final sample is reduced to 696 firms making a firm year observations of 10440 for fifteen years. The summary of the sample firms are presented in the Table 1.

Table 1   Number of Firms per Country

Country	No of Firms
Malaysia	227
Indonesia	118
Singapore	151
Thailand	160
Philippines	40
Total	**696**

The focus of the study is to test the performance of the firm against the capital expenditure. Following Jiang(2016), we have divided the duration of the study into two sub-periods: capital investment period (2000-2007) and the performance period (2008-2014). The reason to divide the duration of the study is because it takes several years to plan and implement any investment project. The potential benefits of those projects may last for several years after implementation. Thus by doing so, we can easily examine the association of the firms' performance with the capital expenditures from the prior

periods.

The capital investment ratio is used to measure the capital expenditures for the first eight years from 2000-2007. The capital investment ratio is obtained by dividing capital expenditures to total assets (C. H. Jiang, H.-L. Chen, and Y.-S, Huang,2016). The annual investment ratios are then obtained by calculating the average investment ratio for each sample firm. Similarly, the annual return on total assets is used to measure corporate earnings for the next seven years from 2008-2014. The return on total assets is obtained by dividing annual operating cash flow to total assets for each firm (C. H. Jiang, H.-L. Chen, and Y.-S, Huang, 2016). The average value of return on total assets is then calculated to obtain the annual return on total assets.

The sample firm are first sorted according to capital investment ratio estimated from the investment period 2000-2007. A total of ten portfolio are made in the way that each portfolio containing equal number of stocks. The association between capital expenditures and corporate earnings is analyzed by applying regression analysis on the portfolios made. In the regression analysis, the average capital investment ratio estimated from the investment period is used as the predictor variable while the average corporate earnings in the seven year performance period are used as the response variable.

The purpose of applying regression analysis is to test the hypothesis that the capital investment in the investment period is positively associated with the corporate earnings in the subsequent performance period. The contemporaneous corporate earnings in the capital investment period are used as a control variable because corporate earnings over the past years also determine the future earnings. Thus, two regressions are run i-e., regression 1 with average capital investment ratio while regression 2 with contemporaneous corporate earnings as a control variable.

$$ROA_{2008-2014} = \beta_0 + \beta_1 investment\ ratio_{2000-2007} + e \tag{1}$$
$$ROA_{2008-2014} = \beta_0 + \beta_1 investment\ ratio_{2000-2007} + \beta_2 ROA_{2000-2007} + e \tag{2}$$

4 Empirical Results

Table 2 shows the average annual figures for each variable for all 696 firms. In 2000 the capital expenditure for the sample firms have an average of US$ million 36.65 while for total assets and the operating cash have the annual average values of 514.86 and 43.11 respectively. Similarly, the annual average values of all these variables are shown in the table from 2000-2007. All the variables shows upward trend from 2000 onward to 2007.

Table 2　Capital Investment Period 2000-2007

Variables	2000	2001	2002	2003	2004	2005	2006	2007
Panel A: Capital Expenditure								
Capital Expenditure (in US$ million)	36.65	30.76	35.82	41.13	46.67	60.39	73.42	87.86
Total Assets (in US$ million)	514.86	473.93	535.97	558.11	648.59	729.77	857.31	994.08
Capital Investment Ratio (Capital Expenditure/Total Assets, in %)	7.11	6.49	6.68	7.37	7.19	8.27	8.56	8.83
Panel B: Corporate Earnings								
Operating Cash Flow (in US$ million)	43.11	39.50	44.03	64.30	70.20	85.30	91.51	107.69
Return on Assets (Operating Cash Flow /Total Assets, in %)	8.37	8.33	8.21	11.52	10.82	11.68	10.67	10.83

In the table 2 the capital investment ratio shows increasing trend from 2000 to 2007 except for the year 2001 which is 6.49. Similarly, return on assets is also showing the increasing trend from 2000 to 2007 which is used as a control variable for the next seven years (2008-2014). The capital investment ratio fluctuates during the first seven years, as it decrease from 7.11% in 2000 to 6.49 in 2001 and then again move upward in the following years.

Table 3 depicted the statistics for the performance period that is, from 2008-2014. The operating cash-flows show the fluctuations throughout the seven years, as it moves from 110.72 in 2008 to 109.81 in 2009. In 2010 again shows the upward trend while in 2011 it moves downwards. The total assets

continuously showing the upward trend in the performance period as it increase 40% from 1155.76 in 2008 to 1901.3 in 2014.

The return on assets ratio fluctuates a bit from 2008 to 2010. But from 2010 onward it is showing downward trend until 2012. In 2014 return on assets again increases to 8.91 from 6.13 in 2012.

Table 3 Corporate Performance Period 2008-2014

Variables	2008	2009	2010	2011	2012	2013	2014
Operating Cash Flow (in US$ million)	110.72	109.81	140.80	136.10	111.32	145.29	169.42
Total Assets (in US$ million)	1155.76	1200.99	1405.83	1602.99	1761.87	1848.85	1901.35
Return on Assets (Operating Cash Flow /Total Assets, in %)	9.58	9.143	10.01	8.49	6.31	7.85	8.91

The results of the capital expenditure and the corporate earnings for the ten portfolio that are made by sorting the firm on the basis of capital investment ratio from highest to lowest ratio are displayed in table 4.

Investment ratio shows downward trend for the first three portfolios that is, from 6.23 for portfolio 1 to 1.24 for portfolio 3, but after that it shows the upward trend from 1.24 to 15.47 which is almost 92% increase. The return on assets fluctuates in the investment period for all the ten portfolios. But in the performance period, the return on assets shows the downward trend from portfolio 3 to 10 which shows the negative impact of capital expenditure on corporate earnings.

Table 4 Portfolios Sorted by Capital Investment Ratio (2000-2007)

Variables	1	2	3	4	5	6	7	8	9	10	All
Panel A: Capital Expenditure in investment period 2000-2007											
Capital Expenditure (in US$ million)	27.25	20.82	2.76	4.84	8.37	14.50	14.30	108.93	147.52	165.50	
Total Assets (in US$ million)	436.76	451.30	221.68	266.86	315.83	455.94	288.26	1489.2	1607.2	1069.4	
Investment Ratio (Capital Expenditure /Total Assets, in %)	6.23	4.61	1.24	1.81	2.65	3.18	4.98	7.31	9.17	15.47	
Panel B: corporate earnings in the investment period 2000-2007											
Operating Cash Flow (in US$ million)	39.07	41.95	10.69	10.29	17.13	18.60	29.04	135.67	155.63	224.10	
Return on Assets (Operating Cash flow/Total Assets, in %)	8.94	9.29	4.82	3.85	5.42	4.07	10.07	9.10	9.68	20.95	
Panel C: Corporate Earnings in the Performance Period 2008-2014											
Operating Cash Flow (in US$ million)	649.78	144.80	244.97	143.24	44.57	42.09	18.08	15.55	9.30	1.62	
Total Assets (in NT$ million)	7997.79	1168.81	1455.66	1107.84	1329.70	1977.88	1380.31	1557.083	2320.21	2387.37	
Return on Assets (Operating Cash-Flow/Total Assets, in %)	8.12	12.38	16.82	12.93	3.35	2.12	1.31	0.99	0.40	0.06	

The regression analysis is applied on the portfolios made to check the impact of contemporaneous capital expenditures on corporate earnings. The regression results based on 696 firms are shown in the panel A of table 5. Investment ratios for each sample firms are estimated first from 2000-2007 and then annual average values are calculated for each year which is used as explanatory variable. Similarly, return on total assets is estimated from 2008-2010 for each sample firms and then the average annual values are calculated for each year, to use it as dependent variable.

Two separate regressions are applied to check the relationship between the investment ratios and the return on assets. In the first regression only investment ratio$_{2000-2007}$ is used as a predictor variable

while in regression 2, the investment ratio$_{2000\text{-}2007}$ is used as a predictor variable and ROA$_{2000\text{-}2007}$ as a control variable. The results have showed no significant relationship for investment ratio in regression 1 and regression 2 even after controlling the earning of the previous period which shows significant positive relationship in regression 2. However, the explanatory power shows much higher improvement in the regression 2 that is, R^2 value shows a jump from 0.078 to 0.59 after controlling ROA$_{2000\text{-}2007}$.

Table 5　Regression of Future Corporate Earnings against Current Capital Expenditures and Current Earnings

Regressions	Intercept β_0	Investment $_{2000\text{-}07}$ β_1	ROA $_{2000\text{-}07}$ β_2	R^2
Panel A: Regression Based on the 357 Sample Firms				
1	11.91	-0.44 (-0.65)ns		0.078
2	11.12	0.75 (1.02)	0.81 (2.23)s*	0.59
Panel B: Regression Based on the Eight Portfolios Sorted By Investment Ratio (1992-1996)				
1	10.91	-0.89 (-2.19)s**		0.37
2	8.13795	-2.19 (-1.83)s*	1.17 (1.15)s*	0.47

*significance at the 0.1
**significance at the 0.05
***significance at the 0.01

Panel B in table 5 shows the regression results of the based on ten portfolios sorted by capital investment ratio. The explanatory power improves in the regression 1 which is 0.37. The regression 1 of the panel B shows significant negative relationship between investment ratio and ROA. The slope coefficient value in regression 1 is -0.89 which is significantly negatively related with a t-value of -2.91. In the regression 2 both investment ratio$_{2000\text{-}07}$ and ROA$_{2000\text{-}07}$ shows significant relationship with ROA$_{2008\text{-}14}$. Investment ratio$_{2000\text{-}07}$ shows significant negative relationship with ROA while for ROA$_{2000\text{-}07}$ the slope coefficient value is 1.17 which is significantly positively related with a t-value of 1.15.

The empirical results of the study oppose the traditional view that there is a positive relationship between capital expenditures and future earnings. Significant negative relationship is found between current expenditures and future earnings even after controlling the earning from the investment period which contradicts the results of (C. H. Jiang, H.-L. Chen, and Y.-S, Huang,2016).

5 Conclusions

This study has investigated the relationship between capital expenditures and future firm earnings on 696 manufacturing listed firms on five ASEAN stock markets. Investment ratio is used for measuring capital expenditure while ROA is used for firm earnings. To test the relationship between capital expenditures and future firm earnings the sample firms are used to make portfolios by sorting the firms on investment ratio. A total of ten portfolios are made in a way that each portfolio containing equal no of stocks. Regression analysis is then applied to test the relationship. Contradictory to Jiang (2016) this study has found significant negative relationship between capital expenditures and future firm earnings. The reason might be the investment by the managers in the wasteful projects like unnecessary acquisitions which results in the overinvestment as argued by Jensen(1986). Thus, capital expenditure in the emerging markets might be the bad news for investors in the investment practice. The future researchers can find out the reason behind the negative impact of capital expenditures on future firm earnings.

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Impact of Exchange Rate, Relative Per Capita Income and Relative GDP on China-Pakistan Bilateral Trade

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Abstract: The aim of this study is to investigate the impact of different economic factors on bilateral trade balance between China and Pakistan. A number of qualitative and quantitative factors affecting bilateral trade have been discussed but not all are included in the proposed model. Annual data from 1991-2013 on exchange rate between China and Pakistan, relative Per Capita income, relative GDP and Balance of trade is collected, analyzed and modeled using multiple linear Regression. Relative GDP and per capita income have a significant positive and negative impact respectively on bilateral trade balance between China and Pakistan. Exchange rate does not have a significant impact on China-Pakistan bilateral trade balance in the sample considered here while one year lagged values of trade balance are found significant in predicting trade balance between these two countries. This study is the first attempt to model China-Pakistan bilateral trade balance till now up to the best of author's knowledge. Future studies can include a panel data set to model Pakistan's overall trade balance with all major countries which should definitely consider a larger and more heterogeneous data set. This study will be helpful for Pakistani authorities to forecast trade balance and formulate appropriate policies to lessen any expected trade deficits with its 2nd largest trading partner (China).
Key words: Bilateral trade balance; Exchange rate; GDP; Per capita income

1 Introduction

There is no doubt that international trade is one of the primary drivers of peaceful co-existence between countries of the world. Even the countries with severe conflicts tend to avoid confrontation when they have a huge bilateral trade volume. Due to ever increasing economic cooperation between China and Pakistan, it is the need of the hour to investigate how trade pattern between these two countries is affected by different economic factors. Understanding of trade balance modeling between Pakistan and China can help policy makers to form policies to reduce any negative impacts of trade deficits and formulate an effective trade policy for the betterment of the people of both countries. Although Pakistan records a net deficit in trade volume with the world while China shows a surplus, still consistent rise in trade deficit with China is the focal point of trade policy discussion these days in Pakistan.

The aim of this study is to determine the impact of some macroeconomic variables on bilateral trade between China and Pakistan. Per Capita Income, Economic size (Pakistan and China GDPs) and Exchange rate are selected as macroeconomic variables to be included in this study. Selection of only these variables was a result of data availability and time related issues. This research will be helpful for policy makers to formulate favorable policies for creating healthy environment for bilateral trade between the two countries. By enhancing trade volumes, the two countries can get great benefits in terms of economic development. Specific study of this nature on these two countries is rarely available in the literature up to the best of author's knowledge.

2 Literature Review
2.1 Exchange rate

Exchange rate is the value of one currency in terms of another foreign currency. "Direct exchange rate" refers to the value of Home County's currency in terms of foreign currency while "Indirect exchange rate shows the value of foreign country's currency in terms of home currency (Chong Lee-Lee, 2007). Increase in the value of the home currency as compared to foreign currency due to market forces is called appreciation of home currency and decrease in value called depreciation (Koi Nyen Wong, 2008). From home country's perspective, increase in direct exchange rate quotation means appreciation while increase in indirect exchange rate quotation means depreciation of home currency as compared to foreign currency (Mohsen, et al, 2007). Direct exchange rate quotations from Pakistani perspective will be used for the purpose of analysis in this study. A number of factors including inflation, interest rates, income level, government controls and people's expectations affect the exchange rate between any two

countries whereas changes in exchange rates affect the volume and direction of bilateral trade between these countries as a result (ABEL, et al, 1982).

2.1.1 Exchange rate regime in China

Asia is experiencing a gradual shift of exchange rate regimes from managed to freely floating. China is not an exception to this phenomenon (Eichengreen, 2006). Chinese currency remained pegged with U.S dollar for a long period of time. China faced great pressures from international community to shift its exchange rate regime to a more flexible one after recording consistent trade surplus for most of the countries, especially United States (Ramkishen, 2012). In response to these pressures, China allowed its currency to depreciate slowly against U.S dollar after 2005. It was a kind of "managed float" regime. Numerous studies have shown the positive effects of undervalued Chinese RMB on its exports. However some researchers have found insignificant impact of undervalued RMB on Chinese exports to the rest of the world recently by taking multiple related considerations into account (Frankel, 2009).

2.1.2 Exchange rate regime in Pakistan

Pakistan adopted a flexible exchange rate policy in 2001 as compared to previous more rigid policy of almost fixed exchange rate. Today's exchange rate regime of Pakistan is nearly free float with intervention from Central Bank only if necessary (Komain, 2012). They don't stick to some rules when it comes to exchange rate rather try to manage it according to situation and need of the hour. Some studies have shown the negative impact of Pakistani Rupee depreciation on the economic growth of the country.

2.2 Bilateral trade

International Trade between two countries is called bilateral trade. Bilateral trade is very important for the development of the countries' masses (Holger., 2011). It is considered as a gauge of relations between counties. It is also considered as a driver for international peace. Trade surpluses and deficits are very important as wealth transfers from countries in trade deficit to surplus countries. Relevant authorities pay great attention to balance of trade in the best interest of their countries. Deliberate exchange rate depreciation is one of the most famous tools to increase trade balance with other countries. Sometimes exchange rate depreciation becomes the major issue of debate to tackle international trade balances among world's greatest powers. A number of other factors than exchange rate also affect the volume and direction of bilateral trade between two countries.

2.2.1 Factors affecting bilateral trade

Different international trade theories and models have identified different factors affecting international trade.

1) Economy size

"Gravity theory" is the famous study to discuss this issue (Wang, et al, 2010). First form of "Gravity theory" stated that bilateral trade between two countries is a function of sizes of two economies and physical distance between them. This remained quite simple and impressive explanation for bilateral trade volumes for a long period of time (Deardorff, 1984).

2) Current and historical trading costs

Second form of gravity theory included "current and historical trading costs" as additional explanatory variables in the gravity equation and excluded physical distance. This form is called "Dynamic Gravity model". This model has widespread support from empirical studies as trading cost is the most significant factor which determines the direction and volume of international trade.

3) Exchange rate

Apart from simple variables included in static and dynamic forms of Gravity equation, a list of other explanatory variables has also been used in numerous studies to explain bilateral trade. Most important of these factors is exchange rate volatility. Impact of Exchange rate changes on bilateral trade between China and Pakistan is the main focus of this study. Its detailed effects on bilateral trade will be discussed later in this study.

4) Per capita income

Little difference in per capita income is associated with large volume of bilateral trade (Helpman, 1985). It implies that countries with similar per capita incomes trade more with each other than countries with large differences in per capita income.

5) Bilateral foreign direct investment

It is not obvious till now that increased trade flows cause FDI or increased FDI causes increased bilateral trade flows but latter has got some empirical support (Gopinath, 1999). A recent study has shown the positive impact of "Japanese FDI in China" on bilateral trade volumes (Jinping, 2008). Both China and Japan are large economies and have positive size effects on bilateral trade.

6) Distance between countries

First form of gravity theory states that bilateral trade between two countries is directly proportional to the gross domestic products of the countries while inversely proportional to the physical distance between them .

7) Institutional arrangements and trade agreements

Literature on effects of "free trade agreements" on bilateral trade shows mixed results sometimes (Magee, 2003). Free trade agreements can increase the volume of bilateral trade up to 100 percent within 10 years' time (Bergsten, 2007). Theoretically this argument sounds good but some studies casted a doubt on its credibility. Another study questions the "greater market access" for developing countries through bilateral trade agreements with industrialized economies.

8) Trade complementarity

Trade complementarity refers to the degree to which one country sells what the other tends to buy. If one country sells the same products which the other needs, they are said to have a high trade complementarity. Trade volume between countries with high trade complementarity is expected to be much higher than countries with low complementarity. This factor is not much favorable for Sino-Pak trade.

9) Cultural similarities

It is much convenient to conduct trade and transactions between people sharing similar values, norms and languages. As they can understand each other well and communicate more easily and effectively. This factor is not favorable in Sino-Pak trade perspective as they have very different culture, norms, traditions and languages. This hurdle is being removed now by cultural exchanges, Chinese language teaching to Pakistani students in China and in Pakistan also now.

2.2.2 Exchange rate and bilateral trade

Effect of exchange rate depreciation is favorable in literature due to increased competitiveness of prices in depreciating country. While in the absence of sound "risk management practices", trade volumes become small in an area of high exchange rate volatility (Gagnon, 1993). According to a recent study, devaluation is contractionary in case of Pakistan (Shahbaz et al, 2011). Depreciation of Chinese RMB is associated with positive trade balances for China due to huge trade surplus and export orientation of the economy (Claus, 2011). China is also accused often to deliberately keep its currency undervalued to take undue advantage in foreign trade (Goldstein, 2003; Taylor, 2003). In such a perspective, it is interesting to know how undervalued RMB affects trade volume and direction with one of its best friends.

2.3 International trade theories

Classical Recardian model of international trade suggests that countries trade due to differences in their relative production efficiencies. This model is superior to "Absolute advantage theory" of Adam Smith, as it explains the trade patterns far better than that. Heckscher-Ohlin model suggests that international trade patterns are determined on the basis of differences in factor endowments between the countries. Standard trade model is a general international trade model which include other models, such as; Ricardian, H-O and specific country characteristics as special cases. It states that differences in physical capital, labor skills, labor services, land type, technological differences cause differences in production possibilities across different countries. The gravity model specifies the value of trade between two countries as a positive function of incomes of the countries and a negative function of the distance between them (Deardorff, 1984). It has been justified theoretically by Leamer and Stern, and Anderson (Learner, 1970; Anderson, 1979). Many researchers have extended Gravity model to include various other variables like current and historical trading costs etc. Linder hypothesis states that countries with little per capita income differential are expected to have more bilateral trade. If transportation costs are controlled to check the effect of similar per capita incomes on bilateral trade, results tend to be somewhat different (Deardorff, 1984). The empirical research on Linder hypothesis is further extended to test it from a product quality perspective. Research has got support for the hypothesis that product quality determines the level of bilateral trade between two countries (Hallak, 2010). Abrams have found support for the hypothesis that exchange rate variability affects the pattern of bilateral trade (Abrams, 1980). Deliberate depreciation of the local currency can increase the exports volume of an export oriented country. This phenomenon sometimes triggers competitive devaluations between different countries. Exchange rate is the most widely discussed factor affecting international trade patterns, in literature today (Wang, et al, 2010; Magee, 2003).

2.4 Economic size (GDP), per capita income differential and bilateral trade

First form of gravity theory stated that bilateral trade between two countries is a function of sizes

of two economies and physical distance between them. This remained quite simple and impressive explanation for bilateral trade for a long period of time (Wang, et al, 2010). Little difference in per capita income is associated with large volume of bilateral trade (Helpman, 1985) . Literature on physical distance has found consistent support according to "Gravity equation" (Egger, 2000; Egger, et al, 2004).

3 Data, Methodology and Results

Data set consists of 23 annual observations for each variable from 1991 to 2013. Exchange rate data is collected from United Nations Conference on Trade and Development. Bilateral trade volume data is collected from statistical website of Government of China while Data on GDP and Per Capita Income is collected from World Economic Outlook by IMF. To avoid problems of non-stationarity, first ratios and then logarithms of the series are taken. Such a data transformation is consistent with the relevant studies in literature (Khan, 2010). Use of exports/imports ratios instead of trade balance values is easy to interpret and unit free. Same is true for ratios of GDPs and per capita incomes. Zakir and Ismail have included import weighted distance while modeling trade balance of Bangladesh with all other major trading partners (Khan, 2010). This study considers only two countries, so distance will have no variability and hence no explanatory power here.

Two different date dummies were tried in the model to capture the effects of shift in exchange rate regime in Pakistan after 2001 and negotiation of "free trade agreement" between China and Pakistan in 2006. Both of these dummies were found insignificant and did not improve any results so they were dropped. One period lagged value of ratio of Pakistani exports to Pakistani imports is also included in the model as its inclusion helped to improve explanatory power of the model (suggested by improved adjusted R^2) and removal of serial correlation (suggested by DW statistic).

Final model of trade balance between China and Pakistan formed here is as following:

In(exim) = a₀(constant) + b₁In(er) + b₂In(cgdpgd) + b₃In(cpcppc + b₄(exim(-1)) + u_t

In(exim) is the log of ratio of Pakistani exports to Pakistani imports from China, a0 is intercept, **In(er)** is the log of direct exchange rate between China and Pakistan (pkr/cny), **In(cgdpgd)** is the log of ratio of Chinese GDP to Pakistani GDP, **In(cpcppc)** is the ratio of Chinese per capita income to Pakistani per capita income, **exim(-1)** is the one period lagged value of ratio of Pakistani exports to Pakistani imports from China and **u_t** is the disturbance term. Coefficients are represented by *b₁, b₂, b₃* and *b₄*.

All data included in this study is secondary and time series data. "EVIEWS 7.2" (Statistical software) is used for data analysis. Multiple linear Regression is run after satisfying all conditions of OLS to check the impact of exchange rate, GDP, lagged values of dependant variable and per capita income on bilateral trade balance between China and Pakistan. Annual data is collected for 23 years ranging from 1991 to 2013. Results of the regression are shown in the following table:

Table 1   Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.44941	2.577929	-3.277595	0.0044
LOG(ER)	-0.08289	0.647323	-0.128052	0.8996
LOG(CPCPPC)	-2.04431	0.928881	-2.200826	0.0419
LOG(CGDPGD)	2.694382	0.830478	3.244374	0.0048
EXIM(-1)	1.66841	0.30222	5.520513	0

Value of Adjusted **R**-squared is **0.80**.
F statistic is **22.70** and Probability of F statistic is **0.00**.
AIC value is **0.15** while **DW** statistic is **2.29**.

Adjusted R^2 is 80% and F statistic is very high (22.70) suggesting an overall good fit of the data to proposed model. Coefficients of per relative capita income, relative GDP and lagged values of trade balance (exports/imports) are significant while of exchange rate is insignificant. One unit increase in the logarithm of ratio of Chinese per capita to Pakistani per capita is followed by almost 2 units decrease in the logarithm of ratio of Pakistani exports to China to Pakistani imports from China suggesting a negative impact. One unit increase in the logarithm of ratio of Chinese GDP to Pakistani GDP is followed by almost 2.6 units increase in the logarithm of the ratio of Pakistani exports to China to Pakistani imports from China suggesting a positive impact on trade balance. Improvement in the trade balance in the previous period is associated with improvement in the coming period suggested by a positive coefficient of lagged value of ratio of Pakistani exports to China to Pakistani imports from

China.   This Regression overall explains 80% of the variation in trade balance which is quite good. Descriptive statistics show that variables included here are almost normally distributed on the basis of Jarque-Bera test. Correlations between independent variables suggest some multicolinearity but it does not affect the coefficients or overall explanatory power of the model (which is the purpose here). No strategy including dropping a variable or including a proxy variable worked here. More data or a panel data set could not be considered here because of limited time and data availability issues. So multicolinearity here was not dealt with and other tests of the model fitness gave good results. Residuals are almost normally distributed suggested by Jarque-Bera test. 2.29 value of DW statistic shows almost no serial correlation. Breusch-Godfrey serial correlation LM test also suggested presence of no serial correlation in the equation. At 5% significance level, null hypothesis of homoscedasticity could not be rejected using White's test for heteroscedasticity.

4 Conclusions and Recommendations

Relative increase in Chinese GDP with respect to Pakistani GDP improves Pakistan's trade balance while relative increase in per capita Chinese income deteriorates Pakistani trade balance with China. Depreciation in Pakistani currency has no role in improving its trade balance due to increased dependence on imports from China for its Industrial sector. Despite little significance found here, exchange rate needs to be kept at a stable and predictable level to give traders and investors confidence, in both countries. Serious efforts are needed at higher official level to address the issue of increasing trade imbalances between the two countries. Recent "Currency Swap Agreement" is a positive step in this regard which can indirectly decrease trade imbalances. Increased trade deficit of Pakistan with China is moving side by side with increase in Per Capita Income Differential. Increased Differential means increased gap between living standards of the people of China and Pakistan. This issue should also be addressed through decreasing the trade imbalances between the two countries by enhancing Pakistani exports to China and providing greater market access by China to Pakistan or by increasing FDI by China in Pakistan.

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Effects of Leone Exchange Rate Fluctuation on Sierra Leone's Foreign Trade

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Abstract: A stable and sustaining improvement of foreign trade is a significant assurance for a country to attain economic development. As an important tool, exchange rate plays a significant role in attaining a country's economy balance and stable development. It also affects the international trade of a country. Owing to this fact, the relationship between exchange rate and trade is widely studied by researchers. This paper is an attempt to study this relationship for Sierra Leone via time-series framework and provide important policy implications. The study employs an econometric approach and found statistically significant relationships among the variables. The result shows that real exchange rate depreciation has adverse effect on total trade volume over the period under review.
Key words: Leone exchange rate; Trade balance; Foreign trade; Sierra leone

1 Introduction

The relationship between exchange rate and foreign trade is undoubtedly an important subject from both the descriptive and policy prescription perspectives. Since the late 1980s, the economy of Sierra Leonean has undergone significant changes in terms of reforms. The shift to export-led growth from import substitution resulted in removing major restrictions on the economy placed on it by the government, including the implementation of a floating exchange rate regime. In recent years, policy discussions have increasingly included references to real exchange rate stability and proper exchange rate positioning as vital elements in the improvement of Sierra Leone's economic performance. Real effective exchange rate movement affects economic activity in Sierra Leone, mainly owing to its dependence on imported capital goods and specialization in commodity exports. The economy has undergone a series of exchange rate devaluations in an effort to improve its trade balance. The government has considered the exchange rate to be an important macroeconomic instrument for ensuring a low inflation rate and a stable financial system, controlling imports, promoting exports, and enhancing favorable balance of trade. In the literature, the real effective exchange rate serves as a better international price for influencing a given country's competitiveness than the nominal exchange rate. Management of the nominal exchange rate depends on the real exchange rate, which is influenced by, inter alia, the nominal exchange rate (Montiel, 1997). An overvalued real exchange rate affects the intensity and pattern of production, the allocation and level of expenditure, the supply and level of factor payments, the composition and size of trade flows, the level of international reserves and external debts, the parallel foreign exchange markets, currency substitution and capital flight. Real effective exchange rate is the best way to objectively reflect the actual exchange rate of a country situation.

At this junction it is important to give an illustration of both real effective exchange rate depreciations in Figure 1 and Sierra Leone's trade with the world in table 1, to see how both the trade balance and total trade volume responded to devaluations of the Leone. Figure 1 revealed a series of depreciation. However, the highest rate of real exchange rate depreciations occurred during 1986 and 2014.

Table 1 Sierra Leone's Trade with World % GDP

Year	Export	Import	Balance	Total Trade
2005	17.8	29.7	-11.9	47.5
2006	16.8	25.0	-8.2	41.9
2007	15.6	24.7	-9.1	40.2
2008	13.5	25.7	-12.2	39.2
2009	13.4	27.9	-14.5	41.4
2010	16.7	34.5	-17.8	51.2
2011	13.8*	31.2*	-17.4*	45.0*
2012	26.3	32.2	-5.9	58.5
2013	12.8*	33.2*	-20.4*	46*
2014	12.3*	34.1*	-21.8*	46.4*

Source: World Development Indicators (WDI), * Indicates estimated figures.

The table above shows that the value of exports declined between 2005 and 2014, though it was reported to be very high in 2012. This is mainly due to the increase in exportation in iron ore products during this period. The table also shows a continuous increase in imports, which is a result of increased demand for finished goods and foreign inputs for the manufacturing sector throughout the periods. In general, imports have always exceeded exports and hence a continuous decrease in the trade balances.
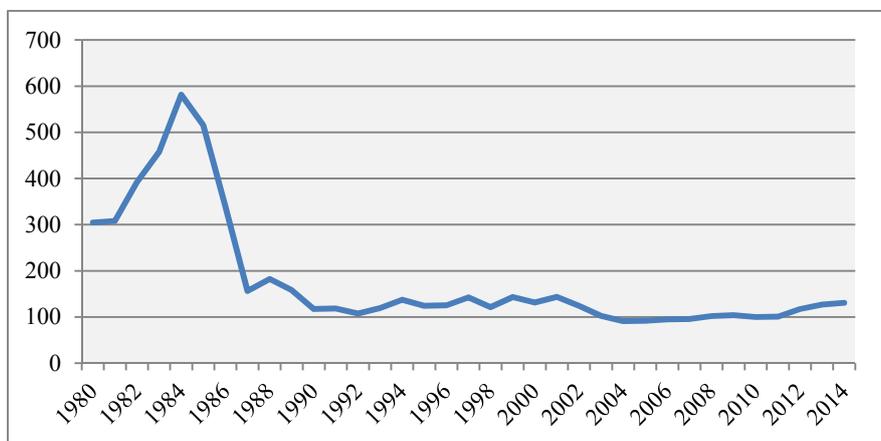
Figure 1   Real Effective Exchange Rate Fluctuation

However outcomes on empirical results on the relationship between exchange rate and international trade are still mixed, for instance, Rose and Yellen (2009) in their study found real exchange rate has no effect on export and import in the long and short run when they estimated bilateral trade elasticity between US and other countries in the case of U.S data for the period 1960 to 2009. In fact, depreciation of currency does not affect the value of import and export commodity itself. However, through changing their relative prices in international trade it can enhance or weaken their competitiveness in international market. Even if for some reasons, the demand for imports have not reduced following the devaluation, industries which produce the same goods in domestic market will be developed and import of this kind of goods will be reduced due to the rise of local currency prices of imported goods (Cerra V. & Dayal A. 2013).

In view of these conflicting results, it is clear that the impact of exchange rate devaluation on international trade remains an unsolved problem in the empirical literature. In the present study therefore, an attempt has been made to examine the extent of relationship between fluctuations of Leone's exchange rate and foreign trade in Sierra Leone via time-series analysis.

2 Methodology

The ordinary least squares (OLS) estimation was used. The choice of this model is based on the fact that OLS is best suited for testing specific hypothesis about the nature of economic relationship. The study uses multiplicative of X-12-ARIMA method to adjust original data and take their logarithm. Unit roots test was also done to test the stationary properties of the variables. The next step was conducted in confirming the level of time lag and constructing co integration test. The final step was the construction of the equation. By evaluating Sierra Leone's export and import demand flexibility, we can validate if Marshall-Lerner condition is appropriate in Sierra Leone, and use general distributed-lag model to analyze the J-Curve Effect.

2.1 Empirical model specification

The main objective of the study is to evaluate the effects the Leones exchange rate fluctuation has on Sierra Leone's total trade volume. Thus in deriving our empirical model for estimating this relationship we assume that:

Domestic Price (P): $P_D = P_X$

Foreign price (P*): $P_M = P_F$

Real effective exchange rate(R): $E \times (P / P^*)$

We have,

$$M_D = M_D (Y_1, R) \qquad\qquad (1)$$
$$X_D = X_D (Y_2, R) \qquad\qquad (2)$$

Where, M_D and X_D are the import and export demand function depends upon their respective incomes and real effective exchange rate. Therefore, the total trade volume (T) can be expressed as follows

$$T = X_D + M_D = T (Y_1, Y_2, R) \tag{3}$$

In a simple regression form, equation (3) can be written thus:

$$T = \delta + \alpha Y_1 + \beta Y_2 + \lambda R + \mu \tag{4}$$

For ease of interpretation, all the variables have been assumed in logarithmic terms. The advantage of taking natural log in a time-series framework is that one can achieve the level of stationary at the earliest level of integration. In the log-linear regression, the coefficients are easy to interpret as the problems of different units have been solved and the interpretation becomes easy in elasticity terms.

$$LnT = \delta + \alpha LnY_1 + \beta LnY_2 + \lambda LnR + \mu \tag{5}$$

2.2 Data and estimation procedure

Annual time series data for the present study have been taken from World Development Indicators (WDI) and Sierra Leone's total trade volume with its major trading partners from 2005 to 2014. In order to increase the sample size and to avoid biasness in the estimation output, the quarterly data were obtained through interpolation of annual time series data using E-views 7.2. This was done using the low frequency to high frequency method and the quadratic match average and quadratic match sum for each observation of the low frequency series (2005Q1-2014Q4). The study has used time series co integration technique to evaluate the relationship between exchange rate and the volume of trade in Sierra Leone with the world. The following variables are incorporated in the regression to achieve the objective of the study.

● Sierra Leone's total trade volume T is the sum of quarterly total imports and exports with the world in constant prices and t is logarithms of T

● The rest of the variables R, Y_1, and Y_2 are the logarithms of real effective exchange rate, Sierra Leone's GDP (Y_1), and USA's GDP (Y_2) respectively.

Since quarterly data may have seasonal fluctuation, it is adjusted using multiplicative of X-12-ARIMA method.

3 Presentation and Interpretation of Results

3.1 Unit root test

The unit root test result (table 2) reveals that all the variables in the trade equation were non-stationary at their level but became stationary at first differencing. Thus the variables are integrated of order one, denoted as I (1). This suggests the use of co-integration analysis since the concept of co-integration requires variables must be integrated of same order.

Table 2　Unit Root Test

Augmented Dickey-Fuller Unit Root Test				
Variable	**Level/ΔLevel**	**ADF test statistics**	**ADF critical value**	**Inference**
T	Level	-0.765997	-3.020686	I(1)
	ΔLevel	-4.739353	-3.020686**	
R	Level	-0.877805	-2.998064	I(1)
	ΔLevel	-5.538360	-3.004861**	
Y_1	Level	0.473877	-2.998064	I(1)
	ΔLevel	-4.019898	-3.004861***	
Y_2	Level	-0.518238	-2.998064	I(1)
	ΔLevel	-5.886847	-3.004861**	

Note: ***, ** and * indicates that the variable is stationary at the 1 %, 5% and 10% level of significance respectively.

3.2 Lag length selection process

Before proceeding with the Johansen's test of co-integration, the optimal lag selection criteria was employed to determine the lag length to be used in carrying out the estimation so as to ensure reliability of long run relationship. In table (3) the lag order selection criteria for sequential modified likelihood ratio (LR), final prediction error (FPE), akaike information criterion (AIC), schwarz information criterion (SC), and hannan-quinn information criterion (HQ) suggested the selection of an optimal lag of 1. Thus a maximum of lag one has been chosen.

Table 3　Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-198.8090	NA	18635.63	18.34627	18.49505	18.38132
1	-151.5687	77.30234*	583.1911*	14.86988*	15.46499*	15.01007*
2	-145.9388	7.677137	838.2097	15.17625	16.21770	15.42159

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: E-views output

3.3 Co-Integration Test

The co-integration test results of each series in the trade equation are reported in table 4. The result of the trace test indicates that at least one co-integrating equation exists at the 5% significance level. Therefore the null hypothesis of no co-integrating equation is rejected since the trace test statistics of 21.23304 is greater than the critical value of 21.13162 at the 5% level of significance. Therefore, it can be concluded that there is one significant long run equilibrium relationship among T, Y_1, Y_2 and R.

Table 4　Unrestricted Co-Integration Rank Test Result (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.619069	21.23304	21.13162	0.0484
At most 1	0.212244	5.248462	14.26460	0.7102
At most 2	0.013195	0.292227	3.841466	0.5888
At most 3	0.001653	0.044681	1.642741	0.8326

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-views output

Table 5　Cointegrating Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-125.2926	30.36971	-4.125579	0.0062
R	-2.224994	0.561731	3.960958	0.0074
Y_1	0.420007	0.125403	3.349270	0.0030
Y_2	0.379324	0.118384	3.204173	0.0043
R-squared	0.895012	Mean dependent var	57.93281	
Adjusted R-squared	0.842518	S.D. dependent var	24.23666	
S.E. of regression	0.618069	Akaike info criterion	7.654338	
Sum squared resid	0.540435	Schwarz criterion	7.775373	
Log likelihood	34.27169	Hannan-Quinn criter.	7.521564	
F-statistic	17.04982	Durbin-Watson stat	2.083371	
Prob(F-statistic)	0.002430			

Source: E-views output

In a regression form, the long run relationship can be written as:
$$T = -125.2926 - 2.2249R + 0.4200Y_1 + 0.3793Y_2 \qquad (6)$$

The residual stability test of the total trade volume equation shows a stable relationship. Therefore there is long run stable relationship among T, Y_1, Y_2 and R. The real effective exchange rate has a negative sign and exerts statistically significant effect on total trade volume. The coefficient of the real effective exchange rate implies that 1% depreciation in the Leones exchange rate will decrease Sierra Leone's total trade volume by 2.2 percent. This finding is in conformity with theories that exchange rate fluctuation can affect international trade, where the depreciation of a country's currency will adversely affect its trade balance. The elasticity of total trade volume to Sierra Leone's GDP and world GDP is

0.42 and 0.38 respectively. Since Sierra Leone's import is more than export, Sierra Leone's foreign trade volume is impacted greatly by the world economy than its economy.

4 Conclusions

The paper has examined the relationship between exchange rate fluctuation and foreign trade in Sierra Leone over the period 2005Q1-2014Q4. The study followed an econometric approach where various tests were conducted in order to avoid spurious regression results. Total trade volume was taken as dependent variable and real effective exchange rate, Sierra Leone's GDP and world's GDP as independent variables. All the variables were found to be stationary after first differencing. The Johansen's cointegration test approach was adopted to estimate the long run relationship of the model. The test suggests that there exists a unique cointegrating relationship among total trade volume, real effective exchange rate, Sierra Leone's GDP and world's GDP.

The study has underscored the importance of exchange rate alignment in influencing foreign trade in Sierra Leone. The findings indicate that foreign trade can be stimulated by the adoption of long run policy to ensure proper exchange rate management. Therefore, the policy suggestions for enhanced favorable balance of trade will be for policy makers to facilitate the maintenance of a stable exchange rate by allowing the exchange rate to appreciate/depreciate within a certain band; to discourage the importation of certain goods that are also produced locally by imposing high import tariffs on them so as to encourage their local production and consumption. Government should help local producers to expand on their production and increase the quality of their products by adding value which will in turn increase their demand.

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Comparative Research on the Impact of Transformational Leadership on Banking Project Success in China and Ghana

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Abstract: The purpose of this study is to comparatively investigate the impact of Transformational leadership (TL) on banking project success in China and Ghana. Primary data was obtained through questionnaires administered to 200 employees within banks in China and Ghana. The results revealed that there is a strong positive correlation between transformational leadership and banking project success in China and Ghana. The highest predictor to project success in China is Intellectual Stimulation While in Ghana is Inspirational Motivation. The study concluded that project leaders (managers) in the banking industry in both China and Ghana can increase the probability of project success by implementing and ensuring an environment that permits the use of TL behaviors notably Idealized Influence, Inspirational Motivation, Intellectual Stimulation and Individual Consideration.
Key words: Transformational leadership; Project; Project success; Leadership; Banking

1 Introduction

Project management is seen as the process of making decisions and defining specific strategies and tactics to bring a project to success. According to the Project Management Institute (2008). Projects are the organization's activities that cannot be carried out within the normal or routine activities in the organization or a transient effort to achieve an unparalleled output. Projects create a better business value.

The service industry of which banking is a part is one of the growing and important sectors in every economy, but, amidst this growth lies various challenges as far as leadership and project success are concerned. These challenges limit their benefits and impede them from achieving their strategic goals and this call for a critical look at leadership and project success

Leadership can affect many work related behaviors like employees' attitude, motivation and performance which can affect the outcome of any project (Bass, B.M, 1985). Bass, B.M (1985) among others proposed that there are two major styles of leadership namely: transformational and transactional. Transformational leadership is person oriented and brings desired changes in their followers. They are most of the time physically strong, enthusiastic and passionate and make sure that every member of the team succeeds. Past researches reveal that project success or failure is linked to the attitude of the employees, their work manners, motivation and performance and transformational leadership is positively correlated with all these attributes of the employees (Dumdum, U.R., et al 2002).

Even though there are a lot of researches exploring the relationship between leadership style and job satisfaction, relatively little attention has been paid to leadership styles and project success in the banking sector of China and Ghana. This provides a significant research gap, so, there is the need for this study to unearth the impacts of transformational leadership style on project success in the banking sector.

In view of the above, the following research questions are posed: What is the impact of transformational leadership style on project success in the banking sector of China and Ghana? And which dimension of the transformational leadership style strongly influence project success in the banking sector of China and Ghana.

2 Literature Review and Theoretical Background

According to Prabhakar (2005), leadership is defined in many ways, but, all the definitions have the following in common; the fact that leadership is a process that influences individuals and groups, concern with facilitating the performance of tasks of teams or groups and focuses on setting and achieving goals and objectives.

Turner and Muller (2004) have studied the impact of project leaders and their leadership style on project success. In their works, it can be deduced that, the studies conducted over the years on the factors of project success have not paid attention to the project leader or manager and his or her style of leadership and competence for project success. The cause of this situation has been attributed to the fact that most of the studies request the project leaders' opinion rather than their own impact on the success of projects. Or it can be because the project manager has no direct impact on project success which in any case is contrary

to the general literature of management which asserts that the leadership style and competence of the manager has a direct and measurable influence on the performance of an organization. To Prabhakar (2005), the transformational leadership style of being an example to a team and person oriented is directly linked to the success of projects. He also put out that transformational leaders who enlivens and motivates their team members by challenging them have a high probability of project success.

According to Bass (1998), there are four facets of transformational leadership: charismatic (charisma and idealized influence), inspirational motivation, intellectual stimulation and individualized considerations which are related to each other. The idealized influence dimension ensures that the vision and mission of an organization is made known and internalized by the followers. They hold on to the assertion that leaders influence their followers when they live an exemplary life. The trust of such leaders is won by their way of life. They value the needs of their followers more than their own, they are sacrificial leaders. As the name suggests, inspirational motivation leaders inspire and highly motivates the firm or business unit as a whole by using words that appeals to their emotions and bringing the best out of its followers; this type of leader builds the organizational morale by making the followers share in the organization's culture (Rafferty, A., E. & Griffin, M., A 2004). Intellectual stimulation refers to the dimension which inspires the followers to be creators and innovators, hence the employees can critique why something is done in a certain way and not the other way. For individualized consideration, the leaders perform the role of trusted counselors or teachers to their team members or followers. Each follower is uniquely treated based on his or her skills and knowledge base. To Bass, B.M (1985) transformational leadership entails three steps: 1) Elevating followers' awareness of the task and its importance and value 2) Making them transcend their self-interest for the sake of achieving organizational goals 3) At the same time, activating their higher-level needs of self-esteem and self-actualization needs.

For the purpose of this research, leadership styles will be conceptualized as possibly being related to project success. The conceptual framework for this research is shown in figure 1.
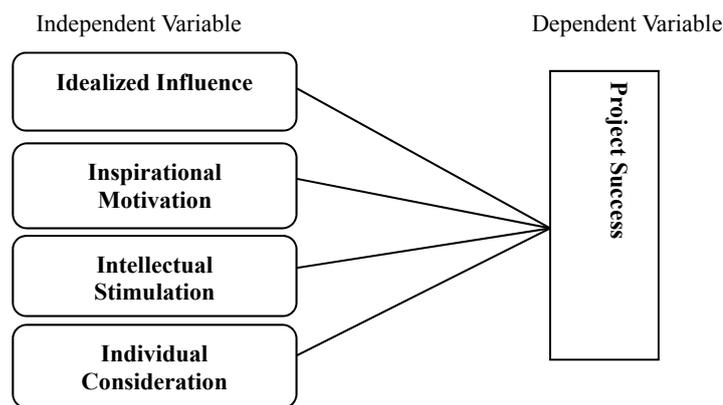
Figure 1   Conceptual Model

Transformational leadership can be seen at various sections of a company, be it within employees' groups or divisions of an organization. Transformational leaders are vision-driven, courageous, think tanks and like taking risks.

According to Lim & Mohammed (1999), two distinctions must be taking into consideration before answering what project success is made up of. The first distinction is the difference that exists between project success and project management success. Project success is measured against the general objective of the project, whereas project management success is measured by using the well-known measures like time, cost and performance. The second distinction is the difference between project success criteria and project success factors.

For a long time in the literature of project success, the iron triangle (cost, time and quality) has been the measuring tool for assessing project success. However, the iron triangle as success criteria focuses only on the delivery stage of a project ignoring the other stages. The success of a project in line with cost, time and quality does not mean that the other stakeholders like customers, sponsors among others view has been taking into consideration (Pinto and Slevin 1989). It is worth noting that there is no generally accepted or defined set of project success criteria.

Pinto and Slevin (1989) carried out a research on 159 R&D projects to understand the factors that are

critical to the success of those projects. In their research, they realized that critical success factors change throughout the life cycle of a project. At each particular stage of the project be it the defining, planning, executing and closing stages, there are new sets of factors that are most critical for the success of the project. From the research of Pinto and Slevin there are two groups of critical success factors. One group is under the control of the project manager and the other group is out of the control of the project manager. The groups that are under the control of the project manager interact with each other differently in each stage of the project life cycle. These factors are: 1) Project mission- clear goals and directions, 2) Top management support- summaries in providing the necessary resources and the delegation of power/authority to the project manager, 3) A detailed specification of the tasks and the sequence of activities needed for project success, 4) Client consultation – particularly at the initial stages of the project life cycle, 5) Selection of the project team members, 6) Availability of technology and expertise to complete the required tasks and technical actions, 7) Client acceptance and the act of selling the final product to its end users, 8) Monitoring, control, feedback throughout the project implementation phase, 9) Communication among all the project stakeholders and 10) Readiness to handle the unexpected crisis and project deviation from the pre-determined plans (Pinto and Slevin 1989).

For the second factors which are not under the control of the project manager, Pinto and Slevin opined that there are four critical factors. These are: 1) Characteristics and competencies of the project team leader – administrative, interpersonal and technical skills in addition to the authority given to the team leader to perform the assigned duties, 2) Politics and power within the organization, conflict of self-interest with project success and the goals of the organization from the project, 3) Influence of the external environmental factors, 4) Sense of urgency regarding the importance of a project and the need to implement the project as soon as possible.

In the same research by Pinto and Slevin (1989), four stage life cycle was considered and to support their assertion that different factors are critical for the success of a project at each stage of the project, their findings revealed that the first stage of the project (defining or conceptual stage), the most critical success factors are project mission, client consultation, selection of the project team members and the sense of the projects significance, At the second stage (planning stage), project mission planning and scheduling, external environmental factors and monitoring, control and feedback are very critical success factors. In the third stage (executing stage), project mission, top management support and technical competence and availability are critical success factors. In the final stage (closing or termination stage), the critical success factors are project mission, planning and schedule, project team member selection, technical tasks and client acceptance.

3 Research Methodology
3.1 Population, sample and sampling technique
The banking industry was considered for this study because of the frequent interaction among leaders and employees clearly depicting the influence of that bank leader's leadership style on the employees. The population is made up of all the employees in the bank. Through a simple random sampling technique, 3 banks namely, Standard Chartered Bank, Ecobank and UT bank were chosen from Ghana and 3, namely, Industrial and Commercial Bank of China, Agricultural Development Bank of China and Bank of China were selected. 230 questionnaires were distributed in the selected banks but 200 were correctly filled and used for the analysis.

3.2 Research instrument
Two research instruments were used in this research to collect the data. These are the short version of the Multifactor Leadership Questionnaire (MLQ 5x Short) by Bernard Bass and Bruce Avolio (2004). The variables in the MLQ are the independent variables and the Project Implementation Profile (PIP) for measuring project success by Pinto and Slevin (1989) is the dependent variable. The MLQ was used because it is the most widely used and reliable instrument for measuring transformational leadership (Schriesheim, C, A, Wu, J.B, and Scandura, T, A (2009). 20 statements of MLQ 5x Short were used to assess the transformational leadership dimensions. 8 items for idealized influence, 4 items for inspirational motivation, 4 items for intellectual stimulation and 4 items for individualized consideration were employed in this study.

A 5 point Likert scale is used to rate the observed leadership behavior of the leaders (managers) and it bears a magnitude estimation based on 0:1:2: 3:4 (Julie Pallant, 2005). The rating scale for the leadership items are: 1=Not at all, 2=Once in a while, 3=Sometimes, 4=Fairly Often, 5=frequently if not always.

The PIP which is the second questionnaire that was used has 12 critical success factors (CSFs) that

were found to be necessary for project success. The PIP can be used in any stage of the project. The CSFs used in the questionnaire are: 1) Project Mission, 2) Top Management Support, 3) Project Schedule/Plan, 4) Client Consultation, 5) Personnel-Necessary, 6) Technical Tasks, 7) Client Acceptance, 8) Monitoring & Feedback, 9) Communication, 10) Troubleshooting (Finch and Peter, 2003). The Critical Success Factors of the PIP has been measured using a set of statements. The rating scale for each statement is a 7 Point Likert scale beginning from 1=Strongly Disagree, 2=Disagree, 3=Quite Agree, 4= Neutral, 5= Quite Agree, 6=Agree and 7=Strongly Agree (Finch, Peter 2003).

The questionnaire which has been used and described above for this research consists of general and specific questions and an attached letter. The letter describes the purpose of the survey. Both the letter and the questionnaire were subject to much effort to make the questionnaire appealing to the respondents.

3.3 Data analysis

The Statistical Package for Social Sciences (SPSS) and Excel were used to carry out the analysis to achieve the objective of this research. The questionnaires were edited, coded and entered into the software where reliability test, factor analysis and multiple regression were carried out to establish relationships between variables.

4 Results and Analysis

4.1 Demographic characteristics of respondents

Majority of the respondents in both China and Ghana were project team members 41 (41%) in China and 49 (49%) in Ghana. 25 (25%) are Functional/Group managers in China and 12 (12%) in Ghana. 10 (10%) are senior or top managers in both China and Ghana. 9 (9%) project managers in China and 12 (12%) in Ghana. 9% educators in China and 10% in Ghana and the last one 6% were project management consultants in China and 7% in Ghana.

4.2 Cronbach alpha test

The internal consistency reliability is used to measure the reliability of the research instruments. Most of the items that range between reliability coefficients of 0.6-0.8 will be retained and used in the scale. Removal of Individual Consideration for China will not significantly affect the reliability of the scale, so, it is preferable to retain it. Table 1 below gives the summary of the reliability test results for the entire scale.

Table 1　Summary of Cronbach Alpha (a) Reliability Test For Each Variable

Sr #	Leadership Styles	China	Ghana
A	Idealized influence behavior	0.838	0.890
B	Inspirational motivation	0.809	0.896
C	Intellectual stimulation	0.630	0.895
D	Individualized consideration	0.522	0.878
P	Project success	0.937	0.926

4.3 Factor analysis

Factor analysis ensures that the researcher is able to condense a large set of variables or scale items to a smaller, manageable number of dimensions or factors. This is done by SPSS summarizing the underlying patterns of correlation and search for "clumps" or factors of closely related items that best measures the construct (Julie Pallant, 2005).

The factor analysis output is mainly a number of factors that represents the measures and the factor loadings of any of the variables on the resultant factor. For the factor loadings of this study, any value less than 0.3 is suppressed and the variable associated with that factor loading is excluded from the rest of the variables. Table 4.2 below shows the summary of the factors for the independent variables and their accompanied factor loadings. No items were excluded from the rest of the group in the rotated matrix since no factor loading was less than 0.3 as could be seen in table 4.2. All the variables are loaded in one component or the other; this shows that the variables are usable for this research and clearly showing a positive effect of factor analysis with the possibility of having effective result.

Table 2   Summary of the Factors and the Factor Loadings for Each Independent Variable, Ghana and China

Idealized influence	A1	A2	A3	A4	A5	A6	A7	A8
Factor loadings	.758	.827	.707	.541	.594	.767	.810	.741
Inspirational motivation	**B1**	**B2**	**B3**	**B4**				
Factor loadings	.595	.584	.649	.564				
Intellectual simulation	**C1**	**C2**	**C3**	**C4**				
Factor loadings	.600	.675	.734	.803				
Individualized Consideration	**D1**	**D2**	**D3**	**D4**				
Factor loadings	.677	.790	.771	.733				
China factors and factor loadings								
Idealized influence	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**
Factor loadings	.772	.862	.737	.629	.528	.772	.736	.815
Inspirational motivation	**B1**	**B2**	**B3**	**B4**				
Factor loadings	.787	.806	.514	.555				
Intellectual simulation	**C1**	**C2**	**C3**	**C4**				
Factor loadings	.562	.563	.712	.558				
Individualized Consideration	**D1**	**D2**	**D3**	**D4**				
Factor loadings	.501	.596	.867	.751				

4.4 Regression analysis

Regression analysis explores the relationship among variables, particularly where there is the need to examine how well a set of variables (independent variable) is able to predict an outcome (dependent variable). In this research, stepwise regression is applied between the dependent variable which is project success and the four independent factors obtained by the factor analysis in tables 4.2. The dependent variable (project success) is obtained through the transformation and computation of all the 12 items or elements for measuring project success into a single variable using SPSS.

Table 3   China Model Summary for Dependent Variable (Project Success)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.742a	.551	.532	11.24309

a. Predictors: (Constant), Individualized Consideration, Idealized Influence, Intellectual Stimulation, Inspirational Motivation

Table 4   China ANOVA for Dependent Variable (Project Success)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14718.485	4	3679.621	29.109	.000a
	Residual	12008.675	95	126.407		
	Total	26727.160	99			

a. Predictors: (Constant), Individualized Consideration, Idealized Influence, Intellectual Stimulation, Inspirational Motivation

b. Dependent Variable: Project Success

Table 3 and 4 displays the results of the regression model summary and ANOVA of the independent variables and the dependent variable. It can be seen that R=.742 showing that there is a strong positive correlation between transformational leadership and banking project success in China. This is because the regression model selected can predict about 74% of the variance dependent variable (project success). R2 =.551 shows the change in dependent variable due to independent variable. The R2 value shows that 55.1% of the change in dependent variable (project success) is due to independent variable (transformational leadership) and the rest can be attributed to other factors. The F-test for the regression model is 29.109, which is far greater than 1. This means that the chosen regression model is better than using the mean model. Since the value of the F-test is greater 1 with a significant value of .000, it can be said here also that there is a significant relationship between the dependent variable (project success) and all the independent variables and the probability of this result occurring by change is .000 (p=.000<.05). The general assumption here is that the model significantly helps to predict the outcome variable.

Table 5 Model Summary for Dependent Variable in Ghana

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.591a	.349	.322	7.46138

a. Predictors: (Constant), Individualized Consideration, Individualized Influence, Intellectual Motivation, Intellectual Stimulation

Table 6 ANOVA Model Summary for Dependent Variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2839.135	4	709.784	12.749	.000a
	Residual	5288.865	95	55.672		
	Total	8128.000	99			

a. Predictors: (Constant), Individualized Consideration, Individualized Influence, Intellectual Motivation, Intellectual Stimulation

b. Dependent Variable: Project Success

Table 5 and 6 displays the results of the regression model summary and ANOVA of the four independent variables together with the dependent variable. It can be seen that R=.591 showing that there is a strong positive correlation between transformational leadership and banking project success in Ghana. This is because the regression model selected can predict about 59% of the variance dependent variable (project success). R^2 =.349 shows the change in dependent variable due to independent variable. The R^2 value shows that 34.9% of the change in project success is due to the dimensions of transformational leadership and the rest can be attributed to other factors. The F-test for the regression model is 12.749, which is greater than 1. This means that the chosen regression model is better than using the mean model. Since the value of the F-test is greater 1 with a significant value of .000 (p=.000), it can be said here also that there is a significant relationship between project success and all the four dimensions of transformational leadership style and the probability of this result occurring by change is .000 (p=.000<.05). The general assumption here is that the model significantly helps to predict the outcome variable.

Table 7 Comparative Regression Analysis and Coefficients for Dependent Variable (Project Success)

TL DIMENSIONS	PROJECT SUCCESS				PROJECT SUCCESS			
	CHINA				GHANA			
IM	3.268				2.026			
II		2.571				1.436		
IS			4.300				1.482	
IC				2.153				1.607
Constant	26.044	23.852	33.366	36.057	37.239	38.880	38.749	37.425
Observation	100	100	100	100	100	100	100	100
R-Squared	0.430	0.375	0.197	0.105	0.226	0.176	0.226	0.314
St. Error	0.376	0.335	0.876	0.636	0.360	0.316	0.277	0.240
Sig. Value	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000

From table 7, all the four dimensions of the transformational leadership were used in the regression model one by one to determine the contribution of each on project success (dependent variable) since almost all of them have significant impact (p=.000<.05) on the regression model as well as the outcome (project success). These dimensions are: Inspirational Motivation (IM); Idealized Influence (II); Intellectual stimulation (IS); and Individual consideration (IC). From the table 4.7, the highest predictor to project success in China is Intellectual Stimulation with B value of 4.300 (B=4.300), with R2=.197 and a significant value of .000 (p=000). This is followed by Inspirational Motivation with B value of 3.268 (B=3.268), with R2=.430 and a significant value of .000 (p=.000) and Idealized Influence has a B value of 2.571 with Individual Consideration having a B value of 2.153 and a significant value of .001 (p<.05). Similarly, for Ghana, all the dimensions of TL have significant impact (p=.000<.05) on the regression model as well as the outcome (project success). From the table 4.7, the highest predictor to project success in Ghana is Inspirational Motivation with â value of 2.026 (â=2.026), with R^2=.226 and a significant value of .000 (p=000). This is followed by Individual Consideration with â value of 1.607 (â=1.607), with R^2=.314 and a significant value of .000 (p=.000) and Intellectual Stimulation has a â value of 1.482 (â=1.482) and R^2=.226 with Idealized Influence having a â value of 1.436 and an R^2 value of 0.176

(R^2=.176) with a significant value of 0.000 (p=.000<.05

It can be inferred that transformational leadership style of leaders in the banking industry of China is strongly correlated to banking project success than in Ghana. For example, Inspirational motivation leadership dimension accounts for 43% of project success in China whiles the same leadership dimension accounts for 22.6% of banking project success in Ghana. Again, Idealized Influence contributed 37.5% to project success in China but 17.6% in Ghana. Intellectual Stimulation and Idealized influence contributed 22.6% and 31.4% respectively.

4.5 Discussion

The findings of this research revealed that Inspirational Motivation and Intellectual Stimulation leadership dimensions have great impacts on project success. Idealized Influence is about making a vision of an organization clear to team members and Inspirational Motivation has to do with motivation of an organization as a unit and inspiring them through the use of emotion laden statements and inspirational talks to make the employees transcend their self-interest for the sake of the organization and also by providing meaning and challenge through the display of optimism of the future and enthusiasm. These findings agree with the results of Pinto and Slevin (1989) on the factors that contribute to project success.

5 Conclusions

This research attempts an investigation on the impact of transformational leadership styles on the success of large strategic banking projects in China and Ghana. The Industrial and Commercial Bank of China (ICBC), Bank of China (BOC), Agriculture Bank of China (ABC) and the Standard Chartered Bank, Ghana, UT Bank Ghana and Ecobank Ghana were purposively selected as case study for this research. The principal aim of this research is to examine the impact of leadership styles particularly the four dimensions of transformational leadership styles namely; Idealized Influence, Inspirational Motivation, Intellectual Stimulation and Individual Consideration on project success. To achieve this objective, the following research questions were posed:

Research Question 1: What is the impact of transformational leadership style on project success in the banking sector of China and Ghana?

Research Question 2: Which dimension of the transformational leadership style strongly influence project success in the banking sector of China and Ghana.

To answer the research question 1, the findings obtained from the empirical analysis show that banking project success depends largely on transformational leadership style as a whole both in China and Ghana. In China 74.2% of project success is dependent on Transformational leadership style (R=.742 and p=.000<.05), and in Ghana 59% of banking project success is dependent on Transformational leadership style (R=.59 and p=.000<.05).

With regards to research question 2, the findings revealed that banking project success depends largely on the project leader's (manager's) application of intellectual stimulation leadership dimension of Transformational leadership (TL) style in China and inspirational motivation of TL in Ghana. These dimensions are strongly linked to project success even though the other dimensions also have a significant contribution to banking project success both in China and Ghana.

The research has come out with the idea that project leaders in the banking industry of China should make use of the intellectual stimulation dimension of transformational leadership style to ensure success of projects whiles in Ghana, project leaders and for that matter managers of banking projects should make use of the inspirational motivation dimension of the transformational leadership style.

Acknowledgement

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An Empirical Study of Financial Sustainable Growth Models in O-Film

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Abstract: Based on the Robert Higgins's sustainable growth models, this article selects financial statistics of Shenzhen O-film Technology Co, Ltd from 2010-2015 to make an empirical study. In the empirical part, it analyzes the relevant financial data and uses the paired t-test and Wilcoxon's sign rank test to verify whether O-film achieves sustainable growth. The results show that O-film belongs to the speeding growth. Then it explores the factors why this company cannot achieve sustainable growth and the suggestions of O-film to achieve sustainable growth. Finally, this article puts forward some suggestions about financial management and development.
Key words: Sustainable growth model; Speeding growth; O-film; Empirical study

1 Introduction

Sustainable growth of companies has been a popular researching topic of academia. At present, the research on the financial sustainable growth model is mainly focused on the theoretical research in China.Li Jinlong, who introductions the financial cost control and restraint mechanisms for combination a sustainable growth model and the enterprise's financial crisis, then the financial value of the merged object can be better reflected(Li Jinlong，2013). Fan Xingjian and Guo Xiaoyan thought that the growth of enterprise needs to consider the change of market and the innovation ability of enterprise (Fan Xingjian,Guo Xiaoyan,2007). Yang Yongsheng put forward application of enterprise capital structure and dividend theory for sustainable growth (Yang Yongsheng,2011).

A large number of studies on sustainable growth models have been carried out in foreign countries. Robert Higgins, who is an American financial expert and had conducted the thorough research for corporate growth and financial problems, then put forward the sustainable growth model in 1977. The sustainable growth rate is the maximum ratio of the company's sales growth without run out of financial resources. According to the sustainable growth rate to set up sales target could make a reasonable balance between increase revenue and control the size of the debt. It is the company's largest growth rate in the condition of not increasing and maintaining the operating efficiency and financial policies, in fact, is a balanced growth(Higgins,Robert C,1977).After Higgins put forward the model of financial sustainable growth, James·C·Van Home, whose opinion is that enterprise development needs of management staff to maintain the balance between the company sales targets and business efficiency and financial resources, also according to the different economic environment respectively to establish the sustainable growth rate of the equilibrium model and non-equilibrium mode(James·C·Van Home,2010).

In summary, no matter in China or abroad, the research of the sustainable growth model is mainly discussed from the theoretical and lack of empirical analysis. This article selected financial statistics of O-film to make an empirical study and puts forward some suggestions about financial management and development.

2 Research Design

The financial sustainable growth model is based on the following hypothesis:
Hypothesis 1: Company intends to grow in some growth that market conditions permit;
Hypothesis 2: Managers are willing to issue new shares;
Hypothesis 3: Company intends to maintain the target capital structure.
On the basis of the above hypothesis, the model is summarized as follows:
SGR = Net profit margin × Asset turnover × Retention ratio × Equity multiplier
$G = (S1 - S0) \div S0$, of which: SGR is the sustainable growth rate, G is the actual growth rate of enterprise, S_1 is the final sales revenue, S_0 is the initial sales.

In an enterprise, the actual rate of growth(G)=sustainable growth rate(SGR),which indicate the enterprise had realized the sustainable growth; if(G)>(SGR), that indicate the enterprise is speeding growth, this stage generally appears in the growth period of the enterprise, adequate funding has played

a decisive role for the further growth of the enterprise; if(G)<(SGR),that indicate the enterprise is insufficient growth, at this stage, enterprise often face the problem of surplus funds, idle financial resources and lower turnover rate of assets.

2.1 Sample selection and data sources

This article takes Shenzhen O-film Technology Co, Ltd as the research object and select 2010-2015 as the analysis period, adopt the financial statistics from that period such as net profit, prime operating revenue and total assets and so on, which are related to the financial sustainable growth model. Selected data are derived from the annual financial report of O-film.

2.2 Descriptive statistics of samples and hypothesis testing

According to the composition of the sustainable growth model, select six financial indicators to study, after summarizing the basic data, the sample data are obtained as shown in Table 1.

Table 1   The Growth Rate Summary Sheet of O-Film from 2010 to 2015

index	time					
	2010	2011	2012	2013	2014	2015
actual rate of growth	0.675	1.015	2.158	1.315	1.140	-0.051
sustainable growth rate	0.038	0.021	0.217	0.149	0.099	0.079

The table 1 shows that the sustainable growth rate of O-film is 0.038 in 2010 and 0.149 in 2013, however, followed by a decline in the two years. At the same time, the actual growth rate of each year is greater than the sustainable growth rate beside the 2015 and not achieve sustainable growth.

Hypothesis: There were no significant differences between the actual growth rate and the sustainable growth rate, adopt the paired t-test to verify and the results are shown in table 2.

Table 2   The Results of the Paired T-Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
G - SGR	0.944500	0.669069	0.273146	0.242355	1.646656	3.458	5	0.018

Table 2 shows the significance probability of two tailed t-test was 0.018, less than 0.05 and reject the null hypothesis, which indicate the mean difference between the sustainable growth rate and the actual growth rate is highly significance in confidence level that more than 95%, so there were significant differences between the actual growth rate and the sustainable growth rate from 2010 to 2015. In order to test the growth of O-film is excessive or inadequate, use the Wilcoxon's sign rank test for non-parametric test. The results as shown in table 3. In conclusion, during the six years, the negative rank sample of the sustainable growth rate is less than the actual growth rate is 83%, so O-film belong to speeding growth, which reflect the firm is in the fast growth and not achieve sustainable growth.

Table 3   The Results of the Wilcoxon's Sign Rank Test

		N	Z	Asymp. Sig. (2-tailed)
SGR – G	Negative Ranks	5[a]	4.00	20.00
	Positive Ranks	1[b]	1.00	1
	Ties	0[c]		
	Total	6		

a. SGR < G b. SGR > G   c. SGR = G

3 Factors Why O-Film Cannot Achieve Sustainable Growth

O-film did not achieve sustainable growth from 2010 to 2015 because the actual growth rate is greater than the rate of sustainable growth. Therefore, based on the composition index of sustainable growth model, this article has made a concrete analysis for the driving factors of financial sustainable growth and have a further exploration about the reason of O-film did not achieve sustainable growth. Driving factors for sustainable growth of O-film are shown in table 4.

Table 4   The Driving Factors for Sustainable Growth of O-Film from 2010 to 2015

	2010	2011	2012	2013	2014	2015
Sales of net profit margin	0.084	0.017	0.082	0.063	0.035	0.026
Total asset turnover	0.458	0.523	0.823	0.956	1.376	1.151
Equity multiplier	1.395	2.447	3.693	2.914	2.432	2.660
Retention ratio	0.705	1.000	0.874	0.849	0.849	1.000

3.1 Sales of net profit margin is declined

Sales of net profit margin is a measure for the ability of an enterprise to obtain sales revenue in a certain period time. During the six years, the net profit of O-film had expanded from 52 million in 2010 to 478 million in 2015, but the growth rate of main business income is far higher than the growth rate of profit and the main business income in 2015 is 32 times in 2010. The rose of profits could not keep up with the pace of the rising incomes, which led to the sales of net profit margin had a decline in the overall trend. At the same time, the development of O-film has a large amount R&D expenditure without reasonable cost control, so that the firm could not achieve large scale when pursuing expansionist.

3.2 Total asset turnover rate is not stable

The total asset turnover reflects the management quality and utilization efficiency of enterprise's total assets. In this 6 years, the total asset turnover of O-film fluctuates almost and trend is up: during the 2010 to 2011, O-film had successful listings and brought huge issues to market, however, the main business income in this period just realize steady growth so that lead to the speed of asset turnover became slow. After 2011, this situation significantly improved and achieve faster of the six years in 2014 that is 1.376.

3.3 Equity multiplier is fluctuation

Equity multiplier is a multiple that total assets equivalent to the shareholder's equity. O-film is a company of new electronic components industry, development requires a large number of internal financing so that the firm has a higher equity multiplier. Meanwhile, the equity multiplier of O-film is fluctuation that indicate the firm not only had been able to raise considerable debt and equity but also realized the perniciousness of high equity multiplier. Then the firm appropriate to slow the pace of external financing and adjust the capital structure to provide power for the rapid development.

3.4 Retention ratio is fluctuation

The Retention ratio reflect how much of the revenue to stay in the company for the development. The retention ratio of O-film is 0.705 in 2010 and rose to 1.000 in 2011, but had a decline three years later, final rose to 1.000 in 2015. Prior to listing in 2010, O-film is at the early stages of development, the firm need to retain more retention earning to enterprise expansion. After had issued shares, cash dividend need to hold most of the net profit and the retention of company will be reduced. Then the firm expanding the scale of debt to balance the cash flow.

4 Suggestions of O-film to Achieve Sustainable Growth

4.1 Opportunities in the external market

As the dark horse in the new electronic components industry, O-film had been established the differentiation of market position for its product and insist on producing good product could enter the world market with independent intellectual when the firm was founded. After joined the WTO, China became a veritable world factory and the international business is getting bigger. On one hand, the new techniques developed abroad in recent years were taken, on the other hand, pay more attention to foreign markets. Thus, O-film would have a broad space for development in the future.

4.2 Strong competition power

The development of O-film has a strong pertinence. O-film is a high- tech platform type of leading enterprise in the field of mobile internet industry and the profession technology have brought stable and high-end customer, which establishes good base for the stability and future development of the company. Moreover, the firm adopt production patterns of produce by order, which could coordinate with real time order requirement from high-end customer to organize production and realize goods supplying, eventually build up a great foundation for the company to maintain high-end customer.

4.3 Financing channels are insured

Although the asset-liability rate of O-film is higher and there is a great economic risk, it was not changed for carry out the strategy that expansion in a high speed growth. From 2010 to 2015, the sales revenue had grown by 59.48% in O-film. The businesses operate is more dynamic with flows from borrowers, besides, the growing sales also had a considerable impact on the huge debt burden. During the six years, the stable equity multiplier had provided a quality financing channel for the firm, and the lower retention ratio had provide space for O-film made full use of internal funds and taken positive dividend policy.

4.4 Profitability is guaranteed

During the 2010 years to 2015 years, O-film's main business income and operating profits had

achieved a quantum leap, as the table 5 shown. At the same time, the business efficiency and growth capability of O-film had always stand at the front of industry and the development prospects are more optimistic. From the perspective of production and sales, O-film depend on the strong R&D strength to expand and consolidate a number of major customers in the　　industry. Thus, the profitability of O-film should be worthy of recognition.

Table 5　Main Business Income and Operating Profits of O-film from 2010 to 2015　Unit:Billion

index	time					
	2010	2011	2012	2013	2014	2015
main business income	6.18	12.45	39.32	91.02	194.82	184.98
operating profits	0.56	0.91	3.15	6.20	6.37	5.46

5 Conclusions

Based on the above analysis, O-film is in the fast growth and not achieve sustainable growth. Thus, this chapter puts forward some suggestions about financial management and development, hoping to provide certain value of reference.

5.1 Issue new shares and increase equity capital

It could provide adequate funding for sales growth through the new equity from issue new shares so that avoid a lot of debt and relieve borrowing pressure. The biggest advantage of this financing way is low cost of financing, in addition, the management decide whether or not to dividend distribution and the quantity, which led to the management have a great autonomy to use this part of funds.

5.2 Reducing dividend payout ratio and raising retention ratio

The earnings retained provide the endogenous equity capital to enterprise. Shareholder's interest in dividend payments is inversely proportional to the opportunity to invest, thus, the payment of cash dividends on the amount should be properly contracted and adopt reasonable dividend payout rate to get the optimistic expectations of the company's prospect from shareholders and potential investors, which is conducive to the further financing for O-film.

5.3 Reinforce the management of the assets and increase total asset turnover

In recent years, market competition is becoming more and more vigorous, the profits of each link will inevitably be squeezed to the lowest. O-film should be speeding up the inventory turnover ratio, average accounts receivable turnover ratio and fixed asset turnover ratio, could not let abundant funds become a stumbling block that stop the improve of asset turnover ratio.

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Research on the Optimization of the Combination Efficiency of Technology and Finance in Wuhan

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Abstract: Scientific-technical progress and finance developments promote each other, and improvement and optimization of the combination efficiency of finance and technology can achieve the results of promoting enterprises' development. As an experimental zone of the combination of finance and technology, Wuhan should affirm its advantages characteristics and should pay attention to the existence of shortages at the same time. Accordingly, this paper uses quantitative and qualitative methods, and analyzes situation of technology and finance's combination efficiency in Wuhan, including the advantages and disadvantages of their combination efficiency, and proposes the optimization suggestions for Wuhan's combination efficiency of technology and finance.
Key words: Finance and technology; Combination efficiency; Financial service

1 Introduction

China's economic development has entered into a new period, economic structure need to be adjusted, transforming the existing economic growth model of factor-driven and investment-driven, into new economic growth model of technology-driven and innovation-driven ahead. Therefore, there is an urgent need to support the development of science and technology industry in order to achieve economic transforming and upgrading. Science and technology have characteristics of high investment, high risk and high-yield, which requires substantial capital investment in each stage from R&D to production(Zhang Yuxi, 2015;Fang Hanting,2013). The economic development relies on science and technology, and the science and technology development requires a strong boost of finance support. Finance can provide technology companies with liquidity support, risk diversification, value discovery, incentive-restriction function and other functions. While technology can provide financial capital with high-quality technical support and value-added approaches (Chowdhury,2012;Ann Yun,2012). Promoting the effective combination of technology and finance, and guiding more financial capital enter the field of science and technology, it is beneficial to achieve effective docking and optimize configuration between scientific and technological resources and financial capital, thus promoting the mutual development of science and technology and finance (Xi Bin, 2013).

As the first experimental zone of the combination of finance and technology, Wuhan continue to explore in many areas, such as policies system and service system of finance and technology, and technological innovation of financial products. During 12th Five-Year-Plan period, it has formed technology and finance service system of various financial formats mutually supportive and complementary. Finance and technology continue to show the efficiency of combination. At the same time, for various reasons, there still have problems which cannot be ignored, and will affect the development of finance and technology. Therefore it is necessary to pay more attention to the optimization research on efficiency of the combination of finance and technology in Wuhan, in order to better serve the development of the financial and technology situation of Wuhan

2 Situation of Technology and Finance's Combination Efficiency in Wuhan

In July 22, 2015, the State Council approved the government document called "Reform and Innovation Programs of Technology and Finance in Wuhan City Circle ". Then, Wuhan city circle became the first financial reform and innovation of Technology and Finance Experimental Zone, as the first pilot city, Wuhan take institutional innovation as fundamental, sound science and finance service system as the way, finance investment as guidance, financial investment as the main body, and gradually formed a diversified investment and financing system of high-tech industrial technology development and technological service achievements' transformation. Particularly, in 2015 with "innovation and entrepreneurship" campaign booming, and the emergence of a large number of science and technology market financial elements, an orderly, efficient and self-evolution of science and technology combined with benign financial ecological environment is gradually taking shape (see Figure 1).
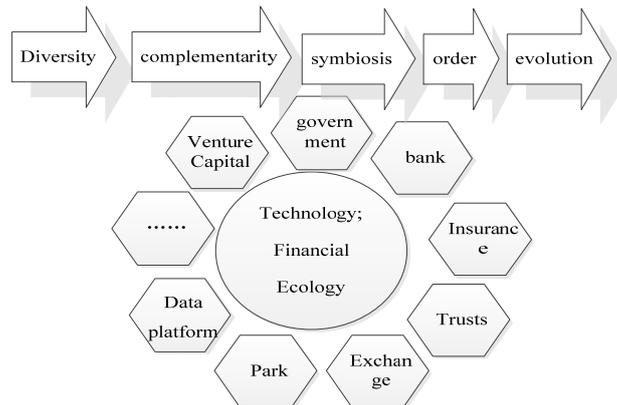
Figure 1   Wuhan Technology and Finance Combination Benign Ecological Sketch Map

2.1 Advantages and Characteristics

2.1.1 Improvement of policy system of technological finance

By the end of 2015, Wuhan issued a total of more than 50 financial policies about science and technology, covering science and technology loans, venture capital, science and technology insurance, capital markets, credit system, financial statistics and science and technology capital of the SAR building, urban linkage mechanism and other technology fields finance. For example, 16 policies focus on technology loans have been issued. In aspect of risk sharing, the credit risk reserve management policy has been issued; in aspect of loan cost, the approaches about loan discount and guarantee fee subsidies have been issued; in aspect of loan variety, the policies of insurance microfinance, copyright pledge, leasing and credit financing have been issued (Gustav, 2010). Bridge loan has issued a financing contingency fund management approach, with the policies of the credit system construction and of the loans statistics of technology enterprise.

2.1.2 Improvement of the technology monetary subjects' interaction

In 2011, Wuhan, one of the pilot areas to promote the integration of technology and finance, has set up technology and finance integration leading group. The government administration department and financial management department have established a good working relationship of technology and finance. What's more, the government department and financial institutions have established a strategic partnership. Science and Technology Department in Wuhan has established a strategic partnership with 10 banks including China Development Bank, The Export-Import Bank of China, Bank of China, Bank of Communications, China Merchants Bank, Huaxia Bank, Minsheng Bank, etc. The department have established 21 technology branches and promoted 19 technology loans products.

2.1.3 Improvement of service system of technological finance

At the initial stage of the pilot, the technology financial services are mainly leaded by the government. The Technology Department and Wuhan East Lake High-tech Development Zone respectively initiated and established technology financial service centers of city and district level, such as Wuhan Technology Financial Innovation Center and Productivity Promotion Center of Wuhan East Lake high tech Zone. The centers provide all kinds of technology financial service and technology transferring service, relying on incubators, industrial research institutes, and pioneer parks and so on, which are the physical carriers of the technology and finance integration. It can make technological resources and financial resources to be combined efficiently, and can fully improve technology industry strength and financial service strength. Technology financial information platforms such as Wuhan Technology and Finance Public Service Platform and Optics Valley Credit Network play a good role in technological finance information issuance, policies and regulations propaganda and enterprise financing demand collection.

2.1.4 Expansion of development space of technological finance

In Wuhan, there are more than one million college students, a strong force of innovation and entrepreneurship. As shown in Figure 2 and Figure 3, in latest few years, Wuhan has constantly increased the technology investment and research and development expenses, which stimulates technological financial innovation. Chinese government is now encouraging "Mass entrepreneurship, multitude innovation", and the government maximize reduced the access threshold of market subjects, which gives entrepreneurs considerate service and ignite entrepreneurial passion of college students,

university teachers and researchers. According to the authoritative department statistics, in 2015, Wuhan newly registered 56448 enterprises (excluding the financial enterprises), 155 new companies formed every day averagely, 9688 companies (excluding the financial enterprises) having access to social investment of 141.350 billion Yuan. Wuhan innovative entrepreneurial wave attracts social capital, providing great space for the development of technological finance.
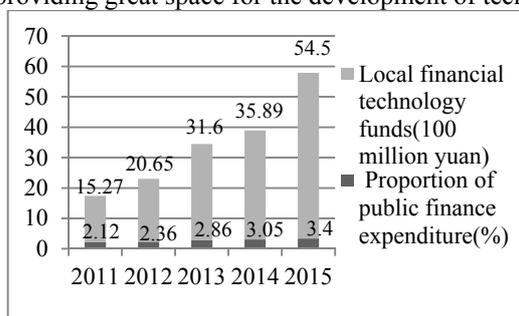
Figure 2   2011--2015 Wuhan Science and Technology Investment Growth
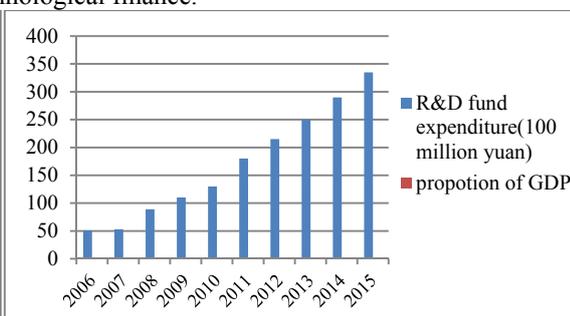
Figure 3   2006--2015 Wuhan R & D Expenditure Trends

2.2 The disadvantage of combination efficiency of technology and finance in Wuhan

2.2.1 Problems of government functions

In pilot of combination of technology and finance, the system of government departments is somehow a hindrance. Some of the functional departments rely on top-down management system, which means some functional departments are administrated locally and have no independent power, resulting in vacuum in management. Management departments have their own systems which are mutually separated, resulting in hard work, mutual information closing, many information platform resources not being shared. Working efficiency and service quality of some government departments are low. The service is time-consuming, through too many departments which don't cooperate and linked with each other. What's more, there are a variety of procedures; thus it takes a long time for government's preparatory work to set up projects for the technology companies. Moreover, there is no unified information platform, and the information between departments cannot be effectively inquired. On the other hand, the service level of some departments' officers is not high; they involved in the production and operation of enterprises too much directly, to a certain extent, will affect the efficiency of the management of companies.

2.2.2 Weakness of economic strength

Table 1   Main Economic Indicators of Wuhan at the End of 2015

Projects	Actual value (100 million Yuan)	Growth over the previous year (%)
Gross product	10905.60	8.8
Primary industry	359.81	4.8
The secondary industry	4981.54	8.2
Tertiary industry	5564.25	9.6
GDP per capital	104132	6.8
Financial revenue	2231.67	12.7
Industrial added value	4081.91	8.4
Fixed assets investment	7725.26	10.3
Investment in real estate development	2581.79	9.7
Gross output value of Agriculture	620.28	4.8
Total retail sales of social consumer goods	5102.24	11.6
Total import and export volume of foreign trade	280.72	6.3
Per capital disposable income of residents	32478.00	9.6
Per capital disposable income of urban residents	36436.00	9.5
Per capital disposable income of rural residents	17722.00	9.7

(Data source: Wuhan Municipal Bureau of statistics, 2015 Wuhan national economic and social development statistics bulletin)

In the process of rapid economic development in China, the total economy in Wuhan has grown rapidly. The indicators in 2015 obtain a certain degree of growth (the data see Table 1) than the previous years. However, compared with the same scale domestic city in some areas, there is a

certain gap. Wuhan is the old industrial base which has few famous brand, famous product and famous enterprises. In recent years, the scientific and technological content of products, brands and enterprises in Wuhan has improved, but the ratio of traditional industrial enterprises is still too high; the overall efficiency of enterprises, management level and degree of modernization are not high enough. Moreover, the development level of service industry is not balanced, and the capital accumulation, local fiscal revenue and income maintain a relatively low level. Wuhan city circle construction force is not enough, and the synergistic effect between the cities is not strong. Wuhan city's strength is still relatively weak compared to other rapid developed cities, which restricts the growth of the economy in Wuhan city. These aspects, to a certain extent, affect the efficiency of the combination of technology and finance.

2.2.3 Weakness of technological finance service innovation consciousness

In recent years, although China and Wuhan City have introduced many loan support policies to support small and medium-sized technology companies, which ease the financing problem of some small and medium-sized technology enterprises. But it did not fundamentally solve the problem of their financing difficult. The awareness of financial institutions to imitatively serve the technology is weak. The reason, on the one hand, is that the overall understanding of financial industry to support technology enterprises have not improved, without financial service innovation power, despite the fact that some financial institutions set up a technology specializing agency, business is relatively small, business product is single, loan size is too small, which cannot meet the demand of technology enterprises. On the other hand, the financial industry has higher risk awareness, taking into account the effect of the small scale of small and medium-sized technology enterprises, as well as uncertain factors of the production and operation of product. That is to say, the financial industry of the small and medium-sized technology enterprises gets "credit crunch". Authoritative statistics show that: 79.8% of small and medium enterprises are collateral or security deficient. In the small and medium enterprises to obtain loans, 59.6% real estate mortgage, inventory mortgage loans, credit loans, secured loans accounted for 11.5%, 10.5% and 14.9%. On the other hand, it takes a long time for small and medium enterprises to apply for loans to the financial industry. The loan is mainly of short-term, since it is difficult to obtain long-term loans. Many small and medium-sized enterprises and high-tech enterprises to apply for loans is not timely, resulting in restricting the development speed and efficiency.

3 Ideas and Countermeasures of the Optimization of Combination Efficiency of Technology and Finance in Wuhan

3.1 Optimization ideas

Through the foregoing analysis, the disadvantages in combination efficiency of technology and finance cannot be ignored, including the functions of the government, financial services, as well as the overall level of economic development. In these aspects, the government's function belongs to the superstructure while financial service belongs to the operational level, which is more likely to change and optimize in the short term. The efficiency of these two aspects increased, the overall level of economic development will naturally improve. Under the logic of this research, the key point to optimize the combination of technology and finance is the change and efficiency improvement of financial services.

3.2 Optimization strategies and recommendations

3.2.1 Innovation of technological finance services model

In Wuhan, combination of technology and finance is a mode reform. The development of technology needs financial support; and financial industry needs to increase innovation and support the rapid development of technology enterprises in Wuhan City, and to provide high quality financial services. Considering of the layout of the scientific and technological enterprises in Wuhan City, it needs to set up professional technology branches in the technology enterprises' intensive area when necessary, and designate officers responsible for technology enterprise business services, providing convenient services for the technology enterprise. It is suggested to speed up the construction of Wuhan financial information, to achieve financial electronic, and to imply financial services network. Moreover, it is suggested to establish Wuhan circle information payment system, perfect customers' credit information database, and provide background

information service for the surrounding city. What's more, central region financial integration development platform should be built to make Wuhan financial information background service center.

3.2.2 A financial credit ecological demonstration zone

It is suggested that the government departments establish the comprehensive financial service platform combining guarantees and credit rating in technological ecological demonstration area to collect technology enterprises credit information in the demonstration district; through information sharing, it can provide advisory services for technology enterprises assessment, credit, loans and guarantees.

3.2.3 Acceleration of legislation process of the technological finance

Wuhan as a pilot city of technological finance reform, in order to reform smoothly, should focus on the problem founded in the reform process, should timely develop related laws and regulations system for the pilot of the reform of the technological finance ecological environment, and should effectively promote the reform of the financial ecological environment in the technology pilot. Effective laws and regulations can promote reform and development, and further improve the efficiency of the combination of technology and finance.

3.2.4 Transformation of government functions

In the reform process of combination of technology and finance, on the one hand, the government departments should accelerate the change of working styles, provide positive service for financial enterprises of technology, and change the problems such as "door hard", "ugly face", mutual shirk, low working efficiency, long service cycle, complicated procedures, self-system, block segmentation, etc. On the other hand, government departments should strengthen the functions of service role, increase financial input for science and finance, improve the management system and regulations, help enterprises solve problems in production and management, and correctly guide the financial industry to support the development of technology enterprises, to provide good technical financial ecological environment for the enterprises.

4 Conclusions

As a pilot of combination of technology and finance, Wuhan has made exciting achievements, but the problem of low efficiency of the combination of technology and finance cannot be ignored. The paper analyzes the present situation of combination efficiency of technology and finance of Wuhan. With the efficiency, aiming at the disadvantages of the present situation, the paper puts forward the ideas of optimizing the combination of technology and finance in Wuhan, which includes innovation of technological finance services model, to build financial credit ecological demonstration zone, to accelerate of legislation process of the technological finance and so on. And, what we must point that comparison research about combination efficiency between Wuhan and other cities is very important, it needed to be studied in the further research.

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Key Success Factors of Commercialization of Ocean Thermal Energy Conversion Product in Malaysia

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Abstract: This qualitative method study paper studies on the key success factors of commercialization of Ocean Thermal Energy Conversion (OTEC) product by focusing on deep sea water (DSW) from Ocean Thermal Energy Conversion (OTEC) plant in Malaysia. It is possible to commercialize DSW in Malaysia even though OTEC plant is not yet exist in this country. The study will benefit the stakeholders in the chain of commercialization of DSW from OTEC plant in setting strategic commercialization strategy in producing and commercializing DSW in Malaysia. The study, in addition, will also contribute to an eye-open to new business opportunity in the area of fresh and healthy drinking water in Malaysia.
Key words: Ocean thermal energy conversion; Deep sea water; Commercialization; Stakeholders

1 Introduction

"Commercialization is a rational process which begins from idea creation and continues toward market and commerce". (Nazanin Jalili, Morteza Mousakhani & Mehdi Behboudi). In knowledge economy era, the government's attitude towards the country economy governance is no more, a mere, to distribute wealth, but also to produce wealth. It requires integrated roles between government and financial venture or risk taker investor, in making the commercialization of products, like OTEC, to success.

Research on Ocean Thermal Energy Conversion (OTEC) being initiated by Jacques-Arsene d'Arsonval in 1880's, and since then, a lot of effort being put in producing electricity and improving the its technology. Georges Claude developed open-cycle-OTEC (OC-OTEC) system 40 years after D'Arsonval discovery, and able to produce electricity as well as desalinated water. In 1979. A generation of electrical power of 100kW gross power from OTEC land-based plant, subsequently operated in Nauru Island, Japan was successful.

Commercializing OTEC product in Malaysia is a challenge. There is no OTEC plant in existence in Malaysia. The potential OTEC area in Malaysia in Sabah trough, located about 100 kilometers off the Sabah coast in the South China Sea. Please refer Figure 1 below.

The differences temperature of over 22°C, with the reading of 4°C of the bottom and 29°C of the surface sea level between the year 2006 and 2008, is highly potential to generate renewable energy (RE) and fresh water (otec.utm.my) produce during the process of generating electricity at OTEC plant. The fresh water is also names desalinated water, cold water or deep sea water (DSW).
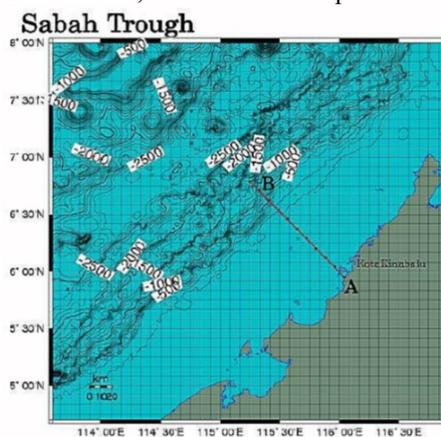
Potential OTEC area in Sabah, Malaysia
Figure 1 Sabah Trough

2 Potential of Commercializing Deep Sea Water from OTEC Plant in Malaysia

Ocean Thermal Energy Conversion in the process of utilization of differences of cold deep sea water at 1,000 meter depth with 4 degrees Celsius to 5 degrees Celsius and hot sea water at 22 degrees Celsius to 29 degree Celsius in producing electricity. (Luis A. Vega, Ph.D., 1992). Accordance to Finney, "OTEC as a process that employs the natural temperature difference between the surface and the depths of the ocean". (Finney K.A. 2008).

Deep sea water (DSW) is the by-product of OTEC producing during the process of generating electricity, pumping up from approximately 100 kilometers depth from the sea level. (otec.utm.my). Commercialization is converting or moving "technology" into a profitmaking position. (Richard A. Siegel Sten-Olof Hansén Lars H. Pellas,1995). Stakeholders is parties which having interest in OTEC consists of the government of Malaysia, researchers, investor or manufacturer and corporate consumers.

The relatively far location of potential OTEC area in Sabah increase the cost of building the OTEC plant and transporting OTEC products, including DSW. Therefore, the commercial cost of DSW will increase. Sharing the experience of De Vega, the team leader of OTEC plant operators in Hawaii, it is found that one of the challenges in OTEC is the cost of transportation of OTEC products to the shore is very high. De Vega had identified 26 problems in OTEC plant in Hawaii, one of them is high cost of transportation will effect cost of product in the market. Transporting hydrogen (H2) may cost approximately USD250/barrel-of-crued-oil (BOC). The cost increase up to 4 to 16 times of BOC at present cost, to cover costs of corrosion, military expenditures, crops losses, health impacts, radioactive waste and research findings for present technologies. (L. A. Vega, 1999). The transportation of DSW from potential OTEC plant in Sabah trough in the near future is expected to face the same challenge with OTEC plant in Hawaii.

Increasing cost, price and problems of utilization of fossil-fuel non-renewable (NRE) source of energy offers wide opportunity to source of renewable energy (RE) to be positioned in energy industry landscape. Besides many islands benefits more from cheaper, low carbon emission and reliable sources of RE, it's provide fresh water by product. Advancement in OTEC technology and keep increasing of fossil fuels price and problems caused, elevate the interests to focus in ocean thermal RE solutions for future energy needs. (Nancy E. Kinner, 2009).

There was initiative done by the Malaysian government in the Malaysia Third Outline Perspective Plan (OPP3) (2001-2010) and the Eighth Malaysia Plan (2001-2005) by Government of Malaysia through Ministry of Energy , Green Technology and Water (KeTTHA) to generate source of power from source of renewable energy. The initiative focused in six focused renewable sources of energy, that are biomass, biogas, mini-hydro, wind, solar and municipal waste. (www.kettha.gov.my, 15 May 2015).

In the plan, Malaysia is potentially able to generate cumulative total of 243.3 MW as of 2014 from RE. The total value represented by 11.7 MW from biogas power, 55.9 MW from biomass power, 15.7 MW from small hydropower, and 160 MW from solar power. (https://www.asiabiomass.jp). Please refer figure 2 below.

Cumulative installed capacity for renewable energies (2014) 243.3 MW

Biogas power 4.8%
Biomass power 23.0%
Small hydropower 6.5%
Solar power 65.8%
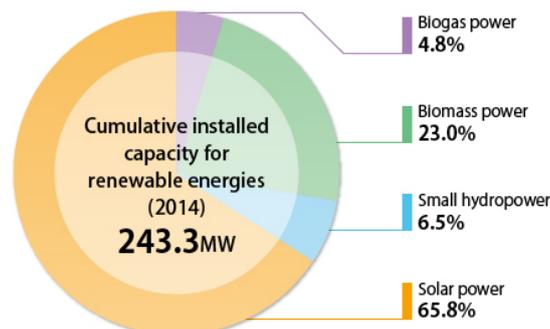
OTEC was not yet included in the Malaysian government initiative in OPP3
Figure 2   Malaysia's Cumulative Installed Generating Capacity for Renewable Energy

Although OTEC being recognized by the government as a source of RE, but, it is not included in the Malaysian government initiative in OPP3 does not include OTEC in the agenda. Solar power, biomass, small hydropower and biogas power are the focus sources of RE in Malaysia until 2014.

The potential of OTEC plant producing DSW through desalination process is up to two million liters per day from the generated of each megawatt of electricity without fuel. The production of electricity and desalinated water does not affects sources of fossil fuel. (http://empowertheocean.com /otec-a-smart-investment/, pp. 16). The research finding shown that the cost of production of electricity

by OTEC plant is relatively high. High volume of electrical user is required, if OTEC plant only rely on its single main product to cover the cost of production.

Interestingly, the savior of this dilemma is desalinated water that include DSW, by-product of OTEC plant. (G. C. Nihous and M. A. Sed, 1996). Desalinated water and chill water for air conditioning from cold deep seawater, are economically potential by products of OTEC, and able to return back the value of investment in 3 to 4 years of duration. (L. A. Vega, Dec., 1999).

Therefore, DSW become a highly valuable by-product of OTEC which can off-set the high cost of electrical power generation. Therefore, it is highly significant to study DSW to support the investor and the government to establish OTEC industry in the country.

At this point, there is only one write up research found in commercialization of DSW being done in great details by (Chiawu Lin et. al., 2009) in Taiwan. A case study was prepared by Professors Chiawu Lin of National Dong Hwa University, Taiwan, Tsai-Hsin Chu of National Chiayi University, Taiwan, and Kuo-I Chang of National Dong Hwa University, Taiwan, .studying the case of Kung Long is a Taiwanese company established by Mr. Hsin-Hsiung Tseng in 1967 and becoming the first enterprise in Taiwan investing in DSW in 2005. Kung Long having extensive experiences in marble manufacturing, venture into DSW industry by using its own technology, not using such as those offered by the Japan OTEC technology provider, in pumping the water at 618 meters below sea level.

Usually, DSW pumping up from 1,000 metres below sea level, but, in the case of Kung Long, the black tidal runs through the Atlantic Ocean and Indian Ocean to the Pacific Ocean brings DSW up to approximate 600 meters depth. In this case study, DSW also called "Blue Gold", pumping up from 200 meters ocean depth and having cold temperature with rich of nutrients. The study found that the DSW having a stable quality due to few pathogens contained in the water and less affected by pollutants dropping from surface of earth.

DSW contains more than 60 kinds of nutrients, with some of them are magnesium nitrogen, selenium. Phosphorus, silicon, calcium, and other inorganic nutrient salts. Interestingly, the magnesium in DSW found to be 20 times greater than general mineral water.

The health value of mineral drinking water is the main issue to the consumers. DSW is found to be beneficial in relieving the symptoms of diabetes, reducing high blood pressure and preventing osteoporosis. Selenium contain in DSW beneficial in reducing heart attacks, diabetes, and cancer incidental illness.

Besides richness of nutrients, DSW water also found to be easily absorbed by the cells and become an instant moisturizing agent and nurturing the skin. According to the case study made by Professor Chiawu Lin et. al, clinical reports done in Japan and Korea shown that, the active mineral content as well as the alkaline characteristics of DSW helpful in increasing blood circulation and removing excess ozone in the human body, which is beneficial in preventing aging effectively and improving body immunity.

Other triggering factor in studying further DSW commercialization is the revenues generated from the industry. In 2009, Kung Long generate total sales of $150 million NTD from the sales of bottled drinking water. The company extracted 28,000 tons of DSW water daily and at the weight of 120 tons of 500 ml per bottle drinking DSW in three shifts of production. The capacity of Kung Long production is 500 bottles per minute and producing 140,000 cartons daily.

Commercializing DSW from OTEC plant in Malaysia is possible. Lack of research in the commercialization of OTEC product, not to mention on commercialization of DSW from OTEC plant in Malaysia give a positive challenge to the stakeholders.

The potential of open-cycle OTEC plant generating 1 MW electricity in producing DSW is 55 kg. Per second, which this amount can reach at approximately 4,000 Meter square feet per day. This rate of fresh water capable of supply a small coastal community. (Finney K. A., 2008).

Since there is lack of study in DSW commercialization, the research question number one is expected to get more opinions on this study area. Barriers in commercialization of DSW in Malaysia from various perspectives are expected to be able to be collected. From the synthesis of the first round feedback in round two responses of participants, more specific issues will be addressed in the question. Eventually, the research is expected to produce practical solutions in overcoming the barriers in the third or final round of the survey in this research.

3 Description of Participants and Context

Participants were selected among whom having some background knowledge in OTEC. In this

study, the first participant is officer of state agency that had signing up agreement with OTEC Universiti Teknologi Malaysia (UTM) to collaborate with UTM Holdings Sdn. Bhd. to collaboratively participate in OTEC business, and the second participant is the researcher of OTEC from MJIIT schools of UTM.

Both participants were selected due to their deep involvement in OTEC business and research. Since OTEC is a new area of business, and had not yet having any business activity and plant in Malaysia, the selection of participants is crucial in getting the right and valid qualitative data in this area.

4 Explanation of Data Collection Process

The qualitative data were collected from the participants through telephone interview. The interviews were conducted after getting an agreement from the participants. The time for interview were mutually agreed between the participants and the interviewer. The telephone conversions during the interviews were recorded. Participants were informed by the interviewer on the recording process and the purpose of the transcribing for analysis. The telephone interviews were driven by set of questions referred by the interviewer. Each interviews took about half-an-hour duration.

5 Explanation of Data Analysis

Data were collected through telephone interview guided by interview sets of eleven (11) questions with five (5) sub-division question for main question number nine (9) in getting wider perspectives in various factors of commercialization of OTEC products. The recorded voice of the interviews were transcribed by the interviewer.   The transcribed data were synthesized in order to combine ideas to get a theme or cluster of ideas that relevant in giving answers to the research questions.

6 Preliminary Findings and Discussion

OTEC is coming to be industry in Malaysia, but limited information available about OTEC in Malaysia. However, the study requires data and information in studying the commercialization of OTEC products in Malaysia. Synthesizing the transcription from participants' interview, the findings can be categorized into three major areas in answering three research questions. Firstly, knowledge in OTEC, secondly, the key success factors in commercializing OTEC products in Malaysia, that covering six major areas; government, potential buyers, market potential and demand; technology, investor and investment return; and thirdly, marketing mix for commercialization.

Answering the first research question, the study had identified two sources of information. Participants knowing OTEC from the briefing session conducted by Dato Prof Dato' Ir Dr A. Bakar Jaafar, Co-Chairman, Universiti Teknologi Malaysia (UTM), Ocean Thermal Energy Centre, and the participant also knows about OTEC and its product from online source of information. The online information offers areas of study in OTEC to research candidates for their master at either master or doctor of philosophy of study. Besides OTEC producing two main products, that are electricity and hydrogen, it's also producing deep sea water, cold water and mineral water, as the spin-off products. Both participants having a clear information with regards to these products and giving high level of confidence to the study in getting further information about OTEC from them.

It is a great challenge to study commercialization of products which there is not available in the market. But, it is meaningful to the future OTEC industry when the study able to answer the second question of the research related to the key success factors in commercializing OTEC products in Malaysia. The findings shown that the government of Malaysia has to play a big role in driving the OTEC industry and has to support the industry politically. Ministry of Energy, Green Technology and Water, Malaysia focusing on six sources of renewable energy; that are biomass, biogas, mini-hydro, wind, solar, municipal waste in their programme [Malaysia Third Outline Perspective Plan (OPP3) (2001-2010) and the Eighth Malaysia Plan (2001-2005)] and do not including ocean thermal source of renewable energy in this agenda.

The financial back-up from government, in the sense of getting support from the banking and financial institutions to provide fund to OTEC project become an important success factor for OTEC products commercialization. OTEC industry, especially in building OTEC plant, require high volume of investment fund. The fourth success factor related to government roles is, the government intention reducing dependency on diesel, gas and charcoal. This direction gives wide opportunity to commercialization of OTEC products with less competition in the market. The fifth factors create good speed momentum to the industry. The findings suggest to educate the stakeholder (government),

investors and buyers with knowledge of OTEC.   The green or non-pollution effect of OTEC products, such as hydrogen fuel cell, create a good impact on the environment.

Second major area of the key success factors of commercializing OTEC products is the potential buyers. The findings found that Tenaga Nasional Berhad (TNB), PETRONAS and Government of Malaysia are the potential buyers of OTEC products. TNB need electricity, PETRONAS require electricity and water, and government of Malaysia in demand of getting more source of energy in replacing depleting domestic source of energy such us petrol, diesel, gas and charcoal. Hydrogen and electricity producing by OTEC plant in near future in Malaysia becoming potential option to the government.

The third major area is the market potential and demand on the products. The findings found that OTEC potentially become a largest contributors of energy in Malaysia in near future. Safe drinking water, electricity and hydrogen as a source of energy capable of fulfilling increasing domestic demand.

Technology becoming the fourth major area in the commercialization of OTEC products. Findings shown that the advancement in OTEC technology able to transport OTEC products throughout Sabah, Peninsular Malaysia and even all over the world. Adopting ready OTEC technology developed by Korean and French, as being mentioned by the participants, will be able to stimulate faster the development of knowledge and expertise of OTEC in Malaysia.

Investors plays the important roles in commercializing OTEC products in Malaysia. This fifth major area giving an evidence that the high profit margin from selling of OTEC products, especially water, become the attractive elements to investors. The highly commercialize water product and good demand from the world market able to offset the high investment in building the OTEC plant.

Marketing becoming the important factor in commercializing products (Leslie H. Vincent, 9 Mar 2015). This sixth major area of commercialization of OTEC products, benefit of products were highlighted. The findings shown that, OTEC cold water able to cooling the land for the purpose of agriculture, air conditioning building with optimum cost compared to conventional system and the deep sea water able to produce a good product of aquaculture. Moreover, a relatively cheap price of OTEC products, if locally produced, will support the commercialization of the products. When the product were locally produced, it is available at all time for the market.

The third research question focusing on the barriers, problems or challenges in commercializing OTEC product in Malaysia. The findings were divided the theme into five major areas that are government, potential buyers, financial capability, logistic cost and piracy.

The government need to be convinced on the technology capability of OTEC. OTEC technology provided by the technology from overseas must be proven and at the best level of performance. The Malaysia government need to be convinced on the viability of the OTEC project and to be viable industry in Malaysia in the near future. Evaluating OTEC project and industry becoming a great challenge because there is no OTEC plant in Malaysia, and even there is no OTEC commercial plant in the world operating at this moment. Findings on OTEC rely on few OTEC pilot plant, one of them is research OTEC plant in Hawaii, United States of America.

Second challenge of OTEC commercialization is potential buyers. There are prospect buyers, but not confirmed buyers to OTEC products. The third challenge is financial capability of OTEC industrial players or investors. Building OTEC plant require high cost and not to include the storage and logistic factor of the OTEC products.

High logistic cost become the fourth challenge. Even though the high cost of logistics can be offset by the expected revenue from the spin-off product, especially water, but, it become a great challenge as well because the OTEC plant build   far from the shore. Transporting electricity and hydrogen require a special kind of transport.

The last challenge of OTEC commercialization is the pirating activity around the nearby area of Sabah through. The cost of securing the plant and logistic require engagement of highly trained and skilful personnel. Involvement from the military is needed on securing the OTEC plant area.

OTEC is potential industry to the government of Malaysia in the near future. Commercializing OTEC products in Malaysia require a lot of effort and highly creative and innovative ideas and strategic plan of action. OTEC is new and there is no OTEC plant in existence in Malaysia, but, the result of the study will contribute to the industry to look consider few major areas in commercializing OTEC products in Malaysia.

7 Response to Research Process

The study made a selection of participants for interviews. Participants with some background of OTEC able to give ideas and opinions regarding OTEC. But, the weaknesses of the study is the participants do not having practical business experience. Lacking of this experience create a vacuum in determining the commercialization aspects required by the potential buyers and investors in valuing the OTEC products and business viability. The limitation of the study clearly seen in the numbers of participants. Opinion of two participants does not portray the right picture of OTEC. Moreover, their lacking of experiences in business may lead them to give an ideal scenario and situation of the OTEC industry. Their opinions may bias to the potential buyers of OTEC products and OTEC investors.

8 Conclusions

The key success factors of commercialization of OTEC products in Malaysia rely on five major areas; government policy and support, potential buyers, market potential and demand, technology, investor and investment return and marketing. There are five barriers, problems or challenges in commercializing OTEC in Malaysia; government policy and readiness, potential buyers to buy the products, financial capability of investors, high cost of logistics and pirating activities. OTEC capable to become a new source of renewable energy and complimentary to depleting fossil fuel source of energy for Malaysia in the near future.

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The Impact of Audit Quality and Earnings Management Conceptual Review

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Abstract: In this paper investigates to impact of audit quality on the earnings management. The ability to control the company's earnings for private gain is considered as disadvantageous for the reliability of the reported earnings. One of the effect on earnings management measured as the degree of discretionary accruals prevalent in a firm is audit quality, where Big Four auditors deliver higher quality audits than non-Big four auditors. A stream of literature explains that audit quality of external auditor mechanisms such as auditor size, audit fees, non-audit services, and auditor industry specialization are able to contribute towards improving the firms' performance and reducing information asymmetry. The other dimension of value creation is the reduction in the earning management raised by companies. Theoretically to some extent, high audit quality of external auditors will lead to lower firm risk, information asymmetry and subsequently, high earnings. This paper aims to prepare a critical conceptual of the empirical literature on the effect of audit quality on the earning management.
Key words: Earnings management; Audit quality and accrual; Emerging markets

1 Introduction

A large body of research has over the last two decades documented the importance of legal foundations, including the quality of the audit, for earnings management. This paper examines the association between audit quality and real earning management. Past literature suggests that higher quality auditors reduce the level of accrual earnings management (Johnson et al, 2002; Balsam et al. 2003; Becker et al. 1998). Despite the importance of audit quality, corporate governance such as boards of directors and its committees are recognized as monitoring mechanisms that may impact the quality of financial reports (Lin and Hwang, 2009; Carcello et al., 2002; Larcker and Richardson, 2004;). Therefore, how audit quality and the monitoring role of the board of directors and shareholders its committees influence the market's perception of reported earnings and audit quality remains important to the policy-makers and regulators. Levitt (1998; 2000) claims that the assessment of audit quality and earnings management is crucial because it is reflected the investors‟ confidence in the financial reporting and it affects the allocation of resources. Since, most of the prior studies relating to audit quality, corporate governance and earnings management have been conducted in developed countries. Monitoring the financial reporting process and ensuring high-quality financial statements is one of the prime tasks bestowed on corporate boards in general, and independent outside directors in particular. In line with this, the annual report and prior evidence suggest that the presence of inside directors on the audit is likely to be related to poorer financial reporting choices (Klein 2002; Bédard et al. 2004), because insiders often have incentives to tolerate a lower quality of reported earnings.

The majority of the research which seeks to explain the incentives for managing earnings draws on costly contracting theory. This study utilizes costly contracting theory which characterizes the corporation as a "legal nexus of contractual relationship" and assumes that corporate reporting enables principals (shareholders) to monitor agents' (managers) compliance with contractual obligations (Godfrey et al., 2003). Jensen and Meckling (1976) identify the existence of two agency relationships:

• The shareholder-debtholder (e.g. debt contracts) where the manager is assumed to act on behalf of the shareholders; thus the manager is an agent whereas the debtholder becomes the principal.

• The manager-shareholders (e.g. bonus plans) where the manager acts as an agent for the shareholders who are considered to be the owners, and Such situations impose agency costs, due to the existence of conflicts of interest between the agents and the principals. Bartov et al. (2000) note that agency costs include a manager's incentive to manage earnings. Experiential evidence from agency theory also reports that management has a preference for managing earnings numbers in order to benefit from the contracting process (Holthausen et al., 1995). Prior studies document that higher transaction costs result from greater information asymmetry amongst market participants. When the markets or investors have less information and cannot observe a company's performance and prospects, they then require higher rates of return and lower current firm's stock prices (Bodnar and Bartov, 1996). Most of

studies also document evidence that the existence of information asymmetry between shareholders and managers is a necessary condition for earnings management (Dye, 1988). Because shareholders have less information, thus management can use its' insider position to manage reported earnings (Lobo and Zhou, 2001). It is argued that earnings management decreases the reliability of earnings because reported earnings is biased, and misrepresents the true reporting earnings figure. Levitt Jr (1998), the former chairman of Securities and Exchange Commission, states that the practice of earnings management has negative impacts on reliability of financial statement. This paper assumes opportunistic earnings management is high characterized via accounting method choices and DAC (Wilsonand McNichols, 1988).

Also, existing agency cost proposes a series of mechanisms that seek to reconcile the interests of shareholders and managers. These include external governance instruments such as takeovers (Manne, 1965), competition in product markets (Hart, 1983), and the managerial labor market (Fama, 1980). Viewing the statutory audit as one of a number of monitoring mechanisms available to shareholders is a useful framework in which to understand the relationship between ownership, board composition, audit quality, and ultimately, audit fees. In their respective reports on corporate governance, emphasize the value of increased non-executive representation on boards' suggesting that non-executives are able of bringing greater independence and impartiality to board decisions. In regard of the audit process, it is anticipated that developed non-executive representation is able of improving the quality of the audit process in a number of respects. First of all, external auditors are to discuss matters arising from the audit process with non-executive board members, free from managerial influence. This is very important if auditors seek to question certain aspects of the way in which the financial statements have been prepared by management, or require further (more exclusive) testing in order to reach an opinion on the quality of the financial statements. The second, in negotiations with the non-executives, external auditors are expected to place a greater emphasis on the quality and extent of the audit rather than on the cost, compared to executive directors. Also, non-executives are expected to favor more comprehensive auditing in order to complement their own monitoring responsibilities, but they share with auditors the objective of identifying and rectifying reporting errors deliberately or otherwise made by managers.

2 Audit Quality

External auditor services to verify accounting numbers are demanded as a market-induced mechanism to reduce agency costs that can arise as a result of the potential conflicts of interest between a firm's owners and managers (Gore et al. 2001). Research shows differences in the degree of audit services quality delivered by auditors. One of the first studies that examined this phenomenon has been carried out by DeAngelo (1981). She argues that the quality of audit services must be defined as the joint probability that a given auditor will discover a breach in a firm's accounting system and at the same time report this breach. In order to evaluate this audit quality, potential clients must incur costs to assess the joint probability, which are likely to be significant. Because of the fact that audit quality is costly to evaluate, potential clients develop surrogates for audit quality. According to DeAngelo (1981) this is done to rely on a less costly to observe variable which is correlated with the quality of the audits. Palmrose (1987) shows that it is possible to assess litigation activities of auditors as a means for making quality distinctions among them. With litigation against auditors, Palmrose means the process of the discovery of false statements, the filing of lawsuits and the resolution of them (Palmrose 1987). She demonstrates that auditors with relatively low litigation activity represent higher quality suppliers and vice versa. Palmrose defines audit quality in much the same way as DeAngelo, namely the probability that statements contain no material misstatements. The lower the probability, the higher level of assurances and the higher the quality of services provided (Palmrose 1987).

2.1 Auditor independence (FEE)

LNNAF and LNTOTALFEES are associates to the fee dependence of auditor on a client. Besides the audit fees received by the auditor, the level of NAS fees further increase the client-auditor economic bond as the auditor reliance on the client increases (Simunic, 1984; Beck et al., 1988). The present study argues that the level of NAS fees and the sum of audit and NAS fees are better measures to capture the economic important of the client to the auditor than the NAS ratio. Although FEERATIO1 and FEERATIO2 do not necessarily capture the client's importance, they do explain the financial link between the auditor and the client, and have an impact on the regulators" perception of independence (Ashbaugh et al., 2003).

2.2 Industry specialist auditor (SPEC_AUD)

The existing literature suggests that the industry specialization of auditors can be measured using several approaches, such as the market share approach (Krishnan, 2003a; Dunn et al., 2000; Balsam et al., 2003; Velury et al., 2003; Chen et al., 2005) and the portfolio approach (Krishnan, 2003a), as well as a complementary approach set out by Neal and Riley (2004). Despite the limitations of each approach, they are recognized as the most appropriate measures for auditor industry specialization. Also, Neal and Riley (2004) introduce the weighted market share, a complementary approach which captures the complementary effects between the market share approach and the portfolio approach. This measure offers a solution for the inconsistency between the two main approaches. However, Neal and Riley note that, like the other two approaches, this approach does not consider the lead/lag period effect. Thus, to ensure the consistency and robustness of the findings, the present study considers all three of these approaches in determining the industry specialist auditors based on audit fees.

2.3 Audit fees (LNAFEE)

The audit fees variable (AFEE) is transformed to natural log and prefixed by LN to achieve normality of information, in order to prevent the largest firms from unduly influencing the findings. Data for this variable (LNAFEE) is gathered from the FAME database.

3 Relationship Between Audit Quality and Earning Management and IPO

The external audit exercise is a governance procedure that analyses and reviews a firm's internal audit and controls the fiscal reports to avoid material misstatements. According to Wallace (1980), claims that shareholders demand audited fiscal reports as these reports offer details that are advantageous for their decisions on investments; hence, the external audit would act as a tracking device that reduces managers' interests in misstating the earnings. Thus, the audit is used as a method of enhancing the top quality of the fiscal information; hence, it is expected that a good audit quality will be linked with reduced cost of capital by organization. Shareholders depend on the external auditor to offer some guarantee that the fiscal reports of a firm are not deceiving. It is critical that the tracking mechanism offered by the external auditors is not affected and becomes the most necessary aspect for the study delivery of an independent auditing function. One of the most important elements that influence the reliability of fiscal reports are said to be the audit quality (Arruñada, 2004). The stakeholders would show more trust on the information revealed in the fiscal reports if the audit of the fiscal reports is recognized to be of top high quality. The auditing quality is based on the likelihood of the auditor being able to find and report any misappropriation in the financial reports (R. Watts & Zimmerman, 1986). DeAngelo (1981) focus on the audit quality pointed out two important aspects that it is dependent on.

The accounting role has to face a growing pressure from external elements to observe and enhance the high audit process of company (Sutton, 1993). To contend efficiently in this setting, audit companies must continuously endeavor to enhance the audit quality and increase customer satisfaction. Firstly, the auditor's capability is to analyses the records and recognizes mistakes or flaws, i.e. their technical proficiency, and secondly, their objectivity or detachment, i.e. their independence. The auditing quality is the unique blend of the auditor's ability to recognize and report issues found in the records (R. Watts & Zimmerman, 1986). According to DeAngelo (1981), defining audit quality is beneficial for research as proficiency and independence to carry out their jobs are quite unique constructs. Nevertheless, these two measurements are not very different nor separate: for instance, the audit company could determine not trying to locate the problematic areas (competence) which they do not wish to report (independence).

Also, Public offerings: "Window dressing", or enhancing financial reports prior to an IPO or secondary equity offering to attract better valuations; Executive compensation: Increasing reported earnings to increase executive bonuses; Financial liabilities: Fulfilling financial requirements in loan covenants; Regulation: Reducing regulation costs or enhancing regulatory benefits. Beneish (2001) suggests that an insider trading can be added to this list of motives. Managers aware of mis-statement of profits can benefit by trading the securities. Stolowy and Breton (2000) suggest three broad objectives for earnings management: minimization of political costs; minimization of the cost of capital and maximization of managers' wealth. Also, most earnings management studies examine whether companies manage earnings in response to some economic incentive. One setting where management has an incentive to manipulate earnings is at the time of an IPO, since greater earnings may be reflected in a higher offering price and greater proceeds to the company and offering shareholders.

Francis et al. (1999) argue that high-accrual firms have greater opportunity for opportunistic

earnings management and have an incentive to hire a big five auditor to provide assurance that earnings are credible. They find that high accrual firms are more likely to hire a big five auditor, but report lower unexpected accruals, consistent with big five auditors constraining opportunistic reporting of accruals.

The objective of this paper is to investigate the limited but expanding body of literature on the effect of audit quality on the earnings management. The remaining of this study is organized as follows. The next section looks at the measurement of audit quality and empirical evidence of audit quality on the earnings management. The final section concludes this study and provides suggestions for future research.

4 Earnings Management

Accounting earnings are used for contracting and can provide investors the information about the firm they need. For these purposes, accrual-based earnings are more appropriate than cash flows (Subramanyam 1996). Since the real earnings are not observable by outsiders, only the reported earnings, uncertainty remains because of potential bias and noise due to possible self-interested behavior by managers. Managers have incentives to alter the earnings to maximize their own wealth. Auditors can provide credibility to management's reported earnings by issuing audit reports. These reports reduce the existing information asymmetry between the firm's shareholders and its managers by allowing the outsiders to validate the reliability of the financial statements. Thus, asymmetric information – and the associated agency costs – affects the demand for auditors by means of an external monitoring-mechanism (Becker et al. 1998; Francis et al. 2004).

Most of the effort in testing earnings management behavior has focused on explaining accounting choices by examining the relationship between an accounting choice variable and a number of explanatory variables. In defining the accounting choice variable, three different approaches have been most widely used: (1) single procedure (e.g., Hagerman and Zmijewski, 1979), (2) sets of procedures (e.g., Zmijewski and Hagerman, 1981; Press and Weintrop, 1990, Inoue and Thomas, 1996), (3) and net accruals (e.g., Healy, 1985; DeAngelo, 1988). All three definitions of accounting choice have been criticized as being poorly specified, and consequently, they may have contributed to the low power of the tests (Watts and Zimmerman, 1990). Jones (1991) developed a model to capture the discretionary component of total accruals. Jones defines the total accruals as "the change in noncash working capital before income taxes payable less total depreciation expense.

In literature accruals have been intensively used as the proxy for earnings management. These accruals can be measured by two different approaches.
• Balance sheet approach
• Cash flow statement approach

5 Audit Quality Measuring

It is challenging and complicated to measure audit quality (K. L. Jensen & Payne, 2005; Niemi, 2004; Wooten, 2003). Nevertheless, according to Bailey and Grambling (2005), Francis (2004) and PCAOB (2008); there are several possible measurements of audit quality available in practice and in the literature. Three proxies of audit quality are examined in this study. In the first empirical analysis, the audit quality proxies are dependent variables, whilst in the second, they are represented as independent variables. The definition and measurement of each audit quality proxy are described below.

6 Relationship Between Audit Quality and Earning Management

Based on the above mentioned arguments and other studies, it is evident that auditors do influence a firm's ability to engage in earnings management. This is stated very comprehensible by Jackson and Pitman (2001, p. 39):

"Independent auditors should lead the crusade to prevent deceptive accounting practices, because they not only possess in-depth knowledge of accounting and reporting matters, but they also have access to the audit quality and the board of directors responsible for scrutinizing a company's decision makers. Auditors are in a prime position to curtail abusive earnings management and help maintain and enhance public confidence in financial reporting."

A distinction exists in the level of impact auditors have, based on the quality of the audits carried out. So, whether the auditor restrains or perhaps even promotes earnings management and to what extent, is partly depending on the quality of the auditor. Once again, I use the dichotomy of Big Four versus non-Big Four auditors as a surrogate for audit quality, in which Big Four auditors provide higher quality

audits than non-Big Four auditors. I will show what exactly the impact of audit quality on earnings management is and to what extent. After that, I will take a closer look at some other factors influencing audit quality and thereby earnings management.

7 Conclusions

Empirically and theoretically to some extent, high audit quality of external auditors will lead to lower firm risk and subsequently to a lower cost. Firms that are well-managed in terms of the existence of external and internal robust monitoring devices as well as the provision of quality financial reporting and protection of stakeholders' well-being will be able to limit the exercise of power of corporate managers and carefully allocate resources, which in turn enjoy lower risk than other companies. It follows that these companies should have access to cheaper source of capital, either in the form of earnings and accrual, than other firms. A few areas can be the focus of future research. First, the influence of audit quality on the earnings management in emerging markets such as the East Asia, Eastern Europe and Russia should be undertaken so as to enable generalization of research findings. Lastly, future research could also draw on cross-countries comparisons by examining the impact of different level of accounting principles and their level of implementation on the earnings management.

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Study on the Development Approaches of Supply Chain Finance of Commercial Bank Based on Internet Plus

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Abstract: This paper, using industrial competitiveness and ecological theory, holds the view that with the implementation of the Internet plus strategy and innovation of the supply side, the commercial bank supply chain financial business, as a kind of service to the real economy, should be transformed from traditional industry to ecological industry under the Internet financial impact. Moreover, it is necessary to build the supply chain financial ecological industry attractiveness evaluation index system on the basis of industry scale, industry development potential, industry innovation capability, and industry advantage and industry social benefit. The paper comes up with the supply chain financial industry development path in terms of its prior development, important issues and general cooperation using factor analysis, cluster analysis and quantitative analysis method. To an extent, it is significant to provide decision-making and the practice basis for commercial banks in its selection of supply chain finance business development direction.
Key words: Internet plus; Supply chain finance; Industrial development approach; Industry attractiveness

1 Introduction

After entering to the 21st Century and facing the rapid development of Internet industry, the trend of internationalization becomes more and more remarkable for all industries. During the periods of two sessions in 2015, Chinese government put forward the concept "Internet Plus" to promote the transformation of Chinese economy and reshape industrial structures by combining with the advantages of Internet. "China Made 2025" works close with the development planning, such as information integration and national informatization, especially the reform of the supply side and new technological revolution featured by big data, cloud computing, Internet and Internet of Things largely change the channels and instruments of finance. It will certainly have constant and deep reform on commercial mode, development model and financial demands.

The rapid development of Internet finance is likely to reshuffle the ability for commercial bank to contend for customers and quicken the market reform of financial industry. The financial innovation changes rapidly, the multi-agent, multilevel and multi-field comprehensive financial market patterns are emerging. Private finance, industrial capital and the cross-industry competition new format of internet finance remarkably form new finance eco-system. As a result, it brings dangerous subsistence crisis for banking industry. In 2015, Chinese banking industry faced several difficulties and situated in a severe development situation, such as low increase of profits, prominent pressure of asset quality and constant "increase" of non-performing loans. Therefore, commercial bank must return to the essence of serving substantial economy under the background of new age. It requires for deep involvement in the optimization of industrial chain and the innovation of commercial mode, exploring new finance and non-finance service model s and finding the increasing point fitting with industrial development. As a great achievement for bank to serve substantial economy, supply chain finance is becoming a strong and powerful gripper for commercial bank. Basing on the policy of "Internet Plus", how can commercial bank go on Internalization reform and carry out supply chain finance in itself? How to precisely seek out excellent industry? It is the practical difficult problem and require to be handled for commercial bank to suit the demands of the changes of macro-economy environment and cope with the challenges brought by Internet.

2 Present Situation of the Research at Home and Abroad

Supply chain finance is a great achievement to solve financing difficulties for small and medium-sized enterprises. Alen N Berger and Gregory G Udell (2004) think supply chain finance is an innovation of financing and they are the earliest person to build the framework of supply chain finance. Hofmann (2005) points out that supply chain finance is the cross product of finance, enterprise cooperation, logistics and supply chain management and is a way for several commercial subjects to cooperatively create values from the aspect of the subjects in the supply chain finance. Michael

Lamoureux (2007) thinks supply chain finance centers on the ability of financing and the systematical optimization of finance cost and goes on optimization management on fund by credit balance, financing preferences and inventory control. This kind of systematical optimization can be achieved by the information flow of supply chain. Towergroup (2006) thinks that supply chain finance is an innovative service for the financing of current assets and it is constantly developed by the promotion of technology, globalization and the management of supply chain. Walters (2004) also believes supply chain finance is an innovation for financial products and services and it is a kind of value chain management process to achieve the value of supply chain.   Based on those achievements, Aberdeen (2006) sums up that the essence of supply chain finance is a scheme to optimize the flow of the financing of supply chain and decreases the overall financing of supply chain and settlement cost.   Domestic scholar Yan Junhong (2007) believes supply chain finance is a new financial service. By providing services to related enterprises on the whole supply chain, it can finally form a supply chain financing "production-supply -marketing" and achieve industry financial ecological chain by the cooperation between financial capital and substantial economy. Sun Li (2014) points out that commercial bank must combine with Internet to achieve the transformation of supply chain finance and points out detailed direction of transformation. Huang Rui (2014) points out that commercial bank has to be innovative and takes advantages of the Internet to lay out financial industry chain, meets the financial demands of small and micro enterprises and individuals and achieves the transformation and upgrade of commercial bank under the wave of Internet.   Chen Zehan (2015) focuses on the analysis of the financial business of a certain commercial bank and points out that he major direction centers on tradition industries, such as steel, automobile and coal.

It is obvious that the researches of supply chain finance theory at home and abroad mainly focus on operation model and types of product type of supply chain financial transaction, financing effects on small to medium sized enterprises and the risk control to carry out supply chain finance for commercial bank. Domestic scholars highlight the transformation of supply chain finance, but they mainly center on business types and changing off-line business to on-line business. They lack the study on the transformation from traditional industries to new industries. The supply chain finance for traditional industries has one core enterprise and provides information basis and risk control to supply chain finance. However, with the promotion and application of new technology, featured by big data, cloud computing, Internet and Internet of Things, especially the promotion of Internet Plus Strategy, enterprise can integrate with the proceeding of Internet. It opens the space for the development of Internet financial for commercial bank. The prerequisite for commercial bank to grasp the opportunity of Internet Plus is to break the constraint of industry and the top priority is to find the proper industry to develop supply chain finance.

3 Industry Choose Based on Industry Attractiveness of Commercial Bank Supply Chain

As for commercial bank, the implement of supply chain financial business firstly requires for opportunity identification, but the opportunity origins from the industry itself and environment. To effectively find out the opportunity of the development of supply chain finance, the paper use the ability of industry attractiveness to measure opportunity. Industry attractiveness includes its own conditions and the guide and support of government.

3.1 Design the evaluation index system of industry attractiveness of supply chain finance

3.1.1 Index design principle

To study the cooperation of industry-finance in the change of industrial structure, the building of the index needs to judge, choose, control, guide and warn. Reasonable evaluation index system plays a key role in enhancing the scientific of results. The key of carrying out supply chain finance for commercial bank is to be on guard of systemic risks within the industry, but the core of preventing the systemic risk is the development space and growth of the industry. This text will center on this core to design the index design principle and carry out index design.

1) Scientific principle

The building of evaluation system obeys scientific principle and the design of any data and index must obey the actual conditions. Try to avoid the overlapping and crossing calculation among indexes and then get the index, which can precisely reveal industry attractiveness. The aims are to precisely reveal the actual conditions of the industry and provide scientific evidence to design approaches of the development of supply chain finance for commercial bank.

2) Ecological principle

The choice of industry must obey the guide of government's industrial policy. With the transformation from extensive management to the content-based developmental transformation to the connotation development, our economy should strengthen industrial innovation-driven model and take the road of sustainable development.

3) Growth principle

The basis of the development of supply chain finance is to have the outlook for growth. If the industry has strong momentum, the risk of the development of supply chain finance is less and it can be more effectively bring the scale effect into play.

3.1.2 Construction of index system

According to the above principles, this text will build index from the aspect of industry attractiveness. Index includes industry scale, development potentials, innovation, advantages and social benefits of the industry. Basing on the principles of index design and the optimization of index, this text will examine and distinguish from 3 levels: ① Invite experts, specializing in the industry competitiveness, to distinguish and arrive at expert validity. ② Using exploratory analysis to exclude redundant titles and increase the construct validity of the scales. Using reliability test to ensure the reliability and stability of the scales. By examining, distinguishing and optimizing part of questions to form the scale on industry attractiveness, composing by 13 indexes (refers to table 1).

Table 1　Index on Industry Attractiveness

Aim	Benchmark	Index	Computing Formula
Industry Attractiveness	Industry Scale	Proportion of Employment	The Number of Employment/ Gross Number of Employment
		Proportion of the Number of Enterprise	The Number of Enterprise/ Gross Number of Enterprise
		Proportion of Total Asset	Industrial Assets/ Total Assets
		Proportion of Total Industry Output Value	Industry Gross Output/ Total Industry Output Value
	Industry Development Potentials	Growth Rate of Industry	Industry Output Value Variable/ Industry Output in the Base Period
		Ratio of Pre-tax	Total Profit and Tax/ Industry Industrial Output Value
	Industry Innovation	Growth Rate of R&D Personnel	The Number of R&D Personnel Variable/ The Number of R&D in the Base Period
		The Proportion of Sales Values of New Technologies Products in Total Sales Values	Sales Values of New Technologies Products/ Industry Sales Values
		The Proportion of R&D Campaign Expenses in Product Sales Values	Input of R&D Campaign Expenses/ Product Sales Values
	Industrial Advantages	Turnover Rate of Current Assets	Output Value of the Industry throughout the Country/ Industry Gross Value throughout the Country/ Industry
		Value Added Ratio of Industry	Industry Added Value Variable/ Added Value Variable in the Base Period
	Industry Social Benefits	Absorption Rate of Employment	The Number of People in the Industry/ Industry Added Value
		Energy Consumption Rate/ Input-Output Ratio	Industry Gross Output Value/ Industry Total Energy Consumption

3.2 Data analysis

The text regards the division of industry in *China Statistical Yearbook* as objects. According to the selected 13 index of appraising industry attractiveness, collect and sort out the original data in *China Statistical Yearbook, China Torch Statistical Yearbook* and *China Statistical Yearbook on Science and Technology* in 2015 to get 62 origin data of the related industries in 2014. To avoid errors resulted by different dimensions, this text adopts common statistical standardization methods to make dimensionless treatment of the origin data.

This text adopts SPSS17.0 as statistics analysis tool to analyze industry attractiveness. If the KMO value is 0.681 and more than 0.6, it means the sample index system has pretty good internal reliability and suits for factorial analysis. The p value of Bartlett sphericity tests are 0.000, which can deny the false of the independence of indexes. That is to say, it means there are prominent correlations between variables. As a result, it means Bartlett sphericity tests and KMO test are proper to go on factorial analysis.

According to the standardized correlation matrix, the factor characteristic root and total variance of industry attractiveness can be explained. It can be known from table 3, those two both have 4 latent roots (over 1) and explain 74.442% of the standard deviation variables. It illustrates that the former 4 factors can reveal most of the information of origin information and describe the actual standard.

Table 2   Factor Characteristic Root and Total Cumulative

Element	Initial Eigenvalues			Square Extraction and Loading		
	Total	Variance %	Accumulate %	Total	Variance %	Accumulate %
1	4.393	33.796	33.796	4.393	33.796	33.796
2	2.223	17.098	50.893	2.223	17.098	50.893
3	1.782	13.710	64.603	1.782	13.710	64.603
4	1.279	9.839	74.442	1.279	9.839	74.442

To deepen the analytical ability and explanatory ability for general factor on practical questions, the text adopts varimax rotation to rotate factors and get the loading matrix (refers to table 3) by 4 principal factors. The rotated loading matrix highlights the internal relation between industry attractiveness and its evaluation index.

Table 3   Rotated Component Matrix

	Element			
	1	2	3	4
Proportion of Employment	.919	.001	.098	-.066
Proportion of the Number of Enterprise	.893	.092	.132	-.029
Proportion of Total Industry Output Value	.888	.106	-.206	.186
Output Ratio of Energy Consumption	.808	.122	-.253	-.137
Proportion of Industry Output Value	.777	.049	-.297	.166
The Proportion of $R \& D$ Campaign Expenses in Product Sales Values	.178	.900	-.088	.127
he Proportion of the Sales Values of New Technologies Products in Total Sales Values	.203	.875	-.139	.253
Turnover Rate of Current Asset	.106	-.759	.034	.296
Value Added Ratio of Industry	-.006	-.077	.895	.091
Growth Rate of industry	-.154	-.060	.835	.153
Growth Rate of R&D Personnel	-.070	-.093	.604	-.271
Absorption Rate of Employment	-.197	-.112	-.132	-.857
Ratio of Pre-tax	-.368	-.063	-.135	.489

As can be seen from rotated component matrix, the first principal factor F1 has great loading on proportion of employment, proportion of the number of enterprise, proportion of total industry output value, output ratio of energy consumption and the proportion of industry assets. Those five indexes reflect industry economies of scale. Namely, it is called industrial scale attractiveness factor. The second principal factor F2 reflects the development potentials of industry in the following 3 aspects: the proportion of $R \& D$ campaign expenses in product sales values, the proportion of sales values of new technologies products in total sales values and turnover rate of current asset. Namely, it is called industrial potential factor. The third principal factor F3 has great loading on value added ratio of industry, growth rate of industry, growth rate of R&D personnel, growth rate of sales revenues and growth rate of industry. Those five indexes reflect the growth of industry. Namely, it is called industrial growth attraction factor. The fourth principal factor F4 has great loading on absorption rate of employment and ratio of pre-tax. Those two indexes reflect industry social benefits. Namely, it is called industrial social attraction factor.

To examine the importance of index on factors and the overall evaluation, calculate the scores of factors and adopt regression method to get the matrix of coefficients of the scores of factors. According to the linear combination of the standard value of the variable of the matrix of coefficients, the scores of

the factors can be calculated. Then, the rotated variance devoting rates of latent root plus the scores of main factors to get the comprehensive scores of factors. The results and ranking refer to table 4.

Table 4　Overall Ranking

Industry	Comprehensive scores	Industry	Comprehensive scores
Computer, Communication and other Electronic Equipment　Manufacturing Industry	0.7164	Wood Processing and Manufacturing Industry of Wood, Bamboo, Vine, Palm and Grass	-0.00121
Electrical Machinery and Equipment Manufacturing Industry	0.703304	Manufacturing Industry of Culture and Education, Art, Gym and Recreation Goods	-0.01892
Chemical Materials and Chemical Products Manufacturing	0.680099	Manufacture of Metal Product, Machinery and Equipment-repairing	-0.01942
Non-mental Mineral Products	0.644058	Coal Mining and Coal Washing Industry	-0.04658
Processing of Food from Agriculture Products	0.592592	Manufacture of Textiles, Clothes and Accessories	-0.05236
General Equipment Manufacturing	0.579135	Manufacture of Paper-making and Paper Products	-0.14761
Motor Industry	0.456413	Manufacture of Furniture	-0.14902
Manufacture of Special Purpose Equipment	0.371869	Leather, Fur, Feather and Its Products and Shoemaking Industry	-0.19677
Manufacture of Metal Products	0.340626	Auxiliary Mining Operations	-0.23322
Manufacture of Medicines	0.335939	Petroleum Processing, Coke Making and Processing of Nuclear Fuel	-0.28174
Manufacture of Instruments and Meters	0.239771	Printing and Record Medium Reproduction	-0.28236
Manufacture of Rubber and Plastics	0.22854	Manufacture of Chemical Fibers	-0.29936
Textile Industry	0.203332	Nonmetal Minerals Mining and Dressing	-0.30439
Smelting and Pressing of Ferrous Metals	0.200978	Nonferrous Metals Mining and Dressing	-0.31511
Manufactures of Railway, Shipping, Aerospace and Other Transportation Facilities	0.144026	Manufacture of Tobacco	-0.37848
Production and Supply of Electric Power and Heating Power	0.080014	Ferrous Metals Mining and Dressing	-0.38344
Production and Supply of Gas	0.07471	Other Manufacture Industries	-0.62436
Food Manufacturing	0.057398	Extraction of Petroleum and Natural Gas	-0.64542
Smelting and Pressing of nonferrous Metals	0.028111	Comprehensive Utilization of Waste	-0.67424
Manufacture of Wine, Drink and Refined Tea	0.013015	Other Mining Industry	-0.69988
Manufacture of Electronic Components	0.90791	Manufacture of Discrete Semiconductor Devices	-0.03311
Manufacture of Electronic Devices	0.54123	Manufacture of Integrated Circuit	-0.05386
Manufacture of Other Electronic Devices	0.46776	Manufacture of Medical Instrument and Apparatus	-0.08353
Manufacture of Chemical Medicine	0.36535	Manufacture of Office Equipment	-0.13811
Manufacture of Instruments and Meters	0.26937	Manufacture of Spacecraft	-0.17354
Manufacture of Communication Transmission Equipment	0.22204	Manufacture of Electronic Vacuum Appliances	-0.23643
Manufacture of Computer Peripheral Equipment	0.22131	Manufacture of Radio & TV Equipment	-0.26139
Production of Chinese Patent Medicine	0.0816	Manufacture of Aircraft	-0.28357
Manufacture of Complete Computers	0.01183	Manufacture of Audio-visual Equipment	-0.41791
Manufacture of Communication Terminal Equipment	-0.0113	Manufacture of Computer Components	-0.45875
Manufacture of Biological Medicine	-0.0149	Manufacture of Rada	-0.92196

4 The Division of the Development Approach of Supply Chain Finance for Commercial Bank

According to the results of calculation, only those industries with positive comprehensive scores have the space of choosing the supply chain finance for commercial bank. To further illustrate industrial difference, this paper adopts Q-mode hierarchical cluster analysis to cluster industries with positive comprehensive scores and get the development approach of the supply chain finance of commercial

bank. To highlight the differentiation, and adopt five clustering methods to three catalogues, such as top-priority, highlight and general development, the other two catalogues will not illustrate here.

1) Top-priority industry

As it can be seen from cluster analysis, the top-priority industries to be developed include 13 industries, such as Manufacture of Medicines, Manufacture of Instruments and Meters, Production and Supply of Gas, Food Manufacturing, Manufacture of Wine, Drink and Refined Tea, Manufacture of Electronic Components, Manufacture of Electronic Devices, Manufacture of Other Electronic Devices, Manufacture of Chemical Medicine, Manufacture of Communication Transmission Equipment, Manufacture of Complete Computers, Manufacture of Computer Peripheral Equipment and Production of Chinese Patent Medicine. Seen from the practical status of those industries, those industries are mainly stand at the upward momentum. They are innovated by national policies and fit with the connotation of the combination of finance with substantial industry.

2) Industries require for great attention

As it can be seen from cluster analysis, Motor Industry, Manufacture of Special Purpose Equipment, Manufacture of Metal Products and Manufacture of Rubber and Plastics have to be handled with great care to carry out the financial services of finance chain supply. Those industries are pretty matured traditional manufacturing industries. At present, majority of the finance supply chain of commercial bank focus on those industries. As it can be seen from the analysis, those industries have great space of development. Besides, they have little risk and deserve for great concern.

3) General cooperation industry

Industries like Electrical Machinery and Equipment Manufacturing Industry, Chemical Materials and Chemical Products Manufacturing, Non-mental Mineral Products, General Equipment Manufacturing and Textile Industry are too weak to grow and have relatively weak industry benefits. They selectively to cooperate with some enterprises, such as the leading enterprises of the supply chain.

5 Conclusions

Supply Chain Finance, an important financial instrument to support substantial economy, is an effective method to solve financing problem for Medium-sized and Small Enterprise. This text focuses on the slow development of supply chain finance of Commercial Bank at present, stopping the development dilemma of minor tradition industry, adopting industry attractiveness as the means of choice and employing factorial analysis and clustering analysis to choice the perspective industries for commercial bank. It has an important practical significance on promoting and developing supply chain finance for Commercial Bank.

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Drivers of Bank Profitability: A Case of Commercial Banks in Morocco

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Abstract: This research examines the drivers of return on asset (ROA) as the proxy of profitability in the commercial banks in Morocco. Panel regression model is employed referring to time series in each cross section of data. Based on the result of Haussmann test, random effect method fit the model better. Thus it was utilized to determine the drivers of bank profitability from its bank specifics in this research. The annual data was collected from bank scope database to cover the period from 2007 until 2015 in the six commercial banks in Morocco as the samples of this research. Out of six variables, we find that there are four independent variables which have significant effect on return on assets (ROA), while the remaining two independent variables have no significant effect on to return on assets (ROA). Size and loan loss reserves to gross loan (LLR/GL) are positively affecting the return on assets with high statistical significance. On the other hand, cost to income ratio (CIR) and loan loss provision to net interest revenue (LLP/NIR) have negative effect and highly significant effect on return on assets (ROA).
Key words: Bank profitability; Panel regression; Random effect method; Bank specifics

1 Introduction

Nowadays, the national and international economic context of Morocco is marked certainly by a recovery in its activity after the "Big Recession" of 2007-2009, initially caused by the United State subprime mortgage crisis and the bankruptcy of Lehman Brothers in September 2008. Despite this recovery, the context is still being fragile. The pivotal actor of the economy are banks, they maintain the financial relations and assure the stability of economies (Suzuki 2012).

We are currently witnessing economic developments in lightning globally, profound regulatory changes in the financial markets and margin erosion in the banking sector. This dynamic has a huge impact on the international competitiveness of the site and the profitability of various activity area. Banks must find appropriate responses to the new provides. For Morocco, the structure of the banking system has undergone many changes since the eighty years. These changes are the result of adaptation of banks to the new order in financial markets marked by an opening of markets has led to an increase in competition. As part of such restructuring of banking systems, include "bank performance" and "determinants" becomes an important issue.

In the banking system, the traditional activity is to collect funds (deposits) from surplus agents to make available to those in need (lend). This conventional way of doing was further complicated by the creation of the award by financial globalization and not to mention the multiple crises. Therefore, Banks with better performance are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al., 2008).

The soundness of banks maintains the stability of the economies. Hence the performance of Morocco banks is crucial for the country economy. Since 1997 until 2016, they are 33 banks in total but many of them declared bankruptcy (BBVA Maroc SA, Fondation pour le Développement Local et le Partenariat-FONDEP, Citibank Morocco, Fondation Zakoura Micro-Credit, Société de Financement d'achats à Crédit - SOFAC Crédit, Banque Nationale pour le Développement Economique – BNDE) or they use merger and acquisition to develop their performance as the case of attijariwafabank. After the elimination of inactive bank and also the bank which haven't data during the period 2007 to 2015, only six bank have been taken as sample of the framework, those banks are: Attijariwafa Bank, Groupe Banque Centrale Populaire, Banque Marocaine du Commerce Extérieur-BMCE Bank, Société Générale Marocaine de Banques, Banque Marocaine pour le Commerce et l'Industrie BMCI and Fonds d'Equipement Communal.

The performance can be expressed in various terms, such as efficiency, productivity and profitability (Bikker and Bos, 2008). In this research, the performance will be analysis in term of profitability. Many academic researchers was attracted by the determinant of banks performance, International academic researcher have shown that "the bank performance" is represented mainly by quantitative or measurable indicators such as financial indicators (ROA, ROE, etc.), also academic researchers in Morocco wanted to examine the performance of Morocco banks like Ferrouhi & Lehadiri

(2014) and Mansouri (2009). However, the research conducted use cointegration modeling approach and others approach, hence there is a gap of studies conducted to investigate the status of Moroccan bank performance and its determinant. In view of these facts, this paper attempts to investigate the drivers of Moroccan bank profitability during and after the financial world crisis by using return on asset (ROA) as the proxy of profitability.

2 Literature Review

Numerous studies attempted to find the determinants of bank performance. Most of studies have been performed in the developed countries, but it is still very few in the developing countries, including Morocco. One of the early studies attempted to find out the major determinants of bank performance and profitability was carried by Short (1979) and Brouke (1989). Since then, many studies have been conducted by other researchers, such as; Molyneux and Thornton (1992), Demirguc-Kunt and Huizinga (1999), Abreu and Mendes (2002), Staikouras and Wood (2004), Athanasoglou et al. (2006), Micco et al. (2007) and Pasiouras and Kosmidou (2007) to investigate the variables related to bank profitability (Zeitun 2012).

Return on asset (ROA) is usually used as dependent variable in the regression equation. This ratio defines the profit gained from bank activities. It is a profitability indicator obtained by net income to total assets (Faizulayev 2011). ROA assesses efficiency management in terms of assets as percentages. In other words, it measures the ability in terms of efficiency of the banks to generate profit by using its assets. Simply to say, how efficiently assets are making earnings. The remaining bank specifics except return on assets will be used as independent variables in the regression equation. There are many bank specific variables and the researchers chose the most common one, such as; liquidity, bank size expressed by log of total asset, credit risk, asset quality, and operational efficiency ratio.

Liquidity is an important ratio measuring the ability of banks to cover its obligation; this important variable can be obtained by net loans to deposit and short term funding (NL/DS). It arises from the possible of inability of a bank to accommodate decreases in liabilities or to fund increases on the assets' side of the balance sheet (Said & Tumin 2011). Liquidity problem may lead to insolvency (Faizulayev 2011). According to (Mirzaei 2011), it is expected a positive relationship between this variable and profitability (Bourke, 1989). (Rachdi 2013) confirmed this finding in Tunisia bank.

It is considered that size is expected to have an impact on financial performance. Previous work witnessed that size banks may have positive or negative impact on the profitability. According to Mirzaei (2011) a positive relationship between size and return on asset can be issued. It can be explained that the bigger the bank is, may having higher total assets that could benefit from scale and scope economies and even larger benefit from market power. According to Sufian (2011) and Rachdi (2013), in a specific case may suggest that cost differences and product may lead to a positive relation between size and profit, large bank high degree of loan thus more revenue. Additionally, (Smaoui & Salah n.d.) find that size affect positive and significantly to return on assets (ROA) in gulf cooperation council countries (GCC) region. So, we can deduce that the size can have positive or negative effect on ROA.

Loan loss provision to net interest revenue (LLP/NIR) as a proxy of credit risk refers to a probable loss of capital accorded as credit while repaying a loan by clients. Credit ratio has significant impact on performance of banks in Malaysia, the higher the credit ratio results may lead to lower profit (Said & Tumin 2011). Furthermore, in the previous research of Miller & Noulas (1997), they found a negative impact between loan loss provision and net interest revenue. That means, the higher banks are exposed to credit risk, the higher banks are exposed to less profitability.

Asset quality refer to the main source of asset's banks, named loans (Faizulayev 2011). The management of loan loss is very important because it measures the creditworthiness of banks, in this paper loan loss reserves to gross loans (LLR/GL) is used to measure the asset quality. Loan loss reserve (LLR) is the percentage of the total loan portfolio that has been set aside for bad loans. The higher loan loss reserve ratio indicates poor quality of loans; hence it will have higher risk on the loan's portfolio. According to Kosmidou et al. (2006), a poor loan quality could reduce interest revenue and increase bank's provisioning costs.

Operational efficiency ratio of banks can be expressed by cost to income ratio. This ratio indicates how quick the expenses increase or decrease when changes to income occurred. (Rachdi 2013) found the negative effect between costs to income ratio to return on assets in the Tunisia banks. The same result found by (Zeitun 2012) in his research on gulf cooperation council (GCC) countries . Minimizing cost-income is a crucial role for banks profitability since it measures the overheads or costs of running

the bank which includes staff salaries and benefits, occupancy expenses and other expenses such as office supplies, as percentage of income. It is typically used as an indicator of management's ability to control costs. The higher expenses normally mean lower profits and vice versa, thus cost to income ratio (CIR) is expected to have a negative effect on bank profits and margins (Kosmidou et al., 2006).

Total equity by net loan ratio, forms part of the Capital and Funding ratios of a bank, and measures a company's financial leverage by calculating the proportion of equity and debt the company is using to finance its assets. Abdallah (2013) in his research on the impact of financial and non-financial measures on banks financial strength rating in the middle east found a positive and statistically significant relation between equity to net loan and profitability. His theory was build based on the finding of Poon et al. (2009). Based on previous research, the following hypotheses are concluded:

H_1: Net loans to deposit and short term funding (NL/DS) has positive effect on return on assets (ROA)

H_2: Size of bank has a positive effect on return on assets (ROA)

H_3: Loan loss provision to net interest revenue (LLP/NIR) has negative effect on return on assets (ROA)

H_4: Loan loss reserves to gross loans (LLR/GL) has positive effect on return on asset (ROA)

H_5: Cost to income ratio (CIR) has negative effect on return on assets (ROA)

H_6: Equity to net loans has positive relation effect on return on asset (ROA)

3 Methodology

3.1 Data collection method

Panel data analysis is conducted which relating its time series to the cross sectional data. In each cross section, it is produced an intercept and the score of coefficient from different slopes in each observation period (Wooldridge, 2013). Yearly based data from 2007 to 2015 is collected from world banking information source, Bankscope and the Commercial banks of Moroccan were selected as sample. All active and currently operating banks which listed on Bankscope constitute the sampling frame. Commercial banks both private and public banks that paid dividend throughout study period are taken for further analysis. There are 33 banks in total, but there are only 6 banks that actively operating and have the data from 2007 to 2015. Hence 6 banks with 54 observations make up the final sample of study.

3.2 Method of the study

This research utilizes return on asset (ROA) to measure bank profitability as dependent variable, while independent variables in this research are the bank specifics, such as; NL_DS, SIZE, CIR, LL_GL, LLP_NIR, EQ_NL. Thus, the model is as follows:

$$ROA_{it} = \alpha_i + \beta_1 NL\_DS_{it} + \beta_2 SIZE_{it} + \beta_3 LLP\_NIR_{it\ it} + \beta_4 LLR\_GL_{it,} + \beta_5 CIR_{it} + \beta_6 EQ\_NL_{it} + \varepsilon_{it}$$

Wheras:

ROA: Return on Asset

β: coefficient of independent variable

NL_DS: Net Loans to Deposit and Short Term Funding (liquidity)

SIZE: Log of total asset of a bank

LLP_NIR: Loan Loss Provision over Net Interest Revenue (credit risk)

LLR_GL: Loan Loss Reserves by Gross Loans (asset quality)

CIR: Cost to Income Ratio (operational efficiency ratio)

EQ_NL: Equity to net Loans

ε: Error terms

i: total number of banks

t: total number observation for each bank

4 The Determinants of Return on Asset

To find the determinant of return on asset, Panel least square is utilized to analyze it. Return on asset (ROA) is used as dependent variable. Based on result of Hausman test, P-value is bigger than 5 percent hence random effect model is used for further analysis.

Based on the table 1, it indicates that out of 6 variables: Net Loans to Deposit and Short term Funding, Log of total asset of a bank, Loan Loss Provision over Net Interest Revenue, Loan Loss Reserves by Gross Loans, Cost to Income Ratio and Equity to net Loans, there are four independent variables have significant on 1 percent level impact on return on asset. NL_DS ratio measuring the

degree of bank liquidity have no significant coefficient on the return on asset of Moroccan banks, hence the first hypothesis is rejected. Size ratio have significant and positive effect on banks profitability, hence we accept the second hypothesis, this result is the same with those of Mirzaei (2011) Sufian (2011) and Rachdi (2013). LLP_NIR ratio have significant and negative relation with banks profitability, this results is consistent with the model result Said & Tumin (2011), hence the third hypothesis is valid. LL_GL is significant with positive impact on return on asset, Cost to Income Ratio (CIR) significant with negative impact. Therefore the fourth and fifth hypothesis s accepted. Equity to net loan ratio have no significant effect on return on asset (ROA), hence the sixth hypothesis is rejected.

Table 1   Determinants of Profitability

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1,425	0,573	2,488	0,016
NL_DS	-0,004	0,003	-1,102	0,276
SIZE	1,917	0,278	6,889	0,000
LLP_NIR	-0,024	0,003	-8,692	0,000
LL_GL	0,041	0,007	5,625	0,000
CIR	-0,019	0,004	-4,282	0,000
EQ_NL	0,001	0,010	0,103	0,918

Table 2   Weighted Statistics

R-squared	0,866503	Mean dependent var	1,276111
Adjusted R-squared	0,849461	S.D. dependent var	0,501528
S.E. of regression	0,19459	Sum squared resid	1,779661
F-statistic	50,8446	Durbin-Watson stat	0,895152
Prob(F-statistic)	0		

Based on table 2, F-statistic, P-value indicate that the model is good for analysis, then the conclusion reached basis on this result are reliable. Adjusted R-squared is 0.849 which represent that almost 85 percent variation in dependent variable is explained by explanatory variables of model. Durbin-Watson static is close to 1 that indicates that model is free of serial auto correlation.

Table 3   Multicolinearity test

	NL_DS	SIZE	CIR	LL_GL	LLP_NIR	EQ_NL
NL_DS	1	0,250604	-0,70511	-0,21263	-0,2479	0,426193
SIZE	0,250604	1	0,183643	0,415214	0,086243	-0,1013
LLP_NIR	-0,2479	0,086243	0,589448	0,796291	1	-0,58002
LL_GL	-0,21263	0,415214	0,603603	1	0,796291	-0,53942
CIR	-0,70511	0,183643	1	0,603603	0,589448	-0,72475
EQ_NL	0,426193	-0,1013	-0,72475	-0,53942	-0,58002	1

Tables 3 explain matrix correlation of commercial banks in Morocco. Explanatory variables may explain the effect of dependent variable when they have no correlations among independent variables. Strong association exist when the score of matrix ≥ 80% (0.80). Briefly, the results show no multicollinearity problem among independent variables. Thus, all the independent variables utilize in this research.

5 Conclusions

This study empirically investigated the determinants of bank's performance for banks in Morocco during the period 2007-2015, using a cross-sectional time-series (panel data). Bank-specific factors (internal variables) have been used in this study. Total banks are 33 banks; many of them declared bankruptcy or they use merger and acquisition to develop their performance or newly created. Only 6 bank that actively operating and have the data from 2007 to 2015. Hence 6 banks with 54 observations make up the final sample of study.

Liquidity measuring the ability of banks to cover its obligation was expected to have positive impacts on profitability, results show no significant coefficient, and hence the hypothesis was rejected.

The size of banks obtained by log of total asset as expected have positive relation on banks profitability, bank in Morocco benefit from scale and scope economies and also market power. LLP_NIR ratio used as a proxy of credit risk has negative effect on return on asset (ROA). Asset quality ratio, referring to the result, has positive effect on the return on asset, hence higher asset quality lead to higher profitability of banks in Morocco. The cost-income was found to have a negative and significant impact on banks performance for banks in Morocco, developing management ability in controlling cost. Finally, equity ratio effect on return on asset was rejected, it hasn't significant coefficient.

Data collection is the main limitation for this study. Data on banking is not easily accessible or available in general. The data for this study was obtained from BankScope and the required information was not available for all banks. Therefore, many banks were not included in this study as they had missing data for many years over the period of the study. Also, some indicators of bank specifics and macroeconomics factor that are not included in this study may be added.

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Innovative Design of "Win-Win" Model of Supply Chain Finance Based on Bank-Enterprise Dynamic Game

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Abstract: The bank-enterprise credit relationship in supply chain finance is a process of dynamic game. Platform of supply chain financing is the optimal contract design and path selection to achieve "win-win" of bank-enterprise. In this paper, we're trying to establish a dynamic game model to analyze the decisions of bank-enterprise, analyze the Bayesian Nash equilibrium and its existing conditions to find out their respective optimal choice, and design the supply chain financing platforms actively. The purpose is to meet the different financing needs of small and medium-sized enterprises in supply chain, achieve the "win-win" target of supply chain finance.
Key words: Supply chain finance; Bayesian Nash equilibrium; Dynamic game; Win-Win

1 Introduction

In recent years, with the complicated and changeable international and domestic economic situation, the SMEs (small and medium-sized enterprises) are faced with the contradiction, such as rising costs, funding constraints, financing difficulties and other conflicts, which are more prominent. The problem of capital constraint problem is prevalent in the supply chain management. Supply chain finance is to further strengthen and improve financial support and services and promote the sustained, rapid and sound development of SEMs, promotes economic restructuring and upgrading, provides a new choice path. Supply chain finance is a combination of financial services and technology solutions (William Atkinson, 2008). How to avoid the risk of a credit agreement reasonably under the risk-sharing mechanism and make the best design and financing platform is the real issue and the urgent task of supply chain finance parties must face.

2 Establishment of the Dynamic Game Model

Supply chain financing model make use of inventory of enterprise and accounts receivable, to provide financing, asset finance through under sufficient control over the banks to control risks, and reduce the probability of default of enterprises. Principal-agent relationship between banks and finance companies is a credit relationship; the game is a dynamic process that requires a dynamic analysis of the financing of corporate defaults, banking litigation process to examine the formation of the supply chain financial risks and their solutions. The participations in the core business with third-party logistics enterprises, the marginal credibility of SMEs are improved, reduce the asymmetry of information between banks and enterprises (Zhang Yan, 2011), but also cut down the cost of the bank to obtain information and the cost of corporate defaults increased, which reduce the probability of default of enterprises, improve the rate of the bank issuing the credit funds, solve the problem of the enterprise finance effectively.

In the context of supply chain finance, when banks and enterprises participating subjects are rational, both in pursuit of maximizing their own interests for the purpose according to the behavior of SMEs, the banks decide whether to lend at the same time, it can build an analysis of model about bank-enterprises credit game to analyze the decisions of them.

SMEs choose α_1 from the feasible set A_1, after α_1 is observed, the banks select an action α_2 from viable A_2, $\max_{\alpha_2 \in A_2} u_2(\alpha_1, \alpha_2)$ said the decision problem the banks facing, at this time their profits are $u_1(\alpha_1, \alpha_2)$ and $u_2(\alpha_1, \alpha_2)$. Assumes that there is only one solution $R_2(\alpha_1)$ to each α_1 from A_1 for the banks of optimization problem, decision-making problems faced by SMEs in the loan application is represented by $\max_{\alpha_1 \in A_1} u_2(\alpha_1, R_2(\alpha_1))$, and the same optimization problem has a unique solution α_1' for SMEs, $(\alpha_1' R_2(\alpha_1'))$ is the solution of this game. When the banks and enterprises is difficult to reconcile the conflict game, the two sides should change the performance indicators in the system, and the system solution is the optimal solution (Li Jiajun, He Sihui, 2004). When SMEs apply the banks for loans, there

are two options in the bank's strategic space: namely, two sets of lending and non-lending operations of two sets, which is based on the supply chain situation in which small and medium enterprise capacity, credit rating, collateral levels, known information etc. If the banks choose not to lend, the entire dynamic game will be suspended; if the bank approved a loan, then the next set of actions of the bank will be decided by the enterprise repayment behavior, such as the performance of SMEs, the game suspended and banks and enterprises to achieve win-win situation. The revenue collection is (1, 1), which is a perfect information dynamic game of bank-enterprise (Xia Taifeng, 2006). As shown in fugure 1.
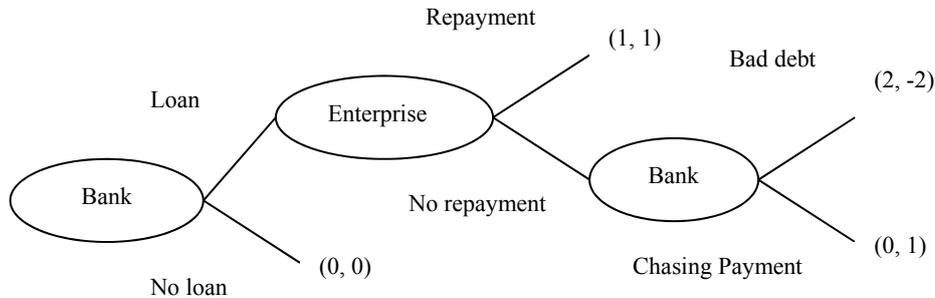
Figure 1   A Dynamic Game Model Between Banks and Enterprises under Perfect Information
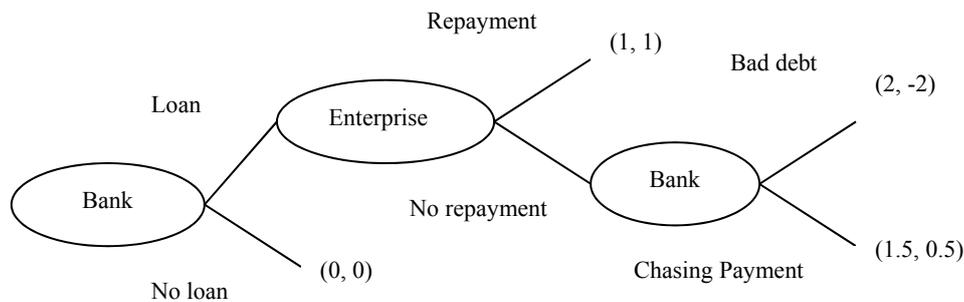
Figure 2   A Dynamic Game Model Between Banks and Enterprises under Imperfect Information

After enterprises decide whether to breach, the banks determine to the verification of enterprise (Liu Weiqi, Gao Chao, 2006). If SMEs defaults, the banks face two behavior sets: the banks take action to recover money, or tolerate and bear the bad debt losses. The bank efforts to verify is the assumption that the transaction costs for the recovery section is 0.5, the total income of the bank to recover compensation is 0.5. Due to the low impact of judicial efficiency, we assuming that businesses can use a gain of 1.5 during the loan recovery section, equilibrium occurs at this time of the game change, the companies are more inclined to default. So in order to reduce losses, the banks will take less credit or no credit policy. Which is an imperfect information dynamic game between the bank and corporate. As shown in fugure 2.

3 Design of Interests of Game "Win-Win" Model

The results of the banks and enterprise in the game are facing the conflict of interest and asymmetric information environment. How does the client design for the principal and the agent is favorable "optimal contract"? Supply chain finance is the best platform designed to achieve this optimal contract, and it is also a "win-win" choice of bank-enterprise. Among them, the risk-sharing contract makes the profit of the supply chain achieve the profits level of centralized decision-making of supply chain, to achieve a Pareto improvement of supply chain systems (Peng Hongjun, Zhou Meihua, Liu Manzhi, 2013). When SMEs apply for loans from the banks and other financial institutions, there has formed a process of dynamic game between them. Throughout the game, the strategic space of SMEs, including compliance and breach of contract, depend on the probability of the bank loans, loan conditions and profit of SMEs default; the strategic space of bank, including bank loans and no credit,

depend on the risk probability of SME performance. By use the game theory to analyze the banks and SMEs to find their optimal choice, the key is to find the existence of Bayesian Nash Equilibrium and its condition. As shown in Table 1.

Table 1   Payment Matrix of Banks and SMEs

Strategic space		Bank	
		Loan （β）	Non loan （1-β）
Enterprise	Compliance （α）	$(R-r, r-C_2)$	$(-R, -r)$
	Breach of contract （1-α）	$(R+C_1-M(\theta), B-A-C_2-C_3-r)$	$(-R-C_1, -r)$

Expected benefits are calculated according to the banks and SMEs payoff matrix, the gain model as follows (Ma Jia, 2008):

$$E_1^{pay} = \beta[\alpha(r-C_2)+(1-\alpha)(B-A-C_2-C_3-r)]+(1-\beta)[\alpha(-r)+(1-\alpha)(-r)] \qquad (1)$$

Here: α expresses the probability of compliance for SMEs;

β represents the probability of bank loans;

$M(\theta)$ represents the continuous increasing function of punishment when SMEs in default;

R is the operating profit of SMEs, A is the principle of loans. And r is the interest of loans.

C_1 is the operating loss for the performance, C_2 is the cost of information for the bank to acquaintance SMEs operating status and C_3 is the transaction costs to recover the loan, B represents the recovery income.

The formula of β （1）derivative to：

$$\frac{\partial E_1^{pay}}{\partial \beta} = \alpha(r-C_2)+(1-\alpha)(B-A-C_2-C_3-r)+[\alpha r+(1-\alpha)r]$$

$$= \alpha(2r+A+C_3-B)+(B-A-C_2-C_3) \qquad (2)$$

Set $\frac{\partial E_1^{pay}}{\partial \beta}=0$，so ：

$$\alpha = \frac{B-A-C_2-C_3}{B-A-C_3-2r} \qquad (3)$$

$$1-\alpha = \frac{C_2-2r}{B-A-C_3-2r} \qquad (4)$$

In the same way, so:

$$\beta = \frac{C_1}{r+2C_1-M(\theta)} \qquad (5)$$

Equation (4) is a Bayesian Nash equilibrium conditions for SMEs, it is a reflection function that represents the default probability of SMEs when the banks gain the maximum expected return. In supply chain finance model, with the cost C_2 of obtain information be reduced, the banks also reduce the cost C_3. But the bank improved the property to recover money income by controlling in order to make the probability of default of SMEs reduced; Equation (5) is Bayesian Nash equilibrium conditions of the banks, it is a reflection on SMEs gain function or a probability of bank loans. With the increase of penalty function $M(\theta)$, that is, once the SME defaults, counter-guarantees for SMEs bear the risk of loss associated supply chain core enterprise or third-party logistics companies will penalize them, SMEs are forced to reduce the default behavior for the cost of default risk increases, then the banks will increase the probability of lending, and will give greater credit support to those SMEs.

For problems about cash flow at different stages and differences in various aspects of financing risks, the supply chain finance offers different business models for SMEs to meet the reality needs about personalized funds in order to achieve supply chain finance parties "win-win" goals (Yan Guangle, 2011). Specifically includes the following aspects: Firstly, the material procurement is using the prepayment financing model to delay payments of suppliers, and reduce the cash flow gap for SMEs; Secondly, the business operations are

using the stock pledge financing models to compensate for the cash gap that led by unsmooth circulation of cash flow; Thirdly, the products sale is using accounts receivable financing model to ease the cash flow shortfall arising from loan recovery cycle. As shown in figure 3.
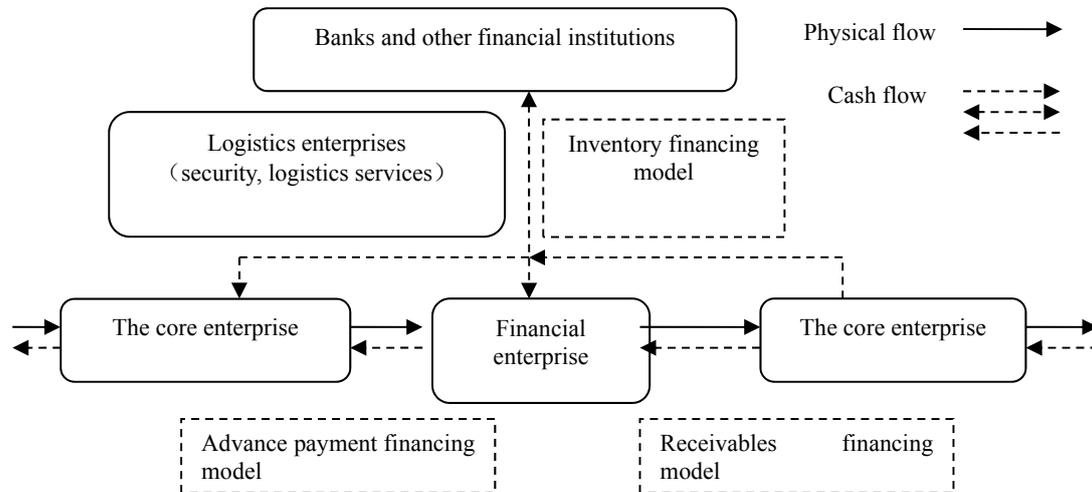
Figure 3   "Win-Win" Model of Supply Chain Finance

4 Conclusions

Supply chain financing model combine the different product innovation, and build diversified financing platform for SMEs in the supply chain to accommodate different financing needs based on the different development and corporate business sectors. Supply chain finance has broken the traditional single bank and corporate credit relationship, based on the whole industry chain credit. It concerns the entire supply chain and core business reputation and ability dynamic working conditions. And it takes the joint guarantees, inventory mortgage, credit enhancement and other ways to provide diversified and personalized financial services. It makes an inventory of the supply chain precipitation assets, strengthen the supply chain partnership, especially logistics enterprises involved in the expanded size of SME financing, reduce the bank's credit risk, enhance the logistics value-added service level, so as to achieve the win-win situation finally.

Acknowledgement

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Enterprise Knowledge Collaboration for Decision Making Based on Cloud Big Data Using HDFS

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Abstract: Knowledge collaboration can accelerate the understanding of market situation of a specific time frame. Enterprise knowledge sharing and mining are often used to discover the hidden information in huge unorganized data of different enterprise company. In this paper, we mainly propose a framework to share the unorganized data and to get a better understanding of importance of different factors. Our model also provides a method to handle huge scattered raw data of different enterprise to generate a structured knowledge for better decision making using hadoop map reduce framework.
Key words: Knowledge management; Knowledge collaboration cloud big data; Decision making

1 Introduction

To handle a large number of critical real-world problems, big data analysis has become increasingly popular. There are many issues arising in big data. They are Management issues, Processing Issues (Changqing,,2012) security issues, and storage issues each issue has its own task of surviving in big data and mainly focusing on security issues. Effective and efficient solutions for many enterprises driven problems require joint collaboration for knowledge management and faster computational methods. Knowledge collaboration's main focus reflected in two aspects: knowledge innovation and interactive knowledge sharing (Cao Yanling,2013). The theory and method of knowledge management and the synergetic theory are a basic theory of knowledge collaboration. Cloud storage is becoming a popular business tool; e.g. Amazon S3, Elephant-Drive, Giga-spaces, etc. Small companies that offer large internet program can avoid large infrastructure expenditures. Business and individual's applications are moving to the cloud because it is accessible from different devices and stored in clouds are reliable in modern technology (H. Ahmed, M. A. Ismail, and M. F. Hyder,2014).

In this paper we use hadoop distributed file system and rough set theory to demonstrate the mutual correlation over the factors of different enterprise business on huge big data. Over the years Rough Set Theory has become a valuable tool in the resolution of various problems, such as: representation of uncertain or imprecise knowledge; knowledge analysis; evaluation of quality, identification and evaluation of date dependency.

2 Data and Methodology
2.1 Information collaboration
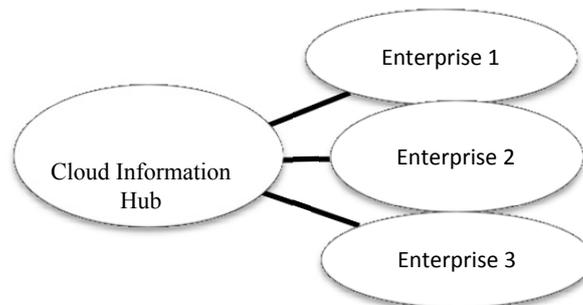
Figure 1　Enterprise Cloud Collaboration Hub

By sharing the current market situation and different factors information companies and different parts of one single enterprise can easily understand the current situation of a market. This framework can also share the correlation between the important factors which surely influence the market situation. Each enterprise that are agreed to share data they can collaborate by mutual agreement the exchange information in a common hub, shown in Figure 1.

2.2 Methodology

In our proposed system, shown in Figure 2 different enterprises jointly share the current organizational and market information in cloud using mutual collaboration. Here Hadoop distributed file system. There are mainly map & reduce module handle all the data in parallel way.
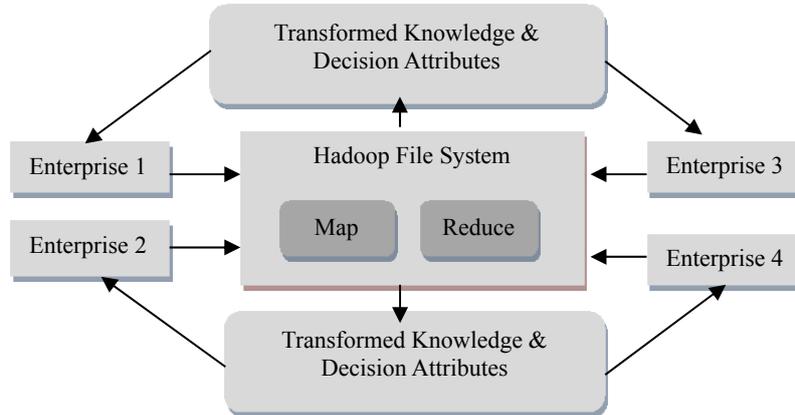
Figure 2   Knowledge Cloud Collaboration Hub

Map function organize the raw data in such a fashion that it can fit in the context, it's also generate the sorted raw data using specific rules. Reduce function is worked for generate the knowledge from the data. All conversion technique and knowledge generation rules are implemented in reduce function.

Apache Hadoop is an open source software framework created by Doug cutting and Michael J. Cafarella .The Hadoop Distributed File System has been widely adopted to build cloud storage systems (Aye Chan Ko ,Wint Thida Zaw,2014), shown in Figure 3. It provides reliable storage and high throughput access to large-scale data by Map/Reduce parallel applications, shown in Figure 4.
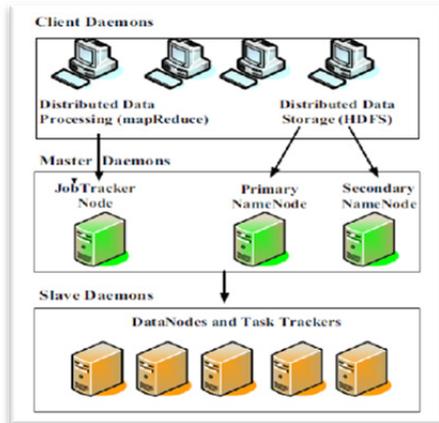
Figure 3   Apache Hadoop Master Slave Operation Structure.
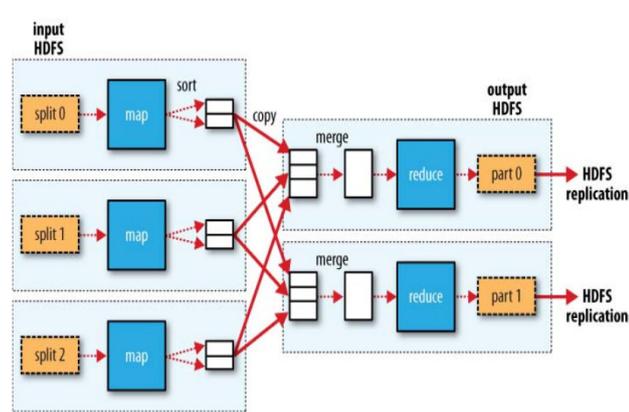
Figure 4   Hadoop Distributed File System Knowledge Collaboration & Generation Framework

2.3 Knowledge generation rule

The collaborated information is shared as a matrix or other format to hub, hub is generally the hadoop file system where map reduce organize the raw data and create knowledge. Raw data is submitted as a decision table format.

A decision table is defined as S= (U, C, D, f) Where U is the domain. A=C∪D is the attribute set, among which C is the condition attribute set and   is the decision attribute set, at the same time, C∩D=φ.

V=α∈UV α is the set of attribute values. f: U×(C∪D)→V is a function, which gives attribute a value(Z. Pawlak,1982).

From the decision table by the help of discernibility relation and function of calculating the significance we can calculate the correlation among the different factors and significance of attributes. The significance function, relations describe bellow in equation 1, 2, 3(Z. Pawlak ,1991,1998).

For decision table S=U, C, D, f, attribute subset P⊆ (C∪D) determines a relation in the following way:

$$\text{IND } (P) = \{(x, y) \in U \times U | \forall a \in P, f(x, a) = f(y, a)\} \tag{1}$$

The significance of attribute a, a∈C, is defined by

$$\text{Sig } (a) = \frac{|POS\{a\}(Q)|}{|U|} \tag{2}$$

Where Q⊆D, U is the domain.
The dependency of attributes P, P⊆C, is defined by

$$\gamma (P, Q) = \frac{|POS\{P\}(Q)|}{|U|} \tag{3}$$

Where Q⊆D, U is the domain.

3 Hypothetical Example

In this part we will describe the hypothetical explanation of our framework.

The reduction can serve in each enterprise processor framework then they will send the reduction result to information hub to share and combined with other enterprise's reduction result. Eventually this process can be done both ways in local processor HDFS or cloud HDFS. It depends on the agreement among the enterprise what they want to share data or the reduction result/Knowledge with knowledge rule set.

Each enterprise share raw data, shown in table 1 in HDFS hub, where 'u' is the entity and 'a' is the attributes. Attributes represents different factors of an enterprise.

From table 1 the raw data converted into indiscernibility matrix using equation 1 shown in Table 2.

Table 1　Information System

U	a1	a2	a3	a4
x1	2	2	0	1
x2	1	2	0	0
x3	1	0	1	1
x4	1	2	1	1
x5	1	0	1	1

Table 2　Indiscernibility Matrix

	x1	x2	x3	x4	x5
x1		a1a4	a1a2a3	a1a3	a1a2a3
x2	a1a4		a2a3a4	a3a4	a2a3a4
x3	a1a2a3	a2a3a4		a2	
x4	a1a3	a3a4	a2		a2
x5	a1a2a3	a2a3a4		a2	

From the discernibility matrix at first we combine all the attributes as a pair of multiple attributes, and then using the function of significance (F_s) we can calculate the significance of the attributes. Basically this part worked in the HDFS file system.

Inside the reduce function all knowledge generation process are done using rough set theory. The example is shown below.

Equation Solving

F_s(a1, a2, a3, a4)=a2(a1 a3)(a1 a4)(a3 a4)(a1 a2 a3)(a1 a2 a5)(a2 a3 a4)
=(a1 a2 a3)(a1 a2 a4)(a2 a3 a4)

Significance Measuring

A1=1/2 + 1/3 + 1/2 + 1/3+1/2 + 1/2+ 1/3
A2=1/3+1/3+1/3+1/3+1/3+1/3+1+1+1/3+1/3+1

A3=1/3+1/2+1/3+1/2+1/3+1/3+1/3+1/2+1/2+1/3+1/3+1/3
A4=1/2+1/2+1/3+1/2+1/3+1/3+1/2+1/4

After that we solve the equation and get the pairs of multiple attributes and the correlation among the attributes. If we go through by different reduction phase, we can find

1) Reduction 1
F_s(a1, a2, a3, a4)
= (a1 a2 a3) (a1 a2 a4) (a2 a3 a4)

2) Reduction 2
F_s(a1, a2, a3, a4)
= (a1 a2 a4) (a2 a3 a4)

3) Reduction 3
F_s(a1, a2, a3, a4)
= (a1 a2 a3) (a1 a2 a4)

After going through different reduction phase for knowledge generation by rough set theory, we can see a2 has most significant occurrence so a2 is the core attribute and (a1,a2,a4) has strong correlation between them .

4 Conclusions

With the arriving of the knowledge economy era, the growth of modern economic increasingly depends on the increase of knowledge content, in modern society, the creation value of knowledge has been much higher than human, physical, financial and he wants to survive and the core competence firstly depends on knowledge rather than the products (Jiang Cuiqing, et al,2007).So if different enterprise or companies can jointly collaborate and share information it's much easier to get better solution and understanding of the specific situation.

The performance of enterprise knowledge collaboration management is directly related to the efficiency of collaboration process. Knowledge collaboration by sharing the information also required fast transformation of the big data into structure knowledge. The cloud big data can easily handle by Hadoop distributed file system; also can process the raw data into important knowledge for understanding and decision making.

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Evaluation Index System of Civil Air Traffic Management Service Satisfaction in China

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Abstracts: The quality of air traffic management is of essential in aviation safety and operational efficiency. The paper proposes the evaluation index system of civil air traffic management service satisfaction, which includes five factors of command and control service, Communication, navigation, and surveillance service, aeronautical meteorology service, and aeronautical information service. The paper takes an ATM bureau from North China as an example. The analysis results suggest that the service quality of civil air traffic management still needs to be improved. ATM managers can utilize the evaluation model to estimate the current situation of the air traffic management. The evaluation model can also to be guidance for managers to develop the operational mechanism.
Key words: Air traffic control systems; Service satisfaction; Evaluation index system

1 Introduction

The quality of air traffic management is of essential in civil aviation safety and operational efficiency (Zhou, 2014; Gawade, 2015). Air traffic control services require communication between pilots and air traffic controllers at every stage of flight (Cavcar & Cinar, 2011, Wu et. al., 2002). Some researchers utilize the quantitative method to examine and compare the quality of air traffic control services. Essner (Essner, 2007) uses the SERVQUAL model to analysis the service quality of air traffic control. Campello et. al. (Campello et. al., 2010) proposes that the development of ATM service quality leads to the satisfaction lift. However, the literatures about the air traffic management service are seldom, and the evaluation methods are simple.

Therefore, the paper aims to develop the evaluation index system of air traffic management service satisfaction. It develops the evaluation model to estimate the service quality of air traffic management. A case of an ATM bureau from North China is carried out to test the efficiency of the proposed model.

2 ATC Service Satisfaction Evaluation Index System

1) Evaluation model and evaluation method

The main services of ATC contain command and control service, command and control service, Communication, navigation, and surveillance service, aeronautical meteorology service, and aeronautical information service (Pasquini & Pozzi, 2005; Chakrabarti, et.al, 2009; Zellweger & Donohue, 2015). There are 31 indices in the evaluation index system. The evaluation indices are as follow in Table 1.

Table 1　ATC Service Satisfaction Evaluation Indices Framework

Level Ⅰ	Level Ⅱ	Level Ⅲ
ATC service satisfaction	Command and control service (CC)	Service awareness; service attitude; command rationality; command initiative; radio standard language; command capacity; ability to assist with special circumstances; ATIS service; DCL; ATC clearance; ground control; tower control; approach control; area control; route flight routes; approach and departure flight; familiar with aircraft performance; telegram received; service agent.
	Communication, navigation, and surveillance service (CNS)	VHF communication quality; ILS signal quality; ATIS signal quality; DCL transmission quality; VOR navigation quality.
	Aeronautical meteorology service (AM)	Timely and accurate of Meteorological data; accuracy of airport alert.
	Aeronautical information service (AI)	Data validity; NOTAM distribution; explanation of intelligence information.

The evaluation criteria are divided into three levels, "satisfaction", "ordinary" and "dissatisfied". The evaluation formula is as follow.

Let:

$$x_1 = the\ score\ of\ choosing\ \text{"dissatisfied"} = 1$$
$$x_2 = the\ score\ of\ choosing\ \text{"ordinary"} = 2$$
$$x_3 = the\ score\ of\ choosing\ \text{"satisfaction"} = 3$$

Then set the formula (1):

$$f(y) = satisfaction\ degree = \frac{x_3 \times n_3}{\sum_{i=1}^{3} x_i \times n_i}, i = \{1,2,3\} \qquad (1)$$

2) Questionnaires subjects and objects

The object of the survey is an ATM bureau from North China (N ATM bureau). The survey questionnaires were distributed to the pilots from the two airlines in China. One airline is a state-owned enterprise; the other airline is a private enterprise. They are both located in Beijing. Each airline gets 100 questionnaires to be asked. The questionnaires were withdrawn, with 164 as valid data.

3 Overall Service Satisfaction Analysis Results

The overall service satisfaction refers to the five factors of the evaluation model. The indices results are from the three airlines shown in the Figure 1. as shows.
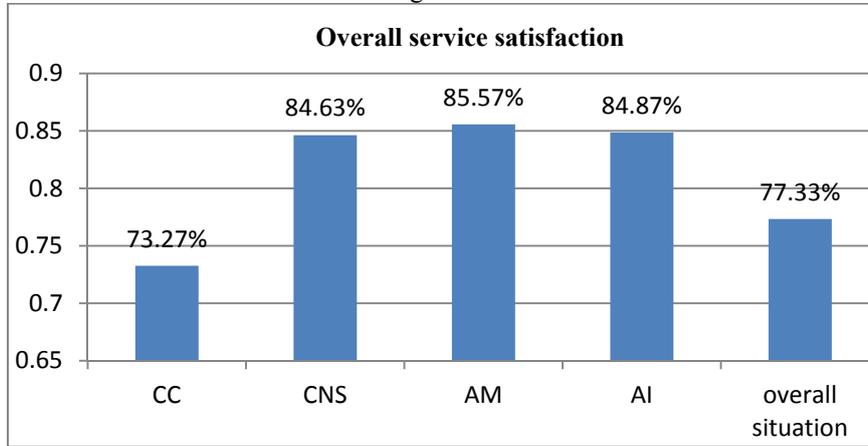
Figure 1   Overall Service Satisfaction

It shows from the Figure 1. that the score of CC factor "73.27%" is the lowest among the four factors. Aeronautical meteorology service gets the highest score "85.57%". The gap between those two factors is 12.3%, which means the dissatisfaction of command and control service is very obvious comparing with other factors.
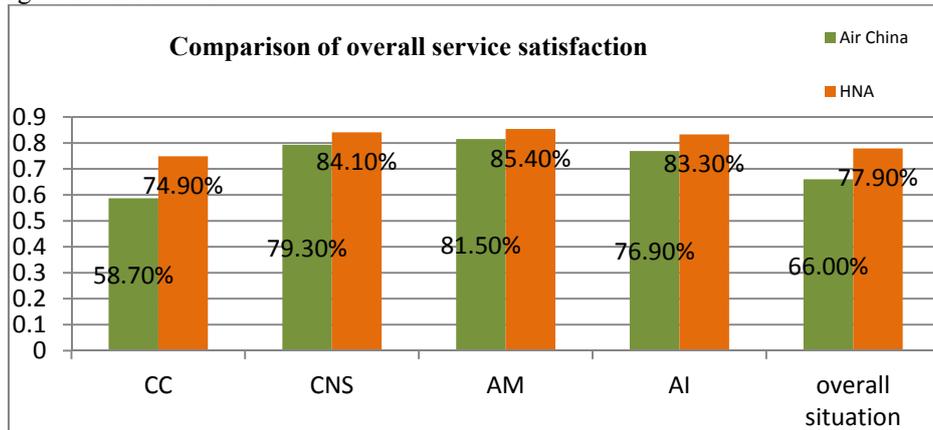
Figure 2   Comparison of Overall Service Satisfaction Between Two Enterprises

The data shows that the service satisfaction level of HNA is better than Air China from Figure 2. The lowest score in the Figure 2. is 58.7% of CC factors, which just more than one half.

4 Evaluation Indices Analysis Results

1) Index ranking result of the ATC service satisfaction

The two airlines give the index ranking of the 31evaluation indices. The result is shown in Table 2. as follows.

Table 2   The Index Ranking of ATC Service Satisfaction in N ATM Bureau

Airline	The top ten indices	Last ten indices
Air China	1. **VOR navigation quality** 2. **ATIS signal quality** 3. Timely and accurate of meteorological data 4. **ATIS service** 5. **Accuracy of airport alert** 6. **Data validity of aeronautical information** 7. **NOTAM distribution** 8. VHF communication quality 9. **DCL transmission quality** 10. ILS signal quality	1. **Familiar with aircraft performance** 2. **Command rationality** 3. **Service awareness** 4. **Command capacity** 5. **Command initiative** 6. Ground control 7. approach and departure flight 8. ATC clearance 9. **Service awareness** 10. **Approach control**
HNA	1. **ATIS signal quality** 2. **Timely and accurate of meteorological data** 3. **ATIS service** 4. DCL 5. **DCL transmission quality** 6. **NOTAM distribution** 7. **VOR navigation quality** 8. Telegram received 9. Accuracy of airport alert 10. VHF communication quality	1. **Command rationality** 2. **Familiar with aircraft performance** 3. **Command capacity** 4. Service agent 5. **command initiative** 6. **Service awareness** 7. **Approach control** 8. ILS signal quality 9. route flight routes 10. **service attitude**

The bold indices in the Table 2 show the common between the two airlines. During the top ten indices, "Timely and accurate of meteorological data" and "ATIS signal quality" have the highest scores, which from CNS and AM. During the last ten indices, "Familiar with aircraft performance" and "Command rationality" have the lowest scores, which from CC.

2) Service satisfaction of command and control

Service satisfaction of command and control reflects the relationship between air traffic controller and pilots. Figure 3. shows the top three indices and the last three indices. It is shown that ATIS service is the best service item among those 19 indices. The air traffic controllers do not familiar with the aircraft performance, which is the biggest obstacle factor impact the ATC service.
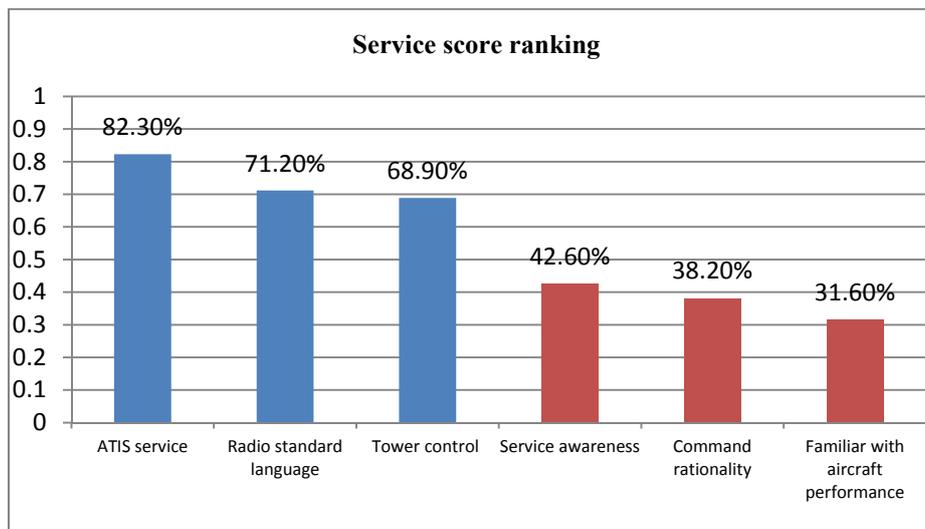
Figure 3   Score Ranking of Service Satisfaction

Area control, approach control and tower control are the three core business of ATC service. Among those three core businesses, the statistical data in Figure 4 show that there is no significant difference among the three service.
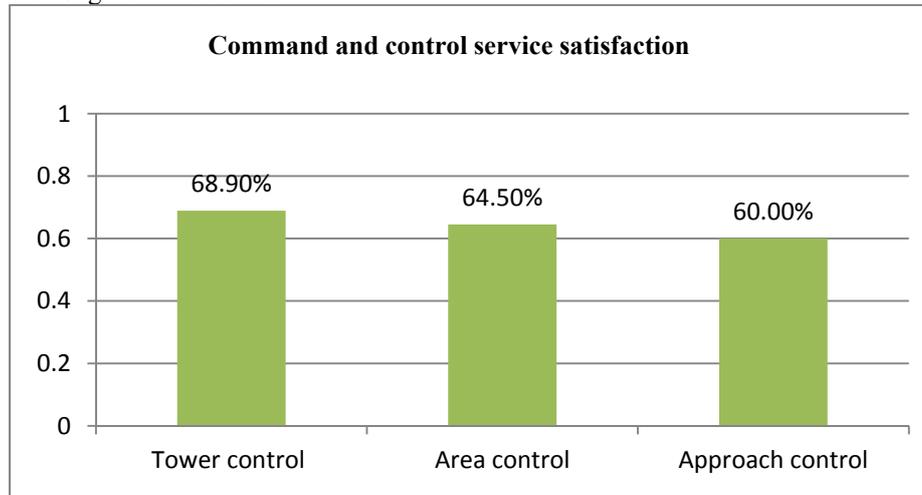
Figure 4   Score Ranking of Command and Control Service Satisfaction

5 Discussions

The paper proposes the evaluation index system of civil air traffic management service satisfaction, which makes the analysis of air traffic management service quality in China. The evaluation index system establishes 31indices from five factors. The paper takes an ATM bureau form North China as an example and did the empirical research. The analysis results obtain valuable views.

1) The overall service satisfaction need to be improved

The evaluation result of overall service satisfaction is 77.33%. The lowest data among the five factors is command and control service with 73.27%, which pulls down the overall service quality. The data shows that the ATC management service still need to be improved, especially the service quality of air traffic controllers. The main reason why the index of command and control service obtain score can be concluded as the unfamiliar with aircraft performance. Therefore, air traffic controllers and pilots should enhance the business understanding to each other in order to improve the ATC service.

2) Difference customers have difference experience

The survey results are from two difference airlines, one is a state-owned enterprise, the other is a private enterprise. It is can be shown in Figure 2 that the scores of service satisfaction evaluated by pilots from the Air China are all lower than HNA. The reason to this conclusion needs to be explored in depth.

6 Conclusion

The paper focuses on the evaluation index system of civil air traffic management service satisfaction. ATM managers can utilize the evaluation model to estimate the current situation of the air traffic management. The evaluation model can also to be guidance for managers to develop the operational mechanism.

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Impact of Firm-Bank Relationship on Dividend Policy of the Client Firm: A Study from Pakistan

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Abstract: Firms are always very curious about their dividend policy as it shows the strength of the firm's financial health and attracts or distract the investors. Many determinants in this regards are studied in the past. This research is aimed to find the link between the firm dividend policy and its banking relationships which is quite significant as this is a less addressed issue in these terms. This paper attempts to explain the firm-bank relationship and its impact on the dividend payout of the client firm. For the said cause the data of listed companies in Karachi Stock Exchange were collected from 2008 to 2013. For the bank-firm relationships, two proxies were used. A dummy variable was used for bank relations (1 if number of bank relations is more than 5 otherwise 0) and the second variable is actual number of relations a firm is maintaining with banks. We have regressed these variables among some of largely used determinants of dividend payout as control variables and found that, though the coefficients are low but both proxies taken for bank-firm relationship are significant at 5%. It concludes that the policy makers and investors may also consider this relationship for their decision making as a significant factor and also draw attention for future researches in this horizon.
Key words: Bank relationship; Multiple bank relationship; Dividend payout; Pakistan

1 Introduction

Every business commences to maximize the shareholder's wealth and the decision to pay or not to pay dividend is one of the important decision to be made by the management of the organization (Tahir, S.H., et al.,2016). The development of agency theory and the associated agency problem caused by the difference of opinion between the management and shareholders has given rise to the need for a set of rules, regulations and standards that work to protect the interests of shareholders. (Lintner, J.,1956) had come up with the findings that firms only increase dividends when management believes that earnings have permanently increased, meaning that a dividend increase implies a rightward shift in (management's perceived) distribution of earnings. Fama and Babiak (1968) had further explored the said issue. Since last few decades, a chain of empirical and theoretical studies have been done which involve three important but divergent conclusions and assertions. First, when there is increase in dividend payout, it positively affects the market value of the firm. Second, decrease in dividend affects the firm's value. And third, the firm value does affect by dividend policy of the firm. Dividend payout policy is an important corporate issue and may be closely related to, and interacts with, most of the financial and investment decisions firms make (Elmi, M.A. and W.M,2016). Miller and Modigliani (1961) introduced the residual theory of dividends based on the firm's sources and use of funds. Based on this theory, we would expect the following outcomes: firms with higher profits should pay higher dividends; firms with higher investment rates should pay lower (or zero) dividends; firms with higher future growth opportunities should build up cash for future investments and consequently make lower dividend payments; and firms facing higher debt constraints will have less financial flexibility and thus pay lower dividends (Aivazian,Booth,Cleary,2006).

Some researchers tried to explore dividend phenomenon with respect to loans & debts and come up with an argument that the firms with public debt are more likely to pay dividend as compared to the firms financed through banks or private debt (Aivazian,Booth,Cleary,2006). However, there were some limitation of the above mentioned studies as both haven't considered the relationship lending and firm-bank relationship. These few researches raise some questions about the developing markets like Pakistan as there are relatively less transparent information and weak creditor rights. In the same manner, the research should further be conducted by considering the relationship lending and firm-bank relationship as this may affect the dividend payout policy of the firm. Moreover, the consideration of the firm-bank relationship is even more important for such capital markets where the availability of public debt is out of question. This argument further intensifies the significance of our study as the main source of financing in Pakistan is banking and this become even important to study dividend payout policy with reference to firm-bank relationships.

There are numerous theories on why and when the firms pay dividends (Ahmed,Javid,2008) and it

is evident from past literature about the topic that there is vast range of the determinants for dividend policy and dividend payout. Especially in bank-based systems, the analysis of the factors shaping the relationships of banks with non-financial firms assumes a crucial importance and is receiving increasing attention among scholars, policy-makers and practitioners(Aristei,Gallo,2016)

This is widely accepted fact that the dividend payout is dependent on the firm's performance and firm profitability. Arguing so, one can extract a relation (direct or indirect) between dividend and firm-bank relationship as the structure and strength of firm–bank relationships significantly affect the external financing conditions and performance of firms (Bharath, S., et al.,2007). Accepting the importance of firm-bank relationship, a lot of researchers have opted this topic as their area of interest in order to explain its effect on firm performance and profitability (Berger,Goulding,Rice,2014). A firm may seek some benefits by developing good banking relations which can be categorized as follows:

● To Enrich business standing and lessen leakage of information to rivals (B.J. Sopranzetti,et al,2012).

● Shrinkage the damaging impact of distorted information (Thanh, V.H. and N.M. Ha,2013)

● Remedy against hold up problem (Rosenfeld, C.M.,2014)

● To moderate agency clashes linked to financial intermediation   (Cenni, S., et al.,2015)

● To increase accessibility to loans and to reduce the interest cost (Chen, Z., Y. Li, and J. Zhang,2015)

● To provide monitoring for firms(Campbell, T.S.,1979)

Above mentioned benefits will enhance the firm's standing and repute consequently improving the firm performance and profitability. This increase in performance may also cause a positive shift in dividend payout (expected). The researchers argued different types of effects on the firm's profitability and performance, so is expected about the dividend payout.

2 Methods and Data Analysis

This research is aimed to find out the impact on dividend payout of a firm by its relationship with different banks. For this purpose, we have taken the data of non-financial listed companies in Karachi Stock Exchange of Pakistan. The facts and figures are taken from the published annual reports of the listed firms. The data is ranged from 2008 to 2013.

In order to build our model we have referred to the methodology of (Bolton, P. and X. Freixas,2000) to investigate the factors of dividend payment. We extend this model to investigate impact of firm's number of bank relationships on dividend payout. For the said cause we have used other determinants of the dividend payout (Size, ROA, Leverage, Market to Book, Liquidity, Liquidity^2, and growth-rate) as control variables for our study.

1) Size: Previous studies shows large companies pay more dividend as cited by some researchers that the large and mature firms are more likely to pay more dividend than those of growing ones (Bolton, P. and D.S. Scharfstein,1996).

2) ROA – Return on Assets: Companies having higher profit pay more dividend however, some companies may not just to finance the future investments. These companies maintain a regular stream of dividends to remunerate the shareholders (Deloof, M. and V. Vermoesen,2010).

3) Leverage: Higher debt level companies anticipates higher future cash flows.

4) Market to Book: Markets are expected to identify companies that offer better present and future cash flows to shareholders.

5) Liquidity: Companies with greater liquidity even increase dividend payout levels. As it depicts the financial health of the company so the better financial health is a guarantee of high payout rate (Houston, J. and C. James,1996).

6) Liquidity2: however a negative sign is expected as the companies may reach this through dividend restriction or a threshold to restrict dividend payments (Houston, J. and C. James,1996).

7) Growth-rate: literature shows that the firms with high growth rates are subject to reduce their dividend payout in order to finance their investments (Bolton, P. and X. Freixas,2000). Investment or growth rate of firm fixed assets is taken as the measurement. Several investments required to retain profits to finance investments.

From the past literature and considering the important variables for our study, we have come up with the following mathematical form of our model to be regressed:

$$div/tasset = \alpha + NBR + MBR + Size + ROA + Lev + MV/BV + Liq + Liq2 + Growth + \varepsilon$$

TABLE 1   Regression Analysis

Variable	Expected Sign	Coefficient	P>t
NBR	-	0.000616	0.03
MBR	-	-0.000738	0.01
SIZE	+	-0.000920	0.424
AGE	+	-0.000925	0.10
LEVERAGE	-	-0.00243	0.0018
LIQUIDITY	+	-0.000228	0.0000
LIQUIDITY^2	+	-0.000727	0.0000
MARKET TO BOOK VALUE	+	-0.000638	0.0000
ROA	+	-0.000016	0.0000
GROWTH	-	-0.0000121	0.53

The regression was run with the panel least squares method and found that R-square is 32.2% with a probability of 0.00 for F-statistics which represents the fitness of our model. The main purpose of the paper was to establish a relationship among bank-firm relationship and the dividend payout. The above table represents the results for the regression and posits that the variables used for the cause are low in coefficient but significant at 5%. The signs for NBR and MBR are found same as expected. Liquidity, market to book value, ROA and leverage are also found significant. While the size and age of the firm, which were expected to impact dividend payout positively, are not significant for our research.

3 Conclusions

The research is conducted in the context of Pakistan and for the purpose listed firms are taken as population. The results show that the firms with more number of banking relationships appears to pay more dividend than those which are having less bank relationships which can be a result of close monitoring by fewer banks. These finding are consistent with the literature which found that the a close or single banking relationship affects the firm performance badly by extracting more rent on the invested capital and financing (Bhaumik, S.K. and J. Piesse,2008). This also implies that the management should reconsider to establish a fewer bank relationship. The decision board should avoid to maintain monopolistic relationship with banks in order to safeguard the interest of the shareholders. Some of our findings are quite different as compared to the previous literature that may be an effect of negative returns for the study period (as most firms reported losses). Future studies can be conducted in this regard by extending the time period of the study and involving some other variables for bank-firm relationship. Moreover, the future researches may also attempt to find out the behavior of such relationships before and after global financial crises.

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Dark Side of Leadership Impact on Project Failure: Towards a Model

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Abstract: This paper examines dark personality traits of leaders in the context of entrepreneurs and proposes a conceptual framework for a future study. Based on the personality characteristics identified using Hogan Development survey, the influence of personality traits is hypothesized on employee well-being and consecutively on project failure. The study suggests a negative relationship between personality traits of leaders and psychological well-being of employees and work-family conflict. Furthermore, according to the developed concept a negative impact of work-life conflict and psychological well-being of employees under the supervision of entrepreneurs with negative personality, on business and project failure exists. Most of the studies in this area focused on identifying the positive sides of leaders, limiting the discussion on negative sides of leaders. The originality of this paper can be described in the context of research on entrepreneurs, whose negative traits are linked towards business and project failure. This paper contributes to the leadership literature by identifying the critical importance of negative sides of personality traits and presenting the link towards project failure.
Key words: Dark side of leadership; Negative traits of leaders; Entrepreneurs' personality; Employee wellbeing; Project failure

1 Introduction

When it comes to related work in corporations' people are divided into the manager functions, executors, office staff, followers, etc. A most scarce and cherished role in such context may be the one of an entrepreneur - a business creator and innovator. Modern entrepreneur is described as an ingenious leader changing the society with own innovative ideas.   Steve Jobs, Jeff Bezos, Mark Zuckerberg, Jack Ma are only a few examples of successful entrepreneurs who have translated their vision and values into their project through effective leadership. Leadership is a component that may be naturally inherent in an entrepreneur. Who is better qualified to lead a company than its creator, putting their "blood sweat and tears" into a project? Nevertheless, the questions still stand: Are entrepreneurs, in fact, good leaders? The entrepreneur exhibits dispositional optimism, indicating that entrepreneurs score particularly high on measures of this personal characteristic (e.g., Abdelsamad & Kindling, 1978; Fraser & Greene, 2006; Lowe & Ziedonis, 2006). For example, Cooper, Woo, and Dunkelberg (1988) found that entrepreneurs express high levels of optimism, regardless how prepared they are to lead their firms. Driven and narcissistic is described as a personality that drives a particular type of leadership impacting the work environment and psychological health of the workers. In this regard, it can be mentioned that although entrepreneurship skills can be acquired in academic environment, most of the skills are practiced and developed in real life business/project cases (Sejjaka, S. *et al,* 2015). In this study, a link between entrepreneurship and leadership will be explored. The research will present the leadership characteristics entrepreneurs possess, and whether these features are inherent in entrepreneurs, stemming from their nature and personality, or they are cultivated and grown by individual experiences. The focus of the study is entrepreneur's failure, as a result of their leadership skills, which may or may not be inherent in their nature.

2 Literature Review and Proposed Conceptual Framework

Most of the studies conducted in the area of leadership utilized one-sided approach by focusing only on the positive sides of leadership and not paying enough attention to negative sides of leadership (Hogan and Kaiser, 2015). The downside of leadership known as destructive leadership was mainly tailored to the aggressive character (Ganster & Kepes, 2007). Moreover, psychopathic traits of leaders are also related to destructive nature of leaders (Hogan & Hogan, 2001). Hogan (2001) mentioned that when leaders feel selfish, emotional, aggressive and intensive, they are less likely to make right decisions which will negatively impact on daily operations of the business. The personality trait of leaders is one of the most widely discussed topics in management research. Although it has been debated for such long time, characteristics relative importance has considerably decreased in recent years. The number of conceptual frameworks proposed in this area lacks originality as well. The study conducted by Judge, Picollo, Kosalka (2009) the notion of leader's trait perspective based on

evolutionary psychology and behavioral genetics. The model takes into account source of leader traits, mediators and moderators of their influence on the effectiveness of leadership and differentiates the effectiveness of perceived and actual leadership. In other words, positive sides of leadership are considered as well as its negative aspects. In this regard, the paper considered the Big Five traits, core self-evaluations, intelligence and charisma. Additionally, "dark side" leader traits including narcissism, hubris, dominance and Machiavellianism are conceptualized.

According to the framework developed by Judge, Picollo, and Kosalka (2009) objective leader effectiveness constituting of perceived effectiveness, rated performance, and follower attitudes, and subjective leader effectiveness, encompassing aggregated individual performance, collective unit performance, and group survival, is directly impacted by emergence (perceived as leader like, peer nominations) and actual (occupies leadership position; behavioral position).The framework also suggests that genetics and selection process both are a cause of personality trait development. They also interact to generate certain personality traits. Certain features are more inherent in humans' biology and genetics such as big five, whereas other are more socially conditioned. In other words, they are a product of SNPs 'interaction with Natural Selection and Sexual Selection. In a meta-analysis performed by Schyns, Birgit, and Jan Schilling (2013) different conceptualizations of destructive leadership and relationship between destructive leadership and outcome variables are analyzed. These concepts include the leader related concept, job related concept, organizational related concept, and individual follower related concepts. Based on the preliminary critical review of existing studies a research model was constructed linking personal traits and certain workplace and organizational outcomes. The research proposes the relationship between dark side of leadership and factors explaining employee well-being
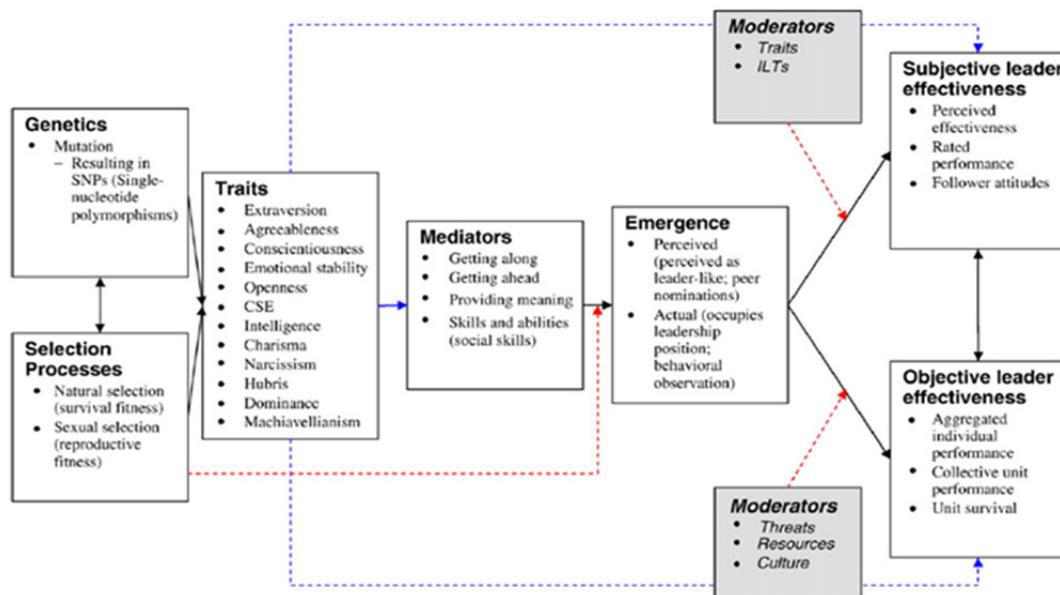
Source: Judge, Picollo, and Kosalka (2009)
Figure 1   The Leader Trait Emergence Effectiveness (LTEE) Model

(Notes.CSE= core self-evaluations. ILTs=implicit leadership theories. Blue lines represent direct effects of leader traits on mediators and subjective and objective outcomes. Red lines represent moderating influences).

Following propositions are derived from review of literature:

Proposition 1 - Certain negative sides of leadership traits identified within Hogan Development Survey are positively related to the psychological well-being of an employee, which will, in turn, lead to business failure.

Proposition 2 - Certain negative sides of leadership traits identified within Hogan Development Survey are positively related to work-family conflict,

Proposition 3 – As a result of negative sides of leaders, employee well-being is positively related to project failure
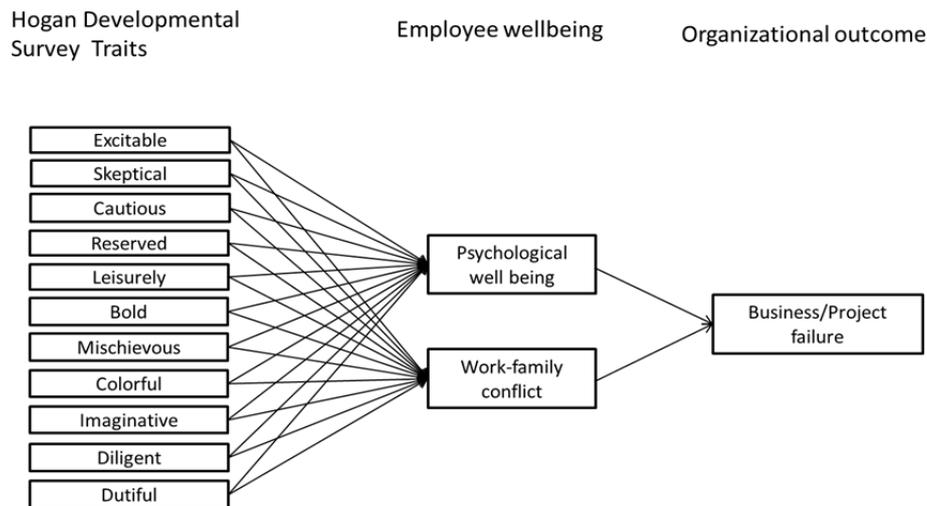
Figure 2   Research Model

3 Proposed Research Methodology for a Future Study

The research question is "Why projects fail and whether the entrepreneur's dark side of leadership is the primary cause?" For the purpose of answering the research questionan explanatory study is required. The study will shed more light on how the negative characteristics of entrepreneurs/leaders impact organizational climate and performance. Based on the analysis of the literature review, we found significant areas for research which should be studied in more detail. For example, no research has investigated the dark sides of entrepreneur's traits and their consecutive influence on employee performance and direct relationship to company performance. Therefore, using Hogan Development survey in different studies, our study will assess the influence of the dark sides of leaders on psychological well-being and work-family conflict. Consecutive influence of entrepreneurship characteristics will be analyzedregarding their influence on company performance.   The questionnaire will be administered online via Survey Monkey tool. www.surveymonkey.com.Questionnaire items are formulated based on a 7point Likert scale questions, with one denoting strongly disagree to 7 strongly agree. SPSS AMOS software will be used for data analysis. GHQ-12 (The General Health Questionnaire 12) consists of a 12-item measure used to identify the symptoms of non-psychotic psychiatric disorders (GHQ-12; Goldberg &Williams, 1991). Having been conducted among employees, the current questionnaire has provided excellent scores of reliability and validity.   To test the influence of work on family life, five items related to thefamily-work conflict were adapted from previous literature on the similar topic. The design of HDS provides information about eleven behavioral traits that lead to success. The scales used in the model are explained regarding risk. Precisely, if aperson receives ahigher score in this category, it will increase the potential of problems on the work, which should be compensated later.

• Excitable - moody, easily annoyed, hard to please, and emotionally volatile
• Skeptical - distrustful, cynical, sensitive to criticism, and focused on the negative
• Cautious - unassertive, resistant to change, risk-averse, and slow to make decisions
• Reserved-aloof, indifferent to the feelings of others, and uncommunicative
• Leisurely-overtly cooperative, but privately irritable, stubborn, and uncooperative
• Bold - overly confident, arrogant, with inflated feelings of self-worth
• Mischievous - charming, risk-taking, limit-testing and excitement-seeking
• Colorful - dramatic, attention-seeking, interruptive, and poor listening skills
• Imaginative - creative, but thinking and acting in unusual or eccentric ways
• Diligent - meticulous, precise, hard to please, and tends to micromanage
• Dutiful-eager to please and reluctant to act independently or against popular opinion

4 Expected Results and Discussion

This study provides information about different personality traits of leaders according to Hogan Development Survey and identifies those factors which are used to describe the negative side of entrepreneurs. Based on the identified personality traits, their relative importance will be analyzed

regarding their impact on business/project failure. To lead the company as a business manager, the person should have certain abilities, which can be developed and learned. First of all, the manager should have knowledge and experience in the field in which the company operates. It is almost impossible to manage the business by being "blind" and without knowing the situation on the market, competitors, and demands of customers. Hence, the theoretical and practical basis can form the person as a good leader.　In this respective, this study provides some insights what entrepreneur traits should pay be attention in order to improve project performance. This study provides practical implications for business managers and executives. Some of the identified personality traits should be accurately controlledto prevent their negative impact on employee well-being. On the other hand, the extent of these characteristics and their relative importance will be identified within the study which gives an overall picture of personality traits to business managers. The findings of the planned future study will provide some useful insights to top executives to increase employee well-being and improve work atmosphere will directly influence on their business success. The future research can also include analyses of important demographic characteristics such as comparison of males and female manager's dark personality (Arami, M, 2016).

5 Conclusions

Despite number of studies conducted in the field of leadership (Hogan and Hogan, 2001; Gangster and Kepes, 2015) and their significant importance in organization in terms of making strategic decisions, empowering employees and maximizing the efficiency of day to day operations, less attention has been paid to investigate the dark sides of leadership which is also critical point that may influence on the short and as well as long run operations of the company. Negative sides of leaders may influence on firm operations through employees who are critical success factor of the project. Therefore, to shed more light on the negative side of leadership, the current study proposes the framework to analyze the relationship between the negative side of personality traits and project failure.

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Performance Analysis of Microfinance Institutions in TOGO

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Abstract: Performance analysis as a source of information on how good or bad an organization is operating, is quite important for microfinance institutions who want to achieve sustainability. Diverse methods have been used to measure and analyze performance of Microfinance institutions in previous works around the world. This paper focuses on analyzing the performance of a sample of Microfinance institutions in Togo by comparing their performance to that of other institutions in Africa. 12 MFIs were chosen for the study and the difference of means test was selected for the analysis which consisted in comparing 22 performance ratios to the Micro Banking Bulletin Africa performance Benchmark ratios of 2010. Available data was collected from the MIXMARKET website based on these institutions reports from 2007 to 2010. Our study found that, compared to their African peers, Togolese MFIs are better performers in terms of expenses, efficiency and revenues; not doing well when it comes to productivity; and are quite bad performers at managing risks.
Key words: Microfinance; Togo; Performance analysis; Benchmark

1 Introduction

Poverty, defined as - "a general scarcity, dearth, or the state of one who lacks a certain amount of material possessions or money"[1] - was once behind the "poor's" non-access to formal financial services. In an attempt to fight poverty, help the poor and remedy to this exclusion from having access to financial service, emerged the concepts of Microcredit and Microfinance. These two concepts are interchangeably used but are in fact quite different as microcredit (which includes credit activities only) is a service provided in microfinance (which also includes savings, money transactions, insurance and other banking opportunities). Microfinance can then be simply defined as offering poor people access to basic financial services (CGAP, 2001).

The microfinance industry has grown rapidly during the last decade in breadth, depth, and scope of outreach and has, as matter of fact, recently attracted much attention. From their growth through their mission drift and performance, to their profitability and sustainability; many aspects have been subject to research and studies regardless of the poverty of available data on the industry. As far as the performance aspect is concerned, The Micro Banking Bulletin (MBB) and MicroRate in conjunction with other organizations such as the CGAP, provide some benchmarking reports and tables on regional and global performance ratios. These benchmarks are a means of comparing the performance of Microfinance institutions among themselves or to others based on diverse grouping aspects.

An ideal way of helping the poor have access to financial services will be helping them have access to it permanently and in a long term. This refers to microfinance sustainability. For a microfinance institution; performance is meeting goals and sustainability is meeting goals now and in the long term (Shreiner, 1997a). Thus to effectively serve and help the poor in the long term, microfinance institutions should obviously assess and manage their performance which evidently involves measuring and analyzing it.

Measuring performance sparks better performance and casts light on bad performance (Von Pischke, 1996). The purpose of this study is to assess thus measure and analyze the performance of a sample of microfinance institutions in Togo. Numbers of similar researches have been conducted on countries in Africa and across the world but no such available previous study in our knowledge has been conducted on this industry in Togo. In fact, very few researches have been done on the Togolese microfinance industry. We assume this study has a practical significance in casting a light on the performance of the industry in Togo and helping these institutions become more sustainable in the future.

2 Conceptual Framework

As the concept of microfinance went global, a high variety of definitions have soared to illustrate it.

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[1] http://www.merriam-webster.com/dictionary/poverty

(CGAP)[1], defined Microfinance as offering poor people access to basic financial services. A broader and much detailed definition of microfinance was provided by (Robinson, 2001) who said that Microfinance refers to small-scale financial services—primarily credit and savings—provided to people who farm or fish or herd; who operate small enterprises or microenterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and groups at the local levels of developing countries, both rural and urban.

In fact, regardless of the variety of definitions and of how these definitions of Microfinance are tailored, all of them imply the same ideas of poverty alleviation and helping the poor get access to financial services.

Performance in Microfinance, as defined by (Shreiner, 1997b), is progress toward the mission of making the lives of poor people better. Good analysis uses theory with knowledge of past and present performance to suggest how to improve future performance (IADB, 1994).

In fact, performance in Microfinance has two main aspects a social aspect and a financial aspect. It's important to note that microfinance can't somehow reach their social objective and achieve sustainability without having a good financial performance and outreach. Based on this, numbers of previous researches have been conducted all focusing on the outreach and financial performance of Microfinance institutions using various methodologies. (Abbas Kheder et al., 2013) reviewed number of these existing performance measurement frameworks and assessment criteria before proposing a new performance measurement system to MFIs for assessing performance from the stakeholder perspective. (Lafourcade et al, 2005) conducted a study on the outreach and performance of Microfinance in Africa measuring the performance of the institutions using the scale depth and outreach indicators. Another study conducted by (Cull et al., 2007) shows a deeper analysis and evaluation of performance of Microfinance institutions using much more parameters. (Ledgerwood, 1999), mentioned some parameters for measuring the performance of Microfinance institutions namely: portfolio quality indicators, productivity and efficiency ratios, profitability indicators, leverage and capital adequacy ratios, Scale and depth of outreach indicators and financial viability indicators.

Another means of assessing the performance of microfinance institutions is through comparison with benchmarks. Ratios are generally more meaningful when compared with other financial profitable MFIs in the region particularly in microfinance. (Tucker Micheal, 2001) measured the financial performance of 17 Latin American microfinance institutions by comparing their financial ratios to benchmark performance ratios for the industry and with Latin American banks.   Based on his findings he concluded that Comparisons with benchmarks can inform managers and donors on to how good or bad a microfinance institution is performing. (Letenah Ejigu, 2009) conducted a similar study by analyzing the performance of a sample of microfinance institutions in Ethiopia by comparing many indicators such as capital structure, asset allocation, breadth of outreach, depth of outreach, profitability and sustainability, revenue performance, expense management, efficiency, productivity and portfolio quality to the Micro banking Bulletin's microfinance institutions' global performance benchmarking of 2007. He mentioned that the performances of the microfinance institutions don't change with the selection of the benchmark.

3 Data Collection and Methodology

There is a dearth of data on microfinance institutions and this makes research in this field quite challenging. The September 2000 Micro Banking Bulletin (Calmeadow, 2000) had data from only 114 institutions out of several thousand for his study. Not all MFIs may want to publicly reveal their financial data, particularly those that are less efficient or perhaps less capable of complying with reporting standards. Data used for this research is purely secondary data and is collected from the Mix market website (www.mixmarket.org). The Mix market is a data hub where microfinance institutions and supporting organizations share institutional data to broaden transparency and market insight. MIX Market has a deep historical dataset, tracking industry development since the 1990s and it is the most reliable platform where we can collect data on microfinance institutions from all around the world.

The challenge we faced was in choosing the test which best fits for analyzing our data. (Letenah Ejigu, 2009) while comparing the performance of a sample of microfinance institutions in Ethiopia to the global benchmark used a one sample t test. After conducting the data normality test as a pre-requisite

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[1] http://www.cgap.org/p/site/c/template.rc/1.26.1302/

for the t test, he found that normality assumption was not met and even after Ln transformations for some variables were not normally distributed thus they had to be ignored in the analysis.

As an alternative to a one sample t test, (Arwal and Sinha, 2010) and (Cletus Ambe Shu & Bilge Oney, 2014) used another method to measure the performance of microfinance institutions. Arwal and Sinha measured the performance of a sample of 22 institutions in India based on the data of the year 2008. Cletus Ambe Shu & Bilge Oney measured the performance of six institutions in Cameroon based on the available data from 2007 to 2009. This method consisted in using descriptive statistics procedure to assess the performance considering six financial performance parameters selected from the reporting format of the Mix Market Namely Financial Structure, Revenue, Expenses, Efficiency, Productivity and Risk. Even though this procedure is not as focused on hypothesis testing as a t test, it provides a lot of useful information to conduct a difference of means test. They both used a difference of means test to compare each ratio to a benchmark using a 95% confidence interval. We shall use the same methodology and apply it to analyze the performance of a sample of 12 MFIs in TOGO (CECA, FAMER MICROFINANCE, FECECAV, FUCEC Togo, MGPCC DEKAWOWO, MICROFUND, Mutuelle Akwaba, TIMPAC, UCECTO, UCMECF-TO, UMECTO, WAGES) based on their available data during the time period from 2007 to 2010.

4 Data Analysis and Findings

To analyze our data, we are going to conduct the difference of means test using α=0.05 and compare the ratios means to the Micro Banking Bulletin's Microfinance institutions Africa performance benchmarking of 2010.

4.1 Financing structure

Capital/ asset: p value<0.05 thus is significant. Based on this we can say that Togolese Microfinance institutions are not operating safely in their environment compared to others institutions in Africa and might not be able to meet obligations and absorb losses.

Debt to equity: There is no significant difference between this ratio and the Africa benchmark with p value greater than 0.05. This means that all institutions rely on leverage to finance their operations and expand loan portfolios and that Togolese Microfinance institutions are as well levered as their African peers but they have different proportions of debts they use to finance their assets.

Deposit to loans: No significant difference here also. P value>0.05 this can be explained by the diversity of funding sources for all institutions.

Deposits to total assets: there is a significant difference between this ratio and the Africa benchmark. We can say that Togolese Microfinance institutions have higher proportion of deposits as part of their assets compared to their African peers as illustrated in figure 1.

GLP to total assets: Significant difference here too, as P value lower than 0.00001 thus lower than 0.05.

Thus higher loan components as part of Togolese Microfinance institutions' asset compared to the other African institutions (Figure 1).

Table 1   Difference of Means Test for Financing Structure

	CAPITAL/ ASSET	DEBT/ EQUITY	DEPOSITS/ LOANS	DEPOSITS/TOTAL ASSETS	GLP/TOTAL ASSETS
Mean	11.9277143	5.456875	99.51625	60.9560606	73.0894118
Standard Error	0.05610138	1.0642612	0.137316019	0.033971361	0.045066007
Median	0.1045	6.96	0.8308	0.624	0.706
Standard Deviation	0.331900242	6.020370494	0.776776703	0.195150612	0.262777719
Sample Variance	0.110157771	36.24486089	0.603382046	0.038083761	0.06905213
Kurtosis	7.752210803	1.409624115	20.39112945	-0.241336708	16.11217966
Skewness	-1.685649622	-1.039756018	4.1171688	-0.522528702	2.942134462
Range	1.952	27.84	4.6395	0.772	1.8462
Minimum	-1.2271	-12.98	0.2036	0.1421	0.1288
Maximum	0.7249	14.86	4.8431	0.9141	1.975
Sum	4.1747	174.62	31.8452	20.1155	24.8504
Count	35	32	32	33	34
Benchmark	35.7	5.4	99.8	7.9	11.9
P value	0.000082	0.298438	0.49169	<0.00001	<0.00001

Source: Author's calculations
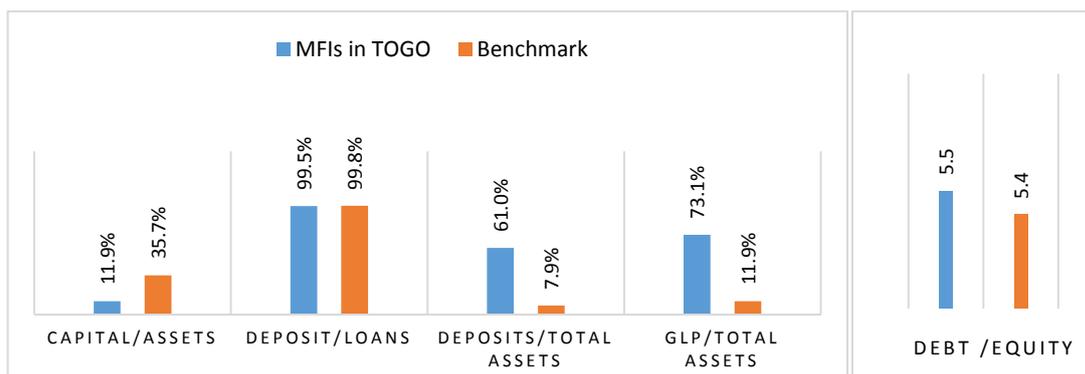
Figure 1   FinAncing structure ratios
Source: Author

4.2 Overall performance

No significant difference in terms of OSS (p value>0.05). All microfinance institutions in Africa (Togolese ones included) have achieved operational Self-sufficiency but the difference lies in the nature of operations. No significance also for the ROA and ROE which show negative returns for all the institutions (Figure 2). This must be related to differences in institutions profit status (for profit, non-profit) and to different accounting policies.

Table 2   Difference of Means Test for Overall Performance

	OSS	ROA	ROE
Mean	115.7772414	-3.6903704	-45.7877778
Standard Error	0.198777972	0.022702321	0.487231994
Median	1.0611	0.0084	0.0466
Standard Deviation	1.070452138	0.117964723	2.531731708
Sample Variance	1.145867781	0.013915676	6.409665442
Kurtosis	24.87368129	7.69725929	26.19343084
Skewness	4.791301015	-2.781633412	-5.084536978
Range	6.3597	0.5102	13.6395
Minimum	0.1744	-0.4684	-13.0406
Maximum	6.5341	0.0418	0.5989
Sum	33.5754	-0.9964	-12.3627
Count	29	27	27
Benchmark	136.2	-4.5	-127.6
P value	0.156606	0.361987	0.052566

Source: Author's calculations
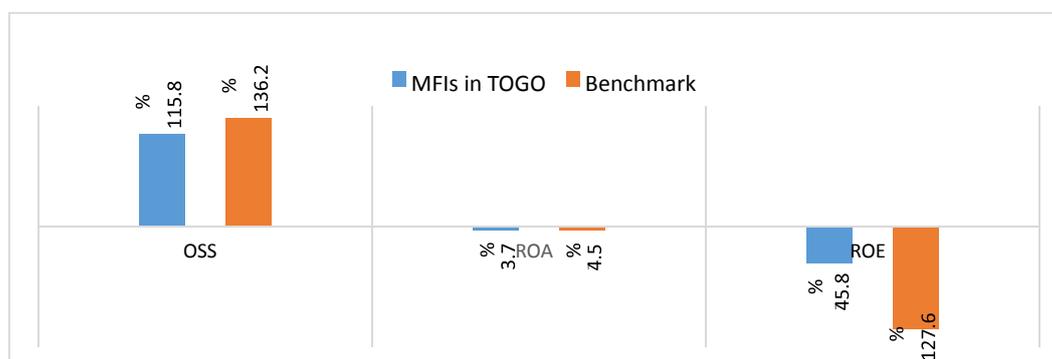
Figure 2   Overall Performance Ratios
Source: Author

4.3 Revenue

There is a significant difference in financial revenues and no significant difference in profits margin between Togolese MFIs and the African benchmark. Togolese MFIs have lower financial revenues per

assets compared to the African average (figure 3). Both Togolese institutions and their African peers have negative average profits margin thus they focus more on addressing social issues rather than making profit but they have different profit statuses.

Table 3   Difference of Means Test for Revenue

	FINANCIAL REVENUE/ASSETS	PROFITS MARGIN
Mean	16.3292593	-23.3531034
Standard Error	0.016831609	0.185051972
Median	0.1442	0.0576
Standard Deviation	0.087459608	0.996535367
Sample Variance	0.007649183	0.993082737
Kurtosis	11.09447756	15.60610869
Skewness	2.838338078	-3.699826621
Range	0.4682	5.5803
Minimum	0.0565	-4.7333
Maximum	0.5247	0.847
Sum	4.4089	-6.7724
Count	27	29
Benchmark	29.6	-34.4
P value	<0.00001	0.277652

Source: Author's calculations
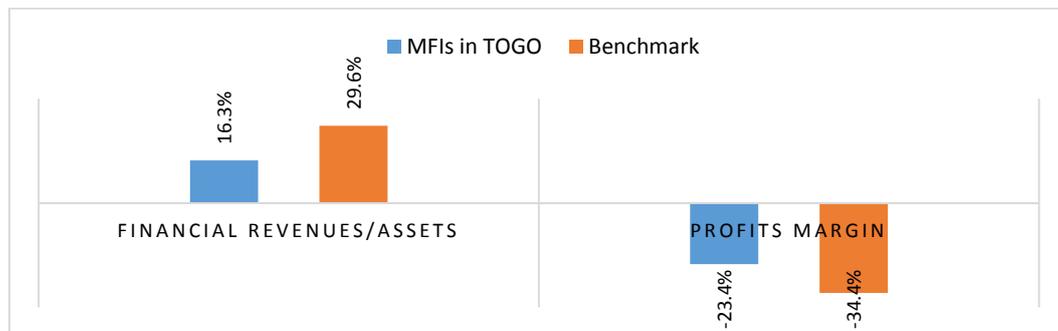
Figure 3   Revenue Ratios
Source: Author

4.4 Expense

Significant difference has been noticed here in terms of financial and total expenses. We can say that Togolese MFIs have registered lower financial and total costs to assets compared to the African benchmarks (figure 4). This reflects a better efficiency in contrast to the African benchmark. There is No significant difference for PLI.

Table 4   Difference of Means Test for Expenses

	FINANCIAL EXPENSE/ASSETS	PLI/ASSETS	TOTAL EXPENSE/ASSETS
Mean	3.04	1.2588889	17.1048148
Standard Error	0.003982701	0.017852471	0.018748064
Median	0.0279	0.0072	0.1491
Standard Deviation	0.020694722	0.092764161	0.097417797
Sample Variance	0.000428272	0.008605189	0.009490227
Kurtosis	1.674537126	12.54210218	10.22802208
Skewness	1.144949727	0.645090914	2.770600579
Range	0.0868	0.661	0.4882
Minimum	0.0025	-0.2991	0.0791
Maximum	0.0893	0.3619	0.5673
Sum	0.8208	0.3399	4.6183
Count	27	27	27
Benchmark	5.7	2.3	33.7
P value	<0.00001	0.282458	<0.00001

Source: Author's calculations
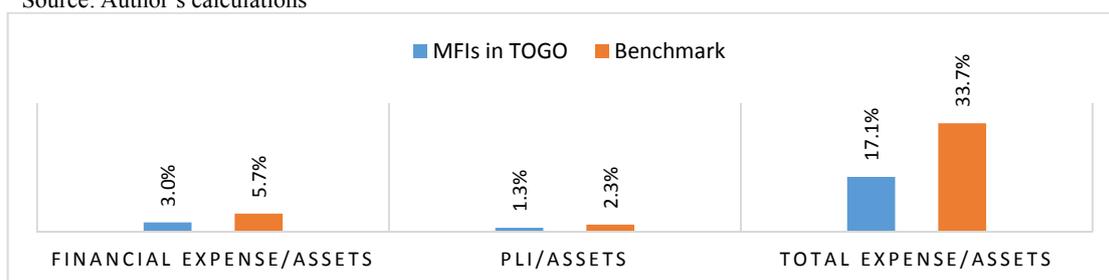
Figure 4   Expense Ratios
Source: Author

4.5 Efficiency

There is a significant difference as for the cost per borrower and for the expense per loan portfolio. The cost per borrower is relatively lower compared to the benchmark which means that it cost less servicing a borrower in Togo compared to the overall Africa average (figure 5). The significance in terms of operating expense to loan portfolio relates the fact that Togolese MFIs spend less on average in managing their loan portfolios in comparison to the African benchmark. This is in line with the expenses analysis.

Table 5   Difference of Means Test for Efficiency

	COST PER BORROWER	OPERATING EXPENSE/LOAN PORTFOLIO
Mean	170.75	20.3466667
Standard Error	26.36486257	0.038157219
Median	128	0.1408
Standard Deviation	129.1609209	0.198270724
Sample Variance	16682.54348	0.03931128
Kurtosis	3.008283466	18.40636625
Skewness	1.542661022	4.001267022
Range	575	1.0963
Minimum	3	0.0193
Maximum	578	1.1156
Sum	4098	5.4936
Count	24	27
Benchmark	299	47.7
P value	0.000033	<0.00001

Source: Author's calculations
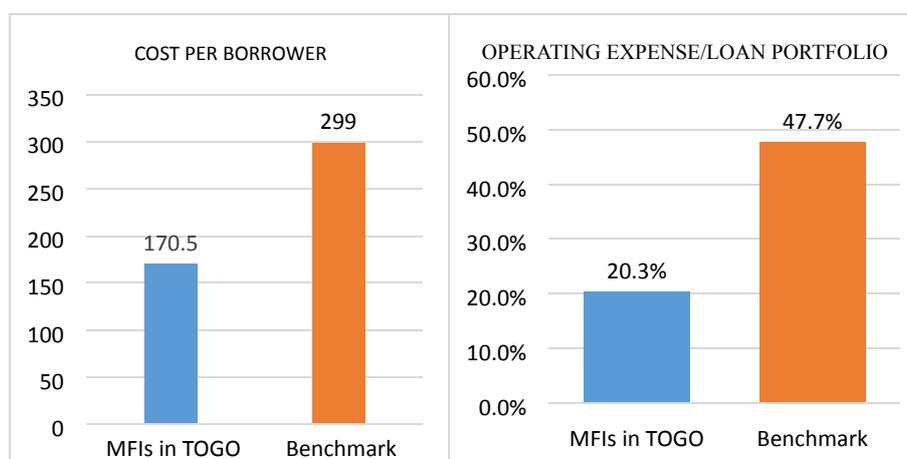
Figure 5   Efficiency Ratios
Source: Author

4.6 Productivity

There is a significant difference for borrower per staff ratio as its p value is less than 0.05. This can be explained by the fact that the number of borrower per staff of Togolese MFIs is lower than the Africa average (figure 6) which might be due to bad lending methodologies On the other hand there is no significance in terms of deposit per staff member thus all the institutions have different deposit incentives or collection methods.

Table 6   Difference of Means Test for Productivity

	BORROWER PER STAFF MEMBER	DEPOSITS PER STAFF MEMBER
Mean	50.15625	211.5
Standard Error	7.073078984	25.12150473
Median	39.5	176
Standard Deviation	40.01137691	128.0950428
Sample Variance	1600.910282	16408.34
Kurtosis	8.369419702	-1.357146312
Skewness	2.422618102	0.264722504
Range	210	412
Minimum	4	42
Maximum	214	454
Sum	1605	5499
Count	32	26
Benchmark	111	239
P value	< 0.00001	0.141977

Source: Author's calculations
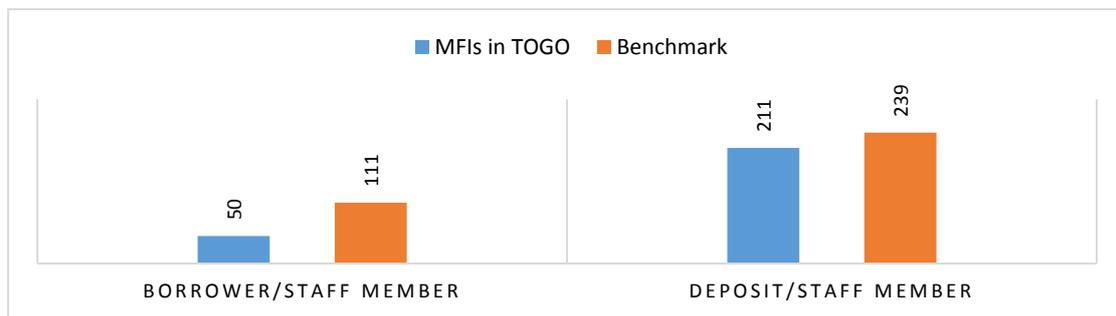
Figure 6   Produtivity Ratios
Source: Author

4.7 Risk

No significant difference for Loan loss rate PAR>30 & 90 days and write off ratio meaning all institutions have different lending policies. But P value<0.05 for risk coverage ratio thus there is a highly significant difference in risk coverage between Togolese MFIs and their African peers as reflected in figure 7. This can be explained by a high percentage of bad debts trying to be covered by negligible loan loss reserves.

Table 7   Difference of Means Test for Risk

	LOAN LOSS RATE	PAR>30DAYS	PAR>90DAYS	RISK COVERAGE	WRITE OFF RATIO
Mean	0.2253846	13.1356522	9.5227273	21.4090909	3.225
Standard Error	0.030280492	0.040661157	0.036726762	0.026724334	0.017235305
Median	0.0024	0.0696	0.0383	0.1796	0.00555
Standard Deviation	0.154400822	0.19500406	0.172263782	0.125348238	0.087883155
Sample Variance	0.023839614	0.038026583	0.029674811	0.015712181	0.007723449
Kurtosis	14.66516517	7.657107028	9.572012924	1.289117664	11.36858625

Skewness	-2.613080907	2.905270729	3.176133113	1.286539963	3.456413437
Range	1.0253	0.7696	0.7047	0.466	0.3752
Minimum	-0.6507	0	0.0145	0.0804	0
Maximum	0.3746	0.7696	0.7192	0.5464	0.3752
Sum	0.0586	3.0212	2.095	4.71	0.8385
Count	26	23	22	22	26
Benchmark	2.7	8.5	5.3	128	4.1
P value	0.210823	0.133273	0.131536	<0.00001	0.307953

Source: Author's calculations
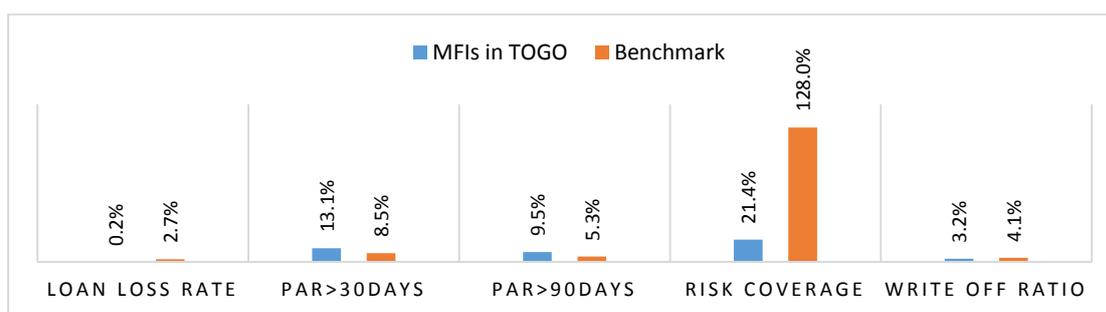
Figure 7   Risk Ratios
Source: Author

5 Conclusions

Having a look at the findings, we can conclude that Togolese Microfinance institutions are generally good at managing costs and efficient at effectively trying to help the poor compared to the average of other African institutions. MFIs in Togo have higher deposits and loans as per assets compared to the industry average but still don't depend that much on the former as source of funding. This means that they rely on other sources as support to finance their activities. MFIs in Togo are not productive.

Risk management is an issue in the Togolese sector as Togolese institutions have a higher proportion of contaminated portfolio (both PAR>30 DAYS and PAR>90 DAYS) compared to the other African institutions, but provide a considerably low reserve coverage for these contaminated loans. This is quite a risky way of operating for these institutions. This must be due to poor risk management practice and lending policies. Togolese MFIs should have a firm look at this issue in order to improve future performance known thus sustainability.

Our study was based on only of 12 microfinance institutions in Togo during a period of 4 years (20072010). A possible increase of the sample size and the period for data collection might give different results and more insights. Future research should consider this.

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Military Expenditure and Stock Market Capitalization: Evidence from an Emerging Market

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Abstract: This research work explores the relationship between military spending and stock market capitalization in Pakistan. We employed the methodology of ARDL bounds testing to cointegration over the period 1990-2012. The series stationarity properties were checked via Augmented Dicky Fuller (ADF) test. The conventional measure of military spending has been augmented by a comprehensive index-The Global Militarization Index. We observed cointegration among military expenditure, interest rate, trade openness, growth in GDP and stock market capitalization. Hence, the long run relationship among the variables has been verified. A negative and significant association has been established between military spending and stock market capitalization. The study concludes that military expenditure is a vital determinant of stock market capitalization in Pakistan. To enhance the performance of stock market the authorities need a gradual and systematic reduction in military expenditure.
Key words: Military expenditure; Stock market capitalization; Co-integration; Pakistan

1 Introduction

Since McKinnon's seminal work in 1973, numerous studies have highlighted the importance of capital markets e.g., it enhances economic growth by speeding up the domestic and foreign resources mobilization and facilitates investment Bencivega et al., (1996), furnishes an opportunity for growth driven firms to raise low-cost capital Marone (2003) and reduces the dependency on bank financing which is vulnerable to fluctuations in interest rates Yartey (2008). Apart from the enhancement of capital formation, an efficient stock market will also increase the current stock of capital of an economy. The overall performance of the agriculture, industry and services sector is improved with the help of capital markets—it provides accessibility to financial resources. In nutshell, stock market is a vital element for the enhancement of economic development. In the last decade considerable growth has been shown by emerging markets till 2008 during which the global financial crisis struck the global markets which instigated uneasiness for policy makers. Recovery has been witnessed in the economic activities for the majority of emerging markets in the later part of 2010. Since that time they maintained their tempo to pull an increasing amount of investment.

Pakistan has undergone numerous contrasting developments in the last decade. Political uncertainty has remained very severe throughout the 1990's and the overall economy was impaired by inadequate fiscal control, rapid increase in public debt burden, poverty and higher unemployment. Nine different Governments ruled Pakistan during 1998 to 1999 followed by the military coup in October 1999.

The new millennium brought a fresh period of macroeconomic steadiness in Pakistan. In order to bring financial discipline, economic reforms were introduced in the regime of President Musharraf. The attacks of September 11, 2001 enhanced the economic growth and its steadiness by pulling in large multilateral donors and foreign capital flows based on Pakistan's assistance in the war on terror Khwaja et al., (2010). The unexpected surge in capital inflows combined with the policies of the government pertaining to privatization and monetary policy reforms granted liquidity to the local markets. The stock market capitalization of Pakistan increased from $5 billion in 2001 to $70 billion in 2007. The structural reforms coupled with political and economic stability enabled Pakistan to attain consistent economic growth during the course of 2000-2007. It is intriguing to evaluate the primary factors associated with intense stock market growth in Pakistan. A few possible sources have been reported regarding this fact. Some research studies have correlated the growth in the period 2001-2007 with the geopolitical condition of the region. For instance Khwaja et al., (2010) contend that the unexpected event of September 11, 2001 resulted in rise of capital flows towards Pakistan. The rise in capital inflows is partly shown by Pakistan's assistance in the war against terrorism after September 11, 2001, since sanctions were removed and also the loans outstanding were rescheduled. A rejuvenated collaboration with the developed countries provided the opportunity for bilateral and multilateral foreign aid. The

significant growth during the period 2001-2007 is additionally related macroeconomic reforms being launched by the government of Pakistan in the year 2000. These types of reforms not only assisted Pakistan to entice a huge amount of direct foreign investment to Pakistan but at the same time led to a sharp increase in workers remittances and foreign exchange reserves.

After 2007, Pakistan has become the major victim of terrorism and is facing severe consequences. Pakistan has now been considered to be the most dangerous territory all over the world Riedel (2008). Nearly all of the terrible incidents of terrorism happened in Pakistan in the last decade. In comparison to Afghanistan and Iraq, Pakistan suffers from the most number of suicide bombings casualties (Global terrorism database). Terrorism results in investors' uncertainty problem thereby making them more risk averse which has an extremely negative effect on the economic growth of a country. In Pakistan, terrorism has affected   nearly every channel e.g., economic growth, volume of trade, GDP per capita thereby resulting in high budget deficit, soaring inflation, and higher military expenditures, which has eventually made the country miserable (Ali, 2010).   Significant slump pertaining to economic activities has been observed recently in Pakistan including the decrease foreign investment. Because of terrorism Pakistan has endured the cost of about 33% of real national income Mehmood (2014). In Pakistan terrorism consumes around 1% of growth in real per capita GDP annually Mehmood (2014)

Since 1947, severe enmity continues between India and Pakistan after their separation. The issue of Kashmir is the main dispute between the two countries not to mention the dispute over water as well as border dispute. Both countries set aside a substantial part of their GDP in order to boost their defense sector. Nuclear tests were carried out by India in 1974 which motivated Pakistan go for nuclearization and the arm race between the two countries still goes on. The Pak-India rivalry has directed Pakistan in bigger disadvantage i.e. not only it has to maintain the army of a million men but the country must also assign approximately 40 percent government expenditure to defense sector.

In order to deal with intimidations countries need some level of security but additional funds utilized on these security measures also carry opportunity costs i.e. they can be used for welfare. Each increment on defense spending is linked to trimming down the welfare expenditure such as health and education expenditures; a high budget deficit and rising inflation Dunne (2012). Defense industries attracts skillful engineers and labor which results in draining effect on the availability of human capital for private organizations Melman (1983). Arms accumulations may unsettle foreign investors and may compel them to shift their capital from the country of investment. Doing so will reduce companies valuations. Apart from this if loans are backing the military expenditure, then the debt amount will inevitably rise. In the same way if the import of military weapons will take place then it will affect balance of trade and thus can trouble the local businesses.

Keeping these backdrops in mind it is pertinent to inquire into the effect of military expenditure on stock market development in Pakistan. This research is novel in the sense that pertaining Pakistan's stock market capitalization determinants, it will use a new proxy for military expenditure i.e. the Global militarization index. Previously studies in the literature have used data from Stockholm International Peace Research. Moreover, an improved approach of cointegration i.e. the methodology of ARDL bounds testing to co-integration will be employed in this research study. Compared to other traditional approaches like Johansen and Juselius co-integration and Fully modified ordinary least square (FMOLS), the properties of this method are appropriate for small samples Huang (2002). The variables order of integration needs to remain the same while applying the conventional methods whereas, it is not necessary in ARDL bounds testing to co-integration. This method is also free from endogeneity problems.

2 Literature Review

Literature pertaining to economic consequences of military spending started from the work of Benoit (1973, 1978) who was of the view that military spending and development go side by side. Since then a lot of research work has been done on this subject.   Other researchers which are supporting the work of Benoit are (Yildirim and ocal 2016; Yildirim Sezgin and Ocal, 2005). Researchers which are not in favor Benoit's findings and confirmed negative association between defense spending and development are Abu-Bader and Abu-Qarn (2003), Klien (2004) and Chang et al., (2011). According to Dunne and Uye (2010) the results about defense spending and economic growth are mixed.

No consensus has been developed among the researchers regarding the nexus between military spending and debt. For example Smyth and Narayan confirmed positive link between military spending and external debt. On the other side of the coin Dunne, Perlo-Freeman, and Soydan (2004b) found that for Chile military expenditures and debt are positively correlated in the period 1970-2000 whereas,

negative relationship was demonstrated by the results for other two countries i.e. Argentina and Brazil. Friedman (2005) attempted to explore the military-debt relationship. He concluded that pertaining to developing countries the impact of military expenditure on debt negligible.

Since the literature regarding macroeconomic consequences of military spending is vague therefore it is difficult to establish the link between military expenditure with other macro-economic indicators such as stock market development as very few studies have attempted to explore the association between the two. DiPietro, Anoruo, and Sawhney (2008) investigated the association between military spending and stock market growth. The countries included in the study were US and UK covering the period 1914-2001. They established significant positive link between military spending and stock market capitalization. Solarin and Sahu (2014) analyzed the effect of military spending on the appreciation of stock market. The methodology of system GMM was employed over the period 1989-2010 and the sample consisted of 36 countries. Their obtained results showed a negative and significant association between expenditure on military and stock market capitalization for the selected countries.

3 Model

Following DiPietro, Anoruo and Sawhney (2008) and other earlier studies pertaining to factors determining stock market development, the following model has been proposed.

$$LogSMC_t = f(ME_t, INT_t, TO_t, GGDP_t) \tag{1}$$

The linear form of equation is:

$$LogSMC_t = \beta_0 + \beta_{MEXP} \, logME_t + \beta_{INT} \, logINT_t + \beta_{TO} \, logTO_t + \beta_{GGDP} \, logGGDP_t + U_t$$

Where,

SMC = Stock Market Capitalization   (Percentage of GDP)
MEXP = Military Expenditures
INT = Real interest rate
TO = Trade openness (ratio of imports plus exports to GDP)
GGDP = Annual GDP growth
U_t = Residual term

4 Data and Estimation Methodology

Stock Market capitalization data has been obtained from the Global Development Finance. Military expenditure being proxies by Global Militarization Index is obtained from the Bonn International Center for Conversion. The data for trade openness as a percentage of GDP has been taken from World Development indicators (WDI) online database. Finally the data for real interest and GDP growth were retrieved from State Bank of Pakistan.

The technique of ARDL bounds testing to co-integration by Pesaran, Shin, and Smith (2001) is applied for examining the long-run relationship among variables. Compared to other conventional methodologies (Engle and Granger 1987; Johansen & Juselisus 1990; Phillips and Hansen) this technique possesses many advantages. For conventional techniques a unique level of integration is necessary for variables. The approach of bound testing is flexible pertaining to integration order of variables. Variables having different order of integration i.e. I(0), I(1) or combination of I(0) and I(1) are accommodated by the bounds testing approach Pesaran & Pesaran (1997). Huang (2002) stated that ARDL is appropriate for data having small range and render good results in comparison with other conventional techniques of co-integration. Linear specification has been used by the approach of bounds testing for dynamic ECM which holds the long-run relationship information Banerjee and Newman (1993). The ARDL unrestricted error correction method is applied for the determination of F-statistic and empirical equations as:

$$\Delta LogSMC_t = \gamma_1 + \gamma_2 LogSMC_{t-1} + \gamma_3 LogME_{t-1} + \gamma_4 LogINT_{t-1} + \gamma_5 LogTO_{t-1}$$

$$+ \gamma_6 LogGGDP_{t-1} + \sum_{i=1}^{p} \gamma_{SMD} \Delta LogSMC_{t-i} + \sum_{j=0}^{q} \gamma_{ME} \Delta LogME_{t-j}$$

$$+ \sum_{k=0}^{r} \gamma_{INT} \Delta LogINT_{t-k} + \sum_{l=0}^{s} \gamma_{TO} \Delta LogTO_{t-l} + \sum_{m=0}^{t} \gamma_{GGDP} \Delta LogGGDP_{t-m}$$

$$+ \epsilon_t \tag{2}$$

$$\Delta LogME_t = \lambda_1 + \lambda_2 LogSMC_{t-1} + \lambda_3 LogME_{t-1} + \lambda_4 LogINT_{t-1} + \lambda_5 LogTO_{t-1}$$
$$+ \lambda_5 LogGGDP_{t-1} + \sum_{i=1}^{p} \lambda_{ME} \Delta LogME_{t-i} + \sum_{j=0}^{q} \lambda_{SMD} \Delta LogSMC_{t-j} \quad (3)$$
$$+ \sum_{k=0}^{r} \lambda_{INT} \Delta LogINT_{t-k} + \sum_{l=0}^{s} \lambda_{TO} \Delta LogTO_{t-l} + \sum_{m=0}^{t} \lambda_{GGDP} \Delta LogGGDP_{t-m}$$
$$+ \epsilon_t$$

$$\Delta LogINT_t = \rho_1 + \rho_2 LogSMC_{t-1} + \rho_3 LogME_{t-1} + \rho_4 LogINT_{t-1} + \rho_5 LogTO_{t-1}$$
$$+ \rho_6 LogGGDP_{t-1} + \sum_{i=1}^{p} \rho_{INT} \Delta LogINT_{t-i} + \sum_{j=0}^{q} \rho_{SMD} \Delta LogSMC_{t-j} \quad (4)$$
$$+ \sum_{k=0}^{r} \rho_{ME} \Delta LogME_{t-k} + \sum_{l=0}^{s} \rho_{TO} \Delta LogTO_{t-l} + \sum_{m=0}^{t} \rho_{GGDP} \Delta LogGGDP_{t-m}$$
$$+ \epsilon_t$$

$$\Delta LogTO_t = \psi_1 + \psi_2 LogSMC_{t-1} + \psi_3 LogME_{t-1} + \psi_4 LogINT_{t-1} + \psi_5 LogTO_{t-1}$$
$$+ \psi_6 LogGGDP_{t-1} + \sum_{i=1}^{p} \psi_{TO} \Delta LogTO_{t-i} + \sum_{j=0}^{q} \psi_{ME} \Delta LogME_{t-j}$$
$$+ \sum_{k=0}^{r} \psi_{SMD} \Delta LogSMC_{t-k} + \sum_{l=0}^{s} \psi_{INT} \Delta LogINT_{t-l} \quad (5)$$
$$+ \sum_{m=0}^{t} \psi_{GGDP} \Delta LogGGDP_{t-m} + \epsilon_t$$

$$\Delta LogGGDP_t = \Omega_1 + \Omega_2 LogSMC_{t-1} + \Omega_3 LogME_{t-1} + \Omega_4 LogINT_{t-1} + \Omega_5 LogTO_{t-1}$$
$$+ \Omega_6 LogGGDP_{t-1} + \sum_{i=1}^{p} \Omega_{GGDP} \Delta LogGGDP_{t-i} + \sum_{j=0}^{q} \Omega_{ME} \Delta LogME_{t-j} \quad (6)$$
$$+ \sum_{k=0}^{r} \Omega_{INT} \Delta LogINT_{t-k} + \sum_{l=0}^{s} \Omega_{TO} \Delta LogTO_{t-l} + \sum_{m=0}^{t} \Omega_{SMD} \Delta LogSMC_{t-m}$$
$$+ \epsilon_t$$

In order to check the existence of co-integration among variable the calculated F-statistic will be compared with the critical bounds. To do so we will check the hypothesis of no co-integration in the equation 2 i.e. H_0: $\gamma_{SMC} = \gamma_{ME} = \gamma_{INT} = \gamma_{TO} = \gamma_{GGDP} = 0$, H_0: $\lambda_{SMC} = \lambda_{ME} = \lambda_{INT} = \lambda_{TO} = \lambda_{GGDP} = 0$, H_0: $\rho_{SMC} = \rho_{ME} = \rho_{INT} = \rho_{TO} = \rho_{GGDP} = 0$, H_0: $\psi_{SMC} = \psi_{ME} = \psi_{INT} = \psi_{TO} = \psi_{GGDP} = 0$, H_0: $\Omega_{SMC} = \Omega_{ME} = \Omega_{IN} = \Omega_{TO} = \Omega_{GGDP} = 0$ against the alternative hypothesis H_a: $\gamma_{SMC} \neq \gamma_{ME} \neq \gamma_{INT} \neq \gamma_{TO} \neq \gamma_{GGDP} \neq 0$, H_a: $\lambda_{SMC} \neq \lambda_{ME} \neq \lambda_{INT} \neq \lambda_{TO} \neq \lambda_{GGDP} \neq 0$, H_a: $\rho_{SMC} \neq \rho_{ME} \neq \rho_{INT} \neq \rho_{TO} \neq \rho_{INT} \neq 0$, H_a: $\psi_{SMC} \neq \psi_{ME} \neq \psi_{INT} \neq \psi_{TO} \neq \psi_{GGDP} \neq 0$, H_a: $\Omega_{SMC} \neq \Omega_{ME} \neq \Omega_{INT} \neq \Omega_{TO} \neq \Omega_{GGDP} \neq 0$.

Cointegration will exist if the F-statistic (computed) is greater than UCB; the decision will goes in favor of no co-integration if the LCB has been observed to be greater than F-statistic. The decision will be uncertain, if F-statistic is between the UCB & LCB. In this research Narayan (2005) critical bounds values were used instead of Pesaran, Shin, and Smith (2001) because of small sample size—Narayan (2005) values tend to be well suited for data of small sample size. For checking the variables integration order Augmented Dicky Fuller test has been employed in order to clarify that not a single variable is I(2) integrated as I(2) render invalid F-statistic Narayan & Narayan (2005). Furthermore for choosing the optimal lag length Akaike information criterion has been followed. The exact information regarding lag order is critical as the selection of lag length has an effect on the ARDL F-statistic value.

5 Results and Discussion

Although ARDL bounds testing methodology is flexible pertaining to integration order of variables we need to make sure that not a single variable included in the model is higher than I(1) because the F-statistic computations becomes will be deemed invalid if I(2) variable is included in the model. For this reason we have employed ADF test. Table 1 presents the outcomes of ADF test, which show that both stock market development and GDP growth are level stationary i.e. I(0) whereas, the rest of variables are integrated of the order I(1). This means that for empirical estimation the variables selected in the models have mixed integration.

Table 1   ADF Test Results

Variables	Levels		1st Difference	
	Constant (5% critical value)	Constant & trend (5% critical value)	Constant (5% critical value)	Constant & trend (5% critical value)
SMC	-1.08312 (-3.0403)	-4.6877* (-3.6736)	--	--
ME	-0.551638 (-3.004861)	-2.087918 (-3.632896)	-4.368212* (-3.012363)	-4.240616* (-3.644963)
INT	-1.576983 (-3.004861)	-2.636017 (-3.673616)	-4.066086* (-3.020686)	-3.964465* (-3.658446)
TO	-2.466694 (-3.004861)	(-2.563067) (-3.632896)	-6.379784* (-3.012363)	-6.206532* (-3.644963)
GGDP	-3.400959* (-3.004861)	(-3.356229) (-3.632896)	--	--

Where, * indicates $p<.05$

Table 2 exhibits the results of ARDL. In this table the calculated F-statistic value for long-run association among variables is (6.1782) which are greater than the upper critical bound by Narayan (2005) at 5% significance level. This result confirms the long run association among variables for the period 1990-2012 in context of Pakistan. Moreover, the classical assumptions related to error term normality, serial correlation and heteroscedasticity hold for ARDL model. Diagnostics tests results have been presented in table 5.

Table 2   Bounds Testing to Co-Integration

Estimated Equation: $LogSMC_t = f(ME_t, INT_t, TO_t, GGDP_t)$		
Optimal lag structure	(1, 0, 1, 2, 1)	
F-statitics	6.178292**	
Significance level	Lower bounds, I(0)	Upper bounds, I(1)
1 percent	3.74	5.06
5 percent	2.86	4.01
10 percent	2.45	3.52

Where, ** indicate $p<.05$

The validation of long run association among variables guide us to interpret the effect of our predictors that is military spending, real interest rate, trade openness and GDP growth on stock market development. Table 3 presents the long-run coefficients. Empirical analysis reveals a negative and significant relationship between military spending and stock market development at 5% significance level hence validating our posited statement. A 1% increase in the level of military spending will decrease stock market development by 2.0732%. In the literature these results are similar with the findings of Solarin and Sahu (2014). To cope with terrorism Pakistan government has been compelled to propel the defense Budget. Besides this a substantial amount of funds are allocated for the nuclear weapons advancement in the Budget. Pakistan is doing so because of severe rivalry with India. A significant negative association has been observed between real interest rate and stock market development implying that 1% increase in real interest rate will depress the stock market development by 0.0062%. In the results these finding are found to be consistent with the findings of Akmal (2007). An expected significant positive relation has been noticed between openness in trade and stock market capitalization in the long-run. Although no association has been noticed in the findings of this study between the GDP growth and stock market capitalization, but the long-run coefficient of GDP growth is still carrying its correct sign.

Table 3 Long-Run Analysis

Dependent variable: SMC_t

Variable	Coefficient	Stand. Error	T-statistic
ME_t	-2.073164	0.915302	-2.265004**
INT_t	-0.810405	0.240108	-3.375165***
TO_t	4.285845	0.740915	5.784529***
$GGDP_t$	0.314248	0.218231	1.439976
Constant	4.8403	1.2816	3.7764***
R-squared	0.923661		
Adjusted R-squared	0.861201		
F-statistics (Prob-value)	14.78813***		
Durbin-Watson	2.625001		

Where, ** p<.05; *** p<.001 respectively

Analyzing the short-run effect of the explanatory variable over the explained variable (stock market capitalization) is the next step. These results have been depicted in table 4. The lagged error term carries a negative and significant sign hence confirming the cointegration association among variables. ECM_{t-1} implies that variations in explained variable i.e. stock market capitalization are function of variations in the explanatory variables (military spending, interest rate, trade openness and economic growth). The ECM_{t-1} standard value lies within the range of 0 and 1 Kremers et al. (1992). In our results the value of ECM_{t-1} is (0.7121) which means that yearly short-run to long-run change will correct stock market capitalization at a rate of 71.21%. Table 4 shows that rise in military spending affect the stock market negatively though the relationship is insignificant. Trade openness is exhibiting a significant positive association with stock market development at 1% significance level implying that it is a vital variable for increase in stock market capitalization. Interest rate and stock market capitalization are linked negatively. The variable of GDP growth and stock market capitalization were found to have no significant relationship.

Table 4 Short-Run Analysis

Dependent variable: SMC_t

Variable	Coefficient	Stand. Error	T-statistic
ΔME_t	-1.476358	0.988000	-1.494289
ΔINT_t	-0.292403	0.075555	-3.870054***
ΔTO_t	2.015890	0.556652	3.621454***
$\Delta GGDP_t$	0.143044	0.118187	1.210317
ECM_{t-1}	-0.712128	0.204066	-3.489688***

Where, *** p<.001

Reliability of the Model:

The results for the reliability of the model have been presented in table 5. Both the issues of auto-correlation and heteroskedasticity have not been observed and the obtained residual were noticed to be normal. Furthermore stable plots were obtained for CUSUM and CUSUM of square tests hence, implying that the model specifications are correct.

Table 5 Diagnostics Check

Diagnostics tests	F-statistics	P-value
LM test for Auto correlation	1.4751	0.2792
Brush-Pagan-Godfrey test for Heteroskedasticity	1.4226	0.2560
Jarque-Bera for Normality	1.1921	0.5509

Multicollinearity Check:

Variance inflation factor (VIF) test has been utilized for the detection of multicollinearity. Multicollinearity can be checked via

VIF= 1/1-R²

The obtained R² value for the model is 0.92 so by incorporating this value in the given formula the obtained value of VIF is (7.28) which is not greater than 10% thereby, indicating that multicollinearity issues were handles during the estimation of the model.
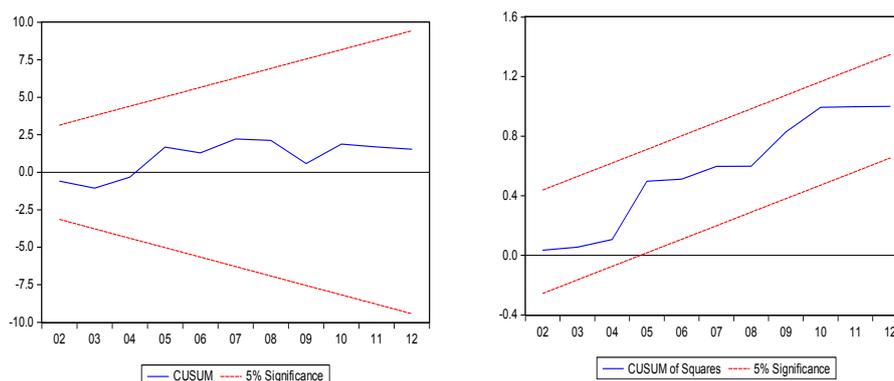
Figure 1   CUSUM and CUSUM of Squares Tests Plots

6 Conclusions and Policy Implications

The principal aim in this research was determine the relationship between military spending and stock market capitalization in Pakistan. The methodology of ARDL bounds testing to cointegration has been applied for this aim. The outcomes of this technique confirmed the cointegration among stock market capitalization, military expenditure, interest rate, trade openness and economic growth. The empirical outcomes of the study revealed a negative and significant relationship with the stock market capitalization in the long run and also in the short run nevertheless, the result is not significant in the short run. A negative and significant association has been established between interest rate and stock market growth both in the short and long-run. Both for the short and long run trade openness has verified the extant research by displaying a significant positive connection with the growth in stock market. No connection has been found between GDP growth and stock market capitalization in this particular study.

When huge amount from the budget will be allocated for the defense expenditures, it means that least amount will allocated to welfare and other development projects. This is certainly wastage of resources. Such kind of practices can also shift the mood of foreign investors to those countries who assign reasonable amount to their defense related activities. Moreover arms accumulation has an adverse effect on foreign relations. Developing countries are of the view that defense sector acts as a strategic tool thereby linking it to national defense or the sovereignty—they set aside large amount from their budget for this sector. Such kinds of policies have a tendency to distort private returns on capital therefore decrease the amount of foreign investment De Mello (1999). In an effort to attain stock market development, military spending needs to be minimized.

A Gradual and systematic reduction in military expenditure will be favorable as private sector will probably not be able to take place of this particular government spending promptly which can have an adverse impact on the economy. In a nutshell, it will be significantly better when the military expenditure cut backs take place over a period of time instead of all at one time which could create a risk of economic downturn for Pakistan thereby, ultimately will affect its stock market capitalization. Apart from military spending, interest rate and trade openness were observed to be significant predictors of stock market growth hence these predictors need to be taken into account together with military expenditure reduction.

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The Role of Islamic Micro-Finance in Enhancing the Wellbeing of the Clients: Exploratory Factor Analysis

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Abstract: This pilot study seek to explore the structural characteristics of Islamic Micro-finance and statistically group them in to Products (Independent), Empowerment (Mediator) and Clients' wellbeing (dependent) constructs. This is to conceptualize an Islamic Micro-finance model towards the Clients wellbeing. Empirical data was collected from the staff of eight (8) branches of Amanah Ikhtiar Malaysia (AIM) in the Johor state, Malaysia. The data collected was analyzed by means of an Exploratory Factor Analysis using IBM SPSS Statistics 21, which resulted to the extraction of five (5) factors which upon grouping, defined the variables for this study. The results indicated an acceptable factor loadings and effective grouping according to the conceptualized framework. The Cronbach's alpha of ≥ 0.7 is an indication of acceptable internal consistency and reliability of the five Islamic Micro-finance constructs. This study is part of on-going Ph.D. to proof the capacity of Islamic Micro-finance towards Clients' wellbeing.

Key words: Islamic Micro-finance; Clients' wellbeing; Malaysia

1 Introduction

Over the last four decades, Malaysia has made remarkable achievements in terms of its economic growth as well as its socio-economic development (MWR, 2013). Poverty reduction through increased productivity and income occupies an integral part of all national plans of Malaysia (Hatta and Ali, 2013). While 49.3% of Malaysian households lived below the poverty line in 1970, the poverty rate has reduced significantly to 1.7% in 2012 (Department of statistics Malaysia, 2013). The reduction in poverty rate can be attributed to the rapid economic growth in Malaysia which generated opportunities for employment as well as micro and small-scale businesses (Hatta and Ali, 2013; Henderson, 2002; Al Mamun *et al*., 2011). Although economic growth has brought significant improvements in the standard of living, there are still individuals living in poverty. Well-being is a positive outcome that is meaningful for people pursuant to good living conditions e.g., housing, employment, family, mental and physical health, and hence of course, there is nothing more seriously important as happiness and wellbeing (Blurton, 2012). There is no consensus on the definition of well-being, but there is general agreement that at minimum, it includes the presence of positive emotions and satisfaction with life, fulfilment and positive functioning. In simple terms, well-being can be described as judging life positively and feeling good in terms of Physical, Economic and Social life (Blurton, 2012). There is no sole determinant of individual well-being, however, it is dependent upon good health, positive social relationships, and availability and access to basic resources e.g., shelter, income (Michaelson, 2012). In general, life satisfaction is dependent more closely on the availability of basic needs being met as well as access to modern conveniences. Pleasant emotions are more closely associated with having supportive relationships which is one of the strongest predictors of well-being, having a notably positive effect (HRQOL, 2016). Countries differ substantially in their levels of well-being but societies with higher well-being are those that are more economically developed. The growing urgency for sustainable development for the entire world has led the idea of targeted efforts gaining ground in order to reach the most vulnerable people (MDGR, 2015). There is the need to achieve a combination of economic development, environmental sustainability, and social inclusion. This typified the triple bottom line approach to human wellbeing, which is in line with the developmental objectives of nations (Sachs, 2012). This new approach seek to offer opportunities to the less privileged in the society toward social, environmental and financial performance. While the benefits from empowerment packages addresses their diverse vulnerabilities, it also help in creating sustainable environment and foster social cohesion. By focusing on this comprehensive perspective, Micro-finance has become an important tool for

improving the lots of the vulnerable poor in the society (Hatta and Ali, 2013; GIFR, 2012). In Muslim countries, Micro-finance is shaped by Islamic principles that seek to achieve prosperity for humanity through opportunities for economic and human capital development. This is perceived as crucial in achieving progress towards greater wellbeing by means of an inclusive growth (Che Rasuli et al., 2016; Al Mamun, Adaikalam and Abdul Wahab, 2012; Mohieldin et al., 2011; Nair, 2010).

The New Economic Model (NEM) in Malaysia promotes a new approach to development, which it defines as inclusive growth, to raise productivity and incomes of the poor and enable them contribute meaningfully to national development (Hatta and Ali, 2013; Xavier and Ahmad, 2012). Another strategy, the Financial Sector Blueprint 2011–2020, was formulated to increase productivity, diversify sources of income and improve the quality of life of the poor. This is a strategic plan that charts the future direction of the financial system as Malaysia transitions towards becoming a high value-added, high-income economy. One of the agenda for this 10-year blueprint is to pursue a financial inclusion that will enable all citizens undertake financial transactions, generate income, accumulate assets and protect themselves financially against unexpected adverse events (FSBP, 2011). This opportunity is expected to contribute to a balanced and sustainable economic growth and development that best serves the Malaysian economy.

Amanah Ikhtiar Malaysia (AIM) is a development program established in 1987 as an NGO with the aim of eradicating extreme poverty. The objective was to offer an interest-free Micro-credit to low-income households to finance income generating activities in order to improve their socio-economic condition. AIM is a replication of the re-known Grameen Bank model established in Bangladesh in the late 1970s by Dr Mohammed Yunus in order to extend Micro-credit to the financially excluded poor. Basically, AIM offers three (3) services to its members/companions. (1) Interest-free Micro-credit with stipulated repayment periods. (2) Saving, which takes the form of compulsory and voluntary saving. (3) Welfare Charity Fund. This is a fund contributed by members to enhance cooperation and improve welfare based on the principles of donation (tabarru') and mutual cooperation (ta'awun) to help members of the group when in trouble. This mutual assistance covers areas such as destruction of home and/or project due to accidental fires and natural disasters, accidents, funerals, and all diseases. By far the most popular of the three services is the Interest-free Micro-credit. This is the basic service which is referred to as the Initial Financial Scheme. The Micro-credit is extended to members using the group-lending method as in the Grameen bank model, where five persons of the same gender who are not close relatives are grouped together and provided a small amount of credit without any collateral (Al-Shami et al., 2014; Dusuki, 2006; Navajas et al., 2000). According to AIM (2015), almost 99% of the members are women and the loans tenure ranges between 25 to 150 weeks. After about 30 years of operation, AIM had established 151 branches and provided financial services to more than 80% of the poor households (AIM, 2015). As at February 2015, there are a 356,485 members/companions and RM12, 153,111,093 total disbursements. Therefore the objective of this paper is to explore the conceptual framework on the internal characteristics, structure and relationship between the products of Islamic Micro-finance and the Clients Wellbeing in the perspective of Amanah Ikhtiar Malaysia.

2 The Research Fame and Structural Model

The conceptual model is depicted to show the relationship between the products of Islamic micro-finance (Islamic Micro-credit/Qardhul-hasan, Micro-saving/Wadi'a, Micro-insurance/Takaful) and the clients' wellbeing. Financial exclusion of the poor and their inability to secure employment owing to low literacy level are the major factors that have denied the poor from making a meaningful contribution to national development (Rahman, 2013; GIFR, 2012). To promote a balanced and equitable growth there is the need to have the poorer section of the society to participate meaningfully in the economy (Mohieldin et al., 2011). The conceptual framework consists of five major components: the Micro-credit services, Micro-saving services, Micro-insurance services, Entrepreneurial Empowerment and the Clients' wellbeing.
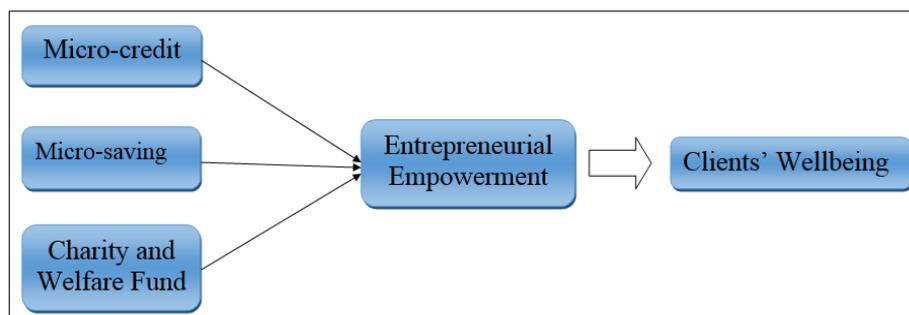
Figure 1   Research Framework and Structural Model

2.1 Micro-credit

This is the initial product offered by Micro-finance institutions. It refers to the small amounts of credit given to the poor people as economic empowerment to enable them generates income through self-employment (Omar et al., 2012). The main objective is to provide low-income people with access to safe, affordable credit to help make them more financially included. Unfortunately, the majority of the programs are unable to cover their financial costs and unable to attain a wider coverage to explore different environments and reach the right people (Rahman & Dean, 2013). Product diversification and the terms of this micro loan are important determinants in meeting the clients' needs (Saad, 2012; Md Saad & Duasa, 2010; Laila, 2010; Praveen, 2009; Rahman & Rahim, 2007). For example, convenient access to a range of Micro-credit products through innovative delivery channels determines that the loan gets to the right people. Flexible Micro-financing terms provides options to the poor. Increasing the size of the loan is important to expand market as well as the size of the micro enterprises. Flexible loan disbursement and repayment facilitates services delivery, time responsiveness and providing adequate information. Moreover, competitive cost and efficiency by the Micro-credit providers all are critical factors for determining the role of Micro-finance services on clients' wellbeing (Kazemian et al., 2014; Nawai and Bashir, 2009). It is important to note that, Micro-credit is the initial offering of the poor which enables them to generate income and entrepreneurial expertise.

2.2 Micro-saving

This is a product that enables the client to enjoy a bigger loan for business expansion and asset accumulation. It takes the form of mandatory and voluntary savings. The low committed periodical savings enable low-income households to inculcate the savings habit towards achieving long term goals such as starting a business, home ownership, education and to have a secure retirement (FSBP, 2011). This is important because capital accumulation is a necessary and sufficient condition for growth and development (Kalu and Nenbee, 2013; Cabraal, 2010). Micro-saving is prelude towards asset accumulation and is a relevant instrument towards future wellbeing (Fiorillo et al., 2014). It is also important for enhancing the capability of the poor to cope with uncertainty shocks, reduce the cost of lending and enhance future growth (Al Shami et al., 2014; Grayson et al., 2013; Tavanti, 2013). More importantly, it provide the saver with the opportunity for enhanced loan repayment and enables easy access to a large size of loan for sustainable growth motives (Rahman, AlSmady and Kazemian, 2015; Fiorillo et al., 2014; Ang, 2010). For sustainability reasons, the poor needs to be encourage towards building future capabilities.

2.3 Micro-insurance/Takaful/Welfare fund

In Micro-insurance offering, concepts such as Tabarru and Ta'awun are important in dealing with unforeseen future uncertainties. The vulnerabilities of the poor people are on how to deal with the deprivations of today and the fears of the unseen tomorrow. Accidents, disasters, diseases are some of the challenges of the poor despite the challenge to break the cycle of poverty (Htay, Sadzali and Amin, 2015; Haryadi, 2006). The Charity and Welfare Fund concepts in the form of Tabarru and Ta'awun that encourages mutual donations are set to address these shocks so as to minimise the tendency of going back to the initial cycle of poverty. This product give protection to the Clients in cases of unexpected emergencies and asset damage or loss (Cabraal, 2010).

However, this emergency coverage needs to be efficient and effective to compliment poverty reduction. Social mission of reaching the poorest poor is still a big challenge for most Micro-finance institutions, and those reached requires more than Micro-credit to solve their problems (Delgado et al., 2015; Prabhakar et al., 2015, Tavanti, 2013). Cooperation among members will go a long way in

subsidising other members and as well serve the social cohesion role in the society (Sharif and Bao, 2013). Some service providers offer Micro-insurance to their clients to achieve this goal. Amanah Ikhtiar Malaysia termed this product as Charity and Welfare Fund, which is contributed voluntarily by clients with religious requirement.

2.4 Entrepreneurial empowerment

Empowerment is increasing the capacity of individuals or groups to make purposeful and effective choices for a better life that brings benefits in terms of greater overall well-being in a society (Smulovitz, Walton and Petesch, 2003). It is the improvement of assets and capabilities of diverse individuals and groups to engage, influence and hold accountable the institutions which affect them (Bennett, 2002; Alsop, Bertelsen and Holland, 2006; Malhotra, Schuler and Boender, 2002). It makes people better equipped to work together, organize themselves, and mobilize resources to solve problems of common interest. Education and training, skills, assets, self-reliance and communal services have been identified to have effect on the clients' performance and improvement in their micro and small businesses (Webster University, 2015; Bartle, 2012).

As outlined in both the New Economic Model and the 10th Malaysia plan, one of the strategies to achieve empowerment is by improving education and providing skills capable of meeting the economic challenges. Eichengreen et al., (2013) have found a positive correlation between economic growth and educational level of the nation. According to Guan et al., (2011), to assure higher productivity and economic growth, there is need to have a critical mass of skilled and knowledge-based workers. It is the key towards a developed country because at its instance, innovation and creative manpower is obtained (Usman and Tasmin, 2015; Othman et al., 2012; Guan et al., 2011). It has been found to be the most significant contributor to poverty alleviation because it reduces the probability of household being poor, regardless of the poverty line being used (Janjua and Kamal, 2001).

The vulnerabilities of the poor people have affected their self-reliance making them with no confidence to contribute towards communal services. This inclusive strategy through Islamic Micro-finance empowerment offer them the ability to reinvent their worth and benefit from increased national growth and as well contribute meaningfully towards national development (Hatta and Ali, 2013). Assets are the stock of wealth that represent the long-term effects of income flows and expenditures, a necessary and sufficient condition for growth and development (Kalu and Nenbee, 2013). They are the foundation of future consumption and wealth, and considered as important indicator of empowerment (Al-Mamun et al., 2012). Quality of life of a household depends on the ownership and quality of household assets. Ownership of asset is an important achievement towards economic viability and self-reliance (Salma, 2004). The more any individual, community or organization has of each of the above elements, the stronger it is, the more capacity it has, and the more empowered it is (Bartle, 2012). Therefore this indicate how successful are initial products offered by Micro-finance in addressing the deficiencies of the poor.

2.5 Clients' wellbeing

There are several varied methods through which Islamic Micro-finance is perceived to have relevance on the client's wellbeing. Rath and Harter (2010) and McCarthy (2010) have outlined that, Career growth, Economic and Social development are key elements in achieving wellbeing. For instance, Islamic Micro-finance Empowerment has been regarded as an important tool for reducing poverty and improving the household's quality of life in terms of better and bigger houses and healthy conditions (Al Mamun et al., 2012). It also plays a vital role in the empowerment of the poor people especially women towards developing their micro enterprises (Omar et al., 2012]. The vulnerability of the poor is reduced and their socioeconomic status improved with better health condition and the education level of their children (Bhuiyan et al., 2011; Md Saad, 2010).

Similarly, it enhances career growth with the significant increase in firm performance especially entrepreneurial values and management practices (Mahmood & Mohd Rosli, 2013; Shirazi, 2012). Therefore, measuring the linkage between Islamic Micro-finance and clients' wellbeing is dependent on both economic and noneconomic dimensions. The empowerment enables the clients to manage the business and make decisions independently and participate in the community with enhanced self-esteem. This status enables them to manage their economic life effectively, reduce stress and increase security (McCarthy, 2010). Therefore, measuring the linkage between Islamic Micro-finance and Clients' Wellbeing is dependent on both economic and noneconomic dimensions. The empowerment enables the clients to manage the business and make decisions independently and participate in the community with enhanced self-esteem.

3 Methodology

In this pilot study, a total number of 32 questionnaires were administered at eight (8) branches of Amanah Ikhtiar Malaysia (AIM) in Johor state, Malaysia. This represent a 10% of the sample population to be used for the field study. A total of 31 responses were retrieved and used for the analysis below, representing about 97% return rate. The descriptors used in the questionnaire for responses were: Strongly disagree, Disagree, Moderate, Agree, and Strongly agree. The pilot data was subjected to three analyses to ensure its normality, reliability and its ability to determine the underline structural pattern of the variables according to the constructs. A descriptive analysis was carried out to examine the normality of the data. The results showed that the data achieved the acceptable normal distribution with skewness and kurtosis within the ranges of +-2 as recommended in George and Mallery (2010). Exploratory Factor Analysis (EFA) was carried out to determine the unidimensionality of the constructs. The unidimensionality was measured by ensuring that all measuring items have acceptable factor loadings. It was also used to identify the underlying data pattern in each construct because there is an inadequacy of research in the area (Gerbing and Anderson, 1988). EFA was also necessary to identify the factors that influence empowerment towards Clients' wellbeing, and also determine the features that "go together" as components (Ishiyaku et al., 2016; Yong and Pearce, 2013). Based on the nature of this study, PCA was used and the extract was based on Kaiser's criteria, which is the SPSS default retention method of eigenvalue greater than 1.0.

4 The Results

Reliability test was carried out to provide a reliable measure of internal consistency of the constructs. This is necessary to identify the variables that need to be deleted to improve the alpha value and ensure that the constructs achieve reliable alpha.

Table 1   Reliability Results

Reliability Statistics		
Constructs	Cronbach's Alpha	N of Items
Wfund	.904	7
Empower	.861	8
Mcredit	.896	8
Msave	.810	6
Cwellbeing	.745	4

The Cronbach's alpha of 0.6 or higher for a component indicates an acceptable internal consistency of items (Awang, 2012). The results in Table 1 indicated that a reliable Cronbach's alpha of more than 0.8 was achieved in all the constructs except Cwellbeing (.745), which is still above the acceptable mark.

Table 2   Exploratory Factor Analysis Results

Rotated Component Matrix									
Components									
1		2		3		4		5	
Mcredit2	.834	Msave2	.821	Wfund2	.843	Empower1	.840	Cwellbeing2	.784
Mcredit1	.818	Msave5	.770	Wfund5	.792	Empower5	.722	Cwellbeing3	.741
Mcredit4	.756	Msave1	.714	Wfund4	.753	Empower3	.694	Cwellbeing1	.691
Mcredit5	.719	Msave6	.699	Wfund3	.735	Empower6	.680	Cwellbeing4	.620
Mcredit11	.608	Msave4	.635	Wfund1	.714	Empower4	.662		-
Mcredit9	.593	Msave7	.606	Wfund8	.689	Empower7	.653	-	-
Mcredit8	.566	-	-	Wfund7	.570	Empower2	.652	-	-
Mcredit7	.561	-	-	-	-	Empower8	.636	-	-

The EFA results in Table 2 indicated good pattern distribution among the variables which showed that five (5) constructs loaded effectively. Therefore, the results indicated that the variables can be grouped effectively into the five (5) constructs based on their characteristics Micro-credit, Micro-saving, Welfare fund, Empowerment and Clients' wellbeing.

5 Discussions

Validity and Reliability defined the adequacy of a data collection instrument. Validity is divided into three (3) namely: content, construct and criterion-related, but at this stages of the study will only cover 'content' and 'construct' validity. The Cronbach's alpha of ≥0.7 (Table 1) is an indication of acceptable internal consistency and reliability of the five Islamic Micro-finance constructs.

The extracted factors for the five constructs (Mcredit, Msave, Wfund, EEmpowement and CWellbeing) revealed the important features that determine Clients' Wellbeing in AIM, which may differ in other studies. The general result revealed that, items which possess similar characteristic are group together, and have satisfied the internal reliability and the construct validity criteria. The analysis of EFA carried out revealed that all the identified factors are relevant and in line with the structural model. The factor loadings of ≥0.5 in table 2 is an indication of the accepted variables moving together. It further revealed that the variables have significance in their respective constructs. Therefore, the measurement models that will be developed later in this study will rely on the validation of the Islamic Micro-finance factors using components, Micro-credit, Micro-saving, Charity and welfare fund, Entrepreneurial Empowerment and Clients' Wellbeing as latent constructs. Hence, it can be used to develop a causal effect model or structural equation model with the Clients' Wellbeing construct as the dependent variable. This invariably means under normal circumstances, there is positive relationship between these Islamic Micro-finance products and the Clients' Wellbeing. It is essential for financial managers, the desirability of these group of offering to address diverse needs of the clients. The high loadings in all the factors is a manifest endorsement by the respondents, who are providers of Islamic Micro-finance.

6 Conclusions

The EFA results revealed the extraction of factors for the five (5) conceptualized constructs of Islamic Micro-finance products (Micro-credit, Micro-saving, Charity and Welfare Fund, Entrepreneurial Empowerment and Clients' Wellbeing). The results indicated the factorability of the variables in line with the conceptual model and hence their correlation structure. This pilot survey result has achieved the objectives of EFA. It has recorded an acceptable internal consistency of the instrument, acceptable factor loadings and has established a good relationships among variables. The study is an attempt to proof the capacity of Islamic Micro-finance and propose how to enhance the contribution of the study variables towards Clients' wellbeing for further validation.

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Feasibility Study of the Methods of Hydrogen Distribution from Ocean Thermal Energy Conversion Power Plant: An Initial Proposed OTEC-Hydrogen Logistics Roadmap

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Abstract: Growing concern over the usage of hydrogen which is anticipated to be one of the promising energy carrier and energy for production platform used in this century. Ocean Thermal Energy Conversion (OTEC) technology will become a large new source of Malaysia energy production for hydrogen whereas hydrogen can be produced via electrolysis using OTEC electricity. OTEC can be a massive alternative to generate large quantities of hydrogen.However, supply and distribution of liquid hydrogen remains a big challenge. There are limit of researches study on liquefied hydrogen distribution from offshore platform to market and end user have been conducted in South East Asia region whereas distributing hydrogen over long distances is one of the most challenging activities, among those related to this energy route. In this communication, this research aim to explore the most suitable and economical mode of hydrogen transportation from OTEC plant to discharging port and to introduces the liquid hydrogen value chain from commercial arrangement until gas transmission and storage by proposing OTEC hydrogen logistics roadmap. This research will adopt a qualitative approach, using the case study method. Information will be collected by semi-structured interview and observation of the expert in industries related area as well as data collected via document analysis. This research shall propose the practical approach to distribute OTEC hydrogen to market and end user together with logistics roadmap as the future guideline.
Key words: OTEC; Hydrogen distribution; Logistics roadmap; Hydrogen

1 Introduction

The progressively high demands of energy usage is growing and fossil fuels are getting insufficient. One of the main problem which impacts our living is global warming which mainly cause by the usage of fossil fuels like coal, petroleum, and natural gas as transportation fuels. Renewable energy, resources which are naturally replaced on a human timescale, such as geothermal heat, sunlight, rain and wind become very significance. Hydrogen is a potential energy carrier which create a sustainable energy value chain(Ball and Wietschel, 2009).

Hydrogen can be produced from several energy sources using means like water splitting, biomass conversion and steam methane reforming. Ocean Thermal Energy Conversion (OTEC) is one of the ways that hydrogen can be produced via electrolysis using OTEC electricity. Generated steam with electrolyte compounds added to improve efficiency is a relatively pure medium for hydrogen production. OTEC can be a massive alternative to generate large quantities of hydrogen(Kazim, 2005).

Pelc and Fujita (2002)mentioned that OTEC can produce fuels via the product electricity including hydrogen, which can be used in hydrogen fuelled cars as well as in the progress of synthetic fuels. For a small city, millions of tons of CO_2 are produced yearly through fossil fuel use, while with OTEC the value is near zero during the operation of devices. OTEC has a high probable to substitute some fossil fuel use.

However, challenge of having hydrogen as by-product for OTEC is transportation, hydrogen can be stored in form of liquid, gas, solid and chemical bonded. Liquefaction of hydrogen commonly use when large volume transport is needed without the use of pipelines(Seifert,2013). Hydrogen is liquefied by cooling it to below $-253°C$ ($-423°F$). Once hydrogen is liquefied it can be stored at the liquefaction plant in large insulated tanks. It takes energy to liquefy hydrogen—using today's technology, liquefaction consumes more than 30% of the energy content of the hydrogen and is expensive. In addition, some amount of stored hydrogen will be lost through evaporation, or "boil off" of liquefied hydrogen, especially when using small tanks with large surface-to-volume ratios(U. S. D., 2013). Hence, to propose technology in logistics and distribution of hydrogen, as well as improved economies of scale, could help lower the cost of transportation and negative impact of OTEC's hydrogen transportation to environment.

2 Hydrogen Production via OTEC

There are various by-product produced by OTEC, fresh water, aquaculture, electric power and liquid hydrogen etc. Liquid hydrogen is one of the main by-product produced by OTEC. Hydrogen is colorless as a liquid. Its vapors are colorless, odorless, tasteless, and highly flammable. Liquid hydrogen is noncorrosive

Hydrogen produced using electricity and desalinated water generated with OTEC technology. Ryzin illustrated the product would be transported from the OTEC plant ship located at distances of about 1,500 km (selected to represent the nominal distance from the tropical oceans to major industrialized centers throughout the world) to the port facility in liquid form to be primarily used as a transportation fuel(Ryzin).

Electrolysis is the process where water molecules are split directly into hydrogen and oxygen molecules using electricity and an electrolyser device. The two most common types of electrolysers are alkaline that uses a potassium hydroxide electrolyte and PEM which employs a solid polymer membrane electrolyte. Based on the estimated cost ranges by the National Academy of Sciences/Engineering and the US Department of Energy (with close agreement), grid power electrolysis in the US would produce hydrogen at delivered costs of $6–7/kilogram (kg) at present, with future potential of about $4/kg. Alternately, the wind electrolysis derived hydrogen would cost about $7–11/kg at present, with future potential delivered costs of $3–4/kg, including the full costs of production from the wind power system. Meanwhile, the electric hydrogen splitting would be more expensive, on the order of $10–30/kg at present, with future delivered costs of $3–4/kg(Lipman, 2011).

Although, the advantages in producing extremely pure hydrogen/oxygen via water electrolysis is known for around two centuries(Stojić,2003) however its applications are still limited to small scale and for unique situations where access to large scale hydrogen production plants is not possible or economical, such as marine, rockets, spacecraft, electronic industry. Presently, water electrolysis represents only 4% of the world hydrogen production(Zeng and Zhang, 2010).

3 Key Technologies in Hydrogen Energy Storage and Distribution

In general, one of the most important fundamental to measure hydrogen economy is technologies in hydrogen storage and the most critical challenges is to improve the storage of hydrogen to be more effective storage, reliable and to consider safety of storage and distribution as priorities.

In transportation industry, hydrogen shall be stored in a light weight and high density. There are three possible mode of hydrogen storage;

In the form of compressed gas as physical storage
In the form of liquefied hydrogen as physical storage
In the form of solid under material based storage(Zhang,et al, 2016)

Table 1   Target and Current Status of H2 Storage Technologies

Storage targets	Gravimetric kWh/kg (kgH$_2$/kg system)	Volumetric kWh/L (kgH$_2$/L system)	Costs \$/kWh (\$/kgH$_2$)
2017	1.8 (0.055)	1.3 (0.040)	\$12 (\$400)
Ultimate	205 (0.075)	2.3 (0.070)	\$8 (\$266)
Projected H$_2$ storage system performance	**Gravimetric (kWh/kg)**	**Volumetric (kWh/L)**	**Costs (\$/kWh)**
700 bar compressed (Type IV)	1.5	0.8	17
350 bar compressed (Type IV)	1.8	0.6	13
Metal hydride (NaAlH4)	0.4	0.4	TBD
Sorbent (MOF-5, 100 bar)	1.1	0.7	16
Chemical hydrogen storage (AB-50 wt. %)	1.7	1.3	16

Source: U.S. Department of Energy (US DoE)

The technical and economical targets for hydrogen storage was set by U.S. Department of Energy (US DoE) to standardize the target for storage system of hydrogen. It is crucial to achieve 7.5 wt.% of gravimetric density and 7.0 wt.% of volumetric density, while the cost of hydrogen should be reduced down to $266 per kilogram(Stetson,2012).

4 Proposing OTEC Hydrogen Logistics Roadmap

Strategic planning is defined as, "the process by which a system maintains its competitiveness

within its work environment by determining where the organization is, where it wants to go, and how it wishes to get there" (Katsioloudes, 2012).

Foresight definition is offered by (Loveridge and Cox, 2013) who describe foresight as 'the act of looking forward'. This is contrary to forecasting, whereby the end-point is a finite forecast, without guidelines or methods for how these will be achieved. Foresight on the other hand, seeks to identify technologies that have a strong influence on the future.

There are various methods for foresight, which should be selected based on their suitability to achieve the activity goals and resources available. The different foresight methods which depicts the different methods according to their inclination level of creativity, interaction, evidence, and or expertise. These methods may be classified as qualitative, semi-qualitative, quantitative, or others.

It is an urge to have appropriate guideline of OTEC hydrogen logistics roadmap which indicate the timeline, compliance and achievement in order to develop logistics flow of OTEC industries. A roadmap made at the level of the industry. "..At the industry level, technology roadmapping for logistics involves multiple companies, either as a consortium or an entire industry (industry technology roadmap). By focusing on common needs, companies' can more effectively address critical research and collaboratively develop the common technologies" (Bray and Garcia, 1997)

Table 2   Proposing OTEC Hydrogen Logistics Roadmap

5 Conclusions

This significance of this conceptual paper is that it proposes OTEC Hydrogen Logistics Roadmap for OTEC industries in Malaysia. This OTEC Hydrogen Logistics Roadmap aims to assist OTEC industry in evaluating the achievement of logistics & distribution of hydrogen produced by OTEC technology. OTEC Hydrogen Logistics Roadmap is useful to provide a guidance consisting of economic and social perspectives to establish and start for hydrogen commercialize.

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Colleges Media Effects System in the Era of Big Data

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Abstract: The world is being more open, the power of freedom is being more decentralized, and the main value of the individual receives unprecedentedly shown underneath the atmosphere of the Big Data era, which is also quietly changing our thinking, behavior and the external environment. The college media gradually develops a communication concept "Data Democracy" and "Self Quantization" on the basis of big data and cloud platform, so that teachers and students could be affected-conducted-served by it, and a more convenient information system has been built as far as possible. College media that triggers a vigorous blossom of "Smart Campus" through the internet and further integration, called High-dimension paradigm.
Key words: Big data; Colleges; Media effects; System

1 Introduction

February 2016, China President Xi Jinping went to People's Daily, Xinhua News Agency, CCTV to inspect, which was a historic event occurred in the field of news media. He said, "The work of the Party's press and public opinion need innovative ideas, content, genre, forms, methods, means, format, structure, mechanism, enhance the relevance and effectiveness."[1]This means that the country attaches great importance to the decision-makers who are constantly exploring the news media's rule in the new age. Media is the easiest digitized industry, also in the forefront of the digital age (Ma Huateng, 2015). As new media technology was reformed and people's right to use the media enhanced, the polymerization and development of media has brought a more powerful media phenomenon - the user has a great deal of participation, can do exchanging of ideas, innovation and information, share things through the network(J.Charles Sterin ,2014)[185], O2O (Online to Offline) mode is developing fast, these factors push the world towards Web2.0, so that millions of users are connected through the network to form a growing, global, interconnected innovation engine. With the growing information data, "big data" have become national and government level development strategy. Data of the "big" lies not only in high-capacity, more significance is that through data exchange, integration and analysis, people can discover new wisdom to create new value and bring great development.

Media Effects Studies emerged with the development of democratic political activity, whose theoretical results are widely used in presidential elections, opinion polls and other political and ecological aspects. From the early "magic bullet theory" view to the "People's Choice"(Lazarsfeld，1944) and then to Neumann's "Spiral of Silence: Public Opinion - Our Social Skin" (Neumann,1980), no exceptions.These theories focused on the audience research. In 2009, US President Obama appointed an Indian immigrant dimension Vivek Kundra as the US federal government's first chief information officer, he established an open data government website, for the full liberalization of government-owned data which offers unprecedented convenience for the general public. As Kundera himself has said, "This is a data democratization movement, we are bringing the power of information into the hands of the American people." (Kundra, 2010) Xi Jinping said at China's eighteenth Politburo Standing Committee to Chinese and foreign reporters: "The people's yearning for a better life is our goal."(Xi Jinping ,2014) People (the audience) is not just the user or consumer of information, they constitute the basic members of the society, they enjoy the "right of communication", "right to know" and "right of access to the media."(Guo Qingguang ,1999). College medias effects research should focus on the study of the effect of the audience, a central issue is how to make information powerfully affect, guide and serve everybody in college.

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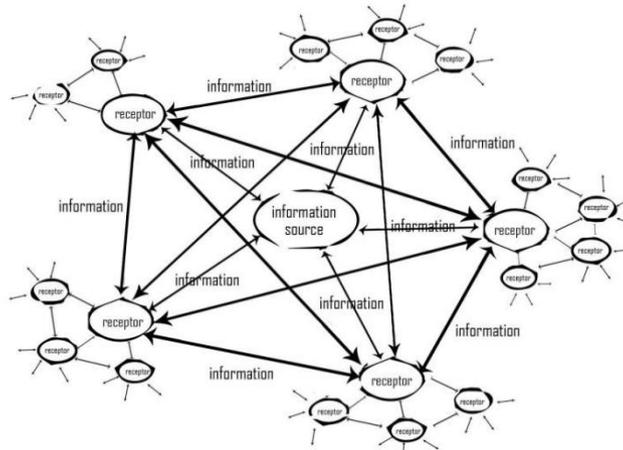
Figure 1   Information Dissemination Mode in Big Data Era

How strong can college media's influence be? And whom does it affect? How can the traditional communication theory explain college internet media effects in big data era? In the famous American media scholar's words, one of the agenda-setting theory creator McCombs, "The play has only just begun." (McCombs, Shaw & Weaver, 2014)

In this paper, we are trying to build an scientific and advanced communication system on college campus based on the media awareness of "Data Democracy" and media behavior of "Self Quantization" through the methodologies of observation, literature study, quantitative research, interdisciplinary research, case studies,etc.

2 College Media Awareness: Data Democracy & College Media Behavior: Self Quantization

2.1 "Audience oriented" -- data democracy

In the 21st century's media-rich world, we have unprecedented demand on the media, because the media content can meet the needs of most of us, both in individual and social aspects, and will choose to keep in touch with the medias who meet these needs. So Internet media launched "Subscription "or "Focus" and other functions, in order to avoid being missed by their users. Some media organizations also use data collection, surveys and other methods to analyze how they can attract the target audiences' attention. Our statistical analysis such as gaming enthusiasts, sports enthusiasts, people with mental illness and other different groups in college aimed the same. Audience "status" has undoubtedly been pushed to a new height.

Have to admit, the digital era influenced a generation and this effect is definitely not in the way of "preaching." Marc Prensky(2001) call the generation grows together with digital media as "Digital Native", and their parents be referred to as "digital immigrants"(Prensky M ,2001) We can say that the disseminating way in the digital age gives a profound impact on China's 90's or 00's, who surrounded by computers, digital audio players, smart phones and a variety of electronic games since they have consciousness. Some scholars said, "They touch the screens as a touch at the foot of the land and the mother's skin " (Yan Yan, Wuhan University, 2014), but the migrants are "still using old, former power era that fragmented time   and space model to think."(Marshall McLuhan ,2011) These phenomena is also because of this era -- inter-generational conflict, shaking culture, concept changing, "Knowledge Gap" theory has been further explained.

"Knowledge Gap" hypothesis originally proposed based on a series of empirical research by the US communication scientist PJ.Tichenor (1970), that the high socio-economic status of people access to information much faster than those of low economic status, the more the mass media deliver information, the deeper the knowledge gap between them will be (Tichenor,P.J ,1970).This hypothesis reflects the social conflicts brought by information polarization. "Knowledge Gap" is also reflected in the gap between China's urban and rural, coastal and inland, east and west. When the use of new media focused on the youth group of highly educated, the old-aged, low-income groups are less likely to use computers and the Internet. As new media technologies emerging, replacement cycles are getting shorter, the trend can be described as "Old channel" is not flat, "New valley" is underway.

General Secretary Xi Jinping on the construction of new media, said, "To solve 'skills panic'

problem, and truly become experts by new means in the use of modern media."(Wan Peng ,2015) "skills panic" is the word used to describe the part of Digital immigrants' psychological traits who are not "arousal"[1] Educators born before the digital age "stumbling to explore in digital age and how can they get ability to educate the digital natives growth in the digital age like duck to water? "(Yan Yan, 2014). In this sense, the challenge of digital media technology progress of educational systems and the concept is far greater than the contribution of educational tools and educational tools(Yan Yan ,2015).

2.2 "Let data speaks" --Self quantization

"Historical records·The prime minister Chen" recorded a story, Chu war, King of Han Liu Bang was besieged by place of overlord Xiang army. Prime minister Chen Ping offered an advice to Liu, "King, 20 kilograms of gold be given, you can set the world." He believes and took 20 kilograms gold to Chen. Chen used the gold to buy Chu soldiers, spread rumors in Chu, as a result, he successfully drove a wedge between Xiang Yu, counselor Fan Zeng and general Zhong Li Mei, which helped Liu win the war. 20 kilograms gold, this seemingly insignificant sum of money in the eyes of Liu Bang, played a key role in the war.Chen Ping used a coup and let the strength of the data work for them. The ancient sages paid much attention to the role of data, not to mention the era of big data today? In recent years, smart phones and other new medias become popular, people not only can recorded their information at any time, but also can transfer it to the "vital records", the result, "Self-Quantized" technology came into being(Wu Jianzhong ,2015)· Now many groups and institutions have begun trying the "digital revolution" and their purpose is self-evident.

China has no shortage of famous person who maximizes numbers, but China's status falling behind in modern history mainly because of the lack of figure spirit. Famous thinker Hu Shi wrote a fable "Mr. Almost"1919, shows his concern about Chinese people's attitude "Everything almost or generally true." An American missionary Arthur Smith wrote a book pointed out Chinese people "ignore precision, think ambiguously" (A.Smith, Chinese Characteristics, 1894).Some scholars believe that it's mainly because Chinese people have a lack of ability to make data speak, as a reason of "heavy in quality and light in quantity"in Chinese language characteristics(Tu Zi Pei,2013). As of December 2015, Chinese netizens reached 688 million, Internet penetration rate of 50.3%, the scale of China's mobile phone users reached 620 million,   the proportion of people using mobile among Internet users increased to 90.1%, online education, health-care network, network of car renting and so have become the scale, the Internet effectively enhance public services[2]. We can say that in the modern era, mastering data is an urgent need for every one of us Chinese people, especially for university medias.

A university in HuBei China made an annual survey on campus media, collected all the data of how they are being operated and explore the law. Information Office of the Ministry of Education published College medias public opinion heat charts in December 2015, provided analysis and reference for universities. The following table (The total heat based on the number of network media reports, the number of print media reports, the forum posts, blog articles, microblog weighted statistics, in which the total heat error does not exceed 0.02).

Table 1   Directly under MOE Positive Public Opinion Heat Top Ten Universities

Ranking	Universities	Network media	Print media	Forum	Blog	Microblog	Total heat
1	Tsinghua University	6286.41	480.00	114.15	95.85	262.60	7239.01
2	Beijing University	3864.90	326.50	69.15	71.65	872.47	5204.67
3	Fudan University	1689.09	171.00	36.85	35.45	54.86	1987.25
4	Zhejiang University	1534.26	193.50	71.05	22.05	36.14	1857.00
5	Renmin University of China	1565.07	122.00	19.60	18.90	27.24	1752.81
6	Wuhan University	1444.56	137.00	36.85	20.85	73.25	1712.51
7	Beijing Normal University	1041.69	95.50	16.75	21.65	77.99	1253.58
8	Tongji University	925.08	95.00	8.85	10.80	30.85	1070.58
9	Zhongshan University	860.34	93.50	12.10	10.55	29.45	1005.94
10	Shanghai Jiaotong University	862.29	66.00	10.05	13.00	29.31	980.65

It may be noted from the table that, network media and print media is still the positive reports

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[1] "Arousal"defined in cognitive psychology as "Individual physical and mental alertness" (Psychology Glossary, 2014a) ,arouse allows people to find the things needed to survive, and to learn from different survival skills.
[2] source: CNNIC: 2015 37th statistical report on Internet development in China [R / OL] (2016.1.22).

medias on which colleges rely heavily, only the number of Beijing University using the microblog reported more than paper media, and forum that gradually fading remains schools' public opinion work force to be reckoned with. Also it has a similar effect when these college medias were in a negative public opinion response. This tells us that colleges are committed to building a media data platform, so that teachers and students state of mind can be concerned, information be sorted and date be analyzed, then the public opinion in some of the hot spots be edited and submitted to the school decision-making department, and timely feedback be given through the appropriate media channels, as a result, campus media become the communication link and teachers and students can be better served.

Some scholars have also carried out research on students' credibility to part of new medias. They used a Likert scale[1] to count the fairness, unbiased, completeness, accuracy, reliability, and other five indicators perception to the medias, to examine young students' credibility of new media for different types of secondary channel, results are as follows:
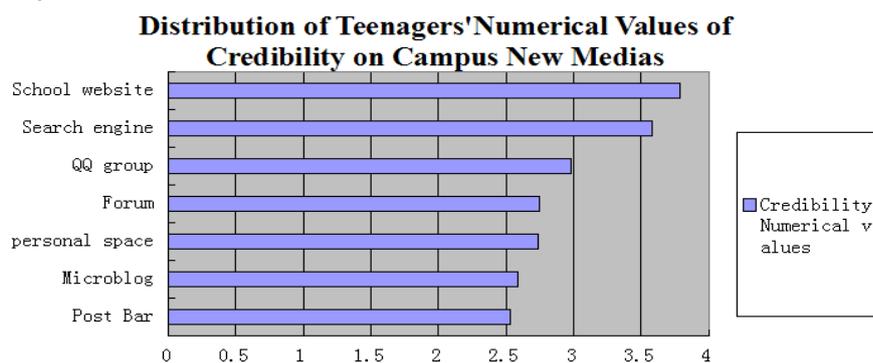
Figure 2   Distribution of Campus New Medias' Credibility to Teenagers [2]

It shows, school website has the highest credibility to teenagers, in addition to the school sites and search engines, the other medias' credibility scope is lower than 3, which is indicating that the students' attitude towards web information is cautious. For the information on the school website, they are either participants or witnesses, which greatly improved their reliability. Search engines are tools teens actively searching for information, they tend to get more credible in information on their own initiative rather than passively pushed information. QQ group's credibility shows the teenagers' rationality among human interaction online, neither blind trust nor excessive suspicion. Representatives as Microblog, post bars whose information are anonymous or semi-anonymous have the lowest credibility, they are more inclined to entertainment. Of course, the young students' media reliability value is also affected by many subtle influence of demographic factors and media technology environment. On campus media itself, in order to establish credibility among the students, it is necessary to make overall arrangement and functional orientation according to the merits of the various campus media, and avoid weaknesses, to meet the personality traits, experience and habit of college students, "take the lens down " and come close to life, so that let media and information be really into students.

Some universities have begun to use Wechat Communication Index (WCI) to evaluate campus Wechat public account's spreading power. WCI utilizes 7 indicators: total reading number(R), average reading number(R/N), max reading number(Rmax), total thumps-ups(Z), average thumps-up number(Z/N), max thumps-up number (Zmax) and thumps-up rate(Z/R), each be given different weights, then compare and operate with each other, logarithmically standardized them, so that to arrive at a comprehensive evaluation. The weighted WCI is calculated as:

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[1] Likert scale is one of most commonly used sum formula Rating Scale, which improved by American social psychologist Likert based on the original sum scale in 1932. The scale consists of a set of statements, each statement contains "strongly agree", "agree", "not really", "disagree", "strongly disagree" Five answers,each recorded as 5,4,3, 2,1. The Total score of each respondent's attitude is the answers resulting scores summed,the scores may indicate strength or the different states on this scale's attitude.
[2] The data is extracted from the "Digital Native Aggregation and Differentiation - Hubei Teenagers New Media Using Report" Yan Yan,2015.

$$WCI = \begin{cases} [65\% * \ln(60\% * R + 30\% * \dfrac{R}{N} * 5 + 10\% * R_{max} * 3) + 35\% * \ln(60\% * Z \\ + 30\% * \dfrac{Z}{N} * 4.5 + 5\% * Z_{max} * 2 + 5\% * \dfrac{Z}{R} * 1000)]^2 * 10, \ R \geq 1000 \\ \\ [65\% * \ln(60\% * R + 30\% * \dfrac{R}{N} * 5 + 10\% * R_{max} * 3) + 35\% * \ln(60\% * Z \\ + 30\% * \dfrac{Z}{N} * 4.5 + 10\% * Z_{max} * 2)]^2 * 10, \ R < 1000 \end{cases}$$

WCI indicators quantifies the spreading heat of school's Wechat public accounts, staff of campus media workers can easily notice the rule of deeper propagation via comparative analysis. Affected by communication content, speed, student preferences and other factors, WCI of each Campus Wechat public account may exhibit alternating cycles, the numbers shifting quickly, an obscure account may become famous by a public event.

2.3 Media aggregation

2014 can be the first year of China's media convergence strategy, mainly due to the strong call and mobilization of Media aggregation issued by the center of CCP media(Cui BaoGuo ,2015). The ultimate aim is to enhance cyberspace culture building capacity by both traditional and new media. Many colleges tried hard to integrate the campus media, however, so far most of this integration is still in its simple form restructuring, because of the influence of the media content, the traditional mode of transmission, media workers' ideological views and other factors. Industry specializing in surgery, each media's unique business model cannot be replaced completely by others, for example, although videos can be widely spread on the web, it still cannot replace TV's audiovisual effects and wide-screen, microblog's debris information cannot replace the information on the website with depth and breadth in content. However, no matter how difficult of the integration, campus media eventually moving towards Internet technology. It's better to say aggregation rather than integration.

The BBC has integrated its radio, television and websites editorial departments into a unified newsroom, reporters implement unified management, all medias operations as one. After the interview, the reporter received a task of feeding all the medias of BBC, and its different editors take different "deep processing" and then make new "permutations and combinations" again, produce various news products. Content sharing has become a trend in campus media today. On the same news content, the newspaper can do depth reports; official news network carry out online publishing; radio and television focus on audiovisual effects; microblog, Wechat use their fast-oriented, short and interactive features, build new media matrix and present the news to teachers and students timely ... The traditional campus media's news gathering ideas, channels, platforms have been put higher requirements, in addition to master the internet technology, colleges and universities should take content development as a fundamental, use their own advantages, to create a fully compatible open media platform, and to match their sustainable development.

Although media aggregation brought incalculable disseminating result to campus media, the negative effect is also worth considering. Aggregated media has greatly improved the user's active participation in the new media that tend to blur the boundaries between professional and amateur (media content producers). Many young students often feel more privacy in the web circumstance than in real life social situations. But unfortunately, this perception about anonymous widespread neglects a very real problem: Any content published on the web will be forever existed. The information they published might be obtained by any people, if it is considered to be "inappropriate", then the information is likely to bring them trouble even disaster. Besides growing up in the digital world, how much can these young "Digital Native" sense that negative information on the network? New media makes it possible that any member of a school can be a reporter, and campus media "gatekeepers" teams mostly composed by students, at the premise of mobility, improving the campus media student workers' checking abilities and media literacy is emergency.

Tencent has launched the "Smart Campus" program, in cooperation with colleges and universities to carry out these attempts, which refers to an intelligence working, living and researching integrated environment based on big data and internet of things. What we must thoroughly consider are: education policy-makers need to possess modern technology and advanced educational philosophy; how can students participate and occupy a certain position in the entire process, and let it close to the students' daily life; how does interscholastic mutual coordination and sharing of resources make sense. "Smart

Campus" ultimate goal is: make continuous development of science and technology as a means to improve the efficiency and quality of education step by step, to make the perfect combination with media and school teaching, to achieve a "high-dimensional" phase of campus media communication effect, truly fulfill what General secretary Xi Jinping said - "Innovative, Harmonious, Green, Open, Sharing"[1]

3 Conclusions

Media effects is the "core" issue of mass communication research(Wei Ran ,2016). In addition to the teachers for their knowledge dissemination, campus also filled with all kinds of media, teachers and students intentionally or unintentionally receive and convey vast amounts of information via media. Universities in a sense is a media agency, which spread the culture, wisdom, Concepts, ethics, communication effects research is particularly important. Scholars divided the effect of media transmission into three levels: the effect of environmental awareness, effect of values formation and maintenance, effect of social behavior demonstration [189.From] Comprehension to reaction, this process is an accumulating process of effect. This paper gives a brief idea on building a scientific communication system in college based on the media awareness of"Data Democracy"and media behavior of "Self Quantization".

Media effects based on audience research is an important topic at colleges and universities in the data media background, the media should play an important role in university education, in addition to improve the hardware and technical "Time Match", but also need innovate the media awareness and education mechanism. Although the "All Media Campus" is the form students loved, but if you do not consider the needs of the audience, just use rigid, step by step ads, you cannot walk to teachers and students, and get them accepted. In the era of big data, universities should play the superiority of "data democracy" in an important role, so that information can be owned and used by teachers and students which as a result benefit them all.

At big data era of renewal, our understanding on campus media effects paradigm has been unable to stay fully on the theoretical basis of the traditional communication studies, it must be judged on the point of development and transmission. We carry out our research on the angles that, put the audience in their living social environment, put campus media in the whole society and entire Internet perspective, so that make data promising.

Acknowledgement

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An Empirical Research on the Effect of Emotion on Consumers' Repurchase Intention under the Service Recovery Situation

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Abstract: With the accelerated development of the Internet, the Internet driving force on economy is strengthening, a series of new changes have also been made in the service industry. At the same time, marketing homogenization, weakness of customer relationship management, service failure and other issues also continue to appear. Based on the questionnaire survey, this paper uses the method of scene simulation, exploring the emotional response mechanism of consumers under different recovery situations, the results show that: the difference of service recovery combination is the main factor that leads to different emotional responses, and the economic recovery is the most influential factor.
Key words: Service recovery; Emotion; Customer satisfaction; Repurchase intention

1 Introduction

In 2016, a survey was conducted by China Central Television on consumers' rights and interests. "Are you hungry" takeaway platform enterprise was exposed, it had the problem of guiding the businesses to show the false location and photos and other problems. This event not only received extensive attention, but also made the consumer seriously doubt its service quality. With the rapid development of modern service industry, the service concept has been increasingly integrated with the factors of the times, which constantly gives its new connotation. Homogenization of services has intensified the competition in the market, and customer loss caused by service failure is an urgent problem to be solved by service providers. In the case of shrinking profit margins, how to improve the purchase intention of consumers is particularly important. As a new form of service industry, the network catering takeaway, due to the timeliness, virtualization and other features, is more prone to service failure.

As for the relevant research, the first definition of the emotional infection: people in interaction, will be unconsciously influenced by other people's facial expression, voice, movement, etc. and imitate, will continue to grasp the feelings of others (Hatfield.Cacioppo and Rapson, 1993); The method of scene experiment was used, verified that the theory of emotion in the service process would have a impact (Henning-Thurau, Groth, Paul and Gremler, 2006); The emotional response of consumers would be triggered by service failure (McColl-Kennedy and Sparks, 2003); Based on the context of network retail, scholars analyzed the effect of relationship quality on consumer's behavior intention, emotion and several aspects of fairness (Zhang Chubing et al, 2014); Taking an hotel as an example, scholars set up the same service failure scenarios to study the effects of customer relationship and service recovery measures on customer's behavior and emotion (Zhang Shengliang, Zhang Xiaobing, 2013); The study of the effect of the service recovery quality on consumers' behavior intention　was conducted under the online shopping environment (Ma Peng, Xia Jiechang, 2014). Through the review of relevant literature, scholars verified the effect of consumer sentiment on service recovery after service failure from different angles. But the research of the relationship among service recovery, emotions and purchase intention is not much, especially in the network takeaway food, the related research content is less, so this paper has certain research value.

2 Research Assumptions

Combined with existing research conclusions, this paper divides the dimensions of relationship benefits under the service recovery into three categories: social benefits, psychological benefits and economic benefits. From the interests of customer relations, the service recovery is divided into social recovery, psychological recovery and economic recovery. These three remedial scenarios contain the different specific remedial actions. social recovery: apology; psychological recovery: initiative, timing of recovery, fairness; economic recovery: compensation. Each of these three remedial dimensions can be subdivided into two intensities of the remedial quality, and can be divided into the following 4 groups:

Group1: high social, high psychological and high economic recovery (three high recovery scenario);
Group2: low social, low psychological and low economic recovery(three low recovery scenario);

Group3: high social, high psychological and low economic recovery/low social, high psychological and high economic recovery; Group4: high social, low psychological and low economic recovery/low social, low psychological and high economic recovery.

In these 4 different recovery scenarios, consumers' emotions and repurchase behaviors will be significantly different, thus this paper has put forward the following assumptions:

H1a: the positive emotion of consumers is the highest in group 1, is the lowest in group 2, is higher in group 3 than group 4; H1b: the negative emotion of consumers is the lowest in group 1, is the highest in group 2, is lower in group 3 than group 4; H1c: the repurchase intention is the highest in group 1, is the lowest in group 2, is higher in group 3 than group 4.

Some scholars believe that, in the context of service recovery, customer perceived justice will affect customer satisfaction and behavior, and will ultimately lead to two extreme emotions: happy and anger, and ultimately influence the repurchase intention. Therefore, we can put forward the following hypothesis in each dimension:

H2a: social recovery and the positive emotions after recovering are positively correlated; H2b: psychological recovery and the positive emotions after recovering are positively correlated; H2c: economic recovery and the positive emotions after recovering are positively correlated; H2d: social recovery and the negative emotions after recovering are negatively correlated; H2e: psychological recovery and the negative emotions after recovering are negatively correlated; H2f: economic recovery and the negative emotions after recovering are negatively correlated; H2g: social recovery and the repurchase intention are positively correlated; H2h: psychological recovery and the repurchase intention are positively correlated; H2i: economic recovery and the repurchase intention are positively correlated.

Finally, about the relationship between service recovery and consumer repurchase intention, some scholars proved that positive and negative emotions have a significant impact on satisfaction. The following assumptions can be obtained:

H3a: the positive emotions after recovering and the repurchase intention are positively correlated;

H3b: the negative emotions after recovering and the repurchase intention are negatively correlated.

3 Research Design

3.1 Questionnaire design

The whole idea of this paper is to design the questionnaire, the questionnaire is divided into four parts: the first part is the basic information of the investigators, which is used for the descriptive statistics analysis; the second part is the description of the service failure scenario; the third part is the description of the service recovery scenario; the fourth part is the questionnaire item, which uses the seven volume table.

3.2 The table design

In the questionnaire, the dependent variables and mediating variables were measured. In order to improve the scientificalness and effectiveness of the questionnaire, it can reflect the real situation of the respondents. This paper has consulted a large number of related literature, which is used for reference in the design of the scale. As shown in table 1-3.

Table 1   Service Recovery Situations

Variables	Dimensions	Measurement items
Social recovery	Apologize	When complaining, the seller will take the initiative to admit
		After complaining, the seller will apologize sincerely
		After complaining, the seller's attitude is good
Psychological recovery	Recovery initiative	I will be informed in advance the possibility of failure
		Before I complain, the seller is able to take the initiative to inform me and make a remedy in time
		I will be informed of the progress and results
	Recovery opportunity	After complaining, the seller's response is very fast
		The seller can solve the problem quickly
		Web design can make it easy for me to contact the responsible person
		The recovery system is simple and clear, the implementation process is reasonable
	Fairness	After communicating with others, find the seller's recovery make me fair
Economic recovery	Monetary compensation	The seller provides a reasonable compensation scheme
		The compensation scheme will be adjusted because of my request

Table 2 Consumers' Emotions

Variables	Dimensions	Measurement items
Emotions	Positive emotions	The service recovery experience made me feel happy
		The service recovery experience made me feel excited
		The service recovery experience made me feel relaxed
		The service recovery experience made me feel touched
	Negative emotions	The service recovery experience made me angry
		The service recovery experience made me regret
		The service recovery experience made me disappointed
		The service recovery experience made me mad

Table 3 Consumers' Repurchase Intention

Variables	Dimensions	Measurement items
The repurchase intention	Expectations and performance	I would like to patronize the business again
		When friends and relatives consulting me, I would like to recommend this seller
		I would be very willing to buy more things in this seller

3.3 The description of scenario simulation

This paper is a study of the emotional changes, need to have a better understanding of the emotional response mechanism, so choosing the scenario simulation method as the main method. This method has good internal validity and is suitable for different situations. It can avoid the memory bias caused by time factor. According to the description and classification of the service recovery scenarios, the service failure and recovery scenarios are designed as follows:

The service failure scenarios focusing on network takeaway food logistics distribution, is designed for 2 * 2 * 2, mainly through apology, service attitude, response speed and economic compensation to show the quality of social recovery, psychological recovery and economic recovery.

Network takeaway food logistics distribution service failure scenario: This is a weekend at 11 o'clock in the morning, cold and windy winter, lying in a warm bed you don't want to braved the cold to go out to dinner, so you pick up the phone, open a takeaway app, after some careful selection, you find a good business, then you choose the favorite dishes, and immediately distribution, then wait for the arrival of the delicious. But half an hour, an hour, two hours later, suddenly you find that now is already at 1 o'clock in the afternoon, at this time you have been hungry very much, you are angry and finding the business phone to make a complaint.

Network outside catering service recovery scenario (group 1): you pick up the phone and dial the business phone, the telephone soon put through, a beautiful sound "Hello! Thank you for calling XXX restaurant, what do you want me to do for you? "You say your problem and then she quickly says "I'm very sorry, your meal was in the delivery, I will immediately contact the staff and ask the reason, and make him send as soon as possible, to express our apology, we will present you with cash coupon, for the inconvenience caused to you we are very sorry." After hanging up the phone, you browse the website, and find that most of the customers thought that the service attitude was very satisfied, the compensation was reasonable, then less than five minutes you receive a call from the delivery service, and receive the cash coupon.

3.4 The pre-investigation and questionnaire adjustment

After the completion of the preliminary design of the questionnaire, selecting the Wuhan University of Technology as the investigation site, 20 college students were randomly selected, communicating with them when they filled in the questionnaire, to learn about their views on the questionnaire. Through them, some problems were found in the questionnaire items, such as: the repetition of meaning. For example: in the table of the consumer repurchase intention, the last item "I would be very willing to buy more things in this seller." and the first item "I would like to patronize the business again.", the meanings of these two items are a little bit repetitive, so deleting the last item.

4 The Model Validation and Analysis

In this paper, we selected three universities in Wuhan, in which 90 students were randomly selected as the research object, making sure that multiple grades were involved to ensure the validity and the scientificity of the sample. Recovery of 250 questionnaires, excluding invalid questionnaires, 230 questionnaires were kept, 113 boys and 117 girls.

4.1 The reliability analysis

The premise of ensuring the real and effective statistical data is the reliability and validity analysis, the results of repeated measures need to be consistent. In this paper, we selected the alpha coefficient, and found that the design of the scale of the alpha coefficient were above 0.7, indicating that the questionnaire design has a good internal consistency, the reliability is high.

Table 4   Reliability Analysis

Variables	Alpha	Survey items
Social recovery	0.812	3
Psychological recovery	0.855	8
Economic recovery	0.901	2
Positive emotions		
Q1	0.902	1
Q2	0.885	1
Q3	0.927	1
Q4	0.912	1
Negative emotions		
Q5	0.875	1
Q6	0.918	1
Q7	0.890	1
Q8	0.902	1
Repurchase intention		
Q1	0.916	1
Q2	0.935	1

4.2 The validity analysis

Validity is that the results can reflect the level of the content of the survey, the closer to the results obtained and the content to be investigated, the higher the validity of the results. In this paper, the variables and items designed were making full reference to the previous research results, based on a large number of literature and the actual situation of online catering takeaway and consumers, with a certain content validity. First, KMO test and Bartlett test of the spherical degree.

Table 5   KMO Test and Bartlett's Spherical Degree Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin metric for sampling sufficient degree		0.756
Inspection of Bartlett's degree of roundness	Approximate chi square	1082.621
	df	32
	Sig.	0.000

From the above test results, KMO value is 0.756, and through the s' Barlett spherical test (P < 0), which indicates that the data has the condition of factor analysis. Then, using the variable degree of test to evaluate the effect of factor analysis, common degree of variables can reflect the influence degree of the various items, generally speaking the value greater than 0.5 indicates that the effect of factor analysis is ideal. Through the analysis, it is found that the index of these items are all more than 0.5, which is more than 0.7, which shows that the factor analysis is more ideal. Therefore, the design of each item in the questionnaire is reasonable, and can clearly reflect the problems to be studied.

4.3 The variance analysis

According to the hypothesis condition H1a-H1c, the method of multivariate analysis of variance and variance analysis is used to test. Test results are shown in table 6.

Table 6   The Multiple Factors Variance Analysis of Customer Emotion after Service Recovery

Independent variables / Dependent variables	Service recovery scenarios				
	III type sum of squares	df	mean square	F	Sig
Positive emotions after recovering	705.264	3	235.088	194.566	0.000
Negative emotions after recovering	588.963	3	196.321	163.233	0.000
Consumers' repurchase intention	871.695	3	290.565	275.695	0.000

As can be seen from table 6, the impact of service recovery on the positive emotion, the negative emotion and repurchase intention is significant. In different service recovery scenarios, these variables will be significantly different, and then continue to carry out a number of variance analysis to do further tests, test results as shown in table 7.

Table 7 The Variance Analysis of Emotion and Repurchase Intention after Service Recovery

Positive emotions after recovering				Negative emotions after recovering				The repurchase intention			
Group2	2.67			Group1	2.33			Group2	2.23		
Group4		3.13		Group3		3.28		Group4		3.04	
Group3			4.23	Group4			4.12	Group3			3.98
Group1				4.69	Group2				4.57	Group1				4.69

Results can be seen from table 7, by comparison, the figures of groups in the table by size sort, and then divided into a number of groups. Three variables in different recovery situations fall in different groups, indicating that in different recovery situation, three variables appeared significant differences. Through analyzing of the size of the variable value, the figures of the positive emotions after recovering and customer repurchase intention consensus ranking, and the figures of the negative emotions is sorting by reversals, which is consistent with the hypothesis, so verifying the H1a-H1c.

4.4 The correlation analysis

For H2a-H2i and H3a-H3b, in order to verify the relationship among the variables in the hypothesis, conducting the Pearson correlation analysis method by using the SPSS17.0. The value of r is generally between - 1 and + 1: if r > 0, two variables are positively correlated; if r < 0, two variables are negatively correlated. The greater the value of the absolute value of r, the stronger the correlation between variables.

Table 8 The Correlation Analysis

Variables \ Dimensions	Social recovery	Psychological recovery	Economic recovery
Positive emotions	0.668	0.789	0.876
Negative emotions	-0.68	-0.738	-0.856
Repurchase intention	0.723	0.698	0.836

From the table 8, we can see that in the 0.01 significant level, the three dimensions of service recovery are significantly positively related to the positive emotions after recovering; The three dimensions of service recovery have a significant negative correlation with the negative emotion after recovering. Among them, the correlation coefficient of the economic recovery and the emotions after recovering is the biggest. And, the three dimensions of service recovery are significantly positively correlated with the repurchase intention of consumers, which can verify H2a-H2i.

Table 9 The Correlation Analysis of Emotion and Repurchase Intention after Service Recovery

Variables \ Dimensions	Positive emotions	Negative emotions
Repurchase intention	0.889	-0.765

As can be seen from the table 9, in the significant level of 0.01, the positive emotions after recovering and repurchase intention are positively correlated, the negative emotions and repurchase intention are negatively correlated, which can verify H3a-H3b.

5 Conclusions

Based on several different dimensions of service recovery, this paper exploring the emotional response mechanism of consumers under the service recovery situation in different recovery situations. Through the method of scene simulation, it is proved that the emotional display of the merchant will affect the customer's emotion, and it will also affect the customer's repurchase intention directly. The difference of service recovery combination is the main factor that leads to different emotional responses, among which the economic recovery is the biggest influence factor, and the emotion will have a big impact as the middle factor. Therefore, this paper puts forward the following suggestions, enterprises should combine the use of a variety of remedial methods, and strengthen the emotional control and response training of employees, should develop and improve the service recovery plan in advance. Hope in the future, be able to collect more comprehensive sample data, and be able to conduct a comprehensive analysis of different industries.

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Financial Inclusion in Rwanda: An Overview

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Abstract: Financial inclusion is a major policy concern with governments across the world. Rwanda as a country with fast development averaging to 6.9% from 2011 to 2015 has done an improvement in financial inclusion as well. This country with stable growth interested the researchers to know whether this development goes hand in hand with financial inclusion. This paper is an attempt to show the overview of financial inclusion in Rwanda. Secondary data from Rwanda Fin scope survey 2008, 2012 and 2016 were used in this study. Apart from that, this paper uses data from Banque National du Rwanda from 2011 to 2015. Many researches were conducted on financial inclusion in different countries but none of them took Rwanda as a special case. The results show that there is an improvement in financial inclusion in Rwanda as the number of financially excluded dropped from 52% in 2008 to 11% in 2016.The problem is that the number of banked adults did not increase from 2008 to 2016. Banked adults in Rwanda were 14% in 2008, 23% in 2012 and 26% in 2016.This shows that many Rwandan adults are not banked. The government should continue to mobilize citizens to join banks. Mobile payment improved tremendously and this should be strengthened and more regulated as it is serving many Rwandans.
Key words: Financial inclusion; Financial exclusion; Rwanda

1 Introduction

Rwanda has got high economic growth from 2011 to 2015. The economic growth is averaged to 6.9% from 2011 to 2015(BNR, 2016). Financial inclusion which is considered as a key enabler of achieving development and poverty reduction objectives is of paramount importance in both developing countries and developed countries. Many researches have been conducted worldwide to know the financial inclusion in different countries. Likewise, there are many researches about financial inclusion in Africa (Triki & Faye, 2013; Demirgüc-Kant & Klapper,2012) as a continent. This paper is an attempt to show the financial inclusion in Rwanda as a particular country which has come from terrible genocide to fast economic growth.

The Government of Rwanda has set the target of formal financial inclusion at 80% of adult population by 2017 and 90% by 2020(BNR, 2015).

Globally, financial inclusion is a major policy concern with governments across the world. The lack of access of a large percentage of working age adults to the formal financial sector is a genuine global policy concern(Arun & Kamath, 2015).

The world bank defines Financial inclusion as the proportion of individuals and firms that use financial services[1].This is again defined as the process of ensuring access to financial services (savings, insurance, remittance, payments, etc.) and timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost(Bhanot, Bapat, & Bera, 2012).According to Sharit, financial inclusion means making financial services accessible to the poor, giving them credit facilities that suit their needs and generate self-employment opportunities for them(Bhowmik & Saha, 2013).Lastly, financial inclusion can be defined as delivery of banking services at an afford- able cost to the vast sections of disadvantaged-aged and low-income groups(Dev, 2006).

Considering the points of views of the above authors, we can briefly say that financial inclusion is the access to financial services. Those who do not have access to financial services are financially excluded.

Financial exclusion is defined as 'the inability to access necessary financial services in an appropriate form(Carbo Sntiago, Grdener Edward, 2005).This is again defined by Leyshon and Thrift as cited by Koku as "those processes that serve to prevent certain social groups and individuals from gaining access to the financial system"(Koku, 2015).

It is evidenced by many authors that financial inclusion is of paramount importance. Demirgüc-Kant & Klapper said that without inclusive financial systems, poor people must rely on their own limited savings to invest in their education or become entrepreneurs—and small enterprises must rely on their limited earnings to pursue promising growth opportunities. This can contribute to persistent income inequality and slower economic growth(Demirgüc-Kant & Klapper, 2012).Financial inclusion

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leads to female empowerment(Ashraf, Karlan, & Yin, 2010).

Continuing showing the importance of financial inclusion, Demirgüc-Kant said that access to the formal financial system can increase asset ownership and serve as a catalyst to greater economic empowerment among women(Demirgüç-Kunt, Klapper, & Singer, 2013);Financial inclusion brings many welfare benefits to individuals(Allen, Demirguc-Kunt, Klapper, & Peria, 2016); building financially inclusive societies can lead to reduction of income inequality(Pais, 2011);financial inclusion is important for improving the living conditions of poor farmers, rural non-farm enterprises and other vulnerable groups(Dev, 2006);

Much of literature has shown financial inclusion worldwide. Examples include: Understanding financial inclusion in China(Fungáčová & Weill, 2014);financial inclusion in north-east India(Bhanot et al., 2012); Financial inclusion and social financialisation: Britain in a European context(Stephen Sinclair, 2013);Consulting the community: Advancing financial inclusion in Newcastle upon Tyne, UK(Fuller, Mellor, Dodds, & Affleck, 2006); Financial inclusion of the poor: from microcredit to Islamic micro financial services(Hassan, 2015); Financial inclusion and its determinants: evidence from India(Kumar, 2013); Integrating financial inclusion and saving motives into institutional zakat practices: A case study on Brunei(Md, 2015) to cite little.

In Africa researches on financial inclusion have been conducted for a continent as whole.

For example: Financial inclusion in Africa (Triki & Faye, 2013).Not only Triki&Faye but also Demirgüc-Kant & Klapper wrote on financial inclusion in Africa(Demirgüc-Kant & Klapper, 2012).To the best of researchers knowledge, there is no scientific research conducted about financial inclusion in Rwanda.

According to the Finscope survey in Rwanda conducted in 2008, only 14% of adult Rwandans were formally banked(Finscope Rwanda, 2008).This has led to setting strategies of improving financial inclusion in Rwanda. As said by Triki&Faye, financial inclusion is necessary to ensure that economic growth performance is inclusive and sustained(Triki & Faye, 2013).This paper has the purpose of showing financial inclusion in Rwanda. It is significant for decision makers especially the government of Rwanda, as it highlights the real image of formally banked adults in Rwanda and non-banked, the formally financially inclusive and informally financially inclusive. This will help in making decisions based on real facts. It is in this regard that this paper attempts to show the overview of financial inclusion in Rwanda. To achieve this general objective, the following specific objectives were formulated:

To know he number of formally banked adults in Rwanda from 2011 to 2015; To identify the number of adults in Rwanda with credits at a regulated institution from 2011 to 2015; To identify the number of modern payment users in Rwanda from 2011 to 2015.

This paper is divided into Abstract, introduction and literature review, data and methodology, results and finally conclusion and recommendations.

2 Data and Methodology

Secondary data from Finscope 2008, 2012 and 2016 were used in this research. Finscope is an independent survey conducted after each four years for the purpose of knowing the financial inclusion in a country. This is approved and published by the National Institute of Statistics in Rwanda and it is on its official website. The same surveys are approved by Banque Nationale du Rwanda. In addition to this, data from Banque Nationale du Rwanda were used in this paper. Monetary policy and financial stability reports were used for the year 2011 to 2015.The five years were chosen because there was a reform supporting access to finance in Rwanda which resulted in starting UMURENGE SACCOs.

3 Results

As said above, data used in this research are secondary data from Banque Nationale du Rwanda and Finscope reports. Finscope Rwanda was conducted for the first time in 2008.The second was conducted in 2012 and the third was conducted in 2016.Finscope Rwanda 2008 revealed the following: only 14% of adult Rwandans were formally banked. That is only 518,423 people among more than 3.7 million adult people[1].

In addition to this, Finscope 2008 revealed that: More than half of the Rwandan adult population

(52%) manage their lives without using any kind of financial product (formal or informal). This is to say that 52% of Rwandans were financially excluded. More than half (54%) of the 47% of Rwandan adults who used financial products, used informal products.

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[1] FinScope Rwanda survey 2008

Over the four years, an improvement has been done to have more financially included citizens in Rwanda. This is highlighted by Finscope 2012.

Financial exclusion has dropped by 46% since 2008.

1) In 2008 52% of adults (i.e. individuals 18 years or older) were financially excluded; in 2012 28% (1.3 million adults) are excluded and 72% (3.2 million adults) of Rwandan adults have or use financial products or mechanisms.

2) In 2008, 21% of adults were formally served; this proportion increased to 42% in 2012.

The increase in formal inclusion was caused by an uptake of banking products, and of products offered by non-bank formal financial institutions (such as Umurenge SACCOs and insurance companies).

3) The banked population increased from 14% of adults in 2008 to 23% in 2012.

4) The establishment of Umurenge SACCOs has significantly changed the landscape of formal access in Rwanda. This intervention has been successful in providing formal financial services to Rwandans who would otherwise not use formal financial services.

5) 22% of adults benefit from Umurenge SACCO products[1].

As shown by highlights of Finscope 2012, there was an improvement in financial inclusion from 2008 to 2012.

Finscope 2016 shown a tremendous improvement of financial inclusion in Rwanda.

Following is the summary of Finscope 2016:

In total, 89% of adults in Rwanda are financially included (including both formal and informal financial products/services, around 5.2 million individuals). About 68% of adults in Rwanda have/use formal financial products/ services (around 4 million individuals), including banked and other formal (non-bank) financial products/services. About 26% of adults in Rwanda are banked (around 1.5 million individuals). About 65% of adults in Rwanda have/use other formal (non-bank) financial products/services (around 3.8 million individuals). In total, about 72% of adults in Rwanda use informal mechanisms (around 4.2 million individuals). About 11% of adults in Rwanda (around 0.7 million individuals) do not use any financial products or services (neither formal nor informal) to manage their financial lives, i.e. they are financially excluded. Note that financially excluded citizens are more in villages than in cities(FinScope, 2016).

All the above are summarized from Rwanda Fin scope survey 2016. As said by Gwalani, it is important to understand that a person with a reasonable access to all essential financial services is considered 'financially included' and merely one off access to some financial services for the sake of fulfilling the mandate of financial inclusion does not construe inclusion in the true sense(Gwalani & Parkhi, 2014).

Considering this, it is clear that only 26% of Rwandans are having bank accounts. Through bank accounts people can get bank loans, this means that 74% are not even eligible for loan application. Other formal (non-bank institutions) users are 65% and the informal users are 72% of adult population in Rwanda. Concluding that only 11% are financially excluded as said by Finscope report will be misleading. That depends on the definition given to financial inclusion. As many authors link financial inclusion with bank account holding, then only 26% would be considered as financially included.

The numbers that are shown in Finscope surveys are not sufficient to conclude that Rwandans are financially excluded or not. For this reason, data from Banque Nationale du Rwanda from 2011 to 2015 have been used for deep analysis of financial inclusion in Rwanda.

Formally banked adults in Rwanda
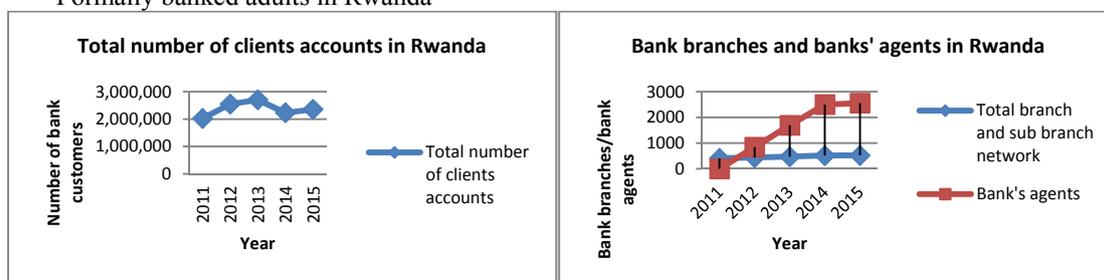
Figure 1   Number of Clients' Accounts, Branches and Sub Branches and Number of Banks' Agents
Source: BNR financial stability report 2011 to 2015

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[1] Idem

Many authors defined financial inclusion as access of   financial services to the poor[1](Bhowmik & Saha, 2013);use of formal accounts(Allen et al., 2016).Based on this we have shown   the accounts penetration in Rwanda from 2011 to 2015.As shown in figure 1, the number of Rwandans having bank accounts was 2,026,738,which increased by 26% in 2012 and 6% in 2013.The number of accounts decreased by 17% in 2014 and increased by 5% in 2015.The total number of accounts holders in 2015 is 2,355,008.Branches serving these customers have been increasing over the five years but at a very low lever as shown in figure 1.The number of branches and sub branches was 408 in 2011;438 in 2012; 471 in 2013; 515 in 2014 and 521 in 2015.The agency banking which started in 2012 have increased over the 4 years as shown in figure 1(b).Banks' agents were 844in 2012; 1,696 in 2013 ;2,499 in 2014 1and 2,555 in 2015.These agents continue to support financial inclusion in Rwanda as they reach regions that cannot be easily reached by banks.
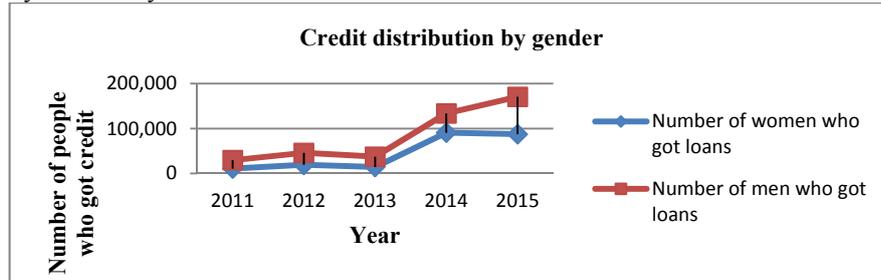
Figure 2   Credit Distributions by Gender
Source: BNR financial stability report 2011 to 2015

One of the main indicators of financial inclusion is access to loans. In Rwanda, the number of men who get loans is greater than the number of women. In 2011 the total number of customers who got loans was 40,515. Women who got loans were 10,920 i.e. 27%. The number of women who got loans continued to increase over the years but still are less than the number of men who got loans. These were 27%,30%,28%,40% and 34% from 2011 to 2015 respectively.

Figure 3(a) shows that the number of automatic teller machines kept on increasing from 2011 to 2015.The number of point of sales kept on increasing as well. We cannot say that these machines are enough as they were only 385 in a country of 26,338km^2.Looking at figure 3 (b), it is the number of debit cards kept on increasing but still this number is too low in comparison to the total number of bank accounts. In the year 2015, the number of debit cards were 650,924 while the total number of clients accounts was 2,355,008 that means only 28% have debit cards. The number of credit cards is too low and not increasing from2011 to 2015.
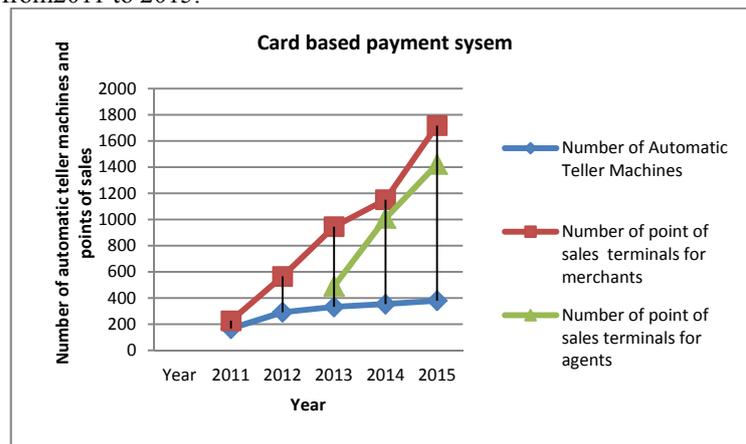
Figure 3(a)

[1] Bhowmik S. K. & Saha D. Financial Inclusion of the Marginalised (First edit). New Delhi: Springer 2013. Retrieved from http://link.springer.com/10.1007/978-81-322-1506-6
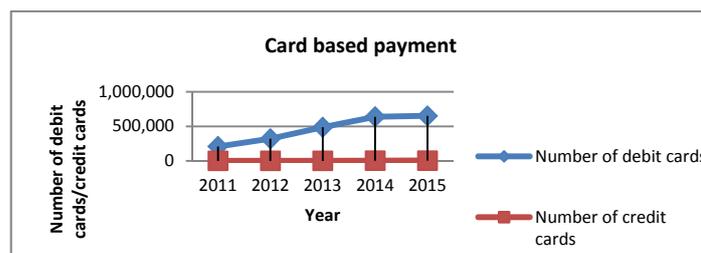
Figure 3(b)
Figure 3   Credit Based Payment
Source: BNR financial stability report 2011 to 2015

Table 1   Mobile Financial Services and Internet Banking Developments

Year	2011	2012	2013	2014	2015
Number of accounts for mobile payments(subscribers)	639,673	1,440,541	2,538,651	6,480,449	7,663,199
Mobile banking users	155,986	297,537	412,007	659,712	828,799
Internet banking users	NA	3,411	8,869	29,840	36,597
Number of Transactions with mobile payment	4,323,490	22,191,674	57,147,777	104,773,115	168,612,455
Number of transactions with Mobile banking	527,300	1,458,063	2,538,820	4,637,849	5,617,368
Number of transactions with Internet banking	1,494	10,036	89,260	312,262	566,152

Source: BNR financial stability report 2011 to 2015

The above table shows the comparison of use of Mobile money, mobile banking, internet banking and respective number of transactions for each. It is clear that the number for mobile payments have increased from 639,673 in 2011 to 7,663,199 in 2015.This shows an improvement in mobile banking. This has contributed at a great extent to showing that financially included Rwandans increased up to 89%.

4 Conclusions

The main objective of this paper was to show the overview of financial inclusion in Rwanda. Through reports of the three Fin scope surveys in Rwanda for 2008, 2012 and 2016, we have found that there was an improvement in financial inclusion. In 2008, 52 % of adults Rwandan were financially excluded. The number decreased to 28% in 2012 and 11% in 2016. Looking at these numbers only will lead to say that there is a great improvement in financial inclusion in Rwanda. But considering the fact that banked adults did not increase at the same extent, it is seen that Rwanda still have a long way to go as far as financial inclusion is concerned. Only 14% of adults in Rwanda were banked in 2008, 23% in 2012 and 26% in 2016.This shows that although many people are claimed to be financially inclusive, most of them don't have access to banks. This is a problem that can lead to slow development. Mobile payment got many users as compared to any other payment method. This should be innovated to help this number of users to have access to more services. The government of Rwanda should continue the good initiative of encouraging people to open bank accounts and save as well as borrow for their development. In addition to this, policies should be set to regulate mobile payment as it serves many Rwandans. Innovative financial products should be developed to reach financially excluded citizens and fully serve the informal financially included.

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Exploration of Big Data Application in University Funding Work

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Abstract: With the flow of emerging information dissimilation channels and data generating models such as social networks and cloud computing, the sudden explosion of information and data models witness the emergence of Big Data Era. In this era full of opportunities and challenges, universities must take advantage of big data technology to innovate university funding programs and systems to improve funding work with better reasonability, pertinence and efficiency so that funding programs can be given full play to education. In this article, big data mindset is applied to university funding programs and specific proposals for innovation i.e. The platform construction, personnel training, system construction etc. to get funding work out of current predicament.
Key words: Big data; Innovation; University; Funding

1 Introduction

With the constant advancing of information technology, data is expanding and acclimating at an unprecedented speed, which witnesses the coming of big data era (Xiaofeng Meng,2013). In February 2011, the special journal "Dealing with Data"[1] by Science elaborates on the importance of big Data for scientific research. In the report "Big Data: The Next Frontier for Innovation, Competition, And Productivity" (Manyika J,2011) released by world famous consulting agency McKinsey June 2011 gives a detailed analysis of the influence of big data in application for key technology fields. The report "Big data, big impact: New possibilities for international development" (Schwab K,2012) released on Davos World Economic Forum in Jan 2012 analyses how to make use of big data to generate better social benefit in the era of big data. In 2014, Big data appears in the Chinese government work report from NPC & CPPCC for the first time, which indicates China has raised the importance of big data to national level. Big data technology can obtain valuable information from various data quickly. Through technology innovation and development, we can have overall perception of data, collection, analysis and sharing to help people with decision-making behaviors (Jie Ji,2014). As big data technology is still at emerging phase, it's not applied widely yet. As the frontier for new ideas and new technology, universities will undergo profound influence by the spurge of big data in all aspects. Out of which, how to innovate funding work both in theory and in practice will be an important research priority.

2 Difficulties in Current University Funding Work

As an important measure to ensure equals rights to education, only by promoting university fund work in a healthy way, can we ensure students from disadvantaged families to enjoy equal rights to education. The key content of university fund work is to help the most needy students within limited resources (Qiang Tao,2015). However, a range of factors lead to difficulties in current university funding work.

2.1 Under-staffed for university funding work

University students with financial difficulties come from all over the country with complex family background. When it comes to funding policies, it entails a lot of details, but university funding is generally under staffed, it's hard to know about every students' family situation to optimize funding strategy for each student.

2.2 Incomplete information construction platform of university funding

With constantly endeavor, information construction in China Universities has achieved some progress but still faces issues like lack of overall planning and obscure service goals (Junqing Tao,2015). In most provinces and cities, universities set up their own management funding systems out of their need and usage conventions, the uniformed data standard and content in these different systems can't be shared which constraint interconnection among systems and hinder efficient application for those

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[1] Science.Special online collection: Dealing with data [EB/OL]. [2012-10-02]. http://www.sciencemag.org/site/speacial/data/,2011

funding data. Besides, students and staff have to switch over among the existing systems which can't be shared, not to mention to enjoy the convenience and efficiency of informatization (Xiaofeng,2015). On the other hand, in some universities information platforms are designed from university managerial perspective, more about propaganda and statics, less about students' practical usage and demand. Meanwhile, no innovation in mechanism and mode by integrating internet resources are involved in designing the platforms. These platforms are just electronic version of paper materials which burden users instead.

2.3 Imperfect verifying criteria system for students with financial difficulties

A reasonable and manageable criterion for students with financial difficulties is the precondition for university financial support. Currently, under the auspices of the joint report from Ministry of Education and Ministry of Finance, Instruction for verifying criteria of university Students with Financial Difficulties in earnest, universities from all provinces release verifying measures of students from disadvantaged families. The Family Financial Compliance Questionnaire with Bureau of Civil Affairs stamp from students' residential district serves as a main reference in together with student's personal statement and democratic evaluation on students' family background by teachers and students (Donghong Wang,2014). But the questionnaire can't guarantee the authenticity of the financial status and personal statement and democratic evaluation from teacher and students tend to be subjective. Under the imperfect verifying criteria systems, inaccurate verification cases occur now and then.

2.4 Difficulties in guiding students from disadvantaged families

Under financial stress, external circumstances can affect lifestyle and concept of value of students from disadvantaged families, sometimes this mindset can turn into inferiority. In interacting with other classmates, some students would get too sensitive proud as to disguise themselves, some even have a attitude and lifestyle that their financial ability can't support. On the other aspect, some students develop dependence psychology on the subsidy from government, society and university, they even take advantage of being poor and take the subsidy as granted. Not being gratuitous, some grumble if less subsidy is granted. As current subsidy pattern is to only grant a fixed allowance to students without proper educational guidance, the goal of funding for education is hard to achieve.

2.5 Lack of continuous follow-up management for students from disadvantaged family

Currently all sectors of society are actively involved to promote a fair and just education environment in which students can focus on their study without worrying financial issues. However, most funding work focus is laid on evaluation before the release of stipend, once stipend is granted, there is no follow-up afterwards. Thus, students' obligation for contribution to society is neglected. Worse, some students with financial difficulties don't study hard instead they fall far behind. Some just indulge themselves in pleasure by arbitrarily squandering the stipend, some obtain the stipend in a fraudulent way in disregard of creditability and obligation of contributing to society. Therefore, without follow-up management action for the aided students and without established code of conduct and constraint mechanism, it's hard for those students to build up grateful and enterprising spirit which goes against the goal of funding.

3 The Significance of Big Data for University Funding Work

3.1 Innovation for data access to sponsored students method

University funding work can be reevaluated in the perspective of big data technology—all related data about the sponsored students should be gained. Traditionally, evaluation mainly relies on non-qualitative measures such as, documents certification, and funding staffs' experience. Usually, recipients' information is not accurate enough that some students from disadvantaged families can't get stipend due to policies or procedure formalities. With the big data, every student's information can be tracked, recorded and analyzed, such as grades, attendance rate, frequency of borrowing library references, hours of voluntary service, living expense in campus and seminar attendance etc. Through tracking students' behaviors in a comprehensive way, multi-evaluation on students can be conducted and more accurate picture of students' family financial condition, personal characteristics, learning attitude and mental status etc come to clear. University can also monitor students' dinning and daily expenses to further integrate relevant information so as to reach out to students who really need customized financial aid in time.

3.2 Innovation for data collection mode

Big data technology can minimize the false data effect on real situation and effectively prevent some inaccurate data affecting the final result. Traditional funding work features in sifting and checking

materials provided by students. Due to limited quantity and ineffective verification measures, some false data can hardly be detected that leads to mistakes and unjust results. In application with big data technology, by collecting instead of checking data, students' correlative data like cash flow, frequently visited locations, online consumption, social network can be fully analyzed in time. With this comprehensive analysis, the specific false data effect on funding work is reduced to minimum level.

3.3 Innovation for fund resource distribution
　　Big data technology can effectively mine multivariate data and demonstrate relative financial status of all students in the same campus. This totally changes the traditional funding policy by checking application paperwork submitted by students with financial difficulties and can ensure financial aid granted to the most needy students accurately within limited resources. In the old-fashion way of evaluating family financial status, orphans or children of revolutionary martyrs can enjoy priority according to national policies, but those students may not be the most needy recipients, instead some in real hard situation may not be able to receive enough stipend. Even though it's almost impossible to be absolute fair, but reasonable distribution within limited resources is one core of university financial aid. With the application of big data technology, students with financial difficulties can be effectively identified and reached out to with reasonable aid.

3.4 Innovation for educational guidance mode
　　Big data technology can track and process multi-type data and analyze students' behavior patterns in different situations so as to come up the most beneficial development pattern for students in any circumstances. With effective educational guidance to students and in-time intervention in abnormal cases, funding for education effect can be enhanced. Based on the data of sponsored students such as character, grades, hobbies and skills, university can provide them proper career instruction and proposals, internship recommendation when granting financial aid. With proper career planning and guidance, the employment rate of sponsored students goes up and they can make better for their future themselves, which is the gist of funding for education.

3.5 Innovation for assessment system of funding work
　　Big data technology can help better track development situation of sponsored students and achieve quantified analysis hereafter which can serve as an assessment basis for university funding work. Big data technology can give full play of evaluation system's encouraging and inspiring functions and guide university to optimize funding work and realize the philosophy of funding for education. Traditional funding work assessment involves institution set up, resource input, stipend distribution, social effect etc, which can't not reflect sponsored students' development progress. Funding work promotion does not equal to students' progress. Therefore, sponsored students' performance, like grades, awards, paper publication, graduate recommendation, work-study, community service, start-up activities, disciplinary action etc. should be included into student development assessment system. By deploying big data technology, a picture of sponsored student progress shows up, which is also an index for funding work assessment to propel the funding work forward.

4 Application of Big Data in University Funding Work Innovation

4.1 Establishment of information management platform based on Big Data technology
　　Application of big data comes along with an infrastructure that meet the requirements of big data technology application. This infrastructure is highly reliable, manageable and secure for data integration and concentration. University funding staff should enhance knowledge of big data technology and emphasize the connections among students' data. By mastery of big data and actively improve their analysis skills, funding staff can not only gain more reliable information about students but also adapt themselves better to work requirement in the era of big data (Hui Wan,2014). Universities should build up the infrastructure according to big data era, improve the infrastructure platform and properly manage the logic of up-to-date and historical data, coordinate the technological convergence of statics actuarial and data mining, fully tap the value of relevant historical data, and proactively enhance data analysis capabilities with big data technology, establish a unified student information management platform, transform thinking patterns and emphasize big data strategically to promote university funding work advancing continuously.

4.2 Cultivating interdisciplinary personnel with Big Data skills
　　Big data technology entails technicians to participate in infrastructure construction, data analysis, system maintenance and also data conclusion and interpretation. With the conclusion from the data, technicians need to understand departments inter-relationship and work flow to customize a feasible

management and evolution funding system for the university. With the new challenges and requirements, universities need to build a professional team for data application and management and cultivate professionals in big data application field systematically to foster integration of advanced technology and funding work. Meanwhile, universities need to enhance funding staffs' big data awareness and technical skills, have training courses like statics and internet technology to cultivate staff with funding expertise and big data skills.

4.3 Improve the information management system in era of Big Data

Big data means massive data out of which most data involves people's privacy, thus it's necessary to establish a specific management system for data. Security comes first when university processes and analyzes big data. When processing external data, distributed cloud computing comes to play for pre-preprocessing data to prevent leakage. For internal data processing, there are some polices to follow to prevent leakage: specific computer for specific purpose, strengthen the information responsibility implementation, enhance information security training, promote information security awareness, improve emergency response mechanism and pre-alert for information security, Standardize the use of big data method and process, intensify routine supervision for key field database (Rongbing Zhong,2014). In era of big data, university funding staff should establish a comprehensive standard flow for data processing based on previous experience. By regulating data processing and usage, all departments from the universities work together to ensure funding work move forward (Rui Zhang,2014).

4.4 Establishment of fund evaluation mechanism based on Big Data

Application of big data technology helps university funding workers to gain more authentic and comprehensive understanding of students, to promote and follow up student' development, which should be the purpose for fund evaluation mechanism. With big data application, quantitative analysis for development can be conducted on sponsored students which serves as the basis for evaluation funding work output. This analysis work together with agency construction, resource input and funding implementation as an evaluation mechanism to help fund workers to achieve goal of helping and education students.

5 Conclusions

Compared with traditional data analysis mode, big data technology can carry out effective analysis on massive data with unparalleled advantage. University funding workers should keep up with the big data era to improve big data technology application skills and make innovation of work methods. While protecting the rights of students from disadvantaged families to equal education, university funding workers can better achieve the goal of funding for education. In this article by stating difficulties in university funding, analysis is conducted on significance of big data application in university funding for innovation while also demonstrating of application cases. Currently big data technology application is still under groping stage, the specific methods for integration of big data in funding work are still relies on relevant experts and scholars to further study.

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Research on Value Evaluation Method of Electronic Commerce Enterprise Based on EVA

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Abstract: In this paper, a method of evaluating the value of electronic commerce enterprise based on EVA is proposed. It is considered that the reasonable value of the electronic commerce enterprise has become an urgent problem to be solved, and the evaluation model of evaluating enterprise value is built. According to the case analysis method, the electronic commerce enterprise value evaluation method based on EVA is applied to the enterprise value evaluation of eBay company, the applicability of the model is tested, and the conclusion is drawn that the value of electronic business enterprise can be evaluated reasonably.
Key words: Electronic commerce enterprise; Value evaluation; EVA; EBay

1 Introduction

Electronic commerce refers to how to use Internet to establish the enterprise internal management activity, and to keep the coordinated with the business development of electronic commerce activities. Due to the higher proportion of intangible assets of e-commerce enterprises, innovative, high risk and high income characteristics, it is difficult to apply to the evaluation method of the electronic commerce enterprise, which makes the evaluation method suitable for the traditional manufacturing industry. How to evaluate the value of electronic commerce enterprises, and to obtain the reasonable value of the electronic business enterprise has become an urgent problem to be solved.

2 Literature Review

2.1 Research status in abroad

Roger. Maureen Rogera and Cheryl. Jerry, in the value of the company (enterprise management publishing house, 2002), introduces the American popular evaluation methods: discounted cash flow method, comparison method, real options evaluation method. The book introduced the discount cash flow method, and according to different evaluation objects and the availability of financial data, divided into free cash flow, cash flow rights and adjust value method.

Voss. Odamo to let in the in-depth evaluation (Peking university press 2005), mainly introduces the technology company's value evaluation method, the author in view of the emerging technology company's sales revenue growth speed but not the phenomenon of profit, by adjusting the capital spending, operating income, capital flows, such as concept, makes the evaluation for technical company. In this book is mainly introduced the discounted cash flow method, the relative valuation method and real option evaluation method, and analyses the control management options, and liquidity, cash flow and investment return at the same time with the introduction of economic added value to the traditional valuation model is improved.

2.2 Researchstatus at home

In China, Run Su (2001) pointed out: when the network enterprise value assessment method can make use of the user value. Because of the development of electronic business enterprise in our country, a relatively short time, lack of financial data, to use some easy determination of statistical data as the standard, the electronic commerce enterprise value assessment is a more realistic choice. Such as web site hits, visitors and search engine data indicators such as volume of receipts.

Zhu Chao (2005), analyzes the influence on the value of ecommerce enterprises, according to the particularity of e-commerce enterprise value factors affecting ecommerce enterprise value evaluation method is proposed, laid a theoretical foundation for the future research work. Fang Xiaocheng (2008) in the traditional evaluation method on the basis of point out its limitation of application in the network enterprise value evaluation. Research shows that: when evaluating network enterprise value, if use traditional evaluation methods, is a lack of data. So, he thinks that the network enterprise customer resources is an important determinant of the network enterprise value, enterprise value assessment network should be combined with theory of customer value. By studying the correlation between

customer and enterprise value network, namely customer resources to effectively promote the development of Internet companies. Value driving factors can be divided into three kinds, namely "customer number", "customer adhesion" and "customer unit income".

Fu Yi, Zhang Ping (2010) wrote the company value assessment and securities investment analysis analyzed in detail the importance of promotion value investment of enterprise value assessment in China's securities market. Ye Caiwen (2010), University of International Business and Economics, master thesis electronic commerce enterprise value evaluation analysis, the core competitiveness of e-commerce enterprises, the traditional pricing model applicability is analyzed.

3 Value Evaluation Model Based on EVA

Based on economic value added (EVA), this paper proposes a method for evaluating the value of e-commerce enterprises. Stern Stewart Company's definition of EVA accounting, enterprise net operating profit after tax (NOPAT) minus the existing capital cost (COC) balance is the enterprise economic value-added (EVA).The existing COC of the enterprise is the product of the total capital (CE) and the weighted average capital cost (WACC). Therefore, the formula can be expressed as:

$$EVA=NOPAT -COC=NOPAT-WACC*CE \tag{1}$$

3.1 Construction process of value evaluation method based on EVA for electronic commerce enterprise

According to the characteristics of the electronic commerce enterprise, the traditional income method based on the EVA theory is adjusted appropriately. E-commerce enterprise value assessment methods to build the flow chart:
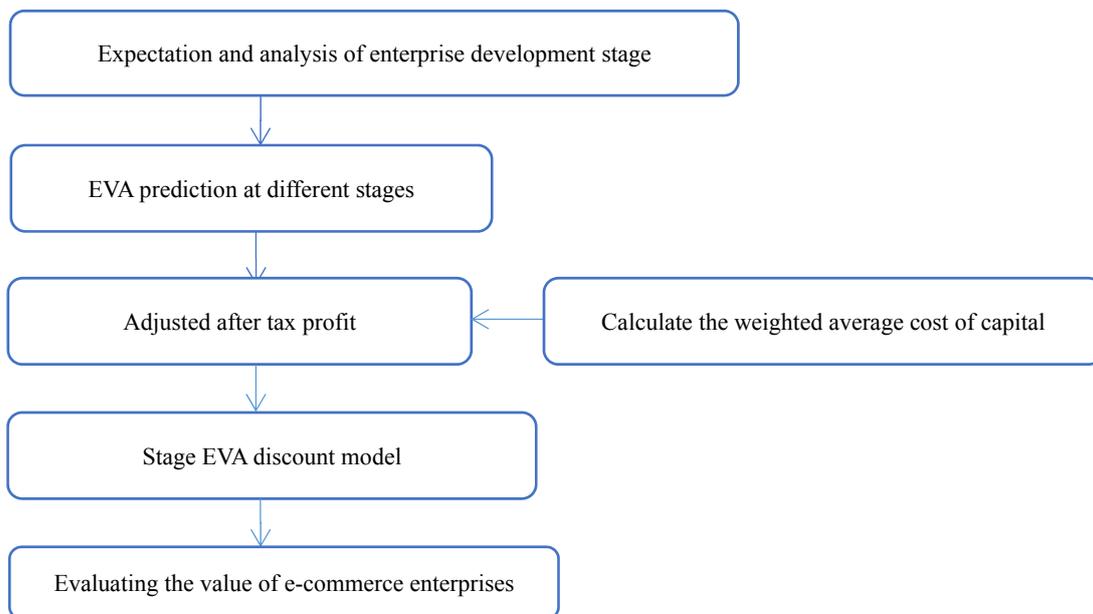
Figure 1   Flow Chart of Construction of Electronic Commerce Enterprise Value Evaluation Method Based on EVA

3.2 E-commerce enterprise value evaluation model based on EVA

3.2.1 The present value of EVA in the unstable growth stage

The period of initial growth and rapid development of electronic commerce enterprises belong to the unstable growth stage. In the unstable growth phase of e-commerce companies have a higher rate of return. The model assumes a growth rate of G, and this growth phase will last for M years. The EVA method is used to evaluate the electronic commerce enterprise in this period, it is necessary to carry out the EVA to get the present value of EVA.

$$p_1 = \sum_{i=1}^{m} \frac{EVA_i}{(1+R)^i} \tag{2}$$

Among them: EVA_i represents the expected i year EVA;

R indicates the discount rate;

i represents the expected annual yield.

3.2.2 The present value of EVA in the stable growth stage

After m+1 years of development, e-commerce business EVA growth is expected to stabilize, which marks the company's entry into a stable development period.

The stable growth stage of the EVA present value model is based on the following two assumptions: 1) the sustained growth of the economic value added EVA, the fixed number of years (I) tends to infinity; 2) the economic value added EVA growth rate is a constant value G.

$$p_2 = \sum_{i=m+1}^{n} \frac{EVA_i}{(1+R)^i} = \frac{EVA_{m+1}}{R-g} - \frac{EVA_{m+1}(1+g)^{n-m}}{(R-g)(1+R)^{n-m}} \tag{3}$$

Among them: G said the fixed rate of growth of EVA;

N represents the number of years of operation;

Assume permanent business of e-commerce enterprises:

$$p_2 = \lim_{n \to \infty} \left(\frac{EVA_{m+1}}{R-g} - \frac{EVA_{m+1}(1+g)^{n-m}}{(R-g)(1+R)^{n-m}} \right) = \frac{EVA_{m+1}}{R-g} \tag{4}$$

3.2.3 EVA discount model of electronic commerce enterprise

To sum up, the economic added value of the electronic commerce enterprise is the economic value added in the unstable growth stage and the stable growth stage, the formula is as follows:

$$p = p_1 + p_2 = \sum_{i=1}^{m} \frac{EVA_i}{(1+R)^i} + \frac{EVA_{m+1}}{R-g} \tag{5}$$

In the valuation of electronic commerce enterprises, it is usually used to evaluate the development period of the reference date and to choose the appropriate value evaluation system and model for the future value growth forecast.

3.2.4 Calculate the discount rate

When determining the discount rate, the discount rate must be greater than the opportunity cost of the investment. When the value of the enterprise to assess, focus on the valuation of corporate shareholder wealth, and in the company is expected to profit will be based on the economic value of the enterprise. The so-called discount rate is the rate of return on the investment of the shareholders.

The calculation formula of the discount rate is as follows:

$$R = R_f + \beta(R_m - R_f) \tag{6}$$

Among them: R represents the discount rate;

R_f indicates no risk return;

R_m indicates the market average rate of return;

β indicates the risk coefficient of the industry's equity system.

3.2.5 EVA adjustment

After tax net operating profit (NOPAT) is the business income tax deduction of enterprise income tax, is an important indicator of enterprise management, it can be recognized in accordance with the accounting standards accrual basis and prudent principle. Therefore, the actual work, in accordance with the accounting standards for financial processing, there will be a difference in the actual costs arising from the handling of operations and depreciation and amortization. Enterprise capital income theory will be less than the creation of all created by the corporate earnings, the evaluation of the results of the assessment will not be able to truly reflect the value of the enterprise. NOPAT can be adjusted as follows:

NOPAT= net profit + bad debt to increase + last in first out of the stock under the first out of the increase in the amortization of goodwill + other operating income - cash business tax (7)

4 EVA Case Analysis - A Case Study of eBay Company

eBay company was founded in September 1995, is currently one of the world's largest network trading platform, for individual users and business users to provide an international network trading platform. Over ninety-five million eBay members from all over the world have traded on eBay and a

pricing auction model, and buyers and sellers are trading on the price.

4.1 NOPAT

2015 for the statutory income tax rate 35%. based on the formula after tax adjusted interest expense = interest expense x statutory income tax rate = 137 x 35% = 48;

Investment income tax = pre tax investment income x statutory income tax rate = 185 * 35% = 65.

Deferred income tax adjustment: excludes the deferred income tax assets from after tax net profit, while the deferred income tax liability increase to add the amount of net profit after tax.

According to the definition of net operating profit after tax, using the formula (7) combined with the actual operation of eBay company and the financial situation, the calculation of NOPAT:

Table 1　NOPAT Calculation (unit: million dollar)

project	2015	2014	2013	2012	2011
Net profit	46	2,856	2,609	3,229	1,801
Profit	2,808	-31	-35	17	350
Increase in bad debt reserves	-4	17	2	1	-16
Increase revenue	30	21	27	14	-3
Return on equity capital	2,834	7	-6	32	330
Interest expenses	123	100	63	25	4
Interest cost	14	14	12	7	6
Adjusted interest expense	137	114	75	32	10
Interest expense tax benefit	-48	-40	-26	-11	-3
Adjusted interest expense after tax	89	74	48	21	6
Loss of marketable securities	-52	-9	–	–	–
Interest income	-133	-111	-134	-111	-87
Pre tax investment income	-185	-120	-134	-111	-87
Investment income tax	65	42	47	39	30
After tax return on investment	-120	-78	-87	-72	-56
NOPAT	2,849	2,859	2,564	3,210	2,081

4.2 Cost of equity capital

The cost of equity capital can be calculated by the method of risk premium.

The so-called risk premium method, refers to on the basis of the bond investment rate of return, a certain increase in equity investment risk premium. The theory of this method is based on the theory of risk and return, the shareholders bear a certain risk of the natural requirements of the corresponding return. In general, equity investors bear the risk of higher than bond investors. Therefore, enterprises must provide higher expected equity for the rights and interests of investors than corporate bonds.

Table 2　The Cost of Equity Capital (unit: million dollars)

	2015	2014	2013	2012	2011
General reporting obligations and leases	8,046	8,046	8,046	8,046	8,046
Equity capital	3,478	3,478	3,478	3,478	3,478
Adjusted total shareholders' equity	22,213	22,213	22,213	22,213	22,213
Securities	-9,322	-9,233	-5,308	-3,502	-2,813
Investment capital	20,937	20,937	20,937	20,937	20,937
Capital cost	11.64%	12.18%	12.08%	12.19%	12.30%

4.3 Economic profit EVA

2015 EVA eBay = NOPAT - capital costs x investment capital = 11.64% - 2849 x 20937 = 412 (million dollars)

Table 3　Economic Profits in the Past 5 Years (unit: million dollars)

	2015	2014	2013	2012	2011
NOPAT	2,849	2,859	2,564	3,210	2,081
Capital cost	11.64%	12.18%	12.08%	12.19%	12.30%
Investment capital	20,937	18,691	20,315	17,016	14,177
EVA	412	582	109	1,135	338

5 Conclusions

More and more electronic commerce enterprises, the instability of e-commerce enterprises can

calculate the economic value added in a single year. The research and development expenses of the enterprise as the capital processing accord with the characteristic of the capital structure of the electronic commerce enterprise, can make the electronic commerce enterprise operator make the decision better, and have certain advantages compared to other valuation methods in the completeness of the parameters, the practicability of the model and the demand of the market .A method of evaluating the value of electronic commerce enterprise based on EVA, hoping to provide a reference value for B2C e-commerce companies in mergers and acquisitions, listed or investors to invest.

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Analysis of the Influencing Factors and Countermeasures of the Management of Scientific Research Funds in Colleges and Universities

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Abstract: The management of scientific research funds is an important part of the financial management in Colleges and universities. Under the background that the source of scientific research funding is increasing and the channels are diversified，funding management for scientific research, standardization, rationalization of management become more significant. In this paper, various factors affecting the financial management of the research study by fishbone diagram，and elaborate measures to be taken in the future, in order to strengthen the management of research funding of universities, improve the university autonomy, enhance efficiency of funding research.
Key words: Scientific research funds; Colleges and universities; Fishbone diagram

1 Introduction

Recently, with the rapidly development of Chinese economic, Colleges and universities own more and more scientific research projects, research funding increase greatly too. Recently, an important factor to measure the strength of colleges and universities is the number of scientific research. However, how to strengthen the management of scientific research funds is a serious problem faced by many colleges and universities. How to manage the scientific research funds efficiently, how to use the scientific research funds and stimulate the enthusiasm of scientific research workers, and create more social value, these have become the problems that the university administrators must think about.

2 Research Status

2.1 Overseas research on management of university scientific research funds

Through the research results of domestic and foreign related research funding, found that it is mainly related to four points. First, the source and management; second, control and motivation; thirdly, system associated with the use; fourth, supervision and evaluation mechanism. The experience of the United States, Britain, the Netherlands, Japan and other countries more involved in the macro description, which has a good reference to supervision of research funding for macro-control.

L. R Jones, Fred Thompson, William Zumeta propose that in the United States, the availability of a scientific research funding must be free competition, so the project's practicality and reality is the key to the funding achieved. (John, Michael, 1996)

G. Altbach Philip, a famous expert in the United States, said: 'the management of scientific research lies in the management of the project contract, and the strict implementation of the funds during the project execution is the essence of the fund management.' (Alison Abbott, 2010)

US experts Tharman said: 'Research Universities fee shall be divided into direct and indirect costs calculation according to the range, and its scope will be specifically defined. The distribution ratio of the cost of the College shall be determined by the state, this will ensure the orderly costs used.' (Jin-Hyo Joseph Yun, 2009)

Since research funding study overseas began earlier and its associated management model, constraint system and supervision mechanism construction has been more mature, there are very few situations such as abuse violations, and thus less use of research funding related research.

2.2 Domestic research on management of university scientific research funds

With the expansion of the growing strength of scientific research and college academic career, research funding for its research system has been basically formed. For some of the key issues has become more unified view, focusing on content sources and expenditures, regulatory university research funding, the process of balance research funding, audit of research funding and so on.

He Defang (2007) clearly pointed out the experience which t China's scientific research institutions can learn form: (1) government supporting as the main channel of access mechanisms. (2) strengthen project management contract. (3) improving the management of funds based on the protection of the law and regulations.

Jiang Zhuo (2011) suggested that the flow of university research funding should be made clear division, and proposed some common problems on the basis of practical purposes.

Cui Huirong, Bao Yang (2010) suggested to improve the audit mechanism of university research funds from the legal policy, budgetary mechanisms, independent and outside the control system, and cultivate professional personnel audit, diversified sources of funding and other aspects.

Shen Yu, Tong Rencheng (2009) found the deficiencies in current research funds management mechanism in universities, though that the evaluation of the performance mechanism of scientific research funds in Colleges and universities should be comprehensive, so as to explore more ways to improve performance.

3 Analysis of Factors Influencing the Management of Scientific Research Funds in Colleges and Universities Based on Fishbone Diagram Method

3.1 Fishbone diagram analysis

A fishbone diagram is the method of finding problem's 'root cause', it can also be called 'Causality Diagram'. It is the use of "brainstorming" and find out the cause and effect benefit by mutual discussion, and according to the correlation, consolidation of structured, coherent, and marked the important factors of the graphics, which is a kind of analysis method see through the nature.

The fishbone usually has three distinctive features:(1) Fishbone diagram is a visual representation of the phenomena observed effect or impact study of the cause; (2) Fishbone can clearly display the inherent relationship between these possible causes; (3) The internal relations fishbone establish are generally qualitative and assumptions.

3.2 The influence factors of scientific research fund management based on fishbone diagram analysis

The distribution of scientific research funds has a wide range of objects; scientific research activities also have a strong professional and uncertainty, which results show a certain lag, so there is great complexity and difficulty in the management of scientific research funds. Scientific research funding runs through the whole process from the beginning of the research project to the transforming into the social productive forces. Therefore, in the management of scientific research funds, often involves many aspects of the problem. In order to study the specific factors influencing the management of scientific research funds in Colleges and universities, this paper analysis the influencing factors by fishbone diagram. The factors affecting the management of scientific research funds in Colleges and universities are mainly divided into four types. Namely, from the system, uncertainty, management efficiency and the use of funds to explore the management of scientific research funds to explore the impact of factors, as shown in figure 1:
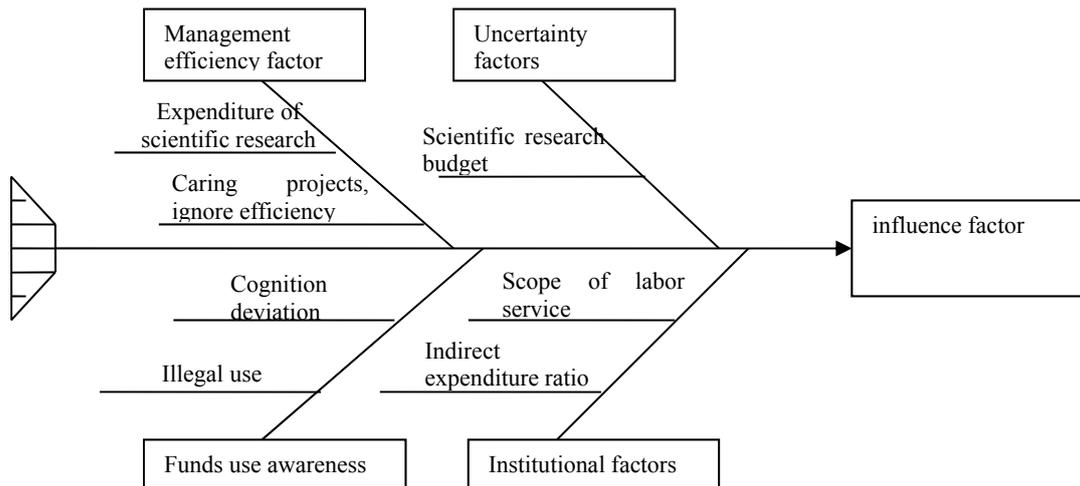
Figure 1   Fishbone Diagram of Effects of University Research Funding Management

3.3 Institutional factors in the management of scientific research funds in colleges and universities

3.3.1 Accuracy of scientific research funding budget

The first principle of management of scientific research funds is earmarked, all funds must comply

with the budget. But because the budget is planned in advance, and tends to be more and more strict, not only to list the project content using the budget, but also to added the strict timetable, which makes some researchers at a loss.

For many researchers, the project budget is a matter of trouble, not only reflected in the complex and cumbersome forms of writing. At present, the research budget need to be list, but the rule contains only a limited number of economic classification, such as equipment, materials, processing and test of travel, meetings, services, expert consulting fees, international exchanges and cooperation, management and so on. However enumerated type method can't exhaust realistic research activities, some expenses belong to the research but without budget accounts are excluded from the budget accounts and beyond the scope of funds use. And the classification of economic subjects such as equipment costs, required to detail the name of the device, the purchase price, etc.

The same to the material cost. It is difficult to predict the number of specific needs and unit price because of the various types of test materials. Science and engineering teachers often said that do the test has never been one-time successful, once the test fail, you have to start from beginning, which need to invest in new raw materials, reagents, etc., so the original budget is likely to double.

3.3.2 Limitation of labor expenditure

May 2015, the newly revised "National Natural Science Foundation of China fund management approach" expanded expenditure range of labor costs, increased no wage income of temporary staff employed. But all items are not allowed to the wages of members of the project group, namely the members of the project group can't have any service fee, and if hire other members of the project group temporary, they should volunteer because of their wage income, so invite the members of the project group is not easy. This limitation artificially fragmented the link between the scientific research work and reward, make the normal rules of labor reward, economic incentive impossible to play a role in the scientific research activity.

Or indeed, labor proportion of scientific research personnel budget will be "self-handicapping." Although the teachers know that there is no upper limit, but do not dare to plan with an enlarged, fearing that the high proportion of projects would not approved by the audit and will be cut and delete. But more important reason is that the expenses does not go out much spent. General pay the master's ￥800 per month, Dr. ￥3000 per month. Therefore, when the project budget is reported, it is still controlled by only 10 percent to 15 percent of the proportion of the cost of labor.

At the same time, the National Social Science Fund and the Ministry of Education, Humanities and Social Sciences made strict rules in the proportion of labor costs account of the total funds, major projects is limited to 5 percent, other projects is 10 percent. At fact, it is 'low' in some cases, the labor costs of specialized personnel who are paid to maintain the daily operation of the project. While labor costs which paid to specialized personnel who maintain the daily operations of the project is actually 'low'. The basic disciplines of humanities research projects mainly rely on mental and manual. Because the vast majority of projects require manual collection of data, and there are a large number of basic data collection and finishing work can't obtain invoices to reimbursement. Some researchers have no way, in specific aspects of financial reimbursement, they take various methods arbitrage funds. It has happened a joke that of a project to buy a thousand boxes of paper in the audit.

3.4 The uncertain factors in the management of research funding

In 2011, the "Adjusting the National Science and Technology Program and certain provisions of the public service industry research and special funds management approach on notice" is promulgated, which is the first time indirect cost appear. Performance expenditure reflects the mental compensation for scientific research projects, but the scale and scope of spending are limited. Internationally and generally, implementation of indirect compensation system more compensate necessary cost of human source which undertake major scientific research tasks of the country, rather than simply providing equipment and housing, water, electricity, gas and other related management costs for the project subsidy expenditures, as well as performance costs and other.

3.5 The efficiency factor in scientific research funds management

3.5.1 Problems in university research expenditure

University research funding in terms of expenditure, due to the dispersion of its scientific research resources, unreasonable funding, innovative funding mechanisms are not perfect and other reasons, not achieve the expected efficiency of scientific research funds. Scientific research resources are not shared in all areas, and the utilization rate of equipment and instruments is low. Although some research programs, scientific research has established a search system, but it is a small part, most of the resources

are still repeated and serious waste. Although there are relatively more funds in some popular areas, there are also many issues that need to be invested, and there is a fierce competition, which is not conducive to the research of scientific research personnel. For innovative funds, financial funds only according to the mode of innovation and stage to give financial support, not from the various aspects of the chain of innovation and effective convergence, which result in funds can't be effectively configured.

3.5.2 Pay attention to the project establishing, and ignore the efficiency

If the performance management of scientific research funds can be effectively implemented, it can avoid the waste of a part of the funds. At present, the performance evaluation of scientific research funds in colleges and universities is still in the exploratory stage, there are few places to carry out performance evaluation. There is a long way to go in order to solve this problem, which is to pay attention to the problem of establishing and neglecting efficiency.

3.6 The awareness factor in scientific research funds management

3.6.1 Research group has the deviation of the understanding of scientific research funds

The research group members and the management of some departments are always lack of scientific research funds management practices related to the university, or not equipped with financial staff to guide the research process of the expenditure, or deliberately misinterpreted scientific research funds. Project Leader's understanding of nature of research funding will be biased, that the provision is a member of economic subsidies to the research team, is a source to improve the income level, is the way to improve the material life level of the project team members. It is because of the nature of the understanding deviation of scientific research funds, that resulting in some scientific research funds become personal consumption fund of the members of the project group. Spending a considerable part of personal consumption from research funding, resulting in some of the research funding is not really applied in the research of scientific research.

3.6.2 Illegal use of project funds

The establishment of the accountability system of China's scientific research funds is still not perfect, although the supervision system has been established for the use of scientific research funds management. But without illegal costs, recently in the audit process, the misappropriation, misuse of false claims and other illegal action of scientific research funds not drastically reduced, the scientific research personnel have not been more effective.

4 Countermeasures to Improve the Management of Scientific Research Funds in Colleges and Universities

Factors Affecting College research funds management effectiveness are varied. It is necessary to improve research fund management from the following in order to improve the efficiency.

4.1 Perfecting the actual demand system in the management of scientific research funds in colleges and universities

4.1.1 Establish a scientific and rational budget management system

In budget management of university research funding, it is more scientific and reasonable to work together by scientific research management department, financial management department, project responsible person. Scientific research management department should establish a unified management system of scientific research funds, develop a reasonable and workable budget process. Accounting department should provide financial services and financial supervision, enable researchers to obtain financial information in a timely manner to prepare a more scientific and reasonable budget.

In the other side, it is necessary to simplify the project budget management, dilute the details of the control. Scientific research project budget preparation should not be sloppy, which can be divided into several categories, and allows the adjustment in the various categories. In basic research, the major cost of natural science projects is the purchase of research equipment, and social sciences should be research and data collection, humanities are mainly books and data finishing, so the management system of scientific research funds shall be arranged separately.

4.1.2 Expand the scope of labor expenses

Wang Yanjue, director of the Department of science and technology of the Ministry of Education said that "The use of scientific research funds to encourage scientific research team did not play out. Foreign labor costs accounted for 50% of research funding, in addition to the use of subsidies for graduate students, more is to be used in full-time researchers, postdoctoral, visiting scholars and laboratory technicians. This is the reason why many universities in foreign countries have a high level and stable scientific research team."

Therefore, the domestic colleges and universities should also conform to the trend, gradually relax the labor expenses scope and scale according to rules. Let graduate and grassroots researchers more benefit from research funding, inspire the scientific and technological workers to innovate and optimize the academic environment.

4.2 Strengthen the uncertainty analysis of the use of scientific research funds

It is an effective way to increase the proportion of indirect costs and to broaden the scope of expenditure by referring to the international practice and domestic related experience. To improve the proportion of performance, because the proportion of personnel costs is to recognize the value of talent and intellectual labor. To innovate the mode of distribution and improve efficiency, colleges and universities should co-ordinate the scope of scientific research expenses. At the same time to realize the incentive, management of research funds should also play a role in the formation of a stable scientific research team, give greater autonomy to the scientific research team.

4.3 Strengthen the management of scientific research funds in Universities

4.3.1 Establish information sharing platform to avoid duplication of investment research

The whole country should establish a unified scientific research project database and research project information sharing platform. In compliance with the provisions of national security conditions, the information of financial supporting scientific research projects should be involved into the database, from the declaration, review, approval, implementation and acceptance. Integration of all kinds of scientific research project information, can facilitate the scientific research personnel and scientific research management personnel to understand the information of the national research projects, avoid the waste of investment and repeated research, so as to improve the efficiency of the use of scientific research funds.

4.3.2 Establishing performance evaluation system of scientific research expenditure

The ultimate goal of the management of scientific research funds is to improve the efficiency of the use of funds, the scientific evaluation of scientific research and its use efficiency is an important basis for measuring the level of scientific management of funds. On the conduct of performance evaluation to research funding can effectively avoid the use of funds in violation of discipline phenomenon.

4.4 Raise the understanding to the scientific research funds of the research group and the management department

4.4.1 Group members should correct the attitude of scientific research funds

Task group members should correct attitude at first, clear that special funds and horizontal research funding is devoted to scientific research with special purpose or special purpose funds, is not a source to raise the income level of the research team, is not the way to improve the material life level of the project team members. So the group leader and the members of the project group shall not be misappropriated and research funds, not expend research group rewards from the project, not expend personal consumption in research funds etc. The research team should thoroughly study and implement the relevant measures for the administration of national research funding, with rigorous scientific attitude towards scientific research funds, so that research funding in the scientific research to play a benefit.

4.4.2 Establish the system of accountability for the use of scientific research funds

Our country should establish and perfect the evaluation system of the efficiency of the use of scientific research funds in Colleges and universities as soon as possible. Based on the evaluation results, implement the accountability system and policy of incentives advanced and spur backward. The accountability system shall include all personnel in the use and management member of scientific research funds, Including the task group responsible person and the member of project undertaking unit, and it also includes the accounting firm to perform the audit issues related to scientific research funds, to participate in the field of scientific research funding and the acceptance of experts and other relevant personnel. Establishment of the system of accountability for the use of scientific research funds in colleges and universities, achieve the goal of management tasks, strictly prohibited misappropriation and other illegal behavior, ensure the standardization and effectiveness of scientific research funds, and accept social supervision.

5 Conclusions

The management of scientific research funds runs through the whole process of scientific research work. Therefore, it is required that colleges and universities should comprehensively improve the level of scientific research management, continuously enrich the management, strengthen learning, train

modern management capabilities, update the traditional management concepts, improve the efficiency of scientific research funds, to promote the sustained and rapid development of scientific research work in Colleges and universities.

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Selection Criteria of Software Packages for Projects Accounting

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Abstract: The emergences of software packages have increased accountability in projects organization. The challenging part of an organization is the selection of these software packages that meet an organization's needs. Users of these software are facing difficulties in locating and selecting the software package that best suits their particular needs. Selecting the wrong software packages may impact the project financially which might lead to financial losses, and possibly even bankruptcy. The purpose of the study is to review the factors for selection of software packages for project accounting and how they contribute to the accountability and sustainability of the organization. This study conducts an interview in different projects centering on non-governmental organizations (NGOs) determining the factors on selection of software package for project accounting and thematic analysis was employed for data analysis. The findings reveal the criteria for selection of software package, importance of considering criteria for selecting of software packages for project accounting, knowledge of workers and their opinion on software package selected and the impact of software package for project accounting for project sustainability.
Key words: Software package for projects accounting; Non-Governmental Organizations (NGOs); Accountability

1 Introduction

International support provided to developing countries is managed by projects, (Diallo & Thuillier, 2005). Project organizations most of which are the Non-Governmental Organizations (NGOs) are known for effectiveness in delivering services and cost efficient. In many developing countries, the cost effectiveness of these organizations has significantly contributed to reforms in the government operations for wider accountability and openness. NGOs are assessed on efficiency and transparency of their resource usage, the reach and scale of their beneficiaries and the impact that they have upon society (Venkatagiri, 2006).

Development of Enterprise Resource Planning system (ERP) which is regarded as information technology solution for business have changed the way of doing business, working practices and even lead to innovations in the entire NGOs sector. A simple and cost effective ERP system can automate management of human resources, financial resources and share essential resources easily among the NGOs (Sharma & Deore, 2015). ERP systems, whilst not accounting systems in the sense that are necessary investigated, designed, or controlled by accountants, are fundamentally bound up with organizational processes of accounting (Chapman, 2005)

The computerization of accounting activities in projects has increase the demand for software package for project accounting. Varieties of software packages for project accounting were produced by the software firms in response to the demand. There is a large number of software packages for project accounting available on the market and potential users were in the dark as to what their needs are, what these software packages have to offer, and which package best fits their requirements.

In projects accounting, these software packages are thought to be effective in promoting accountability for sustainable institutional development through proper records and reports produced by the software package. Despite of using of software packages for project accounting in accounting records, many projects have lack sustainability as reflected into the collapse of the registered and immerging organizations on the daily basis. The remaining successfully organization are notably seen to have the quality project financial reports as a common factor. Selection of appropriate software package for project accounting has become one of the serious resolutions in promoting accountability in projects organization. The software packages for project accounting selected should be able to serve the current needs and can most easily be adapted to its future needs. The organization will allocate great deal of time and money to purchase new software if the wrong choice is made. Therefore, improper selection of software packages for project accounting may result in wrong strategic decisions with subsequent economic loss to the organization. Organization should spend more time searching for the appropriate software packages for project accounting before purchasing.

This study aims to review the factors which projects organization considers in selecting the software

packages for projects accounting and provides a basis to improve process of the software packages selection.   The research questions addressed is in this paper are as following:

RQ1: What are the factors an organization considers in selecting software packages for projects accounting?

RQ2: What prior knowledge and opinion do workers have on the selected type of software package for project accounting?

RQ3: what is the effect of the selected software package for project accounting on staff composition and project sustainability?

2 Literature Review

This section briefly summarizes criteria for selecting of software packages for project accounting based on non-governmental organizations.   An organization should account for the use of its resources and its achievements to its stakeholders, including beneficiaries through publish their financial reports as the concept of NGOs financial stability (Zakrevska & Kotov, 2009). The mechanism of accountability identified by (Ebrahim,2003) are reports and disclosure statements, performance assessments and evaluations, participation etc. These NGOs has different accounting and reporting requirements and are dissimilar from those of municipality or library and it has been more expensive in money and time in electing the right software and vendor, Needle (2013).

According to Kontio, *et al.* (1995). The main problems of the software selection are not taking into consideration system requirements and not using appropriate decision models in decision process. The selection of the accurate software is often a nontrivial task and needs careful deliberation of multiple criteria and careful balancing among system requirements, technical characteristics, and financial issues, Sen., *et al.* (2009). Most of the researchers in their study of selecting software for nonprofit analyze organization requirements through consider the business size and type, current and future needs and scope of the organization such as staff resources, organization capacity and growth, system function ability, cost, customization, vendor factors ,system security and reporting system to determine the system that will meet the organization requirements.

Muhrtala & Ogundeji (2014) in the study of determining accounting software choice, examine primary determinants of commercial accounting packages acquisition among non-financial quoted companies in Nigeria. The survey was made on 5 industries listed on the Nigeria stock exchange with a sample of 178 participants. Factors found as primary determinants of accounting software deployment from the logistic regression model formed are operational, commercial strategic technical and security.

In the study of nonprofit accounting software by Needleman (2013), indicate   factors for selection of software package for nonprofit accounting are the   clear understanding of the organization needs will enable the software selected to meet its needs, vendor factors, staffing resources available, capability of the software to   be customized by the members of the organization, easy to be used by the staff, ability of coding the charts of accounts to make easy preparation of   reports and documents needed , compatibility between the accounting software and other application in the market,   system hardware, cost and find out what your peers are using , the capability of being back up when changes are made in the system.

A theoretical framework on the study of criteria for selecting accounting software is influenced by Abu-Musa (2004) which identified users current and future needs, business types, business size, vendor, information technology and infrastructure and accounting software features ought be taken into consideration before obtaining software package. Also mention the most important software features that should be considered in selection of appropriate accounting software package are the ability of the software package to be customized and satisfy an organization needs. Other features are capable of preparing financial reporting, account number structure contain, web features and e-commerce, capable of handling multi-currency, number of customers using the accounting software, size of the vendors' company and reliability.

Wiegers & Beatty,(2013) in identifying the requirements for selection of packaged solution for projects, point out factors to consider in acquiring a commercial package that meet organization needs. Understanding of the business activities such as identify the user needs for the software, develop the needs for the software by listing the features you need from the package, consider the business rules required by commercial off the shelf (COTS), identify data needs, system quality such as performance, usability, interoperability, integrity and security termed as the right way to choose the right packaged solution. Other is evaluation solution through market research which evaluates cost, vendor experience

and capability, vendor support for product, external interface that will enable extension and integration.

The ability to quickly generate and deliver software that meets customers real needs has become an unquestionable competitive advantage (Leffingwell, 2007). In review of these diverse views and recently many NGOs use accounting software package for project accounting through the emergence of ERP, there is a need to study and assess how these software are selected and how effective are in promoting accountability and sustainability in the projects.

3 Research Methodology

The study was designed using a qualitative approach, where interview method was used to collect information. Interview guides tools moderated a discussion with the participants in this study. The study was concerned with exploring the fact behind the selection of software packages for project accounting in Tanzania. To answer the above research questions, primary data were collected through face to face "open interview" direct from project managers, head of finance department and other staffs who especially are the fundraising and monitoring & evaluation teams for projects studied in Tanzania. Thematic and discourse analysis for interviews was used to handle data (Chandra and Sharma, 2016).

Table 1   Distribution of Interviewees

Interviewee	Number	%
Project manager	9	15
Executive director	13	21.67
Financial controller	20	33.33
Project Officer (fundraising, M&E)	18	30
Total interviewed	**60**	**100%**

4 Results and Discussion

The interview was conducted in different NGOs in Tanzania in the fields of wildlife, environmental, legal rights, good governance, educations, health, economic empowerment and agriculture. The research shows that 60% of the NGOs interviewed have used more than one software package because the earlier software didn't meet the requirements of the organization due to most of the packages need to be customized according to the nature, needs, size, type and the environment of the organization.

4.1 Accounting software packages in use for project accounting

The software packages for project accounting identified during the study are quickbook, oracle, sun and naviation. The NGOs used these software packages depending on the size of the organization. Functions of the software differ some are capable for small and medium organizations and lack some facilities which can suit in large organizations. The study finds that, certain NGOs used quickbook have changed their software as the projects grows because it's unable to function with the current situation. According to interviewers, quickbook software suits for small and medium organizations. This shows that during the selection of the software packages the organizations didn't take into consideration its future needs.

4.2 Factors considered in selection of software package for projects accounting

In identifying how do these NGOs go through selecting their software packages for project accounting, the study noted that selection of accounting software in the organizations and project is based on two main factors. One factor being donor interests and conditions and the other is internal environment. The former is linked to reporting requirement for accountability purposes, while the latter is associated with financial stability. With financial stability an organization can establish an interested on accounting software based on current and future needs building on the past experience.

Other factors in the context of this study were remarkably, the ability of the system to integrate with other system; produce reports according to the organization needs, capable of being customized, security of the system, system support from the vendor, cost i.e. the acquisition, installation, training, testing and support, ability of the system to handle multicurrency and more digits, functioning of the system, accuracy and compatible. Others are identifying the requirement of the organization, user friendly and the ability of the system to review data. Most of these factors are supported by the literature review according to (Abu-Musa, 2004, Wiegers & Beatty, 2013, Needle,2013 etc).

4.3 Prior knowledge and opinion do workers have on the selected type software package for project accounting

These two elements in this thematic area were distilled through data analysis tools to form the following subcategories:

4.3.1 Prior knowledge of workers on the selected type of software package for project accounting

In answering the research question on what prior knowledge do workers have on the selected type software package for project accounting we note that workers /staff were note familiar with the software package which are using rather than past experience of using any accounting software package. According to interviewer, experience of workers on software package selected is not a deciding factor as the organizations are going to provide normal training before the use of the software. According (Jadhav & Sonar, 2011), knowledge of software support decision makers not only in software selection but also increase efficiency, and brings consistency and transparency in the process of software selection. In building capacity to the staff on the software package selected, donors conducted in house training, invite consultant to run training to the staff, and provide practical user guide/ manuals of the system after deciding the accounting package to be implemented.

4.3.2 Workers opinion on the selected type of software package for project accounting

Through the interview indicate that although the accounting software produce the required reports for the projects after customization but some of the software selected need to be upgraded to meet some of the additional requirements which were not considered during the acquisition. The software also require competent person due to many posting code, the improvement of infrastructure because the data base is very huge its challenging to control, and need best   hardware to run the system (Abu-Musa, 2004) if it's old need to be reinvested .The organization needs to stabilize   internet services because the software to function there is need of internet facilities for better performance.

4.4 Effect of the selected software package on staff composition and project sustainability

4.4.1 Effects of selected software package for project accounting on Staff

The software package selected in different projects interviewed has positive and negative impacts to staffs. The positive impacts which were common are reports for a given period of time are produced in time which reduces time, work load, errors and other related costs which could have being incurred using manual accounting. It provides more internal control on the transactions made, accessibility of retrieving what have been done easily, the system allows to spend according to budget (tool to control annual budget) and it is integrated and every staff has accessibility of logging in to his/her part.

The challenges on software packages for project accounting have to staff is its usability. The software uses codes in its transaction which require competent staff and concentration in data capturing otherwise errors will occur. There are many changes occurred in the software such as upgrading the software which is costly because they have to pay the supplier for the changes to be made. This led the   supplier to become strategic partner because users still must rely on continued support regardless the goodness of the software package (Abu-Musa, 2004).The research also find some software require license number for different user, which is very expensive to add new user.

For donors funded projects in which the software packages for project accounting are recommended by the them, has implication to the projects because the size and environment where the projects are conducted differ and some are not supported with in the environment which led to a lot of customization, time consuming because it require several processes before it is implemented and it is cost full. This supports the argument from (Jadhav & Sonar, 2011) that the   selection of   software package that meets specific needs of the organization is complicated and time consuming decision making process. It also tied up with the supplier because for any improvement within the system, the organization should consult the supplier.

4.4.2 Effects of selected software package for project accounting on project sustainability

Nonprofit organizations are usually accountable to stakeholders such as their donors and clients (Van Puyvelde, Caers, Du Bois, & Jegers, 2012).   The implementation of software package for project accounting in projects enable the projects to grow through attaining more funds from donors because of the reliability of the accounting information being reported. There is increase in number of donors from outside and inside the county as well due to the accountability of accounting information through the use of the software package for project accounting. In worldwide NGOs are challenged with an increasing demand for accountability and improved financial transparency and its financial reporting has become a rule (Verbruggen, Christiaens, & Milis, 2011). The information through the system is safe and there is timely and error free of information provided. The report produce complies with the donors requirement and standard and make easier for donors to access information and decision making

5 Conclusions

This paper identifies factors to consider in selection of software package for project accounting in Tanzania focusing on NGOs. The factors help the user of the software package for project accounting to focus on the actual needs for better efficient and effective operation of the organizations. The research finds that, NGOs have used more than software package for project accounting so as to find the one which will suit/ meet the requirements of the organization, better. Users faced challenges in using the accounting software packages. Some NGOs still need to upgrade their software packages for project accounting in order to meet the requirements which were not adhered during the acquisition of the software package. Despite of the challenges faced, the software package has increased accountability of information required by the stakeholders through the financial reports produced with the system which led to the growth of the projects. Donors used the software package for project accounting to access information and the reports produced for decision making which increase transparency and sustainability of the projects.

Organizations should seek on improving information technology environment and infrastructure in finding the software package for project accounting that meets the current and future needs of the organization and then find the best hardware to run it. This will reduce the cost of purchasing new hardware if the current hardware can be utilized but if it is inadequate its costly to the organization. This gap was as well argued by Musa (2004), highlighting the fact that organizations focus so much while giving less weight to the supporting infrastructure. This should include as well venders and supplier conditions and compatibility with the supporting IT infrastructure.

NGOs ought to continue taking necessary steps in selecting software packages for project accounting to maintain standard reporting system and give awareness and training to the staff/users of the software package so as to be equipped with enough skills and knowledge about criteria for software selection in order to increase efficiency and transparency in the selection process. There should be continuous seminars and training to staff about the advantages of using software packages for project accounting and how to overcome challenges to maintain quality reporting system.

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Research on Influence Factors of Financing Choice of Small and Medium-Sized Enterprises in China

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Abstract: In this paper with SPSS software analysis, it creates variables and model building, and derives an important factor affecting SME financing choices. It selects sales margin, total asset turnover, current ratio, total asset growth, total assets of the natural logarithm and asset-liability ratio as the explanatory variables, and chooses equity financing, debt financing for the explanatory variables. It investigates six variables through empirical analysis of different ways of financing and their correlation. Regression analysis is based on the results that it is obtained for each of the various factors. Finally, it finds relevant factors that ultimately affect SME financing, and corresponds countermeasures.

Key words: SME; Financing; Listed Companies; Analysis

1 Introduction

Foreign scholars Financing SMEs corresponding research. Modigliani and Miller proposed financing structure theory (MM) in 1958. In an absence of uncertainty and lack of information asymmetry in the world, no matter what kind of business financing structure will not affect the value of the enterprise (Modigliani Franco,1958). Jensen proposed that the moral hazard issues affect the financing structure between the principal and the agent. He thought the best financing structure that allowed companies to minimize the cost distributor(Jensen,1976). Wi11ianhmson thought that can cause adverse selection and moral hazard problems because of information asymmetry between the bank and Financial Institutions (Willianmson,1996).

At present, the academic research mainly from the three aspects in china: First, it is about the outside area of financing at the operational level of experience and introduces comparative reference. Second, the domestic small and medium enterprises are formed for the study of SME financing research monograph. Third, when the domestic SME financing problem occurs, it has been numerous articles.

Xu Xuexia studied the solvency, management capacity, growth, profitability and asset-backed ability to analyze the relationship between these variables between financial indicators. The existence of a negative correlation between asset-liability ratio and solvency of enterprises. There is a positive correlation between the asset-liability ratio and other factors (Xu Xue Xia, 2009). Wang Hong Bo analyzed the impact of industry on the difference between assets and liabilities of SMEs, reveals the Capital Structure of Chinese SME board industry which has sustained significant difference(Wang Hong Bo，2009) . Ma Guang Qi considered to be the SME development cycle that is divided into four stages, and the financing requirements also differ according to the characteristics of different periods (Ma Guang Qi ,2009).

2 Factors of SME Financing

Strong profitability of enterprises is often not easy to be out of market, and it is able to occupy a seat in today's fierce competition in the market, a higher profitability of the enterprise, the more likely a positive impact on the financing (Qin Guo Lou,2012). Operating capacity reflects the safety, profitability of a business finance degree of capital preservation and assets. The higher a company's operating capacity, the more likely a positive impact on the financing (Sun Wu, 2013). Solvency refers to the business capital chain once broken, whether a company has the ability to repay principal and interest capabilities. The higher the solvency of a business, the more likely a positive impact on the financing (Shen Bo Ping, 2015). Growth of the enterprise is one whose operating efficiency continues to improve, have been expanding, occupy market share is growing. A business growth, the better, the more likely a positive impact on the financing (Wang Xuan, 2012). The larger the size of the business, the ability to achieve diversification, a higher size of the business enterprise, the more likely a positive impact on the financing (Wu You Hong, 2015).

3 Analysis of Sample Selection and Data

3.1 Research methods

In this paper, it uses qualitative analysis and quantitative analysis method of combining. Qualitative analysis section, the first use of descriptive study, which will be described current research. Next, it chooses the 2015 -2016 years of relevant data GTA (CSMAR) database 136 listed companies in the SME sector. In the quantitative analysis section, it establishes multiple linear regression models with SPSS regression analysis, analysis of selected indicators for the impact of financing mode selection mechanism. Finally, according to the analysis, the current situation of SME financing policy is recommended.

3.2 Sample data

This article is about the choice of the sample in 2015 and 2016 in the SME sector Stock Exchange listed company. Select samples in accordance with the following conditions were excluded: 1) the exclusion of the company ST and * ST companies; 2) Excluding financial companies. The data used in this paper are from the GTA (CSMAR) database, to overcome monthly, quarterly effect of accounting indicators, analyze data are used annual data.

In this paper, the company financing as explained variable, referred to as Y. This paper selects selection factors can affect behalf of the company characterized as a financing explanatory variables, each variable and select the appropriate indicators, study variables constructed as shown in Table 1:

Table 1   Study Variables Definition Table

Variable Types	Variable name		Variable Code	Variable Definition
Explained variable	Financing	Equity financing	Y_1	0/1
		Debt Financing	Y_2	0/1
Explanatory variables	Profitability	Sales profit	X_1	Net Income / Revenue
	Operating capacity	Total asset turnover	X_2	Sales / average total assets
	Solvency	Current Ratio	X_3	Current assets / current liabilities
	Growth	Total asset growth	X_4	(End of period total assets - beginning of period total assets) multiplied by beginning total assets
	Company Size	Natural logarithm of total assets	X_5	In(Total assets)
	Debt Structure	Assets and liabilities	X_6	Total liabilities / total assets

NOTE: 0 means the company no equity financing, debt financing,1 for Equity financing, debt financing

3.3 Analysis of data

Reference herein equity financing and debt financing Methods of financing of the factors that may affect the way, drawing Deng Qingyang LI Ning basis and should examine all aspects of domestic literature financing of SMEs affected by the formation of the expected financing model, as follows:

$$Y_1=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6$$
$$Y_2=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6$$

NOTE: β_0 represents the constant term, β_i represents the regression coefficients

Table 2   Regression Results 2016 Year Data

variable	Equity financing	Debt Financing
Profitability	0.445	-7.807
Operating capacity	-3.647	-0.029
Debt paying ability	-0.962	-3.230
growth	-3.024	2.484
Company Size	-1.487	1.344
Debt Structure	-3.294	-34.875
constant	33.704	-15.042
-2 The logarithmic likelihood value	28.482a	17.885a

| Cox & Snell R   value | 0.54 | 0.77 |
| Nagelkerke R value | 0.237 | 0.407 |

Table 3   Data Regression Results In 2015

variable	Equity financing	Debt Financing
Profitability	29.410	-12.907
Operating capacity	-4.475	-8.850
Debt paying ability	-2.353	-0.722
growth	-10.570	5.040
Company Size	-4.202	2.162
Debt Structure	10.016	-40.080
constant	86.414	-34.504
-2 The logarithmic likelihood value	7.411a	14.209a
Cox & Snell R value	0.093	0.047
Nagelkerke R value	0.663	0.338

From Cox & Snell Nagelkerke R and R value, you can see that in 2016 the fit of the model 1 and model 2 and model 3 can accept everything. Eventually build expected financing model is:

$$Y_1=33.704+0.445X_1-3.647X_2-0.9623X_3-3.024X_4-1.487X_5-3.294X_6$$
$$Y_2=-15.042-7.1807X_1-0.029X_2-3.230X_3+2.0484X_4+1.344X_5-34.875X_6$$

From Cox & Snell Nagelkerke R and R value, you can see that in 2015 the fit of the model 1 and model 2 and model 3 can accept everything. Finally expected financing model is:

$$Y_1=86.414+29.410X_1-4.476X_2-2.353X_3-10.570X_4-4.202X_5+10.016X_6$$
$$Y_2=-34.504-12.907X_1-8.850X_2-0.722X_3+5.040X_4+2.162X_5-40.080X_6$$

4 Results

Based on the analysis of data, shows that in 2015 and 2016, the regression model analysis showed that the expressed as a return on sales profitability and equity financing is significantly related to the enterprise's profit ability is strong, for which the enterprise external investors are more willing to be the corresponding investment, in this way, the enterprise can more capital and issuing new shares; Have enough savings to meet the demand of enterprise investment, does not need to be by way of borrowing to the world, so enterprise debt ratio is not high. With total asset turn over, operating capacity and that there was no significant correlation between equity financing and debt financing. The enterprise operation efficiency and benefit of current assets and fixed assets is difficult to judge, which expressed as a current ratio of solvent and no significant relationship between equity financing, liquidity ratio and debt financing that has significant negative correlation, according to the original data more than 90% of the corporate liquidity ratio more than one, which means that the creditors of the margin of safety is big, full recovery of high reliability, creditor's rights debt financing can get the financing needs of the enterprise, in the growth of small and medium-sized enterprises, need a steady stream of funds support. Consider the perspective of growth rate of total assets, whether it does the company further growth and take equity financing is not obvious relationship, on the contrary, it was significantly positively related to growth rate of total assets and the debt financing. Subject to the conditions of the market, equity financing is not good to satisfy the business enterprise growing demand. Total assets growth rate is high, in a certain period, the enterprise assets increase rapidly, the profit is higher. With total assets of natural logarithm of firm size and equity financing is no significant relationship. Total assets of natural logarithm and was significantly positively related to debt financing. Of small enterprises scale is not big, because of the lack of mortgage assets ability and financial statements, which is not true and so on a series of problems, makes them difficult in seeking equity financing and debt financing. Internal financing is enterprise capital source of the main channel. Also it shows that the enterprise ability to resist risk and financial information transparency and the expansion of enterprise development presented the positive correlation.

Asset-liability ratio, has negative correlation with creditor's rights financing and equity financing. Enterprise high debt ratio, mean that the future need to repay debt, risk big, the company issued shares or financing by creditor's rights is difficult to obtain expected goals, financial institutions and commercial Banks worried about close not back to the principal and interest due and contribution to the enterprise financing.

5 Conclusions

How to further improve the local small and medium-sized financial institutions, the need to pay attention to the following: first, the organization must have a clear property right structure and scientific system, establish a standardized corporate governance structure. Second, at present, China's financial industry profit is high, at the same time risk big, prone to dishonest behavior, it must further improve the supervision system for small and medium-sized enterprises, strengthen the supervision strength of small and medium-sized enterprises, in order to better control the market risk, to the whole financial market regulation system is increasingly perfect. Especially senior managers must strengthen audit, assets and liabilities in the financial statements of the enterprise management, loan risk management etc.

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Predictors of Acceptance of Electric Cars in Malaysia: Moderating Effects of Driving Experience and Voluntariness of Use

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Abstract: With the rising attention in saving our earth, and fear of soaring gas and oil prices in next decades, numerous companies have produced electric and hybrid cars. These aspects have attracted people to have intention of using electric cars. In countries having high contribution of renewable energies in electricity production, electric cars have direct effect on healthier environment. In other hand, electric cars have to deal with concerns like battery range or range anxiety, infrastructures, maintenance and spare parts. Also, any new technology, has a very low market share at it initial stage, it is important to study important factors influencing potential consumers of new technology (Rogers, E. M, 2003). In overall, low empirical researches have studied these factors in a single framework for electric cars. This research is going to fill these gaps by examining the association among social influence, perceived enjoyment, anxiety, facilitation condition, attitude toward use and intention to use, along with moderating effects of driving experience and voluntariness in the electric vehicle market in Malaysia.

Key words: Electric cars user interfaces; Technology acceptance model; Electric vehicles

1 Introduction

Although electric cars are still in initial stage, automotive makers are producing more and more electric vehicles with more interesting designs. Many researches has been done, or ongoing abut substitute fuels like bio diesels, hydrogen and others, with hope of possibility of widespread usage of them in society. Though, numerous of these unusual fuels will necessitate too many resources for the world's populace to entirely convert to within the close future. (Beliveau, n.d.)

It has been shown that inspiring the acceptance of environmentally responsive products by changing behavioral intention is a big challenge. In any product development, the most important consideration is costumer needs; in initial stage of life cycle and product expansion. Detection of consumer necessities is indispensable too, in marketing. This is recognized that buyers have complex desires that determine the buying process (e.g. Elliott and Wright 1999, Shiv and Huber 2000). Global warming and possibility of increasing energy prices in next decade made a transformed attention in expansion of electric cars. Current auto exhibitions feature more and newer electric vehicles; models are increasing and being more popular (like Nissan Leaf and Tesla S). Countries policies are also shifted to support usage of EVs: in many countries, governments give subsidies or offer tax inducements for buyers of electric vehicles. Augmented consideration of manufacturers and governments for EVs is comprehensible; though, widespread acceptance of EVs is expected to encounter tough challenges. Uncertain or limited battery range, long time charging, and insufficiency of charging stations, price, and maintenance, may be barriers for widespread EVs adoption. Moreover, expansion of substructure on behalf of charging EVs, (which includes together construction charging stations and improvement of home facilities for charging of electric vehicles, might enforce extra problem on the electric network, possibly causing the need to upgrade the latter too, forming encounters for the electricity markets, besides leading to enlarged environmental damage in countries where oil is used to produce electricity. (Bilotkach & Mills, 2012) Usually, economists and market examiners have been attentive in recognizing the aspects that affect the buyer's intention to predict market share, and for that reason, they have introduced number of models for car type choice. (Beliveau, n.d.).

2 Social Influence

Social influence represents the degree of what a person believes that other people who their idea are important for him or her, think the same way about a new technology (Miao, Xu, Zhang, & Jiang, 2016). The construct called subjective norm, in the Theory of Reasoned Action model. In technology acceptance model 2 or TAM2 and unified theory of acceptance and use of technology, social influence characterized as subjective norm, or social factors in some other models. Thompson et al. (1991) used the term social norms in defining their theory, and recognized its correspondence to subjective norm

within Theory of Reasoned Action model. Although they have dissimilar tags, each of these concepts comprises the obvious or implied concept that the person's behavior is influencing by the way which they believe that society will view them as a result of using the technology. (Venkatesh, Thong, & Xu, 2012).

Accepting from (UTAUT 2 model) or Unified theory of acceptance and use of technology, following hypothesis was proposed:

H1. There is a positive significant relationship between social influence and intention of use of EVs.

3 Facilitating Conditions

Facilitating condition is someone's perception about infrastructures or technical support existed for using a technology or system (Venkatesh et al., 2003). About the electric vehicles, it can be interpreted as availability of batteries, learning tools or maintenances, charging infrastructures in home and roads, or after sale services. This relationship adopted from extension of unified theory of acceptance and use of technology theory. (Venkatesh et al., 2012)

H2. There is a positive significant relationship between facilitating condition and intention of use of EVs.

H3. There is a positive significant relationship between facilitating condition and attitude toward using of EVs.

4 Anxiety

Anxiety in the car industry is a degree of how a person responds to a situation with uneasiness or arousal(Osswald et al, 2012). Anxiety is an important factor in behavioral intention in social cognitive theory. (Compeau and Higgins 1995). Range anxiety in using EVs is about fear that EV has insufficient battery range to reach to a destination (Yang & Forney, 2013). Considering that EV technology comprises of innovative technology and comes up with extreme changes comparing with combustion engine cars, consumer anxiety about using EVs may be higher than anxiety about other cars. Consumers may also perceive risks when there is batteries with limited ranges and lack of technology infrastructures like charging stations. This anxiety may be also increase when consumers are sensitive to spare parts or EVs repair. So, these anxieties may hinder potential consumers accepting the product and may have direct negative effect on EV approval. Sundaravej, T (2010) found a significant negative effect of anxiety on the intention of use. Thus:

H4. There is a negative significant relationship between anxiety and intention of use of EVs.

5 Perceived Enjoyment

It embodies the enjoyment deriving and ownership of an EV. Since EVs are very smooth and have high acceleration comparing with cars with combustion engines, might have an enormous effect on the enjoyment of the passengers and driver.(Miao et al., 2016)

Liao et al (2008) and Venkatesh et al., (2012) view perceived enjoyment as a fundamental source of motivation. This factor has effect on both attitude and intention of use of a system. A system perceived to be easy to use, considered to have further fun to use, foremost to a sturdier association between perceived fun and attitude toward using, and consumers' behavioral intention. (Liao, Tsou, & Shu, 2008). Based on above discussion following hypothesis was proposed:

H5. There is a positive significant relationship between perceived enjoyment and intention to use of EVs.

H6. There is a positive significant relationship between perceived enjoyment and attitude toward using of EVs.

6 Environmental Concern

By increasing global issues, environmental concerns become more significant for purchasing decisions. Public argument on global warming regarding to Co2 emissions, produced by cars, is impacting purchasing decisions of car consumers (Razak, Yusof, Mashahadi, Alias, & Othman, 2014). Using or driving a "green car" lets people to adopt a responsible rule in the social order. Based on an empirical investigation in Malaysia by (Razak et al., 2014) there was a significant relationship between environmental concern and intention to use of a hybrid car. Thus:

H7. There is a positive significant relationship between environmental concern and intention of use

of EVs.

7 Attitude Toward Using

The factor "Attitude towards using" or "Attitude towards the Act of Behavior" indicates the belief of an individual that certain behavior, will lead to certain outcome. (Alain, 2010) relationship between attitude toward using and intention to use introduced by Davis et al. (1989), and widely used for technology acceptance researches. Based on above discussion hypothesis below is proposed:

H8. There is a positive significant relationship among attitude toward using and intention to use of EVs.

8 Intention to Use

Davis, Bagozzi, and Warshaw (1989) defined the behavioral intention to use technology as a degree that an individual has considered cognizant plans to act or not to act certain behavior in future. This study assumed that determine the consumers positive or negative feelings towards using EVs. The attitudes of potential customers toward the use of EV technology along with the association among attitude and intention of use of EVs are the key interests of this specific research. Although many studies reveal a positive relationship between the attitudes of use, and actual use of technology. (Alain, 2010)

9 Moderating Effects of Voluntariness of Use

Voluntariness is a degree of which use of technology is perceived as voluntary, or of self-determination(Venkatesh, Davis, & Studies, 2000). Though voluntariness was not a part of innovation model proposed by Rogers (2003) in diffusion of innovation model, but Venkatesh et al. (2008) have proposed voluntariness as a moderator in the relationship between social influence and intention behavior. Based on this call, this research proposes the following hypothesis:

H9. Voluntariness of use of EVs, effectively moderates the relationship between social influence and intention of use of EVs.

10 Moderating Effects Driving Experience

More experience of using technology will lead to more awareness and better knowledge of structure of system, therefore decreasing user dependency on outward support. (Yang & Forney, 2013)

Customers' driving experience is operationally defined as their driving experiences with EVs. Customers who drive an EV for one or more are identified as experienced, which are distinguished from non-experienced customers with no driving experience. In model UTAUT 2, Venkatesh et al. (2012) showed that the experience of system can have moderating effect on relationship between, social influence and behavioral intention. Thus:

H10. Driving experience of EVs, effectively moderates relationship between social influence and intention of use of EVs.

Experience can moderate the relationship between facilitating conditions and behavioral intention. (Venkatesh et al., 2012).

H11. Driving experience of EVs, effectively moderates the relationship between facilitating condition and intention of use of EVs.

Rauh et al, (2015) investigated the relationship between driving experience and range anxiety toward EVs acceptance. The study showed that experienced drivers had less range anxiety on the cognitive and emotional level than inexperienced drivers. (Rauh, Franke, & Krems, 2015). Base on above discussion, this study generate this hypothesis:

H12. Driving experience of EVs, effectively moderates the relationship between anxiety and intention of use of EVs.

11 Conceptual Framework of Study

The conceptual framework shown in figure 1, describes variables and relationships between them base on empirical studies discussed in literature review. The framework has two main features, first, it explores the links among social influence, perceived enjoyment, facilitating condition, anxiety of use, environmental concern, attitude toward using and intention to use. Second, the framework explores the moderating effect of voluntariness of use and driving experience as moderator on formation of switching intention.
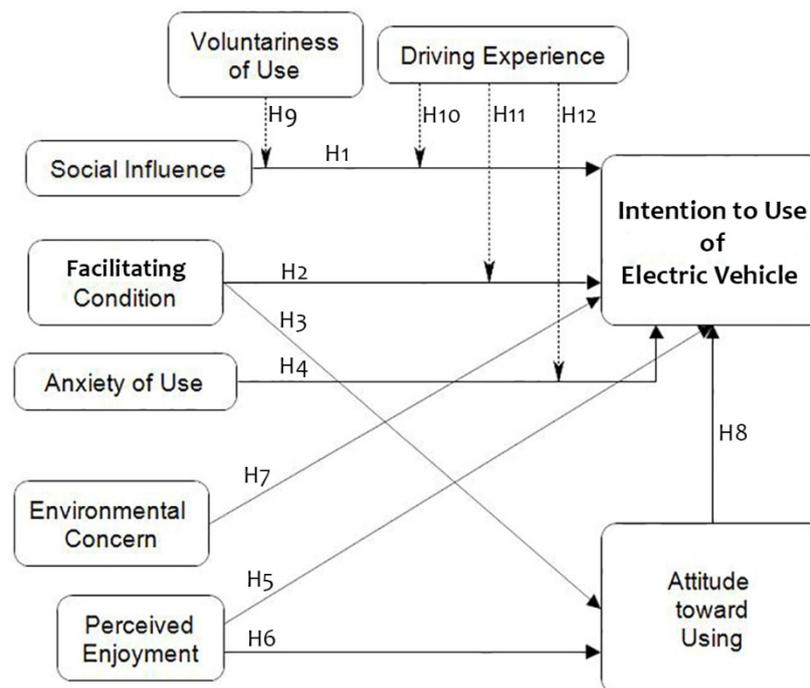
Figure 1   Conceptual Framework of Study

12 Conclusions

One of the major encounters is adoption of electric cars as new technology that needs new aspects of consumers. According to this, this research describes and defines electric car acceptance factors and proposes a new conceptual framework. The framework synthesizes different technology acceptance models such as TAM and UTAUT model's to clarify and predict electric vehicles adoption. This study introduced range anxiety and perceived enjoyment as relevant additional factors in the proposed model for future study.

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Implication of Natural Language Comprehension on Machine Intelligence: A Perspective of Neural Network Mechanism of Intelligence Emergence

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Abstract: Intelligence emerging out of the brain neural networks without outside manual instructions or software supports is not due to that brain can automatically adjust the weights of the neural network nodes, but because conceptual information(s) of vision and audio are respectively resolved and dispersedly stored according to their similarities and discrepancies in large quantity of adjacent neurons structures which forms a conceptual monolithic network by correlating language-centered network with image-centered network. Not like action must be learned through the motor feedbacks and through BP algorithm to adjust the weights of the deep neutral network, intelligence emerges out of the brain from vertically classifying and horizontally interacting of concepts, from optimal choice of the empirical relationship between the upper concept of the behavior object and the behavior itself. This paper analyzed the differences between natural language and artificial language and expounded the comprehension process of two languages. Moreover, it elaborated the existing problems in deep neural network technology. In the end, the paper proposed suggestions for AI innovation directions on the neural network mechanism.
Key words: Language; Concept; AI; Neural network; Similarities; Discrepancies; Emergence

1 Introduction

Linguistics has an indissoluble bond with Artificial Intelligence (AI). Language and intelligence are positively correlated, so the study of natural language comprehension is a way to understand the essence of intelligence, and therefore of crucial importance to solve the current AI problems and develop the deep learning robots. Since 1956, natural language comprehension has integrated into the study of language information processing. Chomsky introduced inference and logic analyzing into the study of language deep structure, but his sentence generation theory proved to be useless to machine intelligence. We are not without good programmers, but without good linguistic theories. With the rising of deep neural network technology, the current situation for AI technology is old problems stayed, new problems keep appearing.

As for old problems, since people treated natural language as a semiotic system, everything is of great complexity. The structures of natural language and its semantic representations have a complicated hierarchical relationship. The first is the sentence structure complexity. Especially for phonetic languages such as English, the sentence has a hierarchical structure, so the grammatical relationship sometimes can be very complicated. But for Chinese sentence, it has no this hierarchical structure phenomena, or at least it shows not on the linguistic level, but shows like an expression habit of concept sequence on the semantic level. The second is the relationship between symbols and its semantic representations. It is believed there are no the isomorphic relations with one-to-one correspondence in the natural language. But artificial language usually has a strict one-to-one corresponding relationship between its structures and semantic representations. How to make machine be able to understand natural language and have language intelligence is not an easy job.

New problems keep appearing. A common criticism of neural networks, particularly in robotics, is that they require a large diversity of training for real-world operation(Hinton,2006). And you have to preserve past training diversity so that the system does not become over trained. "Although neural nets do solve a few toy problems, their powers of computation are so limited that I am surprised anyone takes them seriously as a general problem-solving tool" (Dewdney, A. k. 1997).

A recent study found that visually indistinguishable images that are truly identical to human eyes, but not for the deep neural networks, they will be misclassified. This suggests potential deep flaws in all neural networks. (Collobert, 2008). A further study by researchers from Google, New York University and University of Montreal has found this flaw in almost every deep neural network.

Aside from their utility, a fundamental objection to artificial neural networks is that they fail to reflect how real neurons function. Back propagation(BP) is at the heart of most artificial neural networks

and not only is there no evidence of any such mechanism in natural neural networks, it seems to contradict the fundamental principle of real neurons that information can only flow forward along the axon. How information is coded, stored by real neurons is still unknown. (Bengio, 2003). To use natural neural networks as an inspiration for an approach to computing that is inherently parallel and which provides solutions to problems that have up until now been considered intractable. (Ngiam, 2011). Since people can skillfully speak their mother language without realizing the grammatical, expressional and pragmatic rules, is that necessary to treat the computer understanding of language rules as the precondition for computer understanding of natural language? If the answer is no, how to endow machine with that intelligence that human have?

2 How Intelligence Emerges Out of Brain Neural Networks
2.1 The essence of modern computer is still unchangeably a codes breaking machine

Intelligence, no matter how it is defined, is based on concepts, thoughts and behavior feedbacks. Concept, as the basic unit of language and thought, possesses duplicity in nature, therefore can be broadly divided into two types as image concept and sound concept. It is misleading that Saussure viewing language as symbols, because treating language as symbols or actually codes' linear relationship will naturally lead to a decision that sound and concept are the two sides of a code. (see picture 1, Saussure part of ABC). Part C is in the mind, actually consists part D and part E, while part D and E are in the mind correlated. Hjelmsev's ladder-shaped theory (see picture 1, part of ABED) is better than Sassure's triangle theory. Linear sequence might be true when language is uttered from mouth or transferred in the air, but it does not mean the same is that when language is processed (heard) or produced (uttered) in the mind. Since our brain is a cubic neutral network, the structure of network itself suggests that all the information processed in our mind is multiple line processed. So, viewing language as codes and codes' linear relationship is meaningless. Saussure only saw the superficial phenomena. Moreover, a stronger evidence from linguistics also suggests treating language as codes and liner's relationship is wrong. The phenomena of linguistic discovery that similar sounds share similar meanings, not only indicates that language processing (understood) in the mind is multiple line processed, but also suggests that the information of sounds and images are dispersedly stored according to their similarities and discrepancies. Because only when the information of sounds and images are dispersedly stored according to their similarities and discrepancies, can it be possible that the similar sounds share similar meanings. We mean that both language and image have no integral existence in the brain, so the dispersedly stored information(s) are impossible to be processed by the code's linear model.
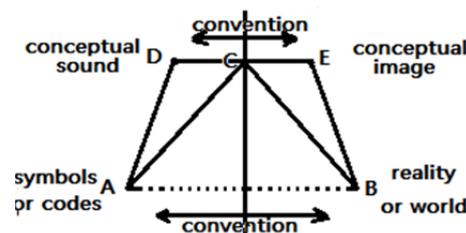
Pic 1: Saussure-Hjelmslev Contrast

Figure 1   Saussure-Hjelmslev Dontrast

Therefore, treating language as codes or codes' linear relationship is misleading, that was why Alan Turing invented a codes breaking machine to break the Enigma, later called Turing machine, because anyone treated language as codes or codes' linear relationship, will naturally design a codes breaking machine. Until now, the essence of modern Von Neumann computer, is still unchangeably a codes breaking machine. The only difference is that modern computer can decode the whole world. This doom decided that modern computer of its design can only imitate intelligence, but with no intelligence. A computing machine can only relay on artificial instructions. Computer can restore and transfer information, but it lacks of the ability of creativity. But human brain, take translation and answering question as examples, different person has different translation or answers, which one is the best, our brain can compare, to choose the best option according to the situation.

Alan said that he defeated God, but God's creation of human intelligence doesn't need any software to support. So God gifts him one bite of a poisonous apple, for God's attitude is clear that computer and AI machine are totally different. Treating language as codes is a terrible idea, that can only develop a codes breaking machine.

2.2 Image intelligence and language are two independently correlated neutron network existences

Obviously, it is concepts not symbols that build up the towers of language and thought as well as intelligence. How can symbols build up the towers respectively of language, of thought and of intelligence? like a Barbie doll to be built up by clothes, but without soul? Apparently, concept is the soul of language, not on the contrary, language has a soul of concept. Symbol itself has no soul. To say symbol has concept and sound as its two sides is to say clothes has man and clothes (as its two sides). What's the difference between symbol and sound? Smart man will immediately find there is a problem of infinite loop of circulated inclusion. Philosophy tells us that the world, no matter psychologically or physically, can only be binary relationship or quaternary the like, it is impossible to be ternary relationship or the like. Therefore, the essence of language is concepts not symbols. After all, while concepts are stable in all languages, symbol is arbitrary and a variable, the fact that language can be translated also suggests that concept is the basic unit of language, because so-called language translation is just to transform the language forms, not concepts themselves.

When we treat language as consisting of concepts, and take sound and image as its two sides, then everything is simpler and clearer. Wolf's hypothesis can be explained. Because language and thought are connected two different things, they are equivalent in effectiveness, activating each concept or sound can activate its related opposite side, they are connected as if they are the two sides of the same paper, while they are relatively independent. Here we must clarify why language (or conceptual language) and intelligence(or image concept) are positively correlated, but not the same thing. Because natural language is not human's patent. Different natural languages have been used by different races: humans, dolphins, whales, gorillas, though only human intelligence and languages are advanced. Since language and intelligence are both naturally evolved, their relationship is obviously parallel to each other and positively correlated. The evolution of language and intelligence are interacted and all the way paralleled. Language is the knowledge carrier, it is helpful to develop and build up intelligence, without inheritance of those language concepts like "agriculture, industry, molecule, bacterial, nuclear, etc.", modern man will not be more intelligent than primitives or animals. The process of language learning is the process of children establishing concepts and building intelligence. Since animals with no language also have been spotted basic intelligence, of course image intelligence is comparatively independent of language intelligence and they have their own nerve neural network existences that are vertically paralleled and horizontally correlated.

2.3 The essence of machine language and machine comprehension of natural language

Compared to natural language, machine language is a set of instructions expressed in binary codes. Machine language is not CPU used language but CPU produced language, since different CPU uses different assembler language. Because natural language and machine language are counter-parted, we can compare them while exploring the characteristics of natural language.

Machine has largely substituted human physical strength, but the substitution of machine for human mental activities is still a fantasy. For the hardware part of computer, an attempt of imitating the brain neuron network has witnessed a thrillingly preliminary success in imitating preliminary intelligence, but by computing 0 and 1, and by adjusting the value of each variable of the network nodes, the mechanical imitating on human intelligence cannot lead to real intelligence. The secret human intelligence can automatically or naturally emerge out of the neuron network lies not only in the network itself. Real intelligence, as we know, like that natural language of human beings, is acquired not only by laboring itself, but by interacting with outside world and with information feedbacks.

Alpha-go must behave like a man to be able to actively explore and collect the information he needed, and be able to judge the quality of the information he acquired excepting for imitating a man to play Go games. Alpha-go should be able to like a man knowing to ask why as well as do more works simultaneously and be experts in all works. Alpha-go leaning to play Go game by manually selecting and feeding him with data, this training process is time consuming, and by software adjusting it weights to learn appears to be awkward.

3 Problem of Machine Intelligence is Defined in Advance

Until now, the study of machine intelligence is still progress and difficulty coexisted. Some of the achievements have been put into practical use. For example, answering questions or settling a matter according to the information in the data base, completing a part of easy jobs according to the natural language instructions. However, machine understanding of natural language has not realized the breakthrough in essence. It still faces great challenges in technologies in order to endow computers with

the intelligence that human being have. One of the challenges is that people seldom realized that natural language is a sounds and situation coordinated conceptual system, and the weights of the neutral tree can be automatically adjusted by the feedbacks of the action. Human brain don't need software to support, the software (if it has) are self-generated and self-exerted.

Computer can better understand non-language instructions than language instructions, for example, our intelligent cell phones, every morning it alarms, but on Sunday morning it does not. It is because the button of alarming on the Sunday morning has been shut down by us, the button instruction can be perfectly understood by computer, but not a language instruction. To respond to behavior language is approximate to respond to stimulus.

Responding to stimulus is animal level of intelligence. In this sense, although Alpha-go defeating human being seems amazing, but it is conditional response level of intelligence. It's like children to learn from watching cartoon, they know the solar system and the USA, but their knowledge of USA is only on the tellurion. Therefore, the problem of Alpha-go is as same as that of the children. All its knowledge is from cartoon or from button instructions, if the knowledge the cartoon spooned is wrong, everything will be wrong, it can not make the right judgment by itself. If we input the Alpha-go with wrong collection of illustrative plates of a Go game, the computer will like that reported stupid children burning their playmate by binding him on a tree to imitate the cartoon of a happy goat. Child never realized danger until the burnt painfully crying. All in all, intelligence is not an accumulation of input knowledge, but the ability to judge and analysis the input knowledge on its quality and usage, this is the knowledge about knowledge, and it can only be acquired from reality instead of from "rule-input". Human beings can use their mother language perfectly without realizing any rules of their mother language, because their intelligence is based on situation not on rules-input. Skill and experience come from practice and feedbacks, this is where real intelligence comes from.

4 The Innovation on the Neural Network Structure
4.1 Both current computer and deep learning neural network are going on the wrong way

In retrospect, computer can do a lot of works, but every work it does needs different software to support. We have too many software to write and to be fixed up, it is a burden and unnecessary for both programmers and users. Although the emergence of windows and assembler language respectively make the computer using and program writing a little convenient than before, but generally speaking, they are not making things easier, but going on the wrong way much further. Different CPU requires different assembler language, so we are always busy with learning new assembler languages. The problem is not we are unwilling to learn, but the inspiration of machine intelligence has proved and would prove the learning of writing program, with time abiding, will be abandoned.

Writing program is out of date. Deep learning technology has been used in the area of image recognition and speech recognition. While reducing the program writing to a negligible degree, it still has great improving space.

The principle of the image recognition technology itself is wrong.

Firstly, large quantity of images of the same type have to be feed to the system, then according to different output results, adjust the weights of each neural network nodes, although this process of adjusting can be realized automatically by using software, but it is still time consuming. In contrast, our brain is not working in such a way. Secondly, from the network training process, we can see software is still needed. In contrast, our brain does not need any software to support. Thirdly, the image recognition training process although can realize the image recognition work, but the image recognition ability is a simulation of intelligence, it is not real intelligence. Intelligence simulation is impossible to create real intelligence, because real intelligence, no matter what it is, it is at least a kind of image combination ability instead of image recognition ability.

All in all, both writing software and adjusting weights are to give instructions to computer, both two methods are to get machine language the 0 and the 1. While assemble language is various, machine language is only 0 and 1. To get weights for the sake of getting weights is unnecessary. If all human works are required to be done by the same robot at the same time, how the weights should be adjusted or assigned by software? Therefore, adjusting weights for different work in essence is equivalent to writing programs, that is to give every step of instructions to computer or to decide the 0 and 1, different work need different weights, that is unnecessary since our final purpose is only wanting to get the binary codes of the world. Why can't we reform the hardware part especially the structure of the neural network to make the complete intelligence to be possible? But how? The answer lies in the conceptual

classification methods.

4.2 Linguistic inspiration on the intelligence emerging mechanism

In the morning, my daughter waked up, began her baby talk: Papa, did you sleep well tonight? Actually she referred to last night for her absence of the word of "last". Here, she is actually not asking a question, but saying a hello to me. Salutation is a behavior of human intelligence. Firstly, in the dialogue, does the right word used in the situation need the adjustment of weights in the brain? The answer is negative. Language expression is no more than an utterance habit. The reason that language must adapt to situation and to meet the pragmatics standard is that every word is a concept, the words "tonight" and "last night" are concepts, their meaning are decided by situation. Grammar, syntax, world-building, and even context itself can be counted as language situation that match to image reality. Language rules is not passive input but active contracting with image reality. Secondly, we can see, the development of human intelligence is in fact comparatively independent of language development. Their relationship is parallel related, but not absolutely synchronous. Human intelligence is decided by something else beyond language, and that can only be the neural network of conceptual information store mechanism.

Another example illustrates the intelligence emerging mechanism and the conceptual information store mechanism.

Mama: Are you willing to bring the perfume to me?

Snow white: No.   Mama: Why not?

Snow white: Because I am afraid of pepper!

Snow white said No to her mum, it is an intelligent behavior. Her intelligence tells her not to do because her brain classifies perfume, wind medicated oil and cooling oil into one class as pepper! Pepper is an upper concept!

Language is not only a series of distinctive astronaut symbols, but the concepts behind every symbols. Concept mainly refers to images, it is not an aggregated collage of vision, audition, touching, smell sense, taste sense, and emotions, etc. Without vision or image, audition, touching, smell sense, taste sense, and emotions, etc. are all meaningless. Without vision, mum is just milk, because we do not know who is the milk giver, so we don't know mum. Who bite me? Who sting me? Without image schemas, next time, dog and bee come, we still do not know escape. So, both conceptual world and real world are binary, and image schemas represent for intelligence.

5 Conclusions

Intelligence emerging out of brain neural networks is not due to that brain can automatically adjust the weights of the neural network nodes, but because conceptual information(s) of vision and audio are respectively resolved and dispersedly stored according to concept similarities and discrepancies in the adjacent neurons structures which forms a conceptual monolithic network by correlating language-centered network with image-centered network. Intelligence emerges out of the brain from vertically classifying and horizontally interacting of concepts, more specifically, from optimal choice of the empirical relationship between the upper concept of the behavior object and the behavior itself. Human intelligence is decided by the neural network of conceptual information store mechanism. We need to reform the neural network structure to change the conceptual classification methods. The reality is 0 and 1, our eyes can automatically acquire the information in nature of 0 and 1 from acquiring image and sound of the reality.

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The Effect of Internal Control Information Disclosure on the Value Relevance of Accounting Information: An Empirical Study of Chinese Listed Companies in Warehousing Logistics Industry [*]

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Abstract: Internal control information is the foundation of decision-making for investors. It reduces the information asymmetry, and improves the degree of trust and use for information users. Through illuminating the current situation of internal control information disclosure of Chinese listed companies, this paper analysis the effect of internal control information disclosure and the value relevance of accounting information, and puts forward the research hypothesis and builds a mathematical model. According to the data of Chinese warehousing logistics industry listed companies in 2013-2015,this paper has the regression analysis and puts forward corresponding countermeasures and suggestions to perfect the internal control information disclosure of listed companies.
Key words: Internal control; Accounting information; Value relevance of accounting information

1 Introduction

2586 listed companies disclose the internal control evaluation reports in 2014, 98.29% of overall disclosure. Bur only 80.74% has the normative form about these reports. In terms of the standards of internal control disclosure, 2141 listed companies disclose the standards, but the rest do not. 351 listed companies disclose the internal control defects, but only 8 listed companies disclose the rectification of internal control defects in the first half of 2014.In terms of disclosure of internal control audit reports, it is 77.88% in 2014.And the disclosed proportion are 92.43%, 86.79%, 56.49% and 92.43% respectively for Shanghai Stock Exchange main board, Shenzhen Stock Exchange main board, Shenzhen SME board and Shenzhen GEM board. However, in terms of the standardization of the disclosure of internal control audit reports, 30.50% of the listed companies do not disclose the normative internal control audit reports. At present, the internal control information disclosure of listed companies is mainly the following three aspects.

1) The disclosure of internal control evaluation report and internal control audit report format are not standard.19.26% of listed companies do not carried out the latest specification. The disclosure of internal control audit reports is not good either. There is any undisclosed or nonstandard disclosed phenomenon.

2) The disclosure of internal control defect information is incomplete, loosely and poor availability.32.10% of Chinese listed companies discloses incomplete internal control defect information. And Internal control evaluation reports of 17 listed companies are serious different to the internal control audit reports Issued by Certified public accountants. Internal control defect information is not rigorous and not strong availability. Its use value needs further evaluation.

3) The professional quality of internal control audit of Certified Public Accountants remains to be improved. The internal control auditing opinions and financial statements auditing opinions of listed companies exist significant differences in 2014. The internal control auditing reports of 286 listed companies does not have a valid digital signature from Certified Public Accountants.

2 Literature Review

The United States promulgated SOX in 2002, which require listed companies to disclose their internal control evaluation reports. And these reports must be audited by Certified public accountants. Many foreign scholars carry out the research about the economic consequences of SOX to internal control. Doyle finds that the internal control defects and accrual quality are the negative correlation (DOYLE J T, GE W, MCVAY S E, 2007; ASHBANGH-SKAIFE H, COLLINS D, KINNEY W, 2008).Chan investigates the correlation between significant internal control defects and more earnings

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management behavior or lower income and surplus under the SOX 404 terms. The results show that the companies' internal control defects are significant to handling accrual quality and handling the absolute value of the accrued are significantly greater than the control sample, and also prove that significant internal control defects in lower income and surplus of close sex of(CHAN K C, FARRELL B R, LEE P,2007).In addition, Donaldson's research proves that the effective internal control has significant function for improving the quality of financial reporting (DONALDSON TESTIMONY W, 2005).

For the research on effects of earnings management on value relevance of accounting information, stock price is affected by the book value and net income commonly. Francis believes that the income statement and balance sheet play an important role in determining the rights and interests of value .Marquardt found that when the companies manage the earnings the value relevance of net profit declines the book value of net profit declines increases. At the same time, the overall value relevance of the book value and the net profit declines (MARQUARDT C A, WIEDMAN C I, 2004).

In conclusion, these papers have proved that the internal control information affect earnings management, but also proved that the earnings management affects the value relevance of accounting information. According to the related provisions of Chinese securities regulatory commission, this article intends to test the influence of the internal control self-assessment report, internal control audit report and internal control defects and the value relevance of accounting information.

3 Research Hypotheses

The higher the quality of accounting information is, the higher its credibility and usefulness. Investors determine the authenticity and fairness of accounting information through a great deal of information. If the financial position and operating results of listed companies can reflect in the accounting information really and effectively, it improves the degree of trust and use for information users to a certain extent. Internal control information is the foundation of decision-making for investors. The parties of the capital markets dependents on accounting information to make a judgment. In capital market, the various stakeholders often can reject untrue and unreliable information, makes the true high quality information to play a leading role, reflects in the company's stock price, thus to guide the allocation of resources and optimize the industrial structure. Therefore, the quality of accounting information and the value relevance of accounting information are the positive correlation.

Internal control is divided into the control environment, risk assessment, control activities, information communication and supervision and so on. These five aspects including the basic situation of the listed companies, operating risk and control measures, production operation, the effective information transmission, the situation outside the effective supervision and so on, are the main content of improving accounting information quality. The quality of accounting information has strong positive influence to the value relevance of accounting information. Therefore, the internal control of listed companies and the value relevance of accounting information are also the positive correlation. With the release of some files, the problem of internal control information disclosure is increasingly important. Investors make the decision by internal control information listed companies released. And it is a significant issue, related to the decision's science if the internal control information is of high quality. On account of the positive correlation relationship between the quality of accounting information and the value correlation of accounting information, the disclosure of internal control information makes a great impact on value relevance of accounting information. These are three hypotheses.

Hypothesis 1: The disclosure of internal control evaluation reports can improve the value relevance of accounting information. Hypothesis 2: The disclosure of internal control audit reports can improve the value relevance of accounting information. Hypothesis 3: The disclosure of internal control defect reports can improve the value relevance of accounting information.

4 Research Design
4.1 Sample selection and data sources

This paper selects Chinese warehousing logistics industry listed companies as samples, and searches and organizes the data according to the information of financial websites and listed companies' official websites.

1) Excluding ST companies. Because the serious defect of ST companies reduces the workability of accounting information, excludes ST companies in the process of research.

2) Eliminating the companies with missing or wrong data, to ensure the scientific and fairness of research results

4.2 Model design

Francis and Feltham define the relationship between the market prices of the stock or the income and accounting information to be the value relevance, and measure the value relevance through the adjustment fitting R2 of the whole model and the significant degree of variable regression coefficient. Ohlson obtains the price model by strict mathematical derivation. He link accounting income and net assets to the stock price directly, then judge the strength of the value relevance of accounting information. This model includes the main factors such as net worth, surplus. Also some relevant variables can be incorporated into the model. The model has undergone major research checkout, and has good explanation ability. On the basis of this model, carries on the model revision to study the relevance between the disclosure of internal control information and the value relevance of accounting information about warehousing logistics industry listed companies.

The original model is $P_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \varepsilon_{it}$. P_{it} is the share price of the last trading day in April of i listed company in t accounting period; EPS_{it} is earnings per share of i listed company at the end of t accounting period; $BVPS_{it}$ is net assets per share of i listed company at the end of t accounting period. To test the impact of the internal control evaluation reports disclosure to the value relevance of accounting information, adds interactive items of IDE and EPS, IDE and $BVPS$ in the original model. When the listed company discloses the Internal control evaluation report, IDE is one, otherwise is 0. The new model can be used to test whether the disclosure of internal control evaluation report can improve the value relevance of accounting information of listed companies. The new model 1 is:

$$P_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 EPS_{it} \times IDE_{it} + \beta_4 BVPS_{it} \times IDE_{it} + \varepsilon_{it}$$

At the same time, to test the impact of the internal control audit reports disclosure to the value relevance of accounting information, adds interactive items of IDA and EPS, IDA and $BVPS$ in the original model. When the listed company discloses the internal control audit report, IDA is one, otherwise is 0. To test the impact of the internal control defect reports disclosure to the value relevance of accounting information, adds interactive items of IDD and EPS, IDD and $BVPS$ in the original model. When the listed company discloses the internal control defect report, IDD is one, otherwise is 0. The new model 2 and new model 3 are:

$$P_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 EPS_{it} \times IDA_{it} + \beta_4 BVPS_{it} \times IDA_{it} + \varepsilon_{it}$$
$$P_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 BVPS_{it} + \beta_3 EPS_{it} \times IDD_{it} + \beta_4 BVPS_{it} \times IDD_{it} + \varepsilon_{it}$$

5 Empirical Analyses
5.1 Variable descriptive statistics

Carries out the descriptive analysis of the variables in the model, and then observes the overall distribution of variables in samples. Descriptive statistics is shown in Table 1 below.

Table 1   The Results of Descriptive Statistics

variable names	year	mean value	median value	standard deviation	variance value	the minimum value	the maximum
P	2013	7.179	6.385	3.286	10.798	3.530	14.070
	2014	20.925	18.010	10.726	115.037	9.250	47.460
	2015	14.011	13.435	7.073	50.028	5.020	30.370
EPS	2013	0.441	0.334	0.385	0.148	0.055	1.590
	2014	0.337	0.303	0.214	0.046	0.036	0.843
	2015	0.297	0.263	0.294	0.086	-0.369	1.116
$BVPS$	2013	3.814	3.452	1.762	3.104	1.751	7.075
	2014	3.900	3.360	1.817	3.303	1.892	8.292
	2015	4.035	4.024	1.536	2.360	1.673	8.043

5.2 Correlation test

The results of the correlation test of samples data about the variables are shown in Table 2 below.

<p align="center">Table 2   The Results of Pearson Correlation Test</p>

	P	*EPS*	*BVPS*
P	1		
EPS	0.504[*]	1	
BVPS	0.511[*]	0.401[*]	1

Note: [*]$p < 0.1$

Can be seen that from the chart, the correlation between *EPS* or *BVPS* and the Share price is more than 0.5, and is positively related. This shows that the model is reasonable preliminary.

5.3 Regression analysis

<p align="center">Table 3   The Results of Regression Analysis of the Model 1</p>

P	2013	2014	2015	All the samples
EPS	9.220[***]	5.670[***]	1.249[***]	6.567[***]
	3.902	5.333	2.120	4.780
BVPS	1.722[***]	2.432[***]	4.780[***]	1.120[***]
	5.524	6.230	2.112	6.455
$EPS \times IDE$	-0.368[***]	-0.121[***]	3.245[***]	1.298[***]
	2.769	-0.145	5.670	3.434
$BVPS \times IDE$	-0.656[***]	-0.244[***]	-0.385[***]	-0.190[***]
	-0.120	-1.675	-0.124	-0.230
Constant term	45.654[***]	35.690[***]	56.120[***]	46.668[***]
	6.493	2.259	5.450	5.690
F-statistic	112.830	230.119	189.305	129.456
Adj R-squared	0.509	0.660	0.517	0.581

Note: [***]$p < 0.01$, [**]$p < 0.05$, [*]$p < 0.1$

<p align="center">Table 4   The Results of Regression Analysis of the Model 2</p>

P	2013	2014	2015	All the samples
EPS	7.210[***]	5.576[**]	1.279[***]	7.007[***]
	4.902	5.2133	2.590	3.580
BVPS	1.222[***]	1.492[***]	3.750[***]	2.120[***]
	5.520	5.230	4.112	3.415
$EPS \times IDA$	-0.218[***]	-0.221[***]	3.575[***]	1.304[***]
	3.769	-1.105	4.690	2.412
$BVPS \times IDA$	-0.776[***]	-0.894[***]	-0.245[***]	-0.460[***]
	-0.139	-1.805	-1.164	-0.660
Constant term	51.654[***]	65.650[***]	38.170[***]	48.668[***]
	6.445	4.259	3.410	4.680
F-statistic	136.830	211.110	134.125	179.442
Adj R-squared	0.540	0.683	0.577	0.593

Note: [***]$p < 0.01$, [**]$p < 0.05$, [*]$p < 0.1$

Table 5   The Results of Regression Analysis of the Model 3

P	2013	2014	2015	All the samples
EPS	11.220[***]	8.610[**]	1.229[***]	6.337[***]
	3.762	6.433	3.124	5.715
BVPS	1.432[***]	2.428[***]	4.330[***]	2.920[***]
	6.514	5.210	3.102	5.125
$EPS \times IDD$	-0.318[***]	-0.021[***]	4.205[***]	2.298[***]
	2.559	-0.545	5.667	4.414
$BVPS \times IDD$	-0.856[***]	-0.344[***]	-0.355[***]	-0.121[***]
	-0.167	-0.235	-0.544	-0.390
Constant term	47.124[***]	46.690[***]	57.130[***]	49.6128[***]
	4.433	3.217	5.670	5.090
F-statistic	127.833	246.109	176.335	229.706
Adj R-squared	0.523	0.545	0.617	0.577

Note: [***]$p<0.01$, [**]$p<0.05$, [*]$p<0.1$

From the regression results, F value of three models is higher, and the adjusted R2 were over 50%. These show that the three models have good fitting. And the fitting of the sample overall reaches more than 57%, show that the model design is reasonable. From the regression results of all the samples, the explanation of EPS and BVPS to shares is in 1% of cases significantly. It shows positive correlation between the internal control self-assessment report, internal control audit report, internal control defects and the value relevance of accounting information. Three Hypotheses are validated.

6 Conclusions

Listed companies of Chinese Warehousing logistics industry in 2013-2015 as research sample, uses the linear regression model to test empirically the influence of the internal control self-assessment report, internal control audit report and internal control defects and the value relevance of accounting information. The result finds that the listed company internal control self-assessment report, internal control audit report and internal control defects affect the value relevance of accounting information to a certain degree. The disclosures of internal control information will help to improve the value relevance of accounting information of listed companies. For the external stakeholders of listed companies, the internal control information is helpful to make their decisions more scientifically and more practically.

Acknowledgement

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The Linkage of Potential Hazards with Safety Impact: A View from Floating Storage Facility in Malaysia

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Abstract：Floating storage facility offers one unique and innovative solution for new installation in offshore crude oil industry. However, the system will easily contribute to potential hazards or risks that are difficult to quantify due to shortness of experience. This article gives an overview of the potential hazards during normal activity and relevant safety impact to personnel, asset and environment. The study applied Risk Assessment approach to measure potential hazard levels. Survey on 157 employees of 4 floating oil storage facilities were analyzed with methodological tools of ANOVA One Way, T-Test and Pearson Correlation to evince linkage between potential hazard and safety impact. The result showed that there is significant and yet low level of relationship between potential hazards and safety impact. The findings from the collected experience-based and research survey data can be applied to facilitate the development of rationalized approaches for top management in decision-making on the safety guideline, policy making and investment towards the floating storage facility.

Key words: Potential hazards; Floating storage facility; Safety impact; Occupational accidents

1 Introduction

Prices for crude oil have been plunging since the late 2008 and this seems barely increasing significantly in the past five years. As such, oil industry seeks better economic solutions to its new challenges for business sustainability. Business operation has always been encountering economic challenges and trying unique methods for sustaining competitive advantage, especially through process efficiency (Tasmin *et al*., 2016). Hence, floating storage and offloading (FSO) crude oil facilities nowadays are becoming one preferred and efficient solution for new installation of oil and gas fields. Wilne (1998) reported that such facilities are suited for both small marginal fields and large deep-water reserves. Due to cost reasons and practical advantages if compared to fixed installation, floating facility is the most commonly used as crude oil storage systems. According to Alford (1997), with the straight forward mechanism of building and conversion basing on the existing ship building technology, the expensive offshore works can be kept to minimum as most of the construction, hook-up and commissioning can be completed onshore, with significantly less cost. The floating facility is a comprehensive system, it subsequently contributes to the potential hazard or risk that is surmountable to quantify due to lacking of experience, when compared to conventional shipping industry. It is reported that global shipping industry has been largely having a safe track record, even though when an incident happens it is expectedly disastrous (Hetherington *et al*., 2006). As such, there is a typical similarity in terms of potential hazards and safety risks in maritime shipping and floating crude oil storage facilities.

For the construction of floating storage facility, two options can be considered. First option is the conversion of an existing shipping vessel. With the condition of the vessel and approval by the Classification Society, the selected tanker is converted to become floating storage and offloading facility. Related transferring equipment is installed to suite for the facility to receive oil and gas from designated oil well via subsea pipeline. Another option for oil storage is by building a new purposely built floating facility. The concept of this huge oil storage is rather similar with the converted vessel. Such storage facilities are expected to remain on a designated location for up to 20 years with all the environmental conditions taken into system design consideration (Ericson, 2016). Some of the facilities are designed to suite the process of keeping hydrocarbon which is located on top of the vessel. The floating facilities are designed to avoid any dry docking as compared to the practice of conventional sailing vessel. This poses new challenges as on-site repairing can become very difficult and equipment failure may have adverse consequences for vessel safety (Wilne, 1998).
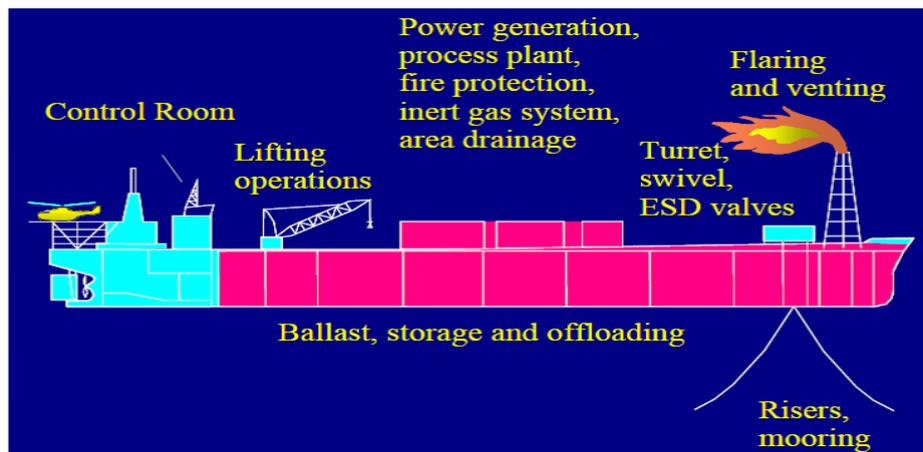
Figure 1   FPSO Compartmentalizing of the Ship

Figure 1 shows the example of Floating Production Storage and Offloading (FPSO) compartmentalizing of the ship, according to Gilbert and Ward (2001). It classified floating crude oil storage vessel in 7 areas, namely control room, lifting operation, ballast-storage-offloading, risers-mooring, flaring-venting, turret-swivel-ESD and power-generation, process plant, fire protection, inert gas system plus drainage areas. Risers and mooring is located at the front part of the vessel, as it is linked to the storage compartments and offloading. Flaring and venting is placed high above at the front part of the facility. Such systematic design has been vital for operational safety and employee safety compliance.

2 Literature Review

Smith-Crowe *et al.* (2003) stated strong and positive correlation between safety knowledge and safety performance, mediated by organizational climate, especially at highly safety guarded facility such as nuclear waste site. As such, studies on safety hazards at acutely safety sensitive venues have been impacting many oil and gas facilities, including floating oil storage terminal vessel. The floating storage structure has been used widely and reliably throughout the oil industry for many decades. The floating storage facility was primarily installed as for storage and offloading activity. Nowadays, with modern technology, the facility becomes offshore producing installation, storage facility and offloading terminal; all rolled into one single unit. Moan *et al.* (2002) described that the floating storage and production unit is a vessel that receives oil and gas from subsea wells through flow lines known as risers. The vessels can be a purpose-built ship or semi-submersible, or a converted shipping line tanker. This facility is commonly known as floating, production, storage and offloading (FPSO). The vessel without production system is termed as floating, storage and offloading (FSO).

Vinnem (2000) explained from the operational safety perspective of FPSOs: based on initial summary report, although the facilities are becoming more common, operational safety performance may still be considered somewhat unproven, especially when compared to fixed installations. Furthermore, floating installations are more dependent on continued operation of some of the marine control systems, during a critical situation. There is accordingly a need to understand the aspects of operational safety for the facilities, in order to enable a proactive approach to safety, particularly in the following areas:

- Turret operations and flexible risers,
- Simultaneous marine and production activities,
- Vessel movement/weather exposure, and
- Production, ballasting and offloading.

Hazard identification is a formal activity to examine all aspects of the operation under consideration using a pro-forma approach. It depends on the quality of the input data available and is typically performed as a table-top exercise lead by an experienced facilitator and the participation by representatives covering the full range of design and operational expertise for the system under consideration (Spires, 2001). The author stated that the hazard identification has considered a total of eleven different hazard categories that exists during the production phase of development. Biasotto and Rouhan (2004) explained that each identified hazard is analyzed in terms of its functional failure, failure

mode, consequences (including the possible different scenarios), existing barriers, control methods and repair strategies. The identified hazards are qualitatively classified on the basis of the likelihood and the related consequences regarding risks to personnel, to environment and to asset and production (Biasotto and Rouhan, 2004).

In the records of history, there have been a number of catastrophic accidents on offshore facility and causes of such accidents have become lessons-to-learn to operators and this has shed more light on the subject matter. While such accidents are undesirable and should be avoided at all costs, the world has benefited in no small measure from these experiences (Omogoroye and Oke, 2007). Chang and Lin (2005) reported that fire which led to explosion account for 85% of the onshore incidents involving petroleum refineries, oil storage and terminals, in the case of 242 oil storage accidents in the last four decades.

Human-related factor, such as manpower and its associated behavior, has been identified as one influential element contributing to fragility of many safety-sensitive industries. Fugas *et al.* (2012) reported that working peers' habitual safety norms and attitudes mediated the relationship between workplace safety climate and proactive safety behaviors, among more than 300 workers in transportation industry. In addition, 　　Hetherington *et al.* (2006) emphasized that monitoring, managing, controlling and modifying the human factors issues of maritime workers could contribute significantly and positively towards safety performance in shipping industry. In February 1986, at Thessaloniki, Greece, cutting torch sparks ignited a tank spill fuel from a dike of a fuel storage tank. As a result, the fire quickly spread to neighboring petrochemical storage areas and causing the destruction of almost all 12 crude oil tanks. Whilst in December, 1985 at Naples, Italy, 24 tanks of marine petroleum products terminal were destroyed by fire that was caused by tank overfill. Fire and explosion totally destroyed the main terminal buildings, neighboring industrial facility and residential homes (Chang and Lin, 2005). Obviously, there are far many more oil storage accidents on the main land, in comparison to the focus of this study which is on floating oil storages in the open sea (offshore).

The major hazard to the offshore oil and gas facility is not much different from others as described in lesson learn of the onshore accidents. They are clearly categorized as: loss of well control or blowout, fire from the process plant, explosion from the process plant, H_2S and naturally occurring radioactive materials from reservoir, extreme weather, ship collision, seismic events and helicopter or other aircraft impact (Galbraith and Terry, 2008). For the past few years, the major accidents happen involving multiples fatalities, equipment damage and environment impact that require high cost to overcome the situation. Khan *et al.* (2004) also pointed out that the main hazards on offshore installation are the processed fluids and processing operations, the sea environment and the process links between the reservoir and other installations. The lesson-learnt is part of the process to identify the hazards and mitigate them to as minimum as possible. These unfortunate events have happened to 'Alexander L Kjelland – structure failure during adverse weather condition', 'Ocean Ranger – capsized due to ballasting', 'Piper Alpha – hydrocarbon release' and 'Super Puma Helicopter crash at Cormorant', as described in "The Offshore Industry – Learning from Accidents" by Galbraith and Terry (2008). Due to these incidents, the industry has managed to be sufficiently innovative in coming up with relevant solutions to overcome the challenges (Tasmin and Woods, 2007). Though those unfortunate events happened at oil rigs, such mishaps may have also occurred at floating oil storage facilities due to its similar nature of offshore operations.

The floating storage and offloading facility has the ability to handle changes of oil reservoir and process, as well as offering storage and offloading of the treated crude to other export tankers. With this significant and comprehensiveness of the system, it will easily contribute to the potential hazard or risk which is difficult to quantify due to FPSO's limited experience if compared to long time spanning of shipping industry. The hazard is defined as a situation with a potential source of harm that are causing human injury, damage to the environment, damage to property or any combination of such event (BS EN ISO 17776:2002). It may be a physical situation (such as a shuttle tanker is a hazard because it may collide with the production installation), an activity (such as crane operations are a hazard because the load might drop) or a material (such as fuel oil is a hazard because it may catch fire). The essence of a hazard is that it has a potential for causing harm, regardless of how likely or unlikely such occurrence might be.

3 Data and Methodology

This research study focused on floating storage facilities that have currently been operating in Malaysian waters. Basically there are 4 field owners operated the floating oil facilities, namely Petronas, Murphy Oil, Talisman and Petrofac. These 4 facilities are selected for data survey which represents the

field owner and their facility in Malaysia. The total number of Personnel On Board (POB) for these 4 facilities is 258 people. According to Krejcie and Morgan (1970), the total number of sample should be 154 respondents, in the survey which had been done via stratified random sampling method. In the overall survey, a total of 157 correspondences have been taken as fully usable. This study demonstrated the level of potential hazards, significant differences between the demographic of facility towards the potential hazards and the relationship between potential hazards with safety impact. As such, it described the potential hazards from normal activities that should be considered at the floating oil storage facility. This is essential in order to achieve an overall safety and reliable design to personnel, asset and environment, as shown by the research conceptual diagram in Figure 2.
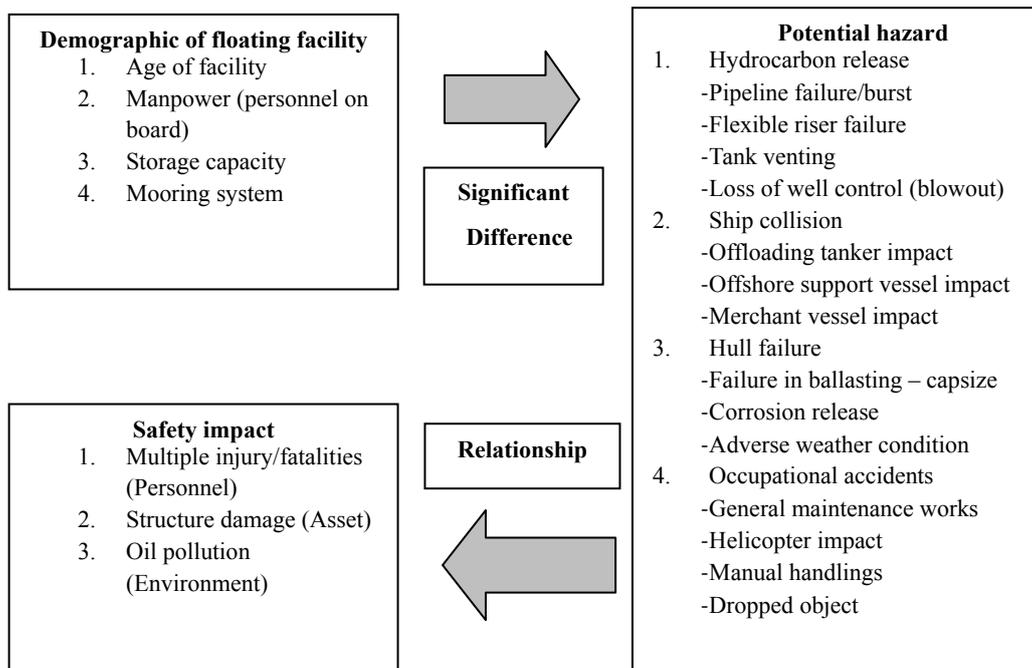
Figure 2   The Research Conceptual Relationship Diagram

This research applies the Det Norske Veritas (DNV) risk assessment approach, which is a step in a risk management procedure. It's a process of gathering data and synthesizing information to develop an understanding of the risk of a particular activity. Guldenmund (2000) stated that the safety climate assessment could be viewed as an indicator for organizational safety performance. Hence, the main purpose of risk assessment is to identify and rank the hazard risks so that they can be adequately managed. The use of risk assessment techniques in major hazard industries has grown significantly in recent years. This is particularly true in the offshore industry in the UK, where many aspects are subjected to full hazard risk assessment (DNV, 2001). Ericson (2016) defined hazard risk management is a discipline that is embedded into system development which is to identify and contain hazards, in order to avoid or alleviate the potential risk. Hazard risk is an assessment metric to forecast the probability and severity of possible incident or accident that will happen. This assessment provides among others, authorities and stakeholders with a sound basis for creating awareness about existing and potential hazards and risks, hence making positive decisions related to how they can prioritize and plan expenditures on risk reduction (Funnemark and Engebo, 2005).

There are two methods used as a tool for the study. The risk matrix and analytical tools are used to measure the level of potential hazard, the significance difference of demographic facility towards potential hazards and the relationship of the potential hazards towards safety impact of the facility. The first method of risk matrix is applied to measure the level of potential hazard whether it is 'low', 'medium' or 'high', based on ISO 17776 Risk Matrix approach. The risk matrix is a convenient method of ranking and presenting the assessment result. The second analytical tools are by applying ANOVA One Way, T-Test and Pearson Correlation, based on SPSS software.

Having set the problem background, literature and research methodology, below are the three

research questions to be pursued in this study.

RQ1. What are the hazard levels of hydrocarbon release, ship collision, hull failure and occupational accidents at the floating storage facility?

RQ2. What are the significant differences between the elements of demographic facility towards the element of potential hazards?

RQ3. Is there any relationship between potential hazards and the safety impact of the facility?

4 Analyses and Results

In this section, the findings from the methodology are discussed and simultaneously, answering the research questions developed for the study. The first research question seeks to determine the hazard levels of hydrocarbon release, ship collision, hull failure and occupational accidents at the floating storage facility; the second seeks to determine the significant differences between the elements of demographic facility towards the potential hazards, while the third intends to determine the relationship between potential hazards and the safety impact of the facility.

RQ1. Level of potential hazards

Table 1 shows the result on each potential hazard to personnel, asset and environment. Tool from ISO 17776 Risk Matrix (DNV, 2001) is applied to study the level of risk rating on each of the potential hazards. The cross reference from consequences and frequency show the risk rating for low, medium and high on each element of potential hazards towards personnel, asset and environment. From the table, it shows the levels of only low and medium risk rating towards the personnel, asset and environment. Fortunately, there is no high risk rating for the element of potential hazards. The level for low and medium level can be applied for ensuring the business continuity of the floating storage operation. If high risk rating appears, few safety steps are taken into consideration to minimize the risk or accident onboard the facility. The new risk reduction measures are implemented and the risk evaluation is repeated. In this particular case, the risk evaluation is defined as risk assessment and to be performed on every task on board facility. The risk reduction or control measures include both those to prevent incidents and to mitigate chronic aftermath of the incidents.

Table 1   Level of Potential Hazard for Malaysian Floating Storage Facility According to Risk Matrix

Potential Hazards	Sub section of potential hazards	Impact to Personnel	Impact to Asset	Impact to Environment
Hydrocarbon release	Pipeline failure/burst	Medium	Medium	Medium
	Failure of riser	Low	Low	Medium
	Cargo Tank venting	Medium	Low	Low
	Loss of well control (blowout)	Medium	Medium	Medium
Ship collision	Offloading tanker impact	Low	Low	Low
	OSV impact	Medium	Medium	Medium
	Merchant vessel impact	Low	Low	Low
Hull failure	Ballasting & capsize	Low	Low	Low
	Corrosion release	Low	Medium	Low
	Adverse weather	Low	Low	Low
Occupational accidents	General maintenance	Medium	Low	Low
	Helicopter impact	Medium	Medium	Low
	Manual handling	Low	Low	Low
	Dropped object	Medium	Low	Low

Table 2 evinces that the hazards are at higher risk probability when it comes to the hydrocarbon releases toward the personnel, the asset and the environment onboard. This is depicted by the sums of 8 mediums and 4 lows, as shown by the first row of Table 2 hazards' ranking. It is generally acknowledged that hydrocarbon release is one lethal issue in FPSO/FSO operation, since it is the most probable antecedent that may spark fire ignition onboard. Hence, the facility's top management has to pay higher attention on any eventuality towards issues related to hydrocarbon release. The hydrocarbon release is the first top priority, since this is the most detrimental issue among the four hazards, in relation to the whole safety of the FPSO/FSO facilities. The least potential hazard (ranking fourth) is hull failure, in which the respondents felt that it is the safest hazard issue. This is so because most hulls are double-layered, complemented with safety compartments which are equipped with safety valves and sensors to prevent failures. Furthermore, ship hulls and their coatings are designed to be in operation for very long time, approximately within 20 years.

Table 2　The Ranking of 4 Potential Hazards toward Safety Impact

Ranking	Potential hazards	Mediums	Lows
First	Hydrocarbon release	8	4
Second	Occupational accident	4	8
Third	Ship collision	3	6
Fourth	Hull failure	1	8

RQ2. Significant difference for demographic facility towards potential hazard

    Table 3 shows the summary of significant differences between demographic of floating facility and potential hazards by using analytical tools of the Anova One Way and T-Test. The age of facility, manpower and storage capacity are applying the Anova One Way due to ordinal data type being collected ranging from 1 to 5 respectively. The mooring system using tool from T-Test due to nominal data collected for turret system and spread moored only. The result shows that the age of facility having significant difference for ship collision since 'f' probability is ≤ 0.05. However, manpower and storage capacity are not showing any significant difference towards the potential hazards. The average age of the facilities in this study is below 15 years old and the ship collision is possibly giving an impact to the potential hazards, such as offloading tanker impact, OSV (Offshore Support Vessel) impact and merchant vessel impact. From the experience at the offshore, the OSV is the biggest threat due to the vessel is always at the alongside of the floating storage facility. The impact from the OSV can cause dented damage at the facility hull or worst oil spill to the sea. The sea environment factors, such as wind, swell, wave, and current, could also contribute to the incident, even though the facility have been operating for long period of time.

Table 3　The Summary of Significant Differences Between Demographic of Floating Facility and Potential Hazards by Using Anova One Way and T-Test.

Demographic of floating facility	Potential hazards			
	Hydrocarbon release	Ship collision	Hull failure	Occupational accidents
Age of facility	f=0.329 Not sig.	**f=0.043** **Sig.**	f=0.819 Not sig.	P=0.762 Not sig.
Manpower	f=0.401 Not sig.	f=0.259 Not sig.	f=0.189 Not sig.	P=0.275 Not sig.
Storage capacity	f=0.121 Not sig.	f=0.161 Not sig.	f=0.133 Not sig.	P=0.581 Not sig.
Mooring system	p=0.547 Not sig.	p=0.469 Not sig.	**p=0.001** **Sig.**	p=0.630 Not sig.

Anova One Way for ordinal data type: significant at 'f' probability ≤ 0.05
T-Test for nominal data type: significant at $p \leq 0.05$

    The definition of ageing of facility is about its condition and how that is changing over time. Ageing is that effect whereby a component suffers some form of material deterioration and damage with an increasing likelihood of failure over the lifetime (Horrocks *et al.*, 2009). The significance of deterioration and damage releases will potential effect on the equipment's functionality, availability, reliability and safety. Overall, ageing facility is facility which is, or may be, no longer considered fully fit for purpose due to deterioration or obsolescence in its integrity or functional performance. Ageing is not directly related to chronological age. There are many example of very old facility remaining fully fit for purpose and of recent facility showing evidence of accelerated or early ageing, e.g. due to corrosion, fatigue or erosion failures. It is important to recognize that many features which may be subject to ageing, can contribute to health, safety and environmental performance of the facility or could compromise the performance were they to fail or collapse. In this study, the ageing of system and structure should be brought into attention for the potential impact of ship collision to the facility.

    The results are also showing mooring system having significant difference for hull failure and it is significant at p≤0.05. As described by Stiff *et al.,* (2003), some differences between mooring system failure scenarios were identified but many of these scenarios were considered to be low likelihood. The slight differences in risk were driven by the redundancy of the two systems. Since the spread moored system has more mooring lines, which are arranged in closely spread groups, the likelihood of loss of one or more adjacent line escalating to, for example riser damage was considered to be slightly lower than for the turret moored system. However, the close proximity for the mooring lines in relation to the risers was considered a factor influencing the likelihood of mooring failure potentially escalating to riser failure for the turret moored facility. The consequences related to health and safety was also considered to be higher

for the turret system because of the more congested and confined area around the turret which can influence the intensity of an explosion as well as the potential for escalation if a gas leak occurs.

RQ3. Relationship of potential hazards towards safety impact

Table 4   The Summary for Relationship of Potential Hazards Towards Safety Impact by Using Pearson Correlation

Safety Impact	Potential Hazard		
	Correlation Value (rs)	Significant value (p)	Relationship
Personnel	0.385**	0.000	Low
Asset	0.401**	0.000	Low
Environment	0.334**	0.000	Low

**Correlation is significant at the 0.01 level (1tailed)

Table 4 shows the summary for relationship of potential hazards toward safety impact by using Pearson Correlation. Correlation coefficient values show that the influence is at lower level, even though they are really significant. As such, there is a low-level impact of potential hazard on safety impact to personnel, asset and environment, and such impact is very significant (p=0.000). This significance means that the potential hazards could severely lower on safety impact towards personnel, asset and environment. From the result, it shows that the asset having higher correlation value (0.401) if compared to personnel (0.385) and environment (0.334) respectively. This finding is relatively acceptable and making sense, as the physical structure of FPSO/FSO is typically huge (big asset). Generally, it is more exposed to the structural effects of potential hazards when compared to personnel and the environment. This finding is in accordance with Gershon *et al*. (2000) who reported the significant relationship, with P < .05, between organizational working safety climate and employee compliance with safe work practices (lower workplace exposure incidents). Furthermore, Singer *et al*. (2009) evinced that among 91 American hospitals with better safety climate had lower reported relative incidence of Patient Safety Indicators (PSIs). These supportive findings signify that excellent safety working environment leads to workers' compliance towards safe working practices.

5 Conclusions

In Malaysia, the floating storage is not much different from one to another, except for production unit that is attached to the facility itself. The size of facility and mooring system are depending upon the client/asset owner requirement. From the size of the facility, it will indicate the manpower requirement for the operation and maintenance. The study has shown that the ageing of the facility gives significant difference to the ship collision as a potential hazard. In general, the ageing process will reduce the performance and efficiency of the facility but the management is always taking efforts to maintain the integrity of the facility. The study also has indicated that the mooring system having significant difference to the potential hazard in relation to hull failure. Majority of the floating storages in Malaysia are using turret moored rather than spread moored system. Turret moored system can be weathervaned according to sea current condition. Due to the facility is always exposed to the sea environment and exposed condition, this will be resulting in high chances of corrosion.

The conclusion of overall study has shown that the influence is at lower level even though they are really significant. As such, there is a low-level impact of potential hazard on safety impact to personnel, asset and environment. All levels in the organization, from managers to operational staffs, are responsible towards the safety of the facility. They are and have always been in constant need to effectively control the risks and preventing harm at their facilities and environment. This can be worked out by strict operation and safety regulation and making sure that the personnel involved are giving priority to the work of controlling the risk by effective prevention and control through well-established safety management system and positive working culture.

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Key Indicators to Build Country Resilience

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Abstract: Building resilience is a long-term process of each country, as it is associated with good governance and the equilibrium of respect for people, planet and profits, which do not deplete natural resources that affect the biosphere. Namely the learning ability, so it is a chance to demonstrate that it is possible under sustainable development. As resulting of applying the statistical method of correspondence analysis to a sample of 132 countries, in which were categorized in AIBER Iberia or American (21 countries); AVECO or advanced economies (28 countries) and others (84 countries) evidenced that resilience manifest as follow: Risk Indices to Natural Disasters for the AIBER Region, Good Government added to EPI and HDI for the AVECO Region and OTHER Region is considered as most vulnerable.
Key words: Resilience; Governance; Vulnerability; HDI; EPI

1 Introduction

For decades, the concept of resilience is becoming common research of several areas of the science and the applied social science. It is common understanding that resilience is the capacity of a system, be it an individual, a forest, a city or an economy, to deal with change and continue to develop (WORLD RISK REPORT, 2014). Based on such a concept it is possible to fit in other fields of knowledge. Moreover, according to the Center Stockholm Resilience, resilience regards more on how to build the capacity to deal with extreme events, unexpected sustainable development changes, including liaisons and ecosystem, i.e., overuse of natural resources, overcrowding in urban centers means the system imbalance. In general, the definition of the hard sciences, especially in engineering that reports that resilience is elastic memory of a physical body back to its normal state after being subjected to some type of pressure. It is noted that the term was adapted for other purposes, but does not differ from its origin in Latin that is ability to return to the previous stable state.

Indeed, the concept of resilience concept has been defined clearly too diverse areas of science; however, it is still part of several studies of social sciences and applied social sciences what is critical for building resilience and understanding of these factors can be applied.

In this study, is analyzed a group of 132 countries, divided in three regions, and based on key indicators including some regarding the concepts of the World Risk Report, a tool used to estimate the disaster risk of each country. For purposes of the statistical application of correspondence analysis, other variables were included in this study in order to assess the similarities between clusters and correlation of these variables with the indicators of the World Risk Report (2014).

2 Theoretical Reference

Considering the notion of resilience held by the exact sciences applied to human sciences as to how a society is able to survive and return to their status quo following an event or social adversity or exposure to natural hazards, The World Economic Forum- WEF (2016) believes that key to building resilience is the stability of societies. In this perspective, they issued on its reports five risks that will stress economies, countries and society as follow: (i) large-scale involuntary migration, (ii) extreme weather events, (iii) failure of climate-change mitigation and adaptation, (iv) interstate conflict with regional consequences and (v) major natural catastrophes. Noting that the Economic World Forum define risk as an uncertain event or condition that, if it occurs, may cause significant negative impact for the economies, in general within the next 10 years.

Evaluation of resilience requires its measurement for performance between communities, cities and countries. In much of the research, there is emphasis of the following: the need for good governance, economic and social development, protection, respect for the environment and respect for people and their communities where they live; that somehow may express the risk exposure, vulnerability, economic and social development and respect for the planet and people.   Next are presented the basic Indexes that will be used for this study.

The World Risk Index (RISCN) - NU-EHS - United Nations University Institute for Environmental and Human Security that define the susceptibility to face extreme events of nature to determine country

resilience. Furthermore, makes use of the definition of governance and the connections of social systems to measure the learning ability and its Internationalization strategies: evidence and reflections on Brazilian companies coping capacities in order to reduce the disaster risk of the country or community. The index of risk aversion of natural disasters is the interaction of events such as earthquakes, floods, storms, droughts, sea level rise, and society at risk community (Wisner et al 2006).

The Vulnerability Index (VULV) is the quality of vulnerable when exposed to physical or moral damage because of its fragility. The concept may be applied to people, social groups and, is associated with its ability to prevent, resist and overcome potential impacts.

The ability to adapt, prevent and learning with negative impact of natural hazards are part of the definition of the lack of responsiveness and lack of adaptability. In addition, it refers to the susceptibility of a system, community is exposed to natural disasters and adverse climatic effects caused by social, physical, economic and environmental factors (Birkmann et al, 2010; 2011; Welle et al., 2012, 2013).

Adaptability is the ability of individuals and or the collective in responding and shaping the changes in the social-ecological system (Chapin et al., 2009). The presence of adaptability allows better management of natural hazards and increase resilience.

Vulnerability, adaptability has been used in different areas of research with no consensus about the meaning. Mostly of the concept has been approaching theories and concepts of societal subsystem, ecological, natural, or biophysical subsystems (Adger et al, 2005, 2011; Adger, 2000, 2006; Smit and Wandel, 2006). As for Adger (2006): "The vulnerability is most often conceptualized as being constituted by components that include exposure to perturbations or external stresses, sensitivity to perturbation, and the capacity to adapt."

Governance (GO) - One of the challenges of reducing the vulnerability of countries is through the intervention of state for public risk reduction policies. In fact, puts the concept of good governance for each country, which is able to recognize the vulnerabilities and manages for inclusion, access and sharing of power. In accordance with World Bank (1992), governance is "The exercise of power of each country to manage the resources for economic and social development. Therefore, good governance submit to high development of country".

Environmental Performance Index (EPI) - In contrast to other performance indicators, EPI evaluates countries according to policies protecting ecosystems and human health, including the assessment of the impact of air quality, water and sanitation on the health of people and how protect your assets water, forests, fisheries, biodiversity, climate, energy and agriculture (Global Metrics for the Environment, 2013, 2014). This indicator presents how each country is balancing the use of natural resources without its depletion and the impacts of economic development, such as disposal of solid waste, ozone depletion among others has public policies set for the equilibrium of balance of its ecosystem, but also the planet Earth.

The Human Development Index (HDI) – deal with performance assessment in some key dimensions: longevity and health care, good standard of living and being knowledgeable. Concept build up by UNDP (2013, 2014) and emphasizes that people and their capabilities are the keys for building the development of any country.

3 Results and Discussion

Correspondence analysis is a statistical method applied on this study to explore relationship of the representative variables for 132 countries considering 3 Regions (AIBER, AVECO and OTHERS). To apply this statistical technique - correspondence analysis the following steps were used: 1) Defining the 3 Regions concerning the 132 countries, 2) Using principal component analysis to help to choose most representative variables for the model, 3) Running ANOVA to obtain the mean and the F test for each variable, 4) Preparing the contingency table.

Defining the 3 Regions– the 132 countries were divided into three distinct regions as follows: AIBER Iberamerican region (21 countries); AVECO or Advanced Economies (28 countries) and the rest OTHERS (84 countries).

Selection of Resilience Variables based on Principal Component Analysis - Resulted in choosing five main variables: Human Development Index (HDI), World Risk Index (RISCN) Vulnerability (VULV), Governance (GO) and Environmental Performance Index (EPI).

ANOVA for the Selected variables - Analysis of variance applied to five more representative variables: DHI, RISCN, VULV, GO, EPI to obtain the mean and F-test of each. The data results of the ANOVA is the basis of the contingency table.

Contingency Table. The table shows the means, F-test and the p-value, for each one of the 5 Variables selected form where will be applied the simple correspondence analysis.

Table 1　ANOVAS

Rows	HDI	VULV	GO	EPI	RISC	Columns
AIBER	65,62	41,83	42,48	52,7	27,07	IDH
AVECO	85,11	13,74	83,25	81,39	10,25	VUL
OTHERS	47,46	57,44	33,36	37,95	23,53	GO
F-test	34,45	57,93	97,02	69,68	10,87	EPI
p-value	0,000	0,000	0,000	0,000	0,000	RISC

Source: Prepared by author.

The inertias shows the relative contribution of each variable to explain the differences among the Regions. Clearly Table 2 shows that GOV and RISK are the most relevant.

Table 2　Relative Inertias

	IDH	VUL	GO	EPI	RISC	Total
AIBER	0	0,009	0,023	0,003	0,035	0,07
AVECO	0,011	0,281	0,099	0,042	0,103	0,536
OTHERS	0,019	0,27	0,042	0,033	0,03	0,394
Total	**0,03**	**0,56**	**0,164**	**0,078**	**0,168**	**1**

Source: Prepared by author.

Table 3 shows that the first Axis already explains already 96.51% of the characteristic of the Symmetric Plot of Correspondence Analysis (Figure 1).

Table 3　Analysis of Contingency Table

	Axis	Inertia	Proportion	Cumulative	Histogram
	1	0,1017	0,9651	0,9651	*****************************
	2	0,0037	0,0349	1,0000	*
Total	**0,1054**				

Source: Prepared by author.
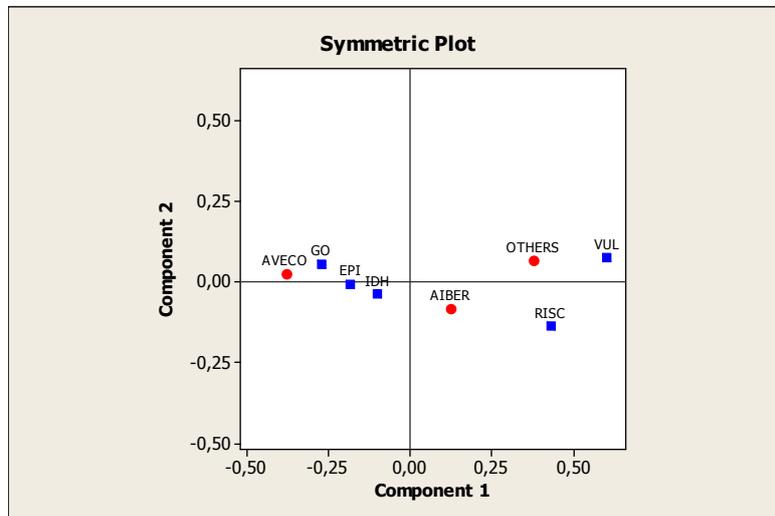
Figure 1　Symmetric Plot – AVECO, AIBER, OTHERS
Source: Prepared by Author.

Figure 1 clearly shows that AVECO Countries are doing much better that AIBER and OTHERS regarding Governance in particular that are the closest and to Vulnerability and where AIBER is in the middle between the two. As a matter of fact North America, Europe, Oceania and Asia: Japan, represented mostly by AVECO demonstrates high governance index, therefore, makes the best management of the investment priorities and allocation of public resources. Furthermore, the absence of good governance has proved that it is extremely detrimental in the fight against poverty, environmental protection because there is lack of public accountability and corruption. Is that what is observed on main

results of this research about Latin and Central America, Africa, Asia that has rates far below that desired, and the variable that has closer correspondence between them is the VULV- vulnerability and high awareness levels of corruption and absence of democracy in each region.

4 Conclusions

The development of resilience of countries is a hard task for governments, but leads to balance and equity to long-term society. Good governance practices includes reducing corruption, one of the greatest evils of society that needs to really foster sustainable development. The corruption occurs in many countries and observed in those where no clear rules, resources are scarce, misallocated, with excessive regulation and punishment is unlikely.

The absence of good governance may produce certain of circumstances that make the country, its cities susceptible to the damaging effects of hazard. This is the vulnerability observed in most of the AIBER sample countries of this study. According to the World Economic Forum (2016) there is a lot of concern regarding Latin America countries, in special the South America, about its capabilities to promote the good governance due to the increase level of corruption and mistrust of the legal institution that impacts the local management of business.

For the United Nations Office for Disaster Risk Reduction (UNISDR), vulnerability´s cause may come from different factors, i.e. social aspect, or poverty and inequality, marginalization, social exclusion and discrimination; or there are economic dependence due to single industries, globalization of business and its supply chains and finally but not last, the absence of environmental policies. Poor environmental management, overconsumption of natural resources, decline of risk regulating ecosystem services, climate change etc. are some   of impacts of non-reduction risks of disasters done by man-made changes. Beyond those factors, for 2016, the region is facing weak economic growth due to the price reduction of its commodities that affects levels of GDP of each AIBER country and government debts. This might increase the risks of failure of reduction of unemployment or underemployment, infrastructure investments to protect and given access to sanitation, water and health to the population.

Except for a few countries of the AIBER, and most of OTHERS there are issues related to vulnerability that does not seem to be fully solved. One example is China that has a chain of significant supplies, but no policy on greenhouse gas emissions and the use natural resources; on the other hand, the African continent, except by South Africa, has lack of governance and its population is below the poverty line. In this sense, for the World Economic Forum, countries in regions assigned AVECO have other important issues to maintain the resilience of their countries and their economies, however is not the same as development countries, but others called man-made. One of them is the assets bubbles, cyber and terrorist attacks and last but not least is the failure mechanism of financial institution and the contagious of global economies. Finally, to build resilience and vulnerability reduction is a hard but vital task for each country that may be leverage by social-economic and political development, in addition to geographical, historical and cultural aspects that normally permeate the attributes for good governance and social stability.

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Antecedents of Perceived Risk and Their Influence on Satisfaction and Behavioral Intention toward Self-Service Technologies

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Abstract：The aim of this study is to examine the influence of two critical antecedents- technical reliability and technology trust of perceived risk on customer satisfaction, and behavioral intention toward self-service technologies (SSTs). A conceptual framework is proposed and its subsequent hypotheses are tested. Results of 95 self-administered questionnaires indicate that when the degree of perceived risk is abated customer have a propensity to be satisfied with SSTs followed by positive behavioral intentions toward SSTs and would like to continue with technology-enabled services. The study also implies that high technical reliability and technology trust are two most important antecedents of perceived risk which help to lessen perceived risk and thus increase the satisfaction. Implications for executives, further research direction and shortcomings of the study have been placed.

Key words: Perceived risk; Technology trust; Technical reliability; Satisfaction; Behavioral intention; SST

1 Introduction

Service industries are increasingly characterized by technology enabled services nowadays. Self-service technologies (SSTs), the way of empowering customer to enjoy their own service encountering by means of the interaction of electronic service interfaces or machines without interacting with a firm's service employee (Shih-Chih et al., 2009), are now widely accepted by the both service providing firms and customers for their tremendous lure. Examples of SSTs include e-commerce, automated teller machines (ATMs), e-stock trading, automated airplane boarding, etc.

The choice of SSTs creates relatively great advantages for firms in terms of productivity and cost-savings (Dabholkar, 1996). Rapid technological development, increasing labor cost, improving productivity of technology and enhancing technical intelligence of customer are influencing the service provider to deploy various technologies. Against a question, why organizations are introducing SSTs at rapid pace? Bitner et al. (2002) identified three most important reasons behind this, namely-(i) to reduce cost, (ii) to increase customer satisfaction and (iii) to reach new customer segments.

Although SSTs is now critical component of services delivery mode, unsurprisingly not all customer enter into the using of SSTs or are ready to embrace them (Lin & Shieh, 2007). Traits of both SSTs and individual customers are considered responsible behind it. From the traits, perceived risk associated with SSTs is mostly responsible one. Johnson et al. (2008) suggest that satisfaction is negatively influenced by perceived risk. Technology or internet behavioral intentions of customers are greatly influenced by customer satisfaction (Taylor, Celuch, & Goodwin, 2002). Since SSTs replacing the way of service delivery tremendously, therefore, the practitioner and researchers need to have insight how to reduce perceived risk and what are its important antecedents to improve customer satisfaction and behavioral intentions toward SSTs.

2 Literature Review

Relevant Literature on technical reliability, technology trust, perceived risk, customer satisfaction and behavioral intentions are summarized below along with the hypotheses and Hypothetical Model.

2.1 Technical reliability and perceived risk with SSTs

Perceived reliability is the belief and confidence of customers that a technology will deliver the services as it is intended to do without embracing any error and inconsistency. A potential user of technology-based services is not likely to use if he or she perceives that new technology is unreliable and believes faulty outcome likely to arise (Dabholkar, 1996). Ganguli & Roy (2010) opined that security and reliability can increase the customers' confidence level and trim down customers' perceived risk in using technology-based banking services as well as play a significant impact on satisfaction. Therefore the hypotheses are.

H1a: Technical reliability negatively affects perceived risk toward self-service technologies.

H1b: Technical reliability has positive impact on customer satisfaction with self-service technologies.

2.2 Technology trust and perceived risk with SSTs

Reliable performance of SSTs and expectation that they will work consistently is trust in self-service technologies (Johnson, 2007), which is one of the outcomes of cognitive assessment of performance beliefs received from using SST (McAllister, 1995). The belief of gains or losses may arise from a transaction is typically known as risk (Mayer et al., 1995; Pavlou, 2003). Perceived risk is consumer's belief about the e-transaction's probable tentative negative outcomes (Kim et al., 2008). Trust is obligatory when risk associated (Corritore et al., 2003; Mayer et al., 1995; Pavlou, 2003). Perceived risk has significant negative association with trust (Pavlou, 2003). Thus with the increase of trust perceived risk decreases (Lewis & Weigert, 1985; Luhman, 1979; Mayer et al., 1995). Again Shunzhong (2012) shows positive association between trust and customer satisfaction. Following hypotheses are offered from the above evidence:

H2a: Customers' trust toward self-service technologies negatively affects perceived risk.

H2b: Customers' trust toward self-service technologies has positive influence on customer satisfaction.

2.3 Perceived risk and customer satisfaction with SSTs

Customer satisfaction is the realization of customer's needs, requirements, and goals at expected level from consumption of a product or services (Oliver, 1997). Satisfaction reflects the extent of positives feelings a consumer experienced from a service encounter (Lin & Shieh, 2006). Many researchers (Kim et al., 2008; Cheng & Chen, 2008; France & Lemuria, 2008) found that intention to use e-service or intention to make e-transaction is negatively influenced by perceived risk. Johnson et al. (2008) also identified that satisfaction is negatively influenced by perceived risk. Thus the following hypothesis is proposed for this study:

H3: Customers' perceived risk is negatively related to customer satisfaction with SSTs.

2.4 Customer satisfaction with SSTs and behavioral intentions toward SSTs

Repurchase intentions, possibility of recommending, devotion and behavioral intentions are significantly and positively influenced by customer satisfaction (Cronin et al., 2000; Dabholkar, 1994). Satisfaction is significantly correlated with technology enabled communication and future intentions (MacDonald & Smith, 2004). Positive behavioral intentions toward technology can be increased by satisfaction (Taylor, Celuch & Goodwin, 2002). Lin & Hsieh (2006, 2007) found that behavioral intentions toward using SSTs are significantly and positively influenced by customer satisfaction. Word of mouth and reuse or repurchase or loyalty intentions towards SSTs are unsurprisingly and positively inclined by customer satisfaction (Taylor et al., 2002; Yoon, 2002). So, the hypothesis is:

H4: Customer satisfaction has positive impact on behavioral intentions toward self-service technologies.
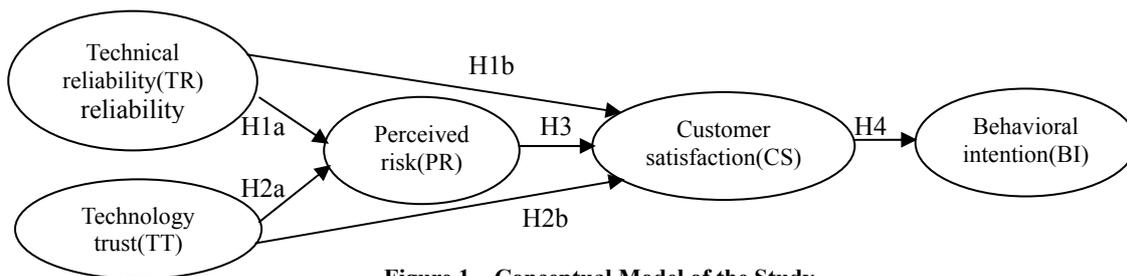
Figure 1　Conceptual Model of the Study

3 Research Methodology

150 questionnaires were distributed in three sections among the Executive MBA students of a University in the Chittagong Metropolitan City of Bangladesh. The primary characteristics of the respondents are they are students. Each section consists of 50 students from whom almost 70-80% students are involved in business or service. The authors considered only the respondents those who have their earning sources and at the same time they are students too. We have found total 107 respondents meet both categories. After eliminating invalid responses, 95 questionnaires were found useable. Therefore, they are predicted frequent users of SSTs like e-stock trading, online shopping, e-banking etc. Survey instrument was developed incorporating five constructs. For technology trust, we used three item scale of Johnson (2007). Five items scale for each technical reliability and perceived risk

were adopted from Walker et al. (2002). Three items American Customer Satisfaction Index (ACSI) scale for customer satisfaction was adapted from Fornell et al. (1996). SmartPLS 2, and SPSS 20 software packages were used for statistical analysis.

4 Results and Analysis
4.1 Demographic profile of the respondents
Table 1 reports the demographic profile of the study respondents and their respective frequency.

Table 1   Demographic Characteristics Respondents

Variables		Percentage	Variables	Percentage	Percentage	Percentage		Percentage
Gender	Male	64(67.4%)	Previous Education	70(73.7%)	16(16.8%)	Experience of service, business or others	1-3 years	70(73.7%)
	Female	31(32.6%)		12(12.6%)	79(83.2%)		4-6 years	12(12.6%)
Age	25-35 years	49(51.6%)	Occupation	8(8.4%)	65(68.4%)		7-9 years	8(8.4%)
	36-45 years	34(35.8%)		5(5.3%)	25(26.3%)		10 and above	5(5.3%)
	46 & above	12(12.6%)	Others		5(5.3%)			

4.2 Validity and reliability of the data and instruments
Smart PLS 2, a structural equation modeling software based on partial least square, is used for finding statistical results. Bootstrapping results were used to confirm the significance of the results. Hair Jr.et al. (2014) has recommended that moving forward the analysis if it holds the calculated values not beyond the threshold limits. It's been reported that internal consistency reliability shown by composite reliability (CR) value should be at least 0.7, and convergent validity measured by Average Variance Extracted (AVE) that should be at least 0.5. For having discriminant valid instrument, the square root of the average variance extracted (AVE) of each construct should always be higher than correlation with other instruments in this study. In addition, Cronbach's alpha (CA) value above 0.60 is just suitable for work (Hair Jr et al., 2014; Urbach & Ahlemann, 2010). The calculated results reveal that minimum AVE, CR, and CA are 0.651, 0.904, and 0.866 respectively which are above the cut off value. Besides, square root of AVE of each construct is above its correlation with other constructs in this study. Therefore, these results are valid and reliable for further study (Hair Jr et al., 2014; Urbach & Ahlemann, 2010).

Table 2   Validity and Reliability of the Instruments

Convergent Validity of the Items							Discriminant Validity of the Instruments					
Latent Variable	Mean	SD	AVE	CR	CA	R^2	Latent Variable	1	2	3	4	5
BI	2.12	0.817	0.817	0.931	0.888	0.648	1. BI	**0.904**				
CS	1.93	0.539	0.839	0.940	0.904	0.891	2. CS	0.805	**0.916**			
PR	2.07	0.897	0.651	0.904	0.866	0.729	3. PR	-0.754	-0.884	**0.808**		
TR	1.94	0.871	0.719	0.927	0.902	0	4. TR	0.813	0.905	-0.802	**0.848**	
TT	1.93	0.818	0.844	0.942	0.908	0	5. TT	0.753	-0.915	-0.791	0.834	**0.919**

4.3 Path structural model
Hair Jr et al. (2014, p. 48) mentioned that path co-efficient with a standardized values above 0.20 are good indicator for social and behavioral science research of a sample size below 1000. Figure 2 reports the path co-efficient (β), percentage of variance explained (R^2), and the indicators' loading. In addition, bootstrapping results reported t- and p-values in order to verify the significance of the hypotheses. Reported standardized co-efficient (βs) of path relationships are- CS→BI is 0.805 *(t-value=10.86, p<0.000)*, PR→CS is -0.350 *(t-value=1.845, p<0.06)*, TR→CS is 0.223 *(t-value=1.703, p<0.089)*, TR→PR is -0.483 *(t-value=3.073, p<0.002)*, TT→CS is 0.414 *(t-value=2.293, p<0.003)*, and TT→PR is -0.385 *(t-value=2.509, p<0.012)* found significant at different *p* values. Those indicators indicated that all hypotheses are proved significantly. To be noted from the figure (2) that CS explains 64.8 per cent of variance (R^2) of BI, PR explains 89.1 per cent variance (R^2) of CS, and TT and TR explain 72.9 per cent variance (R^2) of PR.
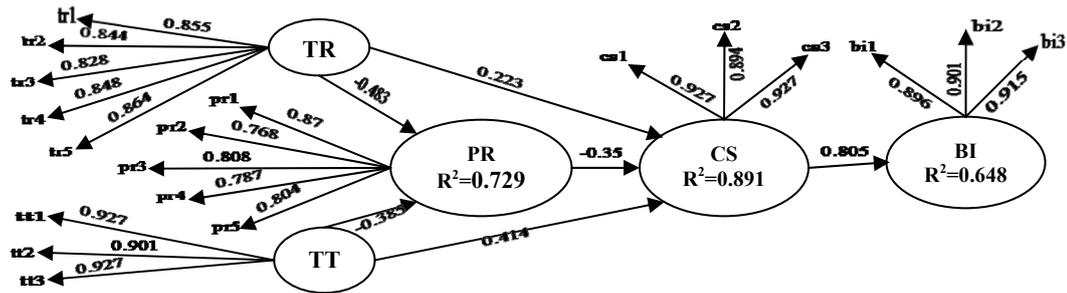
Figure 2   Structural Path Model

5 Discussions and Implications for Management

The study is an effort to demarcate how technical reliability and technology trust influence customer satisfaction and behavioral intention through reducing perceived risk as antecedents of perceived risk. The results of this study are also similar with other studies done in different countries by using same or other instruments. The most important findings of this research is the lack of trust is very high among the SSTs users in Bangladesh. It happens because of low security and lack of technical reliability of SSTs and hence increased the perceived risk associated with SSTs among the service receiver using SSTs in Bangladesh. Result reported negative relationship between technical reliability and perceived risk. Higher technical reliability helps to reduce the perceived risk and also influence to increase customer satisfaction with SSTs. These findings for the propose hypotheses 1a and 1b are similar to the findings with Ganguli & Roy (2010). Technology trust is another important antecedent of perceived risk and customer satisfaction. The research also reveals that technology trust negatively affects perceived risk and also positively influences customer satisfaction. These results of hypotheses 2a and 2b are also affirm the previous study of Pavlou (2003) and Shunzhong (2012). Therefore, higher technology trust would definitely lead to mitigation of risk and thus increases the customer satisfaction with SSTs. A critical factor for customer satisfaction is perceived risk, which influence customer satisfaction negatively.   The proposition 3 is consistent with the findings of Johnson et al. (2008). The study also found that behavioral intention toward SSTs is significantly and positively influenced by customer satisfaction. The finding for hypothesis 4 is also similar with the research of Taylor et al. (2002).

Incremental advancement of self-service technology (SST) is dramatically changing the modes of delivering services and services industries' business practices. Moreover, services industries have no other alternative competitive modes of delivering services choice than SSTs.   Therefore, services industries must pay attention to the abatement of perceived risk associated with SSTs. The constructs-technology trust and technical reliability identified in this study could work as guiding principles for the management of services industries to reduce perceived risk associated with technology to keep the customer with SSTs. Service industries should focus on how to reduce the risk connected with SSTs. They should spotlight on the mechanisms of building trust as well as to enhance the reliability of SSTs. They are supposed to keep close eyes on malfunctioning or failure of SSTs to increase reliability of SSTs and trust with SSTs. These strategies will help them to reduce perceived risk and thus increase customer s satisfaction with SSTs as well as a changed positive behavioral intention toward SSTs.

6 Conclusions

Small number of sample size could be possible limitation of this study to generalize the findings. Considered only two antecedents- technical reliability and technology trust of perceived risk can be mentioned as another shortcoming of the study. However, future studies can address these limitations adopting large volume of sample size. Other antecedents like quality of SSTs, perceived ease of use, capacity of customer would help future research to verify the research model. Although sample size is not sufficient still this study contribute to the existing literature by focusing how to increase customer satisfaction through reducing perceived risk. This ultimately leads positive behavioral response of customers toward SSTs and to retain customers for the long run business development.

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A Study of Politeness Strategies in Corporate Statements in Crisis Public Relations

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Abstract：This paper probes into the corporate statements in crisis public relations from the angle of politeness strategies, which serves as a joint study of crisis management and politeness theory. The focus of the paper is to research on the category of politeness strategies used in corporate statements in crisis public statements and shed some light on how to write a concise and polite statements after crisis. In the study, corporate statements in crisis public relations are analyzed by using Brown and Levinson's classification of positive and negative politeness strategies. The results indicate that positive strategies are more often used in corporate statements than negative ones. Besides, some politeness strategies such as exaggerate, make offer or promise, apologies, etc. are quite indispensable in statements issued to cope with crisis, since these strategies endow the statement with its basic functions.

Key words: Politeness strategies; Corporate Statements; Crisis public relations (CPR)

1 Introduction

With the rapid development of economy in recent years, an increasing number of crisis events are faced by different companies, so there is an urgent need for them to deal with these crisis events properly and effectively. Crisis management is a systematic and scientific way to deal with crisis. Sharad Merotra defined crisis management as "activities that encompass the immediate response to a disaster, recovery efforts, mitigation, and preparedness efforts to reduce the impact of possible future crises" (Sharad Merotra, 2008).Crisis management will help those crisis-hit companies to clarify the situation, reduce the damage, and offer apology or make compensation. There are a number of studies at home and abroad on crisis public relations or crisis management. Christine M. Pearson and Judith A. Clair integrated psychological, social-political, and technological-structural approaches with the research on crisis management in order to carry out a multidisciplinary study on it (Christine M. Pearson &Judith A. Clair , 1998) .Adam Blake & M.Thea Sinclair and Brent W. Ritchi researched on crisis management in tourism, and Adam Blake & M.Thea Sinclair stated that "Sector-specific targeted subsidies" and "tax reductions" were proved to be very effective ways in managing crisis (Adam Blake & M.Thea Sinclair, 2003).You Changqiao proposed 5S principles in crisis public relations, that is, "speed, system, shoulder, sincerity and standard"(You Changqiao, 2007). Bao Changhuo and Gong Huaping analyzed the process of crisis public relations management and divided the whole process into three steps----before, during and after the crisis (Gong Huaping &Sun Xiao, 2014). Apparently, most studies on CPR are focused on how to cope with the crisis by using some managerial principles or techniques, but few researches are done from other angles. Therefore, this paper pays special attention to the language used in corporate statements released right after the crisis in order to probe into the politeness strategies applied in those statements and give some related tentative suggestions.

2 Politeness Theory and Classification of Politeness Strategies

Brown and Levinson's politeness theory is based on the assumptions that "face" is the public image needed by all adults in the society. Then, "face" can be further divided into positive face (people's need to be appreciated and approved by others) and negative face (rights to none-distraction etc.). In daily life, there will be some acts which threaten the positive or negative face need of either the speaker or the hearer. So these acts can be grouped as face threatening acts.

In crisis public relations management, companies will encounter some problems related to the quality of their products now and then. In order to face these problems, companies have to write some official statements to publicly make their apologies, explain the situation, shoulder their responsibilities and solve the existing problems. Therefore, politeness theory is rather essential in writing those statements which embody the sincerity and politeness of the company and satisfy the positive or negative face need of addressees.

Brown and Levinson proposed five politeness strategies in their book *Politeness: Some Universals in Language Usage,* and these strategies are bald on record, positive and negative politeness strategies,

off-record and non-performance (Brown and Levinson, 1987). While, in this paper only positive and negative politeness strategies will be studied due to the features of corporate statements. Brown and Levinson further divided positive politeness strategies into 15 sub-types, and negative politeness strategies into 10 sub-types as is shown as follow in Figure 1.

Positive Politeness Strategies
1.Notice, attend to hearer
2.Exaggerate
3.Intensify interest hearer
4.Use in-group identity markers
5.Seek agreements
6.Avoid disagreements
7.Presuppose/raise/assert common ground
8.Joke
9.Assert or presuppose speaker's knowledge of and concern for hearer's wants
10.Offer, promise
11. Be optimistic
12.Include both speaker and hearer in the activity
13.Give (or ask for) reasons
14.assume or assert reciprocity
15.Give gifts to hearer (goods, sympathy)

Negative Politeness Strategies
1.Be direct/conventionally indirect
2.Question/hedge
3.Be pessimistic
4.Minimize the imposition on hearer
5.Give deference
6.Apologise
7.Impersonalise speaker and hearer: avoid pronouns"I"and "you"
8.State the FTA as a general rule
9.Nominalise
10.Go on record as incurring a debt, or as not indebting hearer.

Crisis → threaten → Positive or Negative Face ← Satisfy ← Politeness Strategies → Bald on Record / Positive Politeness Strategies / Negative Politeness Strategies / Off-Record / Non-Performance

Figure 1　Classification and Function of Politeness Strategies in Crisis Management

Brown and Levinson's classification of politeness strategies will be used in this paper to analyze how these strategies are used in corporate statements to resolve the crisis and rehabilitate reputation.

3 Data Analysis

In this paper, four different pieces of corporate statements are chosen to analyze the application of politeness strategies. The titles of these corporate statements are KFC's statements on White Feather Chickens, Mcdonald's statement on Sanlitun restaurant, Mengniu Diary's statement on exceeded Aflatoxin M1 in the milk product (Mengniu 1) and Mengniu Diary's statement on milk product containing Melamine (Mengniu 2). There is no denying the fact that the chosen companies are very famous and influential in China, they are KFC, Mcdonald's and Mengniu Dairy. Their corporate statements used in this paper are collected either from the official websites or mainstream media, and the all the corporate statements used in this paper are the formal original statements without any further modifications or changes. The four pieces of company statements will serve as examples to analyze the politeness strategies applied in corporate statements.

As for crisis public relations management, according to You Changqiao quick reaction is quite critical in coping with different kinds of crises. All these four pieces of corporate statements were issued on the official websites or Micro-blogs within a week after the crisis. As for each statements, there are 217 words in Mcdonald's statements, 519 words in KFC's statement, 559 words and 261 words in Mengniu Dairy's statements. All the corporate statements here are brief and condensed. Compared with other kinds of statements, language used in corporate statements in crisis public relations are much more formal, clear and concise. In other words, words and sentences used in corporate statements in crisis public relations clearly state the company's attitude towards the crisis and meanwhile provide some possible solutions straightforward.

Based on Brown and Levinson's classification of positive and negative politeness strategies as shown in Figure 1, politeness strategies used in 4 pieces of corporate statements can be grouped and

shown in Table 1. In this table, some common patterns in corporate statements can be figured out and analyzed.

Table 1 Politeness Strategies Used in Four Pieces of Corporate Statements

Company	Politeness strategies
KFC	**Positive strategies:** 9.Assert or presuppose speaker's knowledge of and concern for hearer's wants 13. Give (or ask for) reasons **Negative strategies:** 4. Minimize the imposition on hearer
McDonald's	**Positive strategies:** 2. Exaggerate 7. Presuppose/raise/assert common ground 9. Assert or presuppose speaker's knowledge of and concern for hearer's wants 10. Offer, promise 11. Be optimistic 12. Include both speaker and hearer in the activity **Negative strategies:** 4. Minimize the imposition on hearer 6.Apologise
Mengniu Dairy 1	**Positive strategies:** 2.Exaggerate 10.Offer, promise 11.Be optimistic **Negative strategies:** 4. Minimize the imposition on hearer 6.Apologise
Mengniu Diary2	**Positive strategies:** 2.Exaggerate 10.Offer, promise 14.assume or assert reciprocity **Negative strategies:** 6.Apologise

In table 1, it is quite obvious that positive strategies are more frequently used in corporate statements than negative ones. Among all the positive strategies, 2. Exaggerate, 9. Assert or presuppose speaker's knowledge of and concern for hearer's wants and 10.Offer, promise are more often used than others.

"Exaggerate" can be realized with some adjectives or adverbs. For example, almost all the statements use adjectives or adverbs like "sincere", "deep", "earnest" "completely" etc. To exaggerate or intensify the regret and show company's attitude. These modifiers can build a sincere and responsible image for the company after the crisis. According to You Changqiao, "shoulder the responsibility", one of the 5S principles, is another important move in coping with the crisis. Therefore, showing the regret properly and shoulder the responsibilities willingly will be an effective and important move in after-crisis statements.

One of the crucial functions of corporate statements in crisis public relations is to resolve the crisis or problems, thus almost all the statements need to make offer or promise. For example, offer to replace for free, refund, and promise the problem will be properly solved. Crises and damages cannot be removed, what can be done now is to apologize, solve the existing problem and make compensations. Therefore, to make offer or promise and apology are far more important and relevant strategies are more frequently used than other ones.

Furthermore, corporate statements are issued to solve the problem and rebuild company's image at the same time, which makes consideration for hearer's wants rather necessary. So those statements will show concerns for the infringement of the rights of customers. Some companies in their statements prefer to emphasize the crisis is not a common but an individual case, by this means the damage to company's reputation may be to some extent reduced.

As for these four pieces of statements, apart from "apologies" a few negative politeness strategies are applied. Apologies in statements should be formal and sincere, and through apologizing the negative face need of hearer can be satisfied. Among the three companies mentioned above, McDonald's uses

eight different politeness strategies in its statements, almost twice as others. It is hard to say whether it is better to use more strategies in a statement, but politeness strategies can help to make the crisis less face-threatening and meanwhile further the understanding of companies and consumers.

After the analysis of politeness strategies in four pieces of corporate statements in crisis public relations, some politeness strategies such as exaggerate, make offer or promise, apologies, etc. are quite indispensable in a statement, since these strategies endow the statement with its basic functions which are to make apology, to take responsibility and to solve the problem or make compensation.

4 Conclusions

This paper probes into the corporate statements in crisis public relations from the angle of politeness strategies, which serves as a combination of crisis management with politeness theory. In the study, four pieces of corporate statements in crisis public relations are analyzed according to Brown and Levinson's classification. It turns out that positive strategies are more often used in corporate statements than negative ones. Besides, among the 15 positive politeness strategies exaggerate, assert or presuppose speaker's knowledge of and concern for hearer's wants and offer, promise are more often used than others. Meanwhile, apologies is the most frequently used negative politeness strategy. So it can be summarized in this way, some politeness strategies such as exaggerate, make offer or promise, apologies, etc. are quite indispensable in a statement in crisis public relations, since these strategies endow the statement with its basic functions.

However, there are also some limitations in this study. First, in this paper, only four pieces of corporate statements are analyzed, so the statements in the paper cannot be regarded as diversified. Second, only one linguistic theory is used to analyze the statements. The future study can collect more corporate statements both in Chinese and English to form a corpus, so that not only the politeness strategies but also the words and sentences used in these statements can be categorized and analyzed.

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Research on Strategic Risk Assessment Based on Rough Set Approach

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Abstract: China's manufacturing companies in Bangladesh are committed to achieve optimal investment policy for investors in different industries. The purpose of this research is to assess the strategic risk, and the research approach involves collecting qualitative data through questionnaire survey and computing variables with programmed Rough Set Theory. Researchers have identified a set of key internal and external strategic uncertainties and also have accessed the most important attributes from strategic risks. Here, Sector regulation, changing the tax law and organizational governance are regarded as the most important risk factors in strategic risk analysis. Overall, the focus of our research is to identify strategic risk attributes and to propose a risk assessment framework via demonstrating empirical study analysis of specific industries in Bangladesh which are directly invested by Chinese investors.
Key words: Risk Assessment; Strategic Risks; Rough Set Theory; Manufacturing Companies

1 Introduction

Risk analysis involves risk identification, estimation, analysis, evaluation and control. Assessing risks is an ongoing process; it typically involves an organization engaging in a rigorous analytical process to identify risks and, where possible, to quantify them and the board of directors or senior management to determine the risk tolerance, based on an assessment of the losses of the organization. Subsequent to risk identification, an assessment of the risks concerning their probability of occurrence and the extent of the adverse effect on the entire business ought to be carried out (Kahn, O. Zsidisin, and G. A, 2012).

In conceptualizing different risk management approaches and their associated limitations, we have identified some important factors that need to be given special emphasis while developing a generic risk management framework. Here, in this research paper, our main focus is to identify of strategic risk factors with RST mathematical theory. Primarily, we have collected the factors decision by questionnaire survey from selected companies which are invested by Chinese investors in Bangladesh.
In essence, rough set theory design study is going to be employed to empirically ascertain the extent of such vague attributes. Rough set theory (RST), which is based on knowledge acquisition and discovery, would have brilliant application prospect in the research topic. In many practical systems, there are various degrees of uncertainty, especially in the data collection process which often contains inaccurate and missing data. RST is a suitable mathematical tool to deal with vagueness and uncertainty(Pawlak, Z.,1995).Considering with that the research approach involves collecting qualitative data through questionnaire survey and compute variables with programmed RST theory in this study.

The research process is divided into three stages. Stage 1 involves secondary research in which literature review has been conducted to understand the state of the existing scholarly work related to the topic of interest. The deliverable of the first stage is a tentative list of indicators for strategic risk assessment. The second stage is primary research with the main objective to verify the proposed indicators and data collection. Semi-structured interviews were carried out in recent years to gather opinion and information from the industry. Altogether, 107 usable responses out of around 180 questionnaires from Chinese company's management personnel were returned and have been analyzed and presented in this paper. In this connection, the useful response rate of 62.75% from companies was considered satisfactory and representative of Chinese companies in Bangladesh. The interviewees have given information and opinion on the indicators strategic risk analysis. Then Stage 3 involves modeling by rough set approach. Through a numerical example, RST is applied for obtaining the importance degree of each indicator in quantitative characterization, that is, to obtain the weight vector of each indicator. Finally, based on the output of the evaluation model, result interpretation and judgment on risk mitigation as well as validation are demonstrated. The study will explore relevant strategies needed in managing national manufacturing industry growth and strategic risk assessment.

2 Modeling Through Rough Set Theory

This paper studies strategic risk in the Bangladesh for Chinese manufacturing company which faces high uncertainty and dynamism in a multi-facet environment. After a comprehensive literature review, we propose the Rough Set approach firstly introduced by Z. Pawlak (Pawlak, 1982) as a new solution tool for risk factor identification, which has successful applications in data mining, prediction, control, pattern recognition and classification, mechanism learning, and decision analysis. The concept of rough sets was introduced by Pawlak(1991) as an extension of the set theory, which allows to define an approximate classification of the given set of data objects (data universe) in presence of data vagueness. The method classifies the study objects into similarity classes containing objects that are indiscernible. The condition of company uncertainties and risk management is usually dynamic and hard to predict, which leads to difficulty in finding pre-requisite knowledge. RST does not require any preliminary or additional information about the data, unlike requiring grade of membership or the value of possibility in fuzzy set theory used in previous risk studies.(Grzymala-Busse, J.W ,2014;Kusiak, A., 2001).

2.1 Set information table

U= {1, 2, 3, 4, 5, 6…..} represents the study objects, i.e. a set of company managers evaluation value about strategic risk factor, R_{ij} represents the all risks evaluation indicators as explained in uncertainties assumption section. Based on interview data, from the evaluation value by the company, regarding probability of occurrence of an event, it is advisable to compare several points of view. They are also assessed on a scale of 0 to 5, where 0 is the lowest and 5 is the highest probability. Assessments based on the worst impact and probabilities are not representative and cannot be used. In addition, the outcome on investment is represented by D = {outcome}. Y stands for loss, and N means no loss.

Table 1   Initialized Information 'S (Sample of Strategic risk attributes)

U	SR1					SR2		SR3		SR4		SR5	
	SR 11	SR 12	SR 13	SR 14	SR 15	SR 21	SR 22	SR 31	SR 32	SR 41	SR 42	SR 51	SR 52
1	5	4	3	2	2	2	*	5	3	2	4	1	3
2	4	3	1	4	1	2	1	5	3	2	2	1	1
3	5	3	1	3	3	2	1	4	3	2	1	1	1

*denotes that data unavailable and/or assessor is unable to give the score

2.2 Similarity relation from information table

(A) Denotes a subset of the attribute, i.e. risk evaluation indicators, a refers to a particular indicator within A. SIM (A) denotes binary similarity relation between objects that are indiscernible with regards to indicator's value. The similarity relation can be defined as

$$SIM(A) = \{(x, y) \in U \times U | \forall_A \in A, a(x) = a(y), \text{ or } a(x) =* \text{ or } a(y) =* \qquad (1)$$

Where (x, y) stands for pair of study objects. This means, two study objects (x, y) has binary similarity relation if the value of each attribute for object x, i.e. a(x), is the same as the value of the corresponding attribute for object y, i.e. a(y). For any value of attribute which is missing, i.e. a(x) =* or a(y) =*, a(x) and a(y) are considered the same since * can represent any number. $S_A(x)$ represents the maximal set of objects which are possibly indiscernible by A with x.

$$S_A(A) = \{y \in U | (x, y) \in SIM(A) \qquad (2)$$

Referring to Table 2, we compute the objects' attributes. No object has the same attribute values as the other object. Hence, o objects are similar in this case. Then the similarity relation is given below.

$$S_A(1) = \{1\}$$
$$S_A(2) = \{2\}$$
$$… … … … ..$$
$$S_A(N) = \{N\}$$

2.3 Determine all reduces

A reduce is a minimal set of indicators from A that preserves the original classification defined by A. This can be determined by establishing Boolean Discernibility Matrix (Pawlak, Z. and Skowron, A, 2007) with $\alpha_A(x, y)$ for any pair (x, y) of the objects. Attributes x∈U and ∈{z∈U|d(z)∉δA(X)}, where z is a particular object, d(z) is outcome of object z showing in the last column of table 1,δA(X)is the outcome of object x. Let ∝A(x, y) be a set of indicators, which a∈A and (x, y) ∉SIM ({a}).This means, those objects which are dissimilar in terms of outcome. Let $\sum \propto A(x, y)$ be a Boolean expression which is equal to 1, if ∝A(x, y)=∅.Otherwise, let $\sum \propto A(x, y)$ be a disjunction of variables

corresponding to attributes contained in $\propto A(x, y)$. Δ is a discernibility function for information table.

$$\Delta = \prod_{(x,y)\in U\times\{z\in U|d(z)\notin\delta_A(X)\}} \sum \alpha_A(x, y) \tag{3}$$

$\Delta(x)$ is a discernibility function for Object x in information table

$$\Delta(x) = \prod_{y\in\{z\in U|d(z)\notin\delta_A(X)\}} \sum \alpha_A(x, y) \tag{4}$$

In the below, table 5.6 shows the Discernibility Matrix

Table 2   Discernibility Matrix (an example)

x\y	1	2	3	4	5	6
1				SR11OR22SR31SR42FR51	OR21FR31SR51SR52O11FR22	SR11OR21OR22FR31FR32OR41R61
2				SR11OR12OR22FR31FR51R52	R21R22R31R42R51R52R62	R11R21R31R32R41R42R51R52 R61R62
3				SR11SR12OR21OR32R41FR51	SR11SR21OR22OR31FR42FR51FR52R61	SR11SR12OR21OR22FR32FR41SR42 OR51
4						
5						
6						

2.4 Calculate the importance degree of each risk indicator

Then the importance degree of each indicator can be calculated by using the following equation:

$$f(a) = \sum_{i=1}^{n} \sum_{j=1}^{n} \frac{\lambda ij}{Card(Eij)} \tag{5}$$

In equation (5), $\lambda ij=1$ when $a\in Cij$, $\lambda ij=0$ when $a\notin Cij$. Cij represents a risk evaluation indicator appeared. Card(Eij) Means the total number of indicators in one entry (Table 2). Eij Represents the element of Boolean Discernibility Matrix in table 2.

Thereafter, the importance degree can be normalized for easier comparison, which can be calculated by the following equation; $W_{ij} = \sigma_{cd}(C_{ij})/\sum_{i=1}^{n}(C_{ij})$, where $\sum W_{ij} = 1$ (6)

The rough set approach is flexible and can accommodate any number of objects and indicators as long as they are finite sets. Also, other values can be taken according to different cases. For instance,

$$SIM(A) = \{(x, y) \in U \times U | \forall_A \in A, a(x) = a(y), \text{ or } a(x) =* \text{ or } a(y) =*$$

$$S_A(A) = \{y \in U | (x, y) \in SIM(A)\} \tag{7}$$

2.5 Integration with attribute Weight and Expert Opinion

All values are distributed in liker scale 1 to 5. This attribute value is a Qualitative value, so it's important to integrate with the distribution of importance degree. The basic rule of integration is multiply with the average of attribute value. Assessment value of risk $=W_{ij} \times \frac{\sum_{i=0}^{n} C_{ij}}{n}$ (8)

The comprehensive value of risk factor can be calculated as; $W_j(j) = \frac{\sum_{k=1}^{r} W_k . x_j^k}{\sum_{k=1}^{r} W_k}$ (9)

Index j(j=I,2, ... , n) given by k'th expert (k= 1,2, . . . ,r) and W_k is the weight of expert k.

3 Strategic Risk Analysis Using RST

Strategic Risks attributes' literature suggests the core business environment, regulatory environment, brand and communication, Strategic information and behavior of any organization. Particularly it has suggested that firms should create proactive management practices that improve strategic risk-taking by preparing for the inherent uncertainty of strategic. Based on the literature, we have listed all types of risks and coding for our calculation with RST methodology (Table 3).

3.1 Calculate the importance degree of the risk indicators
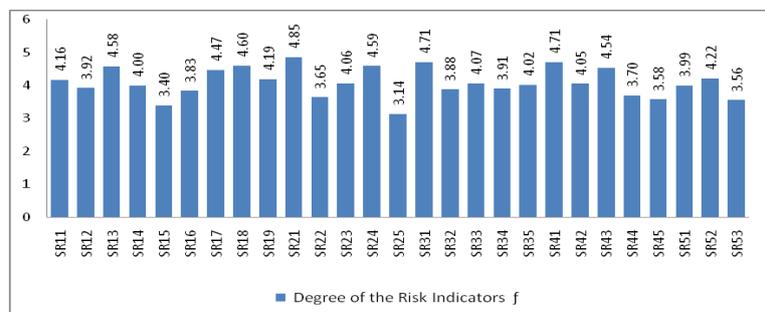
Figure 1   Importance Degree of the Risk Indicators

After identifying the uncertainties and categorizing in major risk types, we set the data table and put in RST software coding to Initialized Information (Table 2). To find out the significant risk attributes, the weighted average function is used (Equation 5) to calculate the most significant risk evaluation indicators. Thereafter, the importance degree can be normalized for easier comparison.

The importance degree of the Risk Indicators is shown in initial value f in Figure 1. We have also calculated the normalized value of all risk attributes of strategic factors for easier comparison. In another word, these factors are the risk indicators from getting the survey result from company managers and calculated with RST methodology. It may give the results of from the company's viewpoints and depends on the industry environment.

To illustrate the degree of risk importance from the above table, we can find the most important attributes from each risk types. As an example, in the risk types of business environment (SR1), the competitive environment is the most degree of important and the economic environment is the second most important factors for business in Bangladesh for Chinese companies which indicates the normalized risk value of SR18=0.042) and SR13=0.042) respectively.

3.2 Risk analysis and comparative risk ranking analysis

As illustrated in Table 3, the relative significance of risk factors can be revealed and quantified. Further risk factors can be valued by calculating $Q_{ij} = W_{ij} \times V_{ij}$ and and also with equation from previous parts which derives the expert opinions can be used to calculate and evaluate the risk exposure of Strategic. Like those normalized values obtained from table of the degree of risk indicators which is given by the experts and averaged from informational decision table, that's given as per values of risk uncertainties from lower to higher given risk. Thus the finally risk knowledge expert(s) illustrates a risk importance and compare with risk ranking, that's values having the highest Q value represents the greatest risk in that sectors.

Table 3   Risk Attributes Risk & Analysis Results for Strategic Risks

Table: Risk Attributes for Strategic Risks			Risk Analysis of SR		
Code	*Kinds of Risks*	*Types of Risks*	ω	V	Q
SR11	Country Risk	Business environment SR1	0.038	4.095	0.156
SR12	Monetary Reforms		0.036	2.810	0.101
SR13	Economic environment		0.042	3.667	0.154
SR14	Investment capital		0.036	2.810	0.101
SR15	Investment and lenders		0.031	2.762	0.016
SR16	shareholders		0.035	2.952	0.002
SR17	Business partner		0.041	2.857	0.117
SR18	Competition		0.042	3.524	0.148
SR19	Industry moves		0.038	3.286	0.125
SR21	Sector regulations for competitors	Regulatory environment SR2	0.044	3.143	0.138
SR22	Business and tariffs		0.033	3.333	0.110
SR23	Environment regulations and trade		0.037	3.524	0.130
SR24	Changing law tax		0.042	3.524	0.148
SR25	Government Regulation		0.029	3.143	0.091
SR31	Reputation	Brand and communication SR3	0.043	2.333	0.100
SR32	opinion and trend		0.035	2.476	0.087
SR33	License		0.037	3.429	0.127
SR34	New products		0.036	2.714	0.098
SR35	Marketing education		0.037	2.190	0.081
SR41	General strategy	Strategic information SR4	0.043	2.333	0.100
SR42	Strategy analysis		0.037	3.048	0.113
SR43	Investment environment and acquisition		0.041	2.762	0.113
SR44	Substitution of products		0.034	1.762	0.060
SR45	Entry-Exit strategy		0.033	2.048	0.068
SR51	Organizational design	Organization behavior design SR5	0.036	1.762	0.063
SR52	Governance		0.038	2.524	0.096
SR53	Employee Retention		0.032	2.095	0.067

From table 3, we can find the degree importance of risk value which is calculated by normali zed risk value and the multiplication of expert opinion or the average of information table value. F

or the simplicity we are using one by one to indicate the risk factors. Same as the first category of risk types, Business environment (SR1; the country risk (SR11= 0.1556) is the highest degree value of risk indicators after multiplying with expert opinion's value. This method is also justified our methodology and more validity of risk factors by comparing with experts' value and with risk degree importance. This country risk factor was the less degree importance in degree indicator table, but here experts give the more importance in the basis of recent country situation in Bangladesh. It was more politically unrest in recent times. Then, in the risk analysis, we can find out next highest value of economic environment (SR13=0.154), which indicates the same ranking value as the degree of importance (ω). The other factors like investment capital, monetary reforms and business partners have the less risk significant in the business of doing in Bangladesh for Chinese manufacturing companies.
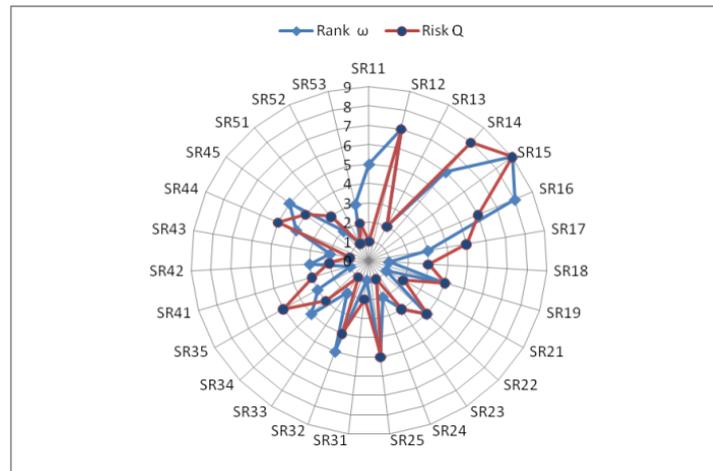
Figure 2　Comparative Images Between the Risk Indicators and Risk Analysis Ranking

It is very important to find the different risk assumptions between the expert's knowledge and company opinion interns of company or industry situation. And we can conclude here with assuming the validity of risk analysis results. In the graphical illustration in figure 2, all the risk attributes are shown for comparison with degree of risk indicator (ω) and the risk analysis with experts' opinion. We can easily compare all the risk factors in that risk mapping figure. In that figure 2, all the attributes are visible as the based on the kinds of risk risks not as the categorized as risk types.

4 Conclusions

The findings provide some support to assessment of strategic risk related to investment in Bangladesh. It implies that such related strategic risks would need to be cared when Chinese manufacturing companies invested in Bangladesh. Managers also imply that country-level efforts to attract capital investment will favor governments in Bangladesh. Risk assessment should involve managers from both the parent and subsidiary levels of the firm. Overall, RST mathematical theory along with fuzzy logic provides new innovative strategic risk assessment methodology to determination of risk analysis for any industry or in international business from its vague huge level of data set that could be computed with a high degree of accuracy. Regarding more future research, the research process and model developed provide a lot of potential that study can be undertaken on other types risk analysis, such as specific company risk attributes or sampling in different countries uncertainties, as well as other risk management topics.

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Research on Early Warning Paradigm for Crowd Stampeding Risk in Public Places

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Abstract: With the rapid development of China's economy today, the increasing number of activities is held. Shopping malls, plazas and other crowded places continues to increase, leading to the limited public space and increasing density of crowd flow, which makes the risk of crowd stampede increased. This paper proposes early warning paradigm for crowd stampede risk in public spaces based on the features of stampede early warning process, and puts forward the three pre rule and the principle of two-stage early warning in order to prevent public places crowd stampeding risk and enhance personnel evacuation efficiency with the provision of a viable path.
Key words: Stampede risk paradigm; Early warning; Three pre rule; The principle of two-stage early warning

1 Introduction

In recent years, as sustained and stable development of economic, improvement of people's material and cultural needs, the growing size of the public places, are responsible for a variety of commercial activities, recreational activities, cultural activities, transportation activities. Highly dense crowds in public places, when disaster strikes, it will cause serious personal injury or death, and therefore the crowd gathering risk has become the focus of attention. According to incomplete statistics, thousands of people were killed in the incidents occurred in the gathering crowd every year in the world. For example: the stampede occurred in Kunming Ming Tong primary school , six people were killed and 26 were injured in 2014.The crowded stampede occurred on December 31, 2014 in Shanghai Bund Chen Yi Square, resulting in 36 deaths, 47 people were injured. Minas region pilgrims stampede occurred on September 24, 2015, and the accident has killed at least 1399 people, and more than 2,000 people were injured. Thus, once the accident urban in public spaces, usually resulting in greater casualties and serious property damage.

Internationally,it is extremely concerned about the crowd stampede in public places. For the effective prevention of accidents, some developed countries have had a relatively complete laws, regulations and the supporting platform, have established an Incident control system. United States, United Kingdom and other nation, used the means of strictly control number mainly , for example, iron fence, and density control, and crowd to control, and limit admission used in New York Times Square on New Year's Eve; number and bottom line is set by United States in advance ,according to physical capacity, comfortable degree and transport situation, concentrating on crowd real-time monitoring, once it is over critical value, they would start plans and force to Implement interrupter and grooming measures. At present, the domestic scholar's studies on a crowd stampede from theoretical perspective, including Tan Rong, Chen Baozhi, Bai Yishang, Zhao Liqun etc. In 2008, Liu Yanfang from the cluster theory, the point of view of social psychology and organization and management of emergency in large mass activities cause of formation and development, points out that in the former fan anti, in supervision and after the disposal of the three links actively respond to emergencies in the large-scale mass activities, construction of emergency warning system. In 2012,Li Tao and others from the safety capacity, safety density, safety speed, density change rate and the rate of change in the rate of five points of view of the large-scale activities of the early warning methods of passenger flow, and compared the advantages and disadvantages of various methods. However, prevention and control of crowd Stampede, our country lack relatively targeted, complete and valid articles and preventive measures.

Based on this, from the theory of crowd Stampede strategy and evacuation strategy, in the view of the domestic situation, this article propose a warning paradigm for crowd stampeding risk in public Places, The "three pre" rule of the risk of stepping in public places is defined, as well as studying the principle of two-stage early warning carefully.

2 Early Warning Paradigm for Crowd Stampeding Risk in Public Places

British scholar Margaret Masterman said: "we define paradigm (from a sociological point of view), a known specific scientific achievement, and a recognized set of habits. Paradigm is a mind construct, an artificial, a system, a tool that relies on its own successful demonstration. "Based on the study of crowd stampeding risk, applying "paradigms "to it, early warning paradigm for Crowd Stampeding Risk in Public Places is presented, it is a specification of early warning. Paradigm for early warning is conducive to the systematic understanding of early warning system, only having a comprehensive understanding of evolution of the disaster,can a general idea of the situation, prior to disasters prevention, rapid and comprehensive insight into the situation of disasters at the time of the incident.
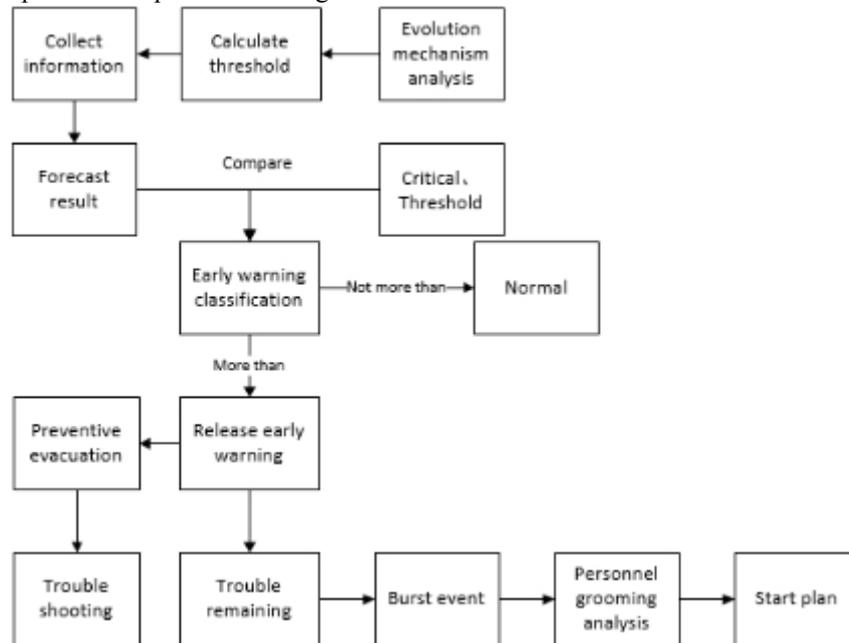
Figure 1   Early Warning Paradigm for Crowd Stampede Risk in Public Places

The subject of the figure 1 refers to the main organizers of public events as well as people, organizations and institutions dealing with emergencies, the object refers to a treatment target, namely all kinds of emergencies.

Mechanism of Evolution is the most important issue to be resolved in early warning. That is to clear mechanism of public emergency evolution of cluster events, to clear what factors will cause the public emergencies cluster and what events will the public emergencies lead to, to provide direction for the recognition and diagnosis of the risk source of the public emergency.

Threshold is a critical state to trig risk. Huqing Mei, who pointed out that the human body tend to have a buffer area, 0 27 - 0. 84m², the space needed by pedestrians to step forward and the best density for crowd is 1.3-1.8 persons per square meter. Leaded by Yanyan Chen from Beijing Traffic University indicated that 1. 2m² / person and 0. 8m² / person is the vast majority of the passengers began to feel crowded and uncomfortable threshold by long-term observation experiment in the subway station; Ran Lijun, who combined Chinese people's body size, made 9 person / m² as a criterion of a crowded scene of the accident; Kobe, Japan, after the University of North Dr. Akihiko through study the records of the exhibition of Kobe neon obtained when cluster density get 8 persons per square, the crowd began to appear fluctuations, there may be an accident. Density of crowd must be limited at 10 persons per square to avoid accidents. For large events, a reasonable threshold should be based on the type and nature of the events, and set the corresponding early warning level alert. (LI Tao,Jin Longzhe,2012)

Information is the key factor affecting incident management. To accurately guard against unexpected events, the most important thing is to scan different risk-related information systematically, collect the crisis information, and analyze their potential impact on the emergency prevention. Then prevent the factors that may cause emergencies and try to deal with the emergency before it develops.

After monitoring and scanning the information of the emergency, next action to be taken is to classify, sort, assess and diagnosis this information. According to the evaluation indicator system, analysis and compare the sorted information with various evaluation indicators. And make an appropriate estimates with the possible type, properties and hazard levels of the emergency that may

occur in the future. Evaluation of the accident include: the population density index, the crowd flow characteristic index, the crowd constitution index, unsafe behavior of the crowd, and the environment condition. Indicators of flow characteristics of the crowd include: the population of changes crowd and crowd situation. The crowd constitution index includes heterogeneous population density, quality of personnel, as well as the degree of organization. Crowd unsafe acts include: personnel disputes, vandalism, intrusion, shoving, fighting for crowd violence.

Obtaining the crowd density and crowd triggers data by real-time monitoring and extracting the information. Then comparing the data with the corresponding threshold. When the data exceeds a threshold value, classify the situation. According to experience, to make the management and operation easier, generally can divide the forecast early warning level into 4 levels: I level (appeared emergency status), II level (specially crowded), III level (mostly crowded), and IV level (generally crowded), followed by with red, orange, yellow and blue, dangerous degree followed by for crowd activities freely, more security while a bit dangerous, barely can accepted crowded, seriously risk, cannot accept appeared serious emergency situation. (Xiong Yan, Feng Zhibing, 2009)

After the early warning alarm sounding and exceeding the threshold, the first phase of the preventive evacuation should be launched. If the agglomeration problem is unresolved and produces a wide range of phenomena, the second phase of evacuation of person should be in stage. Cooperate with the prior to formulate relevant crowd shunt guiding plan, put the corresponding population tap guide plan into effect, which is based on the statistics of people's overly populated areas and periods, according to the degree of concentration that the population distribution of early warning system shown.

3 Three Pre Rule and the Principle of Two-Stage Early Warning

Based on research on risk early warning process trampled by crowds in public places, we combined it with Stampeding risk paradigm and tread on the risk characteristics of public to standardize emergency staff grooming behavior of cluster events. This paper considers it necessary to put forward "three" principle and two steps of the precautionary principle.

"Three" principle that is, early warning, preparedness, control. Early warning means the consequences of emergencies and their expectation, prediction, assessment and analysis of results and a condition of emergency response plan for activities, as well as of appropriate measures depending on the event level is based. Plan is to guide some of the events that may occur in the future; the event handling is the process of plan implementation and adjustment process. Plans or events may occur on some regular analysis and forecasting, through the study of links between events, looking for some regular feature, to know the plans of preparation.

Preventive measures, refers to conduct emergency operations rapidly, orderly and effectively, reduce losses, and response to potential emergencies. On the basis of risk analysis and assessment, preparing the relevant plans or programmes in advance. Development of emergency control measures, will help emergency managers in a limited time, limited resources, and limited information for decision-making, and helps to relieve mental tension. Helping for emergencies prior allocation of required resources, laying the foundations for effective emergency management. Preventive measures should include evacuation possible evacuation route analysis, design of programme managers how to disperse the crowd. Also, note the differs from the other sectors, close cooperation and coordination between different professional areas, including fire protection, public security, environmental protection, health, municipal services, hospitals, medical aid, epidemic prevention, traffic and transport management, etc.

Two step early warning refers to the crowds trampling causes early warning and crowd density of early warning.

Crowd stampede incentive early warning, a macro early warning, refers to the evaluation of the environment people live in and the maximum possible to master the global situation. Please find out the key points of weak links and detection in the danger zones. The dangerous area are generally the bottleneck, steps and cross point. The bottleneck is the accident black spot where the phenomenon of multiple arch at the crowd will flock to the spaciousness while narrow entrances or stairs, in addition to the normal flow of people, many people will squeeze people from both sides, and impede the normal flow of the crowd. Due to the increase in the population density clusters formed at the arch of the crowd, everyone who crowds together cannot pass. Arch is an unstable equilibrium, because the constituted vaulted force in all aspects of push each other, which will soon break the temporary equilibrium occurs "arch collapse". A majority of people at this time will be squeezed down due to a sudden loss of balance,

or be stepped on by the people who is eagering to know the truth or out latecomers. Without good evacuation guide, ARCH and repeated crashes will occur in the entrance arch. In case of a little unrest down stairs or steep slope at the evacuation, the general staffs will scramble down, then the field personnel can easily suffer a false step or a step load fell to the ground on steep slopes, followed by audience due to the great flow of people crowded pressure, so he cannot independently move forward and down, and will step on those who have already been fallen. Such deadly "domino" after stepping down before the domino-style makes the malignant casualties inevitable. In addition, personnel disputes arise, incidents of sabotage, violent people invasion, pushing and shoving, jostle, etc. also evoked the crowd stampedes. Therefore, the early warning must pay close attention to these sensitive areas. But once it happened, we must take evacuation measures immediately and reduce the risk to a minimum.（Liu Yanfang, 2008）

Crowd gathers density early warning refers to determine the key points of the density test, and evaluate the alert level is given. Population density had two accidents usually happen, namely a stampede and crowds. In the Stampede, population density is very high, but people can still move, and once the trigger factors, can lead to accidents. Crowded accident, the population density is very high, almost unable to move, squeezing each other leading to asphyxiation. For density of calculation used following method: after moving objects are separated by the optical flow and other methods, for each frame of the video image, using a rectangular scanning box, the entire image is scanned, and scanned continuously together with the frame shrinking. With the set density threshold value, several high-density region could be identified gradually (as shown in the blue region). The image can be projected onto a two-dimensional plane later, with the combination of the temporal information. Then the image can be separated into blocks, improving the accuracy of target recognition and detection of population density.
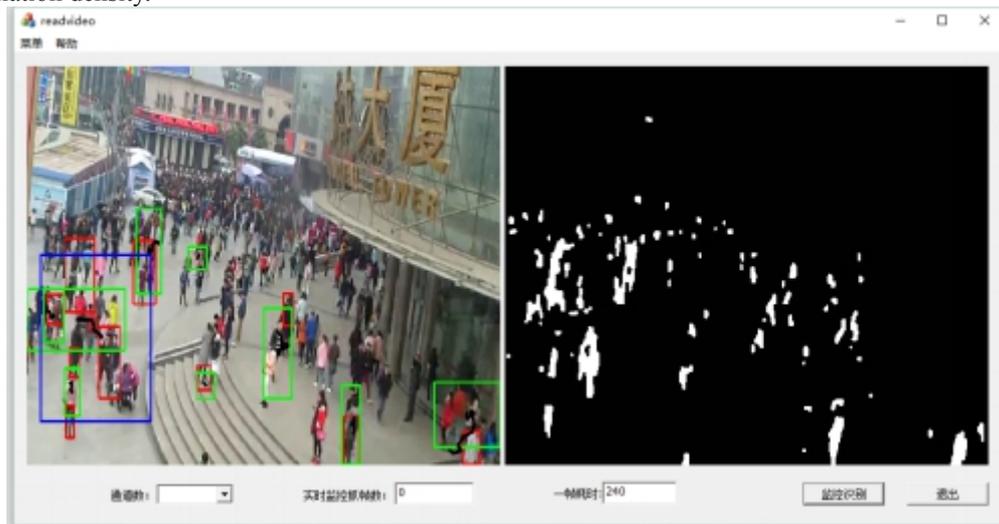
Figure 2   Density Scene Detection

4 Conclusions

Based on the study of emergencies activity in public places, proposed the emergency early warning paradigm and described the classification of early warning, threshold concept. From "three" principle, analyzing early warning, preparedness, forecasting es respectively, introducing crowd trampled of the principle of incentives of the two early warning and crowd gathers density of early warning. To make the current "fragmented" early warning system, which from the overall analysis of tread on the risk, can greatly mitigate the consequences of a stampede. But the current population density of early warning isn't done perfect, reference could not be determined, in-depth studies are needed in this regard, to gradually improve the system.

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Research on Listed Risk of Start-ups on the NEEQ Based on the Hall Three-Dimensional System

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Abstract: start-ups have been important forces to achieve innovation driven development of the national economy. Start-ups have been important forces to achieve innovation driven development of the national economy. This paper uses the Hall Three-dimensional theory to research listed risk of start-ups on the NEEQ from the stage of Pre-IPO, IPO, post-IPO in order of people system, things system and physical system, and then put forward some advice of listed risk prevention and control from the perspective of law system, management system, financial knowledge and team and so on. This paper is aimed to provide references of listed capacity and listed risk prevention measures for start-ups on the NEEQ.
Key Words: Start-ups; Listed risk on the NEEQ; The hall three-dimensional system

1 Introduction

Scientific and technological innovation have been Established as the core status of the social and economic development since the eighteenth national congress of the communist party of China, then the Prime Minister Li Keqiang put forward the new idea of "public entrepreneurship, peoples innovation", entrepreneurial boom gradually formed, especially in entrepreneurial enterprises, which have formed the typical characteristics of "Two high & Six new" of high growth, high technology content, the new economy, new services, new agriculture, new materials, new energy and new business models, they gradually become a new force of the national economy. The statistical data show that the start-ups only take 3% proportion of the total number of new ventures in China, but they contribute as much as 65% of the patents and 75% of technology innovation products. However, innovation is a systematic project of high inputs and long period, which means the small and medium-sized technology-based enterprise (hereinafter referred to as the Tech SME) cannot afford to effective innovations, for the Tech SME possess limited resources. They must rely on the integration of social resources, which make the social environment risk sensitivity higher, so capital has become an important support for the sustainable growth of start-ups. The National Equities Exchange and Quotations (hereinafter referred to as the NEEQ) as an important financing channel of start-ups, providing the impetus to the development of start-ups, especially since when they overall expanded in 2013, the NEEQ has got into a new stage of rapid development. Up to the end of 2015, the NEEQ has owned 5129 listed companies, whose total market capitalization have nearly been 2.5 trillion yuan and their PE ratio are around 30 to 60 times, which is less than small and medium-sized enterprises board (the SME board) and the growth enterprise market (the GEM) but higher than the mainboard.

However, there are still many risk factors which may restrict the development of the NEEQ. Jing Lu(2012) focused on the rotating plate problems of the NEEQ, she analyzed the importance and the necessity of rotating plate, then put forward some suggestions such as improving laws and regulations, implementing green turning plate, and improving the system of rotating plate. Zhang Ke (2014) thought the listed companies on the NEEQ should be supervised in classification, rotating plate mechanism need further planning, insufficient liquidity need a market-maker system actual implementation, corporate governance and the stock trading tax risk still need to be valued. Moore, Bell and Filatotchev (2010) took the stocks market in the USA and the UK for example, testing the effects of IPO market selection on its performance. Tian Juanjuan, Xing Tiancai (2014) combined with trading rules and ways of the NEEQ, applying liquidity index to the GARCH model to carry on the empirical analysis of its liquidity risk.

It is some of the short board that makes risk management in the market necessary for the start-ups, they should make prevention and preparation in advance to avoid policies risk, institutional risk, legal risk, financial risk etc. This article will analyze the systemic risk which is likely to suffer from on the preparation of market listing, in the process of market listing and financing process after its market listing based on Hall Three-dimensional System.

2 Listed Risk of Start-ups under the Perspective of Hall Three-Dimensional System

American scientist Hall put forward the famous Systems Engineering Three-dimensional Structure (temporal dimension, logic dimension, knowledge dimension) in his published book "System Engineering Method" in 1962,which successfully provided a new method of complex engineering management and operation. Hall divided engineering task into seven stages including planning, designing, development, production, installation, operation, updating according to the time order. The financing model of start-ups involves many factors, which constitute structure combination through time and space, and the combination exchanges material and energy with the outside world to run effectively and make corresponding effects (Wei Shijie, 2013). This paper is aimed to analyze the listed risk on the NEEQ of Start-Ups from the perspective of logical dimension, knowledge dimension and time dimension based on the Hall Three-dimensional System, and establish a new Hall Three-dimensional listed risk management model for the start-ups on the NEEQ as shown in figure 1.
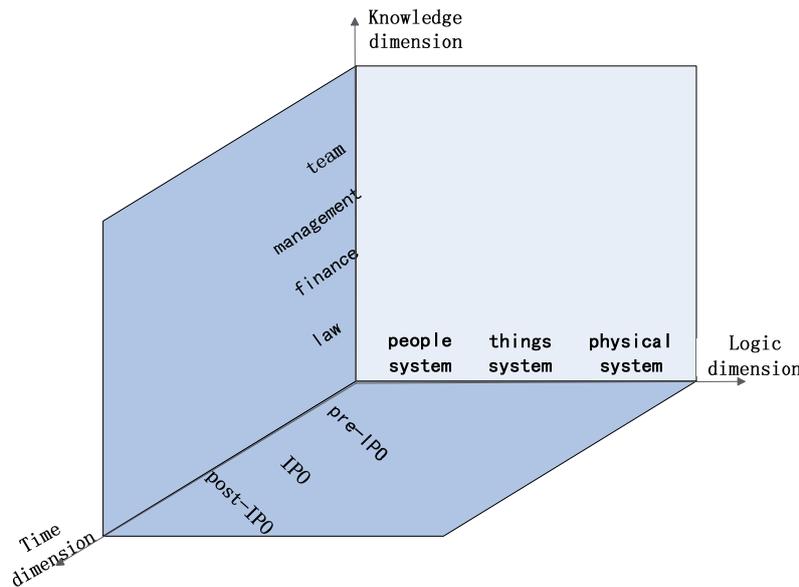
Figure 1   The Hall Three-dimensions Structure of Listed Risk about Start-ups on the NEEQ

Time dimension: The time dimension of Hall Three-dimension Structure is set from project process. According to this principle, the listing process of start-ups can be divided into three stages: pre-IPO, IPO, post-IPO, and listed risk will be very different in different stages.

Logic dimension: Using logic systems of people, things, physical to analyze the listed financing problems of start-ups on the NEEQ, and these three systems are ordered to people system - things system - physical system. People system refers to the stakeholders of start-ups on the market, including start-up, underwriting securities firms, law firms, accounting firms and other subjects. Things system mainly refers to the conversion law of rights and obligations between different listing subjects in the whole listing process, and the integration of the three dimensions will be discussed in this section. Physical system refers to changes of internal and external environment in the listing of start-ups.

Knowledge dimension: knowledge system mainly researches the knowledge reserve capacity of listing start-ups. Start-ups listed on the NEEQ may exist these risks of insufficient governance ability, imperfect equity structure, false information disclosure and so on, which will make negative effects on the interests of the investors and market stability. Thus, the knowledge dimension is also an important source of risk to the listing start-ups.

3 The Systemic Risk of Pre-IPO on Start-ups
3.1 Risk of Financing Goal Orientation

Start-ups can be listed in the New York Stock Exchange, NASDAQ market in the United States, Hong Kong Stock Exchange and Shenzhen Stock Exchange, but there are many differences on financing rules, financing scale, the value orientation of the investors, supervision ways and powers in different

stock markets. Start-ups need to comprehensively consider their own conditions and the corresponding market demand conditions to make the right choice.

3.2 Sustained Profitability Risk of Main Business

Improve the sustained profitability of main business is a top priority of the company in the pre-IPO. They should strengthen independent innovation and management innovation, develop new markets, and control cost and so on to improve profitability to satisfy the IPO requirements. However, it is should be paid more attention that the sustained profitability is mainly for main business. A lot of listing companies in the GEM were suspected on their sustained profitability by the GEM Issuance Examination Committee for its tax incentives accounted too much for corporate profit.

3.3 Risk of Financial Planning Ability

Financial index is an important content in the IPO rules, and the corporate financial planning level often determines if it can pass the conference of IPO. Therefore, it is of great value for start-ups in the pre-IPO to strengthen its financial planning. Start-ups in the pre-IPO should make full preparation such as fully analyzing and assessing financial indicators, timely adjust business strategy and financing strategy, etc. In the process of IPO, start-ups should moderate financial packaging for some non-ideal financial indicators in strict accordance with relevant laws and accounting standards under the premise of accounting policies.

3.4 Risk of Corporate Governance

Standard operation is required for all listing start-ups. The premise of long-term development for all the enterprises, especially for start-ups on the pre-IPO, is to be managed legally. In the current, most start-ups are based on a private small and medium-sized enterprises, most of which own "a dominant" equity structure. That means it is not only difficult to form checks and balances mechanism and reasonable corporate governance structure under the dispersive equity, but also make the family enterprises problems which will lower the efficiency of corporate governance continue to be existed.

4 Risk Control in the NEEQ Listing of Start-ups

4.1 Legal risk control

1) Established in accordance with the law and exists at least two years. In practice, the enterprise usually may meet two kinds of problems. One kind of problem is the intangible assets investment problem. And the other is whether the company in the pre-IPO shall handle the relevant procedures in accordance with the law if it is a joint stock system.

2) Business structure is clear and has the ability for continuing operations. Some of the start-ups in the pre-IPO might have trouble in tax assessment in the reporting period. To solve this problem, enterprises should make adjustment as soon as possible to do audit collection according to the views of the CPA and formulate effective financial supervision regulations and regulatory framework to ensure the standard operation of the financial departments.

3) Governance mechanism is sound, business activities are legal compliance. That is to say, the company in the pre-IPO should set up the company's senior management system in accordance with the modern enterprise organizational structure, which includes the general meeting of shareholders, board of directors, supervisors and senior management (hereinafter referred to as the "three layer structure"). Enterprise as well as the members of the "three layer structure" should strictly comply with the relevant laws and regulations of our country, uphold integrity management and obtain operating income legally during the company's continuing operations. At the same time, the company should obtain the appropriate license documents and certificates if the business activities need to be approved by the relevant departments.

4.2 Financial risk control

The NEEQ has not clearly defined the financial situation of enterprises yet. But according to regulations, companies need to truthfully disclose the company's financial information. The company's financial situation is likely to affect investment enthusiasm of investor for the company. This might lead to the failure of the purpose, intending to financing in the NEEQ, of the enterprise. So, in the beginning of the listing, the company must make reasonable arrangements for the financial management of enterprises, thus avoiding the risk. As shown in Table 1, the indicators to measure the financial risks of enterprises are as follows.

Table 1   The Index System of Financial Risk Assessment on Enterprises of Pre-IPO in the NEEQ

Core competence	Evaluation index
Profit ability	sales gross profit rate, earnings per share
	rate of return on total assets, Return of equity
Operation ability	total assets turnover
	accounts receivable turnover
	inventory turnover ratio
Financial growth ability	prime operating revenue
	OPE, net profit growth rate
Financial structure	asset structure
	asset-liability ratio
	long-term debt structure, short-term debt structure
Cash flow	the source structure of the increment of cash
	the net cash flow
	net increase in cash and cash equivalents
	the normal cash flow
Assets quality	inventory backlog ratio
	large venture capital ratio
	the amount and proportion of accounts receivable that over three years
	reasonable and stable cash inflow
	quality of construction and fixed assets
Solvency	cash flow ratio
	quick ratio, flow rate
Financial soundness	intangible assets and the cost of the project
	Off balance sheet liabilities, contingent liabilities
	"eight provision" policy
	Provision for asset impairment and asset quality

4.3 Management risk control

To become a real sense of scale enterprises, the company must give up the original model, regulate the company's management system, so that company is managed by system. Found in contact with the broker, there is lack of management system in most of their underwriting company in the pre-IPO in the situation, there is no explicit formulation of the management regulations, and the daily work of the enterprise always hectic, tedious and lack of efficiency. However, after the successful listed, due to the improvement of management rules and regulations, the work of the company will be carried out in order.

4.4 Team risk control

For some entrepreneurial team, the shareholding system reform may damage the cohesion of the enterprise management team, which is established as the center of the founder, to a certain extent. In the process of companies' listing, it will not only attract strategic investors to join, but also the shares will be diluted due to equity incentives and other shareholders' join-in. The management team and shareholders might have a conflict of interest, which if not handled well, will affect the overall operating efficiency of the company.

5 Risk Prevention of Post-IPO Start-ups
5.1 Improve Core Competitiveness of Start-ups

The core competitive ability of enterprise covers the entire value chain, highlighting its production technology, production capacity, and product characteristics. The ultimate goal of being listed on the NEEQ is to obtain the financing channels and provide funding guarantee for its continuous running. Listed enterprises should reasonably allocate limited resources of manpower, financial and material resources, keep the original innovation ability, design unique products, pushing them to the track of long-term survival and development, and striving to make the enterprise maintain high levels of profitability, thus enhance product innovation ability and competitive advantage of the listed enterprises.

5.2 Strengthen the Management of Internal Control, Clear Shareholding Structure

Most small and medium-sized enterprises are still in the growth period, they often faced with problems such as non-standard internal personnel deployment system and financial system, unreasonable equity structure and imperfect internal control system. Especially the directors, supervisors, senior management personnel and the large shareholders in the private enterprises have become

accustomed to arbitrary way of decision-making, they tend to focus more on the short-term interests of the enterprise, ignoring the long-term strategic development. Due to a lack of understanding of related systems, they are more likely to make the wrong decisions and increase the listed risk. Start-ups should seize the opportunity of IPO on the NEEQ and positively communicate with the host brokerage, accounting firms and law firms, in strict accordance with the listing and trading rules of NEEQ to regulate corporate governance. It is significant important to make full use of the financing function and provide financial support for the enterprise from the NEEQ that have a clear understanding on the NEEQ. According to the stage of IPO, start-ups should consider the following problems:

1) To perform regular investment procedures, rationally reform the share-holding system to establish a clear equity structure.

2) In accordance with the requirements of the company law, establish a modern enterprise organization structure consisting of the board of directors, board of supervisors, general meeting of shareholders and senior management.

3) To perfect rules and regulations of the company and ensure the affairs of the company operating orderly.

4) To reasonably issue and transfer enterprise equity according to the company law and listing rules after listed on the NEEQ.

5) To standardize enterprise financial system according to accounting standards for enterprises and relevant laws and regulations, solve the problem of historical accounts.

6 Conclusions

After studying the systematic risk and risk control measures of start-ups listed on the NEEQ, this paper believes that it is a hard labor for the enterprise to be listed on the NEEQ, which brings the comprehensive innovation of various aspects to the start-ups. However, innovation is to create, it will help enterprises to thoroughly get rid of the potential risks in the process of growth, and focus on all the resources to develop business and make more profit.

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The Research of Trust Crisis and Firm Performance Risk: The Mediating Role of Internal Conflict

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Abstract: Trust is a kind of interdependent relationship, all the activities in company cannot do without cooperation and mutual trust. Good trust relationship can promote cooperation, but once the enterprise met trust crisis, it would bring some conflicts between the leaders and workers, which may lead to the decrease of the efficiency of some task and individual performance, more seriously, the trust crisis may also bring risk to the enterprise performance, affect its survival and development. Therefore this study considers that the conflict in company plays a mediating role between trust crisis and performance risk, then builds the corresponding model, and obtains the consistent conclusion.
Key words: Trust crisis; Conflict; Performance; Performance risk

1 Introduction

The German scholar Luhmann once said: "trust can simplify the interpersonal cooperation relationship." As we know, all the activities in company cannot do without mutual trust, so the mutual trust, like lubricant, is the necessary condition to guarantee normal company operation.

But as the Chinese scholar Xia Jiang (2014) thought, good situation of mutual trust in company is not inborn. If companies come forth some problems such as unreasonable profit distribution, that may produce estrangement between managers and employees, and the gap would affect their trust relationship, if let it develop, it could further result in trust crisis, which perhaps bring deeper negative impact to the company. Another Chinese scholar Cancan Gao (2010) also mentioned that, Enterprise mistrust may lead conflicts between the workers. And this conflict could affect the corporate performance; meanwhile, it is likely to cause performance risk, endangering the development of the company. Therefore, as a foreign scholar James (2011) once pointed, preventing trust crisis, avoiding internal conflict, building a harmonious business atmosphere, is also what the managers must to do.

Domestic and foreign researches showed that trust crisis has now become a ubiquitous phenomenon in society, triggering a strong focus on academics. However, most studies just stayed on the shallow discussion of its status, influence and countermeasures, but lacking in some combination with specific problems (such as firm performance) and they are short for some analysis of the mechanism about this kind of problem. So this article wants to study the relationship between trust crisis and firm performance, and discuss the further power which affects the relationship between them. And hope the final conclusion may provide certain reference value to give General Corporation some advice to avoid risk, improve firm performance and promote healthy development of the company.

2 Theoretical Foundation

2.1 Trust crisis

Liangbin Chen (2009) pointed out that, in reality, the distrust is a subjective response to what people to be trusted appear inconsistent with the expectations and feedback in the process of interaction. And Xiaoxu Meng, Wan Wang (2010) who based on this idea, pointed out the concept of trust crisis, they defined trust crisis as a psychological phenomenon, which means the social members have some doubt experience due to lacking of trust. Zhenhua Yang (2011) mentioned that, there exists serious trust crisis in the contemporary society at various fields in China. And Wan Ying (2011) also emphasized that the trust crisis is ubiquitous. Besides, Lei Gao (2016) put forward some similar ideas, she referred that China's traditional morality emphasizes "Wisdom and Faith ", but in real life, whether friends or colleagues, the trust between each other becomes less and less. This trust crisis is gradually formed in the process of economic transformation in society.

2.2 Conflict

Foreign scholar Rahim (1986) once said, conflict is a widespread social phenomenon, but the scholars haven't reached a clear agreement on its concept yet. As Thomas (1989) argued, conflict is an occasion when someone is driven to do an incompatible reaction. Joe H.Turner (1997) used a perspective of sociological theory to define conflict as an interaction in some direct ways, and each side

of the action tries to stop the other achieving goals. Wall and Canister's (1996) definition is "conflict is a process, and one always perceiving his interests would be opposed by the other in this process".

Domestic scholars also have done some research on conflict. Fengshu Xu (1989) once in social psychology perspective defined conflict as some behaviors like exclusion, hostility and aggression. Xiaohong Zhou (1996) argued that conflict is a process, in which people struggle, damage and even kill each other for some certain goals or values. Peilun Huang (2001) regarded conflict as behavior contrary states due to the disagreement about the purpose or means between the behavioral agents.

3 Hypothesis
3.1 Trust crisis and the performance risk
The occurrence of trust crisis means that the relationship between people is being threatened, so the team cooperation and the firm performance are bound to be affected. There are some scholars have made co relational studies on the relationship between trust crisis and firm performance risk.

Fengjing Han, Pinpin Fu (2008) pointed out that in certain situations, if the mutual trust degree among the members in the company is low, they would be more likely to make mutual suspect, then reduce the cooperative behavior, and finally they would spend more time and energy to achieve the individual goal, but not the whole goal of the company. Zhenhua Yang (2008) put forward the similar ideas, he considered that the lower mutual trust between members in the company, the lower copulatives power would there be, and there must be litter core competitiveness. Previous studies have confirmed that there is a certain relationship between trust and firm performance, for example, Smith et al. (1994) made a study which suggested that low trust may be more likely to make a contradiction between members, thus to affect work behavior, reduce work efficiency, influence the firm performance and the internal cooperation satisfaction, when serious there would be some firm performance risks. So we put forward the following assumption:

H1: Trust crisis is positively related to firm performance risk.
3.2 Trust crisis and the internal conflict
Trust crisis and conflict as two negative words, which seem to be frequently appear in our life, and there are some scholars analyzed them in recent years.

Xiaoxu Meng, Wan Wang (2010) pointed out that, with the development of the society, the external material conditions become increasingly affecting people's values and the concept of trust, leading to the interpersonal distrust, mainly shown as human indifference, mutual suspicion, promises and so on. As Wan Ying (2011) has noted, the crisis of confidence is a ubiquitous phenomenon, causing the interpersonal conflict from time to time, which we can often see in our life. For example, patients do not trust doctors, they often suspect the doctors of their diagnostic mode. Again for instance, the distrust between both sides of husband and wife, also often leads to the suspicion between each other, so the little things in life can cause many conflicts. So we put forward the following assumption:

H2: Trust crisis is positively related to firm internal conflict.
3.3 The internal conflict and firm performance risk
Conflict means contradiction, once there comes a conflict, the relationship between people would be affected, and when this circumstance appears in work, there must be low efficiency, poor teamwork and firm performance decline, etc.

Many years ago, foreign scholars have proposed their views. Seile (1963) pointed out that the conflict would go against with the tasks completion and the goal achievement. Lewin (1987) also considered that the internal conflict may cause disharmony in the company, while strong conflict is more likely to cause slacking or absenteeism, eventually resulting in a decline in work efficiency, bringing some firm performance risks.

The Chinese scholars also pointed some similar views to foreign scholars. Liu (2007) deemed that, when there is a fierce clash in the company, both sides would try their best to negate each other. Cancan Gao (2010) also mentioned that, in the process of conflict, in order to beat the competition, both sides would thwart each other, decline mutual cooperate, thus influence the work efficiency and give rise to performance risk. So we put forward the following assumption:

H3: The internal conflict is positively related to firm internal conflict.
3.4 Trust crisis and firm performance risk: the mediating role of the internal conflict
It can be seen through the previous discussions, firm performance risks have deep association with trust crisis. The more serious the trust crisis is, the more likely putting time and energy on suspicions the employees are, thereby the work efficiency would be affected and the company would be more easily

getting performance risk. But trust crisis may not directly affect performance risk, it may influence that by means of another variable. Through some related literature reading and thinking, we found that the internal conflict can be one of the most important factors affecting trust crisis and performance risk. According to the above research hypothesis, we speculate that when the internal trust crisis is serious, the members in the company are more likely to "cause more conflicts on the premise of low trust", and this conflict would affect employees' personal emotions, and then affect the work efficiency, reduce the individual performance, and ultimately influence the whole firm performance, leading to a certain performance risk. Thus we think the internal conflict may play a mediating role between trust crisis and firm performance risk. And then we put forward the following assumption:

H4: The internal conflict may play a mediating role between trust crisis and firm performance risk.

4 Research Model

Through the analysis of the above hypotheses, we can establish a model as shown below.
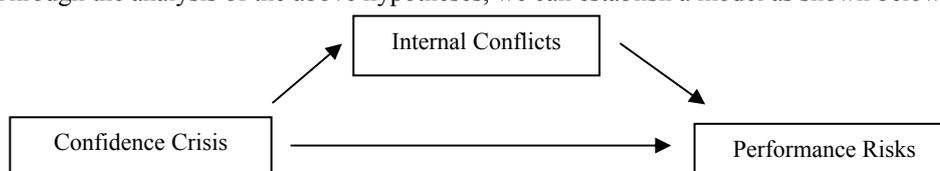
Figure 1   Hypothesis Study Model

5 Conclusions

According to the mechanism of trust crisis on firm performance described above as well as the relationship between internal conflicts and performance risks, this paper presents an integrated research model showed in Figure 1. This study clearly states the process effect of trust crisis's impact on firm performance by playing the mediating role of internal conflicts. Specific findings include:

1) The trust crisis is ubiquitous, meanwhile it will bring some firm performance risks; 2) Trust crisis may lead to the outbreak of internal conflicts, while strong internal conflicts will cause firm performance risks; 3) the internal conflicts have some mediating effects between the trust crisis and performance risks.

These conclusions may contribute to the company for analyzing reasons for its success and failure, and as a whole, there may be some revelations for companies as following:

1) The companies need to prevent trust crisis in order to obtain a harmonious internal atmosphere. And the prevention can be carried out from the following aspects.

Firstly, from the company perspective. The companies need to establish reasonable policies, and not only emphasize the fairness of the policies but also ensure the developing process is transparent, so that to make the employees have a higher trust degree and prevent the crisis in the first place.

Secondly, from the leaders' perspective. If the leaders in company want to win more recognition and trust from their subordinates and prevent confidence crisis, they must be strict with themselves and treat each employee equally. Moreover, they should consider the real demands of subordinates in the daily work, communicate with them and listen to their recommendations, they can get increasing respects and trusts by doing these.

Finally, from the employees' perspective. Since trust is a both-side process, employees should find reasons from themselves. If the employees have some incomprehension or suspicion on the decisions made by their leaders occasionally, they should communicate through formal channels, but not have such sentiments buried in the heart and finally grow into trust crisis, bringing adverse impacts to themselves or even the company.

2) The companies also need reasonable relief on the internal conflicts to improve performance and avoid the performance risks.

Unsmooth communication, or even lack of communication, is one of the main reasons for the conflicts outbreak in the companies, resulting in the ineffective information flow, generating misunderstanding and estrangement and then causing unnecessary conflicts and contradictory. So the most effective way to relieve the internal conflicts is to strengthen the internal communications.

To improve internal communication, the companies should firstly help all the members establish the concept of equal communication and create a nice atmosphere. Then the leaders should establish various channels with the employees for full communication to achieve effective communications.

Thirdly, the leaders should advocate all the members considering problems by transpositional consideration as much as possible, in order to avoid unnecessary conflicts.

Although each company has different specific circumstances, the conclusions obtained in this paper can provide a reference for general companies to improve performance and promote a healthy development. If we could get large-scale sample data in the future, empirical researches can be carried out on the basis of that for the above conclusions.

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Study on the Regulation Model of Consumer Food Safety Risk Perception Based on Social Media

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Abstract: With the increasing severity of food safety problems, it is very important for us to analyze the consumer's risk perception of food safety. In this paper, it's from the perspective of regulating the consumer's risk perception of food safety, analyze how the social media influence consumer food safety risk perception. Through the research on the previous literature, the paper, as a reference, analyzes the effects of social media and the development trend and consumers, thus put forward a new regulation model of consumer food risk perception of social safety based on social media. This study has a great significance on offering a reference of solving the problem of food safety.
Key words: Social media; Food safety; Risk perception

1 Introduction

In recent years, with the improvement of people's living standard and health consciousness, people pay more and more attention on the problem of food safety, and more and more food safety problems have been gradually exposed. For example, British's "mad cow disease", Belgium's "dioxin" and melamine milk powder, clenbuterol pork and other events which had a very adverse impact on our life in China. Despite the implementation of the country's strict food safety management measures, it seems little use to reduce the consumer's panic about food safety. This situation is mainly caused by people's food safety perception. Thus it is very important for food safety problem to reasonable intervene and guide the consumer's perception of food risk. On the one hand, it can improve consumer awareness of food safety by using scientific and effective food safety information to communicate with consumers; On the other hand, it can also help reduce consumers' panic from the exaggerated food safety risks. Therefore, this paper intends to study the regulation model and strategy of consumer food safety risk perception.

2 Literature Review

2.1 Literature review on social media

Social media is a tool and platform for people to share information, opinions, insights, experiences, and ideas (Xiao Rui, 2011). In recent years, with the development of Internet technology, more and more attention has been paid to the social media. In particular, Facebook, Twitter, YouTube and other social media is sweeping the world. "China Internet development statistics report" which reported by China Internet Information Center (CNNIC) showed that Internet users maintain the basic situation of the development trend of the last year till December 2012, especially the instant messaging, micro-blog, social networking sites. Social media creates and gives each person the ability to create and disseminate content. Social media mainly has the following basic characteristics:

1) Available. Social media's threshold for public access is very low, the vast majority of social media can be free to participate and encourage people to comment, feedback and share information. Therefore, social media platform has attracted a large number of social strata.

2) Community. In social media, people with the same interests and hobbies can easily form a community. In this virtual community, people can enjoy and share their anecdotes and pleasure with each other just like in a real life.

3) Interactivity. There is no clear boundary between "media" and "audience" in a social media. In the traditional sense, the "audience" in the social media can often act as a "media" role. The role of traditional media is often similar to the television advertising, the information will be transmitted directly to the audience. However, in the social media, this communication is interactive, the audience can immediately question the message, and spread out the information as "media" after being convinced by the authenticity of information. Thus information is rapidly spreading in a way similar to that of a spider's web.

4) Connectivity. Most of the social media have a strong connectivity, by integrating a variety of media content together through the link and integration. The joint influence such as releasing, video

demonstration and expert analysis can bring audience a more intuitive information.

Social media has impacted on the traditional mode of information dissemination, not only making people become the master of information content, but subverting the traditional concept of information. With the network becoming the main channel of information sources, Information sources are not limited to newspapers, television, radio, and the speed of information dissemination is also more rapidly. People are not willing to be passive recipients of information, instead of expressing their views on the information through the network.

2.2 Literature review on consumers' perception of food safety risk

The concept of consumer risk perception was first proposed by Bauer (1960), Bauer believes that consumer behavior is a burden of risk, consumers bear some of the risks for not sure of its consequences in the process of purchase (Bauer, 1960). Consumer food safety risk perception is that "the consumer perceives the adverse consequences of physical health or the loss of uncertainty in the process of food purchase (Wang Erpeng, 2012)", In recent years, China's food safety problems occur frequently while the food market information is often asymmetric, in other words, that is "one party has more information than the other (Zhou Yingheng et al, 2008)", the difference of consumers' perception on food safety risk is obvious. Xu Lingling believes that "consumer gender, age, education level, income levels, food safety concerns and attention on food safety incidents (Xu Lingling et al, 2013)" will affect the consumer's perception of food safety risk. Peng Hailan studied the consumer's overall risk cognition on meat food safety (Peng Hailan, 2006). Different groups have different state of risk perception, including the risk perception too high, the risk perception too low and the risk perception adjustment state. In the face of different perception of the state of the consumer groups, it must take appropriate, appropriate news release to ease the impact.

2.3 Literature review on food safety information system

In recent years, the frequent occurrence of food safety problems as well as the problem of the food industry has brought a huge impact on our life, reflecting the public system of food information in China has been seriously lagging behind. It became urgent about how to provide consumers with accurate and reliable information on food safety, reduce the damage to the normal interests of qualified enterprises, and establish and improve the food information disclosure system. Zhao Xinlei, Chen Xiuping hold the views that "the weak legal basis, the main dispersion, the backward opening channels, the fuzzy range, the lack of relief system (Zhao Xinlei, Chen Xiuping, 2013)" are all the problem of China's food information disclosure system. Kong Fanhua holds that the improvement of China's food information disclosure system should be implemented between the functional departments of the information bulletin, just like: 1) setting "Information disclosure internal application"; 2) Through the laws and regulations to further clarify the contents of the food safety information; 3) Establishing a unified food safety information disclosure website (Kong Fanhua, 2010). When the food safety information is disclosed, it should pay attention to the information's authenticity, integrity and dispersion. Only when the real complete information response to as many consumers as possible, the risk of food can be minimized and avoid the excessive state of panic from consumer (Zhang Jizhe, 2011).

What we have to admit is that China's food safety information disclosure system is not very perfect, there are many problems such as open the main points, open channels and so on. There are obvious differences in the perception of information among different consumer groups, and it is urgent for us to solve the problem of how to regulate consumers' perception of food safety. It seems that the social media which is gradually into people's life seems to make us find a suitable way to regulate the consumer's perception.

3 Design of Regulation Mode of Consumer Food Safety Risk Perception Based on Social Media

Due to the rapid development of social media, as well as the differences of consumer's perception of food risk, here, we should aim at safeguarding the interests of consumers and the harmonious development of society, and establish a consumer food safety risk perception regulation model in which the government as the leading, the enterprise as the core, and the social media as the means (Figure1). The government plays a role of supervising the information of enterprises and media, and transmitting their information to consumers through digital means. Enterprises should implement strict supervision to sell their products throughout the process, and spread their production information to consumers through social media. The media take responsible for spread the food safety information with some ensure evidence. At last, consumer regulate all the information they already got to make a purchase decision or not.
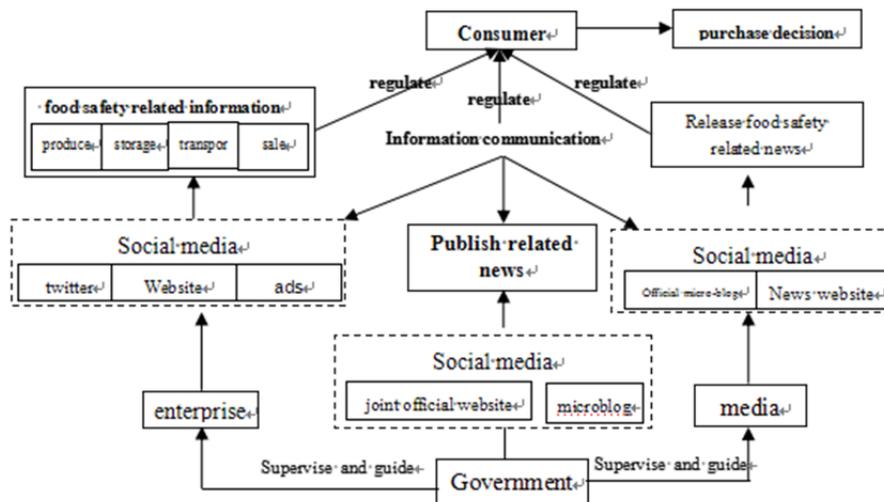
Figure 1 Regulation Pattern of Consumer Food Safety Fisk Perception Based on Social Media

3.1 Taking government as the leading

The government's role of leadership is reflected in that the government strengthen the supervision of all aspects of the production of enterprises by using its function and power, as well as establishing a clear regulatory standard. Meanwhile, government guide enterprises to make the process of production, manufacturing and sales more transparent through social media. At the same time, government also encourage the media and individuals to join the ranks of the regulatory. Supervision of food is harmful to the health of individuals, but when it gets worse, it may be related to the normal development of the country. Therefore, in order to regulate the whole process of food safety from production to sales, we must set up scientific regulatory standards to meet the objective needs. If the safety standards established properly, the government, enterprises, consumers can quickly get the information about food problems, then it can ensure the normal development of the entire food industry.

When the government takes charge in the supervision of enterprises, it should be encouraged for enterprises to use free social media to get consumers access to the information of production, manufacturing, sales. If the enterprises use the social media properly, for example, releasing the information about product or content of some sensitive substances on micro-blog or official website, consumers will easily find the answer and avoid the panic about the food safety.

It cannot be ignored that the important role of the public and the media plays in addition to improving the regulatory system and guide the enterprise itself a good run, the mass media and the government is not a vassal, they can actively play the third role of balancing market forces. For a long time, because of the lack of participation of the public and the media, our country has always maintained the structure of the government - market, which leads to many problems. Now with the emerging of social media, the strength of public and media is more powerful, the government should fully encourage these forces to play a role in the formation of the government - market - public structure. It is more conducive for the healthy operation of the entire market if the three-party structure operates in the food market.

3.2 Taking enterprises as the core

After all, the government can only play the role of legislation and supervision, the food production rely on the enterprise itself. Enterprises must fulfill their social responsibilities, and strictly control their production, sales, storage and other sections. What the enterprise should do is to establish information disclosure system and use social media platform to enhance the transparency of food safety. Enterprises, in the process of production, should not only meet the requirements of the government, but also form a good relationship with the consumer. So it plays the role of the real core in this regulation pattern. Enterprise as the core is mainly reflected in the following two aspects:

1) Taking the social responsibility

It is a basic social responsibility that enterprises should take into account the interests of workers, consumers, the state and the public in the realization of profit maximization. However, mostly the enterprises ignore the responsibility just focus on the profit maximum. Mohr and Webb's research on

corporate responsibility shows that the low level of enterprises' social responsibility will greatly weaken the purchase intention of consumers (Gao Yang, 2010). Therefore, social responsibility is not only the social responsibility of the enterprise, but also the responsibility for their long-term development. In order to take the most basic responsibility, enterprises should strengthen the internal management of enterprises to ensure that food are in line with the requirements of the National Quality Supervision Department in the all process from raw materials to the final sales to customers.

2) Strengthening ties with consumers

Enterprises should Strengthen their ties with consumers besides focusing on their own food production, it is very important for enterprises to release their information about food safety on their official website or on the micro-blog, which can not only help companies understand their own products, but also can help enterprises to supervise the sales channel, and then further ensure that food in the sales channel is not damaged.

3.3 Taking Social media as a means

The core of social media is "information" and "relationship" (Wang Ming, 2011). Enterprises and the government should grasp the core of social media to be used. With the rapid development of Internet technology and mobile terminal technology, social media has made rapid development. This rapid development has not only promoted the development of the times, but also greatly changed the way people access to information. Therefore, government can not only strengthen the education of the consumer's daily food safety problems through the social media platform, but also can government release food safety information in a timely manner. Enterprises can use social media platform to strengthen the publicity of enterprises, keep ties with consumers and strengthen the supervision of products after the factory. What's more, it can help establish a good brand of enterprises through social media.

4 Conclusions

This paper focuses on the food safety issue in the society of economic law, and then by introducing social media's features and analysis how information influence consumer behavior, we construct the social media consumer food safety risk perception regulation model based on the use of theoretical analysis, model construction and system construction.

Social media has the characteristics such as public, community, interactive, connectivity, so that the groups who use social media expand rapidly in a short period. At present, the social media platform replacing the traditional newspapers like television and other media has become the main channel for people to obtain information. In order to correctly guide the consumer groups with different risk perception and to avoid the emergence of the risk perception of consumers, we should establish a suitable model of consumer food safety risk perception. Considering the relationship between government, enterprises and the social media as well as what they can play, it's suitable to establish a consumer food safety risk perception regulation model in which the government as the leading, the enterprise as the core, and the social media as the means.

Acknowledgement

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The Correlation Analysis about Impact of Government Subsidies and Enterprises Growth on Credit Default Risk

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Abstract: Commercial banks should consider influence factors from different ways when evaluating the credit and loan default risk of small and medium-sized enterprises. This article first proceeds from the researches of relative theories and then proposes the assumption. It then takes collected data of small and medium-sized enterprises as an example to construct relative models. The researches mainly include descriptive statistics, correlation analysis and regression analysis,which study respectively on the influences of government subsidies and growth of the firms on credit and loan default risk . The result indicates that government subsidies and growth of the enterprises both have a negative correlation with credit and loan default risk, which means credit and loan default risk could be reduced by raising government subsidies and promoting the growth of the firms.
Key words: Government subsidies; Enterprises growth; Credit default risk; Regression analysis

1 Introduction

In China, commercial bank has strategically set the credit business of SMEs as the development goal, such issues as the stability of the SMES have brought many risks into the credit business.

Foreign scholars got some remarkable achievement. AltHan set up a model named "ZScore", whose principle is to establish discrimination functions by the use of multivariate financial indexes and then classify the borrowers to judge whether to have the ability to repay the loan. Scholar Dutta and Shekhar first made use of neural network to analysis; Scholar Haltin and Ohison established regression model LoHit to forecast the probability that the borrowers break the contract and so on.

Domestic experts are combined with the relevant data of our country to introduce the method of commercial bank credit, and demonstrate the feasibility of the credit risk prevention measures. In 1990s, the domestic scholars began to study the credit risk of commercial banks to guard against. (Edward I Altman, 2009）In 2015, Zhang Xin, in *Chinese commercial banks credit risk management company industry thinking* made a detailed discussion of the bank risk management and the need, update the management philosophy to cope with rapidly changing situations and complicated situation.

2 Theoretical Analysis

In 1997, the Basel committee in the core principles of effective banking supervision determining the three risks of the Banks needed to pay special attention to: credit risk from the customer, external risk from the market, operating risk from the internal bank. This page considers credit extension related objects and influences factor by the review of bank.

2.1 National macro policy

At present the China is in the adaptability of the macroeconomic policy in the field of economy. First, the national monetary policies have a direct effect on difficulty degree of corporate finance in a period. As the means of macroeconomic regulation, Government subsidies can promote the development of SMEs to a certain extent and have important influence of the repayment capacity.

In summary, put forward the hypothesis H1: government subsidies and the credit and loan default risk of SMEs is negatively correlated. (M. S. Weisbach, 2004) in another word, the more government subsidies, the smaller the probability of credit default.

2.2 Middle and small-sized enterprise

The enterprise growth ideas can date back to the classical economic which classical economists represented by Adam Smith considered the economic interests of the scale realized by the division of labor and professionalization as the main cause of enterprise growth. Corporation growth measures the running development status of an enterprise for some time and the ability of an enterprise's expansion and development for some considerable time to come. It determines an enterprise's future growing trend and possibility. The growth of an enterprise has great significance for its decision of capital structure.

Therefore, we come to the hypothesis H2: the growth of small enterprises show negative relation with the venture of credit default,which means that the higher growth, the less venture.

3 Data and Methodology
3.1 Sample selection and data source
Based on SMEs listed in Shanghai and Shenzhen in China from 2013 to 2015, except for st listed companies and listed companies which are lack of key variables, the article finds 480 samples in the end. Enterprise data mainly come from Cninfo and the CCER database. This article uses SPSS to complete data processing and statistical analysis.
3.2 Variable definition and model building
In order to test this research hypothesis, we construct the following model:

Model one: P=a0+a1GS+a2HY+a3ICI

Model two: P=a0+a1TobinQ+a2HY+a3ICI

3.2.1 Explained variable

Default probability (P) is the degree that the debt or counterparty breaks the contract and will not be able to pay off his debts. There are only two cases for bank credit for enterprises: will default or not. If assign a value of one to the default, an event will occur. If assign a value of zero to the success in meeting the debt obligations, an event hasn't occurred yet. It can be assumed that the probability of the event that would happen is PD and the probability of the event that hasn't happened yet is 1-PD. If we regard PD as a linear function of the independent variable, its forms are as follows.

$$P = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \xi$$

Put P into Logistic model, we can get:

$$\log istic(p) = \ln(\frac{p}{1-p}) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \xi$$

After deformation, there is the result:

$$P = \frac{EXP(\alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \xi)}{1 + EXP(\alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \xi)}$$

α is a constant,βn is regression coefficient, Xn is explanatory variable, £ is a random error term, and p/1-p is the odds. The formulas can explain intuitively the impact of factor change on default rates. Logistic model does not require the normality assumption of the sample, which conforms to the sample features of researching the credit-default risk of the small and medium enterprises in this article. Therefore, the article uses the logistic model to do empirical research. (R. M. Stulz, 2010)

3.2.2 Explaining variables

1) Government subsidy(GS)

Based on the financial reports notes of SMEs, concerning about the government subsidy, the government subsidy data is summarized and organized manually. High-tech enterprises are subsidized mainly by the financial subsidies, incentives and tax rebates that the government provides enterprises with. Therefore, the government subsidy measure=the government subsidy/income.

2) Corporation growth

Q determines the level of company investment and represents the value of company benefit. However, we often use Tobin's Q approximation to measure the enterprise value.(Snežana Dičevska, 2012)The article uses the net asset value per share as the approximate prices of non-tradable share and uses the asset book value as the approximate of the replacement cost of company assets. Therefore, the approximate value of Tobin's Q=(circulation market value + the number of non-tradable shares×book value of the net assets per share + debt) / book value of assets.

3.2.3 Controlled variable

1) Industry type (HY): different industries are assigned different numerical values. 1=manufacturing industry, 2=construction industry, 3=transportation industry, 4=catering industry, 5=business service

2) Industry cycle index (ICI): Choose the industry cycle index reflects bank's credit risks.

3.3 The summary of variable definitions

In sum up, we get all variable definitions, as shown in table 1:

Table 1   Variable Definitions

variable	abbreviation	Assignment instructions
Explained variable	PD	0 or 1
Explaining variables	GS	GS =subsidy/income.
	TobinQ	TobinQ
	HY	different numerical values
	ICI	industry cycle index

4 Results

4.1 Descriptive statistics

Before the regression analysis, we carry out descriptive statistics for all variables at first, so that we can intuitively understanding the data distribution of each variable. As shown in table 2.

Table 2   Descriptive Statistics

variable	the whole sample		No default sample		default sample	
	mean	variance	mean	variance	mean	variance
GS	0. 2773	0. 0048	0.5926	0. 0691	0.1238	0. 018
TobinQ	2. 6224	7. 9615	2. 8778	8. 6512	1. 8404	6. 5240
HY	3.40483	1.9744	3.8241	1.5880	4.1667	2.7340
ICI	69.9703	398.8135	107.2916	552.963	43.7082	65.813

Form government subsidies, no default the sample mean is 0.5926, the default sample averages of 0.1238, it reveals government subsidies have great influence on SMEs credit and loan default risk.

From TobinQ value, which is an index about the perspective of a measure of enterprise growth, no default sample mean is 2.8778, the default sample mean is 1.8404, the growth differences of sample companies. Because enterprise growth is different, so the enterprise's financing conditions are different and the credit default risk is different, all these provide support for the research.

4.2 Correlation analysis

This article aims to analysis the correlation between government subsidies, enterprise growth and the probability of credit default. Therefore, it is necessary to carry out Pearson correlation analysis of each variable, as shown in table 3.

Table 3   Pearson Linear Correlation Analysis Table

		GS	TobinQ	HY	ICI
GS	Pearson Linear	1			
TobinQ	Pearson Linear	0.122**	1		
HY	Pearson Linear	0.063**	0.174	1	
ICI	Pearson Linear	-.031	-.010	0.201**	1

From the above table, we can see the correlation between variables selected in this article is not obvious, and there is no need to eliminate the multiple col-linearity between the independent variables. Therefore, the original variable can be put into the model, gone through the regression test and analysed.

4.3 Regression test and analyses

4.3.1 Regression result of hypothesis H1

Take the Probability of Default (PD) and the Government Subsidies (GS) as the explanatory variables, Industry Type (HY), Industry Climate Index (ICI) as the controlled variables. Then Linear regression analysis is carried out between the two kinds of variables. As shown in table 4.

As seen from the above table, the F value of the regression model is 3.521, and the significance level of F value is 0.010, which shows that the regression effect of the model is significant, and there is a significant negative correlation between government subsidies and verifies the hypothesis 1 in this article. Therefore, the business obtained more government subsidies, the probability of default will be lower, and the business is more likely to get bank loans. In other control variables, industry type and industry climate index has a negative correlation with credit risk. When the industry climate index goes

high, it represents that the business development future is good, and the bank will increase the credit rating of the business, also, the business's probability of default will be lower.

Table 4   Regression Result of Government Subsidies and Credit Risk

Mode		Sum of square	df	average square	F	significance
1	Regression	368.883	4	92.221	3.521	0.010
	Residual	2933.586	111	26.193		
	total	3302.469	116			

Model		Unstandardized coefficient		standardized coefficient	T	significance
		B	standard error	Beta		
1	Constant	14.033	7.766		3.101	0.002
	GS	2.457	0.573	0.230	2.555	0.012
	HY	-1.954	2.262	-0.077	-0.864	0.389
	ICI	1.781	0.328	-0.213	-2.379	0.019

According to the coefficients in the table, expressions can be obtained:

$$P = 14.033 + 2.457GS - 1.954HY + 1.781ICI$$

The final regression equation is:

$$\ln(\frac{p}{1-p}) = 14.033 + 2.457GS - 1.954HY + 1.781ICI$$

Restore the linear relationship between the variables, and the result is:

$$\frac{p}{1-p} = EXP(14.033 + 2.457GS - 1.954HY + 1.781ICI)$$

4.3.2 The regression result of hypothesis H2

Take the Probability of Default (PD) and the business growth (TobinQ) as explained variable, industry climate index as the control variable. Then Linearregression analysis is carried out between the two kinds of variables. As shown in table 5.

Table 5   Regression Result of Government Subsidies and Credit Risk

Mode		Sum of square	df	average square	F	significance
2	Regression	1577.499	4	394.375	25.606	0.000
	Residual	1724.971	112	15.402		
	total	3302.469	116			

Model		Unstandardized coefficient		standardized coefficient	T	significance
		B	standard error	Beta		
2	Constant	13.469	3.457		2.217	0.029
	GS	3.338	0.021	0.648	9.465	0.000
	HY	-2.059	1.831	-0.081	-1.189	0.237
	ICI	1.710	0.351	-0.198	-2.882	0.005

As seen from the above table, the F value of the regression model is 25.606, and the significance level of F value is 0.000, which shows that there is a significant negative correlation in the hypothesis 2. Business with high growth has much development potential, and will be more likely to get the expected excess incomes. The better financial situation is, the stronger the ability to repay debts will be. Bank as a creditor, will be more willing to provide loans to the business with high growth. But because growth is an indicator of the evaluation of the future condition, and the regression coefficient of industry climate index is still negative, it will increase the credit risk. So banks in debt financing must consider these three factors as far as possible, thereby reducing the rate of loan default and obtain the loans.

According to the coefficients in the table, expressions can be obtained:

$$P = 13.469 + 3.338TobinQ - 2.059HY + 1.710ICI$$

The final regression equation is:

$$\ln(\frac{p}{1-p}) = 13.469 + 3.338 TobinQ - 2.059 HY + 1.710 ICI$$

Restore the linear relationship between the variables, and the result is:

$$\frac{p}{1-p} = EXP(13.469 + 3.338 TobinQ - 2.059 HY + 1.710 ICI)$$

5 Conclusions

5.1 Research Conclusion

First, the empirical research suggested that government subsidies and credit and loan default risk has significant negative correlation. That is to say the more the government subsidies, the lower default probability of credit and loan. Because the government subsidies for the enterprises in financial support and reduce the credit risk. Thus enterprises are more likely to get credit loans. Second, the enterprise growth and credit and loan default risk has significant negative correlation. That is to say high growth can effectively reduce the credit risk in a certain extent. Because high growth of enterprises has a potential future, can obtain the expected excess revenue and corporate profitability and debt paying ability is stronger, the credit default probability will be reduced accordingly.

5.2 Research Proposals

First, from the aspects of government, bank loans to small and medium-sized enterprises not only need to focus on enterprise's solvency, but also focus on government subsidies and support policies for SMEs. Second, from the aspects of enterprise growth, Banks can provide loans for high growth companies as far as possible. Because of the high growth of enterprise credit default rates are relatively low. When Banks make loans, they can raise the loan interest rate and charge a fee to urge enterprises to avoid the credit risk.

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Research on the Risk Responding Mechanism of Network Public Opinion in the Era of Big Data

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Abstract: This paper makes an analysis of the current technology platform modes of the monitoring system of network public opinion, pointing out the existing problems of "two emphases and two neglects" in the monitoring institutions of network public opinion: they value the data but neglect the analysis, and they emphasize the technology but ignore the response. This article holds that scholars should grasp comprehensively the internal mechanism and evolution law of opinion transmission in the era of big data. Furthermore, the monitoring managers of public opinion have to analyses, identify, judge and evaluate the information and the data of public opinion through the monitoring technology platform of network opinion. It concludes that we should give full play to the initiative, enthusiasm, and involvement of behavior subjects like government departments, experts and scholars, the network media and the public, etc., forming internal and external force, and construct the linkage mechanism of the risk response of network opinion. Only in this way, can we effectively improve the ability to deal with the network public opinion.

Key Words: The era of big data; The risk of network public opinion; Responding mechanism

1 Introduction

When certain social events spread through network media, online masses will initiate heated discussions, comment and pass on others' posts of these events. And the social events will evolve into the risk of network public opinion without proper guide in this process. So the events will not only bring adverse impacts on the event clients, but even affect social stability and the security and harmony of the country. Especially under the background of today's era of big data, any event can instantaneously spread all over the world, and network public opinion has become an important force to influence national security, social stability and people's life. Therefore, the key problems of the current guide work of network public opinion include following aspects: adapting to the change of era, ensuring the guide work in order, strengthening the routine monitoring, exploring the risk judging method, and constructing the guiding linkage mechanism.

At present, the research abroad mainly focuses on the theoretical study of monitoring analysis and dissemination evolution of network public opinion, especially the analysis of survey data, text data and network data and complex social network, such as Aghdam(2016), Galam(2015), Frasca(2013), Chkhartishvili &Gubanov(2011),Pasttor-Satorras & Vespingnan(2001),Larson(2000),etc. However Chinese scholars mainly study hot events of network opinion monitoring, technology platform, alert and response, such as Song Yuchao, Chen Fuji (2016), Sun Feixian, et al. (2015), Li Xiguang (2014), Huang Yonglin (2014), Wang Qing, et al.(2011),Tan Guoxin , Fan Yi (2010) , and so on. As what have been discussed above, the study of how to make full use of current monitoring technology of public opinion for effective daily monitoring and disposal is very weak. And more studies should be done in this field to improve the ability to guide public opinion and dispose of the public opinion risk.

2 Current Problems in Network Opinion Monitoring

From the view of our present concern, these fields closely related to people's basic necessities become the focus of public attention, such as food, medicine, environmental protection, education, housing, transport, industry and commerce, safety in production, journalism, publishing, etc., followed by these fields like "fighting against pornography and illegal publications", the agriculture (the price). In addition, the sectors like environment, family planning, finance, electric power, religion, land and resources, tourism, sports, etc. have increasingly become the focus of public attention. So these relevant departments have set up specialized agencies to monitor and manage public opinion to effectively curb the signs of opinion risk influencing the image of the government or the unit. But with an overview of the current monitoring situation, there mainly exists such phenomena of "two emphases and two neglect": they value the data but neglect the analysis, and they emphasize the technology but ignore the response.

2.1 Data emphasis but analysis neglect

At present, data support and statistical argument are highly regarded under current time's background. Throughout the daily monitoring modes of network opinion, Chinese monitoring agencies and departments of network opinion not only quest for the scale and the quantity of data, but also make full use of monitoring technologies and software for data mining to facilitate monitoring platform to analyses and use the data. However, the complete data mining and collection methods without analysis not only affect the accuracy of data analysis, but make the task harder and increase the workload of monitoring network public opinion, sometimes even a waste of manpower, material and Financial Resources. From the perspective of current monitoring agencies, monitoring personnel of different levels can only use the monitoring software of public opinion without data analysis combined with the social practice. There won't be scientific analysis report of public opinion if without identification, delectation and analysis of the data samples. To a certain extent, this monitoring service with data but without data analysis reduce the practical applied value in the technology platform of monitoring public opinion.

2.2 Technology importance but response neglect

Owing to the different purport of the monitoring position of network public opinion, the monitoring platform cannot be a great intersection of technology, data, and service. There are main three kinds of service organizations of monitoring network public opinion. One is the academic type, whose representatives are the Tsinghua and UU Watch Laboratory of News Public Opinion, Public Opinion Academy, RUC, Tianjin Public Opinion Academy of Social Sciences, and other colleges and Universities and search institutes. This type of organizations put too much emphasis on theoretical study without strong resources guarantee which have weakened the disposal efforts in solving the public opinion crisis of social public events to a certain extent. Another one is the technological kind, whose representatives are Barfoo Software, Goonie International Software, THNWIN, Meiya Pico and other tech enterprises. As these enterprises are in the pursuit of profit model, they take selling software as the core. So the data results obtained by the server show that there are few professional analysis reports of public opinion, let alone feasible disposal plans. The last one is the media type. And the Public Sentiment Monitoring Room, the media platforms of all newspapers, etc. are the representatives. And these media platforms often have a huge amount of data resources and powerful influence of public opinion. But as the application problems of the analysis report from these platforms are not implemented in place, they do not have good decision reference value.

Just as a scholar pointed out, the monitoring system of Internet public opinion, in which theoretical study is divorced from the practice of social governance, public opinion monitoring is out of step with the intervention of public opinion crisis, and data information collection is disconnected with professional data analysis, to a certain extent, has been the bottleneck and the shackles to cope Internet opinion. (Bao Xianping, et al.,2015:37-43)Therefore, the monitoring institutions should not only make efforts in constantly strengthening server construction, improving data mining ability and enhancing the experience sense of monitoring platform, but further consider the operability, practicality and reality of the analysis report of public opinion, and correctly handle the relationship among data, technology and service. Only in this way, can they dig up some useful data with the advanced and scientific technology to better serve for the society and people which is the ultimate goal of developing and designing monitoring platform of network public opinion.

3 The Study Principle and Method of the Risk of Network Public Opinion

In today's era of big data,the monitoring institutions should not only put forward the specific implementation plan after deep analysis of the collected data and careful study of the development trend of public opinion, but also make comprehensive use of multidisciplinary theoretical knowledge, such as communication science, politics, computer science and technology, linguistics, management science, sociology, information science, and so on. "Through the Internet and the technology platform of computer software, they adhere to the principles of the quantitative judgment and scientific decision, multiple simulation, man-machine integration. And they not only make prediction, early warning and intervention of the risk of network public opinion, but apply virtual reality technology to make simulation and prediction of warning sources, warning signs, warning situation."(Li Xiguang, 2014:10-16) They should make some key measures to promote the guidance work of network public opinion to and construct clear network space environment from following aspects: to make real-time monitoring of network public opinion, to timely grasp the dynamic state and development trends of

network public opinion, to closely observe the people's ideological trends, to take timely and effective measures to process the events results to a minimum.

3.1 The study principle of network public opinion

3.1.1 The propagation subjects of network public opinion---netizens.

We need to have a comprehensive understanding of behavior subjects involved in the propagation process of social hot spot information through technical means and association data. Only when we really grasp the identity of behavior subjects, can we comprehensively grasp the focus of information and the process of information flow, because Internet users are one of the most important and critical parts in the spread process of public opinion, and their behavior attitude, psychological cognition, knowledge level determine the propagation and evolution process of network public opinion. So we have to carefully analyze how the behavior subjects spread information through the circle of friend of the social media circle to bring out emotional resonance, behavioral interaction and resonance between the behaviors subjects of public opinion.

3.1.2 The objects of the transmission of network public opinion: problems

The spread of network public opinion is occurred under the background of social hot events. Since the events themselves are closely related to the interests of social public or easily arouse public's interest and attention, so they can stimulate Internet users to search and spread network public opinion. Some social hot spots are more likely to become the focus of network public opinion, particularly some issues associated with the social public interests like education, environmental protection, corruption, traffic, prices, housing and other areas. Of course, the current technology platform makes it possible to achieve real-time monitoring of public opinion on the network space. And the most critical point is to carry out a professional analysis of these data and then form the research report of public opinion. Furthermore, it is necessary to search net citizens, click on the hot information for data analysis, timely grasp the attention tendency of the cyber citizens on the hot issues so that the monitoring departments can effectively guide network public opinion in advance.

3.1.3 The network communication platform: media.

Nowadays, mobile social network media, especially the popularized application of smart phones, provide very convenient hardware of network participation for the public. All kinds of social software such as QQ, WeChat, micro-blog, etc., have become common media for the contemporary public, who can participate in online discussion and comment the social events anyplace and anytime. Compared with the traditional media, these social software of strong relation network, breaking previous linear propagation, have the transmission features of diversity, group nature, and interactivity. So they are easy to form mainstream opinion orientation of the network group events. Accordingly, monitoring these social media and other Internet forums should be the monitoring focus in the assessing process of network public opinion.

3.2 The judging Method of Network Public Opinion

3.2.1 The browsing method of massive human resources.

It is a kind of artificial judgment method which gains the corresponding results from the investigation of current social media or public. It is the most basic, natural and common judging method of network public opinion. However, it has many shortcomings in the face of ever changing technology of network media, such as data missing, mechanical repetition and so on. Thus it is often unable to achieve expected judged target. But it still has certain feasibility and operability in the judgment process of network public opinion because it is intuitive, convenient and simple.

3.2.2 Keyword search method

It is a method which makes massive search of the keywords of opinion information through Internet search engines, and then judges' hotspot information of public opinion from the search result. It is effective, accurate and practical. But this method is mainly dependent on network search tool, and the quality of its search database and information bank determines the quality of the method. Especially some commercial sites will also decide the search scope according to their interests in the face of the current large amounts of information. Therefore, it affects the search results in a certain extent.

3.2.3 Multi document selection method.

It is a judgment method which gets the research result from analyzing target web documents of Internet public opinion in the judgment process. It is artificial in nature, and it forms the judgment method system combined with browsing method of massive human resources, keyword search method. It is of important significance to help the public opinion judger understand the ins and outs of the events, and enhance their judgment level. Generally speaking, it is used in the occurrence period and diffusion stage of network hot events, and help users know the trend of public opinion because of fewer number

of target documents.
3.2.4 Templet factor method

It is a means of intelligent analysis of judging Internet public opinion through modeling paradigm. It needs to take a historical review of the events of network opinion, make an overall objective analysis of occurrence regularity, and undertake a comparative study of the development templet and the corresponding factors. Hence, it is theoretical, reflecting the scientific understanding of the people on the events of network public opinion. Moreover, public opinion events often influence the results and quality level of this method because of the complexity of the events development, the areas of event occurrence and event categories. So it needs to perfect and repair.
3.2.5 Network experiment method

It is an important supplement to the reality judgment of public opinion. It is a judgment method which makes scientific experiment analysis of network events by means of simulating the network environment, and then obtains the judged result of the events development and change. In general, it is mainly used for scientific research institutions to analyses the complex, sensible, diversified events of network opinion to know their main trends, grasp their developing rule. So it is of great research value in improving people's cognition of network opinion and their overall judgment level.

Indeed, the judgment of network public opinion is mainly based on the technology platform of the monitoring system of Internet public opinion. Besides the methods mentioned above, there are other methods, such as the comparison method of case base, the analysis method of network hot words, etc. They form the method system of comprehensive use and mutual support in the process of the implement operation. But these methods are based on artificial analysis, and the monitoring sectors wholly grasp the developing progression of the network opinion events via platform technology and methods of the monitoring system of network public opinion. And they regard some basic information and text data as the analysis objects so that they can make scientific, rational and comprehensive grasp of the occurrence rule, trend and results of the Internet events. Therefore, the study can provide strong theoretical support for the government in the decision reference and action guide.

4 The Response Linkage Mechanism of the Risk of Network Public Opinion

The dissemination of network public opinion is actually a spread process of the social public events in the network space. And its multiple elements and changeable virtual space environment increase the complexity of the risk response of network public opinion. Consequently, the managers should not only firmly grasp the internal mechanism and evolution law of public opinion communication, but also fully mobilize the departments to coordinate work and work together so that they can construct a linkage mechanism and break through progress, as follows figure 1.

From the Table we can see that the response mechanism of network opinion risk mainly includes two mechanisms: "internal linkage mechanism" and "external linkage mechanism" , among which "government sector" and "information resources sharing" play key important roles in the whole process, because high development of the media provides a great convenience and possibility to share information resources in the era of big data. As an important organization of network public opinion, government sectors have strong power on organization, authority and execution, which other social groups cannot go beyond.
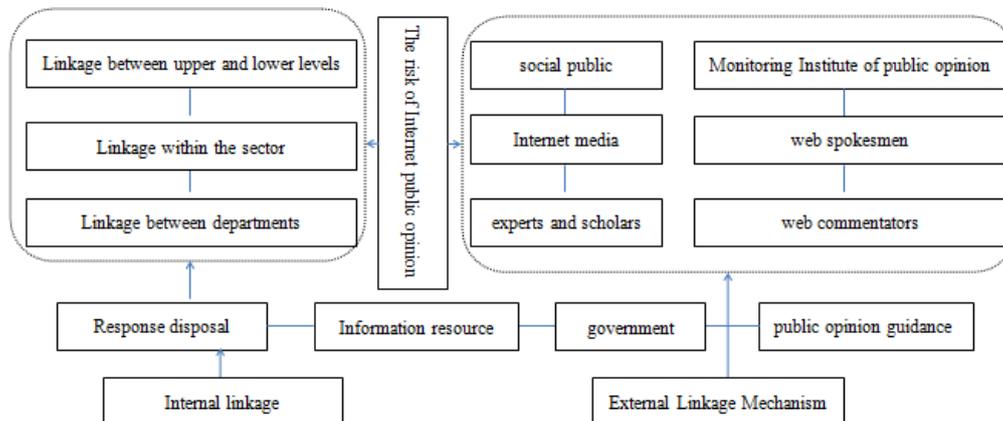
Figure 1   The Risk Response Mechanism of Network Public Opinion

4.1 Internal linkage mechanism

After spreading public emergencies by means of network media, government departments and the administration subjects must form a joint force between higher and lower levels, between departments or within the sector on the first time to constitute a leading group to deal with public opinion and seek the best contingency plans with mutual coordination via sharing the information resources. Because network emergencies, which are different from general emergencies, spread in time and fast, they will threatens to grow into the crisis of public opinion and further aggravate the malignant development of the events if not promptly treated. Thus government departments have to deal with and dispose of these events timely and effectively. For example, the illegal vaccine case on March 18, 2016 had aroused great concern of Chinese people, and the Party Central Committee had attached great importance to it.   And Premier Li Keqiang made some important instructions that relevant departments such as the Food and Drug Administration, the Ministry of Health, the Ministry of Public Security and so on, must properly coordinate and make a thorough investigation of the flow direction and usage of these problematic vaccines so as to respond to people's concerns promptly. We can find that the whole incident was handled very timely, upper and lower levels, internal department and interstates are in joint forces. So the internal linkage mechanism can effectively put an end to the spread of Internet rumors.

4.2 External linkage mechanism

As the network emergencies are often sudden and accidental, it cannot be effective to respond to the events if relying solely on government departments in today's mobile Internet era. And the modes like "fighting alone", "working each for himself" cannot adapt to the governance model of current network space. So the response linkage mechanism can achieve its aims only through sharing of information resources and full cooperation of the media, experts and scholars and the public. On the one hand, the web spokesmen and the web commentators can actively guide the events, timely release the authoritative and reliable news for the first time in the platform of we media such as the micro channel, microblog, to respond to social concerns and the questions of the public in time. On the other hand, the response linkage mechanism can effectively monitor the events through technical means. Only by combination of guidance with confinement, can the main tone of network public opinion move toward the healthy direction. In addition, government departments have absolute power in event processing and decision making, and the media industry is the executer of information selection and dissemination.(Yang Bincheng, Li Juan,2014:20) Various linkage departments and organization personnel should raise their awareness up to the level national stability, social harmony and people's harmony, strengthen their awareness of coordination and communication, improve their social responsibility, actively disseminate social core values and increase social positive energy.

It is true that there is a huge gap between virtual space governance and real social governance because of wide and boundless network space and the ever changing network technology, which brings a serious challenge to the rulers. Especially during the transition period when the commercial tide sweep the world and media industry go through reorganization and transformation, many network media industries are lack of social responsibility, coupled with the lack of public media literacy, which are easy to aggravate the risk occurrence of network public opinion and increase the difficulty of the guide work. Thus, the construction of harmonious ecological environment of network public opinion will be a long historical process. And scholars need more comprehensive theoretical knowledge of multidisciplinary and technology design, such as communication science, psychology, linguistics, sociology and information science, etc, and the cooperation of research teams. Only is this way, can they better control the study of network opinion management, and effectively put forward the scientific plan to guide, intervene and dispose of the risk crisis.

5 Conclusions

With the high development of information technology and the wide application of the smart phones, it has become an important task and time mission to efficiently and timely deal with the risk of network opinion and scientifically and reasonably guide public opinion towards a healthy and harmonious direction. Under the background of the times when the network governance and the news ruling are vigorously promoted, the construction of sunshine and efficient platform of government affairs has become the shared aspiration of various government departments. Furthermore, it has become a touchstone to test the government's ability to govern network whether the government can effectively deal with the network emergencies and dispose of the crisis of network opinion. Therefore, the linkage

mechanism includes not only internal linkage mechanism between the administrative subjects, government departments, upper and lower levels, and departments, but also external linkage mechanism between government departments, social public, the media industry, experts and scholars so that it can promote the positive communication of social events in network space.

Acknowledgement

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Research on Risk Conduction Identification of Enterprise Financial System

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Abstract: This paper puts forward a financial management system of enterprise risk conduction recognition approach, modern means of identification and scientific recognition method by using the method of theoretical analysis. Moreover, the paper builds up a recognition system of financial management system of enterprise risk conduction, which includes effective recognition paths, modern identification methods, and scientific identification methods. In details, the effective recognition paths include risk factors to identify pathways and risk conduction principle recognition approach; the modern identification methods are composed of financial indicators, business process and historical experience, and internal control means of identification form; the scientific identification methods include financial report analysis method, screening method, risk conduction tree search method and trigger method. Furthermore, this paper provides a theoretical and empirical guidance for the efficient and accurate identification of enterprise financial system risk conduction.
Key words: Enterprise financial system risk conduction; Effective identification way; Modern identification method; Scientific recognition method

1 Introduction

The risk conduction identification of enterprise financial system is different from the risk identification of enterprise financial system. It is not only of financial system of enterprise risk identification, and identification of elements of financial system of enterprise risk conduction, namely of business financial system risk source, risk conduction load body, risk conduction path to understanding, identification and confirmation process. Thus, for recognition of business financial system risk source, interception financial system of enterprise risk conduction carrier, cutting off the financial system of enterprise risk conduction path, and effective control of the financial system of enterprise risk conduction play a key role.

The risk conduction identification of enterprise financial system, including the effective identification approach, modern identification method, the scientific identification method.

At present, the current research status of risk conduction is mainly focused on two areas of financial risk conduction and enterprise risk conduction, and there are few scholars who study the conduction of enterprise financial risk from the micro level. The scholars who study and discuss the problem of enterprise financial risk conduction are mainly: Bensten (1986) views on enterprise's financial risk conduction is when the system in a certain number of business failure at the same time, systemic risk will happen. Davis et al (1999), Jarrow, (2001) from vulnerable point of enterprise's financial risk conduction, they think of a business failure will lead to failure of other enterprises, so common financial fragile will. Helwege Jeen (2010), had a more comprehensive study on the enterprise bankruptcy and systemic risk, after the sub loan crisis. The scholars who earlier specialized in enterprise's financial risk conduction of China have Li Bingxiang, Tian Zhanjun, (2006), on the basis of analysis of the relationship among enterprise financial risk and the elements, structure and environment of accounting and uncertainty of management, they constructed analysis framework of enterprise financial risk formation and transmission. Shen Jun, Deng Mingran (2007) researched the enterprise financial risk conduction and the carrier. Yin Li (2009) researched on the effect of corporate collective financial risk conduction in the framework of organizational failure. Chen Aijun (2009) researched on the enterprise financial risk conduction from the perspective of the supply chain. The research on the enterprise financial system risk conduction identification has not yet been found, and this paper fills the gap in this area.

2 An Effective Approach for the Identification of Risk Conduction of Enterprise Financial System

An effective approach for the identification of risk conduction of enterprise financial system is

shown in Figure 1.

Figure 1   Effective Approach to the Identification of Risk Conduction of Enterprise Financial System

2.1 Approach to the identification of risk factors of risk conduction of enterprise financial system

Enterprise financial system of the existence of objective uncertainty and subjective uncertainty, which is caused by the factors of macro environment and micro environmental factors. Therefore, starting from the factors of macro environment and micro environmental factors, is the way to identify the financial system of enterprise risk conduction.

1) From the macro environmental factors identification. It mainly refers to the political environment, economic environment, legal environment, technical environment and international environment.

Macro environment changes will bring the system, global impact, resulting in business, fluctuations in the industry, and even the entire national emergency expected target and uncertainty. The influence of macro environment is to lead to the occurrence of the enterprise production and management target of the origin of the uncertainty, is the source of the risk of financial system of enterprise risk conduction. The risk of enterprise financial system is not only influenced by the macro environment, but also influenced by the social and cultural factors, the types of enterprises and stakeholders.
Enterprise financial system risks resulting from the sources of risk, from the risk source of the dominant carrier (capital, personnel and Technology) or contact carrier (information, behavior and concept) along the business process chain and value chain or capital supply chain transfer and spread and spread.

2) Identification of influencing factors from micro environment. The influencing factors of enterprise financial system by the micro environment, mainly with enterprise production and business activities and financial activities of enterprises is closely related to the enterprise production management, enterprise financial capability, enterprise financial management organization structure and enterprise financial personnel quality elements. The volatility and uncertainty of these factors will directly lead to the expected target of enterprise financial system to change, which is the source of enterprise risk management system risk.

Arising from this kind of risk source of business financial system risk, the dominant carrier or recessive carrier, along the enterprise financial management contents cycle (namely fund raising, long term investment of enterprises, corporate cash flow and profit distribution or corporate finance cycle (that is, financial prediction, financial decision-making, financial budget, financial control, financial accounting, financial analysis) or in the enterprise funds raising activities, activities of corporate liquidity in the process, enterprise profit distribution in the process of transfer and spread and spread.

2.2 Approach to the identification of the basic principle of risk conduction of enterprise financial system

The risk conduction of enterprise financial system follows the direction principle, the principle of time, the intensity principle and the mixed type principle. Therefore, from the perspective of these principles and anatomy of corporate financial system risk conduction, is the identification of corporate financial risk conduction and an important way.

1) Identification of the direction principle of risk conduction from the enterprise financial system.

Enterprise financial system, the direction of risk conduction theory, refers to the enterprise financial risk conduction has a clear direction and path dependence. For example, elaborated in enterprise funds raise risk of conduction between the risk conduction, enterprise long-term investment risk conduction,

conduction of enterprise liquidity risk, enterprise profit distribution risk conduction respective involves the risk of conduction as well as has obvious directivity and size dependent, and risk conduction according to business process chain.

And in the enterprise funds raise way conduction risk, project risk conduction, reserve fund management risk conduction, finished the fund management risk conduction respective involves risk conduction is according to the value chain, chain of interest, the capital supply chain direction and path of risk conduction.

From direction recognition principle of the risk conduction of enterprise financial system is from the influence of factors of macro environment and micro environment of factors analysis identify sources of risk, from the direction of the principle of risk conduction path, from the financial system of enterprise specific business gap identification risk transfer vector, in order to realize the control of financial system of enterprise risk conduction.

2) Identification of the time principle of risk conduction from the enterprise financial system

The financial system of enterprise risk conduction time principle is referring to the financial system of enterprise risk conduction in the conduction process, follow certain regularity in the time, the specific performance for the interval of risk conduction, continuous risk conduction, delay risk conduction and periodic risk conduction. For example, conduction of interest rate risk, exchange rate risk conduction with certain interval, which is because of interest rate and exchange rate by the influence of the objective environment, the interest rate, exchange rate rising or falling, but rising or falling after will be stable for a period of time, to belong to an interval of risk conduction. These changes in interest rates, exchange rate is the source of risk, and interest rates, exchange rate related interests of the chain, the value chain, capital supply chain is the path of risk transfer, a variety of credit business is the risk of conductive carriers. After identifying the elements of interest rate risk conduction and exchange rate risk conduction, and taking corresponding measures, we can effectively control the risk of conduction. However, this type of risk conduction after the regulation, can be stable for some time, the production and operation activities of enterprises may be relatively stable development. And credit risk conduction, market risk conduction, policy risk conduction of enterprise production and management activities influence, may is continuous and persistent, a full range of risk conduction, brought to the interests of the chain, the value chain of enterprise loss is serious. From time recognition principle of The risk conduction of enterprise financial system, because the risk source and risk conduction path, risk transfer vector with the complexity and diversity, which requires us in the process of recognition, identification method and means to have flexibility and pertinence.

3) Identifying the intensity principle of risk conduction from the enterprise financial system

Financial system of enterprise risk conduction intensity principle, is refers to the financial system of enterprise risk conduction in the conduction process, from the risk of risk of risk conduction path on each node of the incoming and outgoing is dynamic, specific recession risk conduction, stable risk conduction and enhancement of risk conduction, or from the degree of coupling and weak coupling, pure coupling and strong coupling. This situation, depending on the level of risk conduction path on each node capacity for internal control strength, risk threshold, from the financial system of enterprise risk conduction intensity recognition principle, mainly enterprise financial management to constantly improve its anti-risk ability, to resolve the risk, made the risk of the strong coupling, pure coupling to the weak coupling changes.

4) From the perspective of the mixed type principle of risk conduction of enterprise financial system

From the financial system of enterprise risk conduction hybrid identification principle is refers to the financial system of enterprise risk conduction of risk source, risk conduction path, risk conduction carrier identification, take the identification methods, means to diverse, comprehensive and overall, the specific situation specific analysis, so as to improve the recognition of pertinence and accuracy, improve the effectiveness of the financial system of enterprise risk conduction control.

3 Modern Identification Method of Risk Conduction of Enterprise Financial System

The modern identification method of risk conduction of enterprise financial system is shown in Figure 2.
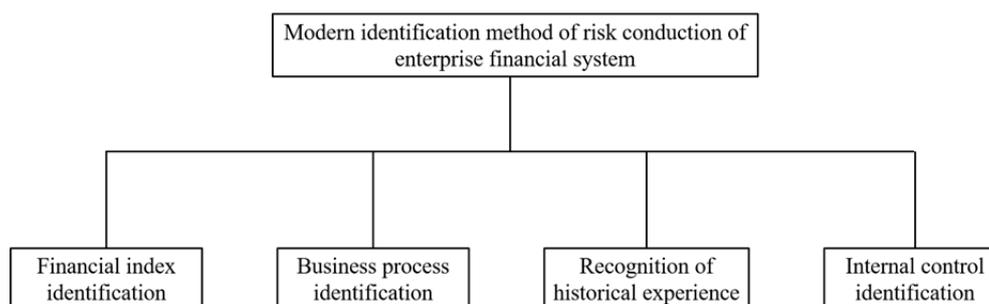
Figure 2   Modern Identification Method of Risk Conduction of Enterprise Financial System

3.1 Financial index identification method for risk conduction of enterprise financial system

In order to evaluate the business performance and the quality of financial status of the people, in practical work, summed up a lot of meaningful financial indicators mainly reflect the enterprise Solvency Index (current ratio, quick ratio, asset liability ratio), reflect the enterprise operation ability index (inventory turnover, accounts receivable turnover, working capital turnover rate, fixed capital turnover ratio, total asset turnover), profitability index (rate of return on assets, rate of return, net profit rate of sales, cost profit rate, profit rate, earnings per share), reflect the enterprise growth ability index (liquidity growth rate, the growth rate of fixed assets and the growth rate of total assets, sales revenue growth rate). By changes in the size of these financial indicators, analyze the influence degree of the macro factors and micro factors, we can reveal the degree of risk and risk source, risk conduction path and the risk of conduction carrier, providing the evidence for the prevention and control of financial system of enterprise risk conduction.

3.2 Business process identification method of risk conduction of enterprise financial system

The financial system of enterprise risk conduction business process identification method, is refers to the enterprise financial system fundraiser, long-term investment activities and distribution of profit, follow certain business processes. Therefore, the analysis of all aspects of the business process node, induce each link node risk factors to find out, business and management flow chart flow chart drawing, establishment of risk observation point and formulate related control measures and early warning criteria, you can effectively identify the source of risk, risk conduction path and the risk of conduction carrier.

3.3 The historical experience identification method of the risk conduction of enterprise financial system

Financial system of enterprise risk conduction the historical experience of the means of identification, is refers to the enterprise in the financial management practice of year after year, from the wealth of experience and many failures, discovery and the incentive for risk identification, so as to reveal the risk sources, risk conduction path and risk conduction carrier, to achieve the purpose of effective pre control of business financial system risk conduction.

3.4 Internal control identification method of risk conduction of enterprise financial system

The financial system of enterprise risk conduction internal control means of identification, is refers to the enterprise internal, through give full play to the wisdom and talent of the staff, mobilize their enthusiasm, regularly scheduled or unscheduled meetings, incentives for analysis and study of corporate financial system risk, identify potential risk and the stakeholders and experts (such as internal and external auditors) provide information to identify potential risks, to achieve the enterprise financial management and orderly, effective work management process to find sources of risk in the bud, to achieve the effective control of financial system of enterprise risk conduction.

4 Scientific Identification Method of Risk Conduction of Enterprise Financial System

The scientific identification method of risk conduction of enterprise financial system is shown in Figure 3.

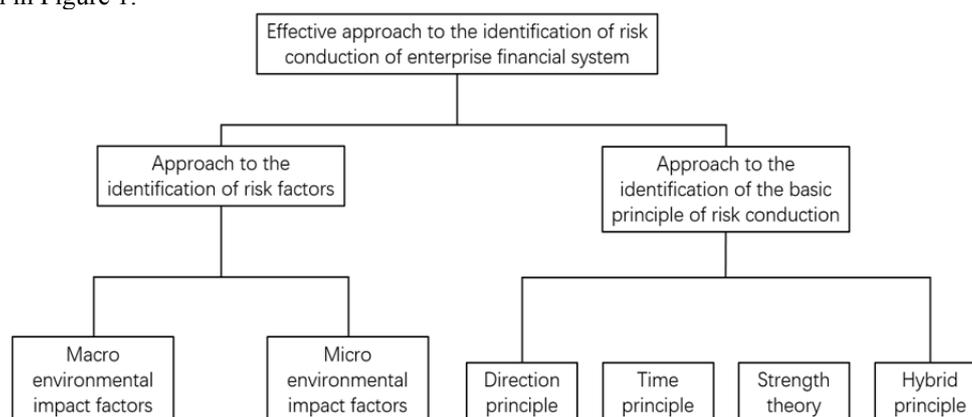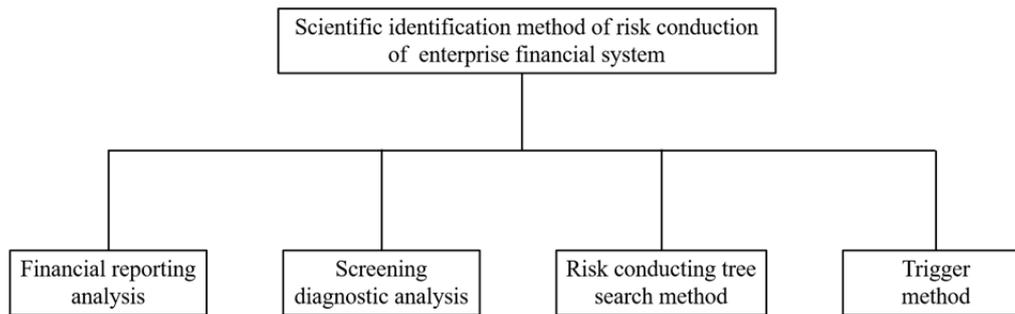Figure 3   The Scientific Identification Method of Risk Conduction of Enterprise Financial System

4.1 Financial report analysis method of risk conduction of enterprise financial system

The financial reports of the financial system of enterprise risk conduction analysis method, is through to the enterprise's financial report which reflects the enterprise's financial position and operating results of written documents, including static analysis and dynamic analysis of the main accounting statements, schedule, report notes and financial status of the instructions to find the financial system of enterprise risk conduction of risk source, risk conduction path and the risk of conduction carrier.

Static gap of financial reporting is to analyze the financial reports of enterprises in a certain period, including structure analysis and ratio analysis; dynamic analysis of financial report is to the several stages of enterprise's financial report according to the time sequence analysis, from the dynamic research enterprise financial characteristics and the change trend, including comparative analysis of accounting statements, comparative financial ratio analysis, trend analysis of the percentage of. Through these analyses to identify the reasons for the decline in performance, and to business as the main line to find the source of risk, risk conduction path and risk conduction carrier.

4.2 Screening and diagnosis analysis of risk conduction of enterprise financial system

Financial system of enterprise risk conduction screening diagnosis analysis method, is to classify the financial system of enterprise risk conduction, confirm what financial system of enterprise risk conduction is the dominant risk conduction, which is the potential risk of conduction, which is can eliminate the risk of conduction. Through the diagnosis analysis and screening, eliminate interference, to seize the main contradiction, concentrated effort to identify a dominant risk conduction of risk source, risk conduction path and the risk of conduction carrier, and the potential risk of conduction prevention and control, to avoid the internal and external environmental conditions trigger, so as to fully and systematically control financial system of enterprise risk conduction occurred.

4.3 Risk conducting tree searching method for risk conduction of enterprise financial system

Financial system of enterprise risk conduction of risk conduction tree search method, is the financial system of enterprise risk conduction be multi-layer decomposition, according to the logic of "the reason", from the final result of, looking for the reasons, which lead to the influencing factors of risk conduction of risk source, risk conduction path and the risk of conduction carrier. The intermediate layer is the result of the upper layer and the lower layer is the cause. Step by step pursue, until the original cause, the shape of tree like, so called risk conduction tree search method. Using this method can more clearly and accurately judge the financial system of enterprise risk conduction risk source, risk conduction path and logical relation of, thus easily and quickly take measures of prevention and control of financial system of enterprise risk conduction.

4.4 Trigger method for risk conduction of enterprise financial system

The trigger method of risk conduction of enterprise financial system is a method to identify and pay high attention to the potential risk of enterprise financial system. Risk of the enterprise finance system in the controllable range is enterprise financial system, risk pooled form of risk not more than the risk threshold, breakthrough risk source, there is a potential risk. A potential business financial system risk once triggered, break through the threshold will spread, spread, this case, it should be to potential risk for risk source, the potential risks of business risk conduction carrier, the potential risk of business process for risk transfer path accurately and rapidly recognition financial system of enterprise risk conduction to comprehensively and systematically control financial system of enterprise risk conduction.

5 Conclusions

The risk conduction identification of enterprise financial system is the premise of the prevention and control of risk conduction of enterprise financial system. For the control sources of risk of enterprise financial system, the risk transfer vector interception, cut the risk conduction, and explore a path to provide a guarantee. The risk conduction identification of enterprise financial system by effective identification ways, modern means of identification, scientific identification method constitutes a mesh layout recognition, the systematic, comprehensive and accurate recognition of risk conduction to become a reality.

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Research on Engineering Risks Aversion from the Perspective of Engineering Ethics

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Abstract: Engineering is a "double-edged sword". Apart from promoting human development, it has also brought about multiple problems and risks to the society. From the perspective of engineering ethics, the article aims to analyze the causes of engineering risks which mainly include the unpredictability of future, the lacked sense of responsibility among engineering participants and the divergence of risk perception. In order to avoid engineering risks in a comprehensive way, the article suggests three countermeasures which are namely cultivating the awareness of ethic and responsibility among engineers, establishing codes of engineering ethics by Association of Engineers and risk data bank, as well as safeguarding the public's rights to be informed in order to promote active participation.
Key words: Engineering risks; Engineering ethics; Awareness of responsibility; Green development

1 Introduction

Engineering activities are likely to stimulate social development. However, the subsequent accidents resulting from engineering risks also do harm to human beings. As a result, it is essential to study engineering risks from various perspectives. The first research on engineering risks in the light of engineering ethics originated in the United States, where Professor Paul Durbin (2013) contended that the quantitative method of "Cost-Benefit Analysis" ignored human values of equality and justice. Therefore, engineering must be included in the discourse system of engineering risks evaluation and research. Mike W Martin (2005), a famous expert in engineering ethics, also claimed that engineers are responsible for predicting engineering risks and minimizing it, and they should also safeguard the public interests by their sense of morality and responsibility. Scholars in Great Britain and Netherlands also made their contributions to the study of engineering ethics. Carohne Wllltheck (2012), a scholar from Great Britain, emphasized that in face of risks, engineers have the obligation to impeach the misbehaviors. Michael C. Loui (2014), a scholar from Netherlands, believed that "the studies on risks from the perspective of ethics are of great scarcity". All these embody the close attention of European and American scholars to engineering risks. China was comparatively lagged behind in the research of engineering ethics, but with the implementation of sustainable development and the conception of "Green development", engineering ethics have been laid more and more emphasis. Zhu Baowei, a Chinese scholar, argued that engineering risks can be avoided through dialogue and negotiation system, with an emphasis on "Ethics of the other". Professor Cao Nanyan contended that the security issues caused by engineering risks should be paid close attention, especially to the issues of who should be responsible, what environmental problems might it cause and how the evaluation should be implemented (Zhang Henli,2016). On the basis of the current researches in different countries, it is effective to analyze and avoid engineering risks from the perspective of engineering ethics. Therefore, this article aims to analyze the causes of engineering risks from the perspective of engineering ethics and to put forward suggestions to more effective risk aversion.

2 Analysis on the Causes of Engineering Risks

2.1 The Unpredictability of Future

Haris (2000), an American scholar contends that unpredictability is the major feature of risk. During any stage of a project, such as deciding, designing, implementing, using or after-sales service, engineering accidents may occur due to some unpredictable factors. For instance, during the using of planes, flight accidents caused by bird strike may take place. In China, the frequency of bird strike accidents is growing by year, which leads to enormous economic costs. (Table 1, 2) (Li Yuhong, 2011)

Table 1   Estimated Direct Maintenance Costs of Civil Aviation Caused by Bird Strike in China in 2008

Degree of damage	Times	The standard of loss （10,000 yuan per time）	Subtotal （10,000 yuan）	Total （10,000 yuan）
Serious damage	3	800	2400	
Moderate damage	51	40	2040	4500.8
Slight damage	7	0.8	60.8	

Table 2　Bird Strike Accidents of Civil Aviation in China from 2004 to 2008

| Year | The times of bird strike accidents | | | |
| | Total | | Airport bird defense area | |
	Accident	Accident proneness	Accident	Accident proneness
2004	119	27	8	3
2005	180	39	13	6
2006	227	44	13	1
2007	326	50	9	5
2008	432	46	42	2

According to the table, in 2008, the direct maintenance costs of civil aviation caused by bird strike in China reached 45,000,000 yuan. The number of bird strike accidents even increased rapid by year. The number of bird strike in 2008 was four times of the number in 2004. The flight of bird is an unpredictable factor. Although people can accurately predict and control the air route and speed of planes, the route of bird can never be determined. Therefore, accidents seem unavoidable. Although human beings can conduct the project to the best, the unpredictability of future will never be reduced. As a result, the unpredictability of future is the primary cause of engineering risks.

2.2 The lacked sense of responsibility among engineering participants

Charls E Halse, an American philosopher, claims that "all the topics about ethics are based on responsibility" (Mike W Martin, Roland Schinzinger, 2005). The cause of engineering risks is also inevitably associated with the lacked sense of responsibility among engineering participants. Engineer is the soul of a project, who is in charge of its design, operation, management and evaluation. IF an engineer is in lack of sense of responsibility and only concerned about his or her own benefits rather than the public security and welfare, this may certainly result in engineering risks. Apart from the engineers, the government official lack sense of responsibility, seek instant benefits and quick success, instead of focusing on the security and rationality of the project, this may also result in engineering risks. For example, the government of Yongning Village in Ningxia Province of China illegally occupied land and developed villa under the name of new rural construction. Consequently, the project benefiting the villagers turned out to be harmful to them. Eventually, the local residents made concerted efforts to prevent the construction of the villa, which forced the project to come to an end. As a result, the lacked sense of responsibility among engineering participants is another cause of engineering risks.

2.3 The divergence of risk perception of different subjects

Different subjects have divergent perception of engineering risks. Engineers evaluate risks from professional techniques, and they mainly focus on the extent to which the engineering risks are acceptable. Government managers consider engineering from the overall interests of the public. Compared to engineers and government managers, the public may seem not so "rational". A majority of the public only try to protect themselves from the risks. They may not accept the project only because of the substantial social or economic benefits it may bring about. For instance, in 2011, the government of Wuhan in Hubei Province of China intended to build a large substation in Hongshan district. The professional engineers had done a rigorous investigation. It was proved that the probability of the risk could be controlled within the acceptable range. But local residents believed that the substation will cause radiation which was harmful to health. So they resolutely resisted the substation building, eventually leading to the abortion of the project (He Jing, 2016). Obviously, divergent perceptions of engineering risks may lead to the conflict between various groups, which may finally result in engineering risks.

3 Analysis of the Countermeasures for Risk Aversion

3.1 Engineers should cultivate a strong awareness of ethics and responsibility

Engineers are the experts who have been trained with professional knowledge about a specialized domain. They play an indispensable role in a project. They should be responsible for the public and the society and promote public benefits within their professional field. If an engineer lacks sense of ethics and responsibility and is indifferent to his or her project and human society, it may lead to disastrous consequences. If a scientist or engineer specialized in studying cloning techniques conducts experiment about human cloning without caring about social ethics, the social ethics will fall into a mess. When an engineer is endowed with a strong awareness of ethics and responsibility, human health, security and welfare will be given the priority during engineering, which is essential for risk aversion. As a result, in

order to avoid engineering risks, it is urgent to cultivate a strong awareness of ethics and responsibility among engineers. In addition, engineers should also be drilled with a rigorous attitude toward work. During the engineering, engineers always need to make various choices when they should constantly keep rigorous. Otherwise, a wrong choice may cause enormous loss. The world-shocking explosion of the Challenger, a space shuttle, is a good case in point. Before the launching of the Challenger, an engineer had found that a circle to fix the assistant fuel compartment on the right was hardened. If the launching continued, the probability of failure was one in ten thousands. In the end, the engineers and decision-makers were convinced that the probability of failure was so scarce and continued the launching as planned. However, the space shuttle ended up exploding. If the engineers had been rigorous enough to make cautious decision rather than take their chance, the tragedy could have been avoided.

3.2 Association of Engineers should establish codes of engineering ethics and risk data bank

Human beings live in society and do various activities in the society. Human beings are connected with other social members and form a group. The same goes for engineers. In the year of 1884, the Institute of Electrical and Electronics Engineers of the US, the first professional association for engineers, was founded. Subsequently, the engineers around the world set up their own associations and made up their codes of engineering ethics. For instance, the German association of engineers carried out *Basic Principles of Engineering Ethics* in 2002. Association of engineers in Taiwan also set up "the Creed of Engineers" which denotes four major responsibilities. Codes of engineering ethics provide a certain standard for the professional practice of engineers, which plays a critical role in risk aversion. As for mainland China, the codes of engineering ethics are relatively lacked. In spite of the existence of association of engineer, there is no standardized code of engineering ethics. As a result, it is urgent for mainland China to set up those codes.

The codes of engineering ethics exert preventative effect on risk aversion. In order to avoid risk more effectively, engineering groups should also set up risk data bank besides coders of engineering ethics in order to better complete post-risk analysis and summary to avoid similar accident in the future. When building engineering risk data bank, the group should take into full consideration the experience of engineering practice and the accumulated material. Even if the engineers are fully experienced, they are not able to take part in every particular project. Hence, the groups of engineering should cooperate to set up an all-rounded risk data bank. The analysis and summary of previous accidence should be integrated with knowledge gained from practical experiences in order to avoid risks more effectively in the future.

3.3 The public should safeguard their right to be informed and take active and rational part in engineering

When it comes to engineering risk aversion, it is widely believed that this is only the task for engineers. However, in fact, the modern engineering is becoming increasingly complicated, which involves more diverse groups. The corresponding issues of accident and risk responsibilities assumption also become more sophisticated. These responsibilities should not only be assumed by engineers. Risk aversion is not only the duty of engineers and engineer groups, but also the responsibility of engineering technology users and the public.

On the one hand, the public should safeguard their rights to be informed about engineering risks. As engineering risks are social, the public who bear the risks should be given the rights to be informed and the rights of permission. The rights to be informed include two aspects: for one thing, risk information should be disclosed sufficiently. For another, the public bears the engineering risks voluntarily rather than being deceived or forced. The realization of the public rights to be informed can effectively avoid potential conflicts and risks. On the other hand, the public should be encouraged to participate. The public scientific literacy should be improved to ensure a scientific and rational perception of risks. The divergent perception is one of the major causes of engineering risks. Because of the lack of professional training, the public are not able to treat risk as rationally as engineers. In practice, the acceptability of risks may not be understood by the public, who may prevent the implementation of the project in a violent way. Therefore, in order to avoid risk effectively, the public should acquire more scientific knowledge and understanding of engineering risks. They should take active part in engineering, and negotiate in a more reasonable way rather making disturbance (Dai Liang, Shi Yumin, 2015).

4 Conclusions

Various factors, including the unpredictability of future, the lacked sense of responsibility among

engineering participants and the divergence of risk perception lead to engineering risks and accidents, which do great harm to human beings and impede social development. In order to avoid engineering risks more effectively, from the perspective of engineering ethics, this article suggests three countermeasures, namely cultivating the awareness of ethic and responsibility among engineers, establishing codes of engineering ethics by Association of Engineers and risk data bank, as well as safeguarding the public's rights to be informed in order to promote active participation. In the future, engineering risk avoidance from the perspective of engineering ethics will attract more attention and research around the world, especially in China. With the conception of "Green Development", engineering risk aversion in China will be more closely integrated with engineering ethics, as a result of which the "double-edge sword" of engineering will bring more benefits to human beings.

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Research on the Radar Transfer Path of Supply Chain Risk

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Abstract: Cooperation among node enterprises of supply chain makes supply chain risk (SCR) transferring easily, while study on the transfer path of SCR can be helpful to the effective management on SCR. Based on methods of theoretical analysis, the radar transfer path of SCR is interpreted in this paper. According to the transfer direction of SCR, two radar paths which are irradiation transfer of SCR and concentration transfer of SCR are concluded. Furthermore, the characteristics of every transfer path are deep explored correspondingly. Meanwhile, the energy measurement model of each radar transfer path is constructed. When crisis occurs, the risk source in the supply chain can be found easily along the risk transfer paths of supply chain.
Key words: SCR; Risk Transfer; Radar Transfer Paths; Risk Energy

1 Introduction

The relationship of agency by agreement in supply chain makes SCR exist inevitably. The independence of the enterprise legal person and increasing cooperation among the supply chain enterprises promote the risk transfer in the supply chain (CHOI,2005).

Researches on SCR transfer home and abroad mainly concern the following three aspects: the transfer mechanism of SCR (Guo-Ping Chen and Ying-Gui Qiu,2009;MA Li,Zhang Guang-ming and Li Ping,2007), the utility of SCR transfer(Denis R,2005) and the control of SCR transfer (Charles,2007;Ying-Gui Qiu,2010;Jae-Hun Kang,Yeong-Dae and Kim,2010), among which studies on supply chain management by applying the adaptive system theory are in the majority(Surya, Jamisonm and Anand,2007; Gonca Tuncel,2010). However, there are few researches studying the paths of SCR transfer and loss measurement of SCR. This paper attempts to construct an energy measurement model of SCR transfer by adopting some concepts in physics as reference, analyzes the different paths of SCR transfer and measure the risk energy of every path on the basis of the model, thus explore the evolution rule of the SCR transfer, hoping to provide some reference for the effective management of risk of the supply chain enterprises.

2 Radar Transfer of Transfer Path of Supply Chain Risk(TPSCR)

Every node enterprise is an integration of both risk receiver and risk sender just like a radar collecting risks and emitting risks at the same time. According to the two systems of both emitting risks and receiving risks, radar transfer of TPSCR can be divided into two types, namely irradiation transfer and concentration transfer just as embodied in figure 1.
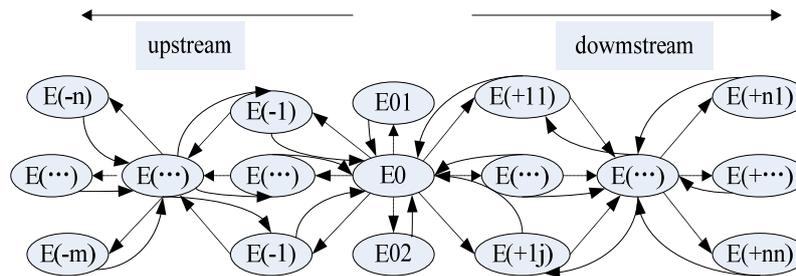
Figure 1   Radar Transfer of TPSCR

In figure 1, E0 means risk source, symbol "–" means the upstream enterprise of the risk source, symbol "+" means the downstream enterprise of the risk source. E01, E02 respectively refers to the node enterprises at the same level in the supply chain. Arrow refers to the transfer direction of risks. Dashed line refers to irradiation transfer and solid line refers to concentration transfer.

2.1 Irradiation transfer of TPSCR

Irradiation transfer means risk starts to diffuse synchronously from one node enterprise along the direction of downstream and upstream. On one hand, the risk sender may send out many risks

simultaneously and the different risks may transfer along different directions. On the other hand, even if the risk sender sends out only one kind of risk, this risk maybe release all the risk current at the same time, or it may release the risk current in turn along different directions. So the irradiation transfer of TPSCR can be further divided into two types, namely continuous transfer and pulse transfer. Continuous transfer means the risk sender releases all the risk current form all risks at the same time. However, pulse transfer means the risk sender releases all the risk current from all risks in a batch diffusion. Irradiation transfer of TPSCR is expressed just as the dashed arrow in figure 1.

In irradiation transfer of TPSCR, the transferred risk may be or not be the same risk. The beginning transfer time of every risk may be the same or different. Risk carrier in every transfer path may be the same or different. All secondary risks release risk current again in the way of irradiation. All these factors together with the impact of the irradiation transfer of risk source increase the complexity the transfer of SCR. The major characteristic of irradiation transfer of TPSCR is explained as the following. 1) Complexity. It is embodied from tree aspects. Firstly, one node enterprise is both the risk sender and risk receiver. Secondly, risks carrier and risk catalyst between two node enterprises may be different. Thirdly, the original risk may evoke other new risks, while the original one may or may not disappear. 2) Concentration. In the irradiation transfer of TPSCR , risk source is the core enterprise,emitting all the risk information. 3) Dynamics. On one hand, risk type may change during the process of risk transfer. On the other hand, SCRC (supply chain risk current) of the supply chain varies all the time during the process of transfer due to the reflectivity, absorptivity, and transmittance of every node enterprise and the risk current of themselves. 4) Snowball effect. Risk irradiation makes the original risks diffuse in a greater scope and the SCRC after diffusion will become bigger than before according to the measurement indexes of the energy of SCRC. Furthermore, original risks will induce new secondary risks, which will consequently produce bigger risk current. Then the snowball effect occurs.

Taking automobile industry in China as an example, in order to avoid risks, whole-car firm transfers' risks to its upstream suppliers of parts components and downstream distributors. When the whole-car firm declares its zero inventory management, the warehouse of parts components suppliers is full. Zero inventory decreases costs of the whole-car firm, but it makes the inventory of the parts components suppliers an irreversible cost. The substance of zero inventory of the whole-car firm is to avoid the risks from plan changing. On one hand, the whole-car firm requires the suppliers to improve safety stock rather than making a good plan by using the advantages of supply chain. In fact, a good plan can decrease product fluctuation, thus the integrated inventory. On the other hand, price of automobile decreases gradually year by year. Whole-car firm, in order to transfer the pressure of decreasing price to the suppliers of parts components, will require the suppliers to decrease the price of parts components every year, doubtlessly bringing a sever cost test to the suppliers of parts components. Meanwhile, by using the authority of agency as a decoy, the whole-car firm signs unequal contracts with the distributors, which include unreasonable high inventory and no mention of quit clause of the distributors, making the distributors lack of guarantee. Finally, the whole-car firm radiates all the risks to distributors and suppliers.

2.2 Concentration transfer of TPSCR
Different from irradiation transfer, concentration transfer of TPSCR means that risk currents from different types of risks or the same type of risks are concentrated on one node enterprise just as embodied by the solid line in figure 1.

Major features of concentration transfer are explained as the following. 1) Influence of external environment. External environment has a great influence on SCRC transfer. As node enterprise receives all the risks concentrated on it passively and all the risks received by the node enterprise come from the external environment rather than from the enterprise itself, concentration transfer of TPSCR is greatly influenced by the external environment. 2) Complexity of risk source. Risk sources of the concentration transfer of TPSCR may come from both the external or internal system of the supply chain. The complexity of the supply chain system determines the complexity of risk source checking during the process of concentration transfer. 3) Dynamics. The uncertainty of external environment and variation of risk transfer process make risk transfer vary all the time. For example, some node enterprises occupy great funds from both the downstream and upstream enterprises. Unstable financial situation will make the supply chain destroyed seriously. In this kind of financial risk, the catalyst of the risk is credit between node enterprises and the risk carrier is fund. Once one node enterprise encounters fund crisis, products from the upstream enterprise cannot be sent out timely. Then the production of the downstream enterprise will be influenced due to untimely input supply. Ultimately, it is possible to make the supply chain breakdown for the dis-junction of one link.

Taking the core enterprise of manufacture industry as an example, suppliers transfer risks to the manufacturers when supply fails, which will restrict the output of the manufacture's production. Delayed transfer of information between distributors and retailers leads to an inadequate communication between upstream and downstream enterprises and misunderstanding on commodity production and market demand, making the products of manufacturer not able to meet the market demand. Excess inventory brings the Bullwhip effect. Finally, risks are concentrated on the core enterprise.

2.3 The measurement of risk current in radar transfer of TPSCR

In radar transfer of TPSCR, original risks are concentrated on one node enterprise, so the $SCRC$ is determined by the original risks, which depends on both the types of the original risks and their risk currents (Qiu Yinggui, 2013).

1) The effect of original risk type on TPSCR

According to the probability of inducing new risks, original risks can be divided into three levels, namely low, middle and high. Two major indexes are referred to judge the classification: the probability of inducing new risk, expressed as P, and the induced risk current, expressed as RC_I, then which induced risk level the original risk belongs to is given as equation (1).

$$RC_E = p \times RC_I \qquad\qquad (1)$$

In equation (1), RC_E Evaluation of Risk Current）means the measured value of the induced risk current. Supposing that RC_{EL}、 RC_{EH} is respectively expressed as the low and high thresholds of the induced risks. Then the judgment standard is given as equation (2).

$$
\begin{aligned}
RC_E \prec RC_{EL} & \qquad ① \\
RC_{EL} \le RC_E \prec RC_{EH} & \qquad ② \\
RC_E \ge RC_{EH} & \qquad ③
\end{aligned}
\qquad\qquad (2)
$$

When the measured value of induced risk current satisfies inequality ① of equation (2), then the original risks can be viewed as low inducing risks. Similarly, if the measured value of induced risks current satisfies inequality ② of equation (2), then the original risks can be viewed as middle inducing risks. If the measured value of the induced risk current satisfies inequality ③ of equation (2), then original risks can be viewed as high inducing risks. Where, probability (P) can be gained from the empirical data.

2) The effect of original risk current on SCRC

The bigger the original risk current, the larger the released risk current to the supply chain, then the higher probability of crisis occurrence. Any supply chain has an endurance limit of risk current. When the risk current is close to the threshold, risk is inclined to become crisis. Subsequently, destruction occurs.

3 Conclusion and Further Study

Through judge TPSCR and evaluating the energy of SCR, risk source can be found and the value of SCRC can be measured to compare the measured value with the value of risk carrying capacity (RCC). When the measured value of SCRC is less than the value of RCC, the SCR can be controlled. When the measured value of SCRC is close to the value of RCC, the supply chain needs to release energy and crisis is occurring in it, or seriously it will disintegrate. It is urgent to adopt some countermeasures to control the risks to avoid the crisis. Further study will focus on the quantization of the three evaluating indexes, namely L^E, L^F, L^S.

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Research on Food Safety Supervision Mode Based on the Theory of Governance

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Abstract: Food safety has become a global livelihood problem, in order to solve this problem, people from all over the world are exploring the theory and methods of food safety management constantly. At the same time, using governance theory to solve the problem of social development, especially food safety related issues, has been the trend of the development of public management. In this paper, we clear the main problems facing the food safety supervision by sorting out the literature of China and other countries. At the same time, this paper constructs the basic framework of food safety supervision mode based on the governance theory, and based on this, some suggestions about government system reform, information technology application and the construction of legal system are given.
Key words: Food Safety; Governance Theory; Supervision Mode

1 Introduction

Food industry is the pillar of China's national economy, it is also the basic industry to protect people's livelihood, which related to the people's health and life safety. And, the frequent emergence of food safety issues, makes food safety gradually evolved from technical problems into economic problems, and even social problems while it causes widespread concern at China and abroad. In order to solve these problems, the state and society have made a lot of efforts. However, due to staggered problem, multiple interests and wide range of subject in food safety field, it makes food safety management, especially the regulatory work face various problems. In this case, how to solve the problem of food safety, especially food safety regulatory problems have become the focus of attention.

The Global Governance Council (1995) believes that governance is the sum of the various public and private institutions to manage their common affairs. The definition is clearly separate governance and rule, emphasize a kind of governance mode of management institutions or organizations and other social forces, involving multiple subjects.

Actually, food safety itself involves multiple subjects, and their interests are staggered. The governance theory involves multiple subjects and their interest too, which just fit the food safety situation. In addition, the application of governance theory to food safety field, can change the government's single role in the traditional food regulation. Based on governance theory, this study explores the food safety regulatory model, not only has the significance of the above, it also expands the pattern of food safety supervision.

2 Current Situation of Food Safety Supervision

An effective food safety regulatory system, not only can curb the frequent food safety incidents, but also can foster a good pattern of food safety. The research on food safety regulation in developed countries and China is both different and similar.

2.1 The same point in food safety regulation between developed countries and China

1)Foreign developed countries and China have a consistent view of the causes of food safety issues, and they all agree that food safety issues are closely related to the asymmetry of food information.

Hennessy scholar believes that the cause of food safety issues is the asymmetry of information (Hennessy, 1996). On the one hand, it will generate moral hazard, namely food raw materials suppliers or manufacturers deliberately reduce the quality, even shoddy, fake productions; on the other hand, it will lead to adverse selection. Actually, it is difficult for consumer to identify the quality of the food enterprises, so the enterprises which provide high quality food would be driven out of the market, or are forced to produce low quality food (Akerlof, 1970; Stiglitz and Weiss, 1981). At the same time, most researches in China believe that the information asymmetry in food market provide space and conditions for the implementation of stakeholder's opportunism behavior, and consumers often have a passive acceptance of food, resulting in many food safety problems (Wang Keshan ,2012).

2) Foreign developed countries and China both think that the perfect legal system is an important guarantee for food safety supervision.

The United States food safety regulatory focus on the construction of legal system. In 2011, the United States revised *The Federal Food Drug and Cosmetic Act*, and on the basis of it formed *Food Safety Modernization Act*, *Food Safety Modernization Act* and other related secondary laws form a complete and unified food safety supervision law (Chen Rongyi, 2011) Germany established and improved the legal system of food hygiene, and this legal system covers the whole food industry chain from production, sales to after sales supervision, mainly involves 4 areas: production system, market system, monitoring system, evaluation system, and ensure the safe operation of food market(Tian Cheng Gang ,2009); Japanese has two basic laws for food safety, they are *Food Hygiene Law* and *Food Safety Basic Law*, and they established the basic legal supervision framework of food safety (Sun Hangsheng,2006).

China also attaches great importance to legal construction of food safety. In 2009, China promulgated *Food Safety Law*. In June 2012, China published *Decision of the State Council on Strengthening the Work of Food Safety* (Zhang Fang, 2015). In addition, scholars are exploring actively in order to improve the legal system of food safety in China. Xu Jingbo (2013) hopes to improve food safety regulatory system through the formulation and revision of food safety related laws and regulations. Zhu Guangxin (2014) explained that punitive damages are a kind of special punishment system from the perspective of law, which breaks the monopoly of the state's right of punishment.

2.2 The differences between developed countries and China in the aspect of food safety regulation

1) The supervision model proposed by foreign scholars is more inclined to a cooperative model of governance, and China's food safety regulation is too single for relying on the government.

Henson (2001) proposed common governance model, that the collaboration of public and private sector can improve the efficiency of food safety management. Elodie (2012) construct a concept framework of food safety governance, and found that the common governance model has been gradually realized transformation from the traditional punishment oriented to modern prevention oriented.

Liu Peng (2010) believes that over reliance on administrative means of supervision has become one of the factors that restrict the performance of China's food safety regulatory. Liu Xiaofeng (2010) thinks that we are used to letting the government regulatory authorities ensure our food safety, which put the food production operators into a passive position.

2) Foreign scholars have already realized that food safety has multiple supervision subject, Chinese scholars also recognize that it is not enough for food safety supervision to rely on a single government, so they are also keen on studying other non-governmental entities in food safety supervision.
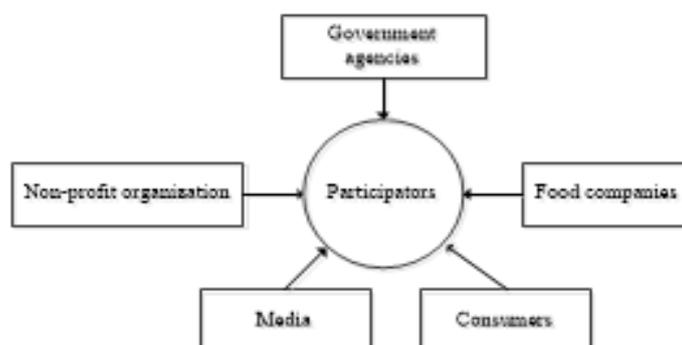
Figure 1   The Participator of Food Safety Supervision

In addition to government, enterprise, Wang Yafeng (2015) proposed that the subject of food safety supervision involves non-profit organizations and news media and other social forces. Chen Shihua (2011) believes that the regulation should pay attention to the participation of various mobile media. Zhu Dian take the consumer as the main participator, to explore the role of consumers in food safety supervision (Zhang Fang, 2013). This paper analyzes the participators that proposed by scholars, participation can be summed up as government agencies, food companies, consumers, the media, and non-profit organization, as shown in Figure 1.

3) Compared with developed countries, China's food safety supervision is not mature, in order to solve the food safety problem caused by information asymmetry, some scholars actively explore solutions that match with China's national conditions.

Information disclosure is an effective way to improve food safety, but it needs the help of other social forces (Gong Qiang, 2013). But the participators of food safety supervision lack effective

integration, lost their role, so that they misjudged their responsibilities (Ding Mingjie, 2009). Therefore, some scholars believe that strict traceability system should be established, which not only allow consumers to have intuitive understanding of food, but also can define the roles and responsibilities of participators, and help to improve the overall level of quality and safety of food industry (Shan Lijie, 2013). But this traceability system depends on the information system, therefore, Wang Hongchang advocated the combination of information technology and institutional arrangements to solve the problem of asymmetric information (Wang Hongchang, 2013). Say concretely: we can solve the problem of information distribution through institutional arrangements, use food safety information through information technology.

All in all, information asymmetry and the problem of food safety are closely related, and food safety information disclosure and related information technology support and system support are the key to solve the problem. However, the use of information technology depends on the system arrangement, while domestic system lacks of systematic research on food safety supervision, cannot integrate various social resources and realize dynamic supervision on food safety. And, it should be noted that the food safety regulatory requires the support of law system. So it is necessary to construct a new pattern of food safety supervision with the combination of information technology and system arrangement.

3 The Basic Framework of Food Safety Supervision Mode

Food safety supervision involves multiple participators which is a source of food information. The construction of the government system is the key to the distribution of information resources. Information technology is the guarantee of the normal operation of all parties. Therefore, this paper puts forward the basic framework of food safety supervision mode, such as 2.
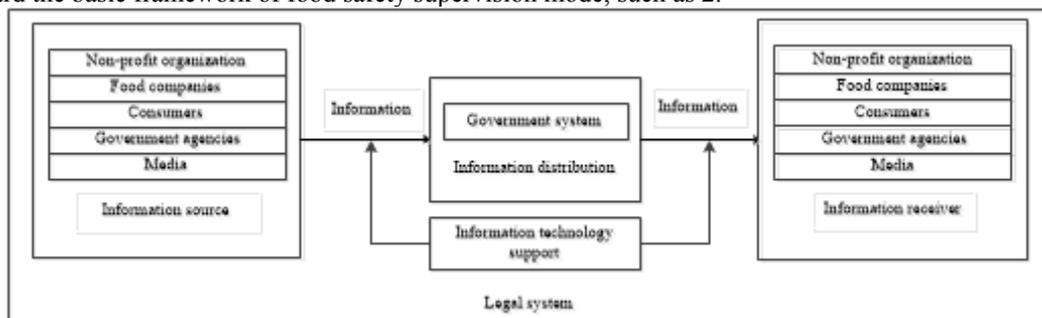
Figure 2   The Basic Framework of Food Safety Supervision Mode

1) The participants of food safety supervision are not only the provider of food information, but also the recipient of food information. The problem of food safety is due to the information asymmetry, so let the food information share between the participants, can avoid the opportunism behavior and adverse selection behavior.

2) Government system is key to the distribution of food information between participants. It can control the flow of food information, achieve maximum information sharing, so the reform of the government system plays a vital role.

3) Information technology support is the tool guarantee of food safety supervision. The characteristics of information technology makes the information flow fast and timely, so it can achieve dynamic supervision of food safety.

4) The legal system is the legal guarantee of food safety supervision. To establish a strict legal system of food safety, can implement the responsibility and role of participants. And appropriate penalties can increase the illegal costs of them.

4 Conclusions

Through the above analysis, we recognize that the government system reform, information technology, legal system plays important role in food safety supervision. On the basis of this, we put forward the following suggestions about system reform, application of information technology and construction of legal system.

1) The reform of the government system. We must adhere the leading role of government, and introduce other social subjects. In the process of regulation, government needs to make appropriate regulation and intervention, but this regulation and intervention has to listen to the voice of other

participants, to play the advantages and positive role of them. In this way, we can not only transfer the limited administrative capacity of the government from a large number of inefficient supervision to more meaningful services and management, but also improve the efficiency and social welfare of the food market.

2) The application of information technology. The government needs to ensure that the food safety information can be shared in time according to the relevant rules. So we need to build China's food safety information cloud computing platform, define standardized data structure and data interface, and achieve convenient data entry, storage and sharing.

3) The construction of legal system. Through legislation, we need to clear all participants of food supply chain and their legal responsibility of information collection, disclosure and sharing. At the same time, in order to ensure the authenticity of food safety information, the audit and inspection operation of food safety information should be standardized. Moreover, it should be clear that the corresponding punishment regulations is essential, which can increase the illegal cost.

Acknowledgement

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Owner-Managers and Risk Perception: Empirical Evidence from Cameroonian Small and Medium Enterprises

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Abstract: The aim of this study is to determine to which extent the characteristics of managers in SMEs influences the perception of risk of Cameroonian SME. A quantitative study was carried out by giving out a questionnaire to 86 managers of Cameroonian SMEs with a range of 50 and 500 employees. Based on our results, we found that the education level of owner-manager has a significant impact on the perception of risk and also the ownership structure of SMEs in the Cameroonian context has a correlation with the perception of risk of managers.
Key Words: Risk management; Owner-managers; Risk perception; Characteristics of managers; SMEs

1 Introduction

In the current economic context, a company is more obliged to take risks to dissociate from its competitors, and therefore adopting new strategies. It could either be a question of innovation or of entry into new markets. According to Barthélémy (2002), with the various risks which the company must face, managers are now obliged to integrate risk management in their corporate management. Moreover in doing so, they increase their competitiveness. Alquier and Lagasse (2006) proposed that risk management should be a concern for all companies especially SMEs which are particularly vulnerable to a plethora of business risks and competition. Risk management has as goal to create a reference framework for companies to effectively face risks and uncertainties. The risks are present in almost all economic and financial activities of companies. Thus, whatever the nature of a business project, the greater the degree of innovation that will be large compared to skills and experience of the company, the more they will be impressed of uncertainties. According to Schuyler (2001), the uncertain, which is the result of the unknown and the variability of the states of nature of materials and the human systems, is at the origin of several risks faced by the company. SMEs have an advantage over the larger companies because of the proximity of managers and their collaborators which do not imply a complex organization to control or direct very diverse or remote teams. This implies that the study of the profile of principal managers of SMEs and how their perception of risk has a strong impact on the strategic management of their company.

The purpose of this article to gain the understanding of the perception of owner-managers toward risks and to include or understand how the owner-managers face the situations that they consider being risky. This article attempts to identify the factors which influence the risk perception of the owner-managers of SMEs. We will focus first on the key actor of SMEs: the manager. We will try to determinate to which extent the entrepreneurial profile of the manager influences his perception of risk. Furthermore, we will test the links between various structural and contextual control variables (size and age of the company, ownership structure, perceived uncertainty of the environment and sector of activity) and risk perception. We will try in this article to answer the following question: Which criteria influence the risk perception of SMEs managers?

2 Definition of Small and Medium Enterprises

The definition of SME varies from one country to another and also according to organizations. In a general way, we can refer to the definition of Julien (1988) for which the small and medium-sized company is before a whole company's jurisdiction, if not financially independent, operating in primary sectors, manufacturing or servicing, and whose duties and responsibilities are incumbent often of a person usually sole owner of the capital. In America, it is a function of the number of employees. Thus, are considered as small businesses, the companies using 5 to 50 employees, whereas the Medium-sized companies are those who's maximum size is 500 employees (American business review, 2001). In the European Union, Small and medium-sized enterprise are defined like companies employing less than 250 people, with a sales turnover which does not exceed 50 million Euros, or which the total of the annual balance sheet does not exceed 43 million Euros (EC, 2003/361/EC, 2003).

In Cameroun, the definition of SME has known changes. Until a certain period, the most usual

definitions are that of FOGAPE (Fund for assistance and guarantee to SMEs), is deemed as a Cameroonian SMEs any individual or collective enterprise, whatever its legal form of which 51 % at least of the capital and the managers are Cameroonian; with sales turnover less than or equal to 1 billion Francs CFA (Article of the decree n° 84/510 of 13 June 1984 on the creation and organization of FOGAPE). In our work, a definition including several criteria will be retained. For our analysis, "Cameroonian SME is a company using completely or partly the Cameroonian capital, employing between 50 and 500 people, and having a share capital of fewer than one billion francs CFA". Those employing less than 10 people will be regarded as "very small company" according to National Institute of Statistics (2009) and will consider on a maximum workforce of 500 people as the ceiling to define SME (November, 2001).

3 The Typologies of the Owner-Managers

Since the work of Smith, his studies show a distinction of two main types i.e. craftsmen and opportunists (Getz and Petersen, 2005; Smith and Miner, 1983). Others will name the conservatives and entrepreneurs (Kotey and Meredith, 1997; Saddler-Smith et al, 2003).
One of the most outstanding typologies in the world of SMEs is that of Julien and Marchesnay (1996) that distinguish the "PIG" and "GAP" owner-managers:

PIG (perenniality, independence, growth)

It seeks stability and independence of its capital, the growth is secondary to him. Julien and Marchesnay (1996) qualify it "*risk averse*",

GAP (growth, autonomy, perenniality)

The GAP research in priority growth; Independence is relegated to the second plan; it is *a "risk taker"*. It is these typologies that explain and describe how SMEs are distinguished in their forms and their intensity in innovation, risk taking and search for opportunities, these various elements being the means used to put in action entrepreneurial profile in a strongly focus on growth and prosperity Sadler-Smith et al., (2003).

Despite the many limitations arising from the typological approaches Cadieux (2010), they still allow us to highlight various factors that may have an impact on how owner-managers of SMEs consider the growth, the risk, and even the performance of their company. Many typologies of managers were therefore established in the literature of management science Filion (2004).

4 Owner-Managers and Risk

Generally, in Small and Medium Enterprise (SME) the owner-managers are involved with the managerial tasks of the company and by this fact are sensitive to the consequences of decision-making. This, in turn, can reduce their capacity of risk taking. When risk aversion of managers is not any more to show; Fiegenbaum and Thomas (2004) reported that the managers are not always inclined to risk aversion and that they can be taking risks in certain contexts. This comes to show that the attitude towards the risk can change according to the context of the decision-making.

It should also be noted that the attitude towards risk and the capacity to identify it are conditioned by the global perception of risk. According to Siovic (2000), social, political and cultural factors play a significant role in the development of risk perception of an individual. For his part, Holton (2004) affirms that the perception of risk depends not only on personal characteristics but also of situational and contextual factors of each decision.

There is multiple evidence that the individual characteristics of SMEs owner-managers and SMEs ownership structure have a significant impact on the business direction of an organization as well as on risk management practices (Watson and Newby, 2005; Acar and Göc, 2011; Brustbauer, 2014; Gao et al., 2013; Georgousopoulou et al., 2014; Kim and Vonortas, 2014). The perception of risk and risk management in a small company cannot be separated from the personality of its owner-managers who is the key actor of SMEs. This allows us to formulate the following hypothesis:

H1: The entrepreneurial profile of SMEs managers is positively associated with risk perception;

The study by Acar and Göc (2011) proved that the risk perception is negatively associated with the risk appetite in health and finance, whereas the risk is positively linked with organizational size. Owner managers of SMEs in this study tend to have a higher perception of risks Acar and Göc (2011). From the study of Gilmore et al; (2004), the perception of running a larger company involves greater risk. Increasing the number of employees, for example, was linked with higher overheads. According to the finding of Gilmore et al., (2004), they showed that because their financial constraints, SME focus on the

marketing strategies which have lower risks rather than on the growth-oriented business strategies. Acar and Göc (2011) also showed that the characteristics of the industry are very important because unstable demand or rapid technological change can influence the individual risk perception. From all the above, we can formulate the following hypothesis:

H2: Perception of risk is positively associated with the characteristics of SMEs;

5 Research Methodology

A quantitative research design has been put into place to test the relationship between the profile of managers and their perception of risk and a data regression model was used to estimate the empirical relationship. To conduct our research process, we solicited 182 SMEs selected by random draw from a population and obtained 86 answers, that to say a rate of response is equal to 45 %.

The purpose of this study is to highlight the existence of a potential link between the factors of contingencies selected and risk perception within SMEs. To achieve this goal, we carried out a multivariate analysis. This analysis allows us to judge the effect different variables taken together. Take from the same model all contingency variables give a clear and more realistic vision between the factors taken into account and the attitude towards risk of owner-managers.

Since, the objective is to distinguish the variables which influence the attitude towards risk of the owner-managers, the variable to be explained is dichotomous: we use the method of binary logic. The qualitative dependent variable Y takes the value of 1 if the owner-managers of the company has a higher risk perception ($Y_i=1$) and value 0 otherwise ($Y_i=0$). The independent variables related to our study are defined by:

- Firm Size is measured by the number of employees;
- Previous experience is measured by the years of professional experience of managers;
- Level of Education, the educational attainment of the managers and measured by 5 items
- Ownership Structure is defined by two items family business and non-family business
- Perception of the environment is defined by the level of risk perceived and measured by 6 items (Likert 5-point scale)

6 Results of Analysis

6.1 Characteristics of SMEs in Cameroon

It arises from the descriptive statistical analysis that more than 68.6 % of companies have a staff of fewer than 100 employees. Only 10.5% have more than 250 employees. We also note that 64 % of the companies have more or less than 20 years old. This mean that following the economic crisis in the 80s, many companies were closed and it was after this crisis, that we were witnessing the reconstruction of the economy.

A reading of the ANOVA table provided by SPSS shows that the two most discriminating variables in the establishment of the proposed typology are the age of manager (F = 72.357; p=0,000) and education level (F = 49.750, p=0,000) of the manager. Then come the variables firm size and risk aversion, the previous experience of manager appears as having not any influence on the constitution of the classes. It is isolated from the descriptive of the identified profiles of managers. The classification of the profile manager in Cameroun realized by K-means cluster analysis gives us three types of the managers respectively containing 31, 41 and 14 managers.

The first group represents 36 % of the managers and is constituted for the majority of the young people whose age is less than 45 years with a higher training level and have a higher risk perception.

The second group consists of 48% of the managers thus the age varies between 45 to 65 years, this group has an education level not exceeding bachelor degree and having also a higher risk perception.

The third group represents 16% of the managers thus the age is more than 65 years, with a training level not exceeding the secondary and having a lower risk perception.

6.2 The entrepreneurial profile of SMEs managers with risk perception

The statistical model to process requires the independence of the behavioral variables between them. To verify this is the case, we initially tested the correlation between the variables taken two by two with a chi-square test. This test shows that only the variable "Education Level" must be considered in the binary logic.

Binary logistic regression analysis in which we crossed the risk perception of managers and level of education (as shown on table1), gives 0.619 the value of R-square Nagelkerke which means that the education level of managers in SMEs in Cameroon explains 61.9 % of the variance in the perception of

risk managers. The model seems compelling; the statistics (overall percentage) in the classification table indicate it is 79.1 %, which means that the model is true in 79.1 % of cases.

Table 1   Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	53.537(a)	.430	.619

The odds ratios show in the same direction the probability that the perception of risk by the manager increases by Exp (B) =35.402 each time the level of education increases by a slice. (Table2). In short, the relationship between the two involved variables in the presence is positive and significant with the threshold of 5%. In support of this, Alrashidi (2016) suggest that Managers' possessing higher levels of education adopted innovative management approaches and have a significant influence on the risk perception associated with exporting decision. However, our result does not confirm Petrakis (2005) study that better educated individuals are associated with a lower perception of risk.

Table 2   Variables in the Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1(a)	V2.edu.level	3.567	1.019	12.242	1	.000	35.402
	Constant	-7.068	2.124	11.071	1	.001	.001

6.3 The characteristics of SMEs with perception of risk

To verify the independence between structural variables, we initially tested the correlation between variables taken two by two with a chi-square test. This test shows that only the variable "sector of activity" should be excluded from the binary logistic.

Then, we checked the absence of a multi-collinear relationship between variables by calculating the VIF coefficient (variance inflation factor). High values of VIF indicate the presence of multi-collinear relationship. Bressoux (2008) indicate that we can speak of a multi-collinear relationship when FIV exceeds 5. The results presented in the table3 show that no multi-collinear relationship existing between the variables retained in our study because their VIF is close to 1.

Table 3   Collinearity Statistics

Variables		Tolerance	VIF
	Coefficients	0.928	1.078
	Size of company	0.970	1.031
	Main sector of activity	0.962	1.040
	Ownership Structure	0.963	1.038
	Perception of the environment	0.980	1.020

The logistic regression analysis by Forward Stepwise (Conditional) allows to test one by one the explanatory variables and to retain only in the equation the most significant variables. The result of our analysis gives us a Cox & Snell R Square 58 % and Nagelkerke R Square 83.6   % which means that the characteristics of SMEs explain 83.6 % the variance of risk perception of   managers.

Table 4   Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	47.420(a)	.469	.676
2	34.177(a)	.545	.785
3	27.149(b)	.580	.836

As shown in table 5 there is a strong correlation between the company size B= 2.124 and perception of risk of managers. Even the value of Wald = 5.214 confirms this hypothesis. This is explained by the fact that managers have a risk aversion and so, the main goal is the growth of their enterprise. This also confirms the study carry out by Acar and Göc (2011) which show that risk perception is positively linked with organizational size.

Likewise, there is a strong negative correlation between the structure of ownership B= -2.776 and risk perception of managers, this is explained by the fact that the majority of the ownership structure of our samples is constituted of 67.4% of the family business. We know that the owner's family managers

prefer to avoid risk, this is why business family grows faster than non-family companies.

Besides, the uncertainty perceived of the environment also shows a strong correlation with B=1.907 and encourages managers of SMEs to take the less risky situation for the survival of their companies. The result of that analysis lets us validate more or less our second hypothesis.

Table 5   Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step	V6.Employees	2.124	.930	5.214	1	.022	8.361
	V8.ownership	-2.776	1.133	6.003	1	.014	.062
	V9.Environment	1.907	.609	9.815	1	.002	6.735
	Constant	-4.231	2.350	3.241	1	.072	.015

7 Implications of the Study

The findings of this study, which present the relationship between the characteristics of owner-managers and risk perception contribute to the literature of risk management by a covering various set of small firms which although still relatively young. These characteristics of owner-managers play a significant role in risk management. Even, it is not yet clear from the literature how these characteristics affect risk perception of SMEs owner- managers. It is also expected to be beneficial for managers as well as to understand whether they are risk-taker or risk-averse managers in different domains. We hope that our study encourages SME manager to new experiences and increase the chance for their survival business, and consequently the economies of the nations.

Therefore, this topic needs to be investigated further in the future taking into account more characteristic of SMEs. And another research could also examine risk perception of SMEs owner-managers in different industries.

8 Conclusions

In this paper, we have investigated the relationship between the profile of SMEs manager and perception of risk. Although the research is limited by the small number of companies, our study suggests the following findings:

There is a positive and significant relation between the education level of managers and his perception of risk. The resulting model explained 61.9 % of the variance in the perception of risk by managers. It means that the education level of managers influences his perception of risk.

There is a strong correlation between the size of company characterized by the number of employees and perception of risk of managers.

The Ownership structure of companies is negatively associated with the perception of risk of managers and positively associated with the uncertainty perceived of the environment

In order to confirm the results found in this study, we suggest enlarging the number of companies in our sample and to include more variables in the model, so that we can have clear details of the links between the various factors which influence perception of risk managers in SMEs.

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Analysis on the Innovation of Modern Logistics Risk Prevention

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Abstract: Through reading the references, this article finds out that as a new form of logistics, modern logistics is a high risk industry that need to strengthen risk management and constantly improve the risk prevention capability of modern logistics. In this regard, based on modern logistics risk, this article discusses and analyzes the current situation of modern logistics risk prevention. Puts forward some innovative risk precaution measures to strengthen the logistics risk prevention and management of effective risk aversion.
Key words: Risk prevention; Modern logistics; Innovation research

1 Introduction

With the rapid development of social economy, the modern logistics is gradually rising, and develop into an independent industry, which has a great advantage in the market and profit. However, modern logistics, as a new type of integrated logistics, compared with the traditional logistics, its responsibility and risk is more obvious, and there is a whole process of logistics production, is a high risk of the industry. Modern logistics for customers to provide the most convenient, the most suitable, the most easy, the best logistics services, because too many aspects of the service, virtually increased risk of logistics. How to effectively identify the risk of each link and strengthen risk prevention is the key issue of logistics enterprises, it should strengthen the innovation of logistics risk identification in order to better prepare the risk prevention measures.

Practice shows that the logistics industry is a highly risky industry. In recent years, the research of logistics risk becomes an important topic of academic and industrial circles.

Foreign some scholars for the chilled food logistics in the presence of risk were studied put forward effective measures to decrease the chilled food logistics risk, some scholars studied waste stream of risk factors, to risk and waste materials recovery and treatment guiding policies were assessed, including dangerous goods transport, recycling and processing three aspects. Some foreign scholars have studied the political risk in the development of airport logistics center. The political risk factors were identified, and the risk was evaluated by using the analytic hierarchy process. And scholars have studied the problem of investment risk in chemical production logistics.

Domestic scholars in the logistics industry risk studies are rare, according to the relevant literature research, and the relevant research are: (1) the research on the industrial risk. Some scholars take the risk of high-tech industry as the research object, and study the risk factors, risk benefit mechanism and risk evaluation model of high and new technology industry. Some scholars have studied the real estate industry risk, Liu Ping (2006) based on the regional real estate development's own characteristic, has studied the regional real estate industry risk analysis and the prevention countermeasure. Some scholars based on the reasons for the growth of China's coal industry performance analysis, proposed the development of the coal industry, how to avoid risks. Soochow University Chao Chuan Yu professor (2012) in the research project, "Taiwan manufacturing industry risk index establish feasibility study" to need the requirements of practice and policy guidance, index establishment of feasibility analysis, established a set of industry risk measurement index and evaluation method, is intended to assess the risk of China's industry of the different industries, and confirm the important elements of the preparation of industrial risk index. (2) Research on the risk of logistics enterprises. Mainly concentrated in the following five aspects: Research on the risk of logistics process; the research of logistics enterprise risk management; the research of logistics enterprise business risk; research on logistics enterprise exchange rate or tax related risks; financial risks of enterprise logistics research. (3) Research on risk prevention. Wang Chuanxu (2003) put forward the third party logistics enterprise operation engineering in the existence of many uncertainties of risk factors, and put forward the risk prevention measures. Zhong Jing (2006) based on the characteristics of exchange rate risk, the system studies the risk prevention of foreign logistics enterprises.

2 The Current Situation of Modern Logistics Risk Prevention

Modern logistics risk diversification, and there is a risk of some yet to be discovered, resulting in modern logistics enterprises take greater risks, for their production and operation pose a threat, affecting the normal operation and management activities in an orderly way. In this regard, modern logistics enterprises should increase the risk recognition and take corresponding risk prevention measures, and to adequate professional staff management and control, as much as possible to reduce the risks to the minimum and ensure normal modern logistics service and guarantees the sustainable and stable development of the modern logistics enterprises. But at present, many modern logistics enterprise risk prevention awareness is not high and has not yet established scientific risk prevention idea, did not develop a risk monitoring mechanism etc., coupled with the lack of effective risk prevention means, resulting in modern logistics risk prevention work effect is not ideal. In this regard, we should strengthen the innovation of risk prevention of modern logistics, improve the ability of modern enterprise risk prevention.
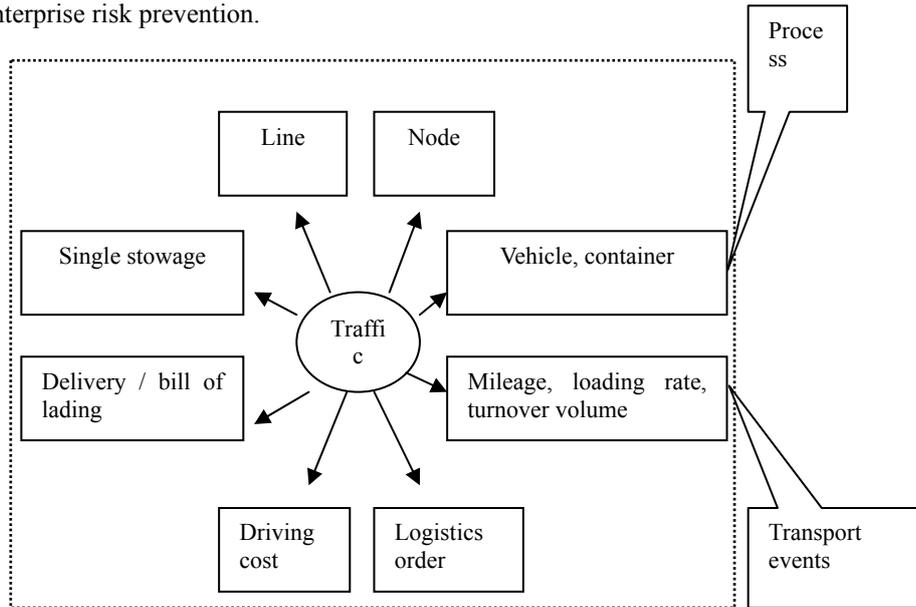
Figure 1   Simple Schematic Diagram of Enterprise Logistics

3 Research on the Innovation of Modern Logistics Risk Prevention

3.1 Risk prevention idea

For the modern logistics enterprises, opportunities and risks coexist, to the fierce market competition to win a certain advantage must pay attention to risk prevention, establish a correct concept of risk prevention to effectively carry out modern logistics risk prevention work (Liu Yongsheng, Yuan Wentao, 2013).

Establish a comprehensive concept. Part of the modern logistics enterprises in the business of blindly pursuing economic profits, is often the first business, will have a management program and the corresponding control methods, even in the presence of the risk before the development of risk management procedures, making each process of logistics services in more or less there are risks, unable to carry out effective risk pre control. In this regard, we should establish the overall concept, mainly includes two aspects: first, to ensure that the risk prevention cover all risks of modern logistics, including each kind of risk of the whole process, all kinds of risk has a special department, full-time staff responsible for; second, to ensure that risk prevention is able to effectively identify the logistics enterprises are facing all the risks (Wang Yanqiu, 2012). In order to achieve the above two points, the modern logistics enterprises must form a "risk first" concept, the modern logistics development in the former to develop risk management and control methods, and all risks which include, in order to realize effective control of all risk. Furthermore, it should establish risk identification information management system, establish an information management system by using advanced information technology, computer technology and so on, to modern logistics service project to conduct a comprehensive risk and understand the existing and potential risks and effectively identify the risk and

take the preventive measures to avoid risks.

Establish the systematic idea. Modern logistics by the production, transportation, packaging, warehousing, loading and unloading, distribution and other aspects of the composition, is a complex system engineering, which determines the risk prevention system. Effective risk management cannot be achieved through a single model, the model should include different subsystems, such as the production risk subsystem, transport risk subsystem, etc., by the subsystems constitute an organic system. So modern logistics enterprises to prevent the risk whether can achieve the desired effect, the key is to see the operation risk management system of each subsystem, which any one subsystem appear operational problems, may lead to the failure of the whole risk management system. Modern logistics enterprises shall establish a system of risk management philosophy, the establishment of a sound system of risk management system, and ensure the integrity of each subsystem and operation, in order to achieve good risk prevention effect.

Set up the idea of centralization and decentralization. In order to improve the effectiveness of modern logistics risk prevention, different types of risk should be responsible for different departments, and set up full-time personnel management, that is, decentralized management. At the same time, all departments should be responsible to the enterprise manager, that is, centralized management. The centralization and decentralization of risk management philosophy, the modern logistics enterprises are facing the risk of spread to various departments, each department can concentrate to control all kinds of risk, so it is convenient to control the risk, eliminate the risk and its adverse effects.

3.2 Innovation of risk prevention measures

Risk is different, the risk prevention measures should be different. Modern logistics enterprises in effective recognition on the basis of risk, the risk for different types of the corresponding risk control measures(Ouyang Fei,2013), to achieve the effective control of risk, for modern logistics enterprise to create a good business environment. Modern logistics enterprises in the risk prevention measures on the innovation, as follows:

3.2.1 The prevention measures of innovation contract responsibility

Logistics enterprises should make clear the strategic partnership between the sub-contractors and the information system providers, and establish a good relationship with them, so that it can help to prevent the risk of contract responsibility. In contract responsibility risk prevention can be used these measures: first, to establish a win-win concept, clear responsibilities of the parties, strengthen the degree of trust in the process of cooperation between the two sides; second, to establish a set of perfect open exchange mechanism, as far as possible to improve the information sharing degree, smooth exchange of information to avoid the information distortion phenomenon, so as to reduce risk; third, the establishment of cooperation mechanism. Based on mutual trust, the logistics enterprises and the sub-contractors and the information system providers establish a formal cooperation mechanism. In the process of cooperation, the two parties share the risk and share the benefits (Wang Wenjuan, 2009); fourth, strengthen the contract management. Logistics enterprises need to establish a set of analysis and evaluation system for the contract, accurately analyze the contract risk, and establish the corresponding warning mechanism and prevention system (Liu Li, Zhang Dong, 2011); fifth, establish credit evaluation mechanism. In the choice of cooperation objects, logistics enterprises should have a set of scientific and effective credit evaluation mechanism, and cooperation with the credit situation of enterprises. In order to ensure the accuracy of credit assessment results, validity, timeliness, logistics enterprises can in the internal organization set up a full-time departments or set up a full-time job, responsible for the collection, statistics, analysis the credit information of enterprises cooperation intention, to the evaluation of the object of service level, operation level etc. dynamic tracking and monitoring, in order to provide the basis for the credit evaluation.

3.2.2 The risk of innovation in the implementation process of preventive measures

The risk in the implementation process of modern logistics is inevitable, can only try to reduce the risk, avoid suffer huge economic losses. For such risks, modern logistics enterprises can set up the whole process of risk prevention and control system with to improve risk monitoring mechanism; dynamic tracking and monitoring throughout the implementation process control every aspect of the risk factors, to realize the effective control of risk. At the same time, the corresponding risk control measures for the implementation of various aspects of logistics risk control. For example, the risk of loading and unloading process, the main responsibility for the main body of the loading and unloading, to determine the loading and unloading of each loading and unloading personnel loading and unloading risks, once the risk and accountability of the responsible person.

3.2.3 The prevention measures of innovation and settlement risk

For modern logistics enterprises, the settlement risk not only affects the normal logistics services, but also endanger their own development, so we must attach great importance to the settlement risk prevention (Huang Shiquan, 2012). First, accounts receivable established beforehand, in the matter, after the risk control measures will be the extension of settlement risk prior to, not in credit conditions and to control the risk of, to the event, the risk control; second, reasonable preparation of capital plan, strengthen the management of cash flow and budgeting, eliminate the financial risk in the bud stage; third, build customer data files, carries on the appraisal according to the contents of the file of customer credit determined customer credit rating. The high credit rating of customers, and normal operation, have the ability to repay customers allows for greater credit amount. On the other hand, to control the amount of credit, in order to avoid large credit receivables, accounts receivable caused by poor management. For other risks, the modern logistics enterprises can be covered by comprehensive liability insurance, through the logistics insurance to minimize the loss of their own. China needs to further improve the laws and regulations related to logistics and insurance, so that the logistics insurance gradually standardized, legal system, improve the authority of the logistics insurance, more logistics companies are willing to insure logistics insurance.

4 Conclusions

To sum up, the whole process of modern logistics service exist all kinds of risks, such as contract liability risk, production risk, the risk of transportation service, handling risks and financial risks, and there are still many unknown risks, so logistics enterprises face a great risk of the industry. However, in the environment of market economy, every industry is facing opportunities and risks, the key depends on how to avoid risks and seize the opportunity. Therefore, the modern logistics enterprises should effectively identify the risk of every link in the process of modern production logistics and continue to increase and innovation risk management, improve the risk prevention capacity, defuse the crisis, seize the opportunities to develop,   create good conditions and environment for its development.

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The Logical Evolution from Management to Governance of Public Security in China

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Abstract: Public safety is a hot topic for a long time, from the sense of danger in peace time, to establish the concept of safe development and related theory of one after another, highlights the important status of public safety in our country. With the economic transition and social structure differentiation, the situation of our country's public security is becoming more and more complex, the risk is also more and more severe, urges the government to change from the management mode of "unit" to "multiple", in order to improve the ability and efficiency of the main body to prevent and respond to public security crisis. Through the history review of public safety management and the reality of the rise of governance, concluded that the system plays an important role in the management of the government model, which provides a theoretical basis for the institutional construction of public safety management in China.
Key words: Management; Government; Transformation; System

1 Introduction

As a subject of science, public security management is both a theoretical and practical question. The international recognition of it is the whole process about the maintenance of people' normal life and the industry state of order, the countermeasures taken when something that disorganizes the order happening, the elimination of the consequences and the recovery of the state of order. The essence of public security management is that the government take measures to maintain, protect and recover public security.

The concept of "governance" is derived from the west, United Nations Commission on economic and social affairs consider that good governance should include 8 main features ,they are participation, consensus, responsibility, transparency, response, effective and efficient, rule by law, and does not exclude any groups and individuals[1].

Participation	Consensus	Responsibility
Transparency	Main Features of Good Governance	Response
Effective and Efficient	Rule by Law	Fair and not Exclude

Figure 1　Eight Main Features of　Good Governance

Compared with the "society-centered" governance system of western developed countries, which mainly regard social self-government and community collaboration as the characteristics. The trace of management in our long-standing experience of subjective experiential, conceptual "government -centered" governance model is too obvious. "Governance" is a stable repeated measures and process of a country in response to its territory, people and various affairs in the different areas faced on both the challenges and crisis (Zhou Xueguang, 2014).The changes of The Times prompted the public security manager acting as the main body of the government will change the idea to reconstruct the relationship between the market and society, on the basis of actively draw on the successful management experience of western and combined with China's national conditions, forming a "public affairs public governance" mode：the government has the division of labor and cooperation with the society, Shared responsibility and Shared work, and public security stakeholders "public management of common governance" government model(Yan Jirong ,2012).

The forms of our country, and the resulting properties and the regime "the minority is subordinated

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[1] Economic and Social Commission, United Nation. What is Good Governance[R].
http://unescap.org/pdd/prs/ProjectActivities/ongoing/gg/governance.asp,23/10/2010

to the majority, the individual subordinated to the collective, the whole party subordinated to the central" are the principles of the public that lay the rationality in the process of safety management in the power of the government .With the development of economy and the deepening of the reform, market and social environment is becoming increasingly complex, based on the need of reality, government has Joined the social variable while continuing to improve the management mode of public safety. In the process of exploring and solving the defects of management, gradually transition to the logical context of governance, formed a reasonable management system for the management of the replacement model, and finally establish the government and social equality, cooperation, sharing of public safety management relations. Under the logic of the environment, it is necessary for us to do a simple comb of the history and the emerging managerial elements of public security management which is helpful to explore the inner mechanism of the transition of management to administration.

2 The Historical Logic of the Management of Public Security in China

With the deepening of globalization, countries around the world has increasingly frequent exchanges in such aspects as politics, economy, culture and so on, public safety has become the focus all over the world, especially the periodic cycle of the economic crisis and the frequent occurrence of terrorism, has encouraged countries to invest a lot of manpower and material resources to study and prevent the crisis of public security, trying to capture and master the commanding heights and discourse power in the field of public security research.

America is the first country which has measures on public security management. In the New Hampshire Fire Accident in 1803, American government offered aids for fire-stricken area, which started the first example to deal with public security crics. Compared with America, public security management began later. Although in Criminal Law, there are detailed provision about public security, but systemic/normative and particular law is lack. When government deals with security crics, they use more subjective will, experience and their own judgment. The typical example of this is that in the late of 1980s, our country mainly used "strike hard" or "control" movement to deal with it, lacking in systemic form and the concept of legality. With the development of reform and open up and the concept of managing state affairs according to law, public security management in China gradually walks on the way of institutionalization, diversity and standardization. From the perceptive of historical logic, the development of public security management can be divided into three periods.

2.1 Construction of traditional public safety management

Traditional public safety including natural disasters, social security incidents, disasters, accidents, public health events and so on, focus on the management of post-disaster and emergency and handle various events, such as the aforementioned "strike hard", "rectification" belong to this phase. The Party and the government played a decisive role in the traditional public safety management. Both in support and reconstruction of natural disasters and accidents, the safety or the protection of society, the public health event or investigation and prevention, the government has played an important role, as the Chinese sage Mencius said: "Mental laborers dominate others, manual laborers are dominated by others. Ruled feed others, rulers rely on others to feed." Although the position of division of labor is different, but as "Mental laborers" government is born to play a manager role, therefore, it is difficult to imagine that without participation of the government, public safety can be effectively managed. On the other hand, social security as traditional public administration objects to accept government administration, but also face the problem of self-reflection and survival. Since the government at this stage is the main way of thinking afterwards emergency management, advance warning is not enough awareness, lack of resources leads to social investment in the face of the public security crisis loss is too large, the high cost of relief, especially in the government lack the social security crisis under effective communication and understanding of the situation, and their experience will be top-down administration and often in sports management phase auxiliary to the crisis, "Diagnosis", will inevitably result in the abuse of administrative power and low management efficiency, its "Diagnosis and treatment" of natural results unsatisfactory. The social organizations and individuals are too dependent on the government in crisis, lacking of its own means and methods in crisis, but it's also an important reason that is difficult to improve for China's public security management.

2.2 Construction of public security management system

It mainly takes those caused by the large public safety emergency events and public security crisis as an opportunity to enact a series of laws, policies and regulations, promote the public safety management transferring the motion, dispersion, intermittent types of management trend to institutional

change. In the work of fighting against SARS in 2003, exposed a lot of related issues, such as poor information, information inaccuracy, emergency preparedness etc. For this purpose, the State Council formulated the Regulations on Preparedness for and Response to Emergent Public Health Hazards, it provides the powerful legal weapon to deal with the same type of emergency, and also establishes a unified, efficient, authoritative emergency disposal mechanism. After the Wenchuan earthquake in 2008, the National People's Congress had revised the Law of the People's Republic of China on Protecting Against and Mitigating Earthquake Disasters, gave a detailed description and arrangements for the earthquake prevention, rescue, reconstruction, supervision and responsibility, provided a clear legal basis for the scientific earthquake prevention and disaster reduction. What's more, in order to cope with the growing food safety crisis, especially the outbreak of the tainted milk powder incident in 2008 prompted our country in the start of the second years had passed the Food Safety Law of the People's Republic of China, in expected to solve the problem of food safety from the system. And in response to deal with large-scale social security incidents such as the frequent occurrence of mass incidents, our country also makes the corresponding formulation and revision of the "Law of the PRC on Public Security Administration", "The Fire Protection Law of the People's Republic of China", "Material Law of the People's Republic of China and "National Security Law of the People's Republic of China" and other relevant laws. The publishing of these laws and regulations, from the system level is very good to make up for the government in dealing with the public security crisis emergency mode and management methods, to standardize the behavior of the government improper administrative in effective at the same time and also provides the society its own means of crisis management, government and society can be legal, systematic and public safety management become more efficient.

2.3 Construction of the modern public security management

There are two aspects to reflect the modernity of modern public security management, on the one hand, securities of network and national sovereignty become a new social concern. On the other hand, with the differentiation of social structure and the development of Internet technology, social network independents of reality gradually, it almost becomes an entity which has the nature of the extensive social. Its independence has shown that occurrence and development of network security events is different from security incidents in traditional society. The characteristics of network, such as opening, interaction and penetration etc. make network of public security crisis broader, spread faster, transform events more complex, response emergency more difficult compared with social public security crisis. Therefore, government should deal with network security crisis using modern point of view, the government should also learn network knowledge actively, focus on the network dynamic and strengthen the network of supervision. Dealing with public opinion on the Internet and network security crisis, according to request of Xi Jinping by using "Six of timeliness". Besides, although the development of economic globalization becomes in-depth, national boundaries get fuzzy at the meantime. Developed countries with the strengths in economic and culture intervene the political and social culture of the developing countries, this makes outbreaks of sovereignty crisis in developing countries and it has a strong impact on public security and social stability. In the process of dealing with national sovereignty security crisis, the party and government should increase crisis warning to a strategic height. To divide the security boundary in form of law, remodeling ideology of country actively, efforting in improving the management level of the government and optimizing the abilities for country to deal with national sovereignty security crisis on the basis of referencing foreign advanced management techniques; The second is to make full use of institutional strengths and to turn the power of institution to the force of improving the present situation of the state and public security on the basis of establishing and perfecting relevant laws, which is the premise to establish modern management of public safety. During this process, the origin and the nature of state authority and derivative government's leadership and compulsive in the field of public safety which is not only the power basis of building government system, but also is the power source of system functions' role playing. As a result, the legitimacy and rationality of the government authority in relation to the rationality and legitimacy of related system is the key to the formation of the public security management environment.

3 The Reality Logic of the Rise of China's Public Security Governance

Management theory is the basis of public security governance. In recent years, the concept of "governance" frequently appear in academia, public security and policy areas and even in the discussion of practical departments, and make it a very hot topic in the theoretical significance. The third plenary session of the eighteenth "several major issue decisions of the Central of the Communist Party of China"

comprehensively deepen reform. Put forward the concept of "governance" at the national level for the first time and risen "National governance" to "the overall goal of comprehensively deepen reform" in the strategic height, highlight the practical significance of governance theory (Zhu Xiongwu,2010). Public security governance emphasizes the cooperation and negotiation between the public security and society. In general, governance is a process in which state and citizens through cooperation, negotiation, partnerships, to realize the interactive of public affairs management. Society changed from the consumers of public security products into producers and providers of public security products, together with the government to decide the type of public security product supply, the scope and the quantity of supply, improve the efficiency of the government public safety management to the greatest extent at the same time to increase the proportion of society in providing public security products. The rise of China's public security governance stems mainly from the following four aspects:

3.1 The gradual consummating of the market mechanism

As has pointed out at the Third Plenary Session of the 18th Central Committee of the CPC: "We should make the market play in allocating resources, thus playing a decisive role and better to the role of Government." "A decisive role" in which signifies the Government's determination to withdraw from the market, allowing markets to self-development and compete orderly, which also gives full play to market forces in allocating resources efficiently. Therefore, the Government has led the market competition mechanism in the supply of public security products, which greatly enriched the variety of the products while developing the quality of public security products, which increased room for Governments to choose the best public safety products, and created the conditions for the Government to reduce spending on public security. On the other hand, the gradual improvement of the market mechanism has promoted further restructuring and development of the economic, which has laid a good foundation for public security governance.

3.2 The gradual maturity of civil society

The rising of Western management theory derived from the development and maturity of civil society. Unlike that in West, the development of civil society in our country originated more from the cultivation and shaping that from the Party and the Government. Thus, the growth of our country's civil society mainly depends on the attitude of the Government. With the focus of the Government shifts to economic construction, the Government needs social organizations to share the task of developing economic, optimizing economic development environment and resolving social conflicts, which can accelerate the development of social organizations. The vigorous development of social organizations has provided a platform for which people can express their standardized, diversified demand intensively and orderly. This is not only advantageous to the communication and coordination between Social organizations and the Government on public security issues, which provide basis for reasonable decision-making of the Government, but also beneficial for public organizations to share some of the functions of public security from the Government, which can express the Government's pressure of public security. With the gradual maturity of the civil society, social organizations are capable of providing public security products different from those provided by the government. As for the product type, the government focuses on such macro aspects of public security events as prevention, rescue, supervision and responsibility, but social organizations can proceed with such micro aspects as disease prevention and control, psychological counseling and safety education and provide differentiated public security products, which is not only a powerful supplement to public security products of the government but also an inherent requirement of the promotion of fine public security governance and the construction of a public security government pattern featured with joint construction and sharing.

3.3 Significant improvement in public security awareness

Maslow, a famous American social psychologist, put forward the famous theory of hierarchy of needs in the book of Human Motivation Theory, which holds that people's demand from low to high is five levels (Lin Fang, 1987).

As the figure shows, human safety needs only after physiological needs, is one of the most basic, the most priority needs. In simple terms, apart from hunger, shelter, sex and other physical needs, nothing is more important than its own security. People will only seek after the three higher levels of need after meeting the physiological needs and safety requirements. Therefore, security requirement is the premise and foundation of all human needs, people can get Free and comprehensive development only in a safe environment. The rapid development of economy basically meets the physiological needs of the majority of the population, the problem of survival is not the topic that people care most about. People began to seek a higher level of need, they concerned much more with their own interests closely related to public safety. With the enhancement of independent consciousness and right consciousness,

People express their concern for public safety through various ways.
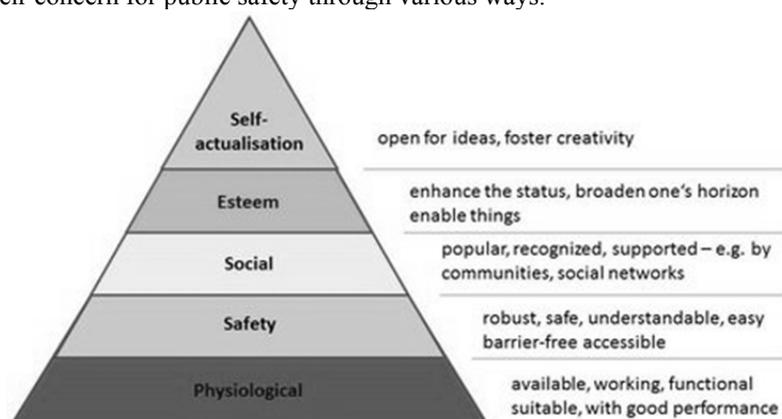
Figure 2   People's Five Levels Demand from Low to High from Maslow

Especially in the internet field, people discuss public security issues through interactions over the internet and gradually form online public opinions which further influence government behaviors. The government is also vigorously cultivating the public security awareness of the people while continuously enhancing its public security management level. To achieve these objectives, the government has been optimizing the public security education system, popularizing public security knowledge among the people and strengthening the efforts in promoting public security, etc. A rational public security governance network is also under active construction, to reduce the costs of public security products of the government.

3.4 The increasingly of social management problems

Our country is in the key period of economic transition and social structure transformation, social differentiation is intensifying, social contradictions presents the complexity, variability, diffusivity, violence and other characteristics, it has obviously increased the difficulty of social public security management. When facing the social contradictions and problems, government, the main body of social public security management, cannot protect the social public security with hysteretic management style and incomplete management system, the frequency of mass disturbance and emergencies has seriously affected the national security and social stability. On the other hand, economic development has extended the scope of public sphere,and then many new departments and fields has appeared. There are have more and more objects of social management, large and large control limit, and required higher standards about professionalization, normalize and refinement of management entity, and if government rely on superincumbent homocentric management mode, it will difficult to meet the requirement of social public security. Therefore, the government is pressing needs to introducing social entities to help governing public security together, and enhance their initiative, encourage them to provide refined and various pubic security's productions for society, eventually make a multi-governance pubic security management system.

In early 2015, Politburo of the CPC Central Committee approved " the outline of national security strategy", highlighting the significance of public safety management for our country's national security strategy, while the coming of the risk society goes beyond the traditional governance category and the concept of crisis management, prompting the shift from traditional "management" model to modern governance model based on the efficient coordination between government and society(Cao Huimin,2015).   In the new era, we should treat the new model" in the whole point of view, giving full play to the characteristics of "governance" coordination and high efficiency actively constructing and improving the management network system with the joint participation of multiple subjects. Timely and reasonably response to the crisis of public security.

4 Results and Discussion

According to the experience of the western, in the process of transforming from the public security management to public safety management, the system has played a decisive role. Compared with the government "rigid" management model, the right way to resolve the crisis is to bring the crisis of public security into to the framework of system. System is a sign of mature public security governance at the

same time, according to the theory of institutionalism, a system is a set of rules of social interaction in some way. as a result, the mature system of governance will change the new management innovation to the prevailing rule of the social interaction in the form of institution (Yan Jirong,2010). With the growing importance in the social interaction, public safety system has become the logical starting point of the change from safety management to governance. Form this concept, we can find the following governance "conversion" path.

4.1 The needs of internal reform

Viewing history of China's reform practice, in public security field, system of design, and produced and change, which implements organizational goal of the government on public safety management, demand on efficiency and order, are oriented toward Government. Therefore, system structure looks "rigid" more and "elastic" insufficient, especially as people lined with public security risk front line of public was not involved actively in constitution process, related legal, and regulations place more restriction rather than support on social, public identity degrees is not high, and legitimacy basis is absent. Therefore, Government has an urgent need to change the system-built process in response to growing public safety crisis. One important way is to combine Government's "political needs" for managing public safety with citizen's" social demand" on their own living conditions. in full respect for the basic needs of community, the government and people should achieve a high degree of agreement, making the public security law or regulations exist and continue. Society is not only to participant in the system design, production process, but also acts as system monitor who supervises the process, feedbacks its effectiveness and change outdated system. It is due to full participation that Government's" innovation" in management changes system into general roles of social interaction, and then, public safety transformation from management to governance becomes a possible thing.

4.2 The choice of external reality

There exists a matter of "heavy application, light management" in public security of our country (Wang Yingying, 2010). The scale of "management" main tends to the approach after public safety crisis and lacks prior warning ability. In addition, the development of economic and differentiation of social structure increase the depth and breadth of the government management, although some advantages for public security in data collection are brought, professional management technology are not supplemented. Therefore, government has limited public security data analysis and judgment ability, and cannot effectively deal with public security crisis. Overall social organization not only can use professional knowledge and scientific method of public security crisis to provide early warning and forecast, but also can provide opinions and suggestions for the government management from the perspective of professional, because of its professional staffing, professional technical ability and the advantages of the stable structure make, to make social organizations becomes the most ideal partner in the field of public security. To arouse the enthusiasm of social organizations involved in public safety management and carry out the principle of "public affairs in public management", the government should give some space for social organizations, release the affairs which government cannot or should not interfere to social organization, but only monitor their behavior with laws, regulations and other forms of social organization behavior regulation, and timely introduction of market competition mechanism, to further improve the efficiency of social organization and management, to promote the transition from the traditional public safety management to the government "at the helm" society "paddle" of the modern public security management.

On the other sides, professional division of labor lead to disadvantages like fragmentation of government departments, refined classification of labor division, department overstaffed and so on. Department barriers exist, the heavy lack of cooperative consciousness cause in each department's over concern about power and weaker responsibility consciousness. When public security crisis occurs between departments, shuffling and wrangling happens frequently which will seriously affect the efficiency of the government public safety emergency management. Social organizations can effectively reduce division of labor based on specialization, contribute the coordination of functions of related parties, turn the ideas of departments, eliminate the discrimination of areas, and attribute to common consciousness of departments by instituting public secure platform. Moreover, they govern public security together based on the target of fairness and effectiveness. What is more, compared with governance, the interaction between social organizations and people was more frequent and deeper and social organizations can provide public with differential, fine-tuning, individualized public secure products, increasing the options for public as well as contributing to the improvement and completeness of products by the governance. It can also large the kinds and enhance the quality of products.

Therefore, both positions in characteristics of society and the social organizational functions in

supply and demand in security management cannot be lack of the establish and fixation of relationship between government and the society, contributing to the regulations becoming the beginning of changes in common security from management to governance.

5 Conclusions

The change from management to governance was a history process. The revolution of concepts of government, establishment and completeness of regulations, the improvements of involvement concept are the indispensable factors. Public security management inevitable commons the motivation and capacity of turning to public security governance due to its public attribute. Therefore, we should build public security regulations from the point of government, regulations and society, improving national precaution and effectiveness of dealing with public security crisis. We also need to accomplish the empathize in 18 the fifth plenary session that "firmly building the concept of secure development, persistence in giving priority to public interest, completeness the public secure system". It can ensure national security and social stability, defending the security of lives and properties.

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Research on Institutional Innovation of Engineering Ethics Risk Control

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Abstract: This paper discusses the institutional innovation of engineering ethics risk control by the method of engineering ethics. The research argues that the government should innovate the decision institution of the project, the project supervision institution and the project evaluation institution from the dimension of ethics concern, and construct the institution of engineering ethics risk control. Finally, we conclude that the institutional innovation can control the engineering ethics risk to a certain extent, and reduce the negative impact of the project, so that the construction of the project will benefit the human being.
Key words: Government; Engineering ethics; Engineering risk; Institutional innovation

1 Introduction

With the development of science and technology, modern engineering construction has become more and more important in the society and environment. The modern engineering, which has a great engineering risk, bring an unexpected negative impact as well as it brings the great benefits to the people. Engineering risk refers to the sum of the factors which cannot be entirely eliminated by all human beings, while it may bring the loss and lead to the expected effect of the project cannot be achieved. The key problem that people pay close attention to is how to control engineering risk. People not only expect the "good project" which the quality of construction techniques can reach the standard, but also hope that the construction can be the "good project" guarantee human safety, health and well-being, which involve the risk control problem of engineering ethics.

As an important part of project management, risk management is the focus of domestic and foreign scholars. However, only a few scholars have studied engineering risk management from the perspective of ethics. For example, Pan Jianhong and Duan Jiwei discussed the role and function of engineers in controlling engineering ethics risk, and put forward the action strategy to carry out the ethical responsibility of engineers (Pan Jianhong, Duan Jiwei,2015). It has great significance for studying the role and countermeasures of the engineering community members in the control of engineering ethics risk. But there is no research on the role and countermeasure of the government in controlling engineering ethics risk as an important member of the engineering community.

The government, one of the members of the engineering community can reduce the risk of engineering ethics through the system innovation. China is a socialist country, and the investment, building and management of the national large-scale project are directly participated by the government. For instance, manned space engineering, large water conservancy projects and the building of large railway and highway are directly led by the government due to the large investment and the higher coefficient of technical difficulty. Although some of the smaller projects are not dominated by the government, it still needs to accept the government's supervision and assessment. If the decision-making, supervision and management of the project are lack of ethical concern, the harm to mankind may be immeasurable. Chinese government should reduce the risk of engineering by institutional innovation to make a better service for human being.

2 Improvement of the Engineering Decision-Making System

As engineering technology is becoming more and more complex, the scope of its influence is growing. Facing a mass of stakeholders and different kinds of interest requirements even including opposite aspects, we should make an important decision on how to make reasonable and efficient engineering decisions into consideration, meanwhile "Habermas's discourse ethics theory" (Song Xiren,2000) has an important reference function for innovating engineering decision-making system.

It can be divided into two main aspects: "internal negotiation" and "external negotiation", by which the discourse ethics theory is used to carry out the project decision-making. The "internal negotiations" means equal negotiation within the company before make the engineering decision, the participants

include engineering managers, engineers, technical experts and workers. A consensus can be reached by fully listening to their opinions of engineering decision-making and interest requirements.

The "external negotiation" refers to the social dimension of project decision-making which should take into account the views and interests of the community, and promote the participation of the social public. In order to achieve the accuracy and efficiency of the external negotiations, of course, there is unnecessary for all the public to participate in. In fact, that part of the public, as a stakeholder in the interests of engineering technology, is the one who should be involved in solving the problem.

The "external negotiation" of engineering decision-making needs to follow "Principle of Informed Consent". In 1964, "Principle of Informed Consent" was put forward for the first time in "Declaration of Helsinki" issued by World Medical Association, and originally used in medical ethics and bioethics. In medical ethics and bioethics, "Principle of Informed Consent" requires that "medical staffs or medical researchers, in the process of clinical diagnosis and treatment or involving in human medical experiments, need to inform patients or subjects related information for them to make decisions by their own" (Liu Yueshu,2013). The objective of "Principle of Informed Consent" is to protect the legitimate rights and interests of patients and subjects from more harm. In engineering ethics, similarly, we can take "Principle of Informed Consent" for reference to protect the stakeholders who may be damaged by the project risk.

Firstly, project stakeholders should be protected to have the right to know the engineering risk in abiding by "Principle of Informed Consent" in the engineering practice. Due to the sociality of the engineering risk, it is necessary to assure that everyone who is undergoing the engineering risk has the right to know. For the engineering stakeholders, the right should include two aspects: one is that the risk information is fully informed, and the other is that the one need to be willing to take the engineering risk rather than achieve the goal by means of deception or external force.

Secondly, some experts believe that "technical matters need knowledge about engineering, or belong to engineering ethics in particular for engineers to protect the public health and safety of the scope of ethics, the decision shall be made by the engineer or from the perspective of engineering"(Li Shixin ,2007)it should promote the public participation and improve public scientific literacy to make sure the scientificity and rationality of risk perception in public. The public cannot professionally and rationally internalize risk like an engineer because they did not receive professional training. In reality, there are usually some cases that the public prevent engineering implementation in a tough way due to the risk acceptability of the incomprehension. In order to avoid the engineering risk, the public in China should enhance the comprehension of scientific knowledge and engineering risk and actively participated in the engineering activities, and solve problems arising in engineering activities through the reasonable negotiation rather than the mob.

3 Improvement of the Engineering Supervision System

Engineering is for human service, and any project must be examined from the ethical perspective. Engineering ethics risk assessment is to assess the hazards that may be brought to human health, safety and well-being. Project risk is objective and universal. In the past, people paid more attention to the engineering technology risk assessment and prevention, which is essential. Because the ethical evaluation of the project and the ethical precautions have the characteristics of anticipation and overall situation, it has become the focus of attention by relevant scholars and engineering practice activities in recent years.

At present, China has basically established a supervision system concerning "Administrative department under the State Council is built to implement unified supervision and management of the engineering quality of the whole country" (Zhang Shisheng, Wu Xinhua, 2011). However, the government will encounter many difficulties on the supervision and management of these projects in the concrete engineering, however, because some large complex engineering projects, such as social public construction project, water conservancy project and railway engineering which involve many different main units of project, are closely related to the interests of the public.

In the engineering activities, the government's object of supervision and management is the members of engineering community which include the decision maker, organizer, designer, implementer of the engineering. Specifically speaking, the government, company and engineer are the members of engineering community. The supervision of the government in the engineering activities mainly refers to the self-disciplined activity that the government develops for its own project management system, supervision system and supervisors, and which can further improve the government supervision system

of the engineering, regulate the behavior of government supervision and achieve the effectiveness and efficiency of government engineering supervision.

Nowadays, Chinese government has strengthened the engineering supervision by the internal inspection of monitoring unit, the reform of supervision and regulation system and the construction of innovative professional supervision institution, but there are still some shortages in Chinese government's internal regulation. For one thing, there still exists the problem such as the position ambiguity of subject role and the decentralization of management function in the process of Chinese government's supervision. At present, different functional departments have their own agenda and low management efficiency within some regional governments in China, however, when such a supervision mechanism don′t run sluggish, it is pretty easy to result in the power dispersion and the lack of authority and leadership ability of the government in the process of engineering supervision, and even the frequent occurrence of corruption. "In 2008, for example, duty crime cases that investigated and dealt with by the national procuratorial organs in the field of engineering construction was more than 60 %"(Qiu Dingnan, 2012). For another, it needs to be improved on the information disclosure of the engineering supervision for the government. The public who is also the stakeholder of the engineering has the right to know the project which is closely related to the people′s lives, to some extent, while there has been so far existed lack of transparency on the investment and decision-making project by Chinese government. This phenomenon will cause the problems the public and society cannot supervise the government in the round, which has some effects to promote the government for a better supervision to a certain degree. In view of the above two aspects, Chinese government still needs to strengthen the internal supervision of the engineering, while it should ascertain the subject of government supervision though the further promotion of the reform of government supervision system, and realize the rapid transmission of information through strengthening the construction of electronic government affairs.

The supervision of the other community members of the engineering by the government mainly refers to audit and supervise these members: engineering contractors, suppliers of raw materials, engineering survey and design team, construction team, engineering management team and etc. So, it can effectively control the ethical risk and achieve the value in the project construction all over the country.

At present, Chinese government still has some problems in supervising the members of the engineering community as following. Firstly, lack of the effective engineering supervision system. Since the complexity and variety of engineering projects, the existing supervision system has the case of supervision invalidation frequently, and in reality, people's safety and health are seriously endangered by the usual occurrence of the misprision and tin pot projects. Secondly, Chinese engineering supervisors lack the professional and ethical quality. Nowadays, in the projects of China, "beat-head decision" of the government officials occurs frequently, while they depend on experience or without any meditation to make decisions which cause a huge waste of human and financial resources at last. Lastly, the accountability system of engineering decision supervision of Chinese government is not so perfect that the supervision function of the government will be greatly reduced if the responsible person can′t be found quickly and accurately as the engineering decision goes the wrong way. For these problems, Chinese government should quickly perfect its engineering supervision system, establish the social supervision mechanism of engineering, encourage the public to participate in it, and implement the accountability system of engineering, so that the government supervision is more effective in the project.

4 Improvement of the Engineering Evaluation System

If you want to build the engineering evaluation system that works for ethical evaluation, it is essential to establish ethical principles of the engineering risk assessment. Engineering ethical code can guide people to correctly evaluate engineering risks, and take timely remedial measures to effectively avoid engineering risk.

Martin, American engineering ethicists, once proposed: "Project is social experiment"(Mike W Martin, 2005). With the development of science and technology and the improvement of human dependence to science and technology and engineering, such as the "social experiment", if it is successful will effectively promote the development of human society, but if it fails, it will often result in casualties and death threats, even a serious threat to the public′s welfare, health and safety.

In modern society, it is fundamental principle for each country to develop laws and policies to ensure the legitimate rights and interests of citizens from abusing. Moreover, "Supreme Principle of

Life" and "Humanitarian Principles" are also the important principles that human beings in practice should follow, while it is the core of the social responsibility and engineering ethics of the engineering community to safeguard the human safety and the sustainable development of the nature.

Currently, there have been many professional associations of engineers listed the principle of protecting the public in the first place in developing the ethical code in the world. For example, "The engineers should put the public′s safety, health and welfare in the first place in performing their duties" was listed in the first position of many terms in the basic principles and employment rules of Canons of Ethics for Engineers in American National Association of Professional Engineers. "Accept the responsibility for making engineering decisions consistent with the public′s safety, health and welfare and timely reveal the factors that may endanger the public or the environment." was put in the first ethical code of Institute of Electrical and Electronics Engineers (IEEE). American Institute of Chemical Engineers also put "The public safety, health and welfare is the most important in performing their professional responsibilities, and protect the environment." in the first place of its ethical code. Thus, "Safeguard the public′s health, safety and welfare", as the primary ethical principle of the engineering safety assessment and the work of engineers and engineering community, has been worldwide recognized by the most association of engineers.

Reviewing China, however, "Chinese Engineer Creed" has been revised for the fourth time Chinese Institute of Engineers in Taipei in 1996, and place the social responsibility of engineers on the top of the creed, among which provides that engineers should "Abide by the laws and regulations, protect the public safety, promote the public welfare". Currently, the other continental engineers in China have not built the specialized professional ethical code of engineers, the sense of ethical responsibility of engineers is still relatively scarce. the professional ethical awareness of engineers is still in the stage of "Do the engineering better" rather than "Do the better engineering", Therefore, it is considerably necessary to establish the independent code of engineer′s professional ethics and determine "Safeguard the public′s health, safety and welfare" as the primary principle in China.

5 Conclusions

According to the ethical principles of engineering evaluation, the government, in addition to the quality evaluation system of engineering, should also develop an evaluation system to assess the social impact of engineering. The assessment of the social impact of engineering should include three aspects: economic impact assessment, ecological impact assessment and safety impact assessment. Economic impact assessment is whether the input-output ratio is high and whether the corresponding economic benefit can be brought about. Ecological impact assessment is used to evaluate the possible ecological damage caused by the engineering and ensure the sustainable development of ecosystems. Try to avoid the damage of the ecosystem by engineering activities and the engineering activities caused by ecological crisis. For example, because the Egypt government had not fully ecological impact assessment on the project Aswan High Dam, it brought the great damage of the local natural environment. Thus, we cannot ignore its impact on the ecological environment in a specific engineering activity, and should maintain the ecological balance to achieve harmonious development between man and nature. Safety in production is the top priority, although the impact factors caused by safety impact assessment and successful engineering construction are numerous. In order to successfully implement the project, it is necessary for man to make a safety assessment of the engineering. The safety assessment of the engineering must be carried out by the invited third independent sector, in case the formalism appears to lose the meaning of the safety assessment.

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Mitigating Real Estate Development Risk from Real Option Angle

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Abstract: This paper illustrates the real options that exist in real estate development projects. Real options analysis (ROA) is an important topic in real estate due to the nature of the development environment. Though developers currently make their decision using intuition and judgment, they actually mitigating real estate development risk from real option angle. Traditional options are introduced, along with key definitions, qualitative and quantitative analysis proposed. Real options analysis provides a framework for analyzing flexibility in development projects by taking into account a manager's ability to react to risk. It is a powerful tool for real options analysis in the field of real estate developing risk management.
Key words: Real estate; Real options analysis (ROA); Investment; Risk

1 Introduction

The uncertainty exists over the course of a property project. Uncertainty around a project's financial return (Per Geltner and Miller, 2007), Most real estate developer showed interest in real options tool, but they drag their feet due to the newness and complexity. However, real option analysis has become considerably popular among both practitioners and scholars (Krychowski and Quelin, 2010).There is plenty of literature using real options analysis to analyze the equilibrium behavior of property prices (Grenadier, 1996; Guthrie,2009a).Various studies have applied traditional option pricing models to empirical data such as land transactions (Quigg,1993), as well as general property transactions (Sing and Patel, 2001). Developers are aware of the many risks and uncertainties in real estate, and the various tools they have to mitigate them. They are also aware that traditional discount cash flow analysis does not directly account for the value of flexibility. When a developer initially conceives of a project, they actually accounts for the uncertainty in real estate development projects in the real options principal. He or she has a base set of assumptions upon which an expected financial return for that project is calculated. However, reality is sure to deviate from these assumptions, flexibility allows a developer to control risk. Each source of flexibility is, in technical terms, a "real option". An option is defined as the right, but not the obligation, to take some course of action in the future. They exist whenever two conditions are met: new information will arrive in the future; and the news will affect decisions when it arrives.

Real options are markedly different from financial options in that their value is based on a physical asset rather than a security such as a stock. Given the roots of real options in the financial theory, the most popular methods for real option analysis are derived from the case of financial options (Krychowski and Quelin, 2010). Real options and financial options share some terminology here:

1) A call option is the right but not the obligation to purchase an underlying asset for a predetermined price (the "strike" price).

2) A put option is the right but not the obligation to sell an underlying asset for a predetermined strike price.

3) An American option can be exercised on or before its maturity date.

4) A European option can only be exercised on its maturity date.

5) A compound option is an option on an option.

6) A rainbow option is any option that is exposed to more than one source of uncertainty.

Real option analysis method is superb valuation method, suitable for higher-risk assets. It explicitly evaluates the flexibility, options, and choices inherent in an asset and account for risk and uncertainty in ways that conventional appraisal method do not (Pomykacz, 2013). Based on the analysis, the projects with negative NPV of expected cash flows may be accepted, or delay investment until an expanded NPV under uncertainty (Trigeorgis, 2005).

2 An Example

A familiar example in real estate is a land option. A land option is a type of call option that is

commonly used in real estate. Though it can be structured in numerous ways, the basic land option provides a buyer with the right but not the obligation to purchase a piece of land at a given price (the strike price).The strike price is normally equal to the residual land value calculated for the proposed project. If the value of the land is equal to or greater than the strike price, the option is "in the money" and the developer will purchase the land. If not, the option is "out of the money" and the developer can walk away. The main value of the option is that it reduces the risk of the investment by providing the developer with time to gain more knowledge, thereby reducing uncertainty. The value of the option is positively correlated with the length of the option and the amount of uncertainty associated with the project.

When one looks closely at real estate development, it becomes evident that numerous real options exist. Following is a different scenario to real estate: The option to defer or expand a project (a call). Common examples are scaling a residential building down in size in order to save costs (often by switching from concrete or steel construction to a wood frame building). The option to abandon a project or scale the project back by selling a fraction of it (a put). An option to extend the life of a project (a call). An option to phase a project (a compound call). An option to switch between different modes of operation. For instance, consider an office building that can be converted to residential. Here the underlying asset is the value of the proposed residential project with the value of the office building (plus the construction or conversion cost) as the strike price. During the development, decision makers align their understanding of future opportunities, risks and objectives, so that they can coordinate their efforts and activities more easily (Amer et al., 2013).

3 Data and Methodology

Two methodologies are utilized in developer's attitude analyzing. One is quantitative analysis, the other is qualitative analysis.

3.1 Quantitative analysis

According to the National Bureau of Statistics, property prices in China's 70 major cities grew and down from different year, Data between 2010 to 2015 are collected.

The table bellow is National real estate market in China.

Table 1   National Real Estate Market in China

Year	National real estate development investment (100 million yuan)	Real estate construction area (10000 sq.m.)	Residential real estate new construction area (10000 sq.m.)	Development enterprises land acquisition (10000 sq.m.)	Residential property sales (10000 sq.m.)	GDP growth rate (%)
	①	②	③	④	⑤	⑥
2015	95979	735693	154454	22811	128495	6.9
2014	95036	726482	179592	33383	120649	7.4
2013	86013	665572	201208	38814	130551	7.67
2012	71804	573418	177334	35667	111304	7.65
2011	61740	508000	190100	41000	109900	9.3
2010	48267	405500	163800	41000	104300	10.45

Data source: National Bureau of Statistics of China

From data above,we calculate two ratios compared to the GDP growth rate.Residential real estate new construction area/Real estate   construction area,and Development enterprises land acquisition /Residential property sales.The two ratios could roughly   indicate the property developer's investment willingness.They will acquisition more parcels of land and more new properties were constructed when economy booming.

Table 2   Developer Investment Willingness and GDP

Year	Residential real estate new construction area/Real estate construction area (%)	Development enterprises land acquisition /Residential property sales(%)	GDP growth rate (%)
	③/②	④/⑤	⑥
2015	21	18	6.9
2014	25	28	7.4
2013	30	30	7.67
2012	31	32	7.65
2011	37	37	9.3
2010	40	39	10.45
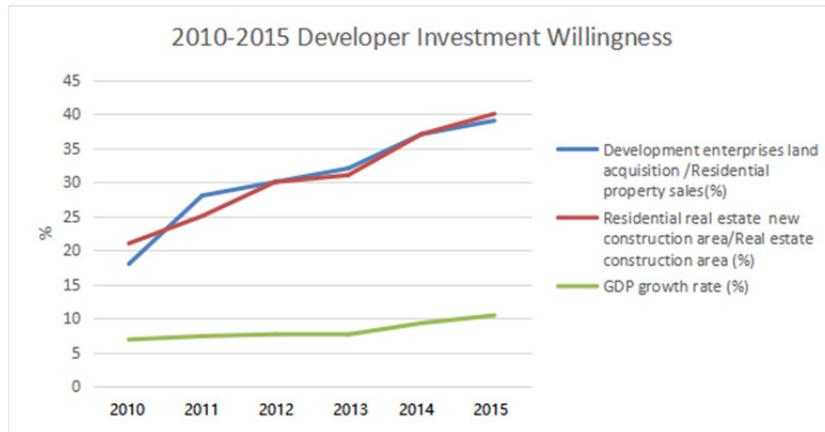
Figure 1   2010-2015 Developer Investment Willingness

3.2 Qualitative analysis

The fluctuations of real estate price affect the real economy at the complex market environment in China. Developers use different means to protect their own interests. By observed, three main developer's behaviors were generalized from news websites. The developers cope with risk though means below:

1) Developers "land" for long times without the development of idle land. Land is a vital social resource, the developers acquiring land for residential development. Lured by the rising land prices, they waiting instead of immediately constructing. There embedded a call option that developer can expand the project several years later, the call option could bring more profits.

2) A project to be phased development. Generally understood by the seasoned practitioner that development profit is always acquired from the rising property prices. When a large project is pushed to the market, the price is often guaranteed price, with the program was popular and successful, and price also started soaring. The next phrase's price to the market is generally higher than the previous phrase. So phrase development is a significant way to maximize the developer's benefit. There embedded a compound option that developer can action accurately on the basis of the former phrase sales results.

For the outskirts real estate project, due to the immature traffic facilities and surrounding environment, there is plenty of risk to developer. To ensure success,the developer phased the project. Then they generally gamble accordingly: transfer land, cooperate with other enterprises. This is a good way for some developers to mitigate developing risk.

3) Property hoarding. Newly built residential flats deliberately held back from the market may push prices high. Most buyers seek property for investment, self-use or retirement purposes. Despite recent fluctuations, most buyers believe that property prices will go up in the long run and real estate is still an ideal investment. On the other hand, the developer insists on a conservative way in selling a property, in order to get more profit. Developers hoarding properties to limit the housing supply in the market. Then property prices will gradually go up as the imbalance between supply and demand improves. Some popular projects increased their sale price by a considerable growth rate, as demand largely exceeds supply. For developers, there embedded a call option to sell higher price real estate.

Table 3   Customer Satisfaction

Scenarios	Next action	Option
"land" without development	drive prices up	call
be phased development	transfer land/cooperate with others	compound
property hoarding	Sell properties more expensive	call

4 Results and Discuss

By summarizing developer invest behavior, we hope to overcome the barriers that currently exist in applying real options analysis (ROA) to real estate development, and help developers better understand the real options investment method. The real options actually exist in real estate development projects from the above analysis. Developers widely used real options analysis (ROA) with no conscious. They use different real options to avoid probably loss, mitigate risk, and gain more profits. Developer choose

their behavior on different economic environment. They use a call option to expand the project some period of time later, use a compound option to transfer investment decision and so on.

We didn't cover the issue that how to value the option. The two most common methods of valuing financial options are the Black-Scholes model and the binomial option pricing model.

5 Conclusions

We learned that a developer's job is to assess and mitigate risk. We also learned that developers implicitly value real options via intuition and judgment by adjusting the hurdle rates or return requirements for any given project. The thesis facilitated the real estate industry's adoption of real options analysis by providing a simple and transparent phenomenon and data that not only serves as a proof of concept for real options analysis, but values the relative risks and returns associated with the real options that developers commonly face in practice. By providing an easy-to-use principal of options in a project, developers will assess the risks and returns better. The frame work should not be used as a prototype due to the simplifications we made. However, it does serve as a proof of concept for the use of real options analysis for real estate development projects.

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Research on the Formation Mechanism of Food Safety Risks from the Perspective of Food Chain and Game Theory

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Abstract: Food security, as a basic livelihood issues, is an important indicator of people's lives to measure the quality of a country. In this paper, the perspective of research focusing on food chain, we present that the interests of the game and information asymmetry are the major trigger factor to the formation of risk, and build the relation diagram of "subject risk" for food security. Then we analyze the formation mechanism of food safety risk based on the production-supply-distribution, government, social supervision and consumption. Therefore, we regard that the government should coordinate and interact with other subjects as the main food safety regulator, and reduce information asymmetry and interests of the game between the constituent subjects through the development of relevant mechanisms and public policy, thus effectively reducing food safety risks.
Key words: Food safety; Food chain; Interests of the game; Subject risk

1 Introduction

Food security, as a basic livelihood issues, is an important indicator of people's lives to measure the quality of a country. In recent years, melamine, clenbuterol, plasticizing agent, and other unsafe factor for food has occurred frequently, which is a serious threat to the health and safety of people. The broad social impact not only damage reputation of the food enterprises, but also is a fatal blow to the entire food industry, and meanwhile the country's image will be also severely affected.

At present, there are still some food safety problems to be solved in China, involving food safety supervision mechanism, laws, regulations, policies, standards, and monitoring and evaluation, inspection and other aspects. These problems mainly display in that the level of industrialization and integration is not high in food industry, the scale is not large and the foundation is weak, the responsibility of business entity is insufficient, the investment of quality and safety control is low, management is not strong and moral integrity and system construction industry lags behind. The FSO (food safety objective) articulates the joint target of a food chain, including all relevant links in that chain, and is common to all other food chains relevant to a pathogen/commodity combination (G.M. Gorris, 2005). Governments can do a better job on the food safety management by revealing the quality and safety information, reducing information asymmetry and providing behavioral incentives (Zhou and Yang, 2002). Zhou and Geng (2002) recommended that traceability systems could be used to control and manage food safety issues. There was growing interest in co-regulation of food safety with public and private sectors working hand-in-hand to deliver safer food at lower (regulatory) cost (Martinez et al., 2006). There is a need for early identification of emerging food safety issues in order to prevent them from developing into health risks. Marvin et al. (2008) proposed a four-step procedure for the early identification of emerging issues. A conceptual framework of enforcement of food safety regulation was developed to assess the degree of shift toward co-regulation from traditional approaches (Rouvière and Caswell, 2012). Jia and Jukes (2013) studied five components of Chinese food safety control system and they thought what need to be improved were as follows: legal requirements, food control management, punishment, and access to information. There are some other scholars also believe that it is needed to build a food regulatory model contains multiple supervision bodies (Tan Defan2011;Li Jing, Chen Yongjie,2013).

In this paper, we focus on the formation mechanism of food safety risks. Based on analyzing the food factors (Section 2), we discuss the formation mechanism from production-supply-distribution,

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government, social supervision, consumption and non-subjective risk triggering in Section 3. Finally, the paper will be summarized in Section 4.

2 Game Subjects in Food Chain

"The People's Republic of China Food Safety Law" defines food safety as "non-toxic, harmless food, conform to proper nutritive requirements of human health, cause no acute, subacute or chronic hazards." Food security does not only have a connection with food science technical level, the formulation of laws and regulations related to food, but is more influenced by food employees' ethical, the level of consumer awareness about food safety and the capacity of government regulation on food supply chain. In this paper, food safety risk is defined as "food safety factors leading to the possibility of loss of public health and sustainable development of the industry, government credibility, the country's image." Among them, the risk caused by the interests of the game and information asymmetry which triggered by the relevant subjects (enterprises, government, social forces, consumer) is called "subject risk", and risk of non-human factors is called "non-subjective risk."

"Food from farm to table" experiences the production, testing, transportation, marketing and other aspects. Related subjects of all aspects including food production, food supply food logistics and other related food companies, forming a complete food supply chain, added to the ultimate consumer, these constitute a food production, supply and consumption network systems. In addition, in the circulation of food, the government and public oversight power also play an important role. Formation of food safety risk is the result of its various circulation factors working together, which has complex and comprehensive features. Under the interaction of interests of the game among parties, information asymmetry and other factors, the subject take wrong behavior in some aspects, it is possible to produce food safety risk, these related subjects will be the main factors of food safety risks.

From food production and processing, food transportation and sales to government regulators, social supervision forces, and ultimately to consumers, relevant subjects play different roles in ensuring food safety. However, with the environment that the law is not perfect and a serious lack of ethics, some roles are prone to problems and triggered by factors, such as the interests of the game and information asymmetry in some external factors, which will form a "food safety subject risk". (Fig.1)
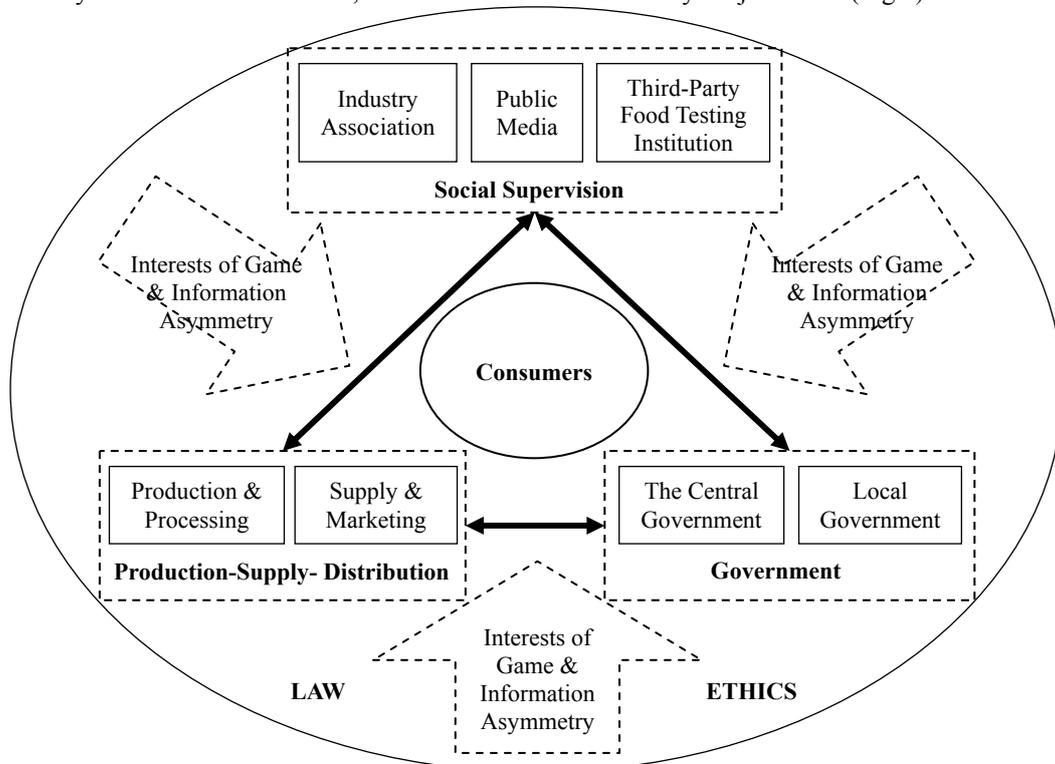
Figure 1   The Relation Diagram of "Subject Risk" for Food Security

3 The Formation Mechanism of Food Safety Risks
3.1 Production-supply-distribution

In the circulation of increasingly complex situation, a perfect internal control system is directly related to whether food enterprises can effectively avoid food safety risk or not. Internal control includes the environmental control, risk assessment, enterprise activities control, information dissemination and communication, monitoring and feedback, running any module loophole could trigger food safety risks. Any modules fail could cause the food safety risk. (Fig.2)
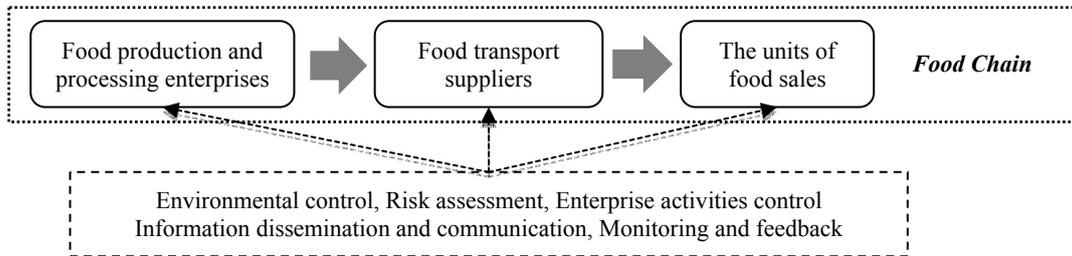
Figure 2   Sources of Risk Within the Food Enterprises

Food production and processing. In reality, farmers tend to invest more pesticides and fertilizers to pursue production and achieve maximum benefit. Agricultural planting and breeding are influenced by pesticides, chemical fertilizers, waste gas, waste water and solid waste. And when people eat these contaminated products, it will produce not only direct health hazards, but also cause an increase in food-borne illness. Thus, at the source of the food supply chain, the extensive uses of chemicals and biological agents bring great risks to food safety. This kind of chemical and biological food contamination often has experienced long-term accumulation in the food chain, and its harm to the health of people tend to be found in a long time after that, and it brings challenges to food safety evaluation. In addition, enterprises tend to extend the shelf life of food, even illegally use food additives in order to meet market needs in food processing. To some extent, these lead to the food safety risk. At the same time, employee's self-awareness and knowledge of risk prevention is weak, which often lead to illegal operations, resulting in food safety risks.

Food transportation and sales. Food is also at risk in the process of transportation and sales. During the food transport, food secondary pollution may occur, due to the packaging, storage, transportation and other facilities are backward and poor management. In addition, in the area where operation order is substandard and regulatory exists loopholes, selling inferior products is very common, resulting in risks in marketing chain. Currently, there is no perfect food market credit mechanism in China. Driven by the profit maximization, food companies would provide information to their advantage by using their information advantages. On the other hand, the cost for consumers getting food quality information is high, and consumers are always at a disadvantage on the right to know and option. It is difficult to judge the food safety for consumers, which easily trigger food safety risks.

3.2 Government

The government has played a single regulatory role for a long time in food safety management in China. The government is the "monopoly" in food safety supervision system. Excessive government intervention in food safety supervision, ignoring the market's own regulatory regulation. (Fig.3)
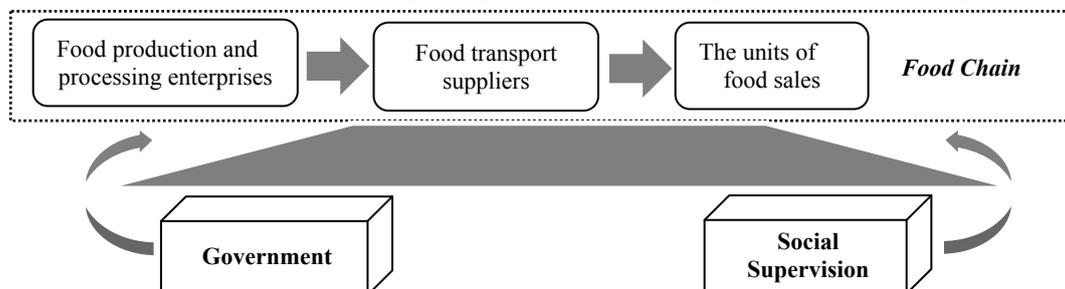
Figure 3   The Model of Food Safety Risks Formation Mechanism in Food Chain Perspective

Government lack of approaches of effective messaging and collaboration with enterprises, social forces and consumers. Regulatory focus is not prominent, resulting in regulatory power cannot function

effectively and induce food safety risks. In a single regulatory system, local government's regulation is often based on local interests, so that the government perform their duties negatively in the regulatory process, and even appear the phenomenon of business-government collusion.

In addition, Chinese government's division of regulatory are based on food chain, and there often will be regulatory gaps at the junction of the food chain. Food safety incidents often occur at this stage. government regulatory department for food safety take sub-management, and there are a number of chain of custody, resulting in multiple management, it is difficult to achieve management integration; the status quo of unclear functions and responsibilities between different departments, causes scattered power regulation; At the same time, the lack of information-sharing mechanism between departments with serious phenomenon of hitchhiking, slacking and prevarication, severely reduce the efficiency of supervision. Existing regulations do not establish a sound food safety information disclosure mechanism. In the collaborative linkage of government, enterprises, social forces and consumers, different actors unable to achieve two-way transmission of information. The government is in the "islands of information", which is likely to induce the regulatory risks.

3.3 Social supervision

Food safety social supervision system is a system which use social force independent from government and the relevant functional departments to supervise food safety , including its main food industry associations, the media, the third-party food testing agencies and so on. (Fig.3)

The legislation of China industry association construction is not mature enough, the relevant policy and documents define no delimitation for law enforcement and industry self-regulation, leading industry associations have no laws when coordinate with the government and enterprises, the imperfect associations internal control mechanism cause that association management systems will not play a substantial role. Consumers get food safety information mainly from the media, but the lack of some of the media's role and the absence of expertise, resulting in distortion of report content, non-effective supervision of enterprises and wrong guidance to consumers. Under the new media environment, press releases and changes are random, easily forming wrong public opinion. In addition, wrong reports easily lead to the proliferation of misleading guidance of public opinion; the effect of new media may increase difficulty of government regulation. China third-party food testing organizations have following problems. First, the company's "credit bundling" lower its credibility and led to oversight effect "greatly reduced"; secondly, to detect poorly equipped to detect the depth and breadth can't meet practical needs. Among food enterprises, government and consumers, there are serious information asymmetry. If social force can provide accurate information for the government, consumers will be able to reduce the degree of information asymmetry, reducing food safety risks. Conversely, if it cannot effectively reflect the information available to the government and consumers, it will trigger food safety risks. In addition, if the consumer associations, the media, third-party food testing institutions related practitioners in the interests of drivers, to act against ethics behavior, do not perform oversight obligations will trigger food safety risks.

3.4 Consumption

Food companies and consumers are in a position of supply and demand in the market, they're a pair of contradiction with the inevitability of conflict of interest exists between the two interests of the game. Furthermore, there is information asymmetry between businesses and consumers, enterprises in order to seek to maximize their own interests, the implementation may take advantage of the information asymmetry opportunistic behavior, harm the interests of consumers. We did a survey of food safety by asking more than 500 customers from Hubei, Jiangsu, Beijing and other provinces and cities in China, the results show a general lack of consumer knowledge related to food safety, customs are not concerned about the quality of food or hygiene; they have low risk perception, lack of self-awareness, to buy food without realizing the problem, these result in food safety risks. While consumer awareness of rights is very weak, which will condone wrongdoing business to a certain extent, accelerate the formation of a food safety risk.

3.5 Non-subjective risk triggering

Some potential risks of force majeure also lead to food safety issues.

1) Environmental Pollution. Our water, soil and others have varying degrees of pollution, in this environment a variety of harmful substances get into the food chain transfer, leading to a variety of food safety issues;

2) Natural Disasters and Climate Change. Global warming, natural disasters, to a certain extent, weakened the resilience of agricultural ecosystems, leading to greatly reduce the yield and quality, food safety problems;

3) New Technology Risks. Technological advances, more and more technologies (such as nanotechnology, gene technology), are applied to plants and animals, and ultimately be consumed by the body, the unknown nature of new technologies may bring uncertainty to the human body harm;

4) Radioactive Waste Radiation. To the human body, some radioactive substances may be acute and chronic toxicity, genetic mutation, carcinogenic, teratogenicity and other long-term effects.

4 Conclusions

Food safety issues occur frequently in modern Chinese society, largely because the interests of the game and information asymmetry under the unstuck food safety regulations. Relying solely on government is difficult to cover everything, and it is needed to establish a food safety supervision mode of which requires governments to collaborate with food producers and consumers, and the three agencies could interact (Wang Shuling and Xie Shouxiang, 2014). In this paper, we analysis the relevant subjects of the formation mechanism of food safety risks from the perspective of the food chain, and find that there are conflicts of interest and information asymmetry among the related subjects, thereby generating the phenomenon about interests of game among production-supply-distribution, government, social supervision. In the production-supply-distribution, raw material producers seek to maximize the benefits available by providing food processors inferior material and deliberately concealed this message; food processors take down the production process and other means to produce substandard products in order to reduce their production costs; local governments use outdated equipment in order to reduce regulatory costs, or do not report the relevant information to their superiors timely for their own performance, and so on. In the food distribution process, the relevant subjects will produce the relevant interests of the game caused by the economic and political interests and other factors, the issue of food security information deliberately concealed make information asymmetry between each other, triggering food safety risks.

At this stage, as the main food safety regulator, Chinese government must unite all the main coordination linkage, through the development of mechanisms and policies to reduce the information asymmetry and interests of the game between the constituent subjects, thus improving radically Chinese food Safety.

Acknowledgement

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Empirical Research on a Fuzzy Comprehensive Evaluation of a Highway Emergency Support Capability

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Abstract: Highway emergency support capability is a prerequisite and important guarantee for successfully implementing the transportation of emergency supplies, the deployment of emergency response teams and other emergency reopening actions. This paper firstly establishes an evaluation system of highway emergency support capability based on a document content analysis, then optimizes the index system using the Delphi method and finally develops an evaluation index system with 5 first-level indexes and 23 second-level indexes. Subsequently, on the basis of this evaluation system, it uses the analytic hierarchy process to determine the weights of each index, establishes a fuzzy comprehensive evaluation model and carries out empirical research on a specific city utilizing field survey data. This paper therefore attempts to provide a theoretical reference for improving highway emergency support capabilities.
Key words: Highway emergency support capability; Fuzzy comprehensive evaluation; Delphi method; Analytic hierarchy process

1 Introduction

There is a particular city located in the southeast area of Hubei province, which is an important transportation hub. It is located in an area where the Yangtze River waterway and the east-west 318 state road are vital passageways through Midwest China, and the south-north 209 state road is one of the important roads connecting southern and northern China. Additionally, the area surrounding this city has a high incidence of natural disasters. Therefore it is extremely important to evaluate the city's emergency support capability and propose optimization strategies in order to enhance the development of the highway support capability in Hubei province.

In the case of a disaster related emergency, a highway emergency support capability is a prerequisite and important guarantee of the successful implementation of the transportation of emergency supplies, the deployment of emergency response teams and other emergency reopening actions (Joseph Yu, 2014). Existing research on the evaluation of a highway emergency support capability mainly focuses on evaluation methods. These include the fuzzy evaluation method, analytic hierarchy process, factor analysis method, neural network method, and grey theory method. For example: Yin used the analytic hierarchy process to construct an evaluation system for a highway emergency support capability(Yin,2012, Ju Y,2012); Some researchers proposed the minimum deviation combined weights based evaluation model in an attempt to resolve the "polarization" effect in group decision making with diverse subjective and objective evaluation methods(Liu et al,2014,Peng Han,2014); and Yang and Peng indicated that it should be possible to synthesize the subjective G1 method and the objective entropy method to provide a weight for each index(Yang,2011). These examples demonstrate that the existing research which has evaluated highway emergency support capabilities has mainly enhanced the scientificness and objectivity of evaluation outcomes through innovative evaluation methods, but has not effectively improved index systems.

This paper makes a comprehensive evaluation of the city's emergency support capability by developing an evaluation system from the perspective of fuzzy mathematics, thereby attempting to achieve objective and accurate evaluation outcomes. This paper therefore develops a relatively scientific index system for emergency support capability evaluation and applies the Delphi method to obtain a more objective evaluation. On this basis, this paper establishes a fuzzy comprehensive evaluation model and conducts empirical research using the field survey data of the city to obtain an evaluation outcome. This will hopefully offer a reference for the further enhancement of highway emergency support capabilities.

2 Research on the Index System for Highway Emergency Support Capability Evaluation

2.1 Principles of constructing an index system

The choice of the evaluation indexes is the key point of a comprehensive highway emergency support capability evaluation. Merely relying on one or several indexes with a low correlation for evaluation is undoubtedly subjective and unilateral; conversely, adopting a large number of complex indexes will inevitably result in a huge amount of data, which not only makes the process difficult to control, but also leads to the "a miss is as good as a mile" phenomenon in the outcome deviation, leading to difficulties in achieving the expected results. Therefore, this paper follows the following principles in constructing the index system: the systematic principle, scientific principle and comparable principle.

2.2 A Preliminary determination of the index system

Having considered development principles, domestic and foreign evaluation systems and both academic and practitioner research results with regard to developing a highway emergency support capability index system, this paper conducts an in-depth investigation and systematic analysis and considers industry experts' opinions to develop the index system comprehensively. At the same time, it reflects the current situation of highway emergency support from its content and constituent elements on the basis of the following government documents: Highway Traffic Emergency Plans, Public Emergency Plans in Hubei Province, Highway Traffic Public Emergency Plans in Hubei Province and Highway Traffic Emergency Support Plans in Hubei Province. The proposed index system incorporates the 7 evaluation levels as first-level indexes and further refines them into 26 second-level indexes, as shown in Table 1.

Table 1   The Index System for Highway Emergency Support Capability Evaluation

First-level index	Second-level index
emergency response team support（B_1）	size of leading group（C_{11}）
	status of emergency reopening teams（C_{12}）
	status of logistics security teams（C_{13}）
	status of expert advisory teams（C_{14}）
	rescue capability of emergency teams（C_{15}）
emergency equipment support（B_2）	status of emergency capacity equipment（C_{21}）
	communication equipment of emergency command（C_{22}）
	status of large mechanical equipment items（C_{23}）
	responding speed of emergency equipment（C_{24}）
emergency supplies support（B_3）	status of emergency supply reserve（C_{31}）
	status of emergency supply management（C_{32}）
	status of emergency supply repository（C_{33}）
	responding speed of emergency supply（C_{34}）
emergency plan support（B_4）	status of emergency plan development（C_{41}）
	status of emergency plan management（C_{42}）
	frequency of emergency plan drills（C_{43}）
	frequency of emergency plan revision（C_{44}）
	situation of emergency plan start-up（C_{45}）
emergency fund support（B_5）	source of emergency fund（C_{51}）
	status of emergency fund utilization（C_{52}）
	evaluation of emergency fund utilization（C_{53}）
	category of emergency fund utilization（C_{54}）
emergency technology support（B_6）	iteration frequency of emergency technologies（C_{61}）
	status of emergency technologies application（C_{62}）
emergency information support（B_7）	feedback speed of emergency information（C_{71}）
	status of regional emergency information sharing（C_{72}）
	status of emergency information evaluation（C_{73}）
	status of emergency information institutions（C_{74}）

2.3 Revisions of the index system

When using the Delphi method, organizers analyze questionnaires and how they contribute to the research questions and consult with specified panel members to come to a consensus. Panel members have no horizontal communication, and only connect with the organizers unilaterally. After several rounds of consultation and feedback, opinions become increasingly unanimous and thus a statistically

significant and collective judgment of experts can be obtained.

For the purpose of this revision, there were two rounds of consultations after which the experts' opinions tended to be unanimous; therefore the revised results were derived after integrating these opinions. The experts consulted included senior personnel from the highway safety emergency management department, people who work in the area and academics. Thus, the advice provided was professional and representative.

2.3.1 The revision of the first-level evaluation index

The aforementioned Delphi method was utilized for the revision of the first-level evaluation index.

The active coefficient of expert refers to the collection rate of expert consultation tables, which indicates the degree of experts' interest in the research and willingness to cooperate. 9 questionnaires were distributed and collected, i.e., 100% active coefficient, for the first round of expert advice, which implies that the degree of cooperation from the experts is relatively high and the research results are of a high credibility.

The ratio of full score refers to the ratio of the number of significant experts and the total number of experts. In this round of investigation, which is the basis of determining the importance of indexes, a less than 50% ratio of full score implies that the experts believe that the significant contribution of the corresponding index in the index system is relatively low. In the second-level index system that was developed, the only index with a less than 50% ratio of full score was "emergency technology support".

The sum of grade is the aggregated score of all experts for an index. The average assignment is obtained by dividing the sum of grade by the number of experts. In the first round investigation, the evaluation opinions of "not important", "ordinarily important" and "extremely important" were assigned with 0, 1 and 2, respectively. The only indexes with a sum of grade less than 9 (the expert average assignment less than 1) were "emergency technology support" and "emergency information support".

The coordination of experts reflects the degree to which experts' evaluations fluctuate regarding the relative importance of an index. The coordination of experts is selected as the basis for judging whether there are significant differences between the experts regarding the evaluation of an index. More specifically, when the coordination of experts is larger than 0.5, there should be a relatively large difference regarding the evaluation on the corresponding index. In the first round of investigation, the only indexes with a coordination of experts larger than 0.5 were "emergency technology support" and "emergency information support".

Therefore, according to these results, the "emergency technology support" and "emergency information support" indexes should be deleted.

Table 2   The Statistics of Experts' Consultation Results in the First Round

name of first-level index	ratio of full score	sum of grade	average assignment	coordination of experts
emergency equipment support	1	14	1.555555556	0.18
emergency supplies support	1	14	1.555555556	0.22
emergency technology support	0.44	4	0.444444444	0.55
emergency fund support	0.90	12	1.333333333	0.25
emergency response team support	1	17	1.888888889	0.18
emergency plan support	1	16	1.777777778	0.18
emergency information support	0.67	8	0.888888889	0.52

2.3.2 The ranking of the significance of the first-level indexes

In the second round of investigation, 9 questionnaires were distributed and collected, i.e., 100% active coefficient. The ratios of full score of all indexes were over 90%. The evaluation opinions of "not important", "not too important", "ordinarily important", "relatively important" and "extremely important" were assigned with 1, 2, 3, 4 and 5, respectively. If each sum of grade is larger than 27, then each index is at least "ordinarily important". A coordination of experts of less than 0.25 implies that the coordination degree of experts is high and the credibility of the results is relatively high. The significance degrees of all indexes were ranked according to the weighted averages and the corresponding results are shown in Table 3.

Table 3　The Statistics of Experts' Consultation Results in the Second Round

name of second-level index	ratio of full score	sum of grade	coordination of experts	weighted average	rank
emergency equipment support	1	39	0.18	6.82	2
emergency supplies support	1	34	0.20	5.11	3
emergency fund support	0.90	30	0.25	3.96	5
emergency response team support	1	48	0.13	7.11	1
emergency plan support	1	33	0.16	4.73	4

After two rounds of experts' questionnaires and data analyses, the index system was revised: subsequently 5 refined first-level indexes as well as 23 second-level indexes constituted the index system of highway emergency support capacity evaluation.

3 A Fuzzy Comprehensive Evaluation of the Highway Emergency Support Capacity
3.1 The determination of the index set in the evaluation
After the preliminary determination and two rounds of revisions of the index system of highway emergency support capacity evaluation, an index system was obtained consisting of 5 first-level indexes and 23 second-level indexes $U=\{B_1,B_2,B_3,B_4,B_5\}$. $B_i=\{C_{i1},C_{i2},L,C_{ij}\}$ (i=1,2,L,6；j=1,2,L)

Table 4　Index Set in the Evaluation

first-level index	second-level index
emergency response team support（B_1）	size of leading group（C_{11}） status of emergency reopening teams（C_{12}） status of logistics security teams（C_{13}） status of expert advisory teams（C_{14}） rescue capability of emergency teams（C_{15}）
emergency equipment support（B_2）	status of emergency capacity equipment（C_{21}） communication equipment of emergency command（C_{22}） status of large mechanical equipment items（C_{23}） responding speed of emergency equipment（C_{24}）
emergency supplies support（B_3）	status of emergency supply reserve（C_{31}） status of emergency supply management（C_{32}） status of emergency supply repository（C_{33}） responding speed of emergency supply（C_{34}）
emergency plan support（B_4）	status of emergency plan development（C_{41}） status of emergency plan management（C_{42}） frequency of emergency plan drills（C_{43}） frequency of emergency plan revision（C_{44}） situation of emergency plan start-up（C_{45}）
emergency fund support（B_5）	source of emergency fund（C_{51}） status of emergency fund utilization（C_{52}） evaluation of emergency fund utilization（C_{53}） category of emergency fund utilization（C_{54}）

3.2 The comment set of the evaluation object
The evaluation criteria set is that which consists of all the possible evaluation results from the reviewers of the evaluation index. For the ease of experts' evaluations and grading and in accordance with the purpose of an emergency support evaluation system, the evaluation criteria set was constructed as Y={Y1, Y2, Y3, Y4, Y5}={Excellent, Preferable, Fair, Poor, Bad}, as shown in Table 5.

Table 5　The Comment Set of the Evaluation Object

level	grade range	median	level illustration
Excellent Y_1	90～100	95	completely meets the emergency support demands
Preferable Y_2	70～90	80	adequately meets the emergency support demands
Fair Y_3	60～70	65	basically meets the emergency support demands
Poor Y_4	40～60	50	less able to meet the emergency support demands
Bad Y_5	0～40	20	cannot meet the emergency support demands at all

3.3 The determination of evaluation indexes' weights

The determination of evaluation indexes' weights is one of the most critical aspects when conducting a comprehensive evaluation, as the relevance of these weights directly affects the final evaluation results. There are multiple methods for determining the weight set, and some common methods in practice are the Delphi method, group comprehensive weight, expert investigation method, and analytic hierarchy process.

This paper applies the analytic hierarchy process to obtain the comprehensive weights for indexes in each level. To this end, the relative importance of indexes in the same hierarchy has to be compared to comprehensively compute the indexes' weights on the basis of an ordered and hierarchical index system. In the analytic hierarchy process, the weight assignment of each hierarchy will affect the final result, directly or indirectly. The analytic hierarchy process combines qualitative and quantitative methods, and as a result, a complex system can be decomposed into clear and explicit factors and the accuracy of the analyzing results can be improved.

3.3.1 Establishing a judgment matrix

The analytic hierarchy process (AHP) uses mathematical methods to compute the weights reflecting the relative importance of elements in each hierarchy, computes the relative weights of all elements based on the total ordering of all hierarchies and ranks accordingly. The weight computation of first-level index is used as an example:

Table 6　The Assignment Standard of Elements in the Judgment Matrix

scale	definition
1	Indexes B_i and B_j are equally important
3	B_i is slightly more important than B_j
5	B_i is more important than B_j
7	B_i is somewhat more important than B_j
9	B_i is significantly more important than B_j
2,4,6,8	The importance degrees of the two indexes are between the odd-numbered scales
reciprocal	$B_{ij}=1/B_{ji}$, the opposite of the abovementioned results

Table 7　The Judgment Matrix of Some Experts

First-level index	team B_1	equipment B_2	supply B_3	plan B_4	fund B_5
team B_1	1	3	5	1/5	1/5
equipment B_2	1/3	1	3	1/7	1/9
supply B_3	1/5	1/3	1	1/7	1/9
plan B_4	5	7	9	1	1/3
fund B_5	5	7	9	3	1

3.3.2 An index weight and consistency check

When a person evaluates complex things, there are often some deviations: thus in order to judge whether the evaluation results have a high degree of consistency, it is necessary to conduct a consistency check. By geometrically averaging and normalizing each row vector in the judgement matrix A, it is

possible to obtain the weight vector W. Let the maximum characteristic root of A be λ_{max}, and then $AW = W\lambda_{max}$.

1) compute the product in each row of the judgment matrix

$$M_i = \prod_{j=1}^{n} b_{ij}, i = 1, 2, \ldots\ldots, n \tag{1}$$

2) compute the geometric mean of Mi

$$\overline{W_i} = \sqrt[n]{M_i} \tag{2}$$

3) normalize W

$$W_i = \overline{W_i} / \sum_{i=1}^{n} \overline{W_i} \tag{3}$$

Table 8   The First-Level Comprehensive Weights of a Highway Emergency Support Capability

First-level index	index weight
team B_1	0.27
equipment B_2	0.13
supply B_3	0.07
plan B_4	0.18
fund B_5	0.34

4) compute the maximum characteristic root λ_{max} of the matrix

$$\lambda_{max} = \frac{1}{n}\sum_{i=1}^{n} \frac{(UW)_i}{w_i} = 5.380616403 \tag{4}$$

5) conduct a consistency check

The construction of a judgment matrix can reduce the interference from other factors and objectively reflect the influence of the difference between a pair of factors. However, such a matrix inevitably contains some degree of inconsistency when synthesizing all the comparison results. Hence, it is necessary to conduct a consistency check on the decision maker's judgment matrix using the following steps:

① compute the consistency index CI（Consistency Index）

$$CI = \frac{\lambda_{max} - n}{n - 1} = 0.0951541007 \tag{5}$$

② look up the corresponding mean random consistency index RI（Random Index）

In order to measure whether the judgment matrixes with different orders have a satisfactory consistence, the RI judging the mean random consistency is introduced, as shown in Table 9.

Table 9   The Mean Random Consistency Index RI

index	value								
matrix orders	1	2	3	4	5	6	7	8	9
RI	0	0	0.52	0.89	1.12	1.26	1.39	1.41	1.46

③ compute the consistency rate CR（Consistency Ratio）

When the order is larger than 2 and the consistency rate is CR=CI/RI<0.10, the judgment matrix is deemed to have a satisfactory consistency; otherwise, the judgment matrix has to be adjusted to achieve a satisfactory consistency.

$$CR = CI/RI = 0.0951541007/1.12 < 0.10 \tag{1}$$

So we think that judgment matrix has a satisfactory consistency.

Similarly, the weights for the second-level indexes could be determined, as shown in Table 10.

Table 10　The Membership Matrixes and Weights Used in Highway Emergency Support Capability Evaluation

first-level index	weight	second-level index	weight
emergency response team support（B$_1$）	0.27	number of people in leading group（C$_{11}$）	0.11
		number of people in emergency reopening team（C$_{12}$）	0.20
		number of people in logistics security team（C$_{13}$）	0.24
		status of meeting job demands（C$_{14}$）	0.17
		reopening speed of emergency reopening team（C$_{15}$）	0.29
emergency equipment support (B$_2$)	0.13	number of emergency capacity equipment items（C$_{21}$）	0.03
		status of emergency capacity equipment（C$_{22}$）	0.07
		number of large mechanical equipment items（C$_{23}$）	0.13
		status of large mechanical equipment items（C$_{24}$）	0.27
		responding speed of emergency equipment（C$_{25}$）	0.50
emergency supplies support (B$_3$)	0.07	mode of emergency supply reserve（C$_{31}$）	0.05
		status of emergency supply reserve and management（C$_{32}$）	0.09
		number of emergency supply reserves（C$_{33}$）	0.15
		radiation range of emergency supply repository（C$_{34}$）	0.28
		responding speed of emergency supply（C$_{35}$）	0.43
emergency plan support (B$_4$)	0.18	category of emergency plan（C$_{41}$）	0.16
		frequency of emergency plan drills（C$_{43}$）	0.16
		frequency of emergency plan revision（C$_{44}$）	0.30
		status of reopening according to emergency plan（C$_{45}$）	0.38
emergency fund support (B$_5$)	0.34	source of emergency fund（C$_{51}$）	0.07
		category of emergency fund utilization（C$_{52}$）	0.10
		status of meeting reopening demands（C$_{53}$）	0.45
		evaluation of emergency fund utilization（C$_{54}$）	0.38

3.4 Constructing the model of fuzzy comprehensive evaluation

3.4.1 Establishing the membership matrix

It is necessary to transform the indexes' value into the eigenvalues of judgment matrixes by using the membership function. The comment set of highway emergency support capability evaluation in Hubei province is Y={Excellent, Preferable, Fair, Poor, Bad} and the affiliation is obtained by statistics. For each index i, there is an evaluation membership matrix R$_i$.

$$R_i = \begin{bmatrix} r_{11} & r_{12} & L & r_{15} \\ r_{21} & r_{22} & L & r_{25} \\ L & L & L & L \\ r_{m1} & r_{m2} & L & r_{m5} \end{bmatrix} \tag{1}$$

（m is the number of second-level indexes in the i-th first-level index, i=1, 2, 3…5.）

3.4.2 Establishing the evaluation model

In summary, by conducting the fuzzy operation and normalizing the fuzzy evaluation matrix and the weight vectors of factors, the set of fuzzy comprehensive evaluation results will be obtained. As a result, U - the set of evaluation indexes, Y - the set of evaluation standards, W - the set of comprehensive weights and R - the set of evaluation membership matrixes constitute the comprehensive hierarchy evaluation model E of the highway emergency support system in Hubei province.

$$E = W * R = \{W_1, W_2, \ldots, W_n\} \begin{bmatrix} r_{11} & r_{12} & L & r_{15} \\ r_{21} & r_{22} & L & r_{25} \\ L & L & L & L \\ r_{m1} & r_{m2} & L & r_{m5} \end{bmatrix} = (b_1, b_2, L, b_5) \quad (2)$$

4 Results

To validate both the rationality of the proposed index system of highway emergency support capability evaluation, and the operability and applicability of the fuzzy comprehensive evaluation model, the field survey data of a particular city are selected so that mathematical calculations can be performed. The detailed data are shown in Table 11.

Table 11   The Index System Data Sheet of the Highway Emergency Support Capability

first-level index	weight	second-level index	weight	evaluation of a particular city				
				Excellent	Preferable	Fair	Poor	Bad
emergency response team support	0.31	number of people in leading group （C_{11}）	0.11	0.176	0.118	0.353	0.118	0.235
		number of people in emergency reopening team（C_{12}）	0.20	0.059	0.118	0.294	0.412	0.118
		number of people in logistics security team （C_{13}）	0.24	0.059	0.118	0.471	0.294	0.059
		status of meeting job demands （C_{14}）	0.17	0.059	0.353	0.412	0.118	0.059
		status of meeting job demands （C_{15}）	0.29	0.059	0.176	0.706	0.059	0.000
emergency equipment support	0.16	number of emergency capacity equipment items （C_{21}）	0.03	0.059	0.059	0.118	0.235	0.529
		status of emergency capacity equipment （C_{22}）	0.07	0.000	0.176	0.588	0.118	0.118
		number of large mechanical equipment items （C_{23}）	0.13	0.235	0.235	0.529	0.000	0.000
		status of large mechanical equipment items （C_{24}）	0.27	0.000	0.000	0.706	0.235	0.059
		responding speed of emergency equipment （C_{25}）	0.50	0.059	0.294	0.588	0.059	0.000
emergency supplies support	0.09	mode of emergency supply reserve （C_{31}）	0.05	0.000	0.000	0.000	0.000	1.000
		status of emergency supply reserve and management （C_{32}）	0.09	0.353	0.118	0.529	0.000	0.000
		number of emergency supply reserves （C_{33}）	0.15	0.000	1.000	0.000	0.000	0.000
		radiation range of emergency supply repository （C_{34}）	0.28	0.000	0.000	1.000	0.000	0.000
		responding speed of emergency supply （C_{35}）	0.43	0.647	0.235	0.118	0.000	0.000
emergency plan support	0.16	category of emergency plan （C_{41}）	0.16	0.588	0.118	0.176	0.000	0.118
		frequency of emergency plan drills （C_{43}）	0.16	0.059	0.176	0.059	0.059	0.647
		frequency of emergency plan revision （C_{44}）	0.30	0.294	0.059	0.176	0.118	0.353
		status of reopening according to emergency plan （C_{45}）	0.38	0.353	0.294	0.176	0.059	0.118
emergency fund support	0.28	source of emergency fund （C_{51}）	0.07	1.000	0.000	0.000	0.000	0.000
		category of emergency fund utilization （C_{52}）	0.10	0.824	0.059	0.000	0.000	0.118
		status of meeting reopening demands （C_{53}）	0.45	0.000	0.000	0.235	0.588	0.176
		evaluation of emergency fund utilization （C_{54}）	0.38	0.176	0.294	0.412	0.000	0.118

4.1 The fuzzy comprehensive evaluation in the first stage

Based on the data in Table 10, the data were processed using the membership function to obtain the eigenvalues of the evaluation matrix. The membership judging matrix of the first-level index B_1 is:

$$R1 = \begin{Bmatrix} 0.176 & 0.118 & 0.353 & 0.118 & 0.235 \\ 0.059 & 0.118 & 0.294 & 0.412 & 0.176 \\ 0.059 & 0.353 & 0.412 & 0.118 & 0.059 \\ 0.059 & 0.118 & 0.471 & 0.235 & 0.059 \\ 0.059 & 0.176 & 0.706 & 0.059 & 0.000 \end{Bmatrix} \tag{1}$$

The membership vector of the first-level index B_1 (emergency response team) is:

$$E_1 = W_1 * R_1 = \{0.017 \quad 0.174 \quad 0.480 \quad 0.202 \quad 0.073\} \tag{2}$$

The final score in the fuzzy comprehensive evaluation of the city's highway emergency support capability is 63.46419044 and the rating is "Fair".

Similarly, the membership vectors of B_2 (emergency equipment support), B_3 (emergency supplies support), B_4 (emergency plan support) and B_5 (emergency fund support) are respectively:

$$E_2 = W_2 * R_2 = \{0.063 \quad 0.192 \quad 0.595 \quad 0.108 \quad 0.042\} \tag{3}$$

The comprehensive evaluation is 66.26692127, the rating is "Fair".

$$E_3 = W_3 * R_3 = \{0.308 \quad 0.260 \quad 0.381 \quad 0.000 \quad 0.050\} \tag{4}$$

The comprehensive evaluation is 75.88301479, the rating is "Preferable".

$$E_4 = W_4 * R_4 = \{0.325 \quad 0.177 \quad 0.158 \quad 0.067 \quad 0.273\} \tag{5}$$

The comprehensive evaluation is 64.13038411, the rating is "Fair".

$$E_5 = W_5 * R_5 = \{0.311 \quad 0.164 \quad 0.164 \quad 0.082 \quad 0.280\} \tag{6}$$

The comprehensive evaluation is 62.98425485, the rating is "Fair".

4.2 The fuzzy comprehensive evaluation in the second stage

By applying the derived weight vectors of the first-level indexes, it is possible to calculate the evaluation results of the city's highway emergency support system as:

$$E = W * R = \{0.199 \quad 0.182 \quad 0.324 \quad 0.113 \quad 0.156\} \tag{1}$$

The results show that the percentages of the city's highway emergency support system evaluated as "Excellent", "Preferable", "Fair", "Poor" and "Bad" are 19.9%, 18.2%, 32.4%, 11.3% and 15.6%, respectively. According to the group median of each evaluation rank, the comprehensive evaluation score is 63.34240456, which means that the capacity of this city's highway emergency support system is rated as fair.

Based on the computations of the fuzzy comprehensive evaluation model above, the comprehensive evaluation score of this city's highway emergency support capability is 63.34240456, in other words, it is fair according to the evaluation criteria. The detailed scores and ranks of the indexes are presented in Table 12.

From the results it can be seen that there are 3 indexes that are evaluated as "Preferable", including the responding speed of emergency supply, the category of emergency fund utilization and the number of emergency supply repositories. 8 indexes are evaluated as "Fair" including the evaluation of emergency fund utilization, the reopening speed of the emergency reopening team, and the status of meeting job demands. The 7 indexes with a score of less than 60 are the number of people in the leading group, the number of people in the emergency reopening team, the status of large mechanical equipment items, the number of emergency capacity equipment items, the frequency of emergency plan revision, the frequency of emergency plan drills and the status of meeting reopening demands; moreover the scores of the number of emergency capacity equipment items and the frequency of emergency plan drills are especially low.

We can see from the weights calculated by the analytic hierarchy process that the emergency response team support and the emergency fund support account for a large proportion of the first-level index, while the status of meeting reopening demands, the responding speed of emergency supply, the status of reopening according to the emergency plan, the evaluation of emergency fund utilization and others, account for a large proportion of the second-level index. Therefore, these indexes should be regarded as the key development targets; however, the development of other indexes should not be ignored.

Table 12   The Evaluation Results of the Second-Level Index

second-level index	weight	evaluation results	serial number
responding speed of emergency supply （C_{35}）	0.43	87.941	1
category of emergency fund utilization （C_{52}）	0.1	85.294	2
number of emergency supply repositories （C_{33}）	0.15	80	3
category of emergency plan （C_{41}）	0.16	79.118	4
status of emergency supply reserve and management （C_{32}）	0.09	77.353	5
number of large mechanical equipment items （C_{23}）	0.13	75.588	6
status of reopening according to emergency plan （C_{45}）	0.38	73.824	7
responding speed of emergency equipment （C_{25}）	0.5	70.294	8
evaluation of emergency fund utilization （C_{54}）	0.38	69.412	9
reopening speed of emergency reopening team （C_{15}）	0.29	68.529	10
status of meeting job demands （C_{13}）	0.17	67.647	11
mode of emergency supply reserve （C_{31}）	0.05	65	12
radiation range of emergency supply repository （C_{34}）	0.28	65	13
number of people in logistics security team （C_{14}）	0.24	61.471	14
status of emergency capacity equipment （C_{22}）	0.07	60.588	15
source of emergency fund （C_{51}）	0.07	60.588	16
number of people in leading group （C_{11}）	0.11	59.706	17
status of large mechanical equipment items （C_{24}）	0.27	58.824	18
number of people in emergency reopening team （C_{12}）	0.2	57.059	19
frequency of emergency plan revision（C_{44}）	0.3	57.059	20
status of meeting reopening demands（C_{53}）	0.45	48.235	21
number of emergency capacity equipment items （C_{21}）	0.03	40.294	22
frequency of emergency plan drills （C_{43}）	0.16	39.412	23

5 Conclusions

For the indexes with a low score in the city's highway emergency support capability, this paper proposes the following optimizing strategies:

1) In order to develop the support capability of the city's emergency responding team, it will be necessary to increase the number of leaders in the emergency leading group, improve the emergency command system and enhance the emergency command capability. Moreover, the grass-rooted emergency reopening team needs to be enhanced by the inclusion of a combination of professionals and part-time workers as well as volunteers. On the one hand, the professional emergency reopening teams need to be strengthened, but on the other hand, their strengths should be utilized and emergency responding work needs to be carried out in an orderly manner under the supervision of emergency management institutions.

2) In order to enhance the capability of the city's emergency equipment support, it will be

necessary to increase the number of emergency capacity equipment items and large mechanical equipment items. Specifically, on the one hand, increase the amount of investment and certain emergency equipment items according to the total number of highway miles in each city and county; and on the other hand, sign agreements with local large-scale machinery equipment leasing manufacturers, in order that emergency equipment can meet the demand in emergency situations by being augmented by leased equipment.

　　3) Finally it will be necessary to increase the frequency of pre-disaster drills as outlined in emergency plans, and evaluate and resolve the problems revealed by the drills in a timely manner. On this basis, the emergency plan should be revised and a dynamically optimized emergency planning system established.

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Construction of the Personnel Management Informatization at the Era of "Internet+"

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Abstract: Under the background of comprehensive reform of universities and the personnel system, how to integrate the Internet technology and traditional personnel management will undoubtedly become the opportunities and challenges for university personnel department. This article deeply analysis the importance and urgency of information technology by comparative analysis and extensive research, and describes in detail from demand analysis, structure design, function module design, system database and so on. The system is tested by the samples and the results of the experiment show that: The system can realize the basic multi-level personnel management operation function, has friendly man-machine interaction interface and good expansibility, can guarantee the real-time and accuracy of the database information, which improve the efficiency of personnel management and promote the university management work.

Key words: Internet +; Personnel management; Information technology; Platform construction

1 Introduction

With the new generation of information technology and innovation 2.0 interactions and development, people's lifestyles, work, organization, social forms are undergoing profound changes. "Internet +" is a new forms, new formats, which is the integration of Internet and traditional industries under innovative 2.0.And it is the new normal of economic and social development, that Morphological evolution of the Internet and the birth of ,driven by the innovation of the knowledge society 2.01 .

Under this new normal social development, personnel management information on personnel management in the universities is particularly important. As an important part of university information technology, personnel management information is conducive to promoting the process of modernization of personnel management; improve the level of Personnel Management. Current College Personnel Management Information has been realized, to personnel management work to bring a qualitative leap, greatly improving the efficiency of personnel management. But we should also see that the current situation of personnel management, information technology is not optimistic, there are still slow to update data, insufficient information processing capability, information management system is not perfect and other issues.

In terms of colleges and universities, The practical significance of 'Internet +' lies in the Internet innovation deeply integrated into the teaching reform of colleges and universities, Fusion in the personnel management of colleges and universities, promotes personnel management information construction of colleges and universities, actively builds the big data, big platform and application of colleges and universities. Promote the efficiency and service quality of college personnel information management, form new form of personnel management and service supported by "Internet +".

2 Thoughts of Personnel Management Informatization Construction

With the continuous development of Internet technology and the needs of expanding the personnel management function, personnel management information construction in colleges and universities should constantly change work idea, innovative work style, gradually construct a multi-level, multi-dimensional informatization development organic system, promote data resources integration between teaching, scientific research and relevant departments, to realize information resources sharing, In favor of the information management system of unified planning and unified coordination, finally realizing the wisdom campus of big data, platform, and application(Deliger,2010).

2.1 Personnel must reduce the decentralization, practice the concept from management to service

Along with the arrival of information age, personnel management of university are also in the ongoing reform, but a lot of universities is not still get rid of the management mode under the planned economic system, management system and management idea obsolete. Universities often spread that

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1 "Internet plus" activated more information energy. Guangming Wang, 2015.07.01

"The personnel department do not do what they should do" and "The personnel department is not the people can do" (Jun Zhao, 2015). The former highlights the phenomenon that current personnel lack service consciousness, the latter from the side reflects the complexity of the personnel work. In order to promote the reform of higher education and the personnel system reform better, the personnel department of universities must innovative work ideas, take the concept of "people-oriented" through the whole process of the personnel management work, try to reduce the decentralization, overall arrangement, coordination and cooperation, actively carry out the management consciousness to the service work. Personnel management information is not in order to control better, or just in order to improve the efficiency of management, but in order to provide better public services for the majority of teachers and students staff, finally realizes the important change of that the service is management.

2.2 Personnel management must optimize business processes, adopt the mode of the combination of offline and online.

Personnel Affairs clue more information cumbersome, and is closely linked with the interests of the faculty. In order to complete the work faster and better, the personnel department must continually review and refine the work content, optimize the business process, actively push forward the "five one" working mode which means post management as the basis, salary welfare as the gripper, talent work as the key, information sharing for the protection, data reporting as the carrier, actively adopt the mode of the combination of offline and online job. Pushing forward the construction of the informatization cannot move the works on the line from offline simply, working online can't completely replace work offline. From offline to online is the developing trend of The Times, it is an effective way to optimize allocation of manpower and resources, online operation can online as far as possible to deal with, This requires a combination ensures unimpeded communication channels, things which can't be online operation is still in use offline. The transformation from offline to online is a process of constantly to improve college personnel management informationization, and this is a gradual process that need to work in the personnel department in the constant practice and exploration (Zhan Wang, 2008).

2.3 Personnel management must promote information management system, improve the work efficiency and service quality.

The personnel management work of universities are very complicated work, they are random city, dynamic, and strong repeatability. Information construction must promote the combination of the existing Internet technology with traditional personnel management work effectively and establish the personnel management information system that satisfies the daily work. The construction of personnel management information system, firstly, we should regard personnel file information as breakthrough, Organize a large number of personnel basic information and programmed information resources well, in order to ensure the information collected timeliness and accuracy from the source; Secondly, we should formulate strict specification information work, form a unified data storage, transmission and application of the standard, as far as possible to avoid data redundancy, to ensure the consistency of data in the process of using information; Thirdly, information management system need to focus on the integration of multidisciplinary, especially introduced scientific statistical theory and methods, to facilitate the existing information processing to reflect the dynamic changes of the personnel information data timely, objective and accurate. So as to implement the data information of application and the function of regeneration; finally, information management system should combine digital campus network and web portal, By means of advanced information technology and media to realize information resources sharing, realize the link of the information seamless between the personnel department, the educational administration department, research department and other related functional organizations to Improve the utilization rate of information to a great extent(Shaofeng Zheng, Pingping Wang,2009).

3 The Information Platform Construction of Personnel Management

Under the general background that the information technology changes rapidly and the school's comprehensive reform as well as personnel system reform advance totally, the reform of the personnel management system need more rapid advance. Personnel information, job information and salary information relating to the personnel department of many colleges and universities are usually managed by Excel or FoxPro and other office software. Some colleges and universities also build the software system of LAN environment to assist the daily management work. So to say, all these lay a good material foundation for the construction of information platform. Personnel management information platform should start from the actual situation of colleges and universities ensure the construction of a unified planning and centralized management, avoid redundant construction. Not only need it to include

all basic business of personnel department, but also to realize the correlation between the various functional departments. The whole platform mainly consists of four parts: core business module, the object module, collaborative module as well as supporting module. As shown in figure 4-1(Haijun Zeng, Ruiqiu Sun, 2015).
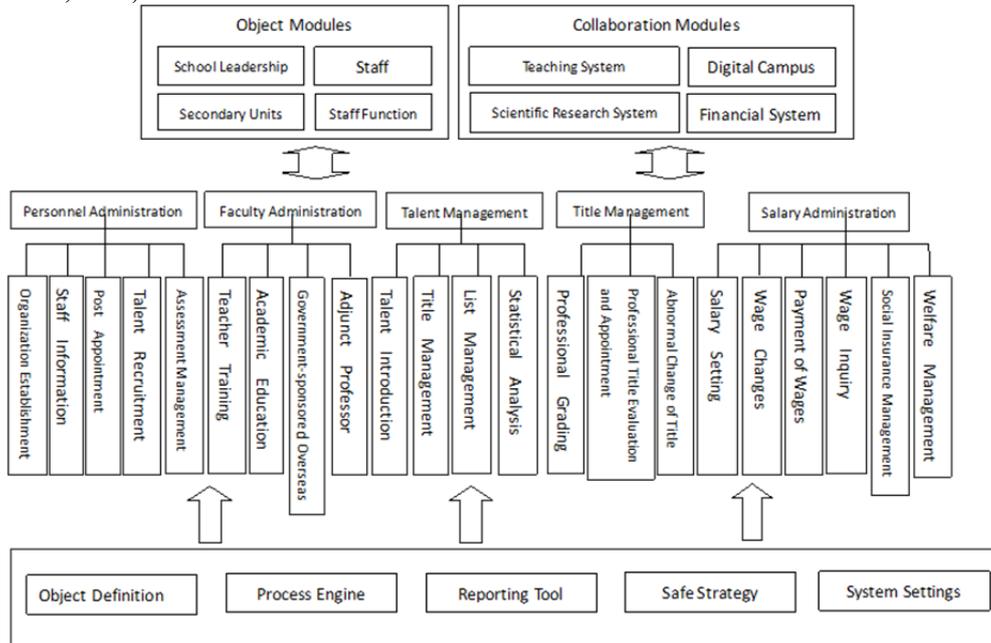
Figure 1   The System Block Diagram of the Personnel Management Information Platform

3.1 The core business module

     The core business module including all daily works of the personnel department, mainly adopt the mode that all information are managed systematically according to the duty, combined with the specialist maintenance of each department to entrust. It is divided into five modules, including the personnel management, teacher management, talent management, job management and salary management. This core business module manages the school staffs' whole relevant information from taking work to personnel changes or retirement. Specific classification is shown in table 4-1. System will divide sections into different working groups and authorize each department different authority according to the specific responsibilities, so that each group only has operating rights for their own management of data information, but for the rest of the data they just has access only to browse and query.

Table 1   Core Business Module Classification

Sub Modules	Specific Items	Function Declarations
Personnel Management	Organization Establishment	Establishment and revocation of an organization. The personnel allocation, statistics and monitoring.
	Staff Information	Basic information management of teaching and administrative staff, information inquiry, statistics and analysis of staff.
	Post Appointment	Post release, declaration, review and evaluation.
	Talent Recruitment	Recruitment website creation, maintenance, management and recruitment of professional and technical personnel.
	Assessment Management	The staff annual appraisal and engagement examination.
Faculty Management	Teacher Training	Training plan management. Teacher training statistics and analysis.
	Academic Education	Application and review of academic qualifications. Statistics and analysis of academic record.
	Government-sponsored Overseas	Application and review of Government-sponsored Overseas. Statistics and analysis of going abroad record.
	Adjunct Professor	Appointment, reappointment and dismissal of adjunct professor.

Talent Management	Talent Introduction	Formulation and implementation of the high level talent introduction plan.
	Title Management	Maintenance of high level talent title or talent project information.
	List Management	Get talent title or talent project staff list maintenance.
	Statistical Analysis	Associated with personnel and unit information, do Statistical analysis of high level talents.
Title Management	Professional Grading	Principles and objectives of professional and technical post classification.
	Professional Title Evaluation and Appointment	Declaration, evaluation and appointment of professional titles.
	Abnormal Change of Title	The change of title information associated with the personnel information.
Salary Management	Salary Setting	The definition of the standard of salary payment, the condition setting, the formula setting.
	Wage Changes	The wage change notification, confirmation for handling and feedback.
	Payment of Wages	Automatically generate monthly payroll data and changes in the form of statements of data.
	Wage Inquiry	Payroll information, changes in the situation of inquiries, export, print.
	Social Insurance Management	Types of insurance, base, set and adjust the formula, and wage information related.
	Welfare Management	Pension and disability allowance, difficulties subsidies and other application, examination, registration, payment.

3.2 The object module

According to the service object and the different types of business, object module including four parts, consists of school leaders, teachers, secondary units and functional organization. Object module's designs are based on the concept of "people-oriented", by the information management and service of the faculty as the main line, open to all kinds of faculty and secondary units, as well as service for decision-making of leadership of the school. Similar to the core business module, the system will set different user permissions according to different objects, in order to ensure the timeliness, accuracy and security of data. For example, when faculty come into the college, the system will assigns the user name (usually the No.) for the worker, by which the user can register and login the system, and they can input their own information, query, can online title appraisal, annual examination and approval of the business, also can print all kinds of reports required for business; But when the information occurs error or change, staff must submit an application for change, after that the related personnel department will review and modify.

3.3 The collaboration module

The structure of the collaboration module is on the basis of a good platform with digital campus network, mainly relating to the financial system, the scientific research system and teaching system. The purpose is to establish a unified data exchange platform between information systems in relevant secondary units in school or department, thus we can integrate the information of staffs within a unified information system, meanwhile provide standards, norms, safety and rich data resources to each other, promote the personnel, finance, scientific research and teaching departments to better serve the school's overall strategic planning and each work of the school carried smoothly, cooperation and exchange, so as to realize seamless link of information between departments, realize the benign interaction of information support, improve, the information service (Haijun Zeng, Ruiqiu Sun,2015).

3.4 The supporting module

In order to ensure the flexible configuration of the whole system and stable operation, convenient to integrate multiple information system, and provide information searching, statistics, data analysis and other functions to each user, design is required for a platform to build the perfect support module. Support module is mainly used for the definition of business object, interface settings, workflow monitoring of production, output and print, all kinds of statements and the design of the security policy.

4 Conclusions

The construction of information platform of college personnel management, can not only improve the resource utilization rate and the work efficiency, ensure the personnel information timely, accurate, security to the greatest extent and simplifying the process, reduce the information redundancy and information asymmetry caused by human factors, but also conducive to promote the construction of college office style of work. Colleges and universities should follow the rule of development of information technology, continue to strengthen organization and leadership, and gradually improve the quality of information and personnel workers, continue to improve and optimize the management information level in practice, so as to promote faster and better development of university information.

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A Research on Risk Management of Agent Construction System of Engineering Project

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Abstract: As a new model of engineering management, the agent construction system not only improve the level of the engineering project management, but also enhance the efficiency of project management. But actually, there are still many risks in the process of project construction. Focusing on the risk of agent construction system in engineering project, this paper analyzes the origin of the risk. The study applies the means of risk control and risk transfer, and establishes comprehensive risk index system through case study. The system can be applied to scientifically evaluate level of risk and standardize management risk.

Key words: Engineering projects; Agent construction system; Construction agency; Risk management

1 Introduction

Project agent construction system derived from America's construction manager system (CM system). CM system means the owner of a project entrusted the construction manager to be responsible for the management of the entire project. The manager has to manage things including feasibility study, design, procurement, construction, commissioning, etc. The project cost is not included. Project agent construction system can take different mode of agent construction according to the characteristics of the project. General project agent construction may apply Project Management model (PM) or Project Management Contract model (PMC). Agent construction system that takes design as its leading task includes Enterprise Project Management mode (EPM) and engineering general contracting mode (EPC). In July 2004, the government issued "the decision of the State Council on the reform of investment system", clearly put forward that the non-operating government investment projects must accelerate the implementation of agent construction system. Compared to other project construction management systems, agent construction system has six advantages, followed by decision-making of the project gets more scientific and thorough; project management level and work efficiency is greatly improved; real implementation of project contra; give full play to the role of competition mechanism; it's conducive to curb corruption; Government regulation of the project gets enhanced.

There are DBB, DB, BT, BOT, EPC and other models in the overseas. Ann V.A (1993) shows that the principal project in order to obtain greater benefits, choose a smaller cost delegate, delegate to obtain greater benefits. It is important to build relations on behalf of the establishment; David Baccarini (1999) through the use of the logical framework approach, the project goal into cost target, output targets, expected earnings target, in order to achieve successful project management; M. Bertolini (2006) that the non-profit government investment projects due to quality and schedule constraints, the tender price given appropriate discounts can increase the likelihood of where the subject should therefore Analytic Hierarchy Process (AHP) the risk of the project shall be evaluated to provide decision-making basis for the contract project.

Domestic scholars mainly analyze the project risk factors acting system. Ding yijun(2013) analyzed the construction units in construction contract, project preparatory stage and the implementation of risk exists, and puts forward some corresponding preventive measures; Gao junfang(2013)describes the system mode forms of agent construction project, and he thought the risks mainly from the project environmental system, project subject, the process of project management and the project objectives; Lijia.and Tengjin (2014) from occurring and types of agent risk management model of risk analysis, think that there is job risk, policy risk, system risk and risk behavior subject such as four major categories.

However, it has to be clearly recognized that, agent construction project has a lot of uncertain factors, since it goes through a entire process from the project initiated, financing, transfer to operation, involving many of the subject such as project owners, construction agency, supervision units and contractors. Generally speaking, there is risk from four stages in project agent construction system, which is decision-making, design, construction and completion. Through recognition of the above four stage risk, studying into a specific case as the research object, this paper constructs project risk evaluation index system to carry out a comprehensive and in-depth research.

2 The Advantage of Agent Construction System

The advantage of agent construction system is mainly manifested in the following six o 'clock.

Firstly, decision-making of the project gets more scientific and thorough. Since the feasibility study not only needs to meet the requirements of the government, but also has to satisfy the needs of the follow-up work of the project. Implementing agent construction system, the owner of the project entrusts construction agency to do the preparatory work. The agency may seek for professional consulting agency to do the work, so that the owner needn't to do the decision by themselves.

Secondly, project management level and work efficiency is greatly improved. Under the agent construction system, since the agency is selected by bidding, it is often a consulting organization that is specialized in project investment and construction management and is familiar with the whole process of construction. They own a large number of professionals and have rich experience and knowledge in project construction management.

Thirdly, real implementation of project control. The implementation of agent construction system introduces legality construction mechanism, which takes strict contract management as core, to government investment projects. In the premise of meeting the function of the project, the investment, schedule and quality requirements of the project once confirmed in the commission contract between clients and construct agency, shall not be altered arbitrarily.

Fourth, give full play to the role of competition mechanism. Since agent construction system uses multi-channel bidding procurement, the whole process is fully competitive. The construction agency, pre bid consulting agency, construction units or supplier of equipment and materials will do its utmost to provide the optimal technology solutions, services and products with reasonable price. It not only helps to reduce the total cost of the project, but also to optimize the project.

Fifth, it's conducive to curb corruption. The implementation of agent construction system will break the pattern of "investment, construction, management and use" in the current government investment system, which makes all sectors separated from each other and restricting each other.

Sixth, Government regulation of the project gets enhanced. Through the division of responsibilities, the project construction parties supervise each other's work. The sense of responsibility of the parties has been strengthened.

3 Risk Evaluation

3.1 Establish evaluation index system

1) Determine the risk list

First of all, use flow chart analysis to analyze the process of the whole project. The whole process can be divided into four stages: planning, design, construction, completion, as shown in table 1:

Table 1   Potential Risk List for Each Stage of the Project

Agent construction contract risk Engineering feasibility study risk Financing risk Bidding risk Approval procedures risk	Design management risk Demolition risk Design bidding risk Organizational coordination risk Excessive authority risk Technology risk	Construction progress risk Safety risk around construction site Quality risk Risk of contract risk cost control Management risk Regulatory risk	Project settlement risk Contract Close-out risk Stakeholder risk moral hazard ......
Decision-making stage	Design stage	Construction stage	Completion stage

Secondly, using expert investigation method, we invite 20 experts to rate probability (P) and the loss degree (L) of each risk factor in the risk list according to the existing conditions of the project. The rate has five grades from low to high according to the standard of 1-5 Points Scoring. Calculate the score of each risk factor according to the following formula.

$$R_i = \frac{1}{n}\sum_{t=1}^{n} P_{it} \times L_{it} \tag{1}$$

Ri is the comprehensive score of risk factor i; Pit is the score that expert t rates the probability of risk factors i at; Lit is the score that expert t rates the loss degree of risk factors i at.

Finally, calculate risk value according to the expert scoring, as shown in table 2:

Table 2   Experts' rates at Risk Factors

Project stage	Risk factor	Risk value
Decision-making stage	Agent construction contract risk	8
	Engineering feasibility study risk	12
	Financing risk	15
	Bidding risk	3
	Approval procedures risk	3
Design stage	Design management risk	12
	Demolition risk	14
	Design bidding risk	9
	Organizational coordination risk	10
	Excessive authority risk	6
Construction stage	Construction progress risk	20
	Safety risk around construction site	9
	Quality risk	10
	Risk of contract risk cost control	24
	Management risk	6
	Regulatory risk	8
	moral hazard	5
Completion stage	Project settlement risk	14
	Contract Close-out risk	12
	Stakeholder risk	10
	moral hazard	2

2) Determine the risk evaluation index system

According to the expert evaluation results above, combined with the project's actual condition and operation, the factors of low risk level are removed. The project risk index system includes 4 first-level index and 17 second level index, as shown in Table 3:

Table 3   The Project Risk index System

Object level	First-level index	Second level index
Total object X	Decision-making stage X_1	Agent construction contract risk X_{11}
		Engineering feasibility study risk X_{12}
		Financing risk X_{13}
	Design stage X_2	Design management risk X_{21}
		Demolition risk X_{22}
		Design bidding risk X_{23}
		Organizational coordination risk X_{24}
		Excessive authority risk X_{25}
	Construction stage X_3	Construction progress risk X_{31}
		Safety risk around construction site X_{32}
		Quality risk X_{33}
		Risk of contract risk cost control X_{34}
		Management risk X_{35}
		Regulatory risk X_{36}
	Completion stage X_4	Project settlement risk X_{41}
		Contract Close-out risk X_{42}
		Stakeholder risk X_{43}

3.2 Calculation of risk evaluation value

1) Establish the index set X for risk evaluation

$$X = \{x_1, x_2, x_3, x_4\} \qquad (2)$$

The sub index sets are:

$$X_1 = \{x_{11}, x_{12}, x_{13}\} \qquad (3)$$
$$X_2 = \{x_{21}, x_{22}, x_{23}, x_{24}, x_{25}\} \qquad (4)$$
$$X_3 = \{x_{31}, x_{32}, x_{33}, x_{34}, x_{35}, x_{36}\} \qquad (5)$$
$$X_4 = \{x_{41}, x_{42}, x_{43}\} \qquad (6)$$

2) Determine the weight of each index

According to the results of the expert investigation method, the weight of each index is determined by using analytic hierarchy process.

We get the weight set of the index as follow:

$$W = \{0.20, 0.33, 0.30, 0.17\} \qquad (7)$$
$$w_1 = \{0.23, 0.33, 0.44\} \qquad (8)$$
$$w_2 = \{0.26, 0.30, 0.15, 0.17, 0.12\} \qquad (9)$$
$$w_3 = \{0.22, 0.16, 0.18, 0.26, 0.08, 0.10\} \qquad (10)$$
$$w_4 = \{0.42, 0.32, 0.26\} \qquad (11)$$

3) Determine the evaluation set

There is 5 risk assessment level from low to high score, corresponding to a score of 1,2,3,4,5. The evaluation set is:

$$V = \{1, 2, 3, 4, 5\} \qquad （12）$$

4) Constructing fuzzy relation matrix

The research invites 20 experts in related fields to score all the risk factors. The result of the scoring is shown in table 3:

Table 4　Risk Factors Evaluation Level Summary Table

Object level	first-level index	Second level index	evaluation grade				
			Low	Relatively low	Middle	Relatively high	High
X	X_1	X_{11}	0	5	14	1	0
		X_{12}	0	2	5	11	2
		X_{13}	0	0	4	14	2
	X_2	X_{21}	0	1	7	10	2
		X_{22}	0	2	6	12	0
		X_{23}	3	4	12	1	0
		X_{24}	1	5	10	4	0
		X_{25}	3	12	5	0	0
	X_3	X_{31}	0	0	2	10	8
		X_{32}	2	5	9	4	0
		X_{33}	0	2	15	3	0
		X_{34}	0	0	3	5	12
		X_{35}	4	12	4	0	0
		X_{36}	4	14	2	0	0
	X_4	X_{41}	0	0	3	14	3
		X_{42}	0	0	6	12	2
		X_{43}	0	1	14	5	0

We get the membership matrix of comment set as follow:

$$R_1 = \begin{pmatrix} 0 & 0.25 & 0.7 & 0.05 & 0 \\ 0 & 0.1 & 0.25 & 0.55 & 0.1 \\ 0 & 0 & 0.2 & 0.7 & 0.1 \end{pmatrix} \qquad (13)$$

$$R_2 = \begin{pmatrix} 0 & 0.05 & 0.35 & 0.5 & 0.1 \\ 0 & 0.1 & 0.3 & 0.6 & 0 \\ 0.15 & 0.2 & 0.6 & 0.05 & 0 \\ 0.05 & 0.25 & 0.5 & 0.2 & 0 \\ 0.15 & 0.6 & 0.25 & 0 & 0 \end{pmatrix} \qquad (14)$$

$$R_3 = \begin{pmatrix} 0 & 0 & 0.1 & 0.5 & 0.4 \\ 0.1 & 0.25 & 0.45 & 0.2 & 0 \\ 0 & 0.1 & 0.75 & 0.15 & 0 \\ 0 & 0 & 0.15 & 0.25 & 0.6 \\ 0.2 & 0.6 & 0.2 & 0 & 0 \\ 0.2 & 0.7 & 0.1 & 0 & 0 \end{pmatrix} \qquad (15)$$

$$R_4 = \begin{pmatrix} 0 & 0 & 0.15 & 0.7 & 0.15 \\ 0 & 0 & 0.3 & 0.6 & 0.1 \\ 0 & 0.05 & 0.7 & 0.25 & 0 \end{pmatrix} \qquad (16)$$

5) Calculate the fuzzy comprehensive evaluation set

We get the fuzzy comprehensive evaluation set as follow:

$$S_1 = w_1 \times R_1 = (0 \quad 0.0905 \quad 0.3315 \quad 0.501 \quad 0.077) \qquad (17)$$
$$S_2 = w_2 \times R_2 = (0.049 \quad 0.1875 \quad 0.386 \quad 0.3515 \quad 0.026) \qquad (18)$$
$$S_3 = w_3 \times R_3 = (0.052 \quad 0.176 \quad 0.294 \quad 0.234 \quad 0.244) \qquad (19)$$
$$S_4 = w_4 \times R_4 = (0 \quad 0.013 \quad 0.341 \quad 0.551 \quad 0.095) \qquad (20)$$

The membership matrix R of the real estate project investment risk object level index X on the evaluation set V is shown as follow:

$$R = \begin{pmatrix} 0 & 0.0905 & 0.3315 & 0.501 & 0.077 \\ 0.049 & 0.1875 & 0.386 & 0.3515 & 0.026 \\ 0.052 & 0.176 & 0.294 & 0.234 & 0.244 \\ 0 & 0.013 & 0.341 & 0.551 & 0.095 \end{pmatrix} \qquad (21)$$

Finally, we get the fuzzy comprehensive evaluation set S of the project as follow:

$$S = W \times R = (0.03177 \quad 0.14489 \quad 0.36295 \quad 0.38007 \quad 0.11333) \qquad (22)$$

6) The comparison result

The corresponding score of evaluation set is set as: $V_1 = 1, V_2 = 2, V_3 = 3, V_4 = 4, V_5 = 5$。

The investment risk comprehensive evaluation value of the real estate project:

$$N = S \times V^t = (0.03177 \quad 0.14489 \quad 0.36295 \quad 0.38007 \quad 0.11333) \times (1 \quad 2 \quad 3 \quad 4 \quad 5)^t = 3.4973 \qquad (23)$$

The evaluation value of the investment risk index of the real estate project is shown as follow:

$$N_1 = S_1 \times V^t = (0 \quad 0.0905 \quad 0.3315 \quad 0.501 \quad 0.077) \times (1 \quad 2 \quad 3 \quad 4 \quad 5)^t = 4.01 \qquad (24)$$
$$N_2 = S_2 \times V^t = (0.049 \quad 0.1875 \quad 0.386 \quad 0.3515 \quad 0.026) \times (1 \quad 2 \quad 3 \quad 4 \quad 5)^t = 3.118 \qquad (25)$$
$$N_3 = S_3 \times V^t = (0.052 \quad 0.176 \quad 0.294 \quad 0.234 \quad 0.244) \times (1 \quad 2 \quad 3 \quad 4 \quad 5)^t = 3.442 \qquad (26)$$
$$N_4 = S_4 \times V^t = (0 \quad 0.013 \quad 0.341 \quad 0.551 \quad 0.095) \times (1 \quad 2 \quad 3 \quad 4 \quad 5)^t = 3.728 \qquad (27)$$

In summary, the investment risk comprehensive evaluation value of the project is 3.5, which indicates a relatively high risk level of the project. The risk comprehensive evaluation value during the decision-making stage is 4.01, which is relatively high. The risk evaluation value during the design stage is 3.118, which indicates a middle risk level. The risk value during the construction stage is 3.442, which is relatively high. The risk evaluation value during the completion stage is 3.728, which indicates a relatively high risk level. Overall, this engineering project faced a serious risk of loss. Therefore, it is significant that manager should enhance identification and prevention of risk, assess risk level regularly and adjust risk management strategy.

4 Risk Analysis
4.1 Analysis of risk in planning stage

In this case, the project is mainly faced with the risk of financing, agent construction contract and feasibility study during the planning stage. And risk level of the three risk factors is much higher than other factors. Therefore, the project managers must attach great importance to risk during this stage.

1) Manager should grasp the progress of the work and check the relevant information frequently. Identify potential risk and associated incentives so that they can timely adjust management decisions before risk arising to avoid the occurrence of it.

2) The risk of agent construction contract may influence the later engineering investment, quality, progress and cost. So the collection of related information should be done before the signing of the contract. Analyze the upper limit of investment, cost and process so that we can sign contract within the range of ability. In addition, the relevant professional and legal personnel should be invited to review the

contract ensuring that the content and conditions of the contract are complete and clear.

3) Choose professional personnel in the field to carry out the project feasibility analysis, and take the environment, policies, funds and their capacity into consideration.

4) Financing is a big problem that many projects will encounter. During this process, we should choose investors who have a good reputation and sufficient capital to avoid a series of risk in later stage due to funds appropriation problems.

4.2 Analysis of risk in design stage

Design risk and coordination risk is the main risk in the design phase. The level of other risk is relatively high, but is still within control. For example, the demolition risk, the risk is so small for this project that can be ignored.

1) When the design agency develops design drawings, they should do works based on the needs of investors and users to avoid the risk of rework. In addition, choose design personnel that are of good reputation and investigate their past works to find out whether they meet the requirements.

2) The project management agency reaches a cooperative relationship with other main units during this stage. Therefore, it is important to choose suitable contact person in order to ensure the smooth cooperation between the various subjects.

4.3 Analysis of risk in construction stage

The construction environment of the project is very special. The project is carried out in the streets that have lots of vehicles and pedestrians. Therefore, the main risk of the project is safety risk around construction site, construction progress risk, cost control risk and quality risk.

1) For the problems of safety around construction site, the project managers can choose protection tools of good quality and inspect the problems of safety around construction site regularly, and arrange safety education for on-site construction personnel.

2) Regularly check the progress of the project to prevent the project duration. But due to the outdoor work, the construction progress is mainly influenced by the weather. Therefore, prepare good rain proof engineering to ensure the project carried out smoothly in case of rain work rush if weather may have a great influence on the project.

3) For cost control, regularly review the cost of the project. Choose suppliers that are cost-effective to save cost for the investors. If the cost is expected to exceed the initial investment amount, make sure you communicate with the investors as soon as possible.

4) Maintain good communication with supervision agencies to get information of the quality of the project timely. Take remedial measures immediately once the project is found out to be unqualified.

4.4 Analysis of risk in completion stage

The main risk during the stage is the project settlement risk and contract management risk. To avoid the risk, the project manager should take good communication with investors and timely finish the project settlement. Classify all funds from the beginning of the project in case that there is need to provide proofs when there is a dispute.

5 Conclusions

This article builds the project agent construction risk management system from the risk identification, evaluation and prevention. Research of risk identification is already very mature. Methods of risk identification are so comprehensive that can meet the needs of risk manager. Compared with former research, this study identifies risk from different point of view. This paper identifies the risk project construction agencies are facing from the point of view combining the level of risk and the stage of risk. Research on risk assessment is difficult. We use fuzzy measure methods to assess risk since risk is unable to measure accurately. Therefore, the risk assessment method has the need to be further developed. This paper chooses risk assessment methods that are of good operability and reliability. This paper discusses risk prevention from two aspects, one is risk level and another is stage of risk, hoping we could develop more thinking about the direction of risk management from different views.

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Study on Social Media Coverage and Management Mechanism in Emergency Events: Case Study of Weibo Coverage on the Wuhan July 6th Torrential Rainfall

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Abstract: The social media here refers to the internet-based platforms, on which the internet users generated content and relationship can be exchanged interactively, including blogs, podcast, WeChat, Weibo, etc. In nowadays information age, social media has been playing an influential role in every aspect of people's daily work and life, historically changing the way they receive or publish information. Especially in coverage of emergency events, social media has become one of the main channels for information generation and dissemination due to its unique propagation characteristics and extensive power. This journal is aimed to explore the reporting characteristics of social media and management mechanisms in emergency events, by studying the case of Weibo coverage on Wuhan July 6th torrential rain.

Key words: Social media; Emergency events; Wuhan July 6th torrential rainfall; Management mechanism

1 Introduction

Between July 5th to 6th 2016, another round of heavy rain poured down in Wuhan, following the attacks of continuous heavy rainfall the week earlier and it became the last straw that had completely paralyzed the entire city transport system. At 7:00 am on July 6th, the heavy rain had caused traffic gridlock in most areas of the city of Wuhan, leading to the emergency shutdown at a number of major roads and subway stations, with more than 180 roads impassable in the city due to the consequent waterlogging. According to the official data issued on CCTV, this disastrous continuing heavy rainfall is the most severe one since the year of 1998, and it had been reported as "a fifty years rare one", for the highest rainfall in city area is claimed to be over 330 mm. Immediate attention from all over the world had been drawn to Wuhan, as well as that from the general public in the city.

At the same time, a plurality of correlation Weibo accounts in a timely manner set on line at the first moment, by publishing inner-city traffic conditions, cancellation or delay of airline flight numbers and train trips, residential areas with water and power lines affected in urgent need of assistance and other real-time transfer of personnel message, all these had effectively complemented the reporting absence of traditional media, by acting as one of the main information channels during the torrential rain.

According to Cohen (2009), social is a short-form news platform that provides audiences with news, links and witnessing of events by various first-hand accounts. On this networked platform that both individuals and organizations participate by publishing and reposting micro-blogs, according to their interest or their judgments of the news value contains in a message.

As the dominant micro-blogging website in China, Weibo provides users with a online platform that delivering no more than 140-character messages, following, commenting, reposting, clicking thumbs-up, etc., and all the facilities of the website has been re-constructed with a series of unique features according to the Chinese tastes (Li, 2011). According to Li, Weibo has made it much easier for anyone to participate in online reporting whether they are directly involved, or just reposting the news, or critically engaging with it.

Although many scholars have been looking into social media and the coverage of news events on Weibo in recent years, the gap that left to be discovered, however, is the coverage of emergency events on Weibo, the analysis of its reporting characteristics and the management mechanism. Therefore, this is the subject that will be specifically look into as following.

2 Reporting Characteristics of Social Media

Faced with this unexpected natural disaster, social media has been given full play to its reporting characteristics, which has mainly been shown in the following three aspects: immediacy, three-dimensional, and interactivity.

1) Immediacy

Social media published reports at the first moment as the event occurred, and continued to follow up on it in real time.

As the most widely used micro-blog site in China, Weibo inherited the fast, convenient and consistent propagation characteristics of social media with on-time and up-to-date information, including residential area wall collapse evacuation, emergency shutdown of subway stations due to intrusion, certain regional traffic warning, different regions proposing different ways to go through, etc., hence to alert the public to travel safety and maintain personal security (Pu, 2013). Especially during the rush hour period, some of the major Weibo accounts updated in quite an intensive frequency of every three minutes, providing information of water sections and bypass solutions for the citizens.

Because of its immediacy, Weibo could therefore respond flexibly to the public in the face of various influences caused by torrential rainfall in Wuhan, and therefore they could handle the situation properly.

2) Three-dimensional

The three-dimensional nature of social media is mainly presented in the form of reports, whereas the information is presented sensibly in a perspective way.

As it can integrate a variety of media forms of communication social media, Weibo is capable of collecting text, pictures, audio and video in one, and by adding a hyperlink in publishing and streaming content, relevant information resources for effective restructuring, breadth of coverage and to extend the validity of depth, so as to achieve a more comprehensive dissemination of results, according to Li (2012). You can see, Weibo on this storm reports, regional and rain close-up of the situation at the scene, pictures and videos had occupied considerable space, with picture, sound and influence of intuitive feelings brought to the public whereas the traditional media cannot match.

100 original Weibo messages posted by verified users between 8a.m. to 11a.m. on July 6th 2016 has been randomly selected and categorized according to the multimedia content contained. The research result is shown in Figure 1.
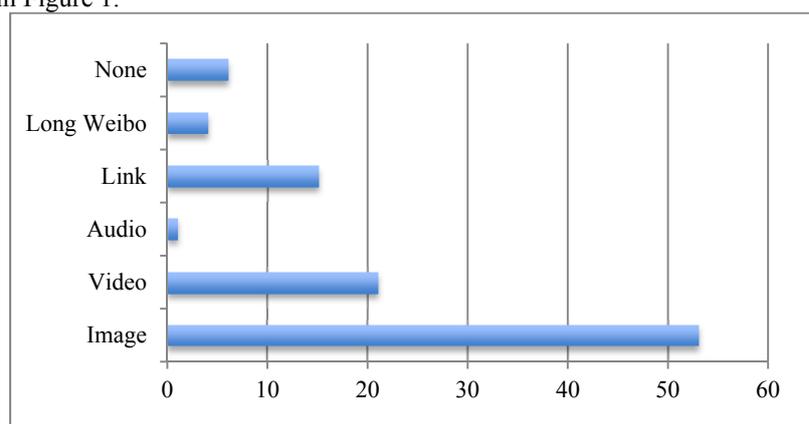
Figure 1   Multimedia Contained in Coverage

Based on the three-dimensional nature of social media, the three-dimensional perception built up by the public facing the extent of the impact of heavy rainfall had further strengthened the dissemination of results.

3) Interactivity

The interactivity of social media works especially in building up an online exchange, real-time interactive network platform between government departments and the public.

As social media has supported information publishers and readers with instant online communication capabilities, in addition to communicating accurate and timely information to the public outside, as Dencik (2012) mentioned, Weibo also plays as an exchange bridge between the government departments and social conditions and public opinion, and guides online public opinion direction. Weibo official information released by means of forwarding and receiving the informed user comments and other features, also provides feedback and additional information to help people in need to build a convenient communication platform (Li, 2012). This mode of transmission, on the one hand, is conducive to the cross complementary practice of social media and traditional media reports, it is also largely conducive to the transmission of information to achieve the integration; on the other hand, Weibo provides a reasonable channel by achieving the effective two-way communication for public utterance

on the storm events.

The selected 100 original Weibo messages have been categorized according to the interactions in coverage. The research result is shown in Figure 2.
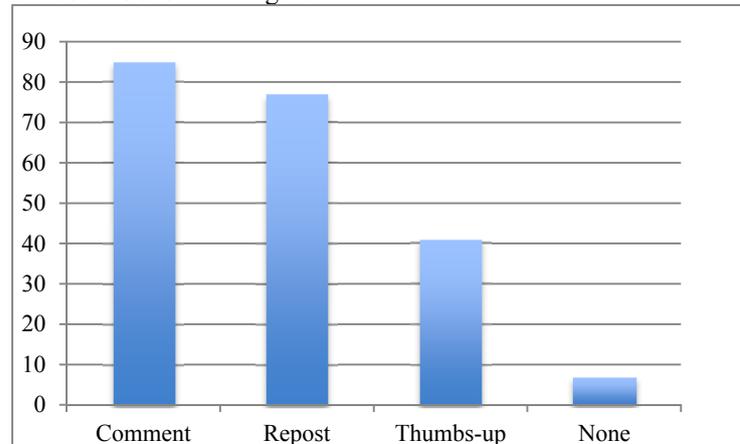
Figure 2　Interactions in Coverage

Interactive social media in the coverage of the incidents was particularly fully expressed, and the public could communicate on relevant topics of torrential rain, express their feelings and offer advice on taking timely countermeasures.

3 Management Mechanism of Social Media in Emergency Report

1) In today's society, social media in emergency management mechanism report fully reflected in the government and the media is interdependent and indivisible. According to Pu (2013), in all types of emergencies, governments at various level need the media to inform the public of the relevant information, and correctly guide public opinion, the media relies on official government channels to get news resources to meet the public demand for information. Thus, management is the essence of social media with regard to its supervision and regulation, and the guidance and control of its report content, report mode, transmission range.

The rapid development of social media, can be called as the network public opinion barometer, but in emergencies reports, the government is still the most authoritative and reliable source of information. As Guo (2010) pointed, due to the fact that certain range of social impact often brought forth by unexpected events' conflicting, abnormal and special nature, therefore, the necessity for the government's role in both guiding social media coverage and public opinion and controlling the boot, cannot be ignored.

2) The management mechanism of social media enables its full coverage feature, including immediacy, three-dimensional and interactivity, etc., and fill the gap of traditional media coverage, hence increasingly becoming an important part of unexpected incidents reporting (Li, 2011). Unlike the traditional media that needs to get first-hand source of information from government departments or professional bodies, social media allows users to customize individual message spreading before being untreated or confirmed. In addition, the impact of treatment processes and other content to convey to the public, the government also relies on social media to gather feedback feelings of public opinion, brought together the people, in order to better perform government functions (Liu, 2013). It could be seen that social media is an unexpected event in the release of information, coordination and supervision of various departments handling, and network output port of public opinion in the speed of information dissemination, breadth, reliability aspects have occupied an important position.

3) The management mechanism of social media is reflected by means of information technology platform to fulfill the functions of supervision and management with strict control and filtering false information. As Liu and Bian (2013) mentioned, media life lies in authenticity and objectivity, but also in the proper meaning of the social media community property itself. In cases of emergency, the public mostly shows panic and herd mentality, more likely to be swayed by false information and rumors. Meanwhile, the lack of public information about the ability to filter filtering performed, will lead the blind proliferation of false information and rumors, spread negative effect on the government emergency department for treatment process and impede social security and public order (Pu, 2013). In this case,

social media should shoulder the responsibilities of the network's constant pressure of public opinion, building public-trust, correctly guide public opinion, in the special period to help stabilize the people.

Therefore, in the emergency report to the strict supervision of social media, it should report the content, form and dissemination of reports and other aspects of the scope of supervision and management, to achieve effective transfer of real information. Specific regulatory measures can start from three aspects: Firstly, the pre-checks before the information reaches a certain propagation effects, truthfulness and objectivity strict consideration; secondly, the medium-term control, handling of false information be deleted, information publishers a serious warning; and thirdly is the late regulation to clarify the rumors, correct guidance, to eliminate negative impact on false new or rumors.

4 Conclusions

In the face of July 6th Wuhan torrential rain, this unexpected natural disaster, social media had performed as a significant part in emergency reportage, and stick to the implementation of strict implementation of relevant management mechanism. Being given full play to its own reporting characteristics, social media respond to the society with immediate, three-dimensional and interactive information that largely contribute to the emergency events reportage. Furthermore, due to the management mechanism of social media, messages published and disseminated on site have been largely guaranteed to function well.

As a consequence, though facing this "fifty years rare" rain, people in Wuhan could still be able to remain calm and handle their routine daily life well. There were no major public safety incidents during the basic maintenance and resumption of the normal production and life, and all this ensured the smooth and stable social order. Through this social media network communication platform, Wuhan people have not only overcome the difficulties caused by the weather, but also have shown the virtue of mutual help, encouraging each other and working together over the crisis.

It is worth mentioning that in following the week after the rain, a section on South Lake hardest hit video on Weibo spread, a record of this piece of land after rain gradual recovery, but also inspired people living here: "Natural disasters cannot be resisted, but time will erase it. Everything will be restored as ever, and the city is still just beautiful as before. "

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Upgrading the Platform of Making Regulation and Technical Standard in Emerging Medical Technology

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Abstract: We have conducted case studies on upgrading a system of making rules and technical standards in advanced medical area including new pharmaceuticals, medical devices, regenerative medicine and treatment, regenerative medicine tools, personalized medicine, personalized diagnosis and personalized medicine tools. Though the observation, we found four focal factors to be shaped for upgrading. (1) awareness of the important role of regulations and technical standards (2) needs of double structure in designing regulatory system (3) a system for finding targeted rules (4) continuity of activity in organizations. This paper will explain the character of four factors and will suggest an optimal design to overcome these disadvantages along with policy value chain.

Key words: Innovation; Regulation; Medical technology; Regulatory science

1 Introduction

PMDA (Pharmaceuticals and Medical Device Agency) has been in charge of approval in pharmaceutical products and the medical equipment in terms of safety and efficacy in Japan. In 2007, MHLW(Ministry of Health Labour and Welfare) in "five year strategic plan for innovative drug and medical device" declared to reduce the drug lag to the US by 2.5 years by 2011, and after the lag has been reduced, there are 1year drug lag to the US in 2016[1]. However, in global market, medical related companies, even Japanese companies, tended to apply approval to European first, then American regulatory authorization, then Japanese one. As Japanese has several innovative technologies in medical field and relatively large market in medical product, upgrading rule making system is urgent need to contribute to society's health and quality of life.

2 Precedence research and methods

2.1 Objectives

In innovative medical technology field, even if a basic study of emerging technology is completed, it sometimes does not lead to a medical product with practical use because the rule or guidance which is need for the new technology has not been created. Therefore, we have analyzed rule making policy and system comparing the US, EU and Japan in order to solve the problem. Our research conducted the case studies on emerging technologies in the field of medical devises, regenerative medicine, regenerative medicine tools and personalized medicine. Through the case studies, we extracted four problems to challenge in order to upgrade the system of rule composition in emerging medical technology. Finally, we will propose policy options for the rule composition system to solve the four problems.

2.2 Analytical methods

Through the case study of rulemaking in emerging medical technology, we used a boundary organization(BO) framework and regulatory policy value chain. BO is situated between different communities and mediates them(Guston,H.David, 1999). BO is formed when a boundary object which is a new demand, new concept, new specialty or new recognition, appears. The related stakeholders gather around the boundary object and try to mediate or bridge different communities as a working group or a consortium (T. Hellström and M. Jacob, 2003). In this case, we analyzed BO between innovators (scientists and engineers) and regulators (regulatory agency). There are information asymmetries in both sides. There are four important functions, networking, agenda/strategy setting, securing resources and organizing operating body, the BO should have when it mediates two communities smoothly (Y. Hayashi and S. Kano,2013). Our research showed the BO itself and the role of BO changed each phase of the regulatory policy value chain (Y. Hayashi and K. Shingo ,2015; Y.

Hayashi and S. Kano ,2014).
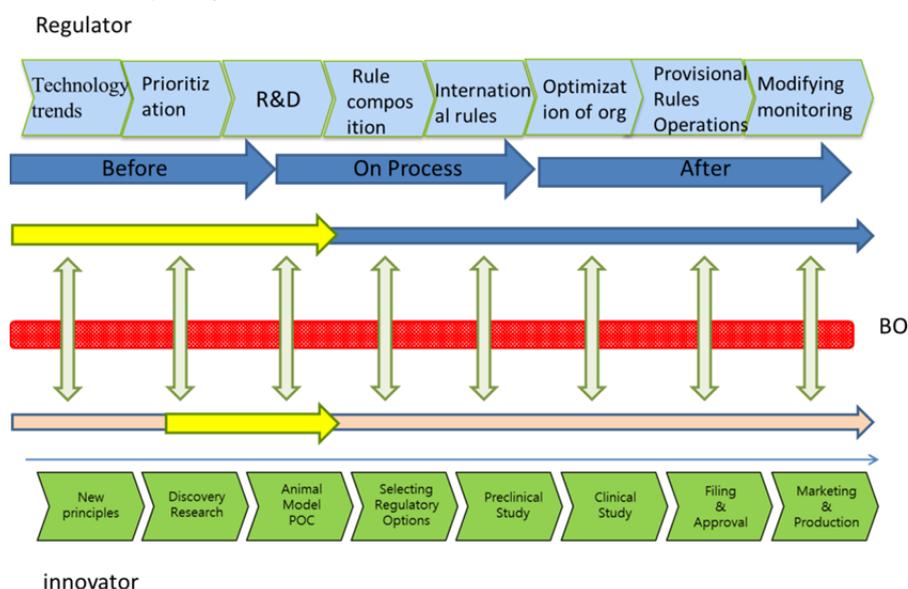
Figure 1　Policy Value Chain and Boundary Organization

3 Analysis and Results

Our case study shows that four remarkable features are disadvantages in Japanese rule making system. We will suggest policy options in light of four functions, Strategy/Agenda settings, networking, resource and operating body, of BO.

3.1 Awareness of the important role of regulations and technical standards

First focal element is "awareness of the important role of regulations and technical standards."

History of regulatory science was short and it was officially defined in the fourth Science and Technology Basic Plan which was approved by Cabinet in 2011 as "in adapting the achievements of technology to social and human needs in the most optimal way, by making precise prediction, evaluation and judgment based on evidence." Article 13, paragraph 2 of the Act to Promote Healthcare and Medical Strategy in 2014 declares importance of regulatory science. PMDA, regulatory authority in Japan, had a well-organized approval system and approval period was shorten in these days as a result of setting target review times and providing basic consideration for reviewers in websites in order to clarify the standards for review[1].

Through the case study observation, Japan's taking initiative in rulemaking of medical fields is still on the way. In ICH case, in the beginning of 21st century, Japan hesitated to take an initiative to make world rule of S7b/E40 and hesitated to incorporate the world rule to Japan. PMDA was a specialist for approval procedure, however, it was passive to rule making in an emerging technology and a new drug tends to be in approval process earlier in EU and the US than Japan. In addition, Japanese pharmaceutical market is big enough so that PMDA resource is not enough for paying much attention outside of Japan (Y. Hayashi and K. Shingo ,2015).

Making world technical standards trough ISO is just beginning and in 2013, in biochip in biotechnology field, the performance evaluation method from Japan was admitted as a new standard for the first time in ISO (Y. Hayashi and S. Kano,2014).

Regulation is as much important as innovation because regulation sometimes accelerates innovation and sometimes disturb innovation. As harmonization of the world progresses, making rules and standards become important elements of a platform of producing medical products.

Policy options are as follows;

● Related to strategy and agenda setting, it is important to continue to insist the importance of RS in government and penetrate the concept into organization and society, as RS play an important role to

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[1] "Regulatory Science/The Science Board/Standard Development | Pharmaceuticals and Medical Devices Agency." [Online]. Available: http://www.pmda.go.jp/english/rs-sb-std/rs/index.html.

make products' practical use possible on the basis of science or statistical based analysis in society.

● Related to networking and resource, RS education in university is essential. Specialists who can work in ICH, ISO and IMDRF should be nurtured to network Japan and abroad.

● As an operating body, in addition to government organization, strategy planning organization which articulate government RS policy is needed to bridge innovator and regulator.

3.2 Needs of double structure in designing regulatory system

The second character is that designing regulatory process needs double structure. A difference between regulator's science and innovator's science is less recognized. A regulatory process needs double structure of evaluation which are evaluation of evaluation and guidance of guidance. Innovator's science means "verification of the validity of the evaluation technology" and "verification of the validity of the criteria on the basis of the evaluation technology." When regulators evaluate an emerging medical technology, their evaluating index should be evaluated whether it works or not. When a technology or product is not new, there already is the evaluating index or you can adapt secondhand index from countries abroad which has approved it beforehand. However, in case of an emerging technology, there is no evaluating index. Therefore, innovator and regulator are interacting in this double structure.

In the US, through the Microarray Quality Control(MAQC) project, the US Food and Drug Administration (FDA), working with related companies and researchers, collected the evaluating data and developed the way of evaluation to make and revise evaluating index and a guidance. In Japan, in the beginning, Japan's Ministry of Health, Labor and Welfare (MHLW) and Ministry of Economy, Trade and Industry (METI) formed a working group to make a guidance for development and evaluation incorporated the US and EU guidelines for microarrays, however, there was no organization to produce evaluating data. In the meantime, National Institute of Advanced Industrial Science and Technology (AIST) joined and Biochip consortium was formed by related companies in order to strengthen Japanese companies' specified technology like accuracy. Through Biochip consortiums, data was corrected and contributed to revise a guideline for development and evaluation.
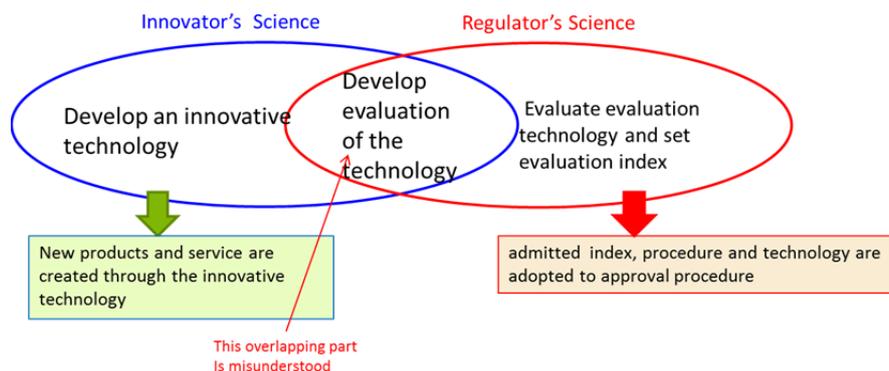
Figure 2   Double Structure in Designing Regulatory System

Policy options are as follows;

● Related to networking, collaboration between RS and IS to develop validation technology is needed.

● Related to Resource, Regulatory side needs its' own RS institute, so called Research Engine to collect data and make a database.

● At present, Japan Agency for Medical Research and Development (AMED) is providing both RS's and IS's funds together. Sorting RS's Funding from IS's Funding, and Reviewing function of AMED should be done.

3.3 A system for finding targeted rules

As Japanese government's science policy have targeted technology, targeted rules should be need in accordance with target technology in medical fields. Though Japanese government has spent large amount of budget to develop iPS cells technology, in the beginning of the research, little attention was paid to a rule making, so that it is hard to make them use as products.

MAQC projects were designated to make targeted rules for microarrays and sequencers to be marketed with safety and efficacy.

Policy options are as follows;

● Related to strategy and agenda setting, horizon scanning system should be incorporated. From an

open innovation point of view, various technology including AI and simulation model from outside should be searched.

● Related to networking and resource, innovators of companies, academia and hospital and regulators should work closely to identify problems and procedures in an agile way. One of the idea is that FDA and academic cooperation centers called Centers of Excellence in Regulatory Science and Innovation (CERSI).

● As an operating body, "Regulatory Science Center" will be established within 3years.

To have operating body, feedback and problem finding could be used for next strategy planning.

3.4 Continuity of activity

The continuity of activity related rule making is very important. Even emerging medical technologies are different each other, some boundary organizations cover several area and accomplish multitasks as HESI did. The case study in S7B/E40 indicated that "HESI could join from the very beginning "before" stage through "after" stage and could help strategic decision making. Continuity cultivated network and reliability among stake holders including regulators and enabled to make securing of research resources and organizing of operating body easier." An organization through Regulatory Value Chain has big advantage to manage each stage. In addition to the continuity of organization, continuity of personnel is also important especially in complicated medical new technology field. To communicate and take initiatives in global scene like ICH or ISO, nurturing specialists is very important.

Policy options are as follows;

● Related to all function, strategy, agenda setting, networking, resource and operating body continuous activity has a possibility to strengthen functions as case study showed.

Table 3　Summary of Policy Options

	Strategy/ Agenda setting	Networking	Resource	Operating body
awareness of the important role of regulations and technical standards	Continue to insist the concept in government policy	Specialists in ICH,ISO, IMDRF	Global specialists / RS education in Univ	Strategy planning organization
needs of double structure in designing regulatory system		Collaboration between RS and IS to develop validation technology	Regulatory Research Engine / Sorting RS's Funding and IS's Funding（Reviewing function of AMED）	
system for finding targeted rules	Horizon Scanning System	Innovator(company, hospital, Research institute) Regulator	CERSI	Regulatory Science Center, CERSI / Feedback and problem finding
continuity of activity in organizations	Continuity of BO strengthen each function			Sorting function of NIHS/PMDA/MHLW

4 Conclusions and Implications

Although Regulatory science situates opposite side of the blue sky science and it is not spectacular or gorgeous science, it is very important in terms of "adapting the achievements of technology to social and human needs with evaluation based on evidence" with safety, efficacy, speedy and continuously. Among four focal points "(1) awareness of the important role of regulations and technical standards" indicates the concept and importance of RS should be penetrated in society. "(2) needs of double structure in designing regulatory system" indicates that difference of role between innovator's science and regulator's science should be recognized. The third point, "(3) a system for finding targeted rules" needs speed, horizontal scanning and front runner's mind in specific rulemaking in addition to the conventional safety and efficacy. The last one "(4) continuity of activity in organizations" means that

organizations should utilize accumulated knowledge and resources at present and in the future.

Toward the establishment of "Regulatory Science Center" and upgrading total regulatory process, more detail of design should be explored.

Acknowledgement

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Inspirations for Innovative Public Policies in the Food and Nutrition Security in China: A Case Study

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Abstract: This paper presents an important discussion in the food and nutrition security area in China. This is a multidimensional, multilevel and an evolving concept, having a wide variety of influencing factors. At the international level, this subject has been managed by different approaches through history. Initially more concerned on supplying enough quantity, this international movement was gradually absorbing other needs in a new set of dimensions in order to combat food insecurity. This context represents a fertile field for the approach and comprehension of the policy-making process towards the complexity science, which has been contributing to the public policy field. In this framework, 'for-benefit' civil society organizations (CSO) have an important role in reaching the desirable ends, also known as the common-good, which here is considered as food and nutrition security. The paper use case study methodology with literature review and statistical analysis, with data from international organizations and indexes. The conclusion appoints that by making good use of the evolving CSOs' voluntary willingness to cooperate for food and nutrition security, the Chinese policy-makers have the opportunity to innovate, to gain scale and to improve quality, by structuring mechanisms for enhancing the involvement of the 'for-benefit' civil society organizations into this public policy, in a regulated and participative manner.
Key words: Food and nutrition security; Public policy; Complexity science; China

1 Introduction

The ideas concerning food and nutrition security (FNS) have been changing in each context along history. After the Second World War along with the creation of the United Nations (UN), this matter was brought to the international level and involved an unprecedented number of actors. During this period, the international arena suffered strong influence from the Cold War bipolarity and had the theme of FNS managerial roles focused in food quantity and food aid, under a bargaining approach in alignment, for instance, with the United States policies.

The outcome of such articulations along with the 'world oil crisis' in the decade of 70's seemed to result in certain instability in the international system, leading to the so-called 'world food crisis' during the same decade due in particular to a growing population demand. This crisis gradually stimulated the participation of the civil society in the UN conferences, held by different agencies on distinct topics, with high incidence and audience in the 1990's. All these movements were relevant for the enlargement of the discussion of the FNS theme, and the increase of the actors' diversity in this area; thus, new ways to deal with a new set of dimensions in order to combat food insecurity were developed.

Regarding China, the main focus of this paper, the history of FNS governance is commonly divided into three moments: the first period refers to the old regime of command and control, between 1949 and 1977. The second one refers to an intermediate regime of mixed instruments, between 1978 and 1992, and the last one, it refers to a new regime of regulatory governance, between 1993 until the present days.

Nowadays, with over 240 million farmers, 1 million processors, and other millions of distributors, China has been promoting several changes in the public policies for FNS. In the last decade, major changes in the public policies were done according to the Food Safety Law (FSL), approved in 2009, as well as an institutional reform that ended in 2015 which shows the dynamism and emergence of the needs for improving the FNS in the country.

Despite this there has been a growing curve of concerns about food security, there is also a strong feeling by the society that the present conditions may improve in the next five years. According to a recent survey performed by the Pew Research Center (2015), 43% of people believe in this positive trend, making the level of confidence being only surpassed by the corruption combat policies, with 63%.

One of the factors for this optimism is related with unprecedented levels of investments to support the agro-food sector. However, the challenge to manage scale persists, considering the complexity to develop a common regulatory framework that effectively integrates numerous actors across multiple

levels of governance with highly heterogeneous circumstances (Yasuda, 2015).

Many achievements were made towards food production and hunger combat, making the country comply with international commitments. However, China faces a paradox: while food quantity has been provided closely to sustainable levels, the country remains with the biggest global undernourished population and at the same time, it has to face problems about overweight and obesity among children, which almost doubled in a decade (X. Zhang, van der Lans, & Dagevos, 2012; Y. X. Zhang, Wang, Zhao, & Chu, 2016).

This paradoxical relation, once again, elucidates the complex environment to improve the FNS policy, which has been highly affected by food hygiene, unsafe food, and poisonous food scandals, usually generating a widespread panic at the society, influencing in a decrease of social trust, and the feeling that the risk for food insecurity is omnipresent. Recent mass media coverage on such scandals has been both informing and alarming the population, making the food safety topic more common in the ordinary conversations in daily life.

The evolving characteristic of the FNS concept and the macro-environment trends in China also demands long-term planning, mainly related to the growing rural-to-urban migrations and the progressive loss of rural workforce, besides the more demanding consumer behavior, which tends to gradually value more certified and green products.

Aiming to keep high levels of self-sufficiency in food supply, the government has been providing investments in the development of agriculture projects and research, placing the country as the world's largest and decentralized research and development (R&D) public system over the matter (ASTI, 2012). While food production is being enhanced through technological developments, the country has also been establishing partnerships in Africa and Latin America for leasing or buying arable lands.

There are difficulties everywhere. In the rural areas, difficulties in the public policy's operational roles have been indirectly stimulating the formation of 'self-governing social organizations' to fulfill these gaps. 'Self-governing social organization' or simply 'civil society organizations' are self-organized groups characterized by voluntary participation, relative autonomy from family, market and state; and capacity for collective action to advance common interests" (Anheir, 2013).

As the number of this kind of civil society organization (CSO) in China has been increasing since last decade, the present paper analyzed that this actor has been able already to bring positive effects to the public policy, even not having their roles clearly defined in the public policy yet. One example of this cohesion is the fact that family farming co-operatives, rather than isolated peasants, has been promoting a healthier and more sustainable food production, using fewer levels of highly toxic pesticides, and delivering a better quality product to the stakeholders.

In the urban areas, the risks at the processing and consumption levels have direct relation with the food poisoning occurrences. The small family businesses still represent a great share of the food shops, and while they have difficulties to converge with the sanitary demands, they have in these ventures the base of the household income. Another risk emerging at the urban centers is regarding overweight and obesity, which has been steadily growing since last decades, reaching levels that give evidences that public policies have failed on predicting the phenomenon and acting preventively.

While China has been evaluating the results of the latest version of the food safety reform, and has been working in enhancing the public policy to face the evolutionary pressures of this matter, more investments have been done for supporting this process. The challenge to enhance effectiveness in the management processes of those policies represents an opportunity to innovate and to generate a civil society enrollment with the propensity of establishing voluntary actions.

This would represent an adjustment of strategies and innovation in the Chinese public policies in the issue of FNS, which seems to demand detailed planning and experimentation, despite giving a constructive answer to the emerging self-governing social organizations about their roles, in particular in the rural areas.

2 Literature Review

Two key concepts are relevant to structure the methodology of the present paper: the definition of food and nutrition security by Gross, Schoeneberger, Pfeifer, and Preuss (2000), and the complex framework for public policy, by Colander and Kupers (2014). This combination elucidates the complexity and the evolving characteristic of the FNS and call for the enrollment of the civil society for the success of public policies.

For FNS, Gross et al. (2000) divided the concept into four dimensions: food availability, access to

food, utilization of food and nutrients, and stability, which is a transverse dimension to the other three, as can be seen below:
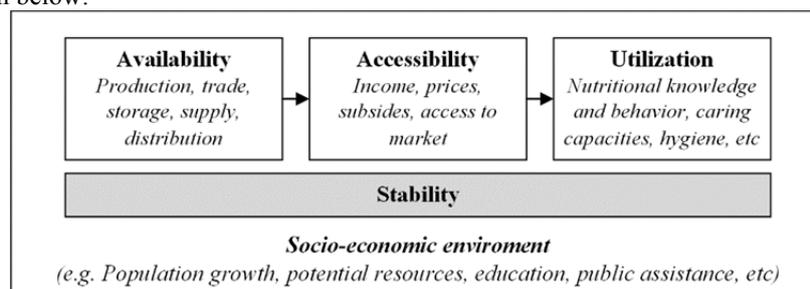
Figure 1 Four Dimensions of Food and Nutrition Security
Source: Based on Gross et al. (2000)

First of all, it is necessary to ensure the availability of enough food for the whole population, including food production, national and international trade, besides food supply and distribution. The access, therefore, is only accomplished when everyone is able to reach food physically and economically, in an acceptable social way, which includes, buying, exchange or hunt.

The utilization of food and nutrients has two different perspectives: the biological and the social aspects. According to Gross et al. (2000), the biological dimension refers to "the ability of the human body to ingest and metabolize food. Nutritious and safe diets, an adequate biological and social environment, a proper health care to avoid diseases ensure adequate utilization of food" and the social perspective cover the nutritional knowledge, choices and eating habits, and the social role of food in the family and community.

At last, stability refers to the time element of the three conditions mentioned above. Problems in the availability, accessibility and utilization of food can be chronic, seasonal or transitory, which has important considerations for the definition of actions, both relevant to the strategies adopted by households or for the public policy.

Furthermore, according to Gross et al. (2000), to comprehend the determinants and consequences of the FNS and its conceptual guide framework for management of public policies, a broad range of social organization levels must be considered. They argued that these levels come from the individual and the household (micro level) to the global levels (macro level).

The wide, evolving, multilevel, and multidimensional characteristic of the FNS concept converges with the complexity framework for public policy, from Colander and Kupers (2014). This frame is inserted in the so-called 'complexity science', which emerged in the fields of physics, mathematics, and biology, but was largely propagated with the computer revolution, during the 1970's and 1980's. Some of these fields were important at this initial phase to include the evolutionist character to the science, because they address the continuous change in social systems. Fewer theories in the social sciences, however, are evolutionary. For a theory to transcend the level of general system change to discuss the level of the exact workings of change, it should focus on the dynamic and temporal dimensions of change; emphasize the selection variables; focus on adaptive processes; and recognize change as a process that is both contingent and path-dependent (Kerr, 2002).

Instead of modelling the public policy as a set of equations as standard science does, complexity science models a system of the general issues the standard science has been lacking a proper model because the matter is simply too complex, too intertwined, to be captured by a set of solvable equations. This does not mean that informal models cannot be used, instead there are many that are consistent with the complexity vision, especially with genetics, evolution, and biology.

The same tendency can be related to the complexity science on the public policy, as the areas may present higher or less degree of complexity. The economics has already developed indexes in the complexity science, such as the 'Economic Complexity Index' (Hausmann et al., 2014), promoting diversified tools for analysis. The complexity economics converges more with strategy, and archetypal constructions, like the artificial stock market, for example.

While the complexity economics has already a vast literature, the complexity frames still relatively new in public policy. However, from the late 1950's, authors like Lindblom (1959) were already criticizing the 'rational comprehensive method' of policy-making: "no one can practice the rational comprehensive method for really complex problems, and every administrator faced with a sufficiently complex problem must find ways drastically to simplify". In this sense, the development of public

policy is a very complex process without beginning or end and whose boundaries remain very uncertain, especially in the case of FNS, as its concept is complex by having the multi-actor, multi-level and evolving characteristics. This diversity assumes that the matter is inserted in a system that cannot be controlled. In this perspective, the government role is not isolated in a top-down approach, but focusing on counting on the civil society to evolve the policies themselves (Colander & Kupers, 2014).

In this sense, the governmental policies are best thought as operating in an ecostructure space where institutions are designed to stimulate creativity and bottom-up initiatives with formal goals and objectives. These goals are not to focus on any specific ecostructure, but to let the ecostructure to emerge, adapt, and to evolve, including governmental changes.

In this framework, the discoveries of the small tweaks in the government operational systems would help them to be more feasible, reducing potential failings (Colander & Kupers, 2014). The cyclical diagram below illustrates the ideal model of this ecostructure under the complexity framework for public policy:
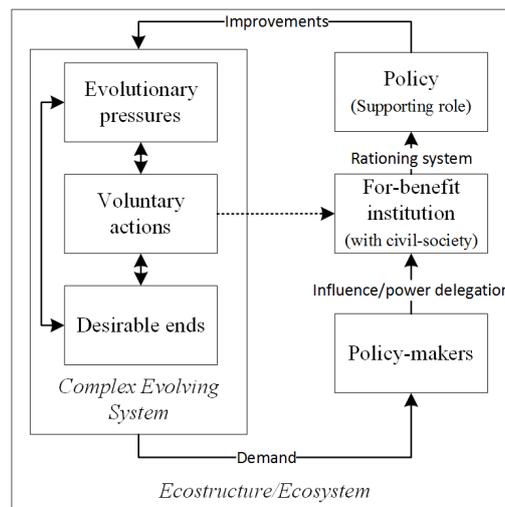
Figure 2   The Complexity Framework for Public Policy
Source: Based on Colander and Kupers (2014)

The complexity framework introduces the realization of policy's goals, which emerge from bottom up and is not imposed. The complexity of these policies is a continuous exploitation of emerging goals and means, all together to achieve their objectives; thus, the complexity framework engaging widely is not only logical but also essential. For this reason, interactions between policy makers and other stakeholders are equally crucial. Community engagement, stakeholder management, and consultation are complementary to the policy making strategies.

In this context, Colander and Kupers (2014) argued that in the policy part, the debate is not either government or market, but the main role of the government to structure the ecosystem. The authors continuing arguing that the ecosystem involves a combination of both bottom-up dynamics, and top-down influence, besides the central issue of the social policies, namely how they can influence themselves.

The policy-makers, then, need to enhance the government's moral strength, in order to continually work on managing these evolutionary pressures, aiming to guide them towards a desirable end. Thus, the signs of an ecostructure able to maintain equilibrium in this perspective seem to be a result of voluntary actions, meaning less influence or control of the government and more influence of the society. In this sense, this complex evolving system shall generate a demand to the policy-makers, who can influence the general ecostructure by only capturing this voluntary willingness to cooperate based on the social goals that have not been met yet.

In order to make good use of this willingness, the government, by delegating many of its coordination roles to other collective institutions shall reach a rationing system for improving public policies. As it was done in the past, the encouragement of corporations, nonprofits, and other institutions come to fulfill collective choice problems. However, the ideal structure under this scheme seems to be the 'for-benefit' institutions, which are legal structures that complement the current dichotomy of for-profit or for-charity structures, and catalyze an ecosystem that is more conducive to people

developing their social nature, rather than just their materialistic nature. 'For-benefit' institutions are those which are invariably composed spontaneously and structured by the civil society, composed of emergent associations, organizations and movements directly attuned to societal problems and able to connect and amplify to the public sphere (Habermas, 1996).

Reaching this rationing system with the CSOs, the delegated for-benefit institution shall work to be budget-efficient, maximizing as much as possible the social return, generating a supporting role to the public policy in this evolving ecostructure – not designed to control the system.

The cycle reaches the end or the new beginning with improvements in the public policies, which have diversity among their characteristics. This diversity drives novelty and innovation and in an appropriately diverse system, improvements shall emerge without being imposed or planned by anyone. These changes in public policies that affect the ecostructure are called by Colander and Kupers (2014) as 'metapolicies', which consider that individuals can solve social problems from the bottom up with far less direct government involvement.

In general, policy theories based on a multi-actor approach are necessarily more complex than theories in situations dominated by one actor or by a tight group of actors. This multiplicity brakes the linear theory on the causal relationships in the policy field, and evolve a diverse set of networks with stakeholder organizations, which relate to the different possible intervention variables in order to be taken into account.

At last, the complexity framework for public policy offers some significant low-cost measures, but demands experimentation, assuming that historically there are success and failures over these attempts and the complex interconnections between activism and laissez-faire seems to be pro-market, pro-social and pro-environment at the same time. To deal with these interactions, the present supervision and management system for FNS in China was restructured between 2003 and 2015, reaching the following:

Figure 3   Food Safety Supervision and Management System in China
Source: Chen, Wang, & Song (2015, p. 2208)

The system illustrated above shows the responsibilities distribution on the national level, but one of the biggest difficulties remain to promote a coherent scale management strategy. According to Yasuda (2015, p. 747), "the country's food safety regulatory system has evolved largely in reaction to crisis". The author adds that the four dominant strategies of scale management currently employed are failing: "the use of coordination bodies, locally directed model production bases, food safety campaigns, and regulatory segmentation". For him, "each policy encounters different challenges: for coordination bodies, the problem is local integration; for model production bases, the challenge is national integration; for campaigns, the shortcoming is poor institutionalization; and, for regulatory segmentation, the problem is policy diffusion".

The chain effect on the communication management and the frequency of the changes on the public policy, including the regulation, affect directly the stability dimension on the FNS concept. It demands time and resources to train the personnel in its thematic varieties and at all levels that the policy presupposes. According to Yasuda (2015, p. 749), this multi-level harmonization process is affected by "the sheer size of China's bureaucracy results in weak monitoring practices that, in turn, give rise to corruption and other pathologies of governance". These side effects tend to be felt in a higher degree where there is greater distance from the driving force of the public policy, raising awareness for the main inspection services at the county level.

While the FSL brought definitions on the responsibility of related governments, and enhanced the communication and cooperation within them, the influence of the old segmented supervision system still obfuscates certain responsibilities, especially in small food workshops and vendors. The mechanisms for sharing information between departments often fail. Therefore, the resource allocation is often not appropriate and results in wastage of facilities and a shortage of professional inspectors is detected. In this sense, the relationship between central governments and local governments requires further clarification in order to become more clearly defined. Besides that, media, consumers and third parties do not play an important role in supervising the management authorities if compared to systems from other countries (Jia & Jukes, 2013).

The civil society participation into the FNS public policy may not be important so far, but it is possible to observe successful experiences. In 2011, for example, "the Ministry of Health[1] announced 21 new food standards, including maximum mycotoxin levels, pesticide residue limits, and blends with the food additives. The food safety standards also solicited and took opinions from food producers, traders and consumers before enacting" (MOH, 2011a,b apud Jia & Jukes, 2013, p. 239).

Another evidence of the contribution from social organizations comes from the investigation conducted by Zhou & Jin (2013). They surveyed 507 vegetable farmers in Zhejiang province to analyze the use of highly toxic pesticides. Among the findings, "vegetable farmers who received less training and selected handlers as their marketing channel had a tendency to apply highly toxic pesticides and cooperative members were less likely to be highly toxic pesticide users". This suggests that the public policy must go beyond the improvements of detecting systems to quality control, but also involve the farmers in educational and training programs to enhance the knowledge of safe vegetables and highly toxic pesticides.

The civil society enrollment through supported organizations can also support the scale reach for the agricultural production bases (*shifan nongye jidi,* hereafter APB), which has been working with 24,600 hazard-free production bases, 593 central-level demonstration zones, 100 demonstration counties, and 3,500 provincial-level demonstrations zone (China, 2007). According to Yasuda (2015), decentralizing regulatory control using the locally directed model of APBs addresses the scale problem in the way that "regulators do not need to develop a complex national law and instead can delegate regulatory authority to local governments. As a matter of governance, decentralization encourages local innovation and intergovernmental learning. Inspectors benefit from local knowledge and are able to identify non-compliers".

The author later details how each APB unit can enhance FNS and the management of scale by appointing that "the solution to the scale problem via decentralization foregoes an integrative approach from the top-down, and instead builds effective governance from the bottom-up. […] Aggregating farmers in a base enables regulators to conduct inspections regularly, whereas regulators typically must spend over a week to reach farms scattered around a single village" (Yasuda, 2015, pp. 755-756 emphasis added).

The Chinese Government recognizes the challenges on FNS, which are reflected in the last 5-year plan on national food safety control systems (China, 2012). In the document, ten key areas are identified for further improvements: laws, regulations, and standards; surveillance and assessment; inspection and testing; processing control; export and import food safety control; emergency management; comprehensive coordination; scientific support; food safety integrity; education and training.

3 Methodology

The present paper is inserted in a broader research comparing the case studies of China and Brazil regarding the historic evolution of the public policy for food and nutrition security. This specific paper brings relevant findings focused on the Chinese case study, analyzed in light of the complexity science regarding its logical and conceptual structure. The methodology was based on literature review from books, articles, and reports; besides statistical analysis with data from international organizations and indexes.

Firstly, the literature review started from the definition of FNS, by Gross et al (2000), and the historic approach for the matter in the international level, inside United Nations system, mainly through the detailed work of Shaw (2007). The literature review for the case study of Brazil, despite of not being detailed in the present paper, was relevant to have an additional reference for establishing comparisons,

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[1] The Ministry of Health (MOH) was dissolved and become part of the National Health and Family Planning Commission (NHFPC) in March, 2013.

allowing a deeper comprehension of the Chinese system peculiarities.

Secondly, the literature related to the complexity science was absorbed from areas such as economics, and public administration, until reach the field of the public policy with Colander & Kupers (2014). This demanded more literature review related to the CSOs roles in the public policy, made with UN agencies reports and contents from Anheier (2013), who also indicated the possibility of using statistical analysis for measuring the civil society enrollment in the public policy[1].

Thirdly, the case of China was studied through books, articles and reports since 1949, but the last decade was focused for the present paper. In this sense, the main contributions came from Zhou & Jin (2013), Wu & Zhu (2014), Yasuda (2015), Chen, Wang, & Song (2015), P. Liu (2010), and Yan (2012), despite Pesqué-Cela, Tao, Liu, & Sun (2009) with the specific outlook on the CSOs in the country.

Finally, international indexes related to the CSOs enrollment in the public policy, such as the Civil Society Index (CSI), and the Bertelsmann Stiftung's Transformation Index (BTI) were studied. The CSI would be the ideal index for establishing statistical analysis, but it does not offer comparative or a time-series measures, mainly by considering qualitative aspects that are not easily reached in a high frequency. To overcome this limitation, the present paper has analyzed such index and found that the BTI is part of the CSI in more than one dimension, and can also be used to measure the civil society enrollment in the public policy. The BTI was disassembled and 27 of the total 52 indicators were regrouped into three big dimensions: political transformation, economic transformation and management transformation[2], reaching a new index, called here as 'CSOs enrollment in public policy', which was correlated with food and nutrition security data from FAO. The results of this last step were significant to confirm the last 10-year evolution of this relation, as already identified through literature review.

4 Findings

In China, it was identified a relative low degree of civil society enrollment in this public policy, but with an on-growing movement, as some experiments has been held recently with positive results, such as the recently extinct Ministry of Health planning new food standards with food producers, traders and consumers in 2011 (Jia & Jukes, 2013). The finding that rural co-operative members are less likely to use highly toxic pesticide rather than other users (Zhou & Jin, 2013) also shows that collective social or communitarian organizations are willing to contribute more to FNS.

The detailed study by Pesqué-Cela, Tao, Liu, & Sun (2009) is another evidence in this sense. The authors called the attention for the emergence of 'self-organizing social organizations' as one of "the most significant yet unexplored developments in rural China". The authors define 'self-governing social organization' as meeting each of the following criteria: Firstly, they are not initiated and sequentially controlled by any of the local Party-state agents. Secondly, local Party and government officials do not participate in the decision-making processes of these organizations. Thirdly, their heads are not appointed by the government and do not concurrently hold a post in the local Party-state apparatus. For this paper, this type of organization is approached to the CSOs for parameterization of the concepts and contents.

Pesqué-Cela, et al (2009) found out that these organizations have been "playing an important role in the provision of local public goods and services". This recent phenomenon was motivated by a high level of distrust with local government officials, "largely for their unwillingness or inability to provide

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[1] Although the complexity framework for public policy (Colander & Kupers, 2014) is relatively new and the dimensions of complexity are not easily subjected to formulas and statistics, some authors have been working on a contrary perspective, pointing out that building local capacity for analyzing civil society is a key to its future strength. One of the references in this perspective is Anheier (2013), who developed the conceptual and methodological framework for an 'index system' to measure the civil society development based on the so-called 'Civil Society Diamond' (CSD). This has been an on-going process that started in 1999 with the initiative from the 'World Alliance for Citizen Participation', also known as CIVICUS, which maintains the 'Civil Society Index' (CSI) until nowadays.

[2] In **Political transformation**: Basic administration; Effective power to govern; Association/assembly rights; Freedom of expression; Separation of powers; Civil rights; Party system; Interest groups; and Social capital. In **Economic transformation**: Socioeconomic barriers; Banking system; Anti-inflation/forex policy; Macro-stability; Social safety nets; Equal opportunity; Output strength; Environmental policy; and Education policy/R&D. In **Transformation management**: Structural constraints; Civil society traditions; Conflict intensity; Policy learning; Policy coordination; Anti-corruption policy; Consensus on goals; Cleavage/conflict management; and Civil society participation.

public goods and services". The villagers might attempt to participate in this CSOs as an alternative to "serve their own and community's interests, independently from the local Party-state".

The authors (Pesqué-Cela et al., 2009) adds that presently there are unprecedented opportunities for citizens to associate and play an active role in community affairs outside the government or Party in China. The aim for these CSOs is not to challenge, nor to complement the local state, but to autonomously assume some of the functions and tasks that the local state does not perform as required or expected. "The main points in this direction are the excessive tax burdens, widespread official corruption, land expropriation without proper compensation, and the deterioration of the environment". It is also found that "lineage structure, inter-lineage rivalry, intra-lineage cohesion, and labor out-migration" have statistically significant effects in villagers' participation in such CSOs in the village level.

The data compilation resulted in the following chart. The result for China counts on an increase of 5.6% between 2005 and 2014, and for 2015-2016 remained the same from the previous biennium. This shows that the CSOs has been gradually achieving more roles in the Chinese public policy. Another relevant aspect is that between 2014 and 2016, China is the only BRICS member-state that has not decreased the CSOs enrollment in the public policy, remaining stable. All the other states have reached results in the biennium 2015-2016 that are inferior if compared to the level verified a decade before, in the biennium 2005-2006, what puts China in a very special position, as are not following the international tendency inside this particular political bloc.
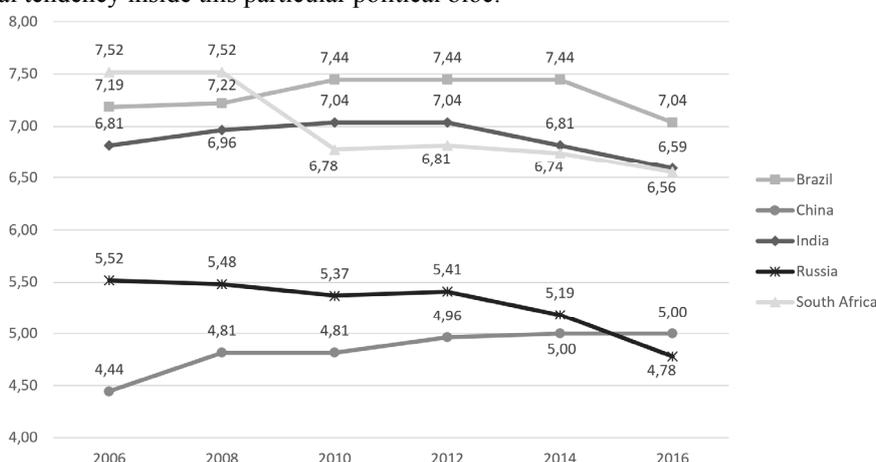
Figure 4   CSOs Enrollment in Public Policy in China and Other BRICS Member States
(BTI Selected Indicators – 2005-2016)
Source: (BTI, 2016)

Having the results structured, a correlation using IBM® SPSS® (Statistical Package for the Social Sciences) version 22 was tested with one FNS indicator available at the FAO statistical database (FAOSTAT, 2016), namely 'average dietary supply adequacy'. The results confirmed the positive correlation in high or strong level, with

$r = 0.888$, $n = 6$, $p = 0.018$, as it can be seen in the table below:

Table 1   Correlation Between CSOs Enrollment in Public Policy and Average Dietary Supply Adequacy (%) in China (2005-2016)

		CSOs enrollment in public policy	Average dietary supply adequacy (%)
CSOs enrollment in public policy	Pearson Correlation	1	.888*
	Sig. (2-tailed)		.018
	N	6	6
Average dietary supply adequacy (%)	Pearson Correlation	.888*	1
	Sig. (2-tailed)	.018	
	N	6	6
*. Correlation is significant at the 0.05 level (2-tailed).			

Source: Made by the authors with data from BTI (2016) and FAOSTAT (2016).

The trend for China is to keep experimenting and enhancing the connection with the CSOs in the

near future, resulting in progresses in scale management and follow-up processes, showing an openness for the bottom-up approach on the Chinese FNS public policy, besides giving a response to the emerging 'self-organizing social organizations', as suggested by Pesqué-Cela, Tao, Liu, & Sun (2009).

5 Conclusions

The complexity framework for public policy adapted to the Chinese political-institutional reality has enormous potential to contribute to the FNS public policies in the country in the short term, mainly on the need for improving quality and scale management. The movement of CSOs enrollment in the FNS public policy is more present at the rural level, but it can spread to urban centers, with its own logic, counting on different segments of the civil society to generate specific demands and voluntary actions to reach this desirable common good. In this movement, including medical doctors and research institutes is highly strategic, as their levels of confidence as social communication channels are considered 'highly honest' and 'highly concerned about the citizen's health' (R. Liu, Pieniak, & Verbeke, 2014). This process demands detailed study and planning, besides experimentations, gradually implementing changes, observing the results and impacts at each step.

For the initial experiments, enhancing public consultations is a relevant source for a cost-benefit analysis, evaluating the results in the sense that good consultations translate into budget allocation, and the lack of consultations or ineffective consultations exponentially increase the risks and therefore the costs of an operation. For creating these risk versus benefit analysis, establishing the use of 'consultation plans' is recommended, as it includes the information gathering based on answering questions of guiding principles and best practices, considering also applicable legal frameworks, and special regulations. Both guiding principles and best practices are the result of processing and gathering practical provisions stated in the legal frameworks, which lay down positive regulations on public consultations, besides experiences and lessons learnt in the field.

Another source for empowering the CSOs is promoting a more efficient division of labor between foundations and grassroots organizations. Considering that the philanthropic sector in China has been increasing steadily, a reform in this sector in this direction could be helpful to build capacity, as this interconnection with the CSOs supports the management of scale in a more responsive approach.

The support for the interconnection between different-targeted CSOs is another aspect to be considered, as it can enhance potential to spread guidance towards a better quality and more sustainable production and consumption. This guidance should be managed through the FNS public policy programs of technical assistance, access to markets – including reward for organic production in public purchases – microcredit, and making food surveillance, which has limitations on the present punitive approach, to work in a more educative perspective in order to enhance nutritional knowledge and behavior.

Improving quality and enhance the scale management will remain affected by the massive production system, the geographic size, and unwieldy bureaucracy, as the regulators attempt to build an integrated national regulatory regime. However, by making good use of the evolving CSOs' voluntary willingness to cooperate for the common good, namely FNS, the Chinese policy-makers have the opportunity to gain scale and improve quality, by simply enhancing the enrollment of this actor into the public policy, in a regulated and participative manner.

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Research on Evaluation of Innovative Business Incubator Service Ability Based on BSC and AHP

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Abstract: In recent years, innovative business incubators are regarded as the cradles of start-ups' innovation. This paper proposes an evaluation hierarchy of five service ability dimensions of innovative business incubator via adapting to BSC theory, and then makes out the importance weights of their indexes by AHP methodology. Finally, the analysis finds out that the fundamental service ability weights the highest among five dimensions, and several indexes, like the transformation rate of science and technology innovation achievement and the ratio of entrepreneurship tutors with advanced titles play the vital roles in evaluating the business incubator's development and innovation service ability.
Key words: Evaluation hierarchy; BSC; Innovative business incubator Service ability; AHP

1 Introduction

In this special time driving by the development of Technology and Innovation, the Massive Entrepreneurship and Innovation by All trend has been the vital national strategy, promoting Chinese economic troika and advancing the whole competency of the country. The innovative business incubators, represented by the Massive Spaces in China, have sprung up and keep developing and innovating.

At present, many innovative incubators have not yet get rid of the traditional service mode, and the basic services and low ability can neither utilize the government-funds effectively, nor satisfy the increasingly need by start-ups. As a result, innovation on service mode of business incubator and the re-evaluation of service ability become an inevitable choice. We use BSC and AHP to conduct an evaluation hierarchy via five dimensions and several indexes of service ability for innovative business incubator, in order to make the innovative business incubator a stable, healthy and long-run operation.

2 Literature Review

2.1 Definition and Innovation of business incubator

The definition of "Business Incubator" in researches is similar with both its physical term and utility function. Business incubator" is a professional physical space where an organized, rich-resources environment and support services were offered, and can accelerate the development of the enterprises (A & Gaynor, 2000). Business incubator can be an innovational system that helps new enterprises to grow up (Raymond, 1987). With the practices for decades, the service quality of business incubator has changed with keeping pace with the market innovation, the mechanism of incubator has changed, and a new networked mechanism can support the innovation effectively (Bollingtoff & Ulhoi, 2005). Also, studies emphasis that the operational mode development of business incubator is key to the innovation and evolution of industry, and should change the traditional mode to a "incubating chain" mode (Haapasalo & Ekholm, 2004; Zuo Li et al., 2015).

2.2 The evaluation system of innovative business incubator service ability

It is a remarkable advantage for innovative incubator to provide strong professional and relevant services for the incubated enterprises. Research on evaluating service ability of innovative business incubator has never stop. Allen & Richard (1990) put forward three categories: shared services, services in management and net-worked services. Yu Qingdong et al. (2008) designs seven indexes for incubating achievements, including the total income and total industrial output of incubated enterprises, the number of personnel and the number of patent invention. Li Jingrong et al. (2011) resolves the service ability into the operational service ability, the development service ability and networked service ability. In summary, the evaluation of innovative business incubator service ability generally consists of physical facility, management support, financial support and network-resource support.

2.3 The application of BSC theory in innovative business incubator evaluation system

BSC (Balanced Scored Card) theory, proposed by American Scholar Professor Robert S Kaplan, is a management system in core of enterprise development strategy and it is widely applied in presenting the performance of enterprises linked with perspectives of financial, customer, internal operation,

innovation and learning (Brander & McDonnell, 1995).

According to the perspectives of BSC theory, the innovative business incubators, especially the service provision should develop in a strategic visual. This paper makes the service strategy off four levels, consisting of the level of financial and benefit, the level of business service, the level of innovational service and the level of customer satisfaction (Figure 1).
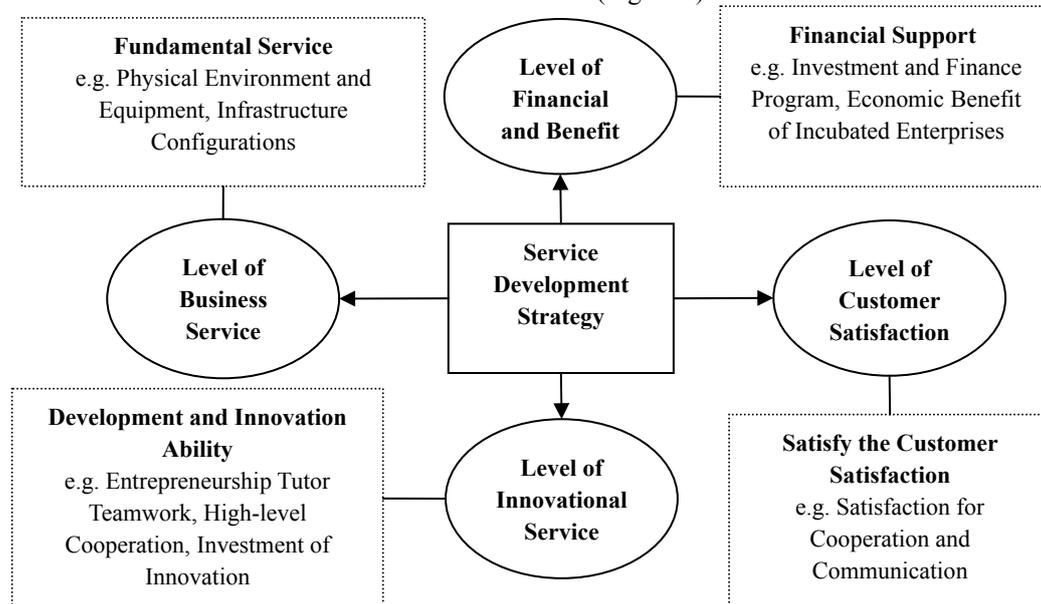
Figure 1   The Application of BSC in Service Development Strategy of Innovative Business Incubator

3 Evaluation Hierarchy of the Innovative Business Incubator Service Ability
3.1 The principles to establishment of evaluation hierarchy

In this evaluation hierarchy, five principles, consisting of objectiveness, hierarchy, comprehensiveness, measurability and sustainability, are taken into considerations, that is, first, the five dimensions we design are accordance with the objective facts, and are consulted by the authoritative experts. Next, we should take a comprehensive and sustainable visual to design the service ability dimensions, which cover from fundamental element to the long-run development elements. Also, the related indexes in the next levels should correspond to the distinct dimensions, and can be qualitatively measured.

3.2 The dimensions and indexes of service ability in the evaluation hierarchy

Based on BSC theory introduced above, as well as referring to some references, we established an evaluation hierarchy of the business incubator service ability with five dimension levels and several related index levels (Table 1).

Fundamental service ability indicates the basic service functions of innovative incubators, which meet the normal operation of incubated enterprises. Although the fundamentals have different focuses for the differences of incubators' scales of operation and resource acquisition, yet most novel incubators share the same basic services, like the physical site, infrastructure figurations and information consults.

Capital operation ability refers to the supportive service ability of investment and finance programs for incubated enterprises offered by incubators. Because most incubated enterprises need sufficient funds in the initial and growth periods, the efficiency of incubator in acquisition, investment and withdrawal of capital chain can effectively evaluate its service ability in investment and finance.

Development service ability, compared on fundamental ones, explains an ability to series of value added services for entrepreneurship, such as senior training lectures, professional service team guidance, entrepreneurship mentor assistance, in further cultivating starting-up enterprise from nursery to acceleration in incubation process.

Innovative service ability mainly aims at high technology and innovative incubated enterprises. Through investing in research and development, introducing and updating technology, certifying and promoting technology, the incubator helps the incubated enterprises to promote the generation, implementation and marketing of their new programs.

Table 1   Evaluation Hierarchy of Innovative Business Incubator Service Ability

Dimension Level (S_i)	Index Level (S_{ij})
Fundamental service ability S_1	site areas of business incubator S_{11}
	construction cost of infrastructure configurations S_{12}
	times of general business service S_{13}
	times of information flow S_{14}
Capital operation ability S_2	the ratio of the number of incubated enterprises in acquisition of finance service S_{21}
	the ratio of the number of incubated enterprises in acquisition of risk investment service S_{22}
	the average ROE of incubated enterprises S_{23}
	the average ROIs of incubated enterprises S_{24}
Development service ability S_3	the growth rate of incubated enterprises S_{31}
	times of training lectures about entrepreneur and innovation S_{32}
	the ratio of employees with bachelor degree or above in the total service employees S_{33}
	the ratio of entrepreneurship tutors with advanced titles in the total members of talent teams S_{34}
	times in promoting the cooperation of leading enterprises in key domains S_{35}
Innovative service ability S_4	the ratio of R&D investment in total investment S_{41}
	the number of invention patents S_{42}
	the number of approved patents S_{43}
	transformation rate of science and technology innovation achievement S_{44}
	construction and maintain cost of invested innovative platform S_{45}
Degree of service satisfaction S_5	incubated enterprises' satisfaction about the cooperation process S_{51}
	incubated enterprises' satisfaction about the information communication S_{52}
	incubated enterprises' satisfaction about the managerial process S_{53}
	the complaint rate of incubated enterprises S_{54}

(The overall objective for all dimension rows is: Evaluation hierarchy of innovative business incubator service ability (S))

Degree of service satisfaction refers to the evaluation on the feedbacks from incubated enterprises to the operation states of all service programs of incubator in their cooperation process. These feedbacks are evaluated by not only the satisfaction of communication and management, but also the complaints from the incubators.

4 Data Analysis by AHP

AHP (Analytic Hierarchy Process) is a practical and ideal solution for multi-objective decision, as well as an extensive use in solving kinds of risk prediction or performance evaluation. This paper wields AHP to measure the weight of each index via conducting the comparative matrixes, and ensure the relative importance between the two indexes. The marks of each matrix are judged by both qualitative and quantitative methods. Interview and expert scoring are used to screen the dimensions and indexes in the evaluation hierarchy, so that the judgment of the importance weights is relatively credible.

4.1 Judgment matrix of dimension level and conformance test

Let the objective level of evaluation hierarchy as "S", the dimension level as S_i (i= 1, 2, 3, 4, 5), the relative importance weights between the former index and the later one are graded as "1-9" points, as well as its reciprocals. Thus, the matrix of dimension level can be as follow:

$$S = \begin{bmatrix} 1 & 2 & 2 & 2 & 4 \\ 1/2 & 1 & 2 & 2 & 3 \\ 1/2 & 1/2 & 1 & 2 & 2 \\ 1/2 & 1/2 & 1/2 & 1 & 3 \\ 1/4 & 1/3 & 1/2 & 1/3 & 1 \end{bmatrix}$$

The feature vector $W(S_i)$= (0.3486, 0.2517, 0.1784, 0.1470, 0.0743)^T; To this five order, λ_{max}=5.1636, RI=1.12, CR=0.0364<0.10, meet conformance.

4.2 Judgment matrix of index level and conformance test

Let the index level as S_{ij} (i, j= 1, 2, 3, 4, 5), Thus, the index matrix of S_1 can be as follow:

$$S_1 = \begin{bmatrix} 1 & 1 & 3 & 2 \\ 1 & 1 & 3 & 2 \\ 1/3 & 1/3 & 1 & 1/2 \\ 1/2 & 1/2 & 2 & 1 \end{bmatrix}$$

The feature vector $W(S_1)$=(0.3509, 0.3509, 0.1091, 0.891)^T, λ_{max}=4.0104 , RI=0.90 , CR=0.0039<0.10, meet conformance.

the index matrix of S_2 can be as follow:

$$S_2 = \begin{bmatrix} 1 & 1 & 1/2 & 1/3 \\ 1 & 1 & 1/2 & 1/3 \\ 2 & 2 & 1 & 2 \\ 3 & 3 & 1/2 & 1 \end{bmatrix}$$

The feature vector $W(S_2)$=(0.1411, 0.1411, 0.3880, 0.3298)^T, λ_{max}==4.1545, RI=0.90, CR=0.0579<0.10, meet conformance.

the index matrix of S_5 can be as follow:

$$S_5 = \begin{bmatrix} 1 & 2 & 1/2 & 1/4 \\ 1/2 & 1 & 1/2 & 1/4 \\ 2 & 2 & 1 & 1/6 \\ 4 & 4 & 6 & 1 \end{bmatrix}$$

The feature vector $W(S_5)$=(0.1321, 0.0941, 0.1719, 0.6020)^T, λ_{max}=4.2153, RI=0.90, CR=0.0806<0.10, meet conformance.

the index matrix of S_3 can be as follow:

$$S_3 = \begin{bmatrix} 1 & 2 & 2 & 2 & 1/3 \\ 1/2 & 1 & 1/2 & 1/3 & 1/5 \\ 1/2 & 2 & 1 & 1/3 & 1/4 \\ 1/2 & 3 & 3 & 1 & 1/3 \\ 3 & 3 & 4 & 3 & 1 \end{bmatrix}$$

The feature vector $W(S_3)$=(0.2258, 0.0702, 0.0965, 0.1665, 0.4410)T, λ_{max}=5.3406, RI=1.12，CR=0.0760<0.10, meet conformance.

the index matrix of S_4 can be as follow:

$$S_4 = \begin{bmatrix} 1 & 5 & 3 & 1/5 & 1 \\ 1/5 & 1 & 1/3 & 1/6 & 1/3 \\ 1/3 & 3 & 1 & 1/3 & 1/2 \\ 5 & 6 & 3 & 1 & 4 \\ 1 & 3 & 2 & 1/4 & 1 \end{bmatrix}$$

The feature vector $W(S_4)$=(0.1885, 0.0483, 0.1051, 0.5029, 0.1552)^T, λ_{max}=5.3114, RI=1.12, CR=0.0695<0.10, meet conformance.

4.3 Analysis on indexes of innovative business incubator service ability

From the calculation of the matrixes above, the weights of service ability indexes are as follow:

Table 2   The Weight Distribution of Innovative Business Incubator Service Ability Indexes

S_i \ S_{ij}	S_1	S_2	S_3	S_4	S_5
S_{i1}	0.1223	0.0335	0.0403	0.0277	0.0098
S_{i2}	0.1223	0.0335	0.0125	0.0071	0.007
S_{i3}	0.038	0.0977	0.0172	0.0154	0.0128
S_{i4}	0.0659	0.083	0.0297	0.0739	0.0447
S_{i5}	-	-	0.0787	0.0228	-

From the Table 2, abscissa suggests the five dimensions of service ability, while ordinate presents the index levels (j=1,2,3,4,5). A horizontal comparison shows that the abilities of fundamental service and capital operation are the most competitive ones among the five dimensions. The service ability of development and innovation are also the crucial dimensions in evaluation of innovative business incubator service ability. Also, figure 2 indicates the rank of top-ten weights among the indexes. Compared horizontally, these indexes are the most importance ones according to our study.

A vertical comparison reveals that each ability dimension has relatively important indexes, such as the construction cost of infrastructure configurations, the average ROE of incubated enterprises, the growth of incubated enterprises, and the ratio of R&D investment, transformation rate of science and technology innovation achievement.
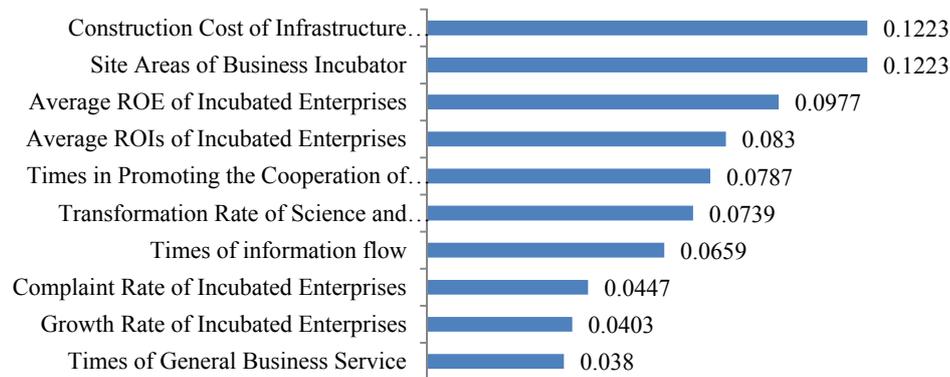
Figure 2   The Ranks on Top-Ten Index of Innovative Business Incubator Service Ability

5 Conclusions

This paper explores the evaluation on service ability of innovative business incubator, and builds an evaluation hierachy, which contains five dimension levels and several relevant indexes, combing through Balanced Scored-Card theory. From each weight of indexes calculated through AHP methodology, the fundamental service ability is weighted the highest among the whole dimensions. However, the indexes, like the average ROE and ROI of incubated enterprises, transformation rate of science and technology innovation achievement, the ratio of entrepreneurship tutors with advanced titles etc., play a vital role in evaluating the service ability of innovative business incubator's development and innovation.

As objective and credible as possible, the limitations of this study cannot be ignored. Firstly, as diverse as the actual innovative business incubators are, the indexes in this article still have an incompletely face, and more comprehensive indexes remains to be explored. Secondly, the scales of some start-ups are limited and they can hardly provide the high-level services, so the dimensions of service ability must be according to fact. Thus, our subsequent research will consider different innovative fields of enterprises, and be focused on the more detailed and appropriate indexes, as well as other service ability dimensions to improve the evaluation hierachy in the future.

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Research on Resource Sharing of Science and Technology Public Service Platform Based on Multi-Agent Game Theory

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Abstract: This paper analyzes the impact mechanism of three subjects on the public service platform of science and technology. According to evolutionary game theory, two group evolutionary game models are established to explore the evolutionary processes and stable strategies of both players in the game. The experimental results show that the resource sharing is related to the government's supervision, the willingness to participate in the enterprises, the power of the resources invested by universities and research institutes. The resource sharing problem can be solved effectively when the game system is developing towards a good evolutionary trend.

Key words: Government; Enterprises; Universities and research institutes; Science and technology public service platform; Resource sharing

1 Introduction

Platform construction has experienced the first ten year period(Zhang Guihong,2015).The domestic scholars defined it as high-quality and effective basic system provided by scientific instruments and equipment, technology resources, information network resources of resources sharing, industry monitoring and other public technology service(Zhang LiHua etc,2007;Wang Rui min etc,2010).The United States, Japan, Britain and other developed countries pay great attention to the government's leading role(Dai Guoqiang,2013).Therefore, it discussed refers to the resource sharing platform which can provide the knowledge intensive service.

Platform of resources sharing participation generally refers to the sharing activities of the undertaker.Enterprises as the main body of innovation,resource sharing system is the most important subjects of interest;universities and research institutions are the resource providers;government resources are unique(Xie Yun,2007);intermediary organizations plays a bridge role.At present, the research is mainly based on the evolutionary game theory of the two main body,such as the sharing mechanism evolution game analysis of technology infrastructure conditions without external supervision(Chen Keke, 2011);the evolutionary game of innovation oriented enterprises and government public service platform (Hou Yumei, Xue Wenhong, 2015); A study on the evolution of service platform and the demand side of technology service in the two sided market operation mode(Gu GuiFang,2015).Therefore, this paper focuses on the three main body,based on the evolution game theory to construct government and enterprises, enterprises and universities and research institutes of evolutionary game model,analysis influence of technology resources sharing factors, respectively to explore the game behavior evolution stable strategy and sensitivity analysis.

2 Evolutionary Game Model of Resource Sharing in Public Service Platform

2.1 The mechanism of resource sharing in the public service platform

According to the theory of resource view, the organization is a collection of heterogeneous resources(PETERAF M A,1993; WERNERFELT B,1984). Dai Guoqiang (2013) believes that platform has become an important carrier for the government to manage the allocation of resources,to effectively overcome the fragmentation of research resources and isolated island phenomenon.The American government set up a special technology center; the Japanese government ensure the efficiency by formulating relevant regulations; the EU"6th Framework (fr6) plan" to implement the network management is the world largest regional synthetic plan.But now, the lack of effective laws and regulations to protect the sharing of scientific resources.Universities and research institutes have innovation resources to share,such as talent, information,scientific research,infrastructure.Enterprises are the main innovation main body.As can be seen from the above analysis, the role of the three resources share mechanism as shown in figure 1.
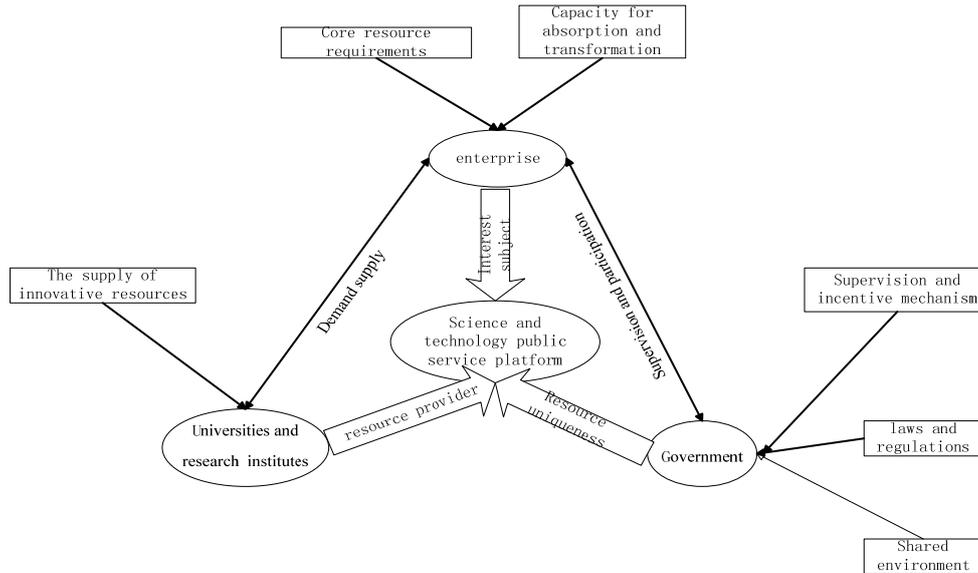
Figure 1   Mechanism of Resource Sharing in Science and Technology Public Service Platform

2.2 Basic assumptions and the establishment of the model

It can be built by the government and enterprises, enterprises and universities and research institutes of the evolutionary game model analysis of resource sharing. make the following assumptions:

Table 1   Related Parameters and Meaning

Parameter symbol	Meaning
R1	Gains from the government's implementation of regulatory strategies
C1	Costs required by the government to implement the regulatory strategy
R2	The gains obtained by the participation of enterprises
C2	Sharing cost, knowledge conversion cost and knowledge conversion cost involved in the implementation of the strategy
R3	The income of the enterprises to implement the strategy of not participating
M1	Due to the implementation of the government regulatory strategy, the enterprises does not participate in the strategy of potential losses
R4	Due to the implementation of the government regulatory strategy for participating enterprises to bring additional revenue
M2	Because the government does not supervise the implementation of the strategy, in order to participate in the additional losses caused by the enterprises
R5	Income from investment strategy chosen by universities and research institutes
C3	The cost of investment strategy required by universities and research institutes
R	The dynamic degree of the resources invested by universities and research institutes
R6	To participate in the enterprises as a result of the additional income that the university, scientific research institute invests the resources to obtain
M3	Participate in the enterprises as a result of the additional loss of resources brought by the university and research institutes
R7	Gains from the government's implementation of non regulatory strategies
M4	The potential loss of the investment strategy in universities and research institutes is not involved in the enterprises.
R8	The income from the implementation of the strategy of non - investment in universities and research institutes
M5	The utility loss of the government supervision without the participation of enterprises
M6	Utility loss of University and research institutes without enterprises participation

1) China's platform construction is from top to bottom, so the government plays a leading role in the construction and operation of the platform. That is, its strategic space for P1{Supervise, not

supervise}. Universities and research institutes are the most important providers of resource sharing because of their rich innovation resources,its strategic space for the P2{Input, No input}. Enterprise is the core of service platform, to speed up the transfer of core technology to the enterprise is an important measure,its strategy space P3 (Participate, Not participate). Because service platform has limited rationality, they will continue to learn to adjust the strategy to achieve interests.

2) It needs to set the relevant parameters and their meaning of the note as shown in Table 1.

3) Assuming that in the initial state, the choice of government regulation strategy is the proportion x;selection of enterprises "participate" strategy on the ratio is y;universities and research institutes selected "Input" the proportion of strategy is z,$0 \leq x \leq 1, 0 \leq y \leq 1, 0 \leq z \leq 1$.This paper builds the evolutionary game model with the game benefit matrix, as shown in Table 2,Table 3.

Table 2　The Payoff Matrix Between Enterprises and Government

government	enterprises	
	Participate	Not participate
Supervise	R1-C1,R2-C2+R4	-M5,R3-M1
Not supervise	R7,R2-C2-M2	0,R3

Table 3　The Payoff Matrix Between the Universities, Research Institutes and Enterprises

universities, research institutes	enterprises	
	Participate	Not participate
Input	R5-C3,rR6+R2-C2	-M6,R3-M4
Not input	R8,R2-C2-M3	0,R3

4) The following are the establishment of the dynamic equation of the copy:

a. During the game model between the enterprises and the government, enterprises to implement the "Participate" and "Not participate" strategy of the expected income benefits were W11, W12, the average expected return of W1, there are:

$$W11=y(R2-C2+R4)+(1-y)(R2-C2-M2); \quad W12=y(R3-M1)+(1-y)R3; \quad W1=xW11+(1-x)W12$$

In the same way, the expected return of the government to implement the strategy of "Supervise" and "Not supervise" is W21, W22, the average expectation is W2, then there are:

$$W21=x(R1-C1)+(1-x)(-M5); \quad W22=xR7; \quad W2=yW21+(1-y)W22$$

So the dynamic equation of the enterprises and the government's strategy is:

$$F1(x)=dx/dt=x(W11-W1)=x(1-x)(W11-W12)=x(1-x)[y(R4+M2+M1)+R2-R3-M2-C2]$$
$$F1(y)=dy/dt=y(W21-W2)=y(1-y)(W21-W22)=y(1-y)[x(R1-C1+M5-R7)-M5]$$

b. Universities, research institutes and enterprises in the game model of enterprises in the implementation of "Participate" and "Not participate" strategy, the expected benefits were V11, V12, the average expected return of V1, there are:

$$V11=z(rR6+R2-C2)+(1-z)(R2-C2-M3); \quad V12=z(R3-M4)+(1-z)R3; \quad V1=xV11+(1-x)V12$$

Similarly, colleges and universities, the implementation of the "Input" and "Not input" strategy, the expected benefits were V21, V22, the average expected to be V2, there are:

$$V21=x(R5-C3)+(1-x)(-M6); \quad V22=xR8; \quad V2=zV21+(1-z)V22$$

Therefore, the dynamic equation of the reproduction of the strategy of enterprises and universities and research institutes is:

$$F2(x)=dx/dt=x(V11-V1)=x(1-x)(V11-V12)=x(1-x)[z(rR6+M4)+(R2-R3-C2-M3)]$$
$$F2(z)=dz/dt=z(V21-V2)=z(1-z)(V21-V22)=y(1-y)[x(R5-C3+M6-R8)-M6]$$

According to the dynamic equation F1 (x) and F1 (y), there are 5 local equilibrium points in the evolutionary game of the enterprises and the government, that is, D1(0,0), D2(0,1), D3(1,0), D4(1,1), D5

($\dfrac{M5}{R1+M5-C1-R7}$, $\dfrac{R3+M2+C2-R2}{R4+M2+M1}$). Similarly, according to the dynamic equation F2 (x) and F2 (z), there are 5 local equilibrium points in the evolutionary game among the University, the scientific research institutes and the enterprises, that is, D6(0,0),D7(0,1),D8(1,0),D9(1,1),D10

($\dfrac{M6}{R5+M6-C3-R8}$, $\dfrac{R3+C2+M3-R2}{rR6+M4}$).The sharing of resources and the evolutionary stability through the Jacobian matrix local stability analysis as shown in Table 4.Figure 2 and Figure 3 are the dynamic process of interaction.

Table 4   Results of Stability Analysis of Equilibrium Point

Equilibrium point	DetJ	TrJ	result	Equilibrium point	DetJ	TrJ	result
D1	+	-	ESS	D6	+	-	ESS
D2	+	+	Unstable fixed point	D7	+	+	Unstable fixed point
D3	+	+	Unstable fixed point	D8	+	+	Unstable fixed point
D4	+	-	ESS	D9	+	-	ESS
D5	-	0	saddle point	D10	-	0	saddle point
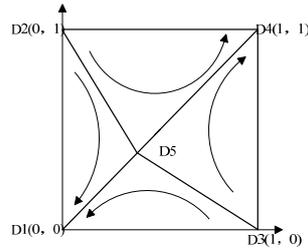
Figure 2   The Dynamic Process of the Interaction Between the Enterprises and Government
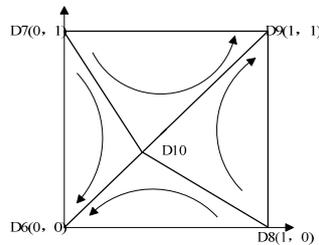
Figure 3   The Dynamic Process of the Interaction Between Universities, Research Institutes and Enterprises

3 Sensitivity Analysis and System Phase Diagram

Through the sensitivity analysis, the effect of the parameter changes to the saddle point D5 and D10, by changing the position of D10 and D5 to make the game system can tend to the state of our hope, that is, ESS equilibrium point D4 (Participate,Supervise), D9 expressed (Participate, Input) state.

1) Parameters R1, R2, R3, R5, R6, R7, R8. As R1 increases, the D5 shift to the left horizontally (Figure 4);as R2 increases, D5 and D10 will be vertically downward (Figure 8); when R3 is reduced, D5 and D10 are vertically downward (Figure 8);as R5 increases,D10 the level of the left (Figure 5);as R6 increases, D10 is vertically downward (Figure 7);when the R7 decreases, D5 will level shift (Figure 9); when reducing the R8, D10 the left shift(Figure 5).

2) Parameters M1, M2, M3, M4, M5, M6.When M1 and M2 increase,D5 is vertically downward (Figure 6);while M3 decreases,M4 increases,D10 will vertically downward (Figure 7);when M5 decreases, the D5 level will shift to the left (Figure 4);when the M6 was reduced, the level of D10 will shift to the left (Figure 5).

3) Parameters C1, C2, C3. when C1 decreases, D5 will left shift (Figure 4); when the C2 decreases, D5, D10 are vertically downward (Figure 8); when C3 decreases, D10 will shift to left (Figure 5). By the above analysis, that is, the government, enterprises, universities and research institutes to reduce costs, the system will be a good evolution of the trajectory of development.

4) Parameter R.when R increases, D10 will vertically downward (Figure 7), the University, research institutes all input resources,which will make the system presents a good evolutionary trajectory.
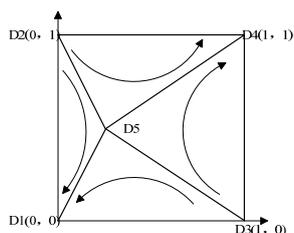
Figure 4　R1, M5 Increase, C1 Decrease
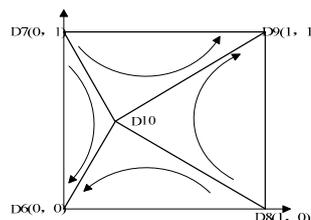
Figure 5　R5 Increase, R8, M6, C3 Decrease
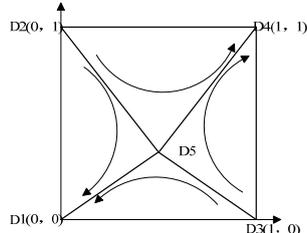
Figure 6　M2, M1 Increase
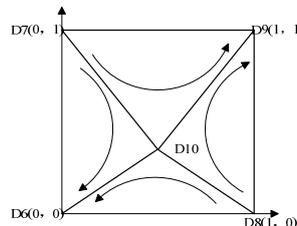
Figure 7　R6, M4, R Increased, M3 Decrease
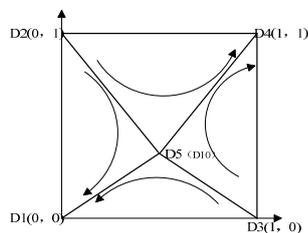
Figure 8　R2 Increase, R3, C2 Decrease
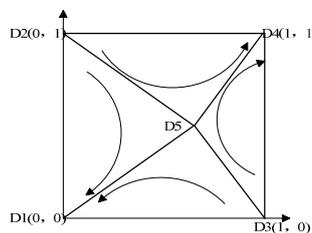
Figure 9　R7 Decrease

4 Conclusions

Analysis results indicate that the resources of science and technology in public service platform and the resources of government supervision,enterprise's willingness to participate and institutions of higher learning and scientific research institutions are shared. Therefore, the breadth and depth of the sharing resources of science and technology public service platform depends on the changes of government, enterprises, universities and scientific research institutions. When the three form a good interactive relationship, it can further promote the effective sharing of scientific and technological public service platform.

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Research on the Industrial Contribution and Influence Factors of Sci-Tech Small and Micro Enterprises in Wuhan

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Abstract: This paper selects current fast-growing sci-tech small and micro enterprises as research object. Though defining the concept for sci-tech small and micro enterprises, it clarifies the distinctions between small micro enterprises and sci-tech small and micro enterprises. In addition, this paper teases out the major seven industry types based on the current development situation of small and micro enterprises in Wuhan. It also analyzes the contribution of sci-tech small and micro enterprises in Wuhan to the development of regional economy by using output value contribution. On the basis of this, this paper concludes the scale economies, government, trade demand, human resources and information network are current leading power affecting industrial contribution by using multiple linear regression model.

Key words: Small and micro enterprises; Sci-tech small and micro enterprises; Industrial contribution

1 Introduction

Hubei province is located in the center of economy and geography in our country, which is facing the good opportunity from national industrial structure adjustment of and industrial upgrading. The rapid development of strategic emerging industry has become the important guarantee to implement the strategic objective of innovation and wisdom, and sci-tech small and micro enterprise is one of the important support for rapid development of strategic emerging industry in Hubei province.

At present, there is no description regarding sci-tech small and micro enterprises abroad, but only small and micro enterprises or small-enterprises, which mainly focus on its development constraints due to financing problems. Visser M Anne (2005) explains the impact of human resources to the financing of small and micro enterprises by using econometric model; Martin, Ludus (2010) analyzes hindering effect of financing problems during the development of small and micro enterprises through the establishment of data model. In addition, Chinese scholars research the interaction between sci-tech small and micro enterprises and economic development in the past two years. Chen Huinv and Ding Li Yang (2013) analyze and found it is very important to the development of economy that sci-tech small and micro enterprises by increasing the growth rate of the total factor of society and driving structural adjustment of social factors; Lin Zhouyu (2013) believes that the government functions, efficiency, and market environment play an important role in the healthy development of sci-tech small and micro enterprises; Yao Qi etc. (2014) propose that it is necessary for science and technology departments of government, scientific research institutes of University, the science and technology intermediary organizations etc. to renew ideas, establish mechanism and build platform, as well as accelerate the development of science and technology small and micro enterprises.

Wuhan is one of the important bases of national trade and logistics, which is also one of the areas with most active business activities of small micro enterprise in China. Now, there are more than 17 small micro enterprise cluster industrial parks, such as Wuhan small micro enterprise (technology) pioneering park, have been built in Wuhan, which could be regarded as the epitome of the development of technology-based small micro enterprises in China, and it has representative. Therefore, it is very meaningful to take Wuhan as the basic point to make the research on the regional contribution and influence factors of sci-tech small and micro enterprises, which is of great theoretical and practical significance.

2 Sci-Tech Small and Micro Businesses Definition

Considering the definition and connotation of technology-based small and micro businesses, the article for the definition of technology-based small and micro enterprises as follows: We believe that products and services of technology-based small and micro businesses are higher scientific and technological. The enterprises are relatively small in scale and the intellectual intensive enterprise,

engaged in high-tech research and development, production and operation of high-tech products, and independent accounting or relatively independent accounting. Their staff are mainly scientific and technical personnel, R & D personnel ratio is not less than 10%, and the R & D intensity is not less than 6%. they are in possession of development of no less than 10% and research and development strength of less than 16%. These enterprises own some intellectual property rights, advanced technology and knowledge, providing products and services by innovation, mainly concentrated in the areas of electronic information, biological engineering, new material, Internet of things, new energy, research and development of science and technology, service and consulting.

3 The Current Development Situation of Wuhan Science and Technology Small Micro Enterprise

Statistics departments at various levels of Wuhan and Hubei province have comprehensive and systematic basic information concerning scale, production, research and development personnel quantity and level of technology-based small micro enterprise. According to the specified industry from technological small and medium-sized enterprise service net, clear Wuhan technology-based small and micro enterprises are mainly distributed in strategic emerging industries and related industries of high technology, including seven industry(biological medicine, electronic information, new materials, light mechanical and electrical integration, resources and environment, new energy and high efficiency saving energy, and high technology services).After 10 years of development, Wuhan photoelectron information industry accounted for 25% of the world market, 60% of the Chinese market, optical communication components accounted for 70% of the domestic market. The development of Bio pharmaceutical industry is well in Hubei, especially in Wuhan. In June 2007, the national development and Reform Commission formally approved to build Wuhan National biological industry base (Optics Valley of biological city). This is the second national industrial of Wuhan East Lake High Tech Development Zone since the national photoelectron information industry base.

4 The Evaluation for Contribution of Sci-Tech Small and Micro Enterprises to The Regional Economy in Wuhan

We choose output value contribution degree to judge and measure the contribution degree of technology-based small micro enterprises to regional economy in Wuhan. Its computation formula as follow:

$$Y = \frac{\Delta C}{\Delta D} = \frac{C2 - C1}{D2 - D1}$$

ΔC standing forthe growth of production value of sci-tech small and micro enterprises in Wuhan.

ΔD standing forthe growth of Wuhan GDP. According to related data from the statistical yearbook, the relevant government departments and small and micro enterprise park, we select nearly 10 years of relevant data and get the calculation result:

Table 1   The Evaluation for Contribution of Sci-tech Small and Micro Enterprises to the Regional Economy in Wuhan

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Contrib-ution degree	0.0125	0.0356	0.0415	0.0757	0.0824	0.105	0.1241	0.1556	0.1741	0.1852

From the results, we can see the situation of the contribution of sci-tech small and micro enterprises to regional economic in Wuhan is getting better and better. With the stronger support of Wuhan for small and micro enterprises, especially sci-tech small and micro enterprises, the number and size of sci-tech small and micro enterprises in Wuhan is growing, and they are become more and more important for the development of the regional economy in Wuhan.

5 Analysis on the Main Factors Affecting the Contribution Degree of Sci-Tech Small and Micro Enterprises to Regional Economy.
5.1 Model

According to the relevant theoretical analysis of regional economy and small and micro enterprises, the paper chooses some probable influencing factors for contribution to the regional economy of technology-based small and micro enterprises in Wuhan. The independent variables include six types of human resources, scale economy, trade demand, infrastructure, government management, information

network (Poon.J,2003).

Establish multiple regression model as follow:

$$Y = b_0 + b_1R + b_2M + b_3TR + b_4JC + b_5GV + b_6X$$

Considering the comparability of historical data, the data using relative indicators:

Y standing for the contribution of technology-based small and micro enterprises to the regional economy.

R standing for human resources, to investigate the contribution of human resources to the growth of technology-based small and micro enterprises of in Wuhan. Specific indicators are the number of employees, in sci-tech small and micro enterprises, accounted for the proportion of total employment in Wuhan.

M standing for the scale economy, an important source of increasing returns, constitute the important determinants of industrial agglomeration. We use industry growth from technology-based small and micro enterprises in Wuhan accounts for the proportion of Wuhan GDP as a measure of the scale economy.

TR standing for trade demand factors, we choose total trade of sci-tech small and micro enterprises in Wuhan accounted for the proportion of total trade in Wuhan GDP.

JC on behalf of the infrastructure, convenient developed and facilities perfect urban infrastructure construction can effectively reduce the cost, and attract sci-tech small and micro enterprises. We use the construction industry output value related to technology-based small and micro enterprises accounted for the proportion of Wuhan GDP as an index.

GV index on behalf of the government management. Political policy stability and good regulatory environment are the important reference information for location selection of technology-based small micro enterprise, and also the influence factors of agglomeration development. The government is specifically set for financial expenditure of related projects of sci-tech small and micro enterprise in Wuhan accounted for the proportion of Wuhan GDP as a share of GDP to measure the government function.

X represents the information network. On the one hand, the huge "information externalities" will generate information arbitrage activities, so that small and micro enterprises of science and technology can be gathered in the amount of information to gain the benefit. On the other hand, as information for technology-based small and micro enterprises in Wuhan can create a greater spatial effect. We choose post and telecommunications business volume accounted for the ratio of GDP as the developed degree of the local information.

B0 is constant, and b1, b2…B6 is the coefficient of each index variable.

The range of sample selection is 10 years of data, which is from 2006 to 2015.

5.2 The empirical results

Make the data type into the Eviews software, and use the least squares (OLS) regression, get the following the final regression analysis result by the correlation test.

Table 1   Analysis Result By the Correlation Test

The independent variables.	T value	Prob.	The coefficient
The human resources R	1.166503	O.0188	0.665608474
Economies of scale M	6.301033	0.0004	3.028875281
Trade demand TR	2.331795	0.0417	1.258127993
Infrastructure JC	1.162454	0.3291	0.114928972
The government management Gv	3.176235	0.0140	1.957556002
Information network X	1.783434	0.0245	0.411069588
R value：0.919726		F statistic：826．919	
R^2 value：0.929179			

We can see that the values of R and R^2 are very close to 1, showing that regression model regression effect is remarkable.

By analyzing the P value and the t value, we can conclude the economies of scale M t value is maximum in the indicators, which influence the contribution of sci-tech small and micro enterprise in Wuhan for regional economic. It shows that the scale economy formed by the group effect of sci-tech small and micro enterprise in Wuhan has the most significant impact on the regional economic contribution rate, and the influence coefficient is 3.03; Second, followed by the impact of government

factors, the impact coefficient close to 2; Trade demand on the regional economic contribution rate are more important, influence coefficient is also more than 1; The T value of human resources and information network is more than 1, which indicates that the agglomeration of high tech service talent has a strong correlation with the regional economic contribution of sci-tech small and micro enterprises in Wuhan. The indicators of infrastructure have the lowest correlation with the regional economic contribution of sci-tech small and micro enterprises in Wuhan, which indicates the impact of the infrastructure and information network on the regional economic contribution is limited.

6 Conclusions

The development of sci-tech small and micro enterprises in Wuhan has become an important force to support the regional economic development and industrial innovation in Wuhan. In recent years, there are a variety of different sci-tech small and micro enterprise industrial parks as the characteristics through policy guidance, industrial cooperation, and other ways. By means of the value of the contribution rate and multiple linear regression model, the paper concludes that the situation of the contribution of sci-tech small and micro enterprises to regional economic in Wuhan is getting better and better, which first thanks to the government and the trade needs, and secondly owning to human resources and information network. With the gradual improvement of relevant data, we can carry out industrial differentiation research aiming at sci-tech small and micro enterprises in the future, to clarify the contribution and impact of different industry types of sci-tech small and micro enterprises on the regional economy.

Acknowledgement

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A Study on Regional Economic Differences of Shandong Province from the Perspective of Regional Intellectual Capital

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Abstract: The interrelation between Intellectual Capital (IC) and economic development is analyzed theoretically, and the main conclusion is that regional economic differences can result from the uneven development of Regional Intellectual Capital (RIC). We construct the evaluation system of RIC to appraise the stock and increment of the eastern, central, and western regions of Shandong Province from 2004 to 2012. The results indicate that the overall stock of RIC shows a growing trendwith significant regional differences: East high and West low. Findings also demonstrate that the amplitude of RIC increment is large, and the Central is even more unstable.
Key words: Regional intellectual capital; Regional economic differences; Shandong province

1 Introduction

Intellectual Capital, which has attracted a wide common attention of domestic and foreign scholars, enterprises, research institutions and international organizations, is pushed to the forefront in the era of knowledge economy. The contribution of traditional production factors to economic development decreases more obviously than ever, under the law of diminishing marginal utility, and the optimistic role of intellectual elements has become increasingly prominent.

Since the implementation of reform and open policy, Shandong's economy developed rapidly, as a regional characteristic manifests apparently: a greater economic development gap broadens between east and west. Accelerating the economic development of less developed areas in West to reduce the widening gap, and acquiring a relatively balanced development to achieve the dual goals of economic prosperity and social stability, are major policy issues. After a long term exploration and implementation of series of policies and development strategies that government did, there is no indication that this gap would be eliminated fundamentally. In addition, the interactions between the four elements of IC bring a spiral upward trend to RIC, which is the driving force for economic growth. Thus, analyzing the reasons of regional differences in economic development, from the perspective of RIC, has a certain reference value for narrowing the gap economic developments caused.

2 Literature Reviews

Intellectual Capital theory, as a strategic management theory, not only is of great significance at the enterprise level, but also has a guiding role in the national and regional economic level. In 1996, Swedish government and Stockholm University applied modified Skandia Navigator to the national level, in order to quantify the development of national intellectual capital. In 2004, Nick Bontis argued that RIC has hidden values owned by individual, enterprise, research institutions, communities and regions, which was a kind of source for enterprises to create wealth in current and future. He raised the National Intellectual Capital Index Theory creatively and introduced structural equation model to measure IC- which include human capital, process capital, market capital and reproduce capital- of the Arab countries. Since then, the concept of RIC has begun to attract widespread attention (Andriessen and Stam, 2005; Bounfour, 2005; Hervas-Oliver and Dalmau-Porta, 2007; Ståhle and Bounfour, 2008; Lin and Edvinsson, 2011; Kapyla, 2012; Ståhle and Ståhle, 2012; Yeh-Yun et al., 2013).

On the basis of foreign researches, domestic scholars began the studies of RIC, combined with Chinese conditions. They tend to divide it into human capital, structural capital and relational capital and innovation capital, in the aspect of measuring RIC(X. Pan, 2003; Y.F. Chen, 2006; X.J. Wang, 2008; W. Chen, 2010; Z.Q. Ding, 2011; J. Lu, 2013); construct evaluation index system suitable for China(Y.F. Chen, 2006; Wang X.J. Wang, 2008; X.B. Wang, 2009; B.R. Dong,2010); based on different perspectives, research the function mechanism of RIC to regional development and the role it plays in the transformation of economic growth mode(A.P. Xu, 2008; Q.C Zhang, 2010; Z.Q. Ding, 2011, X.G. Tang, 2012; M.H Wang, 2013); build metrics system and confirmed that RIC has a positive impact on economic growth, considering the provinces (W. Chen, 2010; B.R. Dong, 2010; H.Y. Pu, 2010; X.P.

Zhang, 2011). All the research results have shown that RIC plays a promoting role in regional economic development.

3 Data and Methodology

3.1 Metrics system

Considering domestic and foreign scholars' classification on intellectual capital, we divide regional intellectual capital into human capital, structural capital, relational capital and innovation capital in this paper. According to the research of some scholars, such as Chen Yufen (2006), Wang Xiaobin (2009), considering the data readily available, this paper selects specific indicators system to evaluate RIC shown in Table 1.

Table 1   The Metrics System of RIC

Primary Indicators	Secondary Indicators	Tertiary Indicators
Human Capital (H)	Education level (H_1)	Education budget expenditure to GDP ratio (H_{11})
		High school students in the school to total number ratio (H_{12})
	Medical level (H_2)	Number of doctors per capita (H_{21})
		Number of beds per capita in medical institutions (H_{22})
	Social security (H_3)	Population participating in pension insurance to total population ratio at the end of the year (H_{31})
		Population participating in unemployment insurance to total population ratio at the end of the year (H_{32})
		Population participating in basic medical insurance to total population ratio at the end of the year (H_{33})
Structural Capital (S)	Industrial Structure (S_1)	Percentage of primary industry (S_{11})
		Percentage of secondary industry (S_{12})
		Percentage of tertiary industry (S_{13})
	Government efficiency level (S_2)	Public finance budget revenues to GDP ratio (S_{21})
		Public finance budget expenditure to GDP ratio (S_{22})
	Social circulation and information communication mechanism (S_3)	Per capita total passenger (S_{31})
		Per capita total freight (S_{32})
		Per capita total postal and telecommunication services (S_{33})
		Per capita number of library (S_{34})
Relational Capital (R)	International trade (R_1)	Total investment from foreign to GDP ratio (R_{11})
		Total import and export to GDP ratio (R_{12})
		Total capital FDI contracts used to GDP ratio (R_{13})
	Domestic trade (R_2)	Total retail sales of social consumer goods to GDP ratio (R_{21})
		Total deposits from financial institutions to GDP ratio (R_{22})
		Total loans from financial institutions to GDP ratio (R_{23})
	Personnel exchanges (R_3)	The proportion of foreign tourists (R_{31})
		International tourism receipts to GDP ratio (R_{32})
Innovation Capital (I)	Innovation investment (I_1)	The expenditure of R&D to GDP ratio (I11)
		Local Financial Allocation to Local fiscal expenditure ratio (I_{12})
	Innovation output (I_2)	The proportion of patent applications (I_{21})
		The proportion of utility model applications (I_{22})
		The proportion of appearance design applications (I_{23})
	Innovators (I_3)	The proportion of R & D personnel in Industrial enterprises above designated size (I_{31})

3.2 Data sources

With reference to F.H. Mu (2006), we divide Shandong into eastern, central and western regions according to their developed degree, shown in Table 2. In empirical analysis, 30 indicators of 17 cities are from the 2004-2012 years of "Shandong Statistical Yearbook" and "Shandong Science and Technology Yearbook".

<div align="center">Table 2   The Economic Regions of Shandong Province</div>

Region	Cities
Eastern region	Qingdao, Yantai, Weihai, Rizhao, Weifang, Dongying
Central region	Jinan, Taian, Zibo, Laiwu, Linyi
Western region	Dezhou, Liaocheng, Binzhou, Hezi, Zaozhuang, Jining

3.3 Evaluation of the four elements of RIC

In this paper, we use factor analysis to evaluate RIC. The details are as follows. Due to the inconsistent dimensions of indicators, we use the data after pretreatment for indicators' calculation: standardize, using the difference between an indicator and its expected value to divide its standard deviation. we use statistical software, SPSS 17.0, to analyze all the indicators of these four elements. The calculation process is as follows:

Expressions of human capital are

$$F_{H1} = -0.239H_{11} - 0.024H_{12} + 0.263H_{21} + 0.145H_{22} + 0.233H_{31} + 0.332H_{32} + 0.078H_{33} \tag{1}$$

$$F_{H2} = 0.613H_{11} - 0.291H_{12} - 0.105H_{21} + 0.129H_{22} - 0.037H_{31} - 0.275H_{32} + 0.226H_{33} \tag{2}$$

$$F_H = \frac{74.28\%F_{H_1} + 19.26\%F_{H_2}}{93.54\%} \tag{3}$$

Expressions of structural capital are

$$F_{S1} = -0.269S_{11} + 0.173S_{13} + 0.043S_{21} - 0.195S_{22} + 0.230S_{31} - 0.050S_{32} + 0.186S_{33} + 0.299S_{34} \tag{4}$$

$$F_{S2} = 0.058S_{11} + 0.071S_{13} + 0.279S_{21} + 0.463S_{22} + 0.021S_{31} + 0.348S_{32} - 0.070S_{33} - 0.170S_{34} \tag{5}$$

$$F_S = \frac{57.71\%F_{S_1} + 22.32\%F_{S_2}}{80.03\%} \tag{6}$$

Expressions of relational capital are

$$F_{R1} = -0.207R_{11} + 0.336R_{12} - 0.068R_{13} - 0.065R_{21} + 0.032R_{22}$$
$$-0.022R_{23} + 0.359R_{31} + 0.379R_{32} \tag{7}$$

$$F_{R2} = 0.093R_{11} + 0.059R_{12} + 0.041R_{13} + 0.241R_{21} + 0.417R_{22}$$
$$+0.426R_{23} - 0.055R_{31} + 0.002R_{32} \tag{8}$$

$$F_{R3} = 0.587R_{11} - 0.080R_{12} + 0.459R_{13} - 0.164R_{21} + 0.040R_{22} + 0.103R_{23} - 0.117R_{31} - 0.15 \tag{9}$$

$$F_R = \frac{50.79\%F_{R1} + 30.35\%F_{R2} + 14.74\%F_{R3}}{95.87\%} \tag{10}$$

Expressions of innovation capital are

$$F_I = 0.154I_{11} + 0.176I_{12} + 0.196I_{21} + 0.189I_{22} + 0.201I_{23} + 0.196I_{31} \tag{11}$$

Finally, put the indicators standardized into the above expressions, and calculate the scores of the four elements, shown in Table 3.

<div align="center">Table 3   Scores of four Elements of RIC of Shandong Province</div>

Region	Years	H	S	R	I
Eastern Region	2004	-0.1189	-0.3383	0.6670	0.8748
	2005	-0.0945	-0.2248	0.6373	0.4554
	2006	0.0413	0.0573	0.6337	0.9297
	2007	0.1941	0.3926	0.6191	0.8948
	2008	0.5896	0.5229	0.3994	0.9912
	2009	0.8512	0.8234	0.6147	0.9411
	2010	1.2259	1.0490	0.7127	1.0521
	2011	1.3976	0.9539	0.7610	1.2963
	2012	1.7318	1.2165	0.8259	1.3695
Central Region	2004	-0.4572	-0.2217	0.1195	0.0377
	2005	-0.4202	-0.1215	0.1348	-0.1869
	2006	-0.3418	-0.0838	0.1207	0.0613
	2007	-0.2213	0.0977	-0.0306	0.3747
	2008	0.0255	0.3745	0.0013	0.5281
	2009	0.3261	0.4936	0.2620	0.5667
	2010	0.6966	0.7017	0.3187	0.5821
	2011	0.8267	0.6037	0.3720	0.3689
	2012	0.9384	0.8452	0.2190	0.4252

	Year			
	2004	-1.2682	-1.6271	-0.8464	-1.6749
	2005	-1.2159	-1.5556	-0.8613	-1.6364
	2006	-1.1198	-1.2816	-0.9022	-1.4695
	2007	-1.0950	-1.0718	-0.9559	-1.2473
Western Region	2008	-0.9406	-0.8004	-0.9741	-1.2648
	2009	-0.6963	-0.4065	-0.7737	-1.2150
	2010	-0.4186	-0.1983	-0.6935	-1.1102
	2011	-0.3165	-0.1958	-0.7110	-1.0394
	2012	-0.1201	-0.0047	-0.6702	-0.9050

3.4 Evaluation of RIC

Pearson correlation test is done to test the interrelationship between the four elements. There are significant linear correlations between H, S, R and I, with confidence level of 0.01. Thus, we need to apply the factor analysis for dimensionality reduction to calculate the composite score of RIC.

Before the factor analysis, KMO test and Bartlett's test go first to the sample data, with the KMO value, 0.687, Approx Chi-Squre, 162.502, and the significant probability of the chi-square statistic, 0.000. All these say that this data is suitable for factor analysis. According to the elements' scores, principal component analysis selects only the first principal component (the contribution is 90.497%). So, RIC can be expressed as:

$$F = 0.263F_H + 0.261F_S + 0.259F_R + 0.267F_I \tag{12}$$

The scores of RIC are shown in Table 4.

Table 4   Scores of RIC of Shandong Province

Years	Eastern Region	Central Region	Western Region
2004	0.2872	-0.1371	-1.4262
2005	0.2034	-0.1573	-1.3873
2006	0.4388	-0.0641	-1.2564
2007	0.5535	0.0596	-1.1496
2008	0.6604	0.2461	-1.0474
2009	0.8502	0.4343	-0.8149
2010	1.0628	0.6049	-0.6386
2011	1.1609	0.5704	-0.5967
2012	1.3538	0.6382	-0.4486

4 Comparative analysis of RIC

Analysis of RIC stock

We can get a line chart of the stock of RIC, shown in Figure 1, according to Table 5. From Figure 1, we can see clearly that there are huge differences in RIC stocks. For example, in 2004, the RIC score of eastern region is 0.2872, while in the west the score is -1.4262; in 2008, this gap is almost unchanged; until 2012, western region's score still cannot catch up with eastern region's in 2004. And from figure 1, the scores are steady upward, especially the western region. To some extent, this ensures that the future economic developments have enough intellectual support. And though the western region lags behind, there is a chance to close the gap still. In addition, we can visually find the curves are almost parallel, with a weak narrowing trend. To put it in other word, from the perspective of IC, bridging the economic differences between the three areas remains a daunting task.

Through Johansen co-integration test, Chen Wu (2010) found co-integration relationship exists between RIC and economic development, that in the short term, RIC and the level of economic growth may deviate from equilibrium, but in the long run, maintain balance. In other words, economic development lags behind the development of IC. According to the descriptive analysis, we try to explore the reasons for the existing differences between RIC.
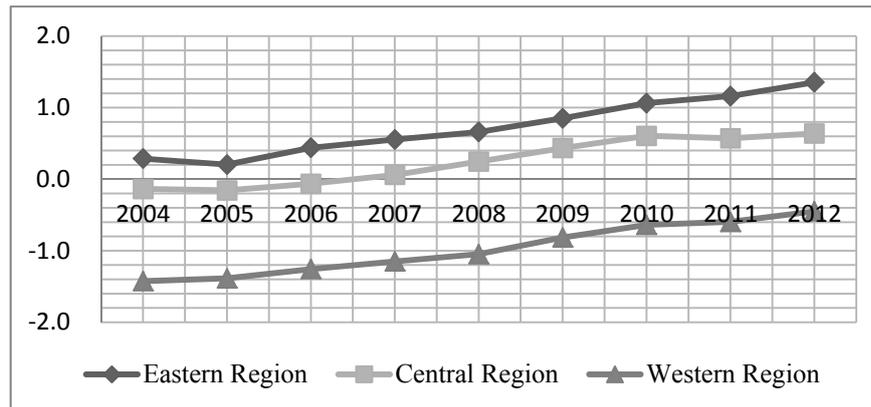
Figure 1   The Line Chart of the Stock of RIC of Shandong Province

1) Human capital

In 2004, the expenditure of education budget in Shandong was 18.07 billion RMB. With the growth year after year, it had reached 114.1 billion by 2012. And in 2010, Shandong implemented Social Security reform and Medicare reform, so the level of social security has been greatly improved. With the investment Shandong Provincial Financial Department put on a yearly basis, human capital acquires a more secure guarantee. In addition, in recent years, the west tried to increase the education spending as much as possible, but it fails to change the condition in the short term for the low starting point. And the east, with excellent geographical location and natural conditions, and a high level of medical and social security, attracts a large number of high quality talents. All of these result in the differences in human capital.

2) Structural capital

In the east and center, the primary industry continues to decline, the service industry quickly became the second largest industry that is able to compete with traditional industries and the tourism and logistics in the tertiary industry experience a rapid rise. Thus, the industrial structure of this region becomes more rational, and the increasing of social interaction accelerates the speed of information dissemination, as well. Located on Jiaodong peninsula, the east owns convenient marine traffic, but due to geographical restrictions, land transports are relatively backward. Thus, the central region with all the geographical advantages becomes the largest regional traffic center. Located in the central of the continent, rail transportation is convenient in the west, and its cargo traffic is also greater than the peninsula.

3) Relational capital

In the last few years, economy is driven by foreign investment in Shandong. This makes industries gathering rapidly in a short term, with wealth created. But it also becomes one of the reasons for the widening gap between rich and poor. Foreign direct investment enriches the investment areas through technology spillover effect, so the more investment eastern and central regions are put into, the wider the gap will be. And in recent years the tendency to rely on foreign investment, has eased, especially in the east. In addition, that South Korea, North Korea and Japan is across the sea with the east, and that the Jiaodong Peninsula is a summer resort with a pleasant climate and beautiful scenery, accelerate the development of tourism to some extent. The foreign tourists' number, tourism revenues, and import and export of goods and labor are more than other regions', and on a yearly basis. In contrast, the disadvantages of the central and western appear.

4) Innovation capital

Shandong provincial government has emphasized on innovation for a long time. In the 12th five-year period, Shandong Province proposes to complete an enterprises-bodied, market-oriented, and production-combined technological innovation system continuously, and built an innovation-oriented province first in domestic. Jiaodong Peninsula is a gathering place of knowledge-based talents. Moreover, compared to traditional domestic firms, foreign enterprises pay more attention to product and technological innovation, and the entrance of Foreign-funded enterprises provides a template of organizational innovation for the traditional private enterprises. In the eastern region, the stocks of other capitals are higher. With the interaction of capitals, business innovation can evolve into regional innovation capital better.
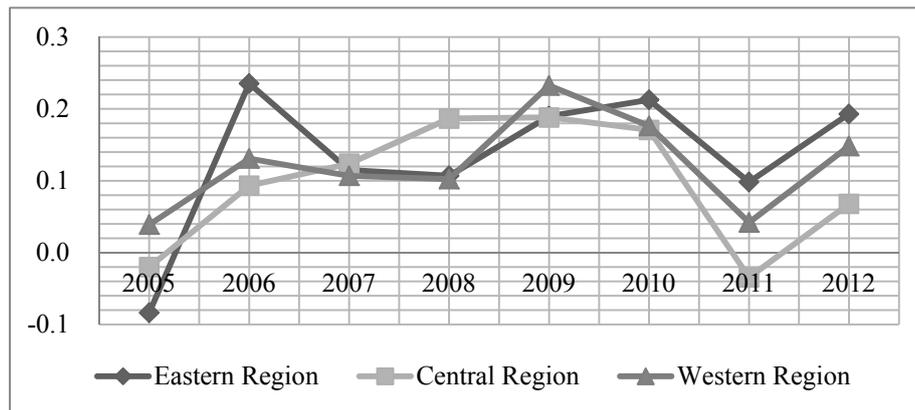
Figure 2   The Line Chart of the Increment of RIC of Shandong Province

5 Analysis of Incremental RIC

We calculate the RIC scores from 2004 to 2012, and get a line graph of increment from 2005 to 2012, shown in Figure 2. As can be seen from Figure 2, despite the large incremental floating, the basis trends are consistent and stable. The increment of 2009 and 2010 is rather, the highest point in history since 2004, but later in 2011, the increment declines overall. In addition, the central region experiences a long period of steady, while there was a significant decline, even negative growth, in 2011. Additional investment in RIC can make it to get some growth, but even without any investments, the existing RIC stock can also produce a certain increment with the interaction of the four elements, which is called endogenous. However, the absence of external inputs will affect the future sustainable development. That is to say the increment of IC lags behind investment.

On one hand, in 2010, with the insignificant increases of other three capitals, the growth in health care and social security level supported the continued strengthening of human capital. So we have to acknowledge that the increase of external inputs does play an important role in the current stock of IC. On the other hand, over the years, the west invested more than the other regions in both educational expenditure and public budget. Yet, because the western population is growing faster and its innate RIC stock is less, such investment brings minimal increments. With the role of both, the incremental IC of 2010 is nearly the same of 2009's.

After 2010, RIC increment happens to a significant decline, and its causes are mainly reflected in the following aspects: (1) A surge in 2010 made the increment in 2011 insignificant. In 2010, the participating proportion of health insurance surged, with little change in the total population. So the decline in 2011 is reasonable. (2) Comprehensive upgrading of communication technology has changed the traditional means of communication. The development of mobile phones and the Internet makes the Posts and Telecommunications in 2011 plummeted from 197.3 billion to 77.1 billion. And since 2010, flights in Shandong increased unprecedentedly, resulting in a weak growth in highway and rail traffic. (3) European debt crisis resulted in import and export and foreign investment projects flagging. The further escalation of the European debt crisis brings a slow economic recovery, a continued decline of foreign investment, a sharp decrease in import and export demand, a continued downturn in shipping market, and weak market demands of container trade. And all these led to a substantial fall in the import and export trade.

In 2011, the increment of innovation output that affected 58.63% of innovation capital in central region, dropped 9.95%, compared with 2010, and the number of innovators is down by 0.8 percentage points. With the insignificant increase of other capitals and a serious recession of innovation capital, the RIC of central region expresses a negative growth in 2011. Moreover, through the analysis above, the overall decline of RIC in 2011 is a normal phenomenon in the rapidly developing. No need to worry too much, but it is necessary for the central region to add the innovation capital investment.

6 Conclusions

Numerous theoretical arguments and empirical analysis done by domestic and foreign scholars have both affirmed the contribution RIC makes to and its decisive role in regional economic development. Therefore, a balanced development of RIC becomes the driving force to coordinate regional economic development. In this study, we use factor analysis to measure RIC of eastern, central

and western regions in Shandong Province, by re-constructing the metrics system of RIC. And the results show that RIC stock of the overall is upward trend, but regional development is highly uneven, showing East high and West low; and that IC increment remained stable, with a large amplitude. This result is consistent with the economic development of Shandong. According to the results, we analyze the impact of RIC elements on the coordinated economic development in turn. But when referred to the reaction the economic development makes to RIC, the study only shows the analysis from a theoretical point of view, not an empirical test. Moreover, when researching the relationship between RIC and economic development, the previous studies, including this one, only focus on measuring RIC and ignore the need to measure economic development. All in all, RIC has gradually become the driving force of economic development of nationals and regions, and despite improving the RIC of backward area, regional economic disparities can be reduced to some extent, but there still need amounts of scientific work to study how to coordinate the development of regional economies.

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Analysis of the Status Quo and Problems of University Innovation Teams in Hubei Province of China

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Abstract: University Innovation Teams are tightly organized creative research groups who have the features of complementary advantages, solidarity and cooperation. They regard leading figures in discipline as the core, backbones of scientific research as the main body, professionals and assistants as the supporting. They are steadily engaged in basic research, applied research, high-tech research, tackling key technical problems, integration and extension of technology, and so on. At present, Hubei Province is vigorously promoting the construction of "Innovation Hubei". Among this process, making the best of the supports of all kinds of university innovation teams should be an important aspect. This study has adopted the traditional questionnaire method, and has analyzed the current development situation of innovation teams through sending out questionnaires to them, and has performed an analysis of the current problems of university innovation teams from the survey results.
Key words: University innovation teams; Leading figures; Team development

1 Introduction

University innovation teams, as intensively innovative research teams in university's innovation group, enjoy the advantages of the knowledge-intensive and intelligence-intensive resources, and offer theoretical support for major theoretical problems and significant scientific task project. In addition, university innovation teams achieve their value of serving locally social and economic development through intensely combining the scientific research problems with social needs as well as turning scientific achievements into a productivity force. What's more, by cooperating with universities and research institutes in other regions, university innovation teams stimulate the driving force brought by scientific innovation, and gradually introduce, assimilate, innovate foreign technology and turn the scientific achievements into productivity so as to serve the social and economic development in Hubei province.

2 Literature Review

Because of the lateness in getting start to construct innovation team, unsystematic related theory and rare experience, there are series of problems and dilemmas urgently requiring being solved and perfected during the construction and development of university innovation teams. The researches of Zhao Hengping, Huang Xueman (2008); Pan Yong, Helmet (2004); Lu Wenming, Zhao Minxiang, Jiang Lai (2006) indicate the major problems which exist in university innovation teams. First, the aim of construction of the team is unclear, the internally interdisciplinary cooperation is insufficient, and management system is unreasonable; the leading figures of the team are scarce, and cultural construction in the team is frequently ignored; second, influenced by traditional thoughts, team members tend to have misgivings toward others through cooperating process, especially with different researchers who are from other disciplines, which leads to massive inefficiency in the cooperation of interdisciplinary and inter-college research teams；third, team resources were wasted. In September, 2012, Hubei government officially initiated The Plan of Promoting Innovation Ability of Universities in Hubei Province (Huang Jian, 2013). Zhao Pengfei, Xiao Juntao (2013) hold the views that the interactive development between local university in Hubei and regional economy is not only the embodiment of social serving function of the university, but also is realization of the harmony in local economy and society. The interactive development between university and local economy at least involves government, entrepreneur, and university; the core of the interaction at least includes scientific research, cultivation of talents, formulation of policy, scientificity of decision-making, and other perspectives; the measure of interaction comprises the cooperative innovation, long-term mechanism, supporting policy, Safeguarding system. Henceforth, the interactive development between local university and regional economy is a long-term systematic project which needs constant exploration and

accumulation.

3 Research Method

This research adopts traditional questionnaire method. By distributing questionnaires to university innovation teams in Hubei, this research analyzes the situation of innovation teams and finds out problems which exist in the innovation teams from the investigation results. During this research, 220 questionnaires are distributed and 200 feedbacks are received, covering various university innovation teams. 192 questionnaires are valid among those feedbacks, through which the team analyzes the reliability and validity of the results. Reliability analysis is completed mainly by split-half reliability method and α reliability analysis method. α is calculated to be 8.2, which has high reliability because of corresponding to the requiring scale of 0.8 to 0.9. Validity analysis is completed under SPSS method. Kom is measured to be 0.62, variance contribution rate is 38%, and correlation coefficient is 0.6 after analyzing content, externality, and structure with factor analysis method, which are up to the standard of effective questionnaire, proving the high credibility of the investigation.

4 The Current Circumstance of Hubei University Innovation Teams

4.1 Basic condition of Hubei's university innovation teams

By the end of September, 2015, Hubei province had already set up 18 state-level key laboratories in universities, which are all led by leading figures in certain related academy, were constructed for scientific innovation team and cooperated with different disciplines and entrepreneurs to research the innovation of industry, university, and institute.   Except for state-level key experiment, the number of state-level and local innovation teams that were formed by different universities reaches 50. These teams engage in subjects including Hylology science, Economy Management Science, Biology, Geological Information and Survey, Agriculture, Shipping, Electronic Machine, Vehicle Engineering, Culture, Medicine, and other fields. According to incomplete data, up until 31th December, 2015, university innovation teams in Hubei province had altogether won 23 international prizes, 306 nation-level prizes, 289 province-level prizes, 7 local prizes, and 9 industrial prizes.   They had published altogether more than 10000 high-level academic papers and 392 writings, applied for more than 1000 patents, acquired 253 copyrights of software, established cooperative relationships with 32 universities which include world first-class universities, Harvard, for example, and had more than 60 cooperative enterprises, including regional organization like EU, Wuhan Government, Traffic Management Bureau of Shenzhen, Zhongguancun Software Park and transitional entrepreneur like Intel, HP, Alibaba, Tecent. With the help of industry-university-research platform, innovation achievements have successfully turned into more than 2 billion RMB outposts.

Statistics above show that current university innovation teams are in well function, and have successfully established the transitional process of research-achievement-outpost, which has produced significant effects. However, after the investigation, there are still some problems in management, construction and evaluation which exist in university innovation teams.

4.2 Status of the construction of Hubei's university innovation teams

Through the investigation about more than 50 innovation teams, some common characters existing in these teams are found. Firstly, high-level leading figures are included; secondly, certain scientific capability and organized staff are equipped; thirdly, nation-level key projects or advanced national key scientific problems are the aiming researches; fourthly, nation or local government offer major funds for the teams.

By investigating 11 nation-level key laboratories practically, it is found that the structure of innovation team in key laboratory is generally formed by 4 units which is organization model, cooperation model, management model and effect model, as shown in Figure 1.

As the construction of innovation teams in China develops rapidly and deeply, it is bound to happen that more and more outstanding innovation teams will emerge in universities that have independent research capability. Therefore, after the parallel comparison between university innovation teams in Hubei and other provinces as well as many foreign countries, it is not hard to find the shortcomings of new university innovation teams, which will be elaborated in the following context.
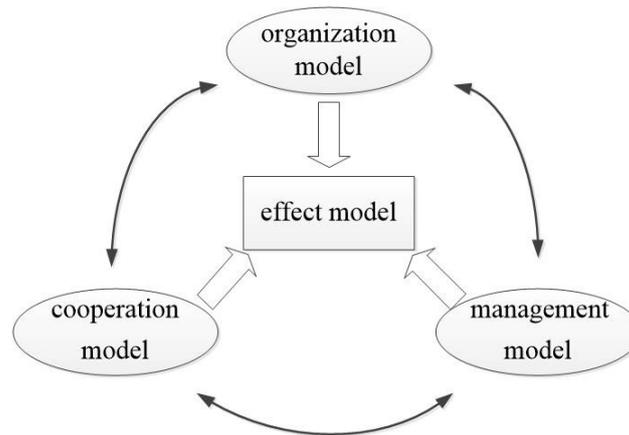
Figure 1   Structure Model of University Innovation Team in Hubei

4.2.1 Master-apprentice relationship is common

According to research paper, currently, most of university innovation teams in Hubei consist of graduate tutor and graduates who they teach, while students who are led by different tutors will find it hard to have access to the team. In these teams, master-apprentice relationship is very common, which causes limitation of the team scale, severe homogenization of academic background, and lack of diverse theory and scientific experience. 90% of university innovation teams in Hubei province are of this type. They tend to adopt comparatively similar research method and technology and scientific aim, which results in the lack of innovation motives. At the same time, scientific achievements are frequently utilized as the capital for the promotion in the work, instead of the further and deep research. Henceforth, influential achievements are seldom produced in these teams.

4.2.2 Structural barrier hinders exchange of different subjects

University Innovation teams are mainly set up on the basis of several colleges, faculties or teaching groups. However, internal system in university was a comparatively stable and independent long-term unit that meets professional teaching requirements. This system tends to be conservative and builds many barriers for reorganization of different subjects in innovation team, hindering the construction of cross-subject and cross-college innovation teams. Besides, in the current cross-subject team, since different academic members generally belong to different colleges, members often lack communication and cooperation with each other, on the contrary, carrying on research individually, which obstructs the genuine cross-subject cooperation.

4.2.3 Piecing-together team is common

Many teams were set up for applying new projects in hurry situations, therefore professional members were urgently introduced to meet research needs. This kind of innovation teams have materialistic aim, lack scientific evaluation, and are simply combined into a structurally imperfect team urgently, which are not as advanced as it appears. Original scientific achievements are hardly achieved because of the lack of cohesiveness, long-term aim, stable status, and deep research. These piecing-together teams have the tendency of being disordered, which put much finical burden on team management and bring both human resource and material resource wastes.

4.2.4 Lacking effective team management

When innovation teams were set up, some universities didn't build appropriate supporting system in time and lack team rules as well as specific managing responsibility. Team managers are often troubled by daily management, which obstructs the research process. Or in other situations, the manager may overemphasize external support. They spend much time finding finical support and resources, but neglect the relationships of internal members, the discrepancy of subjects, pace of research, profit distribution, and other management problems.

4.2.5 Unreasonable evaluation system.

The system of test and evaluation has a strong guidance for research activity, and concerns about whether it can fully stimulate the incentives of members and promote team's harmonious operation. At the present time, there are some major problems existing in the Test and Evaluation. For instance, the first writer was overemphasized in the policy of personnel appointment, promotion and assessment of scientific achievements. This heavily discourages the enthusiasm of other team members who are not the first writer, making them not willing work with others. Besides, the evaluation systems in most

universities are too inflexible and specific, and generally have short evaluating time, and are not conform to the rules of innovation teams. Therefore, it narrows the space for innovation teams to build up systematic research and suppress their willingness to take on researches that are long-term, important and basic, which results in rare influential scientific achievements.

4.2.6 The construction of team culture was ignored

Team culture is the soil for scientific team to exist and develop, and only if there was fair team culture, can team have foundation to inherit and develop. The construction of team culture is to establish people-oriented thoughts, and to create a harmonious, friendly, cooperative, stimulating atmosphere for members. However, current university innovation teams in Hubei rarely put emphasis on the construction of team culture. Abandoning team culture is harmful for forming team cohesiveness and the full realization of the potential of teammates, and finally will influence team's scientific innovation.

4.3 Status of management of university innovation teams in Hubei province

One basic concept in the construction of university innovation team is that by innovating system and management, the team can break the self-barriers existing between colleges, groups, members, and optimize the distribution of innovative resources on a high level so that innovation capability of the team can be improved. This investigation starts from two perspectives---academic exchange and encouraging system. Considering about strengthening the construction of innovation capability under free conditions, optimizing the distribution of resources in premise of exchanging academic information, encouraging engagement under fair situation, selecting the superior ones at the basic of competition, and performing encouraging system under effective evaluation, this investigation designs a scientific management model, as shown in Figure 2.
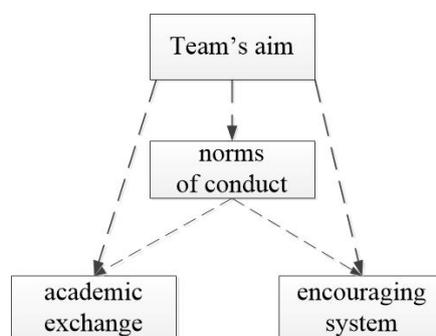
Figure 2   The University Innovation Team Management Model

Based on this model, the status of university innovation team management is analyzed, and some problems are found as shown in the following context.

4.3.1 Management model is antiquated: administrative management model strays from internal norms of scientific research

In recent years, de-administration has become a hot social issue. National Medium and Long-term Educational Reform and Development Program (2010-2020) specifically stated that "proper management system that fits character of university should try to be discovered and established, and the actual existing administrative rank and administrative management system should be cancelled." De-administration finally became nation-level educative policy, but it is still not an easy task. Pan-administration is widely spreading in universities in Hubei province. Pan-administration, on the perspective of the management of innovation teams, is managing team with administrative orders and lacking the innovative talent management system which is on the basis of leading figures that are in related academy. For example, when organizing the application for projects, team is often formed under the administrative order oriented situation, which influences the innovative level and achievements. Scientific research is different from administrative management. Science requires constant attempts and innovation, but administrative management sticks to the rule in order to avoid mistakes. The scientific breakthrough was founded on the basis of many failures. If scientific management was instructed by administrative management, scientific research may balk at making mistakes, which avoids risk but the possibility of success as well.

4.3.2 Unreasonable distribution of interests: sharpening internal conflicts and influencing cohesiveness of research team

University innovation teams have the same target which bonds members with the team. Only if team member shared the same teaching or scientific aim, can they recognize each other's advantage,

pardon others' shortcomings, and stimulate cohesiveness. However, internal conflicts are pretty common among university innovation teams in Hubei, especially conflicts between individual and team. It mainly shows as following perspectives: individual aims and collective aim; individual achievement and collective achievements; individual personality and role in the team; individual willingness and collective decision; individual competitive mentality and collective harmonious need, and so on. In the light of the reason, there are mainly three perspectives causing internal conflicts in team: Firstly, the member's dependence towards each other. For the innovation team, division of labour in the innovative project requires that each member must cooperate with others, keep information exchanged and adjust research activity. However, when these requirements are not met, conflicts become possible. Secondly, difference exists between each other. Informative difference, recognitive difference, individually demanding difference, and characteristic difference are sure to bring some definite discrepancies which lead to conflicts. Thirdly, internally imperfect system contributes to the emergency of conflicts. The scarcity of innovative resources, rough flow of scientific information, unreasonable rewarding system, the lack of reasonable competitive system, and great change of external circumstances can easily cause internal conflicts.

5 Conclusions

Theoretical achievements are remarkable, but frontier achievement shows discrepancy. To a deep extent, theoretical achievement promotes the development of related subjects and the overlap of different subjects and they build solid foundation for promotion of nation's innovative capability. As investigation shows, university innovation teams make great achievements in theoretical innovation. They have published more than 10000 high-level papers until now, and gained great reputation from academy field. However, one of the problems is that advanced theoretical achievements are rare, lagging behind advanced theory. One recognizable result is that research achievements from nation-level key laboratories are in nationally leading position, such as national-level key silicate laboratory in Wuhan University of Technology which is in the lead internationally in silicate field and related applications. It held an international meeting in 2015, and made an academic report to international leading figures in silicate field and had won many national and international prizes. But except for nation-level laboratories, other innovation teams seem to be incapable and delayed in accomplishing innovative achievement.

Industry-university-institute comes into effect, technological IO has obvious achievement, but proportion of technological IO was low. In the industry production, electronic technology, aerospace, motor industry, and many other fields, our country has to relay on foreign technological monopoly, which causes severe dependence on foreign technology and puts much finical burden on China, hindering the development of society. Therefore, innovation teams must focus on these fields and constantly overcome technological difficulties so that China can hold more intellectual property rights. And then, combining the technology with practical needs and turn them into commercial technology to accomplish the transition of research to outpost. University innovation teams in Hubei province have great amount of technological outposts, but actual outposts are seldom to be seen. According to investigation, it is a very low proportion that only 20 technology copyrights can be put into production in every 100 technology copyrights. The projects that are put into production practically make ten million-level profits for corporation averagely every year, and some even have hundreds of millions of economical values, which proves that these IO innovative breakthroughs achieve remarkable success.

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Research on the Function and Practical Path of the Enterprise Association for Science and Technology to Promote Scientific and Technological Innovation

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Abstract: As the important force in the enterprise scientific and technological innovation, the Enterprise Association for Science and Technology of China plays a positive role in the development of society and the modern enterprise, which has features such as non-profit, professional and scientific, etc. This thesis takes these following five aspects as the breakthrough points of the missions of the Enterprise Association for Science and Technology to achieve the aggregation of enterprise innovation talent, meanwhile promoting collaborative innovation, integrating social resources, getting the government support, as well as promoting the formation of enterprise innovation environment, analyzing the specific functions of the Enterprise Association for Science and Technology to promote enterprise scientific and technological innovation, so as to come up with the paths of the Enterprise Association for Science and Technology to promote scientific and technological innovation.
Key words: Enterprise association for science and technology; Scientific and technological innovation; Function; Practical path

1 Introduction

As a kind of non-profit social organization in China, association of science and technology is based on researching, playing an important role in promoting the progress of science and technology and the innovation of nation's science and technology, as well as providing support to guide the decision-making of the government and technology innovation of enterprises. The Enterprise Association for Science and Technology as a subordinate to the branch of science and technology association, becoming an important force to promote enterprise technology innovation, enterprise scientific and technological innovations are in urgent need of more participation of the Enterprise Association for Science and Technology. But at present, the study of the Enterprise Association for Science and Technology is relatively rare. If attention, academic circles mostly stay on the academic ability of the Enterprise Association for Science and Technology, about the study of its ability of promoting enterprise innovation and its role in practice, it is absent. From the point of the research in China, some scholars mostly focus on the overall research of the science and technology association, for example, Xi yongqin and Chen xinfeng (2009) think that the science and technology association plays an important role of circulation in the national innovation system of science and technology, Zeng guoping and other scholars(2015) also think that the work of the Enterprise Association for Science and Technology is of great significance to build an innovation-oriented country, innovation not only needs the support of "hard resources", also needs "soft resources" to support, the science and technology association innovation should focus on the construction of soft environment. Chen yuxuan (2012) comes up with that the Enterprise Association for Science and Technology would like to be a good linkage between the Party and the government should conclude the bridge of technical workers in a large number of new economic organizations, and is supposed to be with practice, develops the work of the Enterprise Association for Science and Technology creatively. These studies take more consideration to put science and technology organizations or the Enterprise Association for Science and Technology in the whole background of the development of enterprises, and put less attention on the promotion of enterprise technology innovation ability. Foreign scholars also have some research of this aspect, through the research of the relationships between south Asian governments and social organizations, Batley Rich, Rose Pauline (2010) and other scholars conclude that social organizations are able to integrate resources. This paper mainly analyses the present missions of the Enterprise Association for Science and Technology and its functions and paths to promote the enterprise scientific and technological innovation.

2 The Missions of the Enterprise Association for Science and Technology in the Development of the Modern Enterprise

As the dominant force in the enterprise scientific and technological innovation, the Enterprise Association for Science and Technology of China plays a positive role in the development of society and

the modern enterprise. The Enterprise Association for Science and Technology is the mass organization for the enterprise of science and technology workers, the bridges and links for the enterprise management policy makers contacting enterprise technical workers (Wu gang, 2014), and the important force to promote enterprises in scientific and technological progress as well as technological innovations. However, with the deepening of the reform, many problems have emerged in association of science and technology, which were not adapted to the current situation and function failure (Wang yuming, Liu xiangyun, 2011). At the same time, China has shifted from the period of social management to social governance, the Enterprise Association for Science and Technology especially needs to grasp their own roles and missions in this transformation period.

2.1 To achieve the aggregation of enterprise innovation talent

In the work of contemporary science and technology innovation, talent reserve is a cutting-edge strength and the core of the effective realization of scientific and technological innovation. But at present, the development condition of the Enterprise Association for Science and Technology in China faces the challenge of small scale and insufficient full-time staff, the existing full-time staff quality is not good enough and lacking professional and technical knowledge, most employees have not received professional training. These directly lead to the shortage of the Enterprise Association for Science and Technology's talent resources. Both self-sufficiency rate of original technology and conversion rate of scientific and technological achievements are not so high which restrict scientific and technological innovation. Therefore, there is no deny that the Enterprise Association for Science and Technology is significant in training outstanding innovative talents for the enterprise technological innovation. The Enterprise Association for Science and Technology needs to unite outstanding scientific and technological personnel, constantly serve for science and technology innovation and provide adequate reserve forces to the science and technology innovation of enterprises. The Enterprise Association for Science and Technology still needs to accelerate the improvement of the outstanding scientific and technological innovation talent cultivation system, extensively carry out scientific research achievement selection of scientific and technical workers and other activities, establish incentive mechanism, implement enterprise special reward system for scientific and technical workers who have outstanding contribution in enterprise technology innovation. Reserving the enterprise technology innovation talents for enterprise innovations is the major mission of the Enterprise Association Science and Technology, and the fundamental support to promote enterprise technology innovation.

2.2 To promote collaborative innovation

There are obstacles and restrictions of partial developmental defect in enterprise technology innovation at the present stage. As for the Enterprise Association for Science and Technology dimension, the Enterprise Association for Science and Technology and the technology innovation ideas of science and technology innovation talents lack of government and social support activities. There is a certain degree of role absence and fragility, and nowhere to display technology innovation ideas. And for the modern enterprise dimension, the modern enterprise lacks the sense of urgency and crisis consciousness in scientific and technological innovation, the original innovation and integrated innovation ability is weak, the concept of enterprise technological innovation is exhausted. The enterprise is the main body of technological innovation, promoting scientific and technological innovation ability including three dimensions: The Enterprise Association for Science and Technology, scientific and technological innovation personnel and modern enterprise, coordinating the force of this three main body. Therefore, the effective docking of Enterprises Association for Science and Technology with the modern enterprise is beneficial to their own shortage. At the same time, bringing science and technology innovation personnel's advantages into full play, promoting the transformation of high-tech achievements, establishing an effective mechanism of production-study-research cooperation, overcoming the key technical problems of enterprise, and enhancing the independent innovation capability of enterprises.

2.3 To integrate social resources

China is in the primary stage of socialism; the development of market economy system is not perfect. lacking of technological innovation and the absence of development financing lead to the poor performance of the Enterprise Association for Science and Technology in the field of economy and culture, etc. In this case, the Enterprise Association for Science and Technology must be based on enhancing their own strength to support scientific and technological innovation of the enterprises, closely circling around the central task of the enterprises, giving full play to the advantages, focusing on the social resources, for their own use. The Enterprise Association for Science and Technology shall put their sights of development to the society, integrate the available social forces, exert the advantages of discipline and specialty, cohere and integrate the resources of technology and human, include popular

science resources, publicity resources, etc., and establish a distinctive image of the Enterprise Association for Science and Technology. At the same time, the Enterprise Association for Science and Technology should focus on the science and technology innovation resources, and promote the improvement of science and technology innovation ability.

2.4 To get the government support

The Enterprise Association for Science and Technology is supposed to actively seek further support from the government when it maintains its own independence and autonomy, as well as the reasonable tension with the government. According to its own professional fields and disciplines, the Enterprise Association for Science and Technology is undertaking different functions of the government, solving the problems of the government mechanism, and promoting the effective development of government work. The Enterprise Association for Science and Technology attracts more attention of the government, so as to drive the government roundly grasping the adverse development of the Enterprise Association for Science and Technology in China, increasing the financial support of the government, taking financial support actively, tax incentives and other positive actions so as to support them better development. The government shall transfer its functions to the Enterprise Association for Science and Technology in a certain extent, commission them to carry out scientific activities and technical training services, conduct public recognition and award, and so on. Such initiatives are not only conducive to the government's work carries out effectively, but also the catalyst which expand the Enterprise Association for Science and Technology and develop modern enterprise innovation.

2.5 To promote the formation of enterprise innovation environment

The enterprise science and technology innovation is an important component in practicing innovation driven development strategy effectively, and building up a good enterprise innovation environment is the key to vigorously promoting the modern enterprise science and technology innovation. In China, the modern enterprise is facing the realistic problem of low technology innovation ability, lacking of independent innovation, etc., the independent innovation consciousness of enterprise is weak, lacking of innovative atmosphere. Therefore, striving to enhance the ability of science and technology innovation and creating the enterprise innovation environment, are the inevitable path to promote the scientific and technological innovation of enterprises in China. To greatly improve the ability and level of service in enterprise's scientific and technological innovation and enterprise construction, and create a good corporate innovation atmosphere need the Enterprise Association for Science and Technology to carry out innovative exchange activities deeply and widely, understand business needs, promote the effective connection between business needs and related intellectual resources, and serve for enterprise transformation and technological innovation. At the same time, the Enterprise Association for Science and Technology is supposed to further optimize the allocation of scientific and technological resources, sound scientific and technological innovation integrated service system, optimize the environment of enterprises innovation and competition, actualize the construction of enterprise innovation environment.

Figure 1   The missions of the Enterprise Association for Science and Technology

3 The Specific Functions of the Enterprise Association for Science and Technology to Promote Enterprise Scientific and Technological Innovation

　　The Enterprise Association for Science and Technology is the mass organization of the enterprise scientific and technological workers, the bond of contacting enterprise scientific and technological workers, business leaders and employees, as well as the solid bridge of enterprises communicating with societies, scientific research institutions and universities (Zhang licheng, 2011). The Enterprise Association for Science and Technology plays a main role in promoting modern enterprise independent innovations of science and technology, the followings are the specific functions of promoting enterprise innovation of science and technology.

3.1 To provide the scientific and technological support and information service for enterprise innovations of science and technology

3.1.1 To provide the support of the innovative technology and encourage original innovations

　　After the reform and opening up, with the planned economy turned to the market economy gradually, Chinese science and technology organizations get rid of the rigid thoughts formed by the planned economy, but new ideas and consciousness hasn't been established indeed (Zhang heng, 2013). Therefore, the enterprise innovations of science and technology badly need the innovative technology support of the Enterprise Association for Science and Technology. Through the research of the relationships between south Asian governments and social organizations, Batley Rich, Rose Pauline (2010) and other scholars conclude that social organizations are able to integrate resources. To promote the improvement of enterprise original technology, the Enterprise Association for Science and Technology integrates human resources and social resources which benefit enterprise innovations, promotes the popularization of resources by providing technological innovations and encourage enterprises to innovate independently on the basis of this. The progress of ability of science and technology innovation is the most direct power source for enterprise technology innovations. The concept of strength innovation is the only way for an enterprise which wants to get great developments. The Enterprise Association for Science and Technology also needs to provide the support of technological innovation for the enterprise, encourage original innovations and integrated innovations, and provide more possibilities for enterprise innovations and developments.

3.1.2 To build the platform of circulation of science and technology information and serve enterprise technology innovations

　　The Enterprise Association for Science and Technology is the builder of the information platform of science and technology—build the circulation channels of the Enterprise Association for Science and Technology transferring science and technology information to the enterprise and the innovative personnel. The Enterprise Association for Science and Technology plays a key role in timely and fast circulation of technology information, and are able to transmit national policies about science and innovation, update information about technological innovations timely and promote scientific information to flow step by step. Enterprise technology innovations must be guided by innovative ideas, driven by innovative technology and linked by innovation achievement. By making innovative ideas scientific, professional, comprehensive and real-time, the new system of science and technology innovation can be improved. The construction of the technology information platform provides a two-way communication platform of experience in technical innovations and decision-making reference tools for enterprises and enterprise innovative talents.

3.2 To do a good job of intermediary services for the enterprise science and technology innovations

　　Enterprise's developments cannot leave the innovation activities of science and technology. Science and technology innovation activities provide the support of path and the guarantee of theory for developments of enterprises. Therefore, for the Enterprise Association for Science and Technology, combining scientific workers in society and enterprise technology innovation activities is another function: intermediary services. The Enterprise Association for Science and Technology plays a role of a "middleman" between scientific workers and enterprises, and the identity of "middleman" cannot be replaced. But due to the previous government influenced by the thoughts of administrative totalitarianism, functions such as intermediary services of science and technology which belong to science and technology communities are interfered and monopolized too much by the government. How to combine scientific and technical workers with enterprises effectively and how to become a good "middlemen" of the Enterprise Association for Science and Technology are problems with which intermediary services are faced.

　　In intermediary services of the Enterprise Association for Science and Technology, innovating the contents and modes of service continuously should be payed attention to instead of conformism and routinism. The Enterprise Association for Science and Technology plays an important role in circulation

and undertaking between the enterprise and the scientific innovation personnel. The work of intermediary service transforms scientific and technological achievements, builds Bridges between science and business to drive the transformation and application of scientific innovation achievements, brings scientific innovation personnel's outstanding scientific achievements on innovations of enterprise activities and promotes enterprise developments forward. The Enterprise Association for Science and Technology plays the role of the "middleman" effectively, combines scientific workers in society with enterprise technology innovation activities organically and translates the enterprise technological innovations into practice, develops preferentially. Meanwhile, the Enterprise Association for Science and Technology should raise the service quality for the government, enterprises and scientific innovation personnel, play the role of bridge actively and strive for common support of multilateral force.

3.3 To provide services of decision-making consultation for enterprise science and technology innovations

Science and technology innovations have become an increasingly important role in the economic and social developments, and have certain influence on the formulation and modification of government policies. Science and technology evaluation and consultation has become one of the important functions of the Enterprise Association for Science and Technology. The Enterprise Association for Science and Technology also provides advice of scientific policies and service of decision-making consultation for the government. As an institution which collects masses of science and technology workers, associations of science and technology have taken on more and more policy advisory work of science and technology (Liu shujun, 2010). The Enterprise Association for Science and Technology establishes and perfects the expert consulting and evaluation system, providing science protection and the support of path for policy advisory of enterprise technology innovations.

The Enterprise Association for Science and Technology serves enterprise technology innovations, through consulting the Enterprise Association for Science and Technology, enterprises can make their decisions more scientific and reasonable. The Enterprise Association for Science and Technology can provide consulting services including reflecting the views and requirements, providing industry research, assisting the propaganda of policies, carrying out the qualification and project demonstration, etc. Business decisions rely on the support of professional consultancy and the professionalism of enterprise innovation decisions can be powerfully guaranteed.
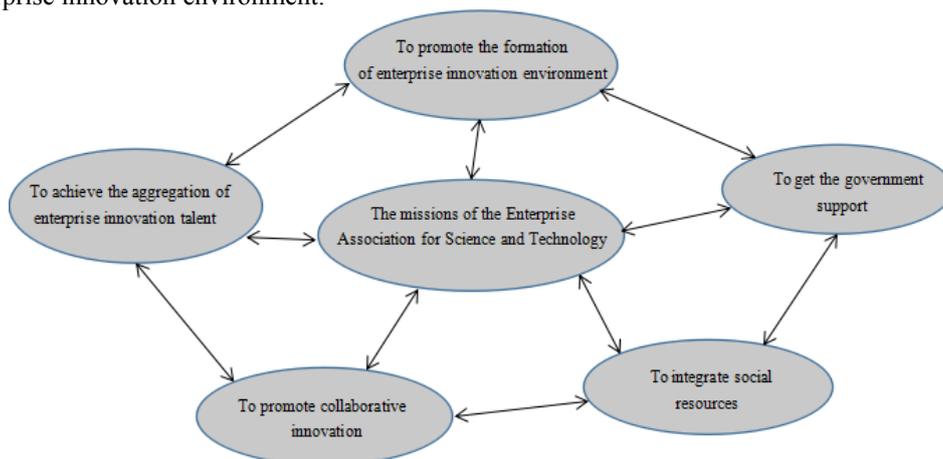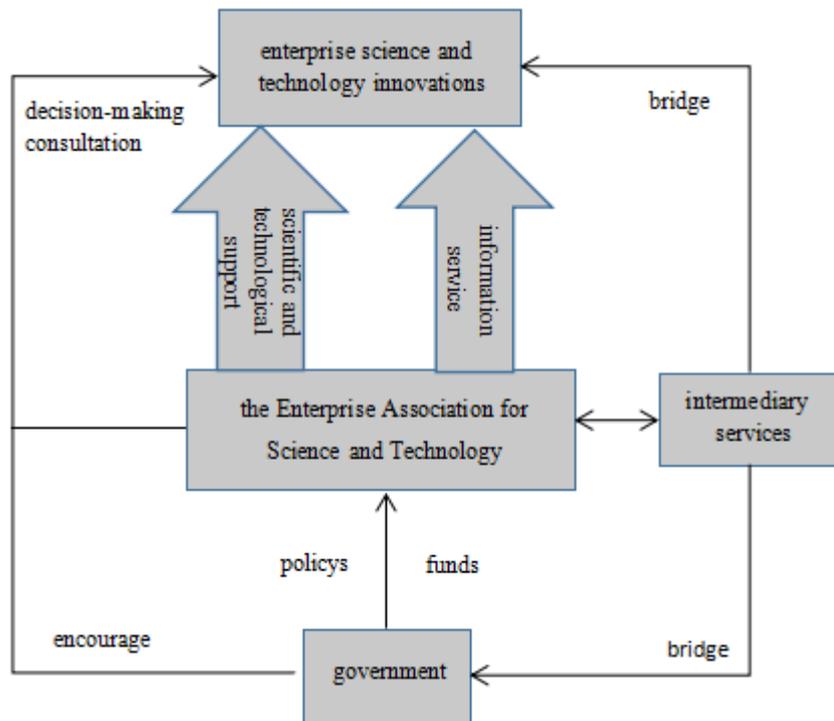

Figure 2   The Functions of the Enterprise Association for Science and Technology

4 The Paths of the Enterprise Association for Science and Technology to Promote Scientific and Technological Innovation

4.1 To build high quality innovation communication platform and innovate science and technology communication means.

The Enterprise Association for Science and Technology is an important organization in the development of science and technology innovations and it is the carrier of scientific and technological innovation in the communication. The scientific and technological innovation of the Enterprise Association for Science and Technology is based on the communication of science and technology workers, and the construction of the innovative communication platform needs to be high quality and pragmatic. The Enterprise Association for Science and Technology carries out high level of national and comprehensive innovation communication meetings, circles around the Enterprise Association for Science and Technology to enhance the independent innovation capacity, provides technical advice and technical diagnosis for the production of technical problems arisen in innovation, encourages the construction of the Enterprise Association for Science and Technology's capabilities and disciplines; at the same time, provides a public platform to communicate freely for entrepreneurs, business practitioners and investors who are committed to build up a new brand. The Enterprise Association for Science and Technology also needs to be carried out high frequency communications for the benefit of science and technology workers, make full use of human resources, promote innovation ability, and provide some guidance for ideas in the association's science and technology innovation.

The innovation of science and technology communication means requires a wide range of measures. If the Enterprise Association for Science and Technology only assembles technology workers on science and technology communication activities, the attraction will weaken or even disappear. It is necessary to give priority to create high quality and pragmatic communication platform of science and technology, and supplement it with science and technology lectures, BBS and so on, so that build up a new pattern for comprehensive and continuous communication of innovation. Firstly, giving lectures on science and technology can improve the quality of scientific and technical workers, update their knowledge, and encourage science and technology information forming a timely, rapid, and comprehensive circulation, effectively promote scientific and technological innovation. Secondly, as for the activities of science and technology BBS, they can push a wider range of enterprise talents' exchanges of ideas, extend the breadth of innovative communication and expand the influence of enterprise technology innovation education. The build of high-level innovative communication platform and the innovation of science and technology are important for creating a good academic ecological environment as well as enhancing the social foundation of independent innovation of the Enterprises Association for Science and Technology and it can provide more paths and choices for the innovation of enterprises science and technology. As some scholars say that "the communication between community of science and technology academic should return to the standard" (Yang wenzhi, 2006).

4.2 To improve the quality of routine work and build high-level talent teams
4.2.1 To improve the quality of routine work

Nowadays, due to many reasons, the Enterprise Association for Science and Technology doesn't have a sound organization and a reasonable regulation, cannot effectively carry out all their work. The Association for Science and Technology has much daily work, so improving the quality of their daily work and enhancing the quality of science and technology workers is an important aspect to promote scientific and technological innovation. Firstly, by training the scientific and technological innovation personnel of the Enterprises Association for Science and Technology to improve the quality of the science and technology innovation and cognitive level, the science and technology innovation will be provided with more possibilities. Secondly, the Enterprise Association for Science and Technology shall improve the quality of regular work such as increasing the supervision and guidance for the work of association, improving the standardization and stability of their work, and expanding the service functions. Thirdly, the Enterprise Association for Science and Technology should establish a transparent and widen participation supervision system, supervise all the work of association and establish accountability mechanism to improve their work especially work for scientific and technological innovation and promote enterprise technology innovations carrying out as planned.

4.2.2 To attach importance to the construction of talent teams

Talent team is the important foundation of the Enterprise Association for Science and Technology service supply. It is the core strength of the scientific and technological innovation, providing professional and scientific support for science and technology innovation. The construction of the high

standard and high quality talent team is the essential path of the Enterprise Association for Science and Technology to promote scientific and technological innovation. Firstly, the Enterprise Association for Science and Technology shall build a high-quality scientific and technological personnel working environment, so as to retain talent and seize the outstanding scientific and technological personnel. Secondly, it also needs to establish science and technology reward and encouragement mechanism, stimulate innovation vitality of scientific and technical workers through the social recognition of their innovation achievement, and strengthen their service ability.

4.3 To strengthen the management of members, and enhance the ability to serve members

Members of association are the main part of the Enterprise Association for Science and Technology and are the foundation of the association's existence and development. The Enterprise Association for Science and Technology should take the association member as the focal point to promote innovation. In China, associations of science and technology always take the way of autonomous management, the leaders of the Enterprise Association for Science and Technology are also produced by the selection of members. However, there is some bad phenomenon in the Enterprise Association for Science and Technology, such as members' structural imbalance, the service consciousness and ability of members is weak, etc. Therefore, strengthening the management and service of members is of vital importance. Through the training of daily work and carrying out innovation activities, the Enterprise Association for Science and Technology enhances the quality of association members, deepens the cohesion and the sense of belonging of the association members, so as to serve for the enterprise technology innovation better. The Enterprise Association for Science and Technology also should strengthen its service consciousness for members, pay attention to the membership interests, create the service platform for association members, and lift the service level for members.

Ben b. Akpan (2000) took the research of the science teachers association (STA), and believed that associations of science and technology played an important role in providing professional services for their members. Firstly, the Enterprise Association for Science and Technology provides updated information and data for the convenience of information communication and interaction among the members. Secondly, it should set up reward and recognition for members who are committed to the technological innovation, show the achievements of technology innovators, strengthen the innovation consciousness of association members. Thirdly, the Enterprise Association for Science and Technology should play a good role of bridge and link when mobilize and lead the members to invest in scientific and technological innovation, build perfect service support system. Fourthly, the Enterprise Association for Science and Technology should fully coordinate the relationship between the members and the association, provide convenient channel to members and the association for their communication and cooperation. The Enterprise Association for Science and Technology is in the service of association members, the members also put their ability on the enterprise technology innovation, forming a benign interactive circulating mechanism so as to promote enterprise technology innovation.

5 Conclusions

As the important force in the enterprise scientific and technological innovation, the Enterprise Association for Science and Technology faces a severe test, the Enterprise Association for Science and Technology shall meet the needs of the new situation of society through positioning its own missions correctly. The missions of the Enterprise Association for Science and Technology in the development of the modern enterprise include achieving the aggregation of enterprise innovation talent, promoting collaborative innovation, integrating social resources, getting the government support, as well as promoting the formation of enterprise innovation environment. The specific functions of the Enterprise Association for Science and Technology to promote enterprise scientific and technological innovation include providing the scientific and technological support and information service for enterprise innovations of science and technology, doing a good job of intermediary services for the enterprise science and technology innovations, and providing services of decision-making consultation for enterprise science and technology innovations. The paths of the Enterprise Association for Science and Technology to promote scientific and technological Innovation are building high quality innovation communication platform and innovating science and technology communication means, improving the quality of routine work and building high-level talent teams, as well as strengthening the management of members, and enhancing the ability to serve members.

Acknowledgement

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Science and Technology Policy and Innovation Efficiency

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Abstract: The Eighteenth National Congress of the CPC proposed innovation-driven development strategy, technological innovation will replace the demographic dividend has become a new source of economic growth. China's "technology economy mismatch" serious current problem, it is difficult to give full play the role of innovation to lead the economic growth, innovation and efficiency of the urgent need to identify constraints factors. In this paper, the efficiency of innovation and technological achievements into output efficiency and conversion efficiency using data envelopment analysis estimated that a two-stage innovation efficiency of 26 manufacturing industries relatively high efficiency two-stage degree of coincidence, analyze the impact of Science and Technology Policy Innovation Efficiency. The empirical results show that the output efficiency of scientific and technological achievements conversion efficiency greater than, science and technology policy orientation can only penetrate into the first stage of technological innovation, scientific and technological output stage and a conversion phase decoupling serious outcomes. The proposed patent ownership empowering individuals to improve the conversion efficiency of scientific research; closely integrated with the market trends, policy recommendations to solve China's manufacturing industry is in long-term low-end global value chains.
Key words: Science and technology policy; Technological achievements outputs; Scientific and technological achievements; Data envelopment analysis

1 Introduction

In the 18th People's Congress, it was proposed that "Technical Innovation is a strategical support to enhance social production force and comprehensive national power, which shall be placed as a core part of the national development"; also, it was highlighted that self-innovation with Chinese characteristics shall be always insisted on and the innovation-driven development strategy shall be implemented. Since then, the public has been greatly encouraged in innovation. From 2012, the number of efficient patents has been increased by over 30%. Even though large amounts of scientific achievements have been made, it is difficult to satisfy the market demand by products supplied by domestic companies. However, in some industries like steel, cement and electrolytic aluminium are witnessing an over capacity, whose market is impossible to be cleared. In the aspect of the whole world, Chinese enterprises have been engaged in low-and-middle products for a long time, whose additional value to the products are low. Besides, there is a gap between the fields with patents and inventions and the actual market demands, which adversely affect the conversion between scientific achievements and economic benefits. Under this background, both domestic and overseas scholars, in order to enhance the efficiency of conversion between scientific achievements and economic benefits, are studying the impact on innovation efficiency by science & technology policy.

Today, the academic world has a new understanding on the range and scope of innovation efficiency. Feng Zhijun and Zhu Jianxin (2011) pointed out that there are two stages from science & technology input to economic output -- first stage is that researchers and funds are invested while patents, inventions and academic theses are output; second stage is the conversion from S&T achievements to economic output. The efficiency of both two stages will determine the innovation efficiency. Therefore, innovation is not only for high quality theses but also for better economic output and development (Hu Weiwu, 2012). Dong Jie (2012), on the basis of stochastic frontier function, analyzed the factors affecting the innovation efficiency in China. By the analysis, it was found that there are several factors like market support, manpower support, fund support and S&T policy support etc, of which S&T support plays a most important role. If S&T policy well blends with market demands, innovation efficiency will be hugely increased. In 1980, DuPont Bill was proposed in America, stating that the researchers have the ownership of the S&T achievements sponsored by the government; in order to maximize the economic output of the patent, researchers will get the patents they have fully satisfy the market demands. By Dupont Bill, a close combination between S&T policy and market demand was pushed forward, which also makes America become the country whose commercialization efficiency of S&T achievements is the highest all over the

world. On the contrary, if S&T policies break away from the market demand, a pattern that "science & technology is independent from economy" will be formed. In China, there are more than 30,000 S&T achievements while only 6%-8% are turned into actual productivity. That is the innovation efficiency in China is much lower than other developed countries (Chai Guorong, 2010). As a result, we can conclude that the relationship between S&T policy and market demand is the key factor affecting innovation efficiency. Currently, the research achievements are mainly about the design and measurement included in evaluation system (regional, provincial and municipal systems) for innovation efficiency, which cannot be directly made use of to optimize the innovation efficiency (Zha Min, 2013; He Defang, 2011). In this thesis, the study on innovation efficiency is not focusing on regions but industries. By comparing the first stage (S&T policies are reflected by relationship between S&T achievements output efficiency and investment on researchers and funds) with the second stage (market demand is reflected by the conversion from S&T achievements into economic output), we find out the industrial overlap ratio between the two stages. Then it will know about the conjunction between S&T policy and market demand. In this way, the impact on S&T innovation efficiency by S&T policy in China will be reflected. Here below is about the structure of the thesis: section 2 is about evaluation method, index selection and data source of the innovation efficiency at different stages. Section 3 is about by combing with specific data, the conversion efficiency between S&T achievements (26 achievements) and economic output is measured and calculated. Section 4 is about by empirical analysis, the conclusion is made and proposals for enhancing innovation efficiency are issued.

2 Evaluation Method, Index Selection and Data Source
2.1 Evaluation method
Normally, there are three methods used to evaluate the efficiency -- IO (input and output), SFA (stochastic frontier analysis) and DEA (data envelopment analysis). Wassily W. Leontief is the founder of IO method, who established the efficiency evaluation system (see Formula (1)). This kind of method is cored on direct consumption coefficient and complete consumption coefficient). In the formula, X_{ij} is an intermediate product invested from industry i to industry j; X_j is the total output of industry j; A_{ij} is the direct consumption efficient, B is the matrix of complete consumption coefficient. In the matrix, elements are the complete consumption coefficients. By this evaluation method, the conversion efficiency between single investment and single output can be correctly reflected, which is being widely used in trade and environment. However, evaluation system for innovation efficiency is in a mode with multiple inputs and multiple outputs. So this evaluation method is not suitable.

$$A_{ij} = \frac{X_{ij}}{X_j}(i, j = 1, 2 \cdots, n) \qquad B = (I - A)^{-1} - I \qquad (1)$$

Aigner, Lovell, Schmidt (1977), Meeusen and Broeck (1977) once designed the SFAs independently, which were used to calculate the technological efficiency. In 1955, Battese and Coelli, in order to analyze the cause of invalidity, introduced technological non-efficiency function, by which the impact on efficiency by input and output was reflected. In Formula (2), x_{it} is the factor input at the time of t in industry i; y_{it} is the output at the time of t in industry i; $v_{it} - \mu_{it}$ is the residual error. TE_{it} (technological efficiency) reflects the ratio between actual output and production frontiers. So we can say that if SFA is to be used to estimate the innovation efficiency, a production factor which is suitable shall be input while the selection of Kebu-Douglas function and CES will directly affect the correctness of the result.

$$y_{it} = \beta x_{it} + v_{it} - \mu_{it} \quad TE_{it} = \frac{E(y_{it}^* | \mu_{it}, x_{it})}{E(y_{it}^* | \mu_{it} = 0, x_{it})} \qquad (2)$$

DEA was proposed by A. Charnes and W.W. Cooper in 1978, which is used to solve the issues related to efficiency evaluation for multiple output and input. When evaluating innovation efficiency, DEA, relying on the input and output data, linear optimization will be used to find out a production frontier, which consists of a decision-making unit with the most efficient innovation. That is the further

other decision-making units from the production frontier, the lower the innovation efficiency is. For Formula (3), X_j is the vector quantity of innovation inputs, Y_j is the vector quantity of innovation outputs, which reflects the quantity of inputs and outputs, u and v is the weight vector, which reflect the importance of inputs and outputs; h_j is the innovation efficiency of j th industry. If DEA is used to evaluate the innovation efficiency, the properties of linear programming can be fully made use of, no need to set up equation and function, so that it is rather simple and feasible; when empowerment, there is no need to be scored by experts but output will be obtained according to actual situation. Therefore, the output will not be adversely affected by subjective factor; moreover, the guidance ideology for relative efficiency will get the output result reflect decision-making units whose innovation efficiency is higher in a clear way. In this way, the gap in innovation efficiency of different decision-making units will be presented, which will help to find out how to optimize the non-efficient units. Because of these advantages, DEA is used to measure the innovation efficiency in this thesis.

$$h_j = \frac{u^T Y_j}{v^T X_j}, j = 1, 2, \cdots, n \quad \begin{cases} \max h_0 = u^T Y_0 \\ s.t. v^T X_j - u^T Y_j \geq 0, j = 1, 2 \cdots, n \\ v^T X_0 = 1 \\ u \geq 0; v \geq 0 \end{cases} \tag{3}$$

2.2 Index selection and data source

Table 1   Evaluation Index System for Multi-Industrial Innovation Efficiency at Two Stages

Variable	Symbol	Unit
R&D staff full-time equivalent	X1	Man-year
R&D fund	X2	Ten Thousand Yuan
Expenditure of new product development	X3	Ten Thousand Yuan
Quantity of efficient patents	Y1	
Quantity of new products	Y2	
Per capita GDP	Z1	Yuan
Sales revenue of new products	Z2	Ten Thousand Yuan

For innovation efficiency evaluation at two different stages, the original input is the investment on R&D innovation. It is known that innovation needs large amounts of funds while R&D fund is an indispensable input. Apart from investing R&D fund, HR, being as an important carrier of knowledge, is also a key factor for innovation input. Therefore, in this thesis, R&D staff full-time equivalent, R&D fund and expenditure of new product development are selected as the indexes to evaluate the innovation efficiency made at the first stage. As for the intermediate products like patents, theses and projects, they are both the input required at first stage but also the input required at the second stage, which plays a transitional role in the evaluation system. In this thesis, it is planned to reflect the S&T policy by S&T achievements made in 26 industries, so it is necessary to collect the quantity of patents, theses and projects related to these industries. At present, the statistical caliber of thesis is that subjects are used as the standard when sorting out theses. Therefore, it is difficult to converse into industry. In this thesis, quantity of efficient patents and quantity of new products are involved into Table 1. In fact, economic output is the final product of S&T innovation. At the same time, in this thesis, the other two factors -- sales revenue (direct economic output) of new products and per capita GDP (indirectly affected by innovation) are taken into account of. Then, under the help of evaluation systems on innovation efficiency made by Griliches (1990), Ahuja (2001) and Liu Shunzhong (2002), the thesis fulfills the establishment of index system.

All indexes are from China Statistical Yearbook and China Statistics Yearbook on High Technology Industry. Since there are several stages from S&T input to economic output, so it takes some time to finish the conversion. In this way, if the innovation efficiency is measured by the past data, it will not true and accurate enough because it is not consistent with the reality. Considering the affect by time lag, this thesis, by using what Shi Xiusong did, uses the data in 2009 in terms of the intermediate products (including patents and inventions) is used when R&D staff and funds are the original inputs. At the same time, final economic output is the data in 2010. For empirical analysis, it studies the impact on innovation efficiency by S&T policy in 2008 and 2009. Lagging process is done to other data.

3 The Effect of Science and Technology Policy Orientation on the Two-phase Innovation Efficiency of China Manufactures

In this part, we firstly has adopted the deap2.1 software, after inputting relevant data and using C^2R option, we get two-stage science and technology innovation efficiency prediction model of China 26 manufacturing from 2008 to 2012 as shown in Figure 1. Then, we have analyzed the coincidence degree between high-efficiency and low-efficiency industry of the two phases, which indicates the relationship between science and technology policy orientation and economic output. If there is a high coincidence degree, our current science and technology policy orientation is conducive to improving the efficiency of innovation, among which it exists a synergistic relationship. If there is a low coincidence degree between the two data, so the industrial commercial efficiency mainly supporting by science and technology policy is low, which will affect the improvement of the ultimate innovation efficiency.
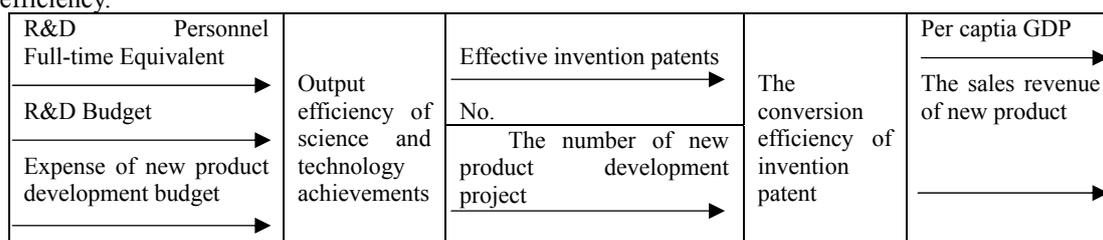
Figure 1 Two-phase technological innovation model of China 26 manufacturing

Table 2 The List of the Innovation Efficiency in the Two Phases of China 26 Segments of the Manufacturing Industry from 2008 to 2012

Industry	The production efficiency of technological achievements(the first stage)						The conversion efficiency of technological achievements(the second stage)					
	2008	2009	2010	2011	2012	Efficiency rank	2008	2009	2010	2011	2012	Efficiency rank
C1	0.448	0.478	0.584	0.795	0.835	16	0.411	0.397	0.440	0.419	0.457	11
C2	0.821	0.590	0.566	0.746	0.818	11	0.296	0.167	0.208	0.206	0.223	20
C3	0.576	0.326	0.464	0.523	0.492	20	0.277	0.234	0.305	0.392	0.408	14
C4	1.000	0.499	0.475	0.937	1.000	7	1.000	1.000	1.000	1.000	1.000	1
C5	0.634	0.554	0.523	0.564	0.657	18	0.476	0.330	0.608	0.805	0.995	5
C6	0.482	0.485	0.386	1.000	0.593	17	0.523	0.596	0.654	0.672	0.516	9
C7	1.000	0.611	0.548	0.825	0.601	10	0.928	0.359	0.576	0.555	0.683	8
C8	1.000	1.000	1.000	1.000	0.796	3	0.184	0.394	0.228	0.150	0.312	16
C9	0.761	1.000	1.000	1.000	1.000	4	0.339	0.159	0.148	0.214	0.346	18
C10	0.258	0.389	0.310	0.420	0.451	25	0.904	0.436	0.493	0.592	0.718	6
C11	0.991	0.634	0.692	0.758	0.826	8	0.264	0.253	0.226	0.191	0.218	19
C12	0.512	0.519	0.292	0.420	0.457	22	0.881	0.744	0.638	0.972	1.000	2
C13	0.410	0.417	0.536	0.596	0.649	19	0.438	0.410	0.262	0.243	0.276	13
C14	0.978	0.963	0.950	0.945	1.000	1	0.174	0.109	0.103	0.107	0.131	26
C15	0.273	0.341	0.256	0.441	0.518	24	0.775	0.549	0.695	0.633	0.734	3
C16	0.499	0.564	0.895	0.774	0.734	13	0.297	0.211	0.189	0.268	0.284	17
C17	1.000	1.000	0.620	0.752	0.800	5	0.323	0.213	0.165	0.164	0.174	22
C18	0.311	0.312	0.192	0.408	0.355	26	0.915	0.476	0.653	0.595	0.684	4
C19	0.385	0.413	0.309	0.452	0.472	23	0.839	0.590	0.571	0.537	0.577	7
C20	0.509	0.688	0.691	1.000	0.763	9	0.299	0.221	0.210	0.150	0.198	21
C21	0.642	0.626	0.681	0.782	0.784	12	0.512	0.313	0.325	0.331	0.351	12
C22	0.606	0.523	0.570	0.688	0.900	15	0.239	0.157	0.134	0.125	0.130	24
C23	0.381	0.433	0.348	0.617	0.552	21	0.809	0.484	0.557	0.484	0.604	10
C24	0.656	0.654	0.467	0.691	0.819	14	0.429	0.250	0.209	0.201	0.250	15
C25	0.527	0.876	0.713	1.000	1.000	6	0.238	0.176	0.165	0.141	0.190	23
C26	0.992	0.894	0.981	0.931	1.000	2	0.185	0.137	0.092	0.096	0.133	25
Industry average value	0.640	0.607	0.579	0.733	0.726	0.657	0.498	0.360	0.379	0.394	0.446	0.415

Data sources: calculating according to the statistical yearbook of China in 2009-2015

As shown in Table 2, the innovation efficiency average value of China's manufacturing industry in the first phase and the second phase show a firstly declining and then rising trend, which is closely related to the economic cycle and the global economy. The outbreak of the financial crisis and deterioration stage is from 2008 to 2010, and the negative impact of economic depression and adverse expectations of investors, the production and conversion efficiency of science and technology all decreased significantly. From 2011 to 2012, the global economy entered the latter two-stage of recovery period, and the scientific and technological achievements and conversion efficiency present a clear rising trend, surpassing the level before the crisis. Under the same change trend, the average size of the innovation efficiency of each industry in the two stages shows a big difference. The efficiency in the first stage was significantly higher than that of the second stage, the scientific and technological achievements is higher, with an average efficiency reaching 0.657; while the transformation efficiency of scientific and technological achievements is lower, only 0.415. This data reflects the main reason for China's science and technology elements into economic output inefficiency lies in the poor science and technology achievements commercialization effect in the second stages.

Note: the industry code represents in order: C1 is for the agricultural and sideline food processing industry. C2 is for the food manufacturing. C3 is for the wine, soft drinks, and refined tea industry. C4 is for the tobacco industry. C5 is for the textile industry. C6 is for the textile and garment. C7 is for the apparel industry, leather, fur, feathers and its products manufacturing industry. C8 is for the wood processing industry. C9 is for the furniture manufacturing industry. C10 is for the paper and paper products industry. C11 is for the printing and reproduction of recorded media industry. C12 is for the petroleum processing, coking and nuclear fuel processing industry. C13 is for the chemical materials and chemical products manufacturing. C14 is for the pharmaceutical manufacturing. C15 is for the chemical fiber manufacturing industry. C16 is for the rubber and plastic products. C17 is for the non-metallic mineral products manufacturing industry. C18 is for the ferrous metal smelting and rolling processing industry. C19 is for the non-ferrous metal smelting and rolling processing industry. C20 is for the metal products industry. C21 is for the general equipment manufacturing industry. C22 is for the special equipment manufacturing industry. C23 is for the transportation equipment manufacturing. C24 is for the electrical machinery and equipment manufacturing industry. C25 is for the communications equipment and computers. C26 is for the instrumentation manufacturing, sports, entertainment, education and other manufacturing.
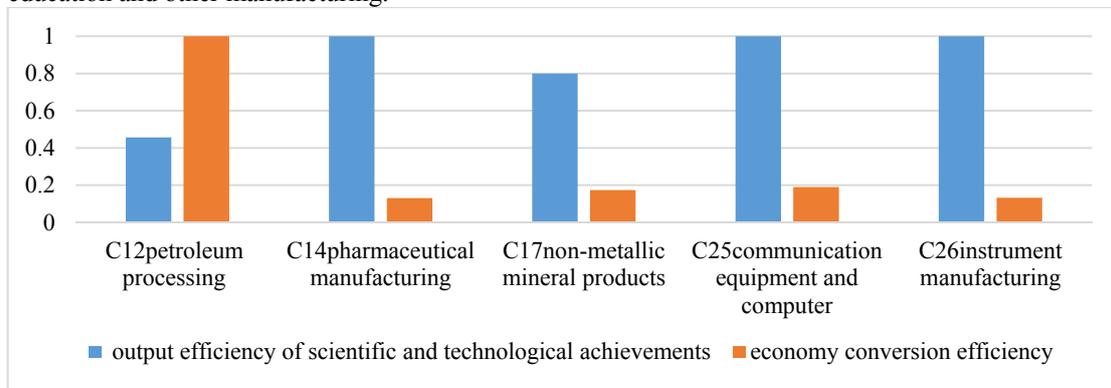
Data sources：calculating according to the statistical yearbook of China in 2009-2015
Figure 2   The Innovation Efficiency Comparison in Two Stages of Industry with the Most Innovative Efficiency in 2012

The deep reason for the poor commercialization of scientific and technological achievements is that scientific and technological policy orientation and the actual market demand is seriously mismatched. As shown in Figure 2, if the industry with more than 0.8 innovation efficiency is defined as the industry with the most innovative efficiency, the pharmaceutical manufacturing industry (C14), non-metallic mineral products industry (C17), communication equipment, computer (C25), and instrument manufacturing, sports, entertainment, education and other manufacturing (C26) that rank in the forefront of the first stage shall rank in the last five in the second stage of the innovation efficiency. Similarly, as the few industries with a more than 0.8 transformation efficiency of scientific and technological achievements, the petroleum processing, coking and nuclear fuel processing (C12) has a lower innovation efficiency in scientific and technological achievements output stage. If the industry with the

most innovative efficiency in two stages is unable to form a synergistic effect ultimately, it will hinder the efficient conversion of technological elements into economic output. Especially in the shift of scientific and technological achievements output efficiency and technological achievements conversion efficiency, no matter how efficient in the single stage, the input-output efficiency will be greatly reduced finally, the vigor of the innovation-driven development strategy the activity will not be fully released.

The influence of science and technology policy orientation on the innovation efficiency of the two stages are further analyzed combined with the discussion of the industrial nature. In order to reflect the key areas supporting by science and technology policy, we need firstly classify the industry according to a certain standard. The 26 manufacturing industry segments adopted in this paper, some of which are high-tech industries, with a high overall technology level, some of which are the traditional industries, with a low overall technical content. "Statistical yearbook of Chinese high-tech industry -2013", in accordance with the 2011 national industry classification (GB/T), defines all the pharmaceutical industry (all two-digit industry code) and aviation, spacecraft equipment manufacturing, electronic and communication equipment manufacturing industry, medical apparatus and instrument manufacturing industry, part of the information and chemicals manufacturing industry (four-digit industry code) as high-tech industry. In accordance with this standard, the corresponding high-tech industry code in table 2 is in order C13, C14, C23, C24, C26 and C25, and the rest of the industry code are the traditional manufacturing industry. As shown in Figure 3 and figure 4, the R & D personnel and funding input of the 6 high-tech industries in 2012, accounted for more than half of the total amount of 26 industries. In September 2010, the State Council passed the "the resolution of speeding up the cultivation and development of strategic emerging industries", and defined the energy saving and environmental protection, new generation information technology, biotechnology, high-end equipment manufacturing, new energy, new materials and new energy vehicles as the strategic emerging industries. Therefore, after the financial crisis, China's science and technology policy has been focused on supporting the high-tech industry. In this policy, there has appeared a large number of high-tech industry patent invention and academic papers from the Research Institute, Colleges and universities in China. The innovation efficiency of high technology industry in the first stage is significantly higher than that of the traditional manufacturing industry, the top six industries with scientific and technological achievements in half belong to the high technology industry. But the patent invention converting into economic output is limited. The Table 2 shows that science and technology achievements transformation efficiency of high-tech industry in the second stage is not ideal, and the communications equipment, computers, instrumentation, sports, entertainment, education and other manufacturing and pharmaceutical manufacturing industry are those industries in the second stage with the lowest innovation efficiency. It indicates that the promoting effect of science and technology policy orientation on innovation efficiency only takes effect in the first stage, and it is difficult to penetrate into the economic output generation stage, and finally form the mismatch situation between policy orientation and market demand.
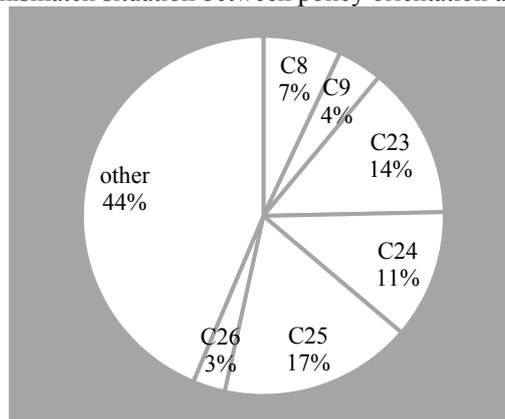
Figure 3   The Pie Chart of Spending Fund in 26 Industries New Product
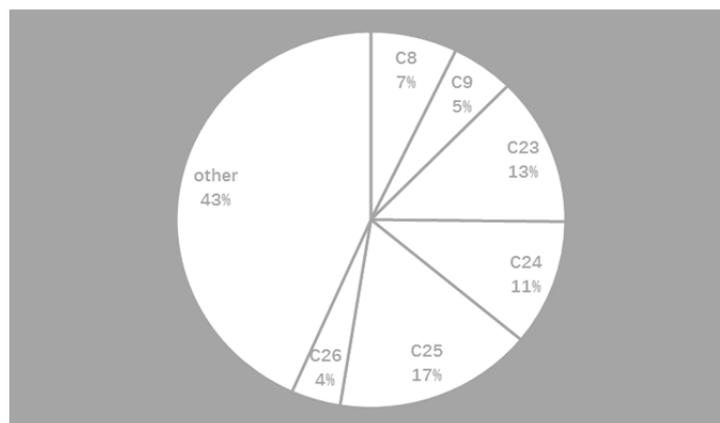
Figure 4   The Pie Chart of R&D Personnel in 26 Industries
Data sources: calculating according to the statistical yearbook of China in 2009-2015

4 Conclusions and Enlightenment

We have analyzed through the examples and calculated the two-stage innovation efficiency of China 26 manufacturing industries, and presented the effect of science and technology policy orientation on the two-stage innovation efficiency of China 26 manufacturing industries, we have obtained the following conclusion and enlightenment.

The output efficiency of scientific and technological achievements is greater than the conversion efficiency. After 2008, the average value of the output efficiency of scientific and technological achievements in each industry is significantly greater than the conversion efficiency of innovation in the second stage. The main factor that hinders the improvement of China's innovation efficiency is the slow commercialization process of scientific research results. At present, the innovation in our country still stays in the level of patents and papers, which belongs to the first stage, while as early as 80s in the last century, and the OECD countries began to pay attention to the promotion of the commercialization of patent papers.

By Other's merits, Wise Men Correct Their Own Faults. The DuPont Act in the United States, the patent law in Canada, and the "university industry cooperation plan" in Australia all effectively improved the innovation efficiency in the second stage, the cores of which are that they endow the patent propriety to individual and make full use of the rational person in the pursuit of maximum personal interest to completely release the value of patents in the market. At present, the proportion of individually holding patents in China is far lower than that of the developed countries. The majority of research results are for the country or institutions, which results in the enthusiasm for commercialization of scientific research results is inadequate, so it is necessary for us to learn from foreign experience, and grant the individual ownership of patents, so as to improve the conversion efficiency of scientific research achievements.

Science and technology policy orientation can only penetrate into the first phase of scientific and technological innovation. The Eighteenth National Congress of the CPC has settled the establishment of innovation-driven development strategy, energy saving, and environmental protection. New generation of information technology, biotechnology, high-end equipment manufacturing, new energy, new materials and new energy automobile industry have been established as the strategic emerging industries, and become the main supporting field of China science and technology policy, resulting in a large number of patent papers, while the economic output is rather limited. China has given new energy vehicles and photovoltaic industry a large number of subsidies and support policies, so a large number of such enterprises come into being in a short time. Once the supporting policy is canceled, a large number of enterprises will face difficulties because of the lack of core technology. It indicates that a large number of patent inventions caused by the scientific and technological policy orientation, failed to effectively support the development of high-tech industries, and the scientific and technological innovation is just stuck in the first phase. In order to make the impact of science and technology policy orientation in our country to deeply penetrate to the second stage, we should pay more attention to the quality of scientific and technological innovation, and encourage major innovation and the production of scientific and technological achievements closely related to the actual production. We can take measures

like raising the identification standards of scientific and technological achievements, controlling the blind application of patent invention, and cracking down on maliciously cheating the high technology industry state subsidies and other measures to avoid high technical policy subsidies to repeat inefficient investment, so as to improve the quality of scientific and technological output.

The output stage and the transformation stage of scientific and technological achievements has serious mismatch. In segment industries, the pharmaceutical manufacturing industry and others, which has the highest output efficiency in scientific and technological achievements, have the lowest conversion efficiency scientific and technological achievements; and the industries, whose conversion efficiency of scientific and technological achievements lying in the forefront rank, has a lag-behind industry output efficiency. The innovation activities of two stages cannot form a cohesive force, but mutual constraints, which result in a large number of patent inventions become useless invention, resulting in the innovation efficiency of China's manufacturing industry is overall ordinary, and is difficult to form innovative industry. The output efficiency of scientific and technological achievements and science and technology policy orientation are closely related.   A large number of scientific research funds and personnel input are the basis of achieving major technological breakthroughs; the conversion efficiency of scientific and technological achievements and market demand are mutually related, the patent invention, which has nothing to do with the market, is difficult to produce economic benefits. At present, we are carrying out the supply side reform, which is to take the market demand as the principle to carry on the orientated flexible production and avoids the production of excess capacity. As the first productivity, science and technology should also be closely combined with the market trends, to solve the real plight of China's manufacturing industry ever lying in the low end of the global value chain. The local government should also pay more attention to the guiding role of the market in the construction of the incubator, innovation park and other technological innovation intermediary platform, interconnect the information networks between enterprises and scientific research institutes, promote the information sharing among the innovation partners, and create excellent conversion channels for scientific and technological achievements.

We should give full play to the role of policy orientation, and offer strong support to the science and technology innovation activities of industries. On one hand, we must establish and perfect the legal system, modern enterprise system, innovative culture and social security system related with technology innovation to optimize the soft environment of scientific and technological innovation. On the other hand, we need to build with plans, steps and focus the infrastructure construction that is closely related to scientific and technological innovation, improve the hard environment of technological innovation.

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An Index Interactive Influence Eliminated Algorithm in Tech-Economy Assessment

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Abstract: The index system is the key indicator to influence the result of technology assessment. The establishment index systems are generally asked to obey exclusion principle. Aimed to the problem of dependence ubiquitous in this field, this paper proposes an algorithm to eliminate the index interactive influence through quantitative analysis on two or more indexes, and conducts calculus on a quality evaluation of military-used software, which proves the algorithm effective on eliminating the index interactive influence.

Key words: Tech-economy assessment; Index system; Interactive influence; Weight parameters

1 Introduction

At present, there are many tech-economy assessment methods such as fuzzy evaluation (Yang Lunbiao, Gao Yingyi,1995), analytical hierarchy process (Xu Shubo,1988), and fuzzy comprehensive evaluation, etc. These methods may differ in their characteristics, applying area, but the merits of their assessing result all largely depends on a scientific, reasonable index system. Conventional evaluation index system often takes on tree characters, and the construction relationship is depended on the inner causality and affiliation of assess targets. Thus, the establishment index systems are generally asked to obey exclusion principle (Yang Qing,2000). The assess indicators are required to be absolutely independent in principle. No interference means that the degree of relativity equals 0. But it's impossible to build a non-relevant index system in assess process. Based on quantitative analysis on inner mechanism of index system interactive influence, this paper plans to adjust index weight parameters with elimination algorithm on the basis of preliminary index weight parameters, minimizing the negative effects of interactive influence on assess result and making the assess structure reflecting the evaluation target more accurate and objective.

2 Analysis on Interactive Influence of Two-index

The interactive influence of two-index can be described with a process similar to loop feedback process (Hou Dingpi, Wang Zhanjun,2001), as is shown in fig 1.
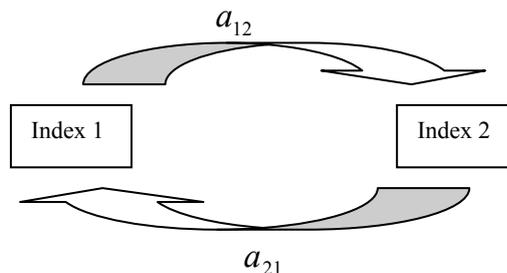
Figure 1   Sketch Map of Two-Index Interactive Influence

To make it easier to analyze, firstly the interactive influence process of infinite circulate is divided into 2n successive phase, assuming that there is only one index to make relevant index change for one time, and that in preliminary stats, the initial value of each index is 1, that is:

$$A_0 = \begin{bmatrix} p_1 \\ p_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \tag{1}$$

Where p1、p2 represent preliminary stats of relevant index of index 1, 2 which influence them to change separately.

After phase 1, the variations of two index as opposed to initial value are:

$$A_1 = \begin{bmatrix} 0 & a_{12} \\ a_{21} & 0 \end{bmatrix} \tag{2}$$

Where $0 < a_{12} < 1$ shows the variation value of index 2 when the variation unit of index 1 is 1; $0 < a_{21} < 1$ shows the variation value of index 1 when the variation unit of index 2 is 1.

After phase 2, the variation value in this variation as opposed to that of phase 1 in equivalent variation is:

$$A_2 = \begin{bmatrix} a_{12} * a_{21} & 0 \\ 0 & a_{21} * a_{12} \end{bmatrix} \tag{3}$$

After phase 2n-1, the variation value in this variation as opposed to that of phase 2n-2 in equivalent variation is:

$$A_{2n-1} = \begin{bmatrix} 0 & a_{12}{}^{n} * a_{21}{}^{n-1} \\ a_{21}{}^{n} * a_{12}{}^{n-1} & 0 \end{bmatrix} \tag{4}$$

After phase 2n, the variation value in this variation as opposed to that of phase 2n-1 in equivalent variation is:

$$A_{2n} = \begin{bmatrix} a_{12}{}^{n} * a_{21}{}^{n} & 0 \\ 0 & a_{21}{}^{n} * a_{12}{}^{n} \end{bmatrix} \tag{5}$$

Since the interactive influence is successive, when $n \rightarrow \infty$, which means to divide time to infinity, the result of interactive influence is:

$$A^* = \lim_{n \to \infty} \sum_{i=1}^{n} A_i = \begin{bmatrix} (1 - a_{12}a_{21})^{-1} & a_{12}(1 - a_{12}a_{21})^{-1} \\ a_{21}(1 - a_{12}a_{21})^{-1} & (1 - a_{12}a_{21})^{-1} \end{bmatrix} \tag{6}$$

According to the calculation and analysis above, normalize the A^*, we can obtain the final influence coefficient of interactive influence of two-index:

$$A = \begin{bmatrix} 1 & a_{12} \\ a_{21} & 1 \end{bmatrix} \tag{7}$$

The equation above means that the final variation of index 2 when index 1 plays a role of argument and final variation is 1 is a_{12}; the final variation of index 1 when index 2 plays a role of argument and final variation is 1 is a_{21}(Haines L ,1998).

3 Analysis on Interactive Influence of Multi-Index

When analyzing interactive influence of multi-index, considering the complexity of interactive influence of indexes, simplification it's demanded. Here the method of two-index interactive influence analysis is adopted to conduct the analysis. The interactive influence of each pair of index is shown in Fig 2: index i no only influence index j directly, and through relevant index it will cast indirect influence on index j, and at last it can be simplified that index i influence index j through b_{ij}'.
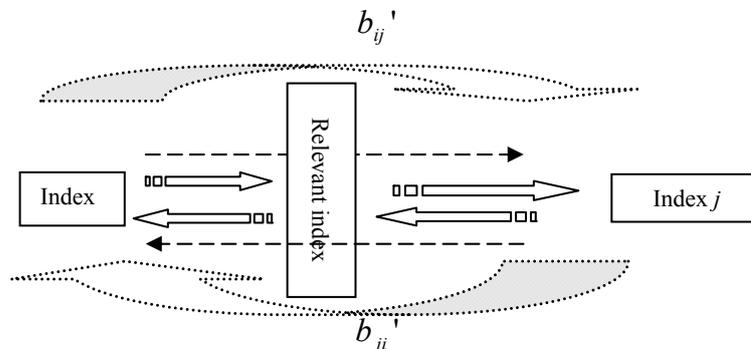
Figure 2   Sketch Map of Each Pair of Indexes' Interactive Influence

Assuming that the factor of each indexes' first interactive influence is:

$$B_1 = \begin{bmatrix} 0 & b_{12} & \cdots & b_{1n} \\ b_{21} & 0 & \cdots & b_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ b_{n1} & b_{n2} & \cdots & 0 \end{bmatrix} \tag{8}$$

The influence factor of index i to index j:

$$b_{ij}' = \sum_{k=1(k\neq i,k\neq j)}^{n}(b_{ik}*b_{kj})+b_{ij} \tag{9}$$

The influence factor of index j to index i:

$$b_{ji}' = \sum_{k=1(k\neq i,k\neq j)}^{n}(b_{jk}*b_{ki})+b_{ji} \tag{10}$$

According to analysis result of two-index interactive influence, the final influence factor of multi-index interactive influence is:

$$B = \left(b_{ij}'\right)_{n\times n}, \text{if } i\neq j, b_{ij}' = \sum_{k=1(k\neq i,k\neq j)}^{n}(b_{ik}*b_{kj})+b_{ij} \text{ ;if } i=j, b_{ij}'=1 \tag{11}$$

4 Elimination Algorithm of Index Interactive Influence

Assuming that the index of a certain layer in a certain assess index system is cut out, the son index of which is D_1, D_2, D_3…, D_n, as is shown in Fig 3. There exists interactive influence between son indexes. To eliminate the influence, the weight parameter is adjusted through interactive influence factor.

Step 1: According to normal calculating method of index weight parameter, firstly through calculation we can obtain son indexes' weight parameter is: $w=(w_1,w_2,w_3 \ldots\ldots w_n)$.
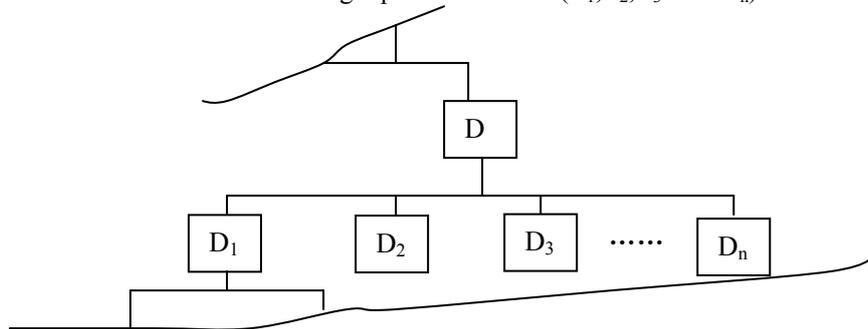
Figure 3   Sketch Map of Locality of a Certain Assess Index System

Step 2: Calculate interactive influence factor.
The factor of son indexes' first interactive influence is:

$$D' = \begin{bmatrix} 0 & d_{12} & \cdots & d_{1n} \\ d_{21} & 0 & \cdots & d_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ d_{n1} & d_{n2} & \cdots & 0 \end{bmatrix} \tag{12}$$

Through analysis on multi-index interactive influence above, final influence factor of n son indexes interactive influence can be calculated:

$$D^{**} = \left(d_{ij}'\right)_{n\times n}, \text{if } i\neq j, d_{ij}' = \sum_{k=1(k\neq i,k\neq j)}^{n}(d_{ik}*d_{kj})+d_{ij} ; \text{ if } i=j, d_{ij}'=1 \tag{13}$$

Step 3：Adjust weight parameter and eliminate influence.
Adjust the weight parameter of son indexes according to D^{**}:

$$
\text{If } D^{***}=\begin{bmatrix} \sum_{j=1}^{n} d_{1j}' & 0 & \cdots & 0 \\ 0 & \sum_{j=1}^{n} d_{2j}' & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots \\ 0 & 0 & 0 & \sum_{j=1}^{n} d_{nj}' \end{bmatrix} \tag{14}
$$

$$
w'= w + w\times D^{***}=(w_1{}',w_2{}',w_3{}'\ldots\ldots w_n{}'), \text{ where } w_i{}'=w_i\sum_{j=1}^{n} d_{ij}' + w_i \tag{15}
$$

Finally, conduct normalization to weight parameter and obtain final index weight parameter with interactive influence eliminated:

$$
w''= w'/\sum_{i=1}^{n} w_i{}' \tag{16}
$$

For the whole index system, steps above can be adopted and calculation shall be conducted from the lower layer to the upper layer, weight parameter shall be adjusted, then the influence can be eliminated.

5 Calculation Tutorial

Table 1　Preliminary Weight Parameter of Evaluation Index System for a Military-use Software

General target	Son target of first level			Son target of second level		
	target	Preliminary Weight parameter	Adjusted Weight parameter	target	Preliminary Weight parameter	Adjusted Weight parameter
Evaluation of Software quality	functionality	w_1=0.1	$w_1{}^*$=0.07	completeness	w_{11}=0.3	$w_{11}{}^*$=0.18
				interoperability	w_{12}=0.3	$w_{12}{}^*$=0.26
				normality	w_{13}=0.4	$w_{13}{}^*$=0.56
	reliability	w_2=0.15	$w_2{}^*$=0.20	accuracy	w_{21}=0.3	$w_{21}{}^*$=0.38
				robustness	w_{22}=0.1	$w_{22}{}^*$=0.08
				security	w_{23}=0.3	$w_{23}{}^*$=0.22
				Document completeness	w_{24}=0.3	$w_{24}{}^*$=0.32
	usability	w_3=0.25	$w_3{}^*$=0.28	understandability	w_{31}=0.25	$w_{31}{}^*$=0.31
				learnability	w_{32}=0.25	$w_{32}{}^*$=0.26
				operability	w_{33}=0.5	$w_{33}{}^*$=0.44
	efficiency	w_4=0.2	$w_4{}^*$=0.18	Communication efficiency	w_{41}=0.2	$w_{41}{}^*$=0.2
				Execution efficiency	w_{42}=0.5	$w_{42}{}^*$=0.5
				Storage efficiency	w_{43}=0.3	$w_{43}{}^*$=0.3
	maintainability	w_5=0.2	$w_5{}^*$=0.22	compatibility	w_{51}=0.1	$w_{51}{}^*$=0.1
				visibility	w_{52}=0.3	$w_{52}{}^*$=0.3
				modularity	w_{53}=0.1	$w_{53}{}^*$=0.1
				Self-descriptiveness	w_{54}=0.1	$w_{54}{}^*$=0.1
				Document completeness	w_{55}=0.3	$w_{55}{}^*$=0.3
				simplicity	w_{56}=0.1	$w_{56}{}^*$=0.1
	portability	w_6=0.1	$w_6{}^*$=0.05	Hardware system irrelevance	w_{61}=0.1	$w_{61}{}^*$=0.12
				Software system irrelevance	w_{62}=0.2	$w_{62}{}^*$=0.18
				extensibility	w_{63}=0.2	$w_{63}{}^*$=0.16
				Public utility	w_{64}=0.1	$w_{64}{}^*$=0.07
				modularity	w_{65}=0.3	$w_{65}{}^*$=0.36
				Self-descriptiveness	w_{66}=0.1	$w_{66}{}^*$=0.11

　　Take military use software quality evaluation as an example: According ISO provisions relating to the software quality properties, referring to the definition of McCall model (Li Liangbao, Han Xishuang,2003), combining the experience we obtain in software development evaluation procession, a comprehensive evaluation index system of software quality is built to assess the quality of a certain financial software for military use, as is shown in Chart 1. There exists rather high relevance between first level indexes of functionality and reliability, maintainability and extensibility, etc. in comprehensive assess index system; and as one of first level index, usability owns 3 second level indexes: understandability, which indicates the efforts user spare to understand the logic conception and its' applying area; learnability, which indicates the efforts user spare to　learn software application(operational control, input and output for example); operability, which indicates the efforts user spare to operate and control operation (Lin Junxing ,2005), considering these 3 second level index to usability, there also exists rather high relevance among them, and other indexes of same level also face the similar problems: interactive influence among indexes of same level. To eliminate the influence that interactive influence cast on assess result, algorithm proposed above is adopted to adjust the weight parameter.

　　Firstly, determine preliminary weight parameter through AHP method, the result is shown in Table 1.

　　Then analyze interactive influence of each son target and adjust weight parameter.

　　For instance, the preliminary weight parameter of understandability, learnability and operability of first level usability:

$$(w_{31}，w_{32}，w_{33})=(0.25,0.25,0.5) \tag{17}$$

Through Delphi method the factor of 3 son indexes' first interactive influence is:

$$D'=\begin{bmatrix} 0 & 0.6 & 0.5 \\ 0.3 & 0 & 0.4 \\ 0.1 & 0.2 & 0 \end{bmatrix} \tag{18}$$

$$\text{Thus, } D^{**}=\begin{bmatrix} 1 & 0.7 & 0.74 \\ 0.34 & 1 & 0.55 \\ 0.16 & 0.26 & 1 \end{bmatrix} \tag{19}$$

$$\text{And, } D^{***}=\begin{bmatrix} 2.44 & 0 & 0 \\ 0 & 1.89 & 0 \\ 0 & 0 & 1.42 \end{bmatrix} \tag{20}$$

　　So:

$$(w_{31}^{*}，w_{32}^{*}，w_{33}^{*}) =(0.25,0.25,0.5) \tag{21}$$

　　According to algorithm above, conducting calculation to son targets of each layer and the adjusted weight parameter can be obtained, as is shown in Chart 1. Finally, a better assessment can be conducted with new weight parameter.

6 Conclusions

　　Assess index system is the key factor influencing the final result of assessment, and the interactive influence of indexes can determine the objectivity of assessment result. Based on analysis on interactive influence among indexes, this paper takes an attempt to solve this problem through eliminating the interactive influence with weight parameter adjustment, thus promote the authenticity and validity of evaluation result, which is of certain significance to practice in this area. The model is simplified for calculation, which is not in conformity with the actual. And this is the direction of further research.

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Research on Online and Offline Promotion Network Coordination to Promote the Transformation of Agricultural Science and Technological Achievements

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Abstract: The transformation of Agricultural science and technological achievements is an important link of agricultural science and technological innovation system. With the rapid development of agricultural informatization and "Internet plus" model, online service in promoting the transformation of agricultural science and technological achievements plays an increasingly important role. This paper analyzes the characteristics of online and offline promotion network for the transformation of agricultural science and technological achievements, and points out existing problems of the two channels in the practice of symbiotic co-existing, and puts forward the model of online and offline collaborative mechanism to promote the transformation of agricultural science and technological achievements.
Key words: Agricultural science and technology achievements transformation; Internet plus; Offline promotion network; Online promotion network; Synergy effect

1 Introduction

Faced with the new requirements of modern agriculture development and new challenges, effective transformation of agricultural scientific and technological achievements is an important way and means to promote agricultural production and increase farmers' income. It is Widespread concerned by agricultural community and scientific community(He Jin,2014).Foreign scholar Scherer using probabilistic model to study the relationship between technology diffusion and market structure, pointed out that market competition can induce high-speed technology diffusion(Scherer,1980);Thomas Eponou divided the agricultural science and technology achievements transformation process into four interrelated sub subsystem: technology transfer environment, organization and structure of the subsystem, resource subsystem and transformation mechanisms(Thomas Eponou,1993).Meanwhile, the domestic agricultural scientists carried out extensive research on agricultural science and technology achievements transformation theory and practice. GU Huanzhang and other scholars beginng with the analysis of supply and demand in agricultural science and technology achievements, suggested improve the supply and demand mechanism of agricultural scientific and technological achievements(Gu Huanzhang, Zhang Jingshun,1997);Pei Cuijuan analyzed the problems of low conversion rate and long conversion cycle of agricultural scientific and technological achievements transformation, discussed and proposed countermeasures to accelerate agricultural scientific and technological achievements transformation(Pei Cuijuan, Dong Zhiqiang et al,2010).

At present, China's agricultural scientific and technological achievements conversion rate is low, due to geographical space limitations, the "last kilometer" promotion and other issues. Traditional channels under a single line can not meet the demand of modern agriculture, such as feedback on time, advanced science and technology to increase production, agriculture science and technology cannot be effectively transformed. With the rapid development of agricultural informationization and "Internet plus" model, traditional agriculture and the Internet virtual economy achieve "cross-border operation", online service is playing an increasingly important role in the promotion of agriculture scientific and technological achievements transformation.

In view of this, based on the principle of synergy, this paper combines network promotion and traditional production practice, proposes and describes two promotion channels, explores the synergistic mechanism of online and offline promotion network in resource sharing, mutual cooperation and common development, in order to promote efficient transformation of agricultural scientific and technological achievements. Finally, according to the model of double channel and synergistic mechanism, the paper puts forward appropriate suggestions to provide a reference for the development of agriculture and enrich the study results on agriculture scientific and technological achievements transformation.

2 Constraints in Process of Agricultural Science and Technology Achievements

Transformation

Scientific and technological achievements transformation rate is an index to measure the scale of scientific and technological innovations into market-oriented commercial products. Statistics show that every year in China about 6000-7000 agriculture science and technology achievements are available, but the results of the conversion rate was 30% -40%, far below the level of developed countries, like the US, Japan's agricultural scientific and technological achievements conversion rate of 70% -80%, conversion rate in Germany, Britain, France up to 90%(Gu Jun,2013).At the present stage, the overall efficiency of China agricultural science and technology achievements transformation is still at a low level and annual growth trend is weak. According to the different types of agricultural scientific and technological achievements, statistics distribute as shown in Table 1.

Table 1   Different Types of Agricultural Science and Technology Achievements Transformation Distribution

Classification	Type	Conversion Rate	Classification	Type	Conversion Rate
Nationwide	Average	0.289	By Technical Field	Biotechnology and Products	0.276
By Region	Central China	0.284		Livestock	0.277
	Northwest District 2	0.284		Agricultural Equipment	0.279
	Northeast	0.286		Water Industry	0.285
	Northern Region	0.287		Efficient Use of Agricultural Resources	0.285
	Southeast	0.288		Agro-industry	0.287
	South West	0.293		Crop Farming	0.298
	Southern Region	0.294		Forestry	0.303
	Northwest District 1	0.303		Other	0.277
By Transformation Subject	University	0.272	By Technology Type	Collaborative Innovation	0.28
	Enterprise	0.288		Innovation	0.291
	Research Institutions	0.299		Imitative Innovation	0.303
	Other	0.281		Other	0.301

Data Sources: Xiao Xian. Agricultural Science and Technology Achievements Transformation Measur- ement and Analysis. China Science and Technology Forum. 2015.

Low conversion rate of agricultural scientific and technological achievements, the imperfect agricultural extension service mechanism, has been far from meeting the growing needs of agricultural scientific and technological achievements transformation and hindered the pace of modern agriculture development. Constraints to achievements transformation embodies in the following several aspects:

2.1 Singlely traditional offline channel, difficult to meet the needs of agricultural modernization

It is a prerequisite to achieve transformation that agricultural science and technology achievements output to match demands of modern agriculture development. Traditional offline promotion network is limited by geographical factor, different regions and different conversion subjects form a natural barrier. In order to feedback in time, we must break the barrier.

Channels of information transmission is not smooth which caused by two reasons: On the one hand, agricultural research institutions topics, projects are most from internal technology systems, which is lack of considering the specific needs of farmers and agricultural enterprise(Pan Dongmei,2010), thus, outcomes are lack of targeted, operability and usability to solve practical problems; On the other hand, regardless of the field or the industry chain distribution achievements belong to, both side exist structural anomaly. Single offline promotion channel is not conducive to integrate and share information of agricultural scientific and technological achievements, the achievements concentration is imbalance, which led in the case of agricultural science and technology needs are not met, there is still a waste of resources of agricultural industrialization, low levels of R&D reconstruction, agricultural science and technology benefits not high.

2.2 Imperfect online promotion network mechanism, weak support services

The degree of agricultural information determines the speed and efficiency of agricultural science and technology achievements industrialization, the establishment of agricultural science and technology information network is an important guarantee for accelerating agricultural science and technology

achievements transformation (Chen Shouhe,2014). Internet-based online promotion network is an important manifestation of traditional agriculture and the Internet virtual economy "cross-border operation". In terms of the current status of China's agricultural information construction, the basic conditions for online promotion of agricultural information network has been improved than the former, agricultural extension site and management system platform has become an important channel for agricultural science and technology achievements. However, due to the virtuality of internet communication carrier and the practical operability of agricultural reality technology and other issues, online promotion network often difficult to meet "seeing is believing" application intentions of the majority of farmers and agricultural enterprises. And thus lead to online trust crisis, which has disadvantage to the effective transformation of agricultural scientific and technological achievements.

2.3 Imperfect cooperative mechanism of double channels, failed in complementary advantages

Agricultural science and technology achievements transform mainly through two channels: offline and online promotion network, the advantages of the double channels perform different, both have played an important role in accelerating the process of agricultural scientific and technological achievements transformation. But the cooperation mechanisms of online and offline promotion network have not been established effectively, two channels lack of coordinate with each other, can not achieve the complementary advantages and mutual synergistic effect. In particular, the agricultural scientific and technological achievements resources of online and offline lack of effective integration, resulting in achievements into the waste of resources and loss, low levels of R&D reconstruction problems(Bian Quanle,2013); Technical support platform for online and offline failed to combine organically, the distribution of research, management, technology, consultants is uneven, thereby impeding the widespread promotion of agricultural science and technology achievements; Online and offline "double channel" cooperation is not wide enough and deep enough, clear asymmetry between the application risk and application income of achievements, resulting in the relevant transformation service agencies lack of enthusiasm.

3 Synergy Mechanism of Online and Offline Promotion Network
3.1 Offline promotion network

Offline promotion network is the inevitable approach and process for agricultural scientific and technological achievements transformed from potential productivity into real productivity, after the achievements supply-side output, the promote-side mainly experimental research on and entity display agricultural achievements, using agricultural parks as carrier and relying on supports of policy and funds. By providing a full range of achievements experience, achieve a direct contact between the application side and results, provide a realistic basis for agricultural enterprises or farmers to apply the results.
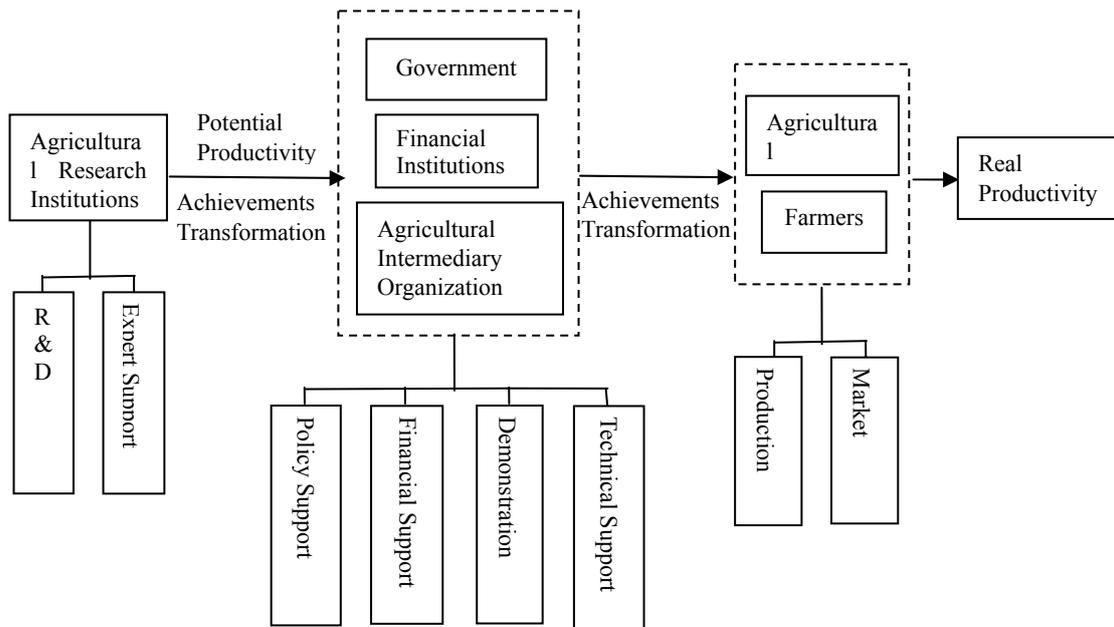
Figure 1   Offline Promotion Network of Agricultural Scientific and Technological Achievements Transformation (Traditional Conversion Channel)

All in all, the offline promotion network namely the traditional conversion channel, its unique advantages in the following three aspects: 1) Realize "face to face contact" between outcomes and the application side, solve the "seeing is believing" problem, win the trust of outcome-user and these are facters for them to make an investment decision; 2) Technical problems can be taught directly, eliminate confusions of outcome-users by consulting at the scene or organizing farners and technical staff in agricultural enterprises to train; 3) Agricultural results need to test during R&D and displaying periods when it encounters practical problems, experimental site can be the carrier. Obviously, these advantages are explained the irreplaceable role of offline promotion network in agriculture scientific and technological achievements transformation.

However, the constraints of offline channel, such as slowly promoting, low input-output rate, geographical limitations and so on, indicate that there are some limitations to offline promotion network, the offline channel alone can not meet the requirements of modern agriculture development, there is urgent need for a strong complement which is the online promote network.

3.2 Online promotion network

With the development of modern computer technology and the popularity of internet, for agricultural scientific and technological achievements promotion, on one hand, it can maintain the traditional channel; on the other hand, it can build an exchanging and promoting platform based on modern information technology in a larger context. Online promotion network constructed in this paper refers to a comprehensive promotion service platform kernelled achievements transformation, the convenient internet as promoting media, in order to streamline the transformation links of agricultural scientific and technological achievements by using modern advanced information technology, break geographical restrictions to integrate conversion chain of agricultural achievements, and to share resources that achievement resources of agricultural research institutions, policy resources of government, financial resources of financial institutions, publicity resources of agricultural intermediary organizations and requirement resources of users. Through online promotion network, to achieve effective docking between supply and demand and between regions, accelerate the conversion rate, shorten the conversion cycle, thereby improving the efficiency of agricultural achievements transformation, and promoting the development of modern agricultural industrialization in China.

Online promotion network uses internet as promoting carrier, which determines the unique advantages of this online conversion channel different from offline channel, mainly in the following four aspects: 1) Break the limitations of the geographical space, integrate and share resources required during the transformation process, achieve more efficient transmission of information between transformation subjects; 2) Low cost, online exhibition on the achievements do not need to build the physical campus, which can save conversion costs and improve achievements transformation rate; 3) Accelerate the speed of agricultural achievements propagation and application, effectively shorten the transformation cycle; 4) The establishment of online interactive platform provides an information place for results evaluation and needs feedback. Accordingly, online promotion network also exists trust crisis on information, training needs on technical problems and poor benefited access of some farmers, a single online channel can not achieve effective agricultural scientific and technological achievements transformation, led to the need for offline promotion network as the support.

3.3 Synergy mechanism of online and offline promotion network

In the process of agricultural science and technology achievements transformation, single online channel or single offline channel is difficult to meet the needs of modern agriculture development. Pure online promotion network must be supported by offline promotion network, which is the basis, and offline promotion network needs to be complemented by online promotion network, which provide systematic resource network and associated support for achievements transformation. Generally, offline channel will be in the form of an entity like rural zone located in various regions, which makes a double value in outcome test and show. Communicating with each other through the network leads coordinate operations more flexible. Therefore, the collaborative mechanism based on online and offline channel is able to break through the bottleneck of agricultural scientific and technological achievements transformation, to solve the problems about low conversion efficiency. Figure 2 is the synergy mechanism of online and offline promotion network to promote agricultural science and technology achievements transformation.

Collaborative theory maintains that within the complex system, cooperative behavior of each subsystem can produce effect beyond their respective elements alone, to form the unified action and joint action of the entire system (Song Wenwen,2013). Although online and offline promotion network transformat in different ways, but in the context of modern agriculture development, there is a mutual

influence and mutual cooperation relationship between the two channels. Offline network supports online network, online promotion network is an extension of the offline channel. Online and offline synergy is not a simple collection of each other, but an orderly combination that mutually supporting and closely linked with each other, to form a close fit between the different channels. The "double channel" operate coordinated around common goals, integrate "visibility and sensibility" of offline channel and convenience of online channel to form complementary advantages, the combination of online and offline, to create a composite force, results in the synergy of "1 + 1> 2".
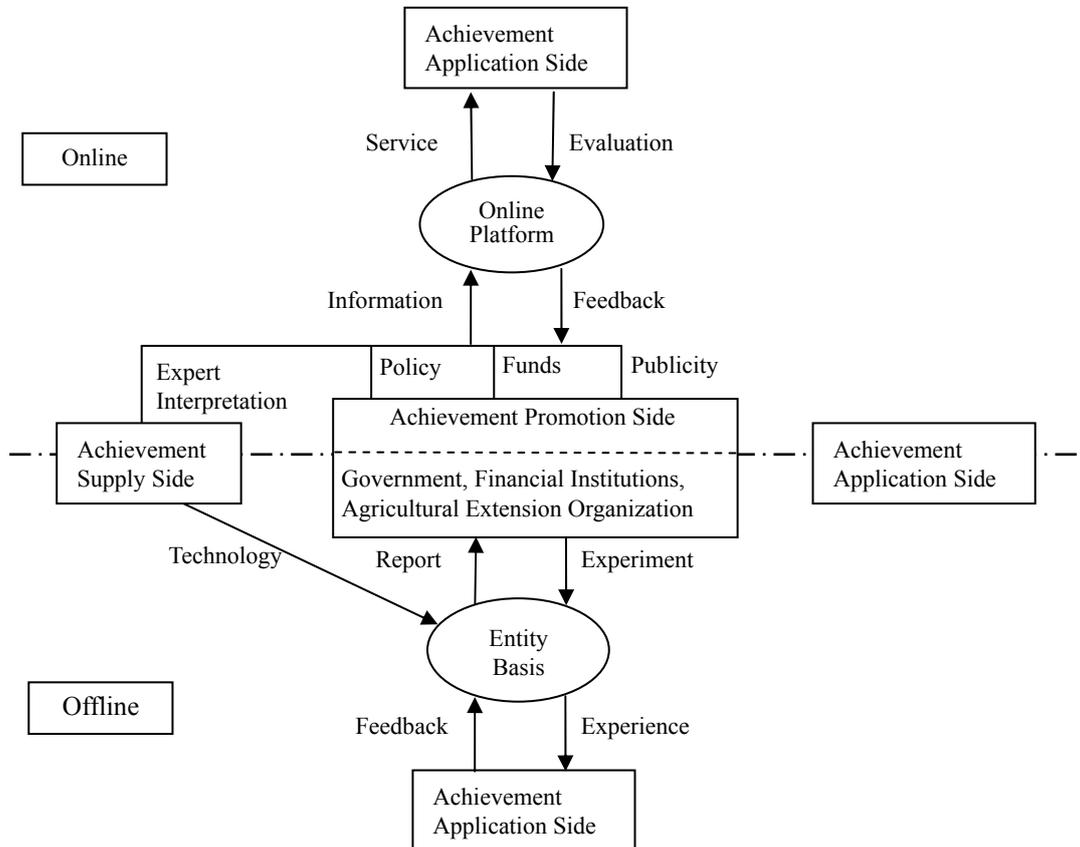
Figure 2   Synergy Mechanism of Online and Offline Promotion Network

4 Conclusions

The development of modern agriculture requires higher standards for agricultural science and technology achievements transformation subjects, achievements transformation needs to integrate capabilities of research, testing, marketing, financing and application, needs to operate coordinated between participants. Therefore, we must strengthen the close cooperation between the main subjects, accelerate the construction of online and offline promoting platform, fully integrate and efficiently allocate resources during transformation process.

Suggestions to perfect collaborative network of online and offline contains the following three points: 1) Strengthen the construction of online and offline platform, to promote resource collaboration of transformation sublects; 2) Complete interactive mechanism between online and offline, to create information collaboration in transformation process; 3) Establish and improve the incentive system for transformation, to promote subjects operating collaboration. Due to the limitations of existing theories and research level of personal not high, this study roughly discusses transformation channels of agricultural science and technology achievements. Just I hope this writing can make a little contribution to promoting agricultural science and technology achievements transformation in China, to promote the coordinated development of agricultural science and technology and social economy.

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Study of Incentive Mechanism about Intellectual Property Based on Enterprise Technological Innovation

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Abstract: The intellectual property regime itself is an incentive mechanism. Based on the internal characteristics of technological innovation and the benefit-oriented incentive mechanism of intellectual property, the incentive measures which can promote the national enterprise technology innovation and the implementation of intellectual property strategy, should be based on the benefit-oriented incentive, for giving full play to the function of benefit-oriented incentive from technological innovation and intellectual property regime. By the document arrangement, case analysis and other methods, this paper made an in-depth research in the existing incentive mechanism of intellectual property rights in the current China, conducted an in-depth analysis of its implementation environment and put forward that the construction of the incentive mechanism about intellectual property of enterprise technological innovation should be started from the business concepts, government support, institutional innovation of intellectual property and other aspects.
Key words: Enterprise; Technological innovation; Intellectual property strategy; Incentive mechanism

1 Introduction

Both the enterprise technological Innovation and the implement of intellectual property strategy have their own inner incentive mechanisms. The creation of the incentive mechanism for accelerating enterprise technological innovation and the implement of intellectual property strategy, which can better give full play to the incentives and the safeguard to technological innovation and then can improve its capacity, is a major task for implementing the intellectual property strategy and promoting the construction of technological innovation project. This paper researched it from several aspects like the theoretical basis, the analysis of environmental implementation and the mechanism construction.

1.1 Overseas research status

With the rapid development of knowledge-based economy, the foreign experts and scholars in this field have also paid more and more attention and research on technological innovation and intellectual property regime. The current international research on technical innovation and intellectual property is mainly conducted from two perspectives: the inner part of economies and the intellectual property protection in the economic opening and association.

William M. (2010), the famous American economist as well as the professor in Harvard, pointed out that analyzing from the perspective of welfare economics, we should take the relationship between creation and spread of knowledge and social welfare as the important content of research. This new idea lays a solid theoretical foundation for later analyzing the intellectual property as an effective way of resource allocation. Ruth Towse (2006), the famous American economist as well as the professor in Yale, studied of the intellectual property regime, and then came up with a model of intellectual property regime (for example, patent) which is equipped with the optimal protection period. There is a very sensitive relationship between the optimal patent protection period and social discount rate, therefore the faster the cost of innovation decreases, the shorter the patent protection period will be. About the intellectual property management, the Harvard University Professor Michael Porter (2013) talked in his "competitive strategy: skills for analyzing industries and competitors" that for the intellectual property management of a company is not only the responsibility for its leaders or for the company itself, but also the responsibility for everyone in this company. We have to establish a sound management and cooperation regime for achieving it. Country and government should publish complete laws and policies for protecting the intellectual property of companies, and should encourage and guide companies to carry the efficient management on the intellectual property.

1.2 Domestic research status

Domestic experts and scholars have also concerned about the intellectual property protection regime on the technological innovation. Though the research of intellectual property protection, the Peking University Professor Wang Dingding (2003) put forward that in a specific period of social development, we need to provide effective economic incentives to promote the creation and progress of knowledge, therefore, it is necessary to effectively protect the intellectual property. Cao Qianyou (2012)

from the perspective of institutional economics, made the in-depth study on the relationship between enterprise technological innovation and intellectual property regime, and described the mechanism of the intellectual property regime and its encouragement on technological innovation. From the perspective of economics, Bu Wei tried to build a game model between the leading innovators and the followers of technology, for specifically analyzing different influences on the development of enterprise technological innovation by different arrangements in the intellectual property regime. Lv Wei (2004) thinks that our intellectual property system needs the protection system which takes the encouragement of technological innovation and competition as goals and regards the development as orientation; needs to vigorously promote the reasonable diffusion and movement of intellectual property, for consolidating the enterprise's subject position on creating and applying intellectual property as well as advancing the utilization ratio of intellectual property; needs to expedite the establishment of the intellectual property service system; needs to limit the abuse of intellectual property, punish the tort on intellectual property and promote the fair competition in intellectual property.

For researchers, up to now, the overseas and domestic research on the enterprise technological innovation and the protection of intellectual property regime has not only made great theoretical achievements, but also obtained rich fruits on practical application. However, with the in-depth development of economic society, the reality as the base of theories is changing all the time. Therefore, theories also need to be advanced with times. Research on technological innovation and intellectual property protection should be deeper and wider.

2 The Basic Connotation of Incentive Mechanism about Intellectual Property
2.1 The basic connotation of incentive mechanism
The incentive mechanism and its corresponding incentive theory are subjects for the study in disciplines like economics, management, organizational behavior and even the law. For instance, in the management, Barnard who put forward the social system theory pointed out in *The function of the Executive* in 1938 that the motivation of individuals' collaboration includes egoistic motives of self-preservation and self-gratification, while objective and subjective incentives are factors to generate these motives.

In management, theories like comprehensive incentive theory and expectancy valence theory show the process incentive theory. This theory is to study the relationship between motivation and target-choosing of human's behavior, and this theory includes the opinion that human will only be completely motivated if they expect that their behaviors can help achieving certain goals, and then will take actions to accomplish goals (Nash, 1951). Represented by Porter and Lawler, the expectancy theory of 1960s pointed out that the motivating force is subject to various factors, including the success of specific matters, gained remuneration and understanding and evaluation of the related impact. In economics, the incentive mechanism and theory take the rational economic person as the starting point and aim to obtain the maximum profit or best effect.

2.2 The intellectual property regime
The intellectual property regime itself is an incentive mechanism which should fully play its role, to implement the innovation of intellectual property regime and to establish a system in favor of the IPR creation, transformation of innovation achievements and value realization. From the perspective of institutional incentives, the longstanding policy applied in our country is the science and technology award (Smith, et al, 1973). Under the current incentive system of intellectual property, though the science and technology award certainly has its historical origins, its existence space is limited. We should be more inclined to the intellectual property regime to encourage enterprises to create knowledge and transform innovations (Dixit, et al, 2009). The reason is that the science and technology award and the intellectual property regime are two fundamentally different systems. The former one is engaging in scientific research activities in accordance with the National Science and Technology Plan not the market. Therefore, it isn't guiding or stimulating the technology industrialization and commercialization. The intellectual property regime includes the guide and mechanism of encouraging the innovation industrialization and commercialization, and the industrialization and commercialization of technological achievements is the ultimate purpose for enterprises to carry on the technological innovation (Hirshleifer, 2000).

2.3 The IP-oriented incentive mechanism
The IP-oriented institutional incentive mechanism, with the encouragement for enterprises to create knowledge and transform innovation, in essence, is a kind of incentive mode and mechanism by taking

the property rights incentive institutions as both the base and the core. The property rights incentive, including the intellectual property, is considered as the basic system to stimulate the subject of market economy to engage in creative activities. Effective system of property rights can form clear expectations for defining the rights, obligations and responsibilities of all stakeholders, to avoid negative externalities in creative activities and to provide protections for stakeholders to occupy themselves in R&D and other related activities (Huang Liping, Li Chaoming, 2010).

Therefore, to promote China's enterprises technological innovation and the implement of intellectual property strategy, it is important and meaningful to establish the incentive mechanism of technological innovation with IP elements involved, to reform the current scientific and technological achievements evaluation system, and to set a scientific evaluation system to promote the technological innovation.

3 The Motive Mechanism of Enterprise Technological Innovation

The reason why the technological innovation can become the conscious actions of company is that it is driven by the enterprise internal motive mechanism and influenced by the enterprises external environmental. The interplay of these two factors constitutes the motive mechanism of enterprise technology innovation.

Based on technological invention, the enterprise technological innovation is the process to realize the economic benefits by the technological productization and marketization. The enterprise technological innovation on the one hand meets the needs of society, on the other hand also achieves its own profits, and therefore obtains a certain competitive advantage in the market (Xiong Qiang, et al, 2014). The internal driving force of it comes from enterprises' pursuits to economic interests by using innovative resources and innovative ability. The innovators are motivated by profits brought by their innovative products.

Under the intellectual property regime, the driving force of enterprise technological innovation mainly comes from monopolistic interests which generated in the intellectual property protection for innovative fruits. This driving force originates from the market competition in essence. As some scholars have pointed out, "if enterprises don't take the enterprise internal impetus and the market competitive impetus as the leading factors to improve the level of patent technological innovation, they would never have real capability of technological innovation." (Chen Lei, et al, 2008) And some scholar indicates that under the intellectual property regime, the mechanism for enterprises to develop intellectual property includes four aspects: technical innovation mechanism of competition, cooperation and diffusion as well as technical standardization mechanism (Nonaka, 1998).

For the external environment, enterprise technological innovation can be implemented on the base of market demands, technological opportunities, market competitiveness as well as government's guiding and supporting policies and institutions on technological innovation. For example, the brisk market demand provides external impetus for enterprises to carry out the technological innovation on certain aspects; ideas and experiences that the advanced technology will equip enterprises with market competitiveness, also offer the driving force to enterprise technological innovation (Toni Laaksonen, 2008). Government's supporting policies and incentive systems related to the enterprise technological innovation are also conducive to create a social environment of technological innovation and to guide the enterprise technological innovation, thus actively promoting policies and strategies of enterprise technological innovation. The market competitiveness is also a vital motivation for enterprises to engage in technological innovation. Competition will pose pressure on enterprises to generate a sense of crisis, and force them to develop better technologies and products than their competitors to win competitive advantages. However, the influence from external environment eventually needs to be converted to the internal motive mechanism for enterprise technological innovation (Zhang Feng, 2002).

In fact, the internal motive mechanism is the benefit-based incentive mechanism. That is, only if a direct and positive correlation exists between the proportion of innovation put by innovators and their interests, there will be high enthusiasm for enterprises to engage in technological innovation. [17] Of course, though the enterprise technological innovation belongs to the individual behavior of enterprises, it will still have huge social benefits. In order to maintain the social effects of technological innovation, we need to balance private profit rate and social profit rate on technological innovation (Robert, 1988).

4 The Construction of Incentive Mechanism about Intellectual Property Based on Enterprise Technological Innovation

The intellectual property regime itself is a mechanism to protect and stimulate the knowledge creation. If enterprises want to integrate the technological innovation and intellectual property strategy, they should make full use of the incentive mechanism in the intellectual property regime from its start point: promoting the knowledge creation. For the important role of the incentive mechanism, enterprises should also establish a set of mechanisms with benefit as the core, in the aspect of promoting knowledge creation. This paper holds the view that we should mainly pay attention to the following strategies:

Firstly, we need to establish a people-oriented concept, pay attention to the role of intellectual capital in enterprise development, and build incentive mechanisms for encouraging innovative talents. From the perspective of human resources theory, the reason why the great importance lies in the incentive measures which can promote the enterprise technological innovation and the implementation of intellectual property strategy, is that human capital is one of the most important factors of production for enterprises, and it is both the subject of R&D, production-manufacturing and marketing campaigns enforced by enterprises as well as the base of integrating resources, managing other factors of production and achieving the optimum economic benefits(Paul, 1987). It is undoubtedly that if we want to enhance the important role of human capital played in business activities, we need to fully mobilize the enthusiasm and creativity of employees, for adequately stimulating the vitality of work. The incentive measures which take the guarantee for economic and spiritual interests of employees as its core is naturally the important factor and measure to stimulate the vitality of the human capital and promote the enterprise innovation (Grossman, 1991). Training creative talents is the precondition to promote the knowledge creation in enterprises, because creative talents are subjects of knowledge creation.

Secondly, we need to establish a sound system of enterprise innovation, for fully stimulating the vitality and potential of innovative talents to engage in the knowledge creation. It is so important for enterprises to set the internal incentive mechanisms for encouraging innovation. From the experience of foreign enterprises, the enterprises in developed countries generally have established a fairly sound system for encouraging technical personnel to be engaged in the technology research and development. For example, IBM in the United States has established a sound incentive mechanism of creation. The company set up a points-based reward system: the inventor can get some points after getting patents, and the inventive patent is 3 points; when accumulated points reach to 12 points, the inventor can get the performance award of $ 3,600 (Paul, 1990). From the situation of China's enterprises, some enterprises set up a similar incentive reward system for knowledge creation, and greatly promote their intellectual property creations and technological capabilities through the establishment and improvement of the inner system of encouraging innovation. For example, Zhengzhou Yutong Group Co., Ltd. of Henan province focus on the creation of independent intellectual property, establishing a research and development pattern of "producing a generation, trial-producing a generation, developing a generation and pre-research a generation" (Philippe Aghion, 1992).

Thirdly, government needs to give policy and institutional support for the technological innovation in enterprises, and to establish policies, systems and cultural concepts for encouraging technological innovation. There is the plentiful content in government policies and institutions for stimulating technological innovation, like protection policies on innovation fruits, encouragement policies and guidance policies on innovation (Fritz Machlup, 1962). For example, policies based on technological innovation and intellectual property protection published by state and local governments include investment and protection for innovation resources, conservation and awards for innovation fruits, guidance for subjects of technological innovation to engage in innovative activities and so on. It should be said that on the aspect of external incentives, a great significance lies on effective policies and institutions published by the government. These policies and institutions are especially reflected in normative documents which can promote technological innovation and intellectual property strategies. In April of 2011, Hubei Province issued "Comprehensive Evaluation Regime on Scientific and Technological Innovation of Cities and Counties in Hubei Province (on trial)." This regime settled the comprehensive evaluation index on scientific and technological innovation of cities and counties which includes three kinds (gross indicators, quality indicators and speed indicators) and seventeen small indicators. Among these indicators, the number of granted patents and the ten-thousand people patent possessive quantity were respectively listed as one of the first gross indicators and quality indicators.

Fourthly, when establishing the property ownership of intellectual creation, we should hold principles of farthest mobilizing the enthusiasm of creators and fully protecting the legitimate rights and interests of creators, practicably implement the intellectual property which formed by the science and technology fund project or the science and technology plan with financial funds, and seriously realize

the system of "One Award Two Payment" for creators (Window & Bramer, 1994). On the base of using state-owned fund or national financial subsidy to carry out scientific and technological innovation projects, enterprises, as the undertaking unit, can take ownership of their achievements of technological innovations with patents innovations and intellectual property rights, unless these achievements involve in the national security, national interests or great public interests. For the intellectual property owned by enterprises, besides the implement by themselves, enterprises can also gain earnings by means like permission, transfer, pledge financing and evaluation in terms of shares. When companies cooperate with universities, research institutes and other units on innovation, they can stipulate the ownership of intellectual property by contracts. Above provisions undoubtedly help to mobilize the enthusiasm of enterprises to engage in innovation, and provide institutional incentives for enterprises to be the undertaking units to launch technological innovation with state-owned fund or national financial subsidy. The key is that after gaining the related intellectual property rights, how enterprises implement these rights in appropriate means, to make them become the guarantee for improving enterprises' competitiveness and technological innovation level.

Fifthly, we need create the atmosphere and culture of innovation in enterprises. The enterprise technological innovation is an economic and technological process with risks and exploratory. To achieve goals of technological innovation, we need to establish an effective mechanism of stimulating knowledge innovation. In addition, we also need to create an external environment which is conducive to innovation, and it is also very important to create a favorable atmosphere for the enterprise innovation.

5 Conclusions

Through document arrangement, this paper clarified the basic meaning of incentive mechanism about intellectual property as well as arranged and analyzed the basic contents of incentive mechanism, intellectual property mechanism and intellectual property-oriented incentive mechanism. Applying environmental analysis, this paper deeply analyzed inner and outer environments for enterprises to implement the incentive mechanism about intellectual property, which can lay a foundation for constructing mechanisms by realizing the environmental advantage. Finally, based on the enterprise technological innovation, the incentive mechanism about intellectual property can be constructed from many aspects, like constructing the humanistic concept, setting and perfecting the enterprise innovation mechanism as well as making awards real, providing governmental policy and institutional support for enterprise technological innovation, implementing policies and creating innovative atmosphere and culture.

Acknowledgement

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Study on Process Management Innovation of Scientific Projects in Universities in Context of Big Data

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Abstract: For universities and colleges, scientific research plays a very important role in improving the level of aggregation, reserving further development power and enhancing international influence. At the same time, the level of management can greatly influence the efficiency of the scientific research. The big data era provides new research scopes, and gives rise to new research tools and paradigms as well. On this basis, we need to put big data as a productivity, and establish the service platform for research projects data and to make the development of process management more dynamic, diversified and scientific.

Key words: University; Scientific projects; Process management; Big data

1 Introduction

The universities and colleges, processing rich talents and technologies resources, have the basis of undertaking scientific tasks. So they are the fresh force for national scientific research. In recent years, with the promotion of hi-tech innovation capacity, the universities have been undertaking more and more projects than before. Therefore the requirement for management of scientific research projects is increasing. To strengthen the process management is an important approach to improve the level of scientific research management.

Scientific research work in China has achieved rapid development over the years. However, the backward management concept restricts the research management level and performance.

But now it is the era of big data. All kins of data can add up and grow very quickly in size, as shown in Figure. 1(Tien James M ,2013). Xu Zhejun et al (2014). briefly described the concept of big data and the challenges to the traditional scientific research management then suggested the application of big data technologies in scientific research management informationization. Yang Weirong (2015) stated that we also need to strengthen the building, matching and docking of external demand databases and university research library. It is also essential to strengthen the "big data" propaganda and promote the transformation of the concept of scientific researchers. Big data has penetrated various areas and sectors of human society including industry sectors, technology, transportation, electricity, health care, finance, social security, defense, and public safety (Jiang et al,2014; McAfee A et al,2012; Liu et al,2014).
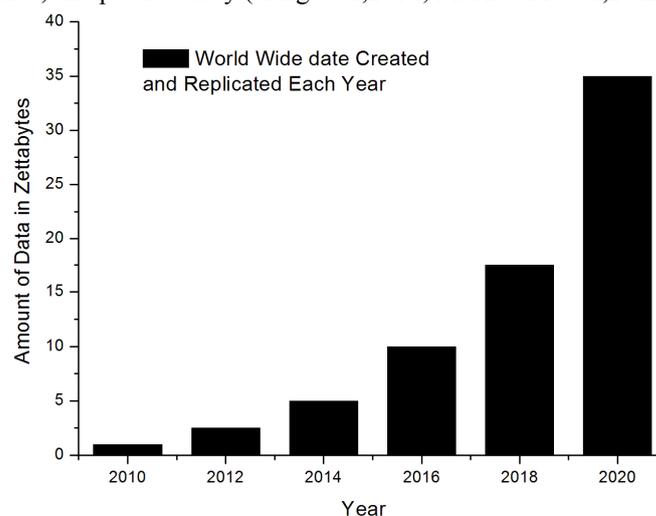
Figure 1   Growth in Data

The big data technology can play a positive role in research assessment, project determination, resources distribution, project monitoring and so on, and provide guarantees on the performance of

research project management and well development of scientific research.

2 The Necessity of Strengthening the Scientific Research Project Management in Universities

The dynamic process of scientific projects management can be divided into several stages, including projects declaration, control execution and final projects measurement. For a long time, people mainly focus on the projects declaration and final measurement. But there is not enough dynamic monitoring for the whole research process. This kind of management mode cannot satisfy the requirement of the researches in nowadays. So the scientific research management department in the universities must enhance the process management of scientific projects (Golston D ,2008).

To strength the process management of scientific research project, the management department needs to achieve two main points. First, they should know the progress situation at any time, that is, make sure that the research projects are under monitoring and quality controlling at all the stages. Second, they need to response the problems and remove the obstacles in time. If necessary, the research plan should be modified to keep the research project innovative and prospective and promote the quality of research achievements (Li Guojie, Chen Xueqi,2012; Huang Hengzhen, Zhou Guohua,2015).

3 Big Data Era's Influence on the University Scientific Research Project Management

In big data era, the new requirements of university scientific research project management request the big data to play a positive role. The appearance and development of big data supply a significant opportunity for the research management from tradition to informatization. The information management contributes to the pertinence of project selection. It's also helpful to the duplicate checking to avoid resource waste and interest confliction. In addition, the big data can optimize the monitoring system of academic morality; also promote the transformation of research achievements from data sharing (Meng Xiaofeng, Ci xiang,2013).

3.1 Big data is helpful to improve the pertinence and scientificity of research topic selection.

Scientific projects start from topic selection. So the scientificity of the selected topics directly affects the feasibility and innovation of the project. The research projects from the nation, provinces or ministries first started from topics collection in some specific scopes. Then the research guide was issued followed by the corresponding research work in the institutes. The problem is that the information asymmetry during regions and ministries easily lead to the overlap in research directions and content. What's more, as the topics are always limited in specific scopes, the managers who supply the topics may be not expert in the social demand, research hotspot or research ability, which could result in the mismatch during the three aspects. The big data technology can dig out the demand of science and technology in social public, business enterprise, government/public institutions, and other nonprofit organizations. It can even distinguish which is the most impendent and beneficial demand, and then promote the pertinence and realize the scientization of topic selection. In big data era, research management departments have the ability and responsibility to guide researchers in topic selection.

3.2 Big data is helpful to the transformation of research achievement

The universities now mainly focus on the innovation of scientific and technology, but rarely on the demand for achievements from social public, business enterprise and government/ public institutions. The situation leads to the mismatch between research achievements and social demand, and results in the low rate and speed of achievement transformation as well. Moreover, the researchers in universities communicate very limited with the potential demanders. So even though some research achievements in universities may be really important for solving the problems form personage, the enterprise/ public institutions and government, they cannot be applied because of the information asymmetry. Aiming at this situation, the scientific research management department in universities could establish the platforms for research achievements and social demands using the big data technology, achieve the match and joint between them, and so promote the achievement transformation and realize the social and economic benefits.

3.3 Big data is helpful to promote the efficiency and precision of scientific research project management

With the high speed development of information and explosive growth of all kinds of data, the statistic and analytical functions of the old management system are too simple and in low correlation.

The research managers can only get to the original data and basic functions of project number, project budget, achievement entry, query and report. In the old working model, the research managers are the bridge to convey instructions and appeals and only play a role in collecting and organizing data. Under the background of big data, the managers in universities should bring the subjective initiative into play with the big data technology. They need to extract the depth information that is useful to the final decision from the mass data, and supply the objective, scientific and high level support to the researchers.

4 Exploration of Building New Model for the Scientific Research Project Management under the Big Data Perspective

From the development tendency, the scientific research project management model in universities at present cannot satisfy the requirement of the achievements' quality for the major research project. In big data era, the new process management model for scientific research projects should be established based on data analysis, and realize the interrelation, interaction and interplay by the management activities from different levels. The activities and resource in every stages of the process should be combined organically. The final target needs to be divided into small targets in every stage for better monitor and control, and followed by the rearrangement and modification through the feedback in process management. The present management model should be transformed thoroughly into the whole-process management, which faces to the self-inspection, mutual inspection and quality inspection for the projects. The dynamic evaluation system of scientific research project management must be built based on big data. With the analyzing of the big data and continuous controlling and modifying of the project, it's probably to realize the quality controlling and promote the transformation rate of scientific research achievements radically. The key point to achieve the target is making the best of the data platform, collecting and analyzing all the related data in research management process, and realizing the overall control during project application, process management and achievement management.

Firstly, the managers need to collect the internal and external data, followed by filtrating and collating. Then the data are input into the project management platform and form the database. Secondly, the data will be analyzed and transformed into knowledge to support the projects from plan establishment, projects declaration, control execution, process management to final projects measurement. Thirdly, the data formed in the whole process can be recorded into the database as well to realize a virtuous circle. In this way, the efficiency of achievement can be promoted. The diagram of the process management based on big data for scientific research projects in universities was shown in Figure 2.
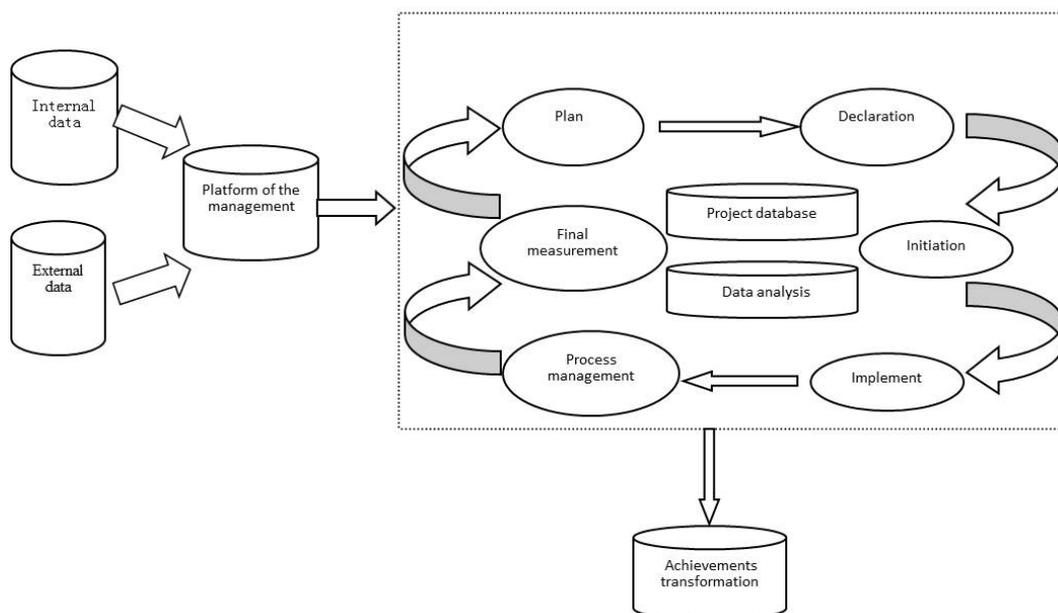
Figure 2   The Diagram of the Process Management based on Big data for Scientific Research Projects in Universities

In addition, the concept of the research managers in universities needs to be refreshed from the "management" to "supporting and service". The information Mining should be more progressive by analyzing the demand from society and nation to make the research target valuable and pertinent. The service also should be more prospective by analyzing and digging out the data in time to support the researchers with the data or conclusion they need.

5 Conclusions

The development of big data provides a good opportunity for the research management from the traditional to the information. The new process management model for scientific research projects could be established based on big data technology. Through the analysis of the big data and continuous controlling and modifying of the project, the quality control has been realized and the improvement of the transformation rate of scientific research achievement has been promoted.

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A Variable Sampling Interval Control Chart for the Coefficient of Variation with Unknown Shift Size

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Abstract: Quality has become a universal goal for organizations to sustain competitive merits. Control charts are one of the powerful tools often used by management to achieve cost savings by minimizing process variation and reducing rework, scrap and the need for inspection. However, most of the control charts were proposed based on a deterministic shift size while in reality, practitioners may not know the shift size due to a lack of data. Therefore, this paper develops a variable sampling interval (VSI) chart to monitor the coefficient of variation (CV) with unknown shift size, thereby allowing practitioners to select optimal parameters without specifying the shift size. Optimization design strategies based on the expected average time to signal (*EATS*), subjected to constraints in terms of the in-control average time to signal (*ATS*) and in-control average sampling interval (*ASI*) is presented. The *EATS* of the chart is numerically compared with its competing charts. The VSI CV chart outperforms the Shewhart CV and synthetic CV charts, while the EWMA-γ^2 chart outperforms the VSI CV chart. Significant cost savings can be obtained from a quicker detection of the shift.

Key words: Average time to signal (*ATS*); Coefficient of variation; Expected average time to signal (*EATS*); Optimization design strategies; Unknown shift size; Variable sampling interval

1 Introduction

　　Superior quality of products and services ensures sustainability of an organization. Statistical Process Control (SPC) concepts within the organization have been a key factor in leading to continuous quality improvement and successful business management. Among the seven tools in SPC, control chart is the most technically sophisticated. Quality practitioners used control charts to monitor the process by determining whether the process is in-control or out-of-control. When the chart signal an out-of-control condition, the process must be stopped to remove the assignable causes before a large quantity of defective units are produced. Therefore, a control chart is considered to be better than its competitors if it is able to detect the out-of-control condition in a shorter time without giving many false alarms.

　　Most of the control charts in the existing literatures monitor the mean and/or standard deviation. Nevertheless, in some processes, the mean and the variability are dependent of one another, where the mean is expected to fluctuate and the variance is a function of the mean. In these cases, monitoring the mean and/or standard deviation is dubious. For such situation, the coefficient of variation (CV) can be used to quantify the variation in the measurements. The CV is defined as the ratio of the standard deviation (σ) to the mean (μ). Since the CV is a unit-free measure of dispersion, it is widely used to compare the variability among data sets of distinct units or distinct mean values.

　　The CV is broadly applied in many different fields. In the context of finance, the CV allows the investor to determine the volatility or risk in comparison to the amount of return the investor expects from the investment (Curto, J.D. & Pinto, J.C.,2009) Besides that, the CV is also used to measure the stability of dividend yields of Hang Seng index (Pang, W.K., Yu, B.W,2008). The CV is also very popular in the field of manufacturing and material engineering. For instance, tool cutting life and several properties of sintered materials (Castagliola, P. ,2011; Castagliola, P., Achouri, A. ,2013). Apart from that, the CV is adopted in health science. For example, the CV is used to measure the variation in the mean synaptic response of the central nervous system (Faber, D.S. & Korn, H, 1991) and to diagnose the presence of a disease based on the amount of certain chemicals in the patient's urine and blood (Tian, L,2005). In chemical and biological assay quality control, the CV is used to validate results (Reed, G.F,2002; Seyler, C,2005). In ecology, the CV is used in predictive ecosystem modelling and aquatic management (Håkanson, 2003).

　　The pioneering work on the CV chart was presented by Kang, Lee (2007). The CV chart proposed by Kang, Lee (2007) is a Shewhart-type control chart which is only sensitive to large shifts but is less

sensitive to small and moderate shifts. Driven by this reason, numerous works and extensions on control charting methods have been made to find the most effective control chart for a quicker detection of process disturbance. Hong, E.P.et al(2008) developed an Exponentially Weighted Moving Average (EWMA) CV control chart, Castagliola, P., Celano, G.(2011) suggested two one-sided EWMA-γ^2 charts, Calzada and Scariano (2013)proposed a synthetic control chart to monitor the CV and Castagliola P., Achouri A.(2013) developed a Shewhart-type CV chart with supplementary run rules. More recently, Zhang, J. et al (2014) suggested a modified EWMA CV chart. Finally, a multivariate version of the CV chart is proposed by Yeong, W.C.et al (2016).

Shewhart-type control charts are often adopted due to its simple implementation. Shewhart-type control charts perform well in detecting large shifts, but the detection speed in small and moderate shifts is insufficient. Extensive research in recent years has developed adaptive control charts. (Castagliola, P., Achouri, A. ,2013) proposed a variable sampling interval (VSI) control chart to monitor the CV, while Castagliola, P., Achouri, A.et al (2015) and Yeong, W.C., Khoo (2015) monitored the CV using the variable sample size (VSS) charts. The results showed that adaptive control charts improved the detection speed significantly.

The VSI chart works by allowing the sampling interval to vary as a function of the prior sample position. (Reynolds, M.R. ,1988; Reynolds, M.R. ,1989; Runger, G.C. ,1991) showed the optimality of two sampling intervals. The VSI chart divides the chart into three regions using warning and control limits. If a sample point falls in the central region which is bounded by warning limits, then the next sampling interval should be long due to a low probability for the process to go out-of-control. However, if a sample point falls in the warning region which is bounded by warning and control limits, then the next sampling interval should be short as the probability for the process to go out-of-control is high. Lastly, if a sample point falls in the out-of-control region which is outside the control limits, then the process is considered to be out-of-control and corrective action is needed to eliminate the assignable cause.

In the existing literature, most of the controls charts were proposed based on an assumption that the shift size is known a priori. Nonetheless, in many real-life applications, the practitioner may not be able to specify the exact value of the shift size due to lack of historical data or the shift size is not deterministic and varies according to some unknown stochastic model (Castagliola, 2011) showed that the run-length properties are seriously affected if the practitioner selects the optimal parameters due to incorrect specification of the shift size. Thus, it is crucial to cope with this unknown shift size problem. Adaptive control charts that monitor the CV with unknown shift size cannot be found in the existing literature. Thus, this paper proposes a VSI CV chart with unknown shift size. Through the chart proposed in this paper, practitioners will be able to obtain the optimal chart parameters even when the shift size is unknown.

The rest of the paper is structured as follows. In the next section, the VSI CV chart is reviewed. Then, the VSI CV chart with unknown shift size is proposed. Next, some results and discussion are provided. Finally, some concluding remarks are provided.

2 The VSI CV Chart

In this section, a brief overview of the VSI CV chart proposed by Castagliola, P., Achouri, A. (2013) is provided. The chart signals an out-of-control situation when the sample CV falls outside the upper and lower control limits. The sample CV, $\hat{\gamma} = \dfrac{S}{\overline{X}}$, where $\overline{X}$ and S are the sample mean and sample standard deviation of a sample of n independently and identically distributed normal random variables.

The cumulative distribution function (c.d.f.) of $\hat{\gamma}$ is

$$F_{\hat{\gamma}}\left(x \middle| n,\gamma\right) = 1 - F_t\left(\frac{\sqrt{n}}{x} \middle| n-1, \frac{\sqrt{n}}{\gamma}\right), \tag{1}$$

where $F_t(\cdot)$ is the c.d.f. of the non-central t distribution with $n-1$ degrees of freedom and non-centrality parameter $\dfrac{\sqrt{n}}{\gamma}$. Inverting $F_{\hat{\gamma}}\left(x \middle| n,\gamma\right)$ gives the inverse c.d.f. of $\hat{\gamma}$ as

$$F_{\hat{\gamma}}^{-1}\left(\alpha\,|\,n,\gamma\right)=\frac{\sqrt{n}}{F_t^{-1}\left(1-\alpha\left|n-1,\frac{\sqrt{n}}{\gamma}\right.\right)}, \tag{2}$$

where $F_t^{-1}(\cdot)$ is the inverse c.d.f. of the non-central t distribution.

The sampling interval of the VSI CV chart is varied at two levels, which is the long sampling interval (h_L) and the short sampling interval (h_S). To apply the VSI CV chart, control and warning limits are needed. The control and warning limits can be computed as follows:

$$UCL = \mu_0(\hat{\gamma}) + K\sigma_0(\hat{\gamma}), \tag{3}$$

$$LCL = \mu_0(\hat{\gamma}) - K\sigma_0(\hat{\gamma}), \tag{4}$$

$$UWL = \mu_0(\hat{\gamma}) + W\sigma_0(\hat{\gamma}) \tag{5}$$

and

$$LWL = \mu_0(\hat{\gamma}) - W\sigma_0(\hat{\gamma}), \tag{6}$$

where K and W are the control and warning limit parameters with the condition $K > W > 0$, while $\mu_0(\hat{\gamma})$ and $\sigma_0(\hat{\gamma})$ are the mean and the standard deviation of $\hat{\gamma}$ when the process is in-control. Since there is no closed form for $\mu_0(\hat{\gamma})$ and $\sigma_0(\hat{\gamma})$, approximations proposed by Reh, W. et al(1996) are adopted in this paper, such that

$$\mu_0(\hat{\gamma}) \simeq \gamma_0\left[1+\frac{1}{n}\left(\gamma_0^2-\frac{1}{4}\right)+\frac{1}{n^2}\left(3\gamma_0^4-\frac{\gamma_0^2}{4}-\frac{7}{32}\right)+\frac{1}{n^3}\left(15\gamma_0^6-\frac{3\gamma_0^4}{4}-\frac{7\gamma_0^2}{32}-\frac{19}{128}\right)\right], \tag{7}$$

$$\sigma_0(\hat{\gamma}) \simeq \gamma_0\left[\frac{1}{n}\left(\gamma_0^2+\frac{1}{2}\right)+\frac{1}{n^2}\left(8\gamma_0^4+\gamma_0^2+\frac{3}{8}\right)+\frac{1}{n^3}\left(69\gamma_0^6+\frac{7\gamma_0^4}{2}+\frac{3\gamma_0^2}{4}+\frac{3}{16}\right)\right]^{\frac{1}{2}}. \tag{8}$$

The average time to signal (*ATS*) and the average sampling interval (*ASI*) is provided by Castagliola, P., Achouri, A. (2013) as follows:

$$ATS = \frac{h_S p_S + h_L p_L}{q(1-q)} \tag{9}$$

and

$$ASI = \frac{h_S p_S + h_L p_L}{1-q}, \tag{10}$$

where $p_L = F_{\hat{\gamma}}(UWL\,|\,n,\gamma_1) - F_{\hat{\gamma}}(LWL\,|\,n,\gamma_1)$ is the probability of the sample falling in the central region, $p_S = F_{\hat{\gamma}}(UCL\,|\,n,\gamma_1) - F_{\hat{\gamma}}(LCL\,|\,n,\gamma_1) - p_L$ is the probability of the sample falling in the warning region and $q = 1 - p_S - p_L$ is the probability of the sample falling in the out-of-control region.

3 The VSI CV Chart with Unknown Shift Size

When the quality practitioners are unable to specify the shift size or the shift size is not deterministic, the optimal chart parameters should be obtained using an alternative method. The expected average time to signal (*EATS*) should be used instead of the *ATS*. The *EATS* can be computed as follows:

$$EATS = \int f_\tau(\tau) ATS(n, h_S, h_L, W, K, \gamma_0, \tau) d\tau, \tag{11}$$

where $f_\tau(\tau)$ is the probability distribution function of the shift τ. The *EATS* can be considered as the expected value of the *ATS* over the distribution function $f_\tau(\tau)$. Note that the *EATS* does not quantify any statistical property of the chart for a specific shift size. As it is often difficult to fit the actual shape of $f_\tau(\tau)$, a simple non-informative solution consists of choosing some discrete uniform distribution over [0.5, 1) for the decreasing case and over (1, 2] for increasing case (Castagliola, 2011). Gauss-Legendre quadrature is used to obtain an approximation of the integral as the integral in Equation (11) cannot be obtained easily.

In order to implement the optimization algorithms, the values of (h_S, h_L) need to be fixed. In this

paper, we consider $(h_S, h_L) \in \{(0.5, 1.5), (0.3, 1.7), (0.1, 1.3), (0.1, 1.5), (0.1, 1.9), (0.1, 4.0)\}$, which are the combinations recommended by (Reynolds, 1989), and were also adopted by (Castagliola, P., Achouri, A ,2013). For the optimization criterion, we select (W, K) which minimizes $EATS_1$ such that

$$(W, K) = \underset{(W,K)}{\arg\min}\, EATS_1(n, h_S, h_L, W, K, \gamma_0, \tau_{\min}, \tau_{\max}), \tag{12}$$

subject to the constraints

$$ATS_0 = 370.4 \tag{13}$$

and

$$ASI_0 = 1. \tag{14}$$

4 Numerical Analysis

Table 1 Optimal Chart Parameters (W, K) And The Corresponding Out-Of-Control $EATS_1$ Of The VSI CV Chart With Unknown Shift Size, For $\gamma_0 \in \{0.05, 0.10, 0.15, 0.20\}$ And $n \in \{5, 7, 10, 15\}$

γ_0	(h_S, h_L)	(0.5, 1.5)	(0.3, 1.7)	(0.1, 1.3)	(0.1, 1.5)	(0.1, 1.9)	(0.1, 4.0)
				$n = 5$			
0.05	(W, K)	(0.686, 3.161)	(0.686, 3.161)	(1.150, 3.161)	(0.929, 3.161)	(0.686, 3.161)	(0.301, 3.161)
	$EATS_1$	25.21	24.51	24.18	23.98	23.82	23.66
0.10	(W, K)	(0.684, 3.191)	(0.684, 3.191)	(1.148, 3.191)	(0.927, 3.191)	(0.684, 3.191)	(0.300, 3.191)
	$EATS_1$	25.41	24.71	24.36	24.17	24.01	23.87
0.15	(W, K)	(0.682, 3.243)	(0.682, 3.243)	(1.144, 3.243)	(0.924, 3.243)	(0.682, 3.243)	(0.299, 3.243)
	$EATS_1$	25.76	25.05	24.69	24.50	24.35	24.21
0.20	(W, K)	(0.679, 3.319)	(0.679, 3.319)	(1.138, 3.319)	(0.919, 3.319)	(0.679, 3.319)	(0.298, 3.319)
	$EATS_1$	26.26	25.55	25.15	24.97	24.84	24.72
				$n = 7$			
γ_0	(h_S, h_L)	(0.5, 1.5)	(0.3, 1.7)	(0.1, 1.3)	(0.1, 1.5)	(0.1, 1.9)	(0.1, 4.0)
0.05	(W, K)	(0.681, 3.089)	(0.681, 3.088)	(1.149, 3.089)	(0.925, 3.089)	(0.681, 3.089)	(0.298, 089)
	$EATS_1$	20.68	20.03	19.75	19.54	19.37	19.20
0.10	(W, K)	(0.680. 3.114)	(0.680, 3.114)	(1.148, 3.114)	(0.924, 3.114)	(0.680, 3.114)	(0.297, 3.114)
	$EATS_1$	20.87	20.21	19.93	19.72	19.55	19.39
0.15	(W, K)	(0.679, 3.156)	(0.679, 3.156)	(1.145, 3.156)	(0.922, 3.156)	(0.679, 3.156)	(0.297, 3.156)
	$EATS_1$	21.21	20.54	20.24	20.04	19.87	19.72
0.20	(W, K)	(0.676, 3.217)	(0.676, 3.217)	(1.141, 3.217)	(0.918, 3.217)	(0.676, 3.217)	(0.296, 3.217)
	$EATS_1$	21.69	21.01	20.69	20.49	20.34	20.20
				$n = 10$			
γ_0	(h_S, h_L)	(0.5, 1.5)	(0.3, 1.7)	(0.1, 1.3)	(0.1, 1.5)	(0.1, 1.9)	(0.1, 4.0)
0.05	(W, K)	(0.678, 3.044)	(0.678, 3.044)	(1.148, 3.044)	(0.923, 3.044)	(0.678, 3.044)	(0.296, 3.044)
	$EATS_1$	16.95	16.33	16.10	15.89	15.71	15.55
0.10	(W, K)	(0.677, 3.061)	(0.677, 3.061)	(1.147, 3.061)	(0.922, 3.061)	(0.677, 3.061)	(0.296, 3.061)
	$EATS_1$	17.06	16.44	16.20	15.99	15.82	15.66
0.15	(W, K)	(0.676, 3.092)	(0.676, 3.092)	(1.145, 3.092)	(0.920, 3.092)	(0.676, 3.092)	(0.295, 3.092)
	$EATS_1$	17.28	16.65	16.40	16.20	16.03	15.87
0.20	(W, K)	(0.675, 3.139)	(0.675, 3.139)	(1.142, 3.139)	(0.918, 3.139)	(0.675, 3.139)	(0.295, 3.139)
	$EATS_1$	17.63	17.00	16.73	16.53	16.37	16.22
				$n = 15$			
γ_0	(h_S, h_L)	(0.5, 1.5)	(0.3, 1.7)	(0.1, 1.3)	(0.1, 1.5)	(0.1, 1.9)	(0.1, 4.0)
0.05	(W, K)	(0.676, 3.022)	(0.676, 3.022)	(1.147, 3.022)	(0.921, 3.022)	(0.676, 3.022)	(0.295, 3.022)
	$EATS_1$	13.70	13.12	12.90	12.70	12.53	12.37
0.10	(W, K)	(0.676, 3.033)	(0.676, 3.033)	(1.146, 3.033)	(0.920, 3.033)	(0.676, 3.033)	(0.294, 3.033)
	$EATS_1$	13.74	13.16	12.94	12.74	12.58	12.42
0.15	(W, K)	(0.675. 3.053)	(0.675, 3.053)	(1.145, 3.053)	(0.919, 3.053)	(0.675, 3.053)	(0.294, 3.053)
	$EATS_1$	13.84	13.26	13.03	12.84	12.68	12.52
0.20	(W, K)	(0.674, 3.084)	(0.674, 3.084)	(1.143, 3.084)	(0.918, 3.084)	(0.674, 3.084)	(0.294, 3.084)
	$EATS_1$	14.03	13.44	13.20	13.01	12.86	12.71

In this section, we consider $n \in \{5, 7, 10, 15\}$, $\gamma_0 \in \{0.05, 0.10, 0.15, 0.20\}$ and $(h_S, h_L) \in \{(0.5, 1.5), (0.3, 1.7), (0.1, 1.3), (0.1, 1.5), (0.1, 1.9), (0.1, 4.0)\}$ for increasing shift size. The motivation of

choosing the increasing case is because (Castagliola, P., Achouri, A ,2013) and (Yeong, 2015) found that CV charts with varying chart parameters lead to poor performance when it is adopted for the decreasing case. The optimal chart parameters (W, K) which minimize the out-of-control $EATS$ ($EATS_1$), subject to constraints $ATS_0 = 370.4$ and $ASI_0 = 1$ is obtained using the algorithm presented in the previous section. Next, the $EATS_1$ values is computed with their corresponding optimal chart parameters. Practitioners may refer to the table of optimal chart parameters provided in this section to facilitate a quick implementation of the VSI CV chart with unknown shift size.

Table 1 shows the optimal chart parameters (W, K) in the first row and the $EATS_1$ values in the second row. Based on Table 1, the best performance is obtained for the combination (0.1, 4.0). The larger the spread between h_S and h_L, the faster the detection of the shift. From Table 1, a smaller $EATS_1$ is obtained for larger values of n. For example, by considering (h_S, h_L) = (0.1, 1.3), when $n = 5$, $\gamma_0 = 0.05$, the $EATS_1$ is 24.18, while the $EATS_1$ is only 12.90 when $n = 15$ for the same (h_S, h_L) combination and γ_0 value. The $EATS_1$ value is slightly larger for larger values of γ_0, but the impact is minimal.

Table 2 shows the comparison of the VSI CV with that of three competing charts in terms of the $EATS_1$ values and the percentage increase. The percentage increase shows the percentage increase in the $EATS_1$ values when the competing charts are adopted instead of the VSI CV chart. The fixed sampling interval of the Shewhart CV, Synthetic CV and EWMA-γ^2 charts is set as unity so that the ATS_1 values of these charts are the same as their corresponding ARL_1 values. For the VSI CV chart, the (h_S, h_L) combination is set as (0.1, 1.3).   From Table 2, for all values of n and γ_0 considered, the $EATS_1$ values of the VSI CV chart is always smaller than the Shewhart CV and the Synthetic CV charts, but generally greater than the EWMA-γ^2 chart. As an example, when $n = 5$, $\gamma_0 = 0.05$, the $EATS_1$ values for Shewhart CV, Synthetic CV, EWMA-γ^2 and VSI CV charts are 38.06, 27.18, 15.72 and 24.18, respectively. Even though the VSI CV takes a longer time to signal the out-of-control condition compared to the EWMA-γ^2, the VSI CV chart is easier to understand compared to the EWMA chart.

Table 2　A Comparison Of The Out-Of-Control $EATS_1$ Values Of The Shewhart CV, Synthetic CV, EWMA-γ^2 With VSI CV charts, For $\gamma_0 \in \{0.05, 0.10, 0.15, 0.20\}$ And $n \in \{5, 7, 10, 15\}$

	Shewhart CV		Synthetic CV		EWMA-γ^2		VSI CV
				$n = 5$			
γ_0	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$
0.05	38.06	57.40%	27.18	12.41%	15.72	-34.99%	24.18
0.10	38.34	53.32%	27.39	12.39%	15.84	-35.00%	24.37
0.15	38.34	55.29%	27.74	12.35%	16.04	-35.03%	24.69
0.20	39.57	57.34%	28.25	12.33%	16.36	-34.95%	25.15
				$n = 7$			
γ_0	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$
0.05	32.12	91.75%	22.76	15.24%	12.52	-36.61%	19.75
0.10	32.41	92.37%	22.96	15.20%	12.62	-36.68%	19.93
0.15	32.90	93.38%	23.31	15.17%	12.81	-36.71%	20.24
0.20	33.62	94.83%	23.82	15.13%	13.08	-36.78%	20.69
				$n = 10$			
γ_0	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$
0.05	26.66	65.59%	18.70	16.15%	9.89	-38.57%	16.10
0.10	26.93	66.34%	18.89	16.68%	9.98	-38.36%	16.19
0.15	27.39	67.01%	19.22	17.20%	10.14	-38.17%	16.40
0.20	28.04	67.60%	19.69	17.69%	10.37	-38.02%	16.73
				$n = 15$			
γ_0	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$	% increase	$EATS_1$
0.05	21.30	65.12%	14.73	14.19%	7.60	-65.89%	12.90
0.10	21.53	66.38%	14.90	15.15%	7.66	-65.92%	12.94
0.15	21.93	68.30%	15.19	16.58%	7.79	-66.08%	13.03
0.20	22.50	70.45%	15.59	18.11%	7.98	-66.29%	13.20

5 Conclusions

Control charts are one of the useful tools used in manufacturing to detect the presence of assignable cause(s) which results in an out-of-control condition. One of the approaches to improve the performance of control charts is by adopting variable sampling intervals (VSI). The existing VSI charts

monitoring the CV is based on the assumption that the shift size is known. However, in reality, the shift size is rarely known. Thus, this paper proposes the VSI CV chart for unknown shift sizes. The VSI CV chart proposed in this paper allows practitioners to select optimal chart parameters when the shift size is unknown. Comparisons are also made with other existing CV charts based on unknown shift size. Comparisons show that the VSI CV chart outperforms the Shewhart CV and synthetic CV charts, but does not outperform the EWMA-γ^2 chart.

Acknowledgement

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Research on the Efficiency of Technology Service of National Model Productivity Promotion Centers

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Abstract: As technology intermediary organizations, Productivity Promotion Centers have many important missions, including serving for enterprises and the regional technology innovation, building the bridge and bond between the government and the enterprise, promoting scientific and technological achievements into productivity and so on. It aims to provide a full range of technological service for the government, enterprises and individuals. In this paper, the DEA method is used to calculate the total factor productivity of national model Productivity Promotion Centers of 26 provinces (cities) in China. The leading factors influencing the total factor productivity are deeply studied in this paper so as to provide reference for improving the total factor productivity of the national model Productivity Promotion Center.

Key words: The national model productivity promotion center; The total factor productivity; DEA

1 Introduction

The productivity promotion center is the new type sci-tech agency that provides the service in terms of technology innovation for small and medium-sized enterprises, and it is one crucial part of national innovation system. The productivity promotion center is a non-profit technology service entity regarding small and medium-sized enterprises and township enterprises as the main service object, and it brings science and technology strength such as technology, achievements, talents, information and so on into the small and medium-sized enterprises and township enterprises. It provides services for enterprises in a variety of ways in order to promote enterprise's technological progress and improve the market competitiveness of enterprises.

Since China established the first productivity promotion center in Yantai, Shandong in 1992, productivity promotion center system has been continuously improved after 23 years of construction and development. And it is actively exploring the new mode of the combination of technology and economy all the time which strong support for the construction of the national innovation system, and gradually formed the pattern of diversification of the subject of investment and institutional properties, and constructing and improving the productivity promotion system suitable for Chinese national conditions. At present, Productivity Promotion Center has become the backbone of technological innovation services. But there are still some problems in our productivity promotion center such as unbalanced development, weak infrastructure, lagging of talent team construction, operation mechanism is not flexible enough and so on on the whole, which restricts overall development of Chinese Productivity Promotion Center.

2 Literature Review

One major constraint to the success of many invention-based ventures proves to be the high degree of uncertainty about their profitability. Apart from technical difficulties, Heidrun C. Hoppe and Emre Ozdenoren thought another important reason is that it is often hard to assess the commercial value of inventions. As a result, profitable new technology may not be adopted by investors. However, intermediaries between creators, financiers, and users of new inventions can play in mitigating this uncertainty problem (Heidrun C. Hoppe,2005). Jeremy Howells thought the functions of science and technology intermediary service industry mainly are embodied in the collection and processing of information, partner selection, evaluation of innovation criteria and results, transfer and exchange of technical knowledge and suggestions on intellectual property protection and so on. And science and technology intermediary service industry can reduce the obstacles of information exchange between the two sides of technology supply and demand, and promote the smooth implementation of innovation activities (Jeremy Howells,2006). Mirjam Knockaert and André Spithoven focus on studying the impact of technology intermediary organizations on the enterprise by enterprise network capacity instead of additional cognitive ability. They distinguishing R & D activities what the R & D institutions and technology intermediary organizations involved in. Results show that absorption ability of technology

intermediary organization in R & D activities does not influence additional cognitive ability produced by the enterprise, but the use of science and technology intermediary service more, the enterprise has more high level of absorptive capacity, resulting in higher levels of additional cognitive ability (Mirjam Knockaert,2014). Zhang Ming and Liu Chunxiao divided the 26 provinces in China into the eastern, central, western and northeastern parts and they use the DEA model to calculate the total factor productivity of national model Productivity Promotion Centers of the four regional. The research shows that the total factor productivity has a significant regional difference, and the technical efficiency is the main factor of the productivity growth of the national model Productivity Promotion Center (Zhang Ming,2013). Xu Shuiping and Yin Jidong used the DEA method to study the relative efficiency of the productivity promotion center of Jiangxi Province of China from 2001 to 2011. They found that the service efficiency of the productivity promotion center of Jiangxi Province of China is increasing unceasingly and factor input ratio is relatively reasonable. Although the scale efficiency scores are low, but it has been increasing year by year. They think Jiangxi Province of China should continue to increase investment in Productivity Promotion Centers (Xu Shuiping,2013).

3 Model

DEA (Data Envelopment Analysis) was proposed by the famous American operational research experts Charnes, Cooper and Rhoades in 1978. It is a model to evaluate the relative effectiveness of decision making units with multiple inputs and outputs. DEA model is divided into input oriented and output oriented in two forms, and the input oriented model is enable the least input in a given output while the output oriented model is enable output reaches the maximum in a given input. CCR model is proposed by Charnes, Cooper and Rhoades using the fixed scale hypothesis. It uses linear programming method to estimate production boundaries and then measures the relative efficiency of each decision making unit (DMU). But in reality, not every DMU production process is under constant return of scale, so based on CCR model, Banker, Charnes and Cooper proposed BCC model which assumes that return to scale can be changed at any time. BCC model can distinguish the pure technical efficiency and scale efficiency. The formula is the scale efficiency is equal to the technical efficiency divided by the pure technical efficiency. It can measure whether the evaluation unit is in the state of optimal production scale under the given production technology.

This paper will use the Malmquist index based on output constructed by Fare et al, which is generally used by researchers. From phase t to phase $t+1$, Malmquist index measure the growth of the total factor productivity is represented as follow.

$$M_0(X^{t+1}, Y^{t+1}, X^t, Y^t) = \left[\frac{D_0^{t+1}(X^{t+1}, Y^{t+1})}{D_0^{t+1}(X^t, Y^t)} \times \frac{D_0^t(X^{t+1}, Y^{t+1})}{D_0^t(X^t, Y^t)} \right]^{1/2} \tag{1}$$

In formula (1), (X^{t+1}, Y^{t+1}) and (X^t, Y^t) represent respectively input and output vector of phase t and phase $t+1$.

Technology T in phase t as the reference, Malmquist index based on the perspective of output can be represented as follow.

$$M_0^t(X^{t+1}, Y^{t+1}, X^t, Y^t) = D_0^t(X^{t+1}, Y^{t+1}) / D_0^t(X^t, Y^t) \tag{2}$$

Similarly, technology $T+1$ in phase $t+1$ as the reference, Malmquist index based on the perspective of output can be represented as follow.

$$M_0^{t+1}(X^{t+1}, Y^{t+1}, X^t, Y^t) = D_0^{t+1}(X^{t+1}, Y^{t+1}) / D_0^{t+1}(X^t, Y^t) \tag{3}$$

In order to avoid the differences in the randomness of the period choice, imitating constructing method of Fisher ideal index, Caves et al used the geometric mean of the formula (2) and (3) measures the Malmquist index of productivity vary from phase t to phase $t+1$. If $M_0(X^{t+1}, Y^{t+1}, X^t, Y^t) > 1$, it represents the total factor productivity of the evaluation industry is growing. If $M_0(X^{t+1}, Y^{t+1}, X^t, Y^t) < 1$, it represents deterioration of the total factor productivity of the evaluation industry. In addition, the Malmquist index can be decomposed into the technical efficiency change index (EC) and the technical progress index (TC) under the assumption of constant return to scale. The formula is as follow.

$$M_0(X^{t+1}, Y^{t+1}, X^t, Y^t) = \frac{D_0^{t+1}(X^{t+1}, Y^{t+1})}{D_0^t(X^t, Y^t)} \times \left[\frac{D_0^t(X^{t+1}, Y^{t+1})}{D_0^{t+1}(X^{t+1}, Y^{t+1})} \times \frac{D_0^t(X^t, Y^t)}{D_0^{t+1}(X^t, Y^t)} \right]^{1/2} \tag{4}$$

$$= EC \times TC$$

EC represents the technical efficiency change index, and it measures the change of the maximum possible output approaching degree represented by actual production and production frontier of each

observation industry from phase *t* to phase *t+1*. TC represents the technical progress index, and it measures the movement of production frontier from phase *t* to phase *t+1*. If EC is greater than 1(less that 1), it indicates that the efficiency is improved(reduced). If TC is equal to 1, it indicates that there is no technical progress from phase t to phase t+1. If TC is greater than 1(less than 1), it indicates that there is technical progress(regress).

4 Data

According to the availability of data and the need of empirical research, this paper selects national model Productivity Promotion Centers which is distributed in 26 provinces in China as the research object. The data from "China Torch statistical yearbook" and the annual report of national model Productivity Promotion Centers range from 2007 to 2014.

In this paper, the input indicators are selected as the total number of personnel and the total assets. The total number of personnel is used as an indicator of labor input, the total assets are used as indicators of capital investment. The number of service enterprises, increased sales of enterprises, increased profits and taxes, increased employment number for society and total service revenue of the productivity promotion center are selected as the output indicators.

5 Empirical Analysis

According to the output oriented Malmquist productivity index model and input and output data, we use data envelopment analysis software package DEAP software for analysis. The results are shown in Table 1.

Table 1   Total Factor Productivity Index and Decomposition

year	effch	techch	pech	sech	tfpch
2008	1.097	0.999	1.129	0.971	1.096
2009	1.147	0.895	1.071	1.071	1.026
2010	0.908	1.145	0.988	0.919	1.040
2011	1.112	1.000	1.017	1.094	1.113
2012	1.036	0.945	1.003	1.033	0.979
2013	0.988	0.938	1.004	0.984	0.926
2014	0.844	1.269	0.883	0.955	1.071
mean	1.013	1.020	1.011	1.002	1.034

From table 1, we can find that the total factor productivity of national model Productivity Promotion Centers of the 26 provinces (cities) was increasing from 2007 to 2014 on the whole, and the average growth rate was 3.4%. The change of the total factor productivity of national model Productivity Promotion Centers of the 26 provinces(cities) showed a clear turning point in eight years from 2007 to 2014. The total factor productivity has been rising from 2007 to 2011, and it was at a stage of decline from 2012 to 2013, but it began to show an upward trend from 2013 to 2014. During these years, the growth of the total factor productivity in 2011 was most obvious and the average growth rate was 11.3% while in 2013 the decline of the total factor productivity was most significant and the average decline rate was 7.4%.

As far as the technical efficiency change is concerned, it increased in 2008, 2009, 2011 and 2012 while declined in 2010, 2013 and 2014. And in 2009 the technical efficiency increased most obviously, in 2014 it declined most obviously. In 2010 and 2014, technology was progressive, and the technical progress of 2014 was most significant. The level of technology was not change in 2011 and the technical regress of 2009 was most significant. Regarding the pure technical efficiency, it declined in 2010 and 2014. In 2008 the pure technical efficiency increased most significantly while declined most significantly in 2014. The growth of the scale efficiency change was most remarkable in 2011.

6 Discussion and Conclusions

From 2011 to 2014, the change of the total factor productivity showed obvious fluctuation. In 2011, the growth of the total factor productivity is most obvious, but the total factor productivity has been in a state of decline in 2012 and 2013. From table 1, we can find that although the technical efficiency increased by an average of 3.6% in 2012, the technical change declined by an average of 5.5%. The

positive contribution of the technical efficiency is less than the negative contribution of the technology regression. As a result, the total factor productivity showed a negative growth in 2012. In 2013, both the technical efficiency and the technical change were reducing, resulting in the lowest total factor productivity. And for 2014, although the technical efficiency was declining and declined most obviously during 8 years, the technical change increased by an average of 26.9%. The decline of technical efficiency is less than the growth of technological progress, so the total factor productivity in 2014 was growing.

During 8 years, the total factor productivity of national model Productivity Promotion Centers in China was increasing on the whole, which indicated that national model Productivity Promotion Centers in China are developing very well and they will get better and better development. Meanwhile, it showed that China is paying more and more attention to the development of Productivity Promotion Centers and small and medium-sized enterprises. And China has made a number of policies to support the development of Productivity Promotion Centers. Although the general trend of development of Productivity Promotion Centers is good, there are also some problems. So China should further increase investment in innovation to improve the ability of value added service in Productivity Promotion Centers. In addition, China should encourage cooperation between national model Productivity Promotion Centers and foreign VC firm and introduce venture capital, promoting global competitiveness. National model Productivity Promotion Centers should actively seek opportunities for international cooperation and communication and study experience in the management, operation and service of foreign technology intermediary to improve their professional proficiency and service level.

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Study of Summative Evaluation by New Multiple-Choice Question Format

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Abstract: In Yamaguchi University, we opened Research and Development Strategy Theory Course as a required subject of Graduate School of Science and Technology for Innovation established on April, 2016. The number of the study taking this course became to over 400, and it was necessary to plan the efficiency of the summative evaluation for the course. Therefore, in this article, we introduced a new Multiple-Choice Question and rating rule based on the issue of the adopted Multiple-Choice Question as a form of the examination that a great many students take at the same time conventionally.
Key words: Summative evaluation; Multiple-choice question; Partial score depending on the degree of the agreement

1 Introduction

Yamaguchi University established Graduate School of Science and Technology for Innovation in April, 2016. Graduate School of Science and Technology for Innovation is the general physical science graduate school which unified an engineering graduate course, a science graduate course and agriculture graduate courses. We started graduate school education to balance innovation with scientific research.

The new education of Yamaguchi University aims at upbringing of the interdisciplinary human resources who can drive a technique to evolve and business to change intensely by rapid progress. As interdisciplinary educational program, we opened a course in research and development strategy theory for all graduate students. The total number of the student taking this subject become to over 400. The learning target of this subject is to be able to explain a technology development strategy, research and development strategy and business model as methodology to let the business in the research and development type company succeed.

We adopted the examination by the new Multiple-Choice Question (MCQ) to carry out the summative evaluation of this subject. In this article, we examine the effectiveness of the learning evaluation by the new multiple-choice question.

2 Background

The MCQ form is one of the test method to perform the learning evaluation of a large number of students effectively. In Japan, the center examination (national united mark sheet-style examination) for high school students is the largest-scale of MCQ form. In addition, MCQ has been adopted in a Medical Doctor National Examination in Japan.

In this article, we look back about the form of the MCQ that has been adopted in the Medical Doctor National Examination of Japan. The MCQ to choose one as among five choices is called as A type. It is the simplest questions form. This form has a characteristic that an another score is added to a score based on the certain knowledge. The another score is got by the insufficient knowledge of the solver. We cannot necessarily evaluate the ability (this case, ability as the medical doctor) of the solver by using this method definitely. The questions ratio of A type among doctor national examinations becomes around 30% now.

A type : Choose one correct answer among the following choices:(a), (b), (c), (d), (e).

You can find "no answers in above" as (e).

Therefore, improvement was carried out in order to avoid a solver getting a score by insufficient knowledge. The number of correct answers was increased to two or three. On the other hand, a form to use an answer cord was devised to plan efficiency of the reduction of the burden on problem creator and the marking. We call the MCQ with two answer cords as K2 type, three answer cords as K3 type.

As for the more than 2 many limbs multiple-choice questions, the combination of choices is complicated a choice in comparison with A type. It is difficult to get a correct answer when the knowledge of the solver is insufficient. However, the pair of the answer is given in K2 and K3 type as an answer code beforehand. As an answer cord number is limited, it is known to decrease the superiority by

plural choices (Hirokazu Saito,1982).

K2 type

Choose one correct answer among the following choices of answer codes.

a. (1), (2)

b. (1), (5)

c. (2), (3)

d. (3), (4)

e. (4), (5)

K3 type

Choose one correct answer among the following choices of answer codes.

a. (1), (2), (3)

b. (1), (2), (5)

c. (2), (4), (5)

d. (2), (3), (4)

e. (3), (4), (5)

A form of K' type which gave a random combinatorial answer cord was suggested to evade this problem. The Saito and et.al. considered the score of the student when the student with the insufficient knowledge answered a MCQ of K' type under the condition as; the number of choice costs five, this student shall understand one original choice and one unjust choice in five choices. A knowledge rate of this student is 40% because the student understands two in five choices. Therefore, the fair evaluation score should become 40. However, the Saito and et.al. showed that the student could get 60 as scores with probability of more than 75%.

In the case of K' type, there is the upper limit of the answer cord number. In the case of this article, it is five. This upper limit restricts a combination of choice, and some answer cords become the consecutive choices certainly. The combination of consecutive choices has a certain constant regularity. Therefore, the solver can suppose a correct answer based on the regularity.

As a result, the solver can choose a correct answer with relatively high probability when a solver does not have the knowledge about all choices. The examination questions of K' type are not adopted now by this reason.

K' type

Choose one correct answer among the following choices of answer codes.

a. (1), (3), (4)

b. (1), (2)

c. (2), (3)

d. (4) only

e. (1) - (4) all of choices

A form not to give an answer cord was devised to make up for the fault of the problem of the K type. We call this Xn type. n is the number of the answers to choose. Difference between Kn type and Xn type is only difference in how to choose choices. Then, the questions producer can make a question of Xn type without changing the purpose of the problem. Xn type is equal to MCQ of A type to choose the choices (n=2, 3, ⋯), and the answer cord is not given. Therefore, the correct answer rate based on the insufficient knowledge for Xn type lowers than that of Kn type.

X2 type

Choose two choices among five choices: a, b, c, d, e.

X3 type

Choose three choices among five choices: a, b, c, d, e.

Ikebukuro generalized a calculating formula to lead relationship between quantity of knowledge (the number that a solver was able to judge whether a choice was a correct answer, or it was a non-correct answer) and the expected correct answer rate in Xn type. Using the general formula, Ikebukuro considered relations between quantity of knowledge and the expected correct answer rate in Xn type MCQ which did not appoint the number of the correct answers. Ikebukuro led 0.4 as value of an expected correct answer rate in case of quantity of knowledge N=2 under instructed correct choice number I=2, (X (I=2, N=2)) using his original numerical formulas (Kenichi Ikebukuro,1999).

Ikebukuro showed quantity of knowledge and the list of correct answer rates based on this expression of relations in the case of I=2. He also calculated a correct answer rate in the case of 0 to 5 quantity of knowledge. Based on the results, a correct answer rate curve was created. From the correct

answer rate curve (Kenichi Ikebukuro,1999), we can observe X type evaluating it more fairly than K type in ranges from quantity of knowledge 0 to quantity of knowledge 4. However, it was recognized that neither of X type and K type could not estimate a difference of quantity of knowledge 4 and quantity of knowledge 5.

Therefore, Ikebukuro suggests a MCQ not to give instructions correct choice number to solve this problem. He generalized the above-mentioned expression of relations and applied to a MCQ not to give instructions correct choice number. He created an expected correct answer rate curve for the MCQ not to give instructions correct choice number. And he showed that the MCQ not to give instructions correct choice number could distinguish a difference of quantity of knowledge 4 from quantity of knowledge 5(Kenichi Ikebukuro,1999).

3 Discussion

The above-mentioned discussion suggests that the MCQ has a potential to make a learning evaluation for huge number of student effectively. In this article, we examined a new test method based on a MCQ not to give instructions correct choice number proposed by Ikebukuro. The examination of this course is different from the Medical Doctor National Examination. Because a purpose of the examination is to measure quantity of knowledge of the examinee, in the case of the Medical Doctor National Examination, the partial score is not considered.

On the other hand, in the case of this subject, we measure and evaluate an understanding level of the student on the concept for strategy and innovation. When the answer of the examinee accords with a right choice, the score of the student is a perfect score. We give a partial score depending on degree of the agreement when an answer does not accord with a right choice. In this article, we made MCQs consisted of four choices.

A sample of MCQ we made is shown as below.

Sample XA type
Choose the choice that you think to be right among the following.
Attention, the number of correct choice may not be one.

a.   …..
b.   …..
c.   …..
d.   …..

Table 1   Rating for Figure 2

The number of the right choices by a question-master	Correct answer rates[%]	Rating
4	100	A
3	75	B
2	50	C
1	25	D
0	0	E

Figure 1 is the matrix which expressed an agreement degree of the answer when a solver chose all four choices. The rating depends on the number of correct answers that a question-master set. The element indicated with crossed line in the figure 1 shows an impossible combination. It is found that there is five ways of rating when a solver chooses all four choices. Rating is shown in Table 1.

Allocation of points for the rating is shown in Table 2.

Table 2   Score for Rating

Rating	Score
A	S : Full Score
B	0.7 x S
C	0.5 x S
D	0.3 x S
E	0 : Score less

Number of Selected Choice by Student	4	Number of Correct Choice		Number of Right Choice				
				0	1	2	3	4
			0	E				
			1		D			
			2			C		
			3				B	
			4					A

Figure 1　Matrix of an Agreement Degree

Figure 2 is the matrix which expressed an agreement degree of the answer when a solver chose nothing of choice.

The rating also depends on the number of correct answers that a question-master set as below.

Table 3　Rating for Figure 3

The number of the right choices by a question-master	Correct answer rates [%]	Rating
0	100	A
1	75	B
2	50	C
3	25	D
4	0	E

Number of Selected Choice by Student	0	Number of Correct Choice		Number of Right Choice				
				0	1	2	3	4
			0	A	B	C	D	E
			1					
			2					
			3					
			4					

Figure 2　Matrix of an Agreement Degree

We would like to expand the above-mentioned rating matrix and show all combinations for the choice (0-4) by the solver and the right answers (0-4) by question-master in Figure 3.

Rating				Number of Right Choice				
				0	1	2	3	4
Number of Selected Choice by Student	0	Number of Correct Choice	0	A	B	C	D	E
			1					
			2					
			3					
			4					
	1	Number of Correct Choice	0	B	C	D	E	
			1		A	B	C	D
			2					
			3					
			4					
	2	Number of Correct Choice	0	C	D	E		
			1		B	C	D	
			2			A	B	C
			3					
			4					
	3	Number of Correct Choice	0	D	E			
			1		C	D		
			2			B	C	
			3				A	B
			4					
	4	Number of Correct Choice	0	E				
			1		D			
			2			C		
			3				B	
			4					A

Figure 3　Symmetric Frequency Distribution of the Rating

We can assign a unique ID number as an index using by three information (the number of selected choice by student, the number of correct choice, and the number of the right choice in the question) for each element in Figure 3 as shown in Figure 4. Then, we can find a symmetric frequency distribution of the rating in Figure 3 as shown in Table 4. It is suggested that we can make a smooth scoring from zero to perfect by using of this symmetric property of rating.

I000	A	I010	B	I020	C	I030	D	I040	E
I100	B	I110	C	I120	D	I130	E	I141	D
I200	C	I210	D	I220	E	I131	C	I242	C
I300	D	I310	E	I121	B	I231	D	I343	B
I400	E	I111	A	I221	C	I232	B	I444	A
		I211	B	I321	D	I332	C		
		I311	C	I222	A	I333	A		
		I411	D	I322	B	I433	B		
				I422	C				

Figure 4　Unique ID Number AS AN Index Using

Table 4　Frequency of Rating

Rating	Frequency
A	5
B	8
C	9
D	8
E	5

4 Conclusions

In Yamaguchi University, we opened Research and Development Strategy Theory Course as a required subject in Graduate School of Science and Technology for Innovation which Yamaguchi University established on April, 2016. We evaluated the learning by the Multiple-Choice Question not to give instructions correct choice number to perform a summative evaluation in this course effectively. We introduced a rule to give a partial score depending on the degree of the agreement when an answer by student did not completely accord with a correct choice. As a result, we were able to give a smooth rating score from zero to perfect using new MCQ and rating rule.

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Intelligence of Industrial Complex[∗]

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Abstract: Circumstances that surround the oil and petrochemical industry recently have been severe. Oil and petrochemical companies are in a situation where they should deal with various problems. In such a severe situation, oil and petrochemical companies came up with the idea of business cooperation in the same region in order to acquire global competitiveness. In this proceeding, I introduce a case of RING (Research Association of Refinery Integration for Group-Operation) in Japan. And the approach and ways of the high-level integration for group operation in petrochemical complex are analyzed, the meaning of the plan is declared, and the economy that arises from the group operation business is considered. Many industries now need further advancement to obtain global competitiveness. One of the answers is effective application of IoT (Internet of Things). RING as the central figure has promoted some projects of group operation in petrochemical complex to overcome the "wall of capital", "wall of person" and "wall of geography" on the slogan "Kombinat Renaissance" (Renaissance of Petrochemical Complex) since 2000. And industrial complexes should improve more productivity and efficiency to follow the changes of global competitiveness. "Intelligent of Industrial Complex" will overcome their disadvantages of small or middle sized factories in the complexes, especially on the conditions of importing oil and materials. This must establish some innovations in oil, petrochemical, and chemical industry.
Key words: Industrial complex; Oil and petrochemical industry; Group operation; Business cooperation; IoT (Internet of Things); Semiconductor sensor

1 Introduction

Strengthening cost competitiveness is requested in oil and petrochemical enterprises in Japan. In the latter half of the 1990's, the merger and reorganization had advanced, and cost reduction had been attempted with efficiency improvement of production facilities. They had pulled out of unprofitable businesses. Positive investments in core business and growth business and participation in foreign complexes had made the business integration and competition stronger. However, the reorganization and integration of oil and petrochemical companies in Japan, if it is seen in the scale, is internationally the medium-scale one. It has faults that many operational companies are independent and production facilities have been distributed to many places. The equipment of oil and petrochemical companies in petrochemical complexes are widely distributed to eight places in the whole country. One company has production facilities in some complexes. The consolidation and expansion of manufacturing scale, efficiency improvement in manufacturing process, and reduction in cost of manufacturing are more necessary to obtain global competitiveness. But one company can't do them alone.

It has been said that weak points of oil and petrochemical companies in Japan are halfway of cost reduction in medium-scale production, excessive competition, surplus of production scale, low degree of rate of profit. Petrochemical complexes of Japan have production facilities at a medium-scale level. It is in the situation in which economies of scale cannot be requested. And the equipment of one company is distributed to two or more districts. It is also difficult to consolidate these in one place. Many enterprises, concentrated in the same district, often belong to different capital groups. There are examples of producing same products by different manufacturing methods in the same district, too. In such a system, each company respectively has continued to conduct business actions, making decisions independently. Unfortunately, if the company is different, the organizational culture is also different and the spoken jargon tends to be dissimilar. There was an assumption not to communicate with each other easily in the situation. They have called these things "wall of person", "wall of capital", and "wall of geography"

To solve the problems, 20 companies in oil industry and chemical industry gathered round at first. Under the Research Association of Technology Law, Research Association of Refinery Integration for Group-Operation (RING) was established in 2000. RING has acted group-operation programs in complex, which the Ministry of Economy, Trade and Industry has supported since 2000. In RING

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projects, they have tried to find new methods of integrated management, exceeding types of business and a frame of capital, developing some latest technologies, aiming at efficiency improvement and optimization. It is important that one complex is thought of as virtual one factory. If it is so, the integrated management could be practiced. As a result, new effects, economies and innovations by new technological development would be achieved. These practices are difficult for one company to do alone.

One company perhaps tends to attempt single survival and optimization. Even if it notices the importance of cooperation, the priority level might be low. There are only two choices whether to execute it or not in one enterprise. Therefore, the government needs to put out a subsidy at first as a trigger, and it is necessary to establish the third-party institution in order to give the motivation to business cooperation. It is important to build the organization to adjust common interest. The support of the government for RING projects is a pump-priming policy. And the enterprises have recognized new possibilities in business cooperation. They would begin to mix well with them, and come to analyze a system of production with each other. They would examine construction of system of production and technological development accommodating wasted gas, heat, and energy etc. And profits between enterprises, which one company cannot conceive, would begin to be recognized, and their interest would spread various contents such as treatment of waste, contribution to the region, joint power generation etc. Innovations have progressed in an upward spiral through cooperation between enterprises beyond the limit of single company business. The new idea of business cooperation has arisen one after another.

2 Common Integration

Strengthening cost competitiveness is requested in oil and petrochemical enterprises in Japan. The consolidation and expansion of manufacturing scale, efficiency improvement in manufacturing process, and reduction in cost of manufacturing are more necessary to obtain global competitiveness. The RING project is an attempt of joint operation and business cooperation in oil and petrochemical business. The project assumes current production facilities, capital tie, and business activities. On that assumption, it is necessary for two or more enterprises to cooperate and work on reduction of environmental burdens facing the world. Different from the strategy that one company pursues productivity and efficiency, same kind of effects may be achieved by cooperation between enterprises and different types of business. Whole optimization will be achieved by the system in group operation. And they can implement simultaneously two strategies, Cost Leadership and Product Differentiation.

In addition to economies of scale and economies of scope, some social interests will be pursued. When collaboration with many enterprises is achieved, 'commons' will be necessary for cooperation. Therefore, the aspects to social interest will arise: joint energy use, efficiency improvement, regional contribution, establishment of safety technology, positive commitment to environmental measures, and cooperative treatment of waste etc. And enterprises will pay more attention to practices of social activities: greening of the complex, ownership of joint power generating equipment, security cooperative relationship etc. I call these effects "Economies of combination". This is defined as some economic effects which group operation produces; whole optimization and efficiency, simultaneous implementation of two strategies, pursuit of social interests, innovations with group management, management of sustainability. And common integration is defined as the concept of presenting social and economic effects, observed from the development of complexes in Japan, caused by group operation.

3 Intelligence of Industrial Complex

Many industries now need further advancement to obtain global competitiveness. Then how should we level it up? One of the answers is effective application of IoT (Internet of Things). I want to promote one attention here. It is to introduce open IoT, not closed IoT. We often see news of introducing some IoTs in manufacturing industry. But, in many cases, I am anxious about the plans that concluded only in the company. In this way, their proposals will reproduce a defeat pattern seen in some industries. Huge companies of Internet business can hold hegemony in IoT of manufacturing industry, and they will decide standardization and specifications of IoT in the near future. Many companies which have developed closed IoT must be pressured by open system of IoT and may move second and lose initiative. Therefore, each industry must build the system which utilizes IoT, AI (artificial intelligence), big data by oneself, on the assumption of open IoT.

Many companies in industrial complex currently have IoT plans that productivity, maintenance,

and safety management of plural factories in one company. However, to put it accurately, these utilization is partial optimization, and not the level that whole optimization of industrial complex. It is important for them to achieve partial and whole optimizations at the same time. And it is necessary for them to build a cooperative system. When they could establish a system of utilizing big data among other firms and between different types of business, this would be called open IoT.

I explain the steps of open IoT. Firstly, each company systemizes IoT in individual districts of industrial complex. Secondly, to revitalize the whole oil, petrochemical, and chemical industry, they set up information networks among the industrial complexes and create a system of IoT to apply big data. In this stage, I can call it "Intelligent of Industrial Complex". Thirdly, they establish a system of whole optimization of almost industries in the whole country. Fourthly, they may organize a worldwide system of whole optimization among every industry. This is IoE (Internet of Everything).

Similarly, "Intelligent of Industrial Complex" powerfully require development and design of semiconductor sensors (IoT semiconductor). We should install variable networks and produce new IoT semiconductors to utilize sensing of industrial complex. These semiconductors expect to be applied to manufacturing in other industries. Industrial complex can realize the first stage of open IoT and give introductive opportunities of it.

4 Conclusions

RING as the central figure has promoted some projects of group operation in petrochemical complex to overcome the "wall of capital", "wall of person" and "wall of geography" on the slogan "Kombinat Renaissance" (Renaissance of Petrochemical Complex) since 2000. And industrial complexes should improve more productivity and efficiency to follow the changes of global competitiveness. "Intelligent of Industrial Complex" will overcome their disadvantages of small or middle sized factories in the complexes, especially on the conditions of importing oil and materials. This must establish some innovations in oil, petrochemical, and chemical industry.

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Odebrecht Entrepreneurial Technology—An Innovative Managerial Tool for Internationalization: A Case Study

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Abstract: The current paper presents an intriguing issue in the business and economic areas: the potential relationship between innovation and firm's internalization strategies. Due to deep transformations (i.e. social and economic) in the domestic and international markets, innovation seems to be the only guaranteed strategy to survive in this so competitive environment, especially in developing country such as Brazil. To approach this issue, the authors decided to investigate the internationalization process of one of the largest companies in Brazil, Construtora Norberto Odebrecht (CNO). Using the case study methodology, the investigators concluded that innovative practices such as the Odebrecht Entrepreneurial Technology – OET facilitated the process of CNO's internationalization. This managerial tool, based on two pillars: planned delegation and administrative decentralization created a competitive advantage (i.e. flexibility for local decisions) and made possible the company to grow and develop in multiple fronts, particularly in foreign markets.
Key words: Innovation; Internationalization; Entrepreneurship and competitive advantage

1 Introduction

Innovation is a double spectrum phenomenon which affects companies and countries, domestically and internationally. It seems to be influenced by a wide variety of factors such as the development of new technologies, public policies, financing mechanisms and the entrepreneur behavior, among others. As consequence, it provokes impacts on firms' market position, dilutes risks, attracts new investments, promotes companies' growth and facilitates the internationalization processes of organizations.

Nowadays, in a social and economic scenario based on pillars such as globalization and competitiveness, innovation may be the only way to guarantee a winning strategy towards firms' survival, particularly in developing countries such as Brazil.

In the past twenty-five years, Brazil has been strongly affected by transformations in social and economic areas; companies had to go through a deep modernization process influenced by the globalization of markets and the dynamism of technological changes.

Organizations in different areas from manufacturing to construction sectors had to face challenges in the market arena due to the irreversible need to innovate in order to survive. Many of these innovations in products, services and organization and marketing strategies have created conditions to stimulate firms' internationalization process; then, many Brazilian companies, mostly the big ones, decided to go overseas as a result of this competitive scenario and a weak domestic market.

In this sense, the authors have decided to investigate how the phenomenon of innovation has contributed to the process of internalization of Construtora Norberto Odebrecht (CNO), the largest Brazilian representative of the engineering and construction industry in the world.

CNO is a Brazilian global organization with presence in over 27 countries, which operates in the engineering & construction sector, industry and development and operation of infrastructure and energy sectors. According to Fundação Dom Cabral Ranking of internationalization of Brazilian multinationals in 2015 (FDC, 2015), CNO is the second Brazilian company with the highest degree of internationalization (see figure 1).

The Ranking of Internationalization is carried out by Fundação Dom Cabral, using a sample of 49, mostly Brazilian capital and ownership companies, which develop international activities of manufacturing, assembly, services, research and development centers, bank agencies, franchising, commercial offices, warehouses and logistics centers abroad. The internationalization index is based on the calculation of the transnationality index, measured by the weighted average of some indicators, as seen below in figure 2.

POSITION	COMPANY	TRANSNATIONALITY INDEX	INDEX VAR. 2015/2014
1	Fitesa	0,720	▬
2	Construtora Norberto Odebrecht	0,644	▲
3	InterCement	0,573	▬
4	Gerdau	0,560	▬
5	Stefanini	0,559	▬
6	Marfrig	0,536	▬
7	Artecola	0,521	▲
8	Metalfrio	0,500	▬
9	CZM	0,492	▲
10	JBS	0,488	▬

Figure 1   Brazilian Multinational's Ranking 2015
Source: Fundação Dom Cabral (FDC, 2015)

$$\text{Transnationality Index} = \frac{\dfrac{\text{Foreign Assets}}{\text{Total Assets}} + \dfrac{\text{Foreign Revenues}}{\text{Total Revenues}} + \dfrac{\text{Foreign Employees}}{\text{Total Employees}}}{3}$$

Figure 2   Transnationality Index Formula
Source: Fundação Dom Cabral (FDC, 2015)

The importance of this study, then, is due to the fact that as far as the macro construction sector in Brazil is concerned, it was responsible for approximately 13,9% of the Brazilian Gross Domestic Product (GDP) in 2014 (Serasa Experience, 2015). Moreover, regarding the macro sector's core business - the construction itself - accounts for the highest income produced in the activity in that year, which was around 7, 8% of the country's GDP.

In terms of economic performance, the last three years was fully positive for the sector, mainly due to the completion of the construction and renovation of the host stadiums for FIFA's World Cup and related events as well as to the Olympic Games this year in Rio de Janeiro. However, a slowdown in investments of infrastructure was perceived since the second half of 2014, as part of the complexity of the economic scenario Brazil is facing. This picture has led to the reduction or postponement of important projects in the country duet to, in particular, cutting off governmental investments, as result of progressive budget deficits and lack of public funding, reducing the resources for investments of the Brazilian Nacional Bank for Economic and Social Development (BNDES) (Serasa Experience, 2015).

Until recently, one of the most popular firm's internationalization process theory argued that organizations go abroad as an external expansion movement as response to internal demand constraints.

2 Short History of CNO and the Internationalization Process

Norberto Odebrecht, an engineer, founded the Construtora Norberto Odebrecht S.A, in 1944 in the city of Salvador, State of Bahia, Brazil. In the second half of the decade of 40's and the following decade, the company was involved in important construction projects, first in Salvador, and later in other cities in the State of Bahia and cities in other States such as Ceará and Pernambuco.

In 1962, CNO opened the first office branch in Recife, State of Pernambuco and started its expansion in the Northeast region of Brazil. Due to the rapid expansion, CNO had to acquire and to develop new competences in all areas: from engineering to management. In the engineering area, CNO was involved in bigger projects such as larger buildings which required new technologies, a large number of workers and use of a great volume of different materials; therefore, the challenges and need for innovation were immense (Odebrecht, 2015). At the end of 60's, CNO already counted with more than 500 construction projects, most of them large and highly complex ones.

In late 60's, CNO expanded its businesses to the Southeast region of Brazil. The first mega project

in that region was the construction of the building of headquarter office of Petrobras, the Brazilian oil company. Other important projects were also important such as the main campus of the Federal University of Rio de Janeiro (UFRJ), Galeão International Airport and the thermonuclear power plant "Angra I", in the county of Angra dos Reis. These projects were responsible for enabling the company to definitively consolidate CNO's business expansion within the Brazilian territory.

In the 70's, the ability of managing and operating many construction projects at the same time and in different regions, allowed CNO to take advantages of that economic scenario in Brazil: The so-called economic miracle. During that period, the country's GDP grew in average of 7% a year. The economic growth stimulated manufacturing and the urbanization phenomenon which demanded for continuous infrastructure projects in all forms. However, the scale and duration of large engineering programs began to lose momentum at the end of 70's.

The economic and financial difficulties faced by Brazilian Military Government at the end of the decade, made large scale projects, trademark of the military government, increasingly less frequent. As a result, CNO started looking for new opportunities to assure its ongoing growth. One of the selected strategies was the search for foreign markets. For CNO, external markets could be a solution when globalization was not in the business radar of the Brazilian companies nor it was a common practice, and did not appear often in the economic section of newspapers and magazines (Odebrecht apud Barcelos & Cyrino, 2006).

Hence, in 1979, the first international contracts were signed: one in Peru (Charcani V Hydroelectric Dam) and other in Chile, project to re-route Maule River to the Colbún Machicura Hydroelectric Dam. Both projects were the start point of the successful international trajectory of the CNO. The expansion in Latin America happened chronologically as follows:

i. Argentina, in 1986, with the construction of Pichí Picun Leufú (PPL) Hydroelectric Dam, in Patagonia;

ii. Ecuador, in 1987, with the project of Saint Elena Irrigation, in Guayaquil;

iii. Mexico and Venezuela, in 1992, respectively with a construction of Los Huítes Dam and of El Lago Commercial Center;

iv. Colombia, with the construction of La Loma-Santa Marta railway, in 1993;

v. And during the decade of 2000, CNO began to conduct work in the Dominican Republic (2002), in Panama (2004), in Cuba (2010) and in Guatemala (2013).

In others regions such as Africa and Europe, the expansion of operations happened as follow:

i. Angola in 1984 with the signing of the contract to the building of the Capanda Hydroelectric Power Plant, capable of generating 520 MW; and,

ii. Europe, operating in Portugal since 1988 through the acquisition of the Portuguese construction company José Bento Pedroso & Filhos and the building of the bridge Vasco da Gama in Lisbon. Later, CNO started operations in England (1991), through the acquisition of SLP Engineering, specialized in building of offshore petrol exploration rigs.

In 1990, CNO started operations in the United States of America (USA). CNO was the first Brazilian company to carry out a public construction project in the country. The first project in the American territory was the Miami Metromover project, an elevated train system that serves Miami downtown area. Other such as the Seven Oaks Dam, in California was also successful projects. This one in particular, earned the construction company of the year award, in 1999, an honor awarded by the US Army Corps of Engineers.

In 1995, International operations were responsible for half of CNO's total revenue and stands in this high level until today, allowing the organization to have a certain independence from the domestic market.

3 Theoretical Reference

To understand the process of innovation of CNO in connection with the expansion to foreign markets, the authors provide an overview of the main theoretical subjects involved in this case study: entrepreneurship (the influence of the entrepreneur's profile), innovation and theories of internationalization.

The main objective is to understand from the theoretical point of view, how the entrepreneurial and innovative profile of the CNO's founder has allowed the creation and adoption of new management practices that ultimately resulted in the creation of its own management tool – Odebrecht Entrepreneurial Technology (OET) – used as the main vector to the process of internationalization of the

company.

3.1 Innovation – A bridge to the future

Over the last decades, the theme of innovation has called attention of many scholars, government and entrepreneurs as both business strategy and economic phenomenon. Researches from many fields, from economic geography to business management have been discussing innovation from their own perspective; thus innovation seems to be a multifaceted issue hardly explained by a single point of view (Melo et al., 2015).

To Michael Porter (1990), for instance, the companies gain competitive advantage by innovative actions and according to Bessant and Tide (2015), innovation in its broader sense, include both: new technologies and new ways of doing things.

Additionally, Rothwell (1994) explained that innovation might be associated to the result of the expansion of the networks model and the increase of technological changes. He recognizes the importance of the social interaction of different actors in the innovation process. It seems to be that successful innovation is a result of a combination of social elements and ideas which must be based on a landscape of abundant cooperation and networking (Chesbrough, 2003). In fact, Chesbrough's proposition is a social interpretation of Schumpeterian vision of the process of innovation, which stresses innovation as a result, or combination of internal and external factors able to generate wealth.

To Joseph Schumpeter, innovation as a complex mechanism of the introduction of a new product, process and service, method or production, opening a new marker, new source of raw material or the establishment of new business (Schumpeter, 1979). In 2005, Schumpeter's definition was the main reference used by the Oslo Manual to define innovation: innovation is any product/service, process or marketing and organizational changes which are new or significantly improved to the firm or to the market (OECD/Eurostat, 2005). In this context, most of the authors in this area seem to agree that innovation happens inside the organization, therefore is an organizational phenomenon, despite has an impact and depends on factors from the external environment.

Considering the organizational perspective, some authors, such as Melo et al. (2011) associate innovation to the generation and dissemination of knowledge and as consequence new technologies, which have accelerated new innovation initiatives, forcing organization to adopt new practices rapidly. Therefore, one of the main strategies to innovate and to develop new technologies is the firm's capacity to generate knowledge through training and educational programs which tend to improve creativity and new solutions inside organizations. Thus, innovation outcomes depend on how organizations improve their internal capabilities and conditions to stimulate the continuous learning process among employees.

The constant changing in the working environment and in the society have required new techniques and models which are based on the evolutionary management process and the technological development. The technology responsible for many of these changes, including management models, is linked to technical and scientific aspects of the improvement of the means of production and the advancement and improving of the new management techniques. Management technology comprises a set of knowledge, information, techniques and strategies used by managers, aiming to control the production process and the work processes.

In, summary, it seems that both external and internal knowledge sources are important references to new solutions for operational and organizational problems and all innovation theories since Schumpeter are somehow associated to the crucial presence of knowledge and therefore for the development of the companies and progress of nations (Melo et al., 2015).

3.2 Internationalization approaches

In the context of the global competitiveness, internationalization is mandatory not an option. Many theories try to explain how and why firms go abroad. In general, the theories on the firm's internationalization process can be divided into two major areas, representing very different approaches: the economic and the behavioral. The economic theories cover the following main theories: economic power, internalization and eclectic paradigm. On the other hand, the main behavioral theories are: Uppsala model, networks and international entrepreneurship.

Regarding the economic theories, one of the most famous academics, Stephen Hymer, developed the theory of economic power in 1960. This theory develops the argument that there are three reasons for direct investments abroad: the neutralization of competition, the competitive advantages and the internalization of market imperfections. According to him, the decision of companies to operate internationally aims to neutralize the action of the main competitors, to reduce dependence of the domestic market and to seek for competitive advantages, generally derived from intangible assets such

as cost, technology or economies of scale. Lastly, Hymer ruled that for the adequate protection of these assets, the company may prefer to conduct direct investments abroad rather than adopting entry modes and simpler operation; for example, export (Almeida & Rocha, 2006, p.18).

Another theory of internationalization based on economic approaches is the eclectic paradigm. It is the result of John Dunning's works and explains reasons why a company decides to produce abroad. Companies that decide to internationalize should be prepared to compete, and to do so, should use advantages such as (i) ownership, represented by factors that can be created or developed by the company (intangible); (ii) internalization, which makes more convenient the use of its own structure and arise from market imperfections and the level of government intervention; and lastly, (iii) location, which occur when the local government seeks to attract multinational companies through incentives or when the combination of multiple locations allows better conditions of financial arbitration and management of exchange risk (Almeida & Rocha, 2006, p.23-25).

At last, the theory of internalization, developed by Peter Bucley, Mark Casson and Alan Rugman, was based on the assumption that the greater the risk of a firm losing expertise, the greater the incentive to internalize transactions. Some of the benefits of internalization are as follow: reduction of time to coordinate activities between several economic agents, price control, increasing bargaining power, less government intervention, and others (Almeida & Rocha, 2006, p.20-21). In this scenario, managers compare external (transaction) costs to internal costs (cost to support operations on their own management control). The balance between these two types of costs will determine the company's scope at any time period, including in relation to internationalization (Buckley, 2009).

On the other hand, the so called behavioral theories, in their turn, seek to explain processes of internationalization as well as forces acting in the course of this process, and not the reasons that lead companies to invest abroad (Almeida & Rocha, 2006, p.25). Thus, the decision to start international operations are not only market needs or perspectives of economic gains, but it seems to start "inside" the organization itself, either for the entrepreneur's profile or for the business relationship network (Silva, 2014, p.13).

The most famous representative of the behavioral theories is the Uppsala model. In this model of internationalization, which has the theoretical base in the behavioral theory of the firm and Penrose's theory of the growth of the firm, is seen as a process in which the enterprise gradually increases its international involvement.

Uppsala model explains that whatever the entry modes in international markets are, it is always the results of series of incremental decisions and commitments which gradually increase according to the growth of knowledge and experience (Almeida & Rocha, 2006, p.25-27). In this context, it was developed the concept of "psychic distance" (i.e. cultural, language, economic and political conditions) which indicates that companies are likely to first seek the markets considered closer (similar) to its domestic market and then going later, into markets "more distant".

In additional, the Networks' theory is based on the concept of social networks that are composed of long-term relationships, developed and maintained between different economic agents in a certain market. Participating in a network means to have access to resources belonging to other agents, resources that are unique or exclusive of the latter, not being possible to retain them, except for the establishment of long-term ties with those who hold them.

The links between members of the network can be technical, social, cognitive, financial, logistic or legal. In these terms, the entry in the foreign market is understood as a coalition of interest groups. The degree of internationalization of the company becomes depend on the internationalization degree of the network in which it is inserted (Almeida & Rocha, 2006, p.28). Network relationships have an impact on foreign market selection as well as on the mode of entry in the context of ongoing network processes (Johanson & Vahlne, 2009).

Finally, the theory of international entrepreneurship establishes a direct relationship between the internationalization process of the company and the entrepreneur's profile (i.e. risk taking, innovative and proactive cross borders). The most common entrepreneur's profiles are as follow: (i) technical entrepreneur who seeks new technologies and innovation; (ii) commercial entrepreneur seeking new markets and opportunities; (iii) structural entrepreneur who seeks expansion of the organization via joint venture, merging, or acquisition; and (iv) entrepreneur with a focus on marketing - seeking new distribution channels.

According to the theoretical references above, the internationalization process of CNO can partially be explained by the work of Stephen Hymer: the economic and financial difficulties faced by the Brazilian Government at the end of the 70's forced the company to seek for alternatives: foreign markets,

reducing the dependence on the domestic market was the solution.

Other theories such as Eclectic paradigm, Uppsala model, Networks' theory and the international entrepreneurship can also explain the internationalization of CNO. The theory of international entrepreneurship, in particular, had a significant weight in this process, as the CNO's founder profile, Norberto Odebrecht, was crucial for the initial push of the CNO's internationalization. The organizational culture and the leader's profile were key elements to explain the reasons that led the organization to seek for foreign markets.

4 Methodology

There are several ways of doing academic researches such as surveys, experiments, analysis of archival information and case studies, among others. The decision of what the best strategy depends on the research question, the control of the investigators has over the events and the focus on contemporary as opposed to historical phenomena (Yin, 2003).

For this paper, the authors decided to use the case study methodology in order to understand the complexity and characteristics involved in the use of the Odebrecht Entrepreneurial Technology (OET) as a managerial tool that facilitated the process of internationalization of CNO.

According to Yin (2003, p. 3), "…case studies allows an investigation to retain holistic and meaningful characteristics of real-life events such as individual life cycles, organizational and managerial processes, neighborhood changes, international relations, and the maturation of industries.".

In this sense, the use of case study method helped significantly to explain and understand how CNO using a managerial tool such as the OET was able to deal with the challenges of international experiences in different markets and organizational cultures.

5 The Odebrecht Entrepreneurial Technology (OCT) - An Innovative Managerial Tool for the Internationalization

It can be stated that CNO has its development and growth history closely linked to the innovative DNA of its founder, Norberto Odebrecht. He developed a managerial model so called The Odebrecht Entrepreneurial Technology (OET), based, mostly, on full and decentralized delegation. This tool was very innovative, in particular, in the construction sector, where administrative centralization used to prevail and it was determining factor for the internationalization of the company.

The lessons learned with several crises faced by the company since its foundation, and experience of Mr. Odebrecht in the construction and engineering sector were sources of inspiration for the conception of the framework of the OET. The Odebrecht Entrepreneurial Technology (OET) is the foundation of the culture of the Odebrecht Group and guides the actions of the associates and employees around the world. This managerial tool made possible to meet customers' needs, add value to shareholder equity, and has allowed the company to grow on multiple fronts such as in foreign markets (see figure 3).
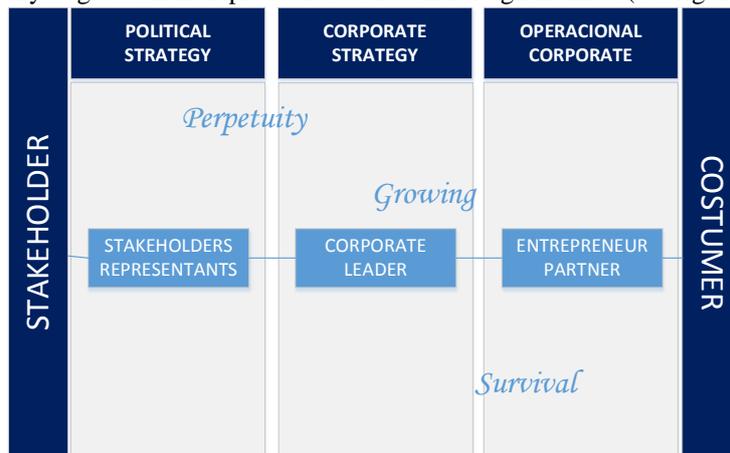
Figure 3   The Three Areas of Odebrecht's Entrepreneurship Line
Source: Odebrecht, 2015

The first steps demanded, in addition to hard work, a great dose of creativity and innovation to enable the completion of construction projects. Norberto Odebrecht sought the support of customers, as well as

employees and even creditors. With each of them, he set a specific agreement. With the creditors, it was signed a political pact, turning them into allies, thus ensuring the necessary resources for the completion of the construction project. With customers, it was signed an economic pact, under which they would be assured the accomplishment of the deadlines and cost reductions. Regarding the employees, it was established a social pact with delegation of responsibility based on trust and sharing of profits as a result of a full commitment in increasing and improvement of productivity (Odebrecht, 2015).

One of the main pillars of OET is of crucial importance to the success of CNO's internationalization: decentralization of the managerial processes. This managerial strategy was very innovative, in particular in the segment of heavy construction. According to Norberto Odebrecht, decentralized organizational structure might turn problems into challenges and consequently into opportunities. In addition, he believed that delegation and the practice of trust, adopted in all levels of the hierarchy would enhance the potential of human being, allowing employees to obtain better solutions and results in different environments. This model was referred to as "delegation of responsibility". It decentralizes and expedites the work, in addition to stimulating the productivity of CNO's employees (Brito & Oliva, 2009).

CNO, then, started to value and practice decentralization, planned delegation and partnership. The decentralization was used as an administrative strategy and allowed the approximation of CNO and customers, through a closed contact between its employees (contract leaders) and customers as well as the use of the concept of partnership as a higher form of planned delegation, by which every CNO's contract leaders become responsible for the results of their respective area (Magalhães, 1998, p. 44).

This innovative model of management has contributed to the development of new and continuous changes in design, production, and marketing methods. In scenarios of diversities and globalization, decentralization and planned delegation showed efficiency and strength, especially given the global dispersion of the construction projects and the geographical distance of the team leaders and employees. Therefore, OET was crucial for the company's internationalization process. For Odebrecht (2015), much of what would happen in the internationalization process would be unpredictable. However, the practice of decentralized management strategy, based on trust and planned delegation was given plenty of agility in managerial decisions.

Transformation requires new technologies and new strategies. Great part of the CNO's model of management is focused on team and contract leaders. They must create and innovate together with the customers as well as to understand customers' needs in a way of mobilizing creativity and innovation in search of solutions that comes to satisfy customers and as consequence increasing project productivity.

Figure 4   Summary of Philosophical Concepts of Odebrecht Entrepreneurial Technology
Source: Odebrecht, 2015

In summary, there are eight general topics that influence the thinking and action of CNO's members: (i) human beings are the basis of all company values; (ii) each employee must focus on clients' and shareholders' satisfaction simultaneously; (iii) educational and entrepreneurial skills are inseparable; (iv) employees must always be alert on improving results and new opportunities; (v) Every employees' action must contribute to the general company's result; (vi) employees must always be open to recognize errors

and willing to quickly correct them; (vii) what matters and make difference are those which is built based on clients' satisfaction and   the well-being of the whole company; (viii) team leaders must provide safety operations, quality of life for themselves and for those they lead and the duty to promote environmental preservation of the communities and localities they operate.

The fundamental principles and basic concepts of OET (see figure 4) were published in the book "Sobreviver, Crescer e Perpetuar", written by Norberto Odebrecht himself and published in 1983 in Brazil. The purpose of the publication was to spread out the CNO's philosophy throughout the organization (Odebrecht, 2015).

6 Conclusions

In a global environment increasingly integrated and competitive, the continuing growth and development of companies are directly tied to their ability to act globally and to innovate in a continuous learning process. CNO, the second Brazilian most internationalized company according to Fundação Dom Cabral Index in 2015, stands out among the large organizations in the country.

In this sense, internationalization and innovation processes seem to be directly related. CNO achieved an outstanding success in the international arena due to the development of managerial tools such as the Odebrecht Entrepreneurial Technology (OET) which is based, mainly, on two main pillars: planned delegation and administrative decentralization. OET is a result of a strong entrepreneurial ability of the CNO's founder, Norberto Odebrecht, who stimulated a continuous innovation process resulting in new operational and administrative practices which guided the expansion of the company, including its successful international journey.

OET provides the philosophical basis for all CNO's leaders and supported company's expansion in carrying out construction and engineering projects in several regions inside and outside Brazil. Moreover, it allowed strengthening and deepening relationship with the different customers and enabled the organization to add new technical and entrepreneurial competences. Thus, Innovativeness and Competitiveness acquired through learning and interactions with external partners and customers generated complementarities and synergy which can be considered one of the company's success factors.

Finally, the continuous growth and achievements of CNO, including international expansion, have created a strong competitive advantage and seems to be a result of a strong internal culture, expressed in values, philosophy, working methods, pursuit of excellence and focus on innovation.

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Education and Liberties in the Five Regions of Brazil

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Abstract: This article aims to reflect on the role of education in building civil liberties in the five Brazilian regions so that individuals have autonomy and ability to make choices and exercise their rights (Sen, 2010). As for methodological procedures, it was used a quantitative approach by using Minitab for the statistical treatments, and Box plot charts to analyze the results. Data were obtained from the platform Atlas Brasil (2013), which provides indicators to compose the HDI (Human Development Index) of Cities. The results presented in charts describe that there are two types of Brazil, and education in Brazil presents the best results in the early school years and decreases according to the years advance. Another important point is that the best results are concentrated in the South, Southeast and Midwest, and education issues in Brazil has been discussed in two apparently contradictory ways: as a solution to the major issues of the country and as a problem that still remains. In this scenario, pledges of change and solutions to the historical bottlenecks and barriers to the development of education in Brazil are proposed. However, strategies to move towards solutions cannot be derived from established general formulas, and results will be superficial and not achievable if there is not a well-structured planning or well-targeted resources.
Key words: Citizenship; Education; Rights

1 Introduction

Every citizen of a country is entitled to have their rights guaranteed in order to exercise full citizenship. However, in a society where opportunities are scarce and freedom of choice is questionable, citizenship is restricted to access to health, education or culture in precarious conditions or even to the lack of these.

In this manner, in order to promote access to opportunities and rights in a country, citizens are required skills and motivation to participate in social and economic life of the country. In addition to this description of constraints, and based on a system thinking between people's autonomy and access to rights, this article assumes that access to education generates more autonomy for individuals since it provides them with the freedom to choose, exercise or fight for their rights.

Therefore, individuals need access to rights in order to have their full citizenship ensured, but this is only possible when education is taken as a state policy, because when individuals are empowered of an ability to discern and choose, they can take advantage of local and worldwide opportunities

Moreover, in this context, access to education is a requirement for the development of aware and emancipated citizens. The ongoing lack of basic levels of public services such as health, education and culture promotes an infrastructure that imprisons their poorest citizens (Sachs, 2008). Thus, better prepared individuals can fight for their active condition of citizen even in contexts of restrictions on their rights, and education can lead to either a situation related to submission and oppression or to liberty and autonomy (Rousseau, 2005; Sen, 2010; Freire, 2014).

Therefore, access to general education can lead individuals to a position of active subjects in their own lives. Incidentally, it is worth remembering that the ability to read and write is associated with the use of technology to work, as well as an awareness of the real situations experienced by individuals. Based on this idea, it is highlighted the content inserted in the 1988 Brazilian Federal Constitution, which places education as a social right and results from the protection and the need to extend this right to all citizens (Brasil, 1988; Camara, 2013).

In this manner, education aims at a kind of freedom designed and made more reasonable into the background of the individual (Freire, 2014), but also reflects on the society as a whole. In addition, reflection on a civic dimension in implementing policies on education generates contradictory behaviors that range from the recognition of the importance on the citizenship and its consequent social engagement to the expressions of astonishment on the educational processes in Brazil (Moura, 2012).

Given these facts, a point regarding education that deserves to be approached is regional

differences. Brazil is a continent-sized country and has local characteristics that describe needs and opportunities in relation to public policies. Therefore, the present paper aims to answer a question: how is access to education in the five Brazilian regions presented?

In order to do so, our main objective, by means of variables presented in the platform of human development, is to verify regional differences when it comes to education. In addition to this objective, specific objectives were established: i) to describe the situation of access to income in the five Brazilian regions; ii) to describe the situation of longevity in the five Brazilian regions; iii) to present a descriptive table of the evolution of access to education in the Brazilian regions

It is worth noting that the purpose of this study is not to qualitatively deepen the behavior and the situation of individuals in each region, but to highlight regional differences and generate subsidies to new debates on education, citizenship and quality of life of Brazilian individuals, then allowing innovations in public administration within this scenario.

In order to justify the argument presented in this study, we point out that education strategies should be conducted to established partnerships for the common good in a local, regional, national and world scope since many projects that benefit social and economic issues may have as origin schools. Thus, Brazilian educational institutions should extend the scale or broader sectors of society in search of assertive actions to their communities (Dejors, 1996).

The latter point is the core argument of the present paper because education, in its system as a whole, can be understood as the major factor of human development generation. Access to the school environment now has a role of civilizing role and catalyzes human development, thus, innovative and feasible strategies for education are required.

2 Theoretical Reference
2.1 Liberty to human development
In the twenty-first century, access to human rights and political freedom has become a fight subject in several nations and institutions. An example is the events related to the so-called Arab Spring (Joffe, 2011), and the rallies of June 2013 in Brazil (Gohn, 2013). Considering these events, it is worth mentioning Sen (2010, p. 9): "the twentieth century established the democratic system as a preeminent model of political organization."

However, this reality of struggles for access to human rights is possible only when individuals have a high degree of autonomy or ability to understand the role of a citizen in democratic governments. Note that this ideia is aligned to the thought of Rousseau that the sale of liberty from an individual to another is a conscious concession of people themselves (Rousseau, 2005). Nevertheless, this transfer can take place by means of brutal force, or even by ignorance, applied to those who were subject to this removal of the individual freedom.

Thus, in contexts where there is restriction of access to work, education, health and other rights that should be guaranteed by public policies, individuals are guided by a reality of poverty and inferiority. In this scenario, individuals could not take advantage of a favorable environment for civil liberties.

According to Sen (2010, p. 21), "the rejection of the freedom to participate in the labor market is one of the ways to keep subjection and captivity of labor, and the battle against deprivation of the existing freedom in the postscript work [...] ". It should be emphasized that this kind of work is forced and often unhealthy, given by a condition of submission due to the state of lack of livelihood of individuals.

This same issue, by the way, is back to the agenda with Piketty (2014), who addresses the condition of access to income by private individuals of higher paying job since higher income provides greater freedom to have a dignified condition of access to rights. Thus, a wealth of condition can give a better educational preparation, which allows access to jobs with higher payment.

Thus, to improve access to human rights is one resource to improve educational level. The income should not be the main objective of a nation, but increasing the distribution of wealth can also guarantee right of choice to their individuals. Moreover, access to better standards of education and work can promote better access to quality of life, culture, and other needs that guarantee the rights to live in dignity to individuals of a society.

Based on this idea of access to individual freedom and human rights, it can be stated that the country as a whole is benefited. As stated by Piketty (2014, p. 75) "[...] the poorest economies reduce the gap with the richer in that it can achieve the same level of technological knowledge, labor

qualification and education, but not when they become property of the richest." Therefore, by increasing the capacity of individuals of a city, state or country as a whole, their ability to compete and develop is also increased, although better prepared citizens claim more effectively for their rights, which requires a more active and effective state.

The discussion of strategies that should be adopted to promote improvements in education is recurrent. In 2000, 164 countries met in Dakar and committed to pursue six goals of "Education for All" by 2015, when the next conference would be held. These goals are related to the care and education in early childhood, universal basic education, youth and adult skills, adult literacy, gender equality, and quality of education. The purpose of this meeting was to propose a common agenda of education policies to EPT for the strengthening of citizenship and the promotion of skills necessary to a full and sustainable human development. These challenges are being addressed in different ways in educational systems around the world, and significant collective efforts have been developed to provide means to improve the living conditions of children, youth and adults through education. The next conference, to be held in South Korea this year, is to establish new commitments for medium and long term, also incorporating the challenges established at previous conferences.

2.2 Education to promote access to civil liberties

Discussions on the role of education can have as a starting point the report coordinated by Jacques Delors to UNESCO "Learning: The Treasure Within" (Delors, 1996), where Delors (1996) states that education has as core objective to develop human being in society. Thus, learning has a civilizing role, acting as a tool for development of cultures and values, besides fostering socialization environments. It also emphasizes that the civilizing role of education occurs regardless of the place and the means it is promoted since it has to be generated with a view to development and to the creation of bonds between people.

Education, therefore, has the role of preparing and integrating people for a better life in society. Individuals who are entered actively in society can relate and share spaces in a more civilized and constructive way, that is, in a more citizen way.

However, even arguing that the access to education facilitates the construction of a behavior which is more citizen-like, this access is given by a change in the behavior of individuals, and a civilized attitude is only achieved with a clear awareness of rights and duties in society. Vasconcelos (2007) corroborates this idea by questioning the role of education in citizenship-building process. The author counteracts the myth that social mobility occurs via diploma by concluding that this is not effective. Thus, only access to school is not enough, and a redefinition of the education's role in building citizenship is necessary.

Thus, a major citizen behavior is possible when school is a fundamental space in its building process because it provides a wider scope for the child or young individual in what concerns life. An example is the kindergarten, where children live their first experiences of democracy. To the extent that people have the opportunity to socialize with others and learn to live in groups, the fact of community experiences is consolidated (Delors, 1996; Vasconcellos, 1997; Freire, 2014).

Based on this thinking, it can be deduced that educational and social processes are directly connected, and when analyzed together, this link hiders any significant reform in education if there is no compatible reform of the social plan (MESZAROS, 2008).

Educational environment becomes a mirror that reflects the social reality of a country. However, this impact can be changed in both directions because individuals may require a change in the current system, as well as the system can generate a change in the behavior of individuals. This can be a relationship of liberty and restrictions, but which shows to its participants the existence of rights and responsibilities when living in society.

Therefore, the school environment can teach individuals about the concept of freedom from the perspective that it is the power to make choices, take action and make decisions, and that their behavior should be directed to the personal and social situations related to real opportunities available. Moreover, this scenario can lead up to the abolition of civil liberties such as to vote (or any other political or civil law) or to have access to public services such as health, culture and education (Sen, 2010).

Thus, in relation to education, government is responsible for mapping the context in which global and local conditions are established, and for guiding individuals towards the reality they are faced with. Thus, taking into account the global context marked by different means for dissemination and storage of information and communication, the adjustment and the role of education are paramount in this sense.

It is worth noting that the learning perspective offers people the means to build a conscious and militant citizenship, and this condition can only be fulfilled by every participant in democratic societies

(Sen, 2010; Delors, 1996). Although there are levels of education, none is complete because education is interminable, and knowledge is built by means of ongoing overcoming (Freire, 2014).

On the other hand, it is necessary to be careful so that this reality does not hinder the update, deepening and enrichment of the first knowledge obtained by someone. An accumulation of knowledge only is not enough if these are not developed throughout life and do not prepare individuals for a world in constant change (Delors, 1996).

When dealing with access to education in Brazil, it is emphasized that education for the construction of full citizenship comes along a history of struggles of the civil society organized by the establishment of democratic liberty. Vieira (2001) points out that from the 1988 Constitution onwards education has been treated as a legal right. Therefore, with the movement of educators, some learning requirements were introduced in the text of the 1988 Brazilian Constitution (Brasil, 1988; Camara, 2013).

A significant advance in the Brazilian education was the consolidation of the Law of Directives and Bases of National Education (known in Portuguese as the acronym LDB), n. 9394, enacted on 20th of December, 1996. LDB rules the educational system in Brazil, and as it stands, "education is a duty of family and State. Its purpose is the full development of the student, his/her preparation for the exercise of citizenship, and qualification for work" (Brasil, 1996).

Thus, early childhood education, and elementary and high school are described by LDB as school levels of education in Brazil. The first level corresponds to day care and pre-school period, from 0 to 3 years old, and from 4 to 5 years old, respectively. At this stage, children do not fail the school year, and the goal is the development of the children. In elementary school, one of the objectives is to develop the ability to learn, and the minimum period of this phase is nine years, while in high school, whose minimum is three years, there is the deepening of studies, and one of the purposes is the preparation for the work life (Brasil, 1996; Mortatti, 2010).

In what concerns responsibilities, cities are responsible for early childhood education (day care and pre-school). Elementary education is a priority of the cities co-operated by the State, and the high school is the priority of the States. According to the 1988 Constitution / LDB, Art. 69, the Union must fund education with the minimum investment of 18%, while the States, the Federal District and the cities are expected to contribute with 25% of tax revenue.

Regarding the reality of education in Brazil, the 1990s was marked by a significant progress with the advent of education programs, which ensured a considerable increase in the number of children in school, although there was a questioning about school quality and education in this period.

As if in answer to this progress, besides the necessity to advance in quality, there was the creation of the Education Development Plan (known in Portuguese as the acronym PDE) April 24th, 2007. PDE determines some goals to be achieved by the application of projects that aim to obtain an opinion of Brazil's education, analyze it and promote the improvement of education's quality (Munhoz, 2007).

In this manner, when dealing with education as a civilizing instrument that promotes access to the liberties that grant full citizenship, it is noteworthy that provide only access to an enrollment in school does not guarantee the development of citizenship skills. However, even if this stage of insertion of individuals in school is reached, the rights of the citizens may be restricted. In addition, civil liberties require choices and autonomy, otherwise, lack and necessity can lead to oppression and submission.

3 Methodological Procedures

The methodological procedures adopted in the present paper were adopted based on the discussion on access to education in Brazil. Therefore, it was used an exploratory approach using the data available on the platform Atlas Brasil of Human Development in Brazil (Atlas Brasil, 2013) as source of information. The platform is available for consultation of the HDIC (Human Development Index of Cities) of 5.565 Brazilian cities, 27 States, 20 districts, and their Human Development Units (HDU). Atlas Brasil also offers more than 200 indicators of demography, education, income, employment, housing, and vulnerability.

Thus, initially it was sought to build, by means of literature review, categories of analysis that would support and justify the discussion on access to education. Therefore, it was necessary to describe what we understand in this article about access to civil liberties (Rousseau, 2005; Sen, 2010; Piketty, 2014), and about the role of education in the development of individuals in society (Brasil, 1988; Delors, 1996; Freire, 2014; Meszaros, 2008; Vasconcellos, 1997).

After the development of the theoretical framework, indicators were consulted and selected at Atlas

Brasil platform (Table 1) to give subsidies to understand the situation of education in Brazilian regions, as well as variables that demonstrate access to income and longevity that influence access to citizens' individual liberties.

Table 1   Variables in Education and Human Development

VARIABLE	MEANING	TYPE	MEASUREMENT UNIT
HDIC _L	Index of the dimension Longevity, which is one of the three components of the HDIC. It is obtained from the indicator Life Expectancy at the birth.	Quantitative Variable	Index
IHDM _E	Synthetic index of the dimension Education, which is one of the three components of the HDIC.	Quantitative Variable	Index
IHDM	Human Development Index of Cities. Geometric average of the dimensions income, education and longevity, with equal weights.	Quantitative Variable	Index
RDPC	Ratio of the sum of income of all individuals living in permanent private households and the total number of these individuals. Values in Real in August 1st 2010.	Quantitative Variable	Percentage
T_FUND11A13	Ratio of the population aged from 11 to 13 who attend the final four years of elementary school or completed the basic school, and the total population in this age group multiplied by 100.	Quantitative Variable	Percentage
T_FUND15A17	Ratio of the population aged from 15 to 17 who completed the basic school in any modality (regular annual basis, non-annual, youth and adult education programs) and the total of people in this age group multiplied by 100.	Quantitative Variable	Percentage
T_FUND18M	Ratio of the population aged 18 or over who completed the basic school in any modality (regular annual basis, non-annual, youth and adult education programs) and the total of people in this age group multiplied by 100.	Quantitative Variable	Percentage
T_MED18A20	Ratio of the population aged from 18 to 20 who completed the basic school in any modality (regular annual basis, non-annual, youth and adult education programs) and the total of people in this age group multiplied by 100. People aged from 18 to 20 still attending the 4th grade of basic education were considered as concluded.	Quantitative Variable	Percentage
T_FREQ5A6	Ratio of the population aged from 5 to 6 who was attending any school grade, and the total of people in this age group multiplied by 100.	Quantitative Variable	Percentage

Source: Authors, 2015 (Atlas Brasil, 2013)

The exploratory analysis technique with a quantitative approach allowed using appropriate arithmetic to synthesize data (Anderson; Sweeney; Williams, 2011). Minitab data processing program was used, providing great capabilities for creating tabular summaries and graphical data. The graphical method presented in this work is Box plot.

Note that the scheme drawings of Box plot enable an exploratory data analysis considering the rule of the five things to know: minimum value, first quartile, median, third quartile and maximum value. Moreover, Box plot goes without the calculation of mean and standard deviation (Anderson; Sweeney; Williams, 2011).

In the data analysis, the classification according to the regions in the Atlas of Human Development in Brazil (Atlas Brasil, 2013) was made. The separation of regions into North, Northeast, Midwest, South and Southeast made it easier to analyze the regional differences in Brazil.

4 Data Presentation and Analysis

At first, and by using Box plot, the five regions in Brazil were studied regarding T_FREQ5A6; T_FUND11A13, T_FUND15A17, T_FUND18M, t_MED18A20 and IDHM_E. The result of this

analysis is shown in figure 1.
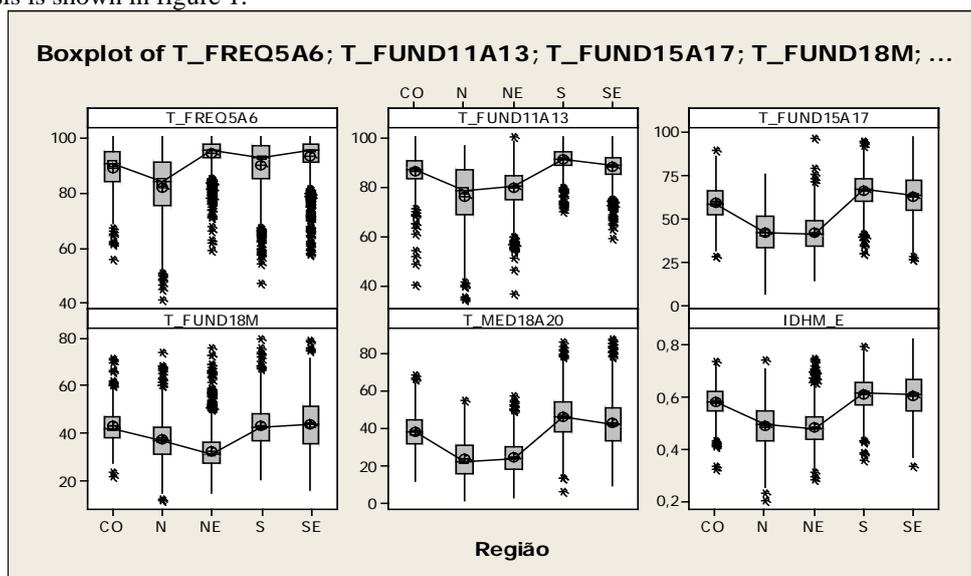
Figure 1   Box Plot of the Variables Education and human Development Atlas Brazil, 2013
Source: Authors, 2015 (Atlas Brasil, 2013)

For the indicator T_FREQ5A6, it is verified that northeast has the highest rate, followed by South and Southeast. The lowest index for this indicator was found in the North, whose median is 84.11%, when most regions are close to 100% in this variable. Also, there is considerable variability in data from northern compared to other regions in Brazil.

T_FUND11A13 indicator showed the highest rate in South, Southeast and Midwest. On the other hand, the lowest rate is in North, with a median of 78.34%, where this variable is near 90% in most regions. Moreover, there is greater variability in the distribution of data in the cities of the North. As for the South, Southeast and Midwest have lower variability of the data. The degree of variation from regions to region is high (743.32) and the p-value indicates that the information is reliable.

For T_FUND15A17 indicator, the rate is higher in the South, Southeast and Midwest, and North and Northeast present median values near 40%. So, it is worth noting that medians of regions with better performance are close to 60%, and the degree of variability among regions is high (1327.12). Moreover, when the analysis of p-value is analyzed indicates that the information is reliable and there is no chance that this value will be different.

The result of the analysis of T_FUND18M indicator shows better results in the South, Southeast and Midwest, and the lowest rate was found in the Northeast. Nevertheless, the five regions present average below 50% for this variable, and the cities that showed better results were considered in this analysis as outliers, that is, as atypical information. The greater variability of data is in the Southeast, and the region with less variability is the Northeast. The degree of variation among regions is high (413.92), and the p-value indicates that the information is reliable.

T_MED18A20 indicator showed that the best results are in the South, Southeast and Midwest, while the lowest rates are in the North and Northeast regions. For regions with the highest rate in this variable it was found that the average is closer to 50%. However, cities that showed the best results were considered in this analysis as outliers. The degree of variation among regions is high (1031.13), and the p-value indicates that the information is reliable.

The analysis of the IDHM_E indicator showed that the highest rate was found in the South and Southeast, whereas North and Northeast showed median values near 40%. It is important to note that for this variable, the medias of regions with better performance are near 60%, and that the degree of variation among regions is high (884.60). P-value indicates that the information is reliable.

Another analysis performed in this study was the scenario of income in Brazilian regions, as can be seen in Figure 2. The indicator applied was the RDPC, with the highest value in the South and Southeast regions. The lowest rates were found in the North and Northeast, the latter being the region with the lowest results for this variable. The average is R$467.65. Moreover, it was noticed that the difference between the highest and the lowest income is more significant in the North compared to the Northeast,

although the median is greater in the North.
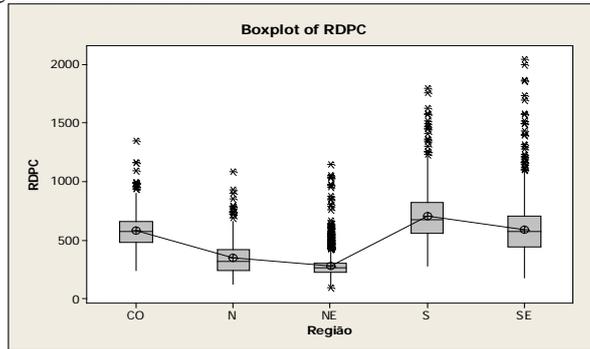
Figure 2   RDPC Variable per Region
Source: Authors, 2015 (Atlas Brasil, 2013)

A point to underline in this analysis is that the cities that showed the best results were considered outliers, and these values were far apart from the middle of the Midwest, North and Northeast. It is important to note that the highest concentration of outliers with higher values is in the Southeast and South. It was also possible to realize that the greater variability of data is in the South and Southeast regions; the degree of variation among regions is high (1432.31), and the p-value indicates that the information is reliable. Besides the issues of education and income, the present study aimed to describe longevity in the five regions in Brazil by applying the IDHM_L indicator to explain regional differences, as shown in Figure 3.
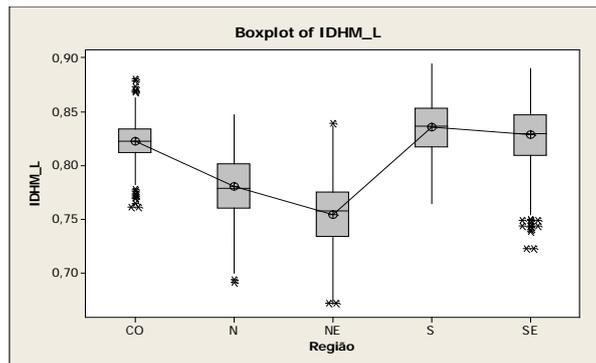
Figure 3   IDHM_L Variable per Region
Source: Authors, 2015 (Atlas Brasil, 2013)

Previous information indicates that there are regional differences that must be taken into account in the discussion of public policy. Correlations to understand this reality in each region based on selected indicators were not used. However, the inferences obtained pave the way to discuss the relationship between access to education and the freedom to exercise full citizenship that impacts on the quality of life of individuals.

5 Conclusions

The present study aimed at an innovative reflection on human development and how it should be focused on people and on the increase of their well-being. This approach used variables related to education, income and longevity. It is worth noting that access to better conditions of income and distribution of wealth is not an end in itself, but it means that people can develop and seek better living conditions. This view corroborates Sen (2010) when he discussed freedom of choice of individuals.

Therefore, economic growth of a society does not automatically translate into quality of life, and the reinforcement of inequality is often observed (Piketty, 2014). However, with a better ability to achieve subsistence or to strive for autonomy in their activities, individuals can build their own ways.

As presented in the previous section, this study aimed to describe the major indicators related to education and to show the scenario of income and longevity presented in the Atlas Brasil report 2013.

Based on this analysis, it was concluded that education in Brazil presents better results in the early school years and decreases throughout the years. Another important point in this study is that the best

results are concentrated in the South, Southeast and Midwest, which is also repeated when the variables are income or longevity.

These definitions indicate that cities have large disparities in the variables studied, emphasizing that this occurs mainly in relation to the North and Northeast regions compared with the others. It is worth noting that the observations of the charts describe that there are two types of Brazil, that is, the data about the Southeast and the South, often followed by the Midwest, are very similar and have better results in the issue of education, income and longevity, while the data in the North and the Northeast regions are also close, but showed the worst results for the indicators.

The comparison of the rates indicates that education up to 13 years old presents average results over 50%, close to 80% in some cases, which is generally good results regarding the completion of the education cycle in a given age range studied. However, outliers change position as age advances, which is negative for the Brazilian population in general.

For the variable income, it is relevant to note that the values are around R$500, 00 per month, and cities whose values are considered high are diagnosed as outliers. It is important to emphasize that the highest outliers are in the Southeast and South. In order to understand how each region is developing in terms of education, income and life expectancy, it would be required to concurrently compare a qualitative analysis so differences and regional needs could be better understood. In fact, this is a proposal for future research to foster the discussion of regional public policies to ensure full citizenship. Innovations in this area are necessary because the education strategies implemented so far are certainly not promoting the expected improvement in public education levels. The issue of education in Brazil has been discussed in two apparently contradictory ways: as a solution to the major issues of the country and a problem that still remains. In this scenario, pledges of change and solutions to the historical bottlenecks and barriers to the development of education in Brazil are proposed.

Experience, however, shows that the answers to the challenges of Brazilian education are often far from rhetoric and generalizing speeches. There is no ready or general formula. Changes and improvements must be developed in a daily basis, and therefore the paths to be followed are not and should not be the repeated.

The diversity of action strategies and means also characterizes cities able to improve their indicators, according to a study conducted by the United Nations Children's Fund (UNICEF). The qualification and the working conditions of teachers are seen as the major factor for the advance of Brazilian education. Factors such as school infrastructure and access to textbook materials also influence learning, but the teacher's role is crucial to the academic achievement of students at all levels.

The qualification of the teachers directly impacts the results of efforts for education. When there is lack of well-structured planning and no funds are allocated for education, the results are superficial and not feasible. One example is Korea, a country that has invested 10% of its GDP in education for two decades and became a world power in this area.

In a nutshell, the issue of citizenship of individuals of a country should be approached based on their regional characteristics, and in this manner, learning provides preparation for access to rights, but also enables everyone to have autonomy and freedom of choices. Thus, the issue of income is only one more intermediate factor for civil liberties, and not an end in itself.

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How is Quality of Democracy Doing in the World?

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Abstract: Implementation of democracy finds resistance in political economy, which dominates and sets the rules of the game, both at the national and international level. Indicators show the panorama worldwide: protests about civil liberty, economic difficulties and corruption which have introduced new divisions between elites and unsatisfied citizens. How can partnerships be made more harmoniously with respect to people, the planet, aiming at common prosperity and peace? This study aims to offer an approach that fosters awareness of meaning of the issues for decision making: as well as an analysis of the correlation among democracy and corruption through 16 variables divided in seven synthetic indicators and nine analytical indicators, in 132 countries. Secondary data was analyzed for all variables through Minitab Statistical Software – Version 16. Results show that the synthetic indicator Social Progress Index (SPI) is high, positive and statistically significant with all variables ($p < 0.01$). Social Progress Index (SPI), Human Development Index (HDI), Governance (GOV), Environmental Protection Index (EPI), Political Rights (PR), Private Property Rights (PPR), Political and Economic Transformation (PET), and Corruption Perceptions Index (CPI) explain 79.55% of the model. New indicators may be an impulse to conscious interpretations of the issues involved, letting awareness of worth emerge, as the axis of practical philosophy of the characteristics of democracy: respect to the person, acceptance of pluralism and quest for peace, when creation is used constructively, away from corruption.
Key words: Democracy; Corruption perception; Social progress; Interdisciplinarity; Awareness

1 Introduction

The dimension of meaning of the word Democracy - from the Greek 'dimos' and 'kratos' – power of the people - has evolved from a specific kind of government to a way of being and thinking. Regardless of the definition by different thinkers, nowadays Democracy shows to be an open, fraternal society, with 3 characteristics: respect to the person, acceptance of pluralism and quest for peace, which constitute, respectively, the foundation, method and object of Democracy, where awareness determines the rhythm of development**.** Democracy is a policy that removes obstacles to development and fosters an integral sense, with freedom from negative conditioning and encouragement of positive possibilities (Abbagnano, 2012, pg. 277).

The attitude to Knowledge plays a very important role in letting awareness emerge to accelerate development. In the past 50 years, Interdisciplinarity has encouraged the integration of Knowledge. According to Fazenda (2002), Interdisciplinarity does not only refer to the integration of disciplines from different fields of Knowledge, but also to the creation of Knowledge, besides reproduction of Knowledge.

Hence adding the contribution of Complexity by Morin, referring to the importance of letting perceptions emerge, we open way for creation. Syrgiannis (2013), who focuses on the experience of the inner creative processes using the 4 quadrants by Ken Wilber**,** offers an approach that allows issues to be understood in depth. The main element of awareness that emerges is the own worth, which can be transferred to the others and the environment. The approach can be used by professionals, scholars and citizens to expand understanding of issues for decision making, individually and collectively. Partnerships become easier then. Building alliances at all levels to advance development does not seem to be an easy task for the different actors, both public and private. However, everybody wins with democratic countries, which are inclusive and sustainable.

The more the process of creation is understood, constructive action will prevail, not destructive like corruption. Recently, we have being observing the unveiling of corruption and mass mobilization of citizens against corruption, as in Brazil, Guatemala, Australia and North Korea. Leaders must revise their efforts and take measures to reduce the impunity of corruption. It is worrying to see corruption in other

countries, too like Hungary, Macedonia, Spain and Turkey. To address corruption, not only laws and regulations are necessary to be put in action, and media to be truly a contribution for freedom and social progress, but also increase everybody's awareness on the issue of destructive creation.

2 Development

The crisis of politics is universal. The parties have to rethink everything. Representative democracy by itself is no longer answer to the aspirations of people to be building part of society. Democratic countries seek alternatives to deal with the civil war, combat poverty, help refugees, reduce the high number of deaths in regional conflicts, in addition to numerous tensions that continuously emerge on the planet. These threats are worrying, because they do not respect the values and rights of society and restrict the freedom of individuals.

Even in some democratic countries, the political opposition and civil society force autocracy. The protests about civil liberty, economic difficulties and corruption have introduced new divisions between elites and unsatisfied citizens. Some democratic countries faced crises that feed the xenophobic feeling; other countries have undermined the economies of States dependent on the sale of natural resources and increased the power of authoritarian regimes. All this contributes to a decade of decline in global freedom (Democracy Index, 2015).

Bearing in mind that the foundation of Democracy is respect to the person, the question is acceptance of pluralism and the object is quest for peace, how can we practice this? It is urgent that all of us go deeper into the meaning of things and the use of creation in a constructive way and develop further high social impact innovations.

2.1 Democracy

For the purpose of working with indicators in this paper, we are going to use the following additional definition for Democracy. The democracy of a country may be measured by the following kind of variables: a) political rights which involves the evaluation of three subcategories of political law: electoral process, participation and pluralism, Government management; b) Freedom of speech which is the extent to which freedom of expression and the press are affected by Government censorship, including the ownership of the means of communication; c) Freedom of assembly/association which is related to the extent freedom of association and union are subject to governmental restrictions or limitations; d) Freedom of movement which is the measurement of the sum of two variables: freedom of movement to foreigners and citizens of own country; e) Private property rights which is the degree to which the laws of a country protect the rights of private property and the degree to which their Government enforces these laws; f) Freedom over life choices which is the percentage of respondents satisfied with the question: are you satisfied or unsatisfied with your freedom to choose what you do with your life?; g) Freedom of religion is a combined measure of 20 types of constraints, including the efforts of the Governments to ban certain beliefs, prohibit, limit   preaching or giving preferential treatment to one or more religious groups; and h) Democracy Index which is the civil liberties based on five categories: electoral process and pluralism, civil liberties, Government management, political participation, and political culture (Freedom House)., events that make us reflect on context and trends of democracy around the world.

Can this trend be reverted?   What is the Dynamics of the Process?

When we have the opportunity to experience our inner creative pro2016)

Moreover in addition to the above variables, the democracy of countries is based on the processes of transformation and political management that may be classified in two indexes: a) Situation Index; and b) Management Index. The Situation Index has two factors for analytical dimensions of political and economic transformation, which identify if the individual countries assessed are developing democracy under the rule of law and social market economy (Bertelsmann Stiftung's Transformation Index, 2016).

The economical authority crisis blames democratic powers, which was evident in China in 2015, when major economic forces were concentrated on work at the expense of human rights and political repression. Autocracy is also visible in the aggressiveness of Russia in relation to liberal values, in the increase of terrorism in Arabian countries promoted by the civil conflicts, in the rise of anti-democratic politicians in Venezuela and the rampant corruption in Brazil.). Such events that make us reflect on context and trends of democracy around the world.

Could this trend be reverted?   What is the Dynamics of the Process?

When we have the opportunity to experience our inner creative, letting words emerge on a topic, registering them in an exercise of inner individual consciousness; then, looking at the words and correlating them by colors in an exercise of outer individual consciousness to be able to tell the meaning of

correlations as an idea that emerged, then we become the authors of meaning. This individual achievement may be shared with others, in such a way that we can keep on adding anything that others say that makes sense to our meaning, exercising then an inner collective consciousness; then, looking at the notes taken and correlating them together in an exercise of outer collective consciousness and it relates to what Nonaka and Takeuchi (1995) consider in Knowledge Creating Organizations; and nowadays this may be happening all the time through the social networks that also may be followed by Big Data Analysis.

This may represent the real time emerging of raw material for joint Creation, which is now going to be consciously analyzed for selection, for a proposal like the trunk of a tree. Two or three main ideas are chosen to be the main branches, with illustrations for each one. The formation of the tree follows Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144...This stage defines the Unity of the proposal. During this constructive and consistent process, it reflects our own constructive consistence. Next, is as an exercise to find our Way to bring our proposal   in a rhythm that flows, has clarity and harmony, we ask ourselves whether there is anything to be changed in our proposal. If there is, it is time to perform the adjustments, before the implementation. Finally is Achievement, where we can now choose a style that better fits to the implementation of our proposal, making sure it will bring prosperity for all the parts involved, feel happy and manifest the proposal. That stage is generally followed by a sense of Self Realization. It is through these 4 movements: Creation, Unity, Way, Achievement that the approach by Syrgiannis (2013) reveals to bring worth into awareness as the axis of any attitude and action in life. All of us may benefit from using it.

2.2 Corruption perception

According to Aristotle, corruption constitutes, together with its opposite, the generation of 1 of the 4 kinds of movement, more specifically the substantial movement, due to which the substance is generated or destroyed. 'Corruption', says Aristotle, is a change that goes from something to the not-being of this something, specific when it goes to the opposite specification -in the Dictionary of Philosophy (Abbagnano, 2012, pg. 250).

Corruption impacts societies in a multitude of ways. In the worst cases, it costs lives. Short of this, it costs people their freedom, health or money. The cost of corruption may be divided into four main categories: political, economic, social and environmental. On the political front, corruption is a major obstacle to democracy and the rule of law. In a democratic system, offices and institutions lose their legitimacy when they're misused for private advantage. This is harmful in established democracies, but even more so in newly emerging ones. It is extremely challenging to develop accountable political leadership in a corrupt climate (Transparency International, 2015).

Corruption corrodes the social fabric of society. It undermines people's trust in the political system, in its institutions and its leadership. A distrustful or apathetic public may then become yet another hurdle to challenging corruption. One country has to comply with the commitments it has taken and disregarded to restore confidence. The mistrust is with the policy, but also with the business world, with religious institutions. There is a questioning of the elite. The countries elites need to question themselves about what they have being doing and reinvent itself to keep playing the role which corresponds to the political parties, the only organization that may offer a nation a collective idea. We need a policy close, clean, transparent, and concerned with people.

The transparency is about shedding light on rules, plans, processes and actions. It is knowing why, how, what, and how much. Transparency ensures that public officials, civil servants, managers, board members and businesspeople act visibly and understandably, and report their activities. And it means that the general public can hold them to account. It is the surest way of guarding against corruption, and helps increase trust in the people and institutions on which our futures depend (Transparency International, 2015). In addition to this, development of awareness of worth will foster constructive creation.

3 Methodology

For the quantitative part of this study, we deal with data from the Observatory Red Iberoamericana de Prospectiva - ORIBER (2016) that considers 132 countries divided into three groups: a) AIBER, formed by 21 Latin-American countries plus Portugal and Spain; b) Advanced Economies (AVECO), formed by 27 countries, including advanced economies located in Europe, as well as Japan and South Korea (Asia), New Zealand and Australia (Oceania), the United States and Canada (North America); and c) Other Countries (OTHERS), formed   by the other   84 remaining countries.

This study aims to analyze the relationship between democracy and corruption through 16 variables divided in seven synthetic indicators and nine analytical indicators, respectively: 1) Social Progress Index

(SPI); 2) Human Development Index (HDI); 3) Governance (GOV); 4) Environmental Protection Index (EPI); 5) Happy Planet Index (HPI); 6) GINI Index (GI); and 7) Democracy Index (DI) from the Program of the United Nations Development (2014). Additionally, the nine analytical indicators: 1) Political Rights (PR); 2) Freedom of Speech (FS); 3) Freedom of Association (FA); 4) Freedom of Movement (FM); 5) Private Property Rights (PPR); 6) Freedom over Life Choices (FC); 7) Freedom of Religion (FR) from Freedon House (2016); 8) Political and Economic Transformation (PET) from Bertelsmann Stiftung's Transformation Index (2016); and 9) Corruption Perceptions Index (CPI) from International Transparency (2015), in 132 countries. It´s important to mention that for the purpose of the study all the indicators considered were Normalized (0 – 100) and Positivized - the higher the better.

When the indicators are used in the experience of the inner creative processes, meaning emerges with clarity and choice for constructive proposals in partnership may lead to a way of being and thinking close to the new dimension of the word Democracy.

4 Considerations

Figure 1 show the degree of correlation of all variables, in particular that the correlations among the (color red) variables Social Progress Index (SPI), Human Development Index (HDI), Governance (GOV); Environmental Protection Index (EPI), Happy Planet Index (HPI), Democracy Index (DI), Corruption Perceptions Index (CPI), Private Property Rights (PPR), Political Rights (PR), Political and Economic Transformation (PET) were high, positive and statistically significant each other.
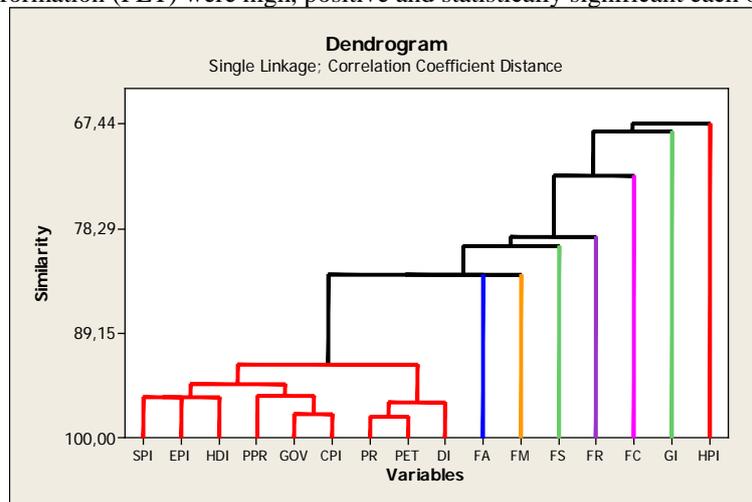
Figure 1   Dendrogram
Source: by authors

The Kaiser-Meyer-Olkin (KMO) technique was used with the aim to compare the simple correlation with the partial correlations, show an excellent result with a KMO of 0.89. The extraction of   a limited number of factors to represent the structure of the original variables by means of Principal Component Analysis, show that the most relevant variables were the Social Progress Index (SPI), Human Development Index (HDI), Governance (GOV), Environmental Protection Index (EPI), Political Rights (PR), Private Property Rights (PPR), Political and Economic Transformation (PET), and Corruption Perceptions Index (CPI) that explain 79.55% of the model; and in particular that the Social Progress Index (SPI) has the highest representation.

It is observed from the results that a model of development based on economic progress alone is incomplete. Economic growth alone is not enough. A society that fails to address basic human needs, equip citizens to improve their quality of life, protect the environment, and provide opportunity for many of its citizens is not succeeding. We must widen our understanding of the success of societies beyond economic outcomes. Inclusive growth requires achieving both economic and social progress.

Social progress is the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow citizens and communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential. The countries with very high Social Progress are Finland (90.09), Canada (89.49) and Denmark (89.39), the very low are Chad (36.38), Afghanistan (35.89) and Central African Republic (30.03). Research shows the correlation between

economic progress and social progress, and our study reveals that the correlation is high with all the variables, which indicates that the social progress is related to economic performance. Hence, economic performance alone does not fully explain social progress (Social Progress Index, 2016). Figure 2 show the correlation among economic progress and social progress, which as may be seen is not linear: SPI grows very fast with GPD PPP per capita at the beginning up to $ 20000 and then go slow; and moreover there are 3 oil producer countries where SPI did´nt improve after reaching this SPI kind of tipping point...
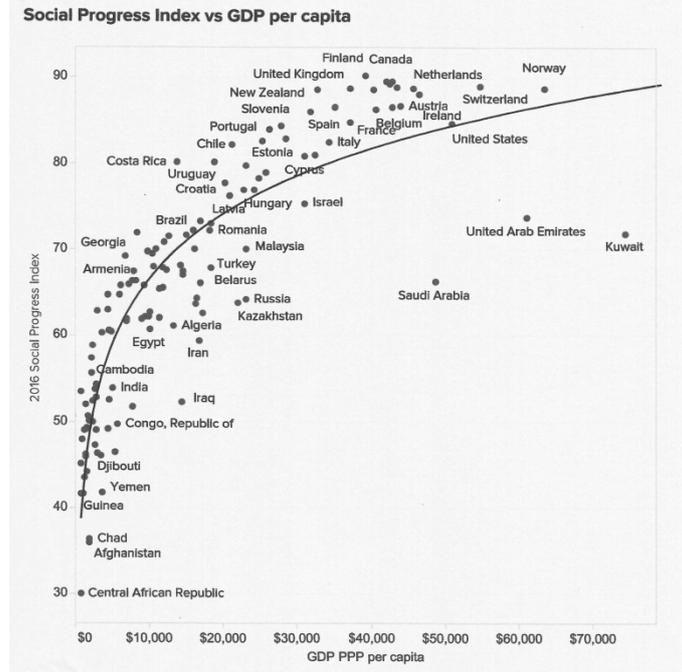
Figure 2   Relation Among Economic Progress and Social Progress
Source:https://www2.deloitte.com/content/dam/Deloitte/mx/Documents/about-deloitte/Social-Progress-Index-2016-Report.pdf

As the world faces increasingly complex challenges, the SPI is a roadmap that guides investment policies and business decisions. One of the main conclusions of the index is that we should expand our understanding of what is a successful society in addition to the economic results. Growth requires economic, social progress, political rights and civil liberties. Figures 3, 4 and 5 compare the regions with all variables of this study.
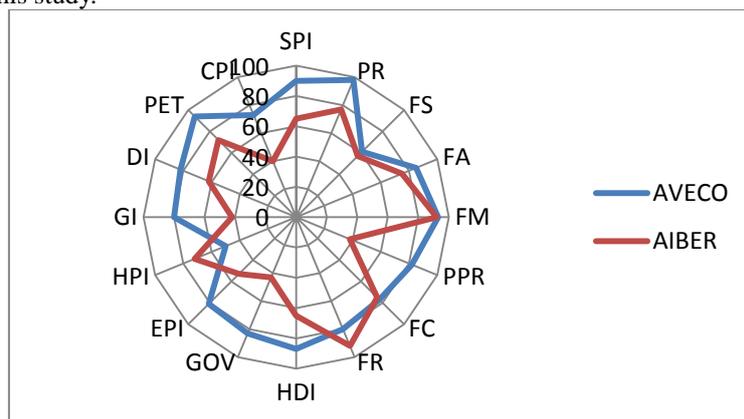
Figure 3   Comparing the Regions AVECO and AIBER
Source: Produced by author

The AVECO countries as a whole are doing better than the AIBER, except Freedom of Religion (FR) and Happy Planet Index (HPI), while the difference is the greater the other way around concerning Private Property Rights (PPR), Governance (GOV) and Corruption Perception Index (CPI). The variables

Freedom of Speech (FS) and Freedom of Movement (FM) are near in both Regions.

The results show that the Freedom of Religion is very important for a country; however the influence of the religious dogmas about the inner workings of political systems once again increased. The results show that the influence of religions like Islam in politics continues to grow in some parts of the world like the Arab countries, as well as Iraq, Libya, Syria and Turkey; and now days Fundamentalist Terrorism acts and Migration because of violence are becoming more and more common.

Moreover in many Asian countries, there was a relation in 2015 between the strained political institutions and forms of nationalism or religious extremism. The Hindu nationalist government of India, under pressure to fulfill campaign promises in 2014, failed in containing violence and intimidation anti-Muslim, sometimes to encourage or take advantage of religious divisions for political again. As was seen in the Islamic radicals who carried out a series of attacks in secular Shiites and foreign writers.
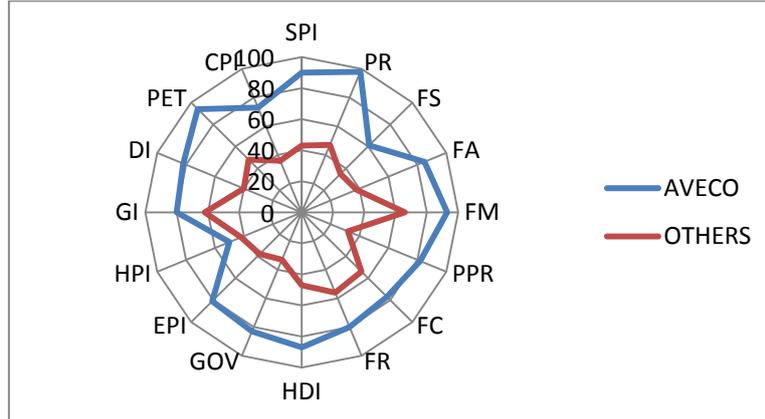
Figure 4   Comparing the Regions AVECO and OTHERS
Source: Produced by author

The AVECO countries as a whole are doing much better than the OTHERS. The Happy Planet Index (HPI) is near in both Regions. It shows that while the challenges faced by rich resource-intensive nations and those with high levels of poverty and deprivation may be very different, the end goal is the same: to care of a healthy Planet for a better life to live now and in the future. The best results are in Costa Rica, Mexico and Colombia. Countries like Costa Rica, that are closer to managing to build sustainable economies that deliver relatively high wellbeing, and long life expectancy, without a large ecological footprint. Although no country is yet well enough, the countries that are doing better may offer valuable insights into the types of policies which would lead to sustainable wellbeing (Happy Planet Index, 2016).

As the Good Country Index, that is a new way of looking at the world. The Index does aim to do is to start a global discussion about how countries can balance their duty to their own citizens with their responsibility to the wider world, because this is essential for the future of humanity and the health of our planet. Finland ranked second after Ireland (Anholt, 2016).
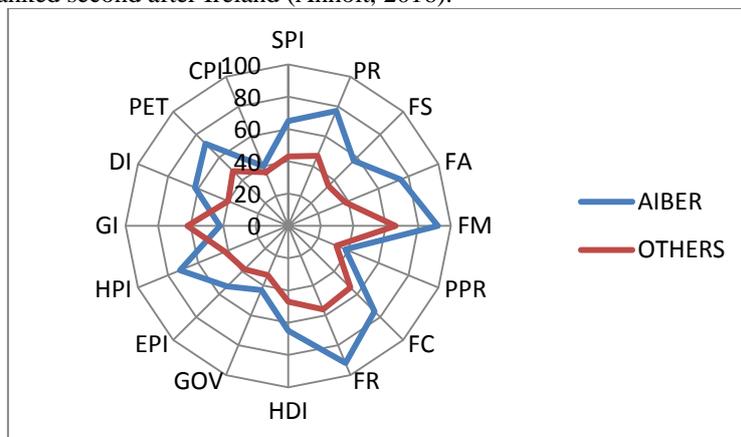
Figure 5   Comparing the Regions AIBER and OTHERS
Source: Produced by author

The AIBER countries as a whole are doing better than the OTHERS, except GINNI Index (GI). The variables Private Property Rights (PPR), Governance (GOV) and Corruption Perceptions Index (CPI) are near in both Regions. As one could see social policies continue to be a major weakness. The conflicts and crises of transformation are related to social limitations. Poverty, inequality and the lack of economic opportunities are aspects of bad governance. Most Governments are not yet well prepared to deal with these challenges. Only six countries Uruguay, Chile, Taiwan, Estonia, Poland and Lithuania have an excellent quality of Government. The highlight Turkey by prioritizing the inclusive growth and robust through collective action, which was expressed in the three pillars of the Turkish Presidency: implementation of past commitments; investments to strengthen the economic recovery and the growth potential of countries; and promotion of inclusivity.

The proportion of democracies and autocracies remained relatively stable, Iraq and Thailand continue with the autocracy. However, Guinea, Madagascar, Mali and Nepal meet minimum standards of democratic Government. But participation rights are still restricted in democracy. The status of political transformation has deteriorated in many democratic Governments in aspects such as, free and fair elections, the freedoms of association, assembly and expression, the separation of powers; and even civil rights have been further restricted.

The anti-corruption policy presents the worst aspect of performance of all Government indicators, especially with regards to Africa, the Middle East and Eurasia. Singapore is the only autocrat country with integrity mechanisms. Only the Central East and South-Eastern Europe stand out positively, with significant improvements, especially in Latvia and Poland.

The human cost of corruption is enormous. The leaders with notoriously corrupt records continue to enjoy a life of luxury at the expense of people living in poverty. Figure 6 presents the rate of corruption in Latin America. It is vital we change the mindset which accepts corruption. Corruption will stop when we fight against it.
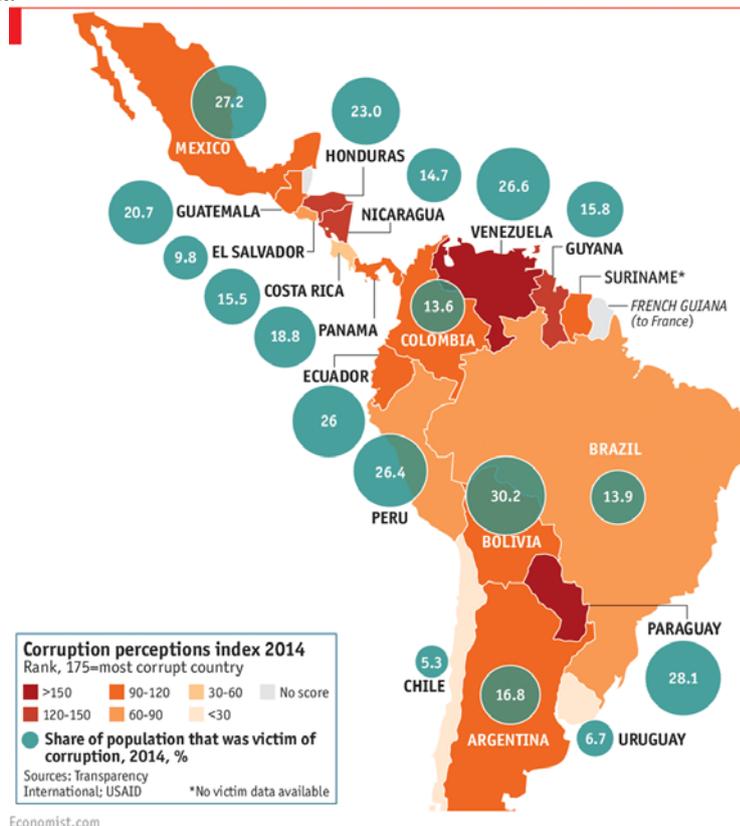
Figure 6   Corruption Perceptions Index in Latin America
Source: http://www.economist.com/

The world's dominant trends in the economy and in society exacerbate the contradictions of a development style that became unsustainable. The deep economic, social and environmental imbalances

have motivated the search for responses by the international community, through efforts maturing along at least the last two decades.

5 Conclusions

A strong democratic State is not a State closed, but open to access information, social values and practices of collaborative policy. It is a State that develops systems for planning, evaluation, and participation in the formulation and implementation of public policies. The open Government involves the modernization of public administration, based on transparency, accountability, citizen participation and collaboration of all actors to produce value. Open Government policies drive the practices, values and cultures that favor the establishment of an open and collaborative platform.

In this sense, evolutionary public administration focuses on the complex interactions between systems and the non-linear development of governance structures, processing through time when they attempt to adapt and cope with the ongoing changes in their environment (Teisman, Van Buuren & Gerrits, 2009). This transformation requires long-term vision and a new political and social forces correlation that may allow to implement four basic mechanisms of governance: a) international coordination of economies in favor of the sustainable expansion of investment, based on fiscal policies that prioritize low-carbon projects and greater energy efficiency; b) a new international financial architecture to reduce the volatility of prices and progress in reforming the international monetary system; c) governance of trade and technology on a multilateral basis in order to facilitate and expand the access to technology and financing for the dissociation between growth and environmental impact, leading to the closure of asymmetries between countries and regions; and d) the governance of the essential components of the digital economy shared globally   and at a regional level.

The same tendency can be related to the complexity science on the public policy, as the areas may present higher or less degree of complexity. The economics has already developed indexes in the complexity science, such as the 'Economic Complexity Index' (Hausmann et al., 2014), promoting diversified tools for analysis. The complexity economics converges more with strategy, and archetypal constructions, like the artificial stock market, for example.

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Leicester City Triumph: Engagement Execution or Pure Luck?

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Abstract: This study focuses on the astonishing accomplishment of Leicester City Football Club in overcoming the English Premier League Session 2015/2016. Despite the fact that their voyage is by all accounts like children's fables we cannot avoid our self from the science behind it. Broad desktop research has been directed to uncover the noteworthy variables for Leicester triumph. Taking team sport, for example, football otherwise known as soccer as a contextual analysis to characterize an example of overcoming adversity giving us a superior point of view particularly as far as the genuine implications of engagement and execution.

Key words: Sport case study; Engagement; Execution; Excellence; Leicester city

1 Introduction

It is quite typical for most organization nearly a third to the extreme of fifty percent of their workforce is disengaged. Participation is a bit poor, turnover is high, and profitability or adequacy is average. In astounding organizations seventy five percent or a more unmistakable measure of the workforce is secured, feels enabled, gives more thought and thought and commitment to the relationship since they see their work as basic and feel that the connection knows and ponders them as people (Jim Clifton, Stephanie Holgado.2013). They are adjusted to organization objectives; they are exceptionally required in their work and give it their best exertion since it mirrors their qualities and effectively uses their ability and information at an abnormal state (James W. Marcum.2014).

On occasion exceptional initiative achieves extraordinary accomplishment by moving individuals to put forth a strong effort, to extend and accomplish more than they suspected they could. An exceptional coach can shape a formal or even social event into a triumphant get-together; an influenced maker like Stalin or Hitler can make a world-propelling alliance; an engaging speaker like Barack Obama can make a political change. Regardless, such mixes of capacities and personality are remarkable. Luckily phenomenal learning and abilities are not required. An understanding of human instinct merged with practices that are learnable can ensure an engaged organization (James W. Marcum, 2014).

2 The Execution Enigma

Execution excellence has for quite some time been a center methodology utilized by organizations to manage change and enhance their aggressiveness. Extensive experience and best practices have been created to help organizations enhance the rate, expense, and nature of their center operations (Sajiv Anand, 2016). They keep on deploying these procedures with expectations of fighting the difficulties of the new ordinary, yet frequently these methods lead to incremental, as opposed to leap forward, upgrades. This methodology frequently abandons them uncompetitive when pace and many-sided quality are quickening much quicker than in customary times.

Recently, there has been a noteworthy movement in center toward execution advancement. Development frequently gives an achievement level of change that can re-characterize an association's aggressiveness. Instead of depend on incremental change that can be jumped, organizations wish to influence new innovation and different advances to accomplish a really practical favorable position. Advancement in execution can take numerous structures all through the Enterprise, including plan of action, working model, procedure, or calculation. Luckily, the broadness of new innovation, new accomplices, new materials, and so on is exhibiting a rich arrangement of inputs to supercharge execution advancement.

The perfect reaction is to make magnificence in development, execution and linkage between the two. Much like the Gartner Group's outstanding "enchantment quadrant", firms who can exceed expectations at both creating and sending leap forward development will be all around situated to lead later on (Gartner, Inc, 2015). At the point when greatness is accomplished in both orders, a profoundly prudent circle is made. New developments are effectively and immediately incorporated into existing operations, which abbreviate the basic time-to-quality gauge, enhance speculation ROI, and in particular

enhance operations. At the point when execution results are caught and nourished back to the development procedure, critical knowledge into business sectors, contenders, and clients is utilized to enhance the velocity, expense, and nature of the following advancement cycle.

Looking ahead, the persistent difficulties of rivalry, direction, and globalization will wear out organizations that are not all around situated with driving innovation and execution capacities. Accordingly, business must discover better approaches to influence existing Intellectual Proprietary (IP), stimulate synergistic improvement, and assemble outside linkages all while managing a legacy of exceedingly appropriated information, applications, and infrastructure.

3 The Engagement Sensation

The most ideal approach to manage definitive accomplishment today is not publicizing, or cash related impact, or range; the key is getting a charge out of the eventual outcome of the data, experience, creative limit and duty of the association's family. Basically, the key is workforce engagement (Jim Clifton, Stephanie Holgado, 2013).

The idea of engagement rose as of late as a main component to compelling work and learning. Engagement happens when individuals attempt assignments identified with their fitness, learn ceaselessly, submerge themselves and persevere due to the worth they credit to the work. Engagement can be treated as a procedure and continuous action, not an occasion. Its deciding qualities are learning and inclusion. Applying the idea to data association, researchers use a sliding size of engagement beginning with withdrew acknowledgment, moving to talk, to presentation or instructing, at last to use in every way that really matters (Davenport, Thomas H., Lawrence Prusak, 1998). This process serves to handle data over-burden, a progressing issue, and supplements the movement engagement approach.

Engagement is fundamentally the same as Intrinsic Motivation (IM). IM essentials, as indicated in previous research incorporate weightiness, decision, skill, and advancement (Kenneth Thomas, 2009 (a)). Yet, compensates additionally stay focal in "overseeing" IM, as does an emphasis on initiative qualities to get inspiration "going." There remains a certain yearning with respect to the "inspiration business" to accept it can be educated and oversaw. Simply said, engagement cannot be "made to happen". The action stays with the individual, no matter whether an expert or understudy (Kenneth Thomas, 2009 (b)). Engagement is more a kind of "base up," grassroots marvel that can't be coordinated from the top.

To reiterate the above argument, engagement is something very different from motivation. The following table (Table 1) highlights those differences:

Table 1   Motivation vs. Engagement

KEY ELEMENTS	MOTIVATION	ENGAGEMENT
Aim	Initiate, Activity Focus	Learning, Knowledge Transfer
Accountability	Management	Individual, Team
Action	Planned, Triggered	Ongoing, Continuous
Belief	Human Biological Need	Self Realization
Power	Top Down, Subtle : "rewards"	Self Determination
Perspective (Worker)	Employee	Partner
Philosophy	Atomistic, Linear	Holistic, Complex

Source: Adapted from Intrinsic Motivation at Work by Kenneth Thomas, 2009 (b).

With a specific end goal to completely drew in the whole workforce a very surprising association style is required: not a controlling, coordinating style, yet rather a visionary, honing, facilitator scrambling to stay aware of the pack is the fitting model. He or She will have impeccable position of the unleashed learning, establishment, data and obligation of the pulled in bit of the association looking for development and perfection.

Engagement can be nurtured despite the fact that it cannot be directed or commanded. Various authors, scholars, and experts offer apparatuses, procedures and strategies to build representative engagement (Driscoll, Maurice John and Evans, and Robert Hugh, 2009). These offerings are coordinated to directors and pioneers of companies to improve profitability. These frequently are upheld by broad information, as we see with the Gallup association's reports on enhanced money related execution consolidated with recommendations that their specialists and methodology can get it going for the forthcoming customer.

The admonishment here is that every one of these tries offers a top-down push to guarantee a

positive showed result. Since expenses are joined, there is thought concerning giving quantifiable results in sensible time to legitimize those expenses. Ordinarily, this procedure falls by the day's end into the solicitation and control suspicions of most affiliations today; it falls into the same trap, as does the "prizes" approach evaluated prior in this talk. The longing to tail thusly is totally sensible yet may not satisfy a complete motivation driving engagement. Review that engagement starts with individual decision and is portrayed by learning and responsibility. This is nonsensical for a couple however key for honest to goodness engagement. In light of current circumstances, what should be possible?

Consider a tool by which the individual measures their own engagement in their present position. These advancements the relationship of the effort from a top-down to a typical power grass roots attempt more inclined to reveal a driving forward change in the organization's lifestyle.   This in itself would exhibit the advantage of continuing with the improvement. A true example of engagement endeavour can be pick up from the most popular sport i.e. football aka soccer. Leicester City triumph during 2015/2016 English Premier League distinctly serves as an eye opener in terms of Execution Engagement Excellence.

4 Leicester City Case Studies: Execution Engagement Excellence

Leicester City winning the English Premier League title is presumably the best underdog story in the historical backdrop of games basically in light of the fact that the league is the most focused, competitive and wealthiest games association in the planet. In fact, Leicester's title is the first by a non-"Big 4 Clubs" in the propelled Premier League time (1992-present) since Blackburn Rovers were assigned champs in 1995 (Borden, Sam, 2016). Likewise, and still, toward the day's end, Blackburn finished second the season some time as of late. Leicester finished fourteenth last season. It's the reason this impossible run blind-found the entire world of soccer.

One way to deal with perspective Leicester City's (famously known as the Foxes) outlandish title is through wagering possibilities. Prior to the season started, British bookmakers recorded Leicester — as a 5,000-to-1 to be crown as champion. The shocking wagers raised lots of hope for pundits even though it's a kind of fairy tales (Igor Mello, 2016).

5 The Journey

The phenomenal journey of Leicester started as early as on APRIL 4, 2015. With nine games left, the Foxes are in danger to be relegated as they are sit at the bottom of English First League. However a week in the wake of King Richard III's remains is reinterred, they beat their rival (West Ham United) with a single goal. Coincidentally it's King (Andy King) that put the ball behind West Ham United goal post. Call it a blessing and the Foxes never look back. They keeps on winning the remaining seven last games thus confirmed its inclusion to the top flight (The Premier League). This marks the beginning of its journey, which among its most significant events (Sky Sport, ESPN, 2015):

5.1 New boss, new approach

JULY 13, 2015 - Leicester City new owner (a Siamese) bring appealing news to the club by naming an Italian citizen as the new Chief Coach (Borden, Sam, 2016 (a)). The selection of Claudio Ranieri, whom just recently being sacked by Greece, is a shock decision by the club's Thai owner. Coaching Leicester would be Ranieri's 16th attempt in becoming a supremo in soccer.   True enough in his first press conference; he states that his ultimate goal is to avoid relegation and his plan simply for Leicester to gain a minimum 40 points (Borden, Sam, 2016 (b)).

5.2 Great start

AUGUST 8, 2015 - In their premier season opening, Leicester surprised everybody including themselves by beating Sunderland, 4-2. Three of their goals come from their "season" but not forgotten player Riyad Mahrez (2 goals) and Jamie Vardy (1 goal) (Borden, Sam, 2016 (a)). Thinking back, it is purely an execution — by those two players and by the gathering — it is critical of what is yet to come.

5.3 With pizza we deliver

OCTOBER 24, 2015 - Winning 8 out of 9 games have make Leicester overjoyed with their solid beginning. However, they begin to be sloppy in defence and let an easy goal. Hoping to propel his players, Ranieri guarantees that in the event that they can hold a rival scoreless, he will purchase every one of them pizza (Borden, Sam, 2016 (a)). At the point when Leicester finally creates its first shutout in its tenth games by beating Crystal Palace 1-0 — Ranieri makes an even better offer. He extends "pizza party" to cover their upcoming games as well hence delighted the entire team.

5.4 New year, new perspectives …

DECEMBER 29, 2015 – In the verge of New Year, a 0 – 0 draw with Manchester City provided Leicester another pizza party despite losing to Liverpool earlier. As 2015 shut, the Foxes are in their best ever position in the Premier League i.e. sharing the same points with the Gunners - Arsenal (Borden, Sam, 2016 (a)).

5.5 Blessing in disguise

JANUARY 20, 2016 - A 2-0 defeat to Spurs during FA Cup does not jeopardize Leicester title chances, however it is undoubtedly put Leicester's out of other contention (Borden, Sam, 2016 (a)). This has given Leicester a solid focus and enough rest while its nearest rivals juggle their fitness with Cup matches. In addition they are having another two competitive battle in the prestige Champions League and Europa League, which totally challenged their stamina. The changes in perspective makes Foxes fans start to believe in their dream. The fantasy might now become a reality!

5.6 An assertive viewpoint

FEBRUARY 6, 2016 - "We're going to win the League" a few thousand Leicester fans chanted a marching song after they beat Manchester City, 3-1. The win has built a clear 5-point lead on the table standings. Even though several tacticians had predicted that Ranieri might play for a tie; rather, Leicester keeps on pressing and scores (Borden, Sam, 2016 (b)). The rest is history, confirming their aspire to be the new king of English Premier League.

5.7 In defense we trust!

APRIL 3, 2016 - Leicester 1-0 win against Southampton moved them 7 points ahead of Spurs with six matches to spare (Borden, Sam, 2016 (b)). Pizza becomes a norm as the Foxes maintained their clean sheets to fifth shutout from six matches. The following week, the Foxes extended their record to six out of seven games impressively by beating Sunderland 2-0.

5.8 Three points … just three points more

APRIL 24, 2016 - The Foxes impactful run continue by beating Swansea City, 4-0. Leicester is inside a solitary triumph the following day as Tottenham Hotspur just managed to seal a draw with West Bromwich Albion (Borden, Sam, 2016 (b)). Leicester's fans are in jovial mood — can't hide their eagerness for the Sunday game, as they can finally lifted the trophy with a triumph over the Red Devils (Manchester United) at their home ground - The Old Trafford.

5.9 A tie and a title

MAY 2, 2016 - Leicester City missed a chance to secure the title early when it tied, 1-1, at Manchester United on May 1. In any case, when Chelsea struggled back to tie Tottenham, 2-2, somewhat more than 24 hours sometime later, the plan was accomplish. Leicester surpassed Spurs in the standings by 7 points with two matches to go, which implies the Foxes couldn't be beaten. Clearly, Leicester City players and fans, celebrated vigorously.

6 A View from Engagement and Execution Perspectives

The following table (Table 2) represents Leicester City Engagement Matrix, which summarize the chronology of its debut since the start of the season till they lifted the trophy. It's clearly shown how the team treat different situation with different principles; hence the decision to solve their complications.

Table 2   Leicester City Engagement Matrix

Situation	Principles	Decision
Normal	No Harm Done – Keep Trying	Business As Usual (Operational)
Tricky	Face 1 by 1 – Focused	Business As Usual (Tactical)
Complex	Do or Die – Calculative yet Simple	Strategic Moved

The team are really onto it since the very beginning where they simply just trying their best to outperform other teams. During this Normal situation (5.1 New Boss, New Approach, 5.2 Great Start and 5.3 With Pizza We Deliver) it's merely kinds of day-to-day operation for Leicester. However when the thing get tough (5.4 New Year, New Perspectives …, 5.5 Blessing in Disguise and 5.6 An Assertive Viewpoint) Leicester approach are more focused and they start treating each and every team differently. Their "business" has changed from "Operational" to "Tactical" in order to meet the course.

When they entering the end of season their situation has dramatically changed from Tricky to Complex mainly because of the intense of the league itself. Leicester circumstances (5.7 In Defense We Trust! 5.8 Three Points … Just Three Points More and 5.9 A Tie and a Title) and agony does not help either. At this junction their title contender – Tottenham still have the chance surpassing them provided they scored the maximum available point while Leicester drop a game. The playing field has totally

changed. Leicester need to incorporate Strategic Move in every remaining game. Their slogan has turn into "Do or Die". A simple plan, which is to avoid any defeat, was establish. Very calculative strategic moves towards their opponent threats.

Table 3   Leicester City Execution Matrix

Situation	Rules	Impact
Normal	Guided	LOW
Tricky	Semi-Guided	MODERATE
Complex	Simplified	HIGH

The above (Table 3) delineates the effect of Leicester City execution as for their system decisions to beat challenges all through the season. As the circumstance changed from Normal to Tricky to Complex; so does the guidelines in their execution methodology. Complex circumstance required a more unwind and rearranged rules contrasted with Normal circumstance that entirely guided. The effect here are fluctuates also whereby the straightforward principles delivering a high effect to the group and supporters. Case in point, the administration straightforwardly announced "Pizza" as their menu for any diversions they won and the supporters can participate in the festival. The activities appear to be next to no however the effects for the solidarity are astonishing.

7 Conclusions

Consequences of execution and engagement are liable to the circumstances in which it is grasped. One methodology and structure can't fit in all situations. In general, right awareness towards a critical fit helps a relationship to see the fitting merger and securing open gateways, which helps it to make higher execution. Skills transferred across different business entity reached it maximum impact when both strategic execution and engagement exists (blended accordingly).

Genuine execution of an engagement is controlled by the technique institutionalization in the utilization environment. In any case, the level of execution may reduce if the use environment variables veer off from their expected behavior. A case of vital fit is shown by computers' maker Dell, which has aggressive procedure to give an assortment of adaptable tablets and PCs at a sensible cost to their clients, however postponed conveyance when contrasted with another organization's in-house offering approach crosswise over entrances and retail outlets (Christopher Calnan.2016). In such case, an inventory network system that guarantees adaptability and responsiveness is a perfect fit for Dell rather than another organization's strategy to create expanded items, with higher expense of managing business (Chopra, S., & Meindl, P.2006).

The alignments between internal and external elements relevant for the company is necessary to create a strategic fit correspond to corporate strategy (Scholz, C.1987). Leicester City success highlights the importance of stimulating both engagement and execution to create value for them. Balancing the two in an appropriate way creates a supportive environment to achieve their mission and goals hence produced the desired outcomes. Viva Leicester!

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A Modified Model for the Evaluation of the Academic Conferences' Quality

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Abstract: This paper uses the method of literature review and summarizes the two perspectives of the quality evaluation of the academic conferences, including the perspective of the status of academic conferences and influential factors of the quality, and building and evaluating an evaluation index system for the quality of academic conferences. The evaluation system of American Customer Satisfaction Index (ACSI) is a wildly used to evaluate the quality accurately, it is necessary to consider academic conferences as the process of servicing delegates and considering delegates as service consumer, and based on this, this paper establish a modified model.
Key words: Academic conferences; ACSI model; Quality evaluation

1 Introduction

With the increased level of globalization, the development of science and technology in China and abroad is getting increasingly closer, and academic exchange activities also continue to increase. By the end of 2015, 60000 Academic exchange activities were organized by the Association for Science and Society, which had 5.72 million participants and 1000,000 papers were presented. With the increase in domestic and international academic exchanges, the number of associated activities and participants are rising. The organization of academic conferences in China is still developing therefore, most of academic conference themes are not clear, the communication level of participating academic papers and conference reports is not high, and countless problems such as unreasonable organizational formats and agendas always emerge. Although some academic conferences are organized on a large scale, the participants do not get much valuable gains [1]. Moreover, some of the academic conferences are organized without considering their academic effectiveness and just for fulfilment of formality. Consequently, these flaws lead to a huge waste of conference resources (Xiao Jianhua, et.al, 2009). According to a survey, the overall quality of academic conferences organized in China is not high and the experience of participants is poor (Chen Shijun, Liu zhou, 2008). Therefore, improvement of the quality of academic conferences has become a significant issue that is faced by researchers, conference organizers and the Association for Science and Society. In order to improve the quality of academic conferences, scientific evaluation of their quality should be made first.

2 Research and Evaluation of the Quality of Academic Conferences

The research on the quality of academic conferences started late in China. At present, research on the quality of academic conferences is mainly classified into two categories: one is focused on the status of academic conferences and influential factors of the quality; the other is focused on building and evaluating an evaluation index system for the quality of academic conferences.

1) Influential Factors of the quality of academic conferences

Liu Xing-ping considered that the quality of academic conferences depends not only on the target system, organizational structure, communication, operational processes and other factors, but also on the level of each factor and the degree of coupling between elements of various factors (Liu Xingping, 2010). Huo Guoqing and others have found that the quality of academic conferences in addition to be related to the use of language is influenced by many other factors like the theme, level of papers, the attitude of representatives and so on (Huo Qingguo et al,2008).

2) Building and evaluation of the evaluation index system for the quality of academic conferences

Liu Guo-wei systematically analyzed the process of academic conferences and proposed that the evaluation index system of the quality of academic conferences should be built by considering five aspects i.e. subject content, the overall level of papers, the level of seminars, and reflections of the participants (Liu Guowei, 1991). Zhang Zi-li evaluated that the quality of conferences is mainly based

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on conference topics, the level and efficiency, the atmosphere and affairs etc. He also proposed that the evaluation should be done according to the type of conference (Zhang Zili, 1991). Based on the principles of fuzzy set theory, Yang Zhi-wen established a multidisciplinary comprehensive quality evaluation system of academic conferences, mainly including the theme, papers, academic communication, data management etc. (Yang Wenzhi, 1992). Yang Min considered using the fuzzy set model for the evaluation is too complicated to operate. He put forward scorecard method of the five indicators of the conference and the level of papers to evaluate the quality of academic conferences (Yang Min, Bi Xiao-jing, 1994).

3 Modification of the ACSI Model
3.1 ACSI model and its application
The evaluation system of American Customer Satisfaction Index (ACSI) is a wildly used CSI system designed and improved by Dr. Fornel according to the Swedish Customer Satisfaction Index improved model (SCSB). It is a new type of measurement system focused on the customer to evaluate and improve organizational performance, and is organized and implemented by the American Society for Quality (ASQC), the University Of Michigan School Of Business Administration, and the National Quality Research Center (NQRC) (Wu Jiannan, Zhang Meng, Huang Jiawei, 2007).

Construction of the entire structure of evaluation is based on cause and effect that places ACSI in a chain of causation. The chain of causation starts from early factors like quality expectations, perceived quality and value which influence the customer satisfaction, and ends in customer complaints and/or loyalty (Lin Hui, 2005).

Specifically, the customer satisfaction is determined by feelings of the customer in the purchase and use of the product experience, Product quality and value generating actual experience. If there is low customer satisfaction, it will produce customers' complaints and it will decrease the degree of customer loyalty.
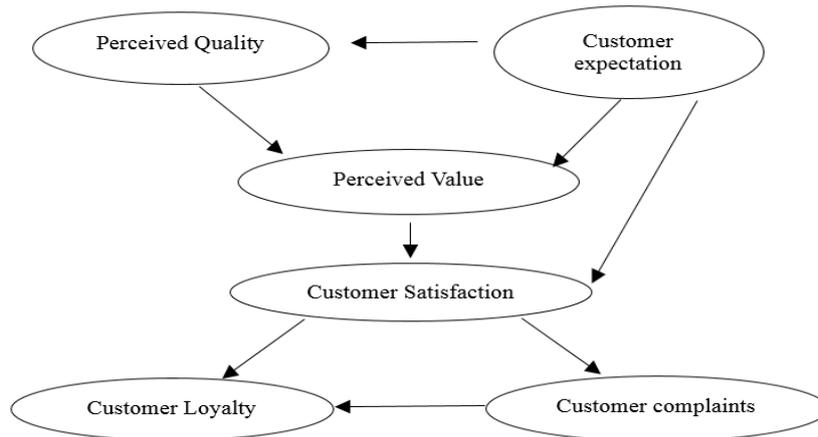
Figure 1　ACSI Evaluation System Diagram

3.2 Modification of the ASCI model and the connotation of variables
We can use the ACSI to evaluate the quality of academic conferences by considering academic conferences as the process of servicing delegates and considering delegates as service consumer. There are similarities between academic conferences and the traditional service, but there are some differences as well. Therefore, if the ACSI model is used in evaluating academic conferences in China, modification of this model is necessary for incorporating its unique characteristics. Hence, factors such as the academic status of organizers and conference level determines that a conference have the ability to generate high level academic papers and reports, propose innovative topics, and attract influential experts and scholars. Considering that the conference level has a relatively great impact on quality expectations, perceived value and satisfaction of delegates, on the basis of the original model we include the conference level as the exogenous variable. The modified ACSI delegates' satisfaction model as shown in Fig.2.
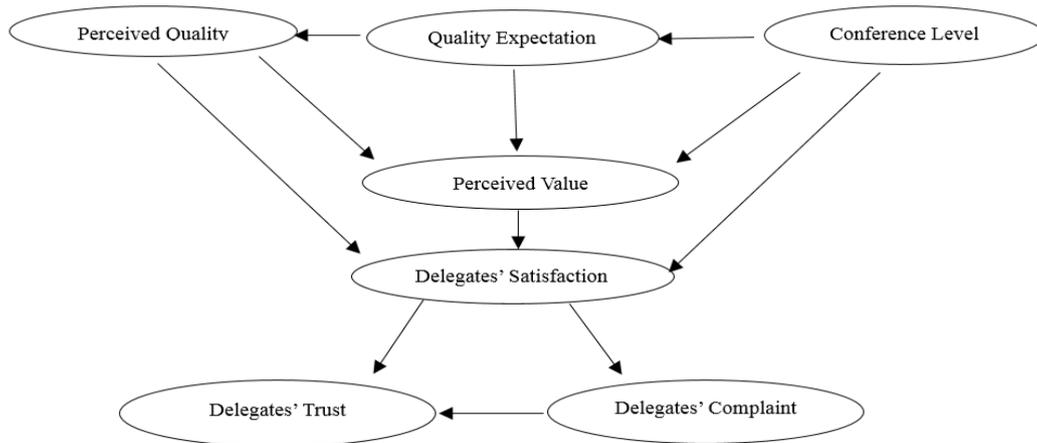
Figure 2   The Modified ACSI Delegates' Satisfaction Model

The delegates' satisfaction model includes two parts: one is measurement model representing the relationship between latent variables and observed variables; the other one is structural equation model indicating a causal relationship between latent variables. Formula for the structural equation model is given as:

$$\eta = B\eta + \Gamma\xi + \zeta \tag{1}$$

In the formula, $\eta = (\eta_1, \eta_2, \eta_{3...}\eta_m)'$ and $\xi = (\xi_1, \xi_{2,}\xi_{3...}\xi_n)$

are endogenous and exogenous latent variables respectively; ζ is a stochastic disturbance term; η is the unexplained part; $\Gamma(m \times n)$ is the coefficient matrix of the exogenous variables ξ, describing effects of the exogenous variables ξ to endogenous variables η; $B(m \times n)$ is the coefficient matrix of endogenous variables η, influencing each other; m is the number of endogenous latent variables, and n is the number of exogenous latent variables, and $E(\xi) = E(\zeta) = E(\eta) = 0$.

The latent variable expression of delegates' satisfaction model is given as formula (2):

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ \beta_{21} & 0 & 0 & 0 & 0 & 0 \\ \beta_{31} & \beta_{32} & 0 & 0 & 0 & 0 \\ 0 & \beta_{42} & \beta_{43} & 0 & 0 & 0 \\ 0 & 0 & 0 & \beta_{54} & 0 & 0 \\ 0 & 0 & 0 & \beta_{64} & \beta_{65} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \end{bmatrix} + \begin{bmatrix} \gamma_{11} \\ 0 \\ \gamma_{31} \\ \gamma_{41} \\ 0 \\ 0 \end{bmatrix} \xi + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \\ \zeta_5 \\ \zeta_6 \end{bmatrix} \tag{2}$$

While, The exogenous latent variable ξ =conference Level, the endogenous latent variable η_1 = quality expectations of delegates, the endogenous latent variable η_2 = perceived quality, the endogenous latent variable η_3 = perceived value, the endogenous latent variable η_4 = delegates' satisfaction, the endogenous latent variable η_5 = delegates' complaint, the endogenous latent variable η_6 =delegates' trust.

The model of exogenous observed variables:

$$X = \lambda_x \xi + \delta \tag{3}$$

X is the vector of 2×1, which is two observed variables of the exogenous latent variable ξ; λ_x is the matrix of 2×1, which is a matrix composed of observed variables and latent variables; ξ is the vector of 1×1, the exogenous latent variable; δ is the vector of 2×1, which is the measurement error of observed variables influencing exogenous latent variables.

The formula (4):

$$\begin{bmatrix} X_1 \\ X_2 \end{bmatrix} = \begin{bmatrix} \lambda_{11} \\ \lambda_{21} \end{bmatrix} \xi + \begin{bmatrix} \delta_1 \\ \delta_2 \end{bmatrix} \tag{4}$$

X_1 is the influence depth and level of academic conferences; X_2 is the academic status of organizers in the field.

The model of endogenous observed variable:

$$Y = \lambda_y \eta + \varepsilon \tag{5}$$

Y is the vector of 25×1, which is the observed variable of endogenous latent variable η; η is the vector of 6×1, which is 6 endogenous latent variables; λ_y is the matrix of 25×6, which is the impact factor of observed variables and endogenous latent variables; ε is the vector of 25×1, which is the measurement error of observed variables influencing endogenous latent variables.

The delegates' satisfaction is consistent with the calculation of ACSI method, as shown in formula (6).

$$CSI = \frac{E[\xi] - \min[\xi]}{\max[\xi] - \min[\xi]} \times 100 \tag{6}$$

In the above formula, ξ (the η_4 in the formula (2) is the latent variable of the delegates' satisfaction, $E[\xi]$, $\min[\xi]$ and $\max[\xi]$ respectively represent the expected value of variables i.e. the minimum and maximum values.

Formula (7) and (8):

$$\min[\xi] = \sum_{i=1}^{n} \omega_i \min(x_i) \quad (7) \quad \max[\xi] = \sum_{i=1}^{n} \omega_i \max[x_i] \tag{8}$$

In the formulas, x_i is three observed variables of the delegates' satisfaction, which are delegates' satisfaction on the overall quality of conferences, the conference's satisfaction compared with the expectation, and the conference's satisfaction compared to the idea of conference; n is the number of measured variables; ω_i is the weight; the scope of the delegates' satisfaction is [1,10]. Because numbers in the scope are non-standard measuring values, weights in the formula are calculated by non-standard weights, and the calculation formula can be simplified to the formula (9):

$$CSI = \frac{\sum_{i=1}^{3} \omega_i \overline{x_i} - \sum_{i=1}^{3} \omega_i}{9 \sum_{i=1}^{3} \omega_i} \times 100 \tag{9}$$

By specifying measurement of the satisfaction of conference through the participants only, we create an evaluation model focused on the "delegates' satisfaction". The core values of academic conference are; the spread of academic information, the realization of knowledge sharing, and the promotion of scientific and technological innovation (Xiao Jiahua, etal, 2009)[3]. Therefore, in addition to structural variables of the ACSI itself, this paper adds other indexes in the ACSI model system, such as conference's organizational level, the level of papers and reports, participating costs of delegates and so on. The evaluation index system of the delegates' satisfaction is shown in Tab. 1.

Table 1 Evaluation Indicators of the Delegates' Satisfaction

The secondary indicators	The third indicators
Conference level ξ	x1= The influence depth and level of academic conferences x2The academic status of organizers in the field
Conference quality expectations η_1	y1=Before attending，overall qualityexpectations y2=Expectations for the conference organization and hardware facilities y3=Expectations for the degree of preparation and the agenda y4=Expectations for the academic and democratic atmosphere y5=Expectations for academic papers and reports y6=Expectations for the theme y7=Expectations for research achievements in related fields y8=Expectations for the ability to resolve the pending issues in related fields
Conference quality perceptions	y9=After attending, the overall quality Perceptions y10=Perceptions for the conference organization and hardware facilities

η_2	y11=Perceptions for the degree of preparation and the agenda y12=Perceptions for the academic and democratic atmosphere y13=Perceptions for academic papers and reports y14=Perceptions for the theme y15=Perceptions for research results and Processed in related fields y16=Perceptions for the ability to resolve the pending issues in related fields
Perceived values η_3	y17=Perceptions about the conference quality, compared to the cost and energy spent in conferences y18=Perceptions about attending prices, under the given quality of conferences
Delegates' satisfactions η_4	y19=The overall satisfaction of delegates y20=Satisfaction compared to the expectations y21=Satisfaction compared to idea of conferences
Delegates' complaints η_5	y22=The possibility of warning colleagues or peers not to attend y23=The tendency of complaining to other participants
Delegates' trusts η_6	y24=The possibility of recommending colleagues or peers to attend y25=The possibility of participating again

4 Conclusions

This paper focuses on establishing a modified ACSI model to evaluate the quality of academic conferences. To incorporate Chinese unique characteristics, the modified model contains the following factors: perceived quality, quality expectation, conference level, perceived value, delegates' satisfaction, delegates' trust, and delegates' complaint (shown in Figure3).
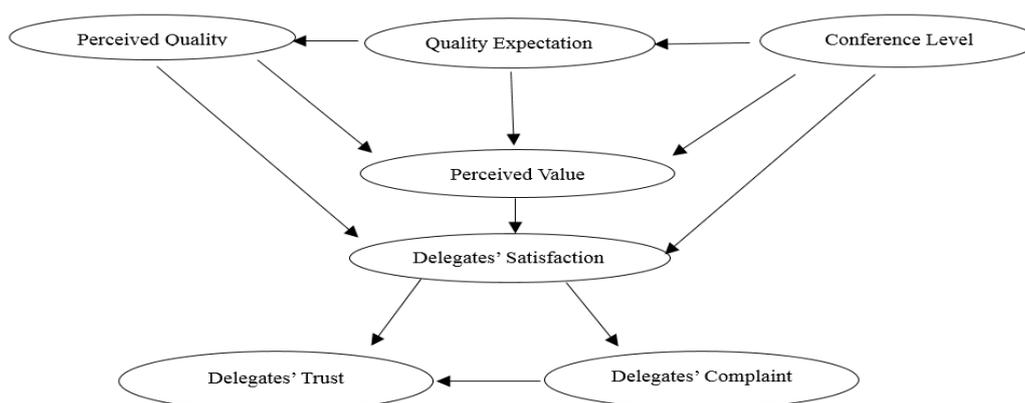
Figure 3   The Modified ACSI Delegates' Satisfaction Model

As an applied research of the ACSI model, the research aims to find a method suitable to evaluate the quality of academic conferences. However, there is no empirical method in this paper, and further research is needed to testify the reliability and representativeness of the index system. With the development of the quality evaluation system for academic conferences we can gradually establish a database of the quality of academic conferences on regional and national level which can improve the quality of academic conferences.

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Study on the Paths to Improve Innovation Ability of College Students

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Abstract: Under generally social background of fierce employment competition at present, "mass entrepreneurship and innovation" has been regarded as a new engine of economic development in China, presenting a new pattern, a new type of operation and a new highlight of economic development. This article is based on researches of predecessors and puts forward that knowledge is the basis, ability is the core and character is the guiding direction of innovation quality of college students. Meanwhile the paper thinks that knowledge, ability and character are three dimensions of innovation quality, building the paths to improve innovation quality of college students "through correct values to shape good character of college students, through innovative practice to promote mutual transformation of knowledge and ability and through humanistic quality education to promote integrated development of college students". It concludes that the improvement of innovation quality of college students "not only needs government, school and family to create good conditions but also needs college students to extend individuality in self-education and self-cultivation".
Key words: Innovation ability; College students; Knowledge; Ability; Character

1 Introduction

The concept of "innovation" is first proposed by the American-born Austrian economist J.A.Joseph Alois Schumpeter in the book "Theory of Economic Development" in 1912. In recent years, many scholars have study on "innovative quality" and some of them think that innovative quality of human is resulted from interaction of several factors, which include individual's intrinsic motivation, innovation ability and skills as well as knowledge and abilities in related fields (Ambi1e, 1983). American scholar in mental development John Chaffee proposed the five methods to cultivate innovative quality: fully and further discuss creative environment, try to develop the best state of mental resources, make efforts to promote the production of creative thinking spark, reserve time for making creative thinking, timely catch and track the creative thinking spark (John Chaffee, 2001). From the general constitution of innovative quality, Zhang Shuchun divides the universal creative quality into five contents, including basic skills, innovative thinking ability, practical ability, innovative spirit and innovative personality (Zhang Shuchun, 2007). Chen Hong thinks that innovative quality is the core of talent quality, consisting of three basic elements, such as innovation consciousness, innovation ability and innovation personality (Chen Hong, 2009). Xie Chenlan and Wang Yan conclude the content of innovative quality into three aspects of innovation awareness and innovative thinking, professional scientific innovation ability and innovation personality traits (Xie Chenlan, Wang Yan, 2012). According to national strategic deployment, universities of China are positively exploring law of growth of innovative talents and carrying out cultivation of innovative talents. However, theoretical problems such as the composition of innovation quality of college students and how to improve innovation quality of college students very important for innovative talent training need further investigation. This article tries to analyze structure of innovation quality of college students, builds paths to improve innovation quality of college students and provides theoretical reference for innovative talents training of China.

2 Structure of Innovation Quality of College Students

It is well-known that comprehensive quality of people is a multi-layered and complicated system structure of "all around development of moral, intellectual, physical, aesthetics and labor education" and embodied in knowledge, intelligence, technology, ability, mentality, physical power, emotion, thought and morality. At present, it is impossible to use unified and accepted developmental standard to standardize quality structure of a people. Scientific research shows that various types of talents with comprehensive quality required by the society can be shaped through modern scientific education. "Quality is the integration of relatively stable accomplishments such as knowledge, ability and character of individuals formed and developed under combined action of influence factors such as congenital physiological basis and acquired environment and education." Innovative knowledge, innovation ability

and innovative character naturally form structure of innovation quality of college students, namely three dimensions of innovation quality of college students. They are relatively independent and interpenetrate. Knowledge is the basis, ability is the core and character is the guiding direction of innovation of college students.

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                              │  innovation ability │
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         ┌────────────────┐   ┌────────────┐   ┌──────────────┐
         │   knowledge    │   │   ability  │   │  character   │
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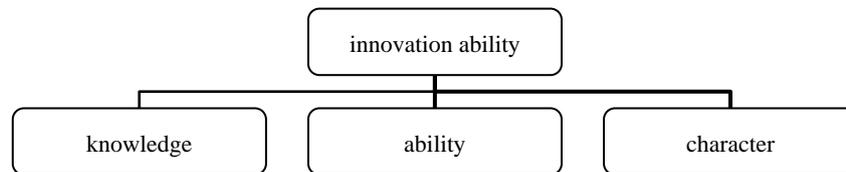
Figure 1   Structure Chart of Innovation Quality

2.1 Knowledge is the basis of innovation of college students

As achievement of human perception, knowledge plays an important role in breeding of human being and social development process, as a concentrated expression of spiritual civilization of human being. The conception of knowledge is always one of the themes of academic exploration of human being. Because knowledge is multidimensional, complicated and uncertain, and the connotation is extended continuously, people have not reached a consensus on it. Up to this day, there is not a universally accepted definition of knowledge. Understanding of researchers in different fields on knowledge is different. One of the reasons is that it lacks "restriction" on knowledge, without a core domain and research basis. Innovation bases on profound knowledge of human being. In the process of innovation practice activities, human beings ceaselessly break through existing cognition. As a special social group, college students have the advantage that they have solid professional knowledge, which is the basis of innovation of college students as well as core competitiveness of innovation. According to development experience of foreign countries, "scientific and technological innovation and knowledge innovation of college students are important forces to promote structural transformation of the economy and drive the progress of social economy". Besides, open mind of college students can help them to learn related knowledge on business, management and law to a large extent.

2.2 Ability is the core of innovation of college students

Many countries have focused educational reform on training of students' ability since the 1990s. As essential power of people, ability contains knowledge and character of a person. However, in different historical background, the connotation endowed by the society on people is different, too. In modern society, knowledge economy begins to take shape. Multiple intelligences burst out freely. Core technology is venerated by people. Ability will become important condition to produce knowledge and innovate in technology. It is embodied in ability of people to respond to nature as well as creatively break through all sorts of bottlenecks in practice process (Yang Jie, 2014). "Ability" is the substantive characteristic of "what makes us human". Ability includes many aspects with multiple layers and has close relationship with external existence, life and development of people as well as awakening, production and satisfaction of inner consciousness of people. For college students, it is also the same. Education experience of different college students may be similar and professional knowledge and technology reserved by them is also similar, but the innovative results may be totally different. Tracing to its source, the "ability" plays a vital role. The ultimate purpose of innovation education is not to let students master more and more knowledge. After receiving knowledge, students only have materials for innovation. The key is to extract, analyze, select and classify related knowledge, and then reprocess and reproduce through appropriate compound, recombination and adding new components. This process is very important for improving innovation ability of college students. Improvement of ability is the essential embodiment of individual innovation development, the core of innovation quality of college students. In practical activities of innovation, it is embodied as self-survival and self-development. It is the ability to smoothly realize innovation objective and self-conscious response to conform to the era of knowledge economy.

2.3 Character is the guiding direction of innovation of college students

Character is not a new vocabulary. Since the time of Ancient Greece, one of the responsibilities of education is to let people become smart and better and focus on shaping character. "Genius is always worshipped by people, but character can win respect of us. The former is rich fruit of superior intelligence; the latter is achievement of noble soul. However, in the long run, soul is the master of man's life. Geniuses win social status by virtue of their intelligence, but people with noble character gain reputation with their conscience." "Teaching wisdom instead of teaching morality is like cultivating

the root of the trouble." "Talent" and "wisdom" here mean that this man is very smart and brilliant, and mainly refer to "knowledge and ability" mastered by people. "Morality" focuses on "ideology and morality and ideological character" of people. In the final analysis, it refers to "character" of a people. Sima Guang makes incisive explanation in his work of History as a Mirror, "Ability is the support of morality; morality dominates ability". Confucius says, "If simplicity surpasses literary talent, people become crude. If literary talent surpasses simplicity, people become superficial. Gentleman shall have proper temperament and etiquette. … People take righteousness as the noblest moral character. If people have foolhardiness without righteousness, they will rise in revolt. If vile characters have foolhardiness without righteousness, they will steal." Here, the "literary talent" refers to "knowledge". "Foolhardiness" refers to "ability". "Simplicity" and "righteousness" refer to "character". Gentleman shall have matched knowledge, ability and character. It is exactly the same as "equal stress on integrity and ability" and "taking morality as first" frequently mentioned by us. Knowledge and ability become different forces if they are mastered by different people. It involves character of people. If people have knowledge and ability but without good character, especially for high-level talents, such as college students, if they lack morality, the more knowledge they grasp, the stronger ability they have and the more dangerous they will be, even become disaster. Knowledge and ability must be restricted by character. Character guides direction for innovation quality of college students as well as important guarantee for sustainable development of college students.

3 Paths to Improve Innovation Quality of College Students

Main path to improve innovation quality of college students is to carry out innovation education. Innovation education is to solve problems of life purpose and meaning of college students fundamentally. Innovation education focuses on letting college students set up correct values and shaping good innovative character, promotes mutual transformation of knowledge and ability through innovative practice and strengthens humanistic quality education and facilitates comprehensive development of college students.
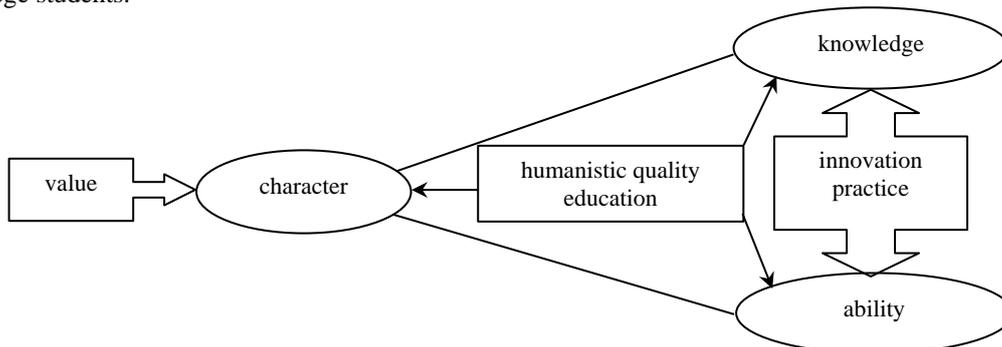
Figure 2   Path Diagram of Improvement of Innovation Quality

3.1 Set up correct values and shape good innovative character of college students

During transformation period of society, in real life, many "talented people" pursue personal petty profits, do not honor credibility and lack morality, swindle and bluff, even do things through violating the law and discipline at the cost of sacrificing national interest. When college students see funny business, they will be influenced, lack countermeasures and become "confused". As time passes, they gradually lose "ego", make original ideal and faith begin to shake, lose lively personality, give up the construction of self-spiritual home and go with the stream in collective unconsciousness. In the final analysis, the values go wrong. Innovation activities have close relationship with various interests, with many temptations. Values are "calcium" of college students on the way to innovation. Without correct values, the "ideal and faith" of college students will become infirm. College students will "lack calcium" and suffer from "chondropathy" and do harm to the society. Setting up correct values can help college students to cultivate good ideological and ethical standards, correctly analyze, judge and make decisions on the road to innovation and deal with relations between individual and society, individual and nation, individual and collective, reality and ideal as well as interest and morality in future development, comply with social morality, honor credibility, observe law and discipline and shape good innovative character. The process of shaping of college students' innovative character is also the process for them to unceasingly correct their understanding for innovation. It requires college students to recombine their

ideal and faith, find and affirm meaning of self-value in real life and continuously position themselves in society. In this process, college students shall establish corresponding innovative knowledge and innovation ability as well as acquire due attitude, emotion and value, connect personal lifecycle with innovation activities, choose "pure, noble and moral" innovative manner, experience meaning and value of life in innovation practice, pursue happy life and excellence and then continuously reach ideal state with improvement of innovation quality of college students under the background of "mass innovation". Heidegger says that the existence of people is survival. A person shall live "like this". To live is survival. "Like this" means the process of continuous production, self-creation and self-actualization. Base on true meaning of people, depend on understanding of life meaning, integrate college students with living world of innovation, and then change quality of college students into language of living practice (Li Qingyan, Yi Lianyun., 2009).

3.2 Pay attention to innovation practice and promote mutual transformation of knowledge and ability

Knowledge and ability have difference and connection, with mutual penetration and connection. Knowledge itself does not represent ability, but refer to basis of ability. The main purpose of learning knowledge is to form and develop ability. Meanwhile, the formation and development of ability also need the support of knowledge. Innovation activities have characteristics of strong practicality, wide sociality and big comprehensiveness and involve knowledge of many disciplines as well as need very strong ability to finish. But the energy of a person is limited. It is unrealistic also impossible to master all knowledge and ability. The selection of knowledge that needs to be used in innovation process shall base on actual requirements. It requires college students to apply their knowledge, practice while learning and improve ability to learn. From the perspective of current situation of higher education, "scissors difference" exists between theoretical knowledge mastered by college students and practical ability. That is to say, the theoretical knowledge mastered by them is superior but the level of practical ability is relatively low. Practical ability lags behind mastering of theoretical knowledge. Obvious degree of difference often exists between theoretical knowledge and practical ability. To achieve successful innovation, except for essential theoretical knowledge, college students must have innovation ability, which is the key to decide successful innovation of college students. It involves mutual transformation of knowledge and ability. Practice is the effective method for mutual transformation of innovative knowledge and innovation ability. In implementation process of innovation practice, it contains knowledge and experience of the world and people as well as value orientation of character and morality. Both of them are integrated and embodied in practical ability of people. In the process of innovation practice, college students will inevitably contact with real situation, understand all kinds of situation and encounter various difficulties and show "unification of value concern about 'what should I do' and rational question of 'how should I do'" in the process of getting out of trouble and overcoming difficulties. Finally, college students gain experience that "knowledge and ability can realize mutual transformation", and train real ability to deal with problems. For this purpose, on one hand, schools shall pay close attention to practical requirements of college students, add scene of social practice to classroom teaching design, establish effective model of innovative practice, confront real and complicated practical problems faced by innovation, and set up various forms of cooperative relationships with government, enterprise and association and enrich practical experience of college students through forms of "invite in" and "send out"; on the other hand, attach importance to close combination of theoretical knowledge and practice, help college students to timely and effectively integrate theoretical knowledge in innovation practice and promote mutual transformation of knowledge and ability through application of theoretical knowledge in practice.

3.3 Strengthen humanistic quality education and promote comprehensive development of college students

With progress of science and technology, material life of people becomes increasingly rich. "Irresponsible generation" appears in real life. They blindly indulge in a life of pleasure and comfort and pursue money, without strong social responsibility, only know to pursue material benefits and enjoy achievements brought by science and technology but do not know what they can do for the society. The root cause is education. Because we "pay attention to science and knowledge and think little of humanity and ability" for a long time and lack humanistic education, we cultivate not few talents "with knowledge but without ability and culture". The report of Education—Contain Wealth written by International Committee for Education in 21st Century for "UNESCO" requires schools to strengthen humanistic quality education and improve moral standards of students as well as to enhance social responsibility. Humanistic quality is also called cultural quality. It is the general performance of inner

self-restraint and temperament and external spiritual style and the basis of all qualities. Humanistic quality education means internalizing excellent cultural achievements into personality, temperament and culture and relatively stable intrinsic character of people through knowledge teaching and edification in environment (Hu Xianzhang, Xu Baogeng, Yuan Dening, 2009). Humanistic quality education that comes from development of people can arouse desire of students for innovation and self-awareness, effectively stimulate creative potential and innovate in inner driving force and make college students actively devote to innovation activities (Chen Hang, 2015). "Building of nine layers begins with a handful of earth", the bigger and thicker the base, the higher the building will be. For students, in order to complete historical mission of "innovation", without good humanistic quality as the basis, it is difficult for the building of college students to become high; even it is very high, it is easy for wind to blow it down. Therefore, it is necessary to strengthen humanistic quality education of college students, train humanistic spirit of college students, help college students to perceive survival wisdom and realize correct self-cognition, strengthen their social responsibility and make them become harmonious people with integrated development.

4 Conclusions

On Contradiction of Mao Zedong tells us that factors that decide development and changes of things include internal cause and external course. Internal cause is the basis and external cause works through internal cause. Government, school and family shall take powerful measures to strengthen innovation education, create dense innovation atmosphere, and use wisdom of culture and ecology to guide students to think, perceive and understand in it, lead them to purify soul, sublimate personality and carry out self-cognition, self-evaluation and self-improvement and then promote integrated development of them. College students shall integrate good conditions created by society, school and family with self-cultivation, extend individuality in self-education and self-cultivation and make efforts to realize self-transcendence and self-fulfillment as well as unceasingly improve innovation quality of their own. There are diversified methods and patterns to improve innovation quality of college students. The article only makes preliminary analysis and discussion. The issue on improvement of innovation quality of college students also needs us to keep pace with the times and implement continuous innovation.

Figure 3   Figure of Factors Influencing Innovation Quality

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Research on the Optimization of the SECI Model of Knowledge Learning of Leading Cadres in Colleges and Universities and the Design of Its Assessment Mechanism

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Abstract: This paper reveals the importance, necessity and the urgency of knowledge learning of leading cadres in colleges and universities under the background of the deep reform of the new era. Meanwhile, it presents the guiding function of the classical Leadership Competency Model, SECI Model and Kirkpatrick Model for knowledge learning. Based on the characteristics of higher education and the characteristics of knowledge learning of the leading cadres, this paper optimizes the SECI Model and Kirkpatrick Model and puts forward the operating mechanism of the optimized models.

Key words: Leading cadres in colleges and universities; Knowledge learning; SECI Model; Kirkpatrick Model

1 Introduction

The knowledge learning of leading cadres is a process that they are obtaining knowledge, enhancing quality, and improving behaviors in order to better integrate into the organization and the environment, and finally realize their benign development (Guoquan Chen & Lan Li, 2009). Knowledge learning of leading cadres can change the learning atmosphere of the organization, stimulate members within the organization to learn more (Yuklg, 2009), and then improve the group performance of the organization (Hirst, 2004). The importance of knowledge learning of leading cadres for individual and organization has been widely acknowledged by scholars and researchers home and abroad. Systematical researches have been done by them, including the research on the prerequisite knowledge structure of leading cadres, the research on the influence mechanism of knowledge learning of leading cadres on organizational performance etc. At present, the relationship between universities and society has experienced great changes. Meanwhile, the internal management structure of universities urges for optimization continuously. As a result, leading cadres in colleges and universities shoulder more responsibilities and are confronted with more difficult missions. In this context, it is essential for the leading cadres in the higher education to improve their political quality through learning the theories like the socialist core values system, and to enhance their professional skills through knowledge learning. However, the problems regarding to whether the classical SECI Model and the Kirkpatrick Model can effectively guide the knowledge learning of leading cadres in the higher education have never been solved yet. So, this paper optimizes the SECI Model and the Kirkpatrick Model based on the characteristics of higher education and the characteristics of knowledge learning of its leading cadres, attempting to reveal the micro-mechanism of knowledge learning of leading cadres in higher education and to utilize the mechanism to guide the practice of knowledge learning effectively.

2 The Theoretical Foundation of Knowledge Learning of Leading Cadres in Colleges and Universities

2.1 Leadership competency model

General leadership theories emphasize leaders' personality characteristics, while Leadership Competency Model theory attaches greater importance to their behavior and performance when they are at work (Chung-Herrera et al., 2003). The leadership competency of leading cadres in higher education embodies in "doing things right" and "doing right things", however, this leadership competency need them to improve the dimensions and levels of certain ability continuously through systematical knowledge learning. The connotation of Leadership Competency Model theory put forward by the academic world differs from one another, but it is widely believed that different competency leads to different working effects. Leadership Competency Model theory believes that the only and perfect learning method and test standard of knowledge learning has never existed, so the research results about the dimensions and levels of knowledge learning of leading cadres in higher education related to the Leadership Competency Model can not be accepted totally. From the perspective of Leadership Competency Model theory, the practice of knowledge learning that aims at raising the ability of leading

cadres in higher education, should not be restricted to constructing integrated competency model, but to examine the systematicness and effectiveness of knowledge learning (Hollenbeck,et al,2006). In fact, the knowledge learning of leading cadres has specific goal in specific tasks, so the practice of knowledge learning of leading cadres in higher education should have a focus and be qualified with diversity and pertinence (Hollenbeck et al, 2006). Some scholars shared the opinion that knowledge level exists as a part of Leadership Competency Model and the application of knowledge itself can be seen as a kind of ability. Therefore, it is possible for leading cadres in the higher education to improve their ability through the necessary and effective knowledge learning.

2.2 SECI model

In the classical knowledge learning model of SECI designed by Ikujiro Nonaka and Hirotaka Takeuchi, explicit knowledge and tacit knowledge can transmute into each other through four kinds of patterns, that are socialization, externalization, combination and internalization. According to the classical SECI Model, the leading cadres in the higher education need to strengthen the knowledge learning with the common characteristics, like education management, education economics, organizational behaviors etc. in order to realize the accumulation and quantitative variation of explicit knowledge. Meanwhile, they should summarize, refine and sublimate the knowledge mentioned above by considering the characteristics of higher education in the new era in order to form the tacit knowledge with the characteristics of pertinence, particularity and specificity. Through the tacit knowledge of the leading cadre in the colleges and universities, such as the party spirit faith, the political and self-discipline consciousness etc., is internalize in minds and externalize in behaviors, it is necessary to advertise and popularize the tacit knowledge by various kinds of methods. In the practice of knowledge learning of leading cadres in higher education, the forms like past experience communication, mental model sharing, mutual learning are commonly utilized. These forms help to revel the techniques and skills that cannot be expressed by words, and subsequently the new tacit knowledge will generate, realizing the transformation from explicit knowledge to tacit knowledge. According to the SECI Model, the knowledge learning must establish under the suitable "condition" and "platform" (Nonaka, et al,2000), including the condition for internal and external knowledge learning and the learning platform of online and outline in the era of the Internet. With the help of the suitable "condition" and "platform", the learning cadres can realize the transformation of explicit knowledge and tacit knowledge through instructive learning, reflective learning and interactive learning.

2.3 Kirkpatrick model

The Kirkpatrick Model was proposed by professor Donald.L.Kirkpatrick in 1959, it comprehensively assesses the efficiency and effectiveness of training through the level of reaction, learning, behavior, and result. Training is a process that teaching and learning supplement each other and benefit each other. Though the training evaluation model focuses on the evaluation of teaching and training, we should admit the fact that to certain extent, the teaching effect equals the learning effect. As a result, it is safe to say that the Kirkpatrick Model can also be utilized to guide knowledge learning of leading cadres in the higher education. To be specific, the Kirkpatrick Model includes four aspects that are, subjective feeling, objective numbers, practical application and value transformation (Bates, 2004). From the perspective of Kirkpatrick Model, the assessment of knowledge learning has a premise, that is, the leading cadres in the colleges and universities should be satisfied with trainers, training theme, training method, training place etc. Knowledge learning starts with the goal of achieving the knowledge with expected quality, stops at the application of the knowledge been learned, aims at solving the problems the leading cadres of higher education confronted in their work, and finally changes the leading cadres' working behaviors and improving the productivity. The Kirkpatrick Model not only can help to evaluate the training efficiency, but also can be utilized to judge the effectiveness of learning. Based on the analysis above, the knowledge learning of leading cadres in higher education should take personal preference for knowledge as well as organizational value orientation of knowledge into consideration (Farjad, 2012). The knowledge learning of the leading cadres in higher education is a system engineering, covering the object, behavior, process and result of knowledge (Tian, 2015). None of the elements, stages and connection joints of knowledge learning can be ignored. Only in this circumstance, can the evaluation of knowledge learning of leading cadres in the higher education be scientific and effective.

3 The Multiple SECI Model of Knowledge Learning of Leading Cadres in Colleges and Universities.

According to the demands of reformation in educational field, higher education management need to attach greater attention to efficiency and fairness, balance the relation between reform and stability, and emphasize mass education as well as elite education. Moreover, it is essential for management department of higher education to adopt innovative measures based on the new relationship among government, school, and society, the new characteristics of students, and the new demands for talents. Under this circumstance, the explicit and implicit knowledge that the leading cadres in the higher education needed to finish their job is equipped with the characteristic of timeliness, situationality and unicity. Therefore, the classical SECI Model can not satisfy the demands of knowledge learning of leading cadres in colleges and universities, and it is very necessary to optimize the classical SECI Model, as seen figure 1 and figure 2.
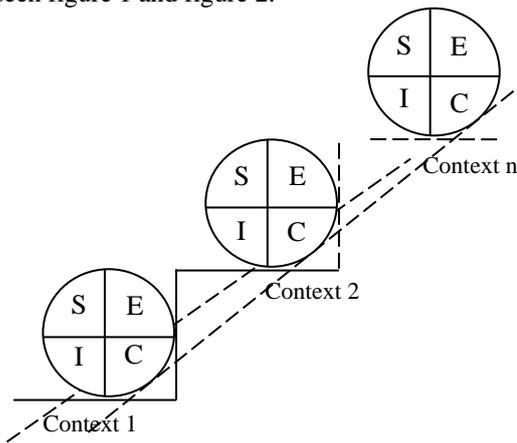
Figure 1   The Optimized SECI Model 1   **Figure 2   The Optimized SECI Model 2**
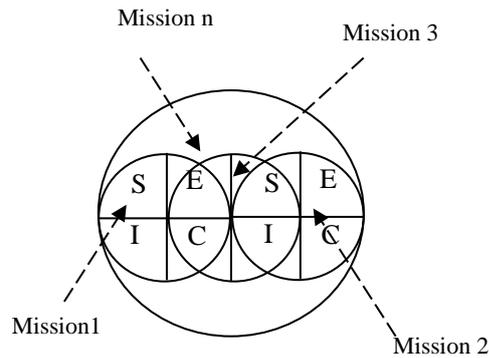
As seen in figure 1, the knowledge learning of leading cadres in colleges and universities should apply the continuously optimized SECI Model according to the different and escalated problem context. In the new era, the anti-corruption situation in higher education is still very grim, and the accident-prone links of integrity risk continue to upgrade. Colleges and universities still shoulder historic missions and heavy responsibilities of teaching, researches and social service in years to come. It becomes increasingly more important for them to satisfy parents, employing unit, teachers, students etc., and the systematicness of the leading cadres to coordinate the internal and external economic, social and political environment is continuously flourishing. In response to the situation mentioned above, the comprehensive knowledge including administration knowledge, education management, education economy etc., that the leading cadres possessed become increasingly more complex and more comprehensive. So, it is very necessary to upgrade and transform the knowledge accordingly. The optimized model of SECI shown in figure1is a multiple SECI Model established on the basis that the explicit and implicit knowledge that the leading cadres possessed continue to upgrade. The operating mechanism of the multiple SECI Model can be listed as follows.

1) Evolution of knowledge state. In different context, it is very essential for the leading cadres in the colleges and universities to promote the evolution of their knowledge state as job mobility raises new requirements for their knowledge and their pre-existing knowledge is experiencing the process of being forgotten. Moreover, it should be mentioned the fact that the value of the knowledge they have is continue to decrease, which makes the evolution of knowledge state more important and more valuable. As shown in figure 1, though the four transformation modes of knowledge (socialization, externalization, combination, and internalization) in different context share the similar form, the initial state of the knowledge transformation in the different context is basically different, and it is a kind of evolution process from socialization to internalization.

2) Knowledge stickiness breakthrough. The characteristics of knowledge stickiness make it very hard for the leading cadres in higher education to transform their knowledge from one context to another. The multiple SECI Model is aimed to break the limit of knowledge application, decrease the ambiguity of knowledge dissemination, and shorten the retardance of knowledge assimilation and transformation. Finally, it can realize the free switch among the four knowledge transformation modes (socialization, externalization, combination, and internalization) in specific context. Therefore, the multiple SECI Model is a rational description of knowledge transformation process that established on the

breakthrough of explicit and implicit knowledge.

3) Upgrading of knowledge energy level. The four different knowledge transformation modes (socialization, externalization, combination, and internalization) shown in figure 1 are in different energy state. Relatively speaking, the simpler the situation the leading cadres in higher education faced, the simpler the contradictions and conflicts they confronted will be. In this context, the knowledge that the leading cadres possessed will present obvious generality and universality and the knowledge ability of the leading cadres shown in SECI Model will be lower. Motivated by the working enthusiasm in education, affected by the specific target and mission, and guided by the pursuing of the answers of specific problems, the leading cadres are highly motivated to promote the upgrading of their knowledge energy level in the process of knowledge learning.

Different with the optimized SECI Model in figure 1, the optimized SECI Model of knowledge learning in figure 2 is the multiple SECI Model constructed under multiple missions. The explicit and implicit knowledge that the leading cadres in colleges and universities possessed has the quality of relativity. For example, the implicit knowledge related to the students' management and communication often manifests as explicit knowledge when communicating with teachers. The implicit knowledge about the management of lower grade students often manifests as explicit knowledge when managing the higher grade students. To be specific, the operating mechanism of the multiple SECI Model shown in figure 2 manifest as follows.

1) Overlap of multiple missions. The multi-dimensional goals of educational quality, scale and benefit in higher education require higher education management continue to pursue the pareto optimal state. The leading cadres in higher education shoulder the responsibility of researching teaching as well the responsibility of administration management. For them, the academic thinking does not equal with administrative thinking. Though some leading cadres' research areas and the administrative work they are responsible have some obvious overlap, the mission of these two areas is often relatively independent. In this context, the leading cadres must know how to realize the SECI transformation of explicit and implicit knowledge that across different tasks. As seen in figure 2, the mission 1 and mission 2 are relatively independent with each other, and when they are involved in the same mission, it is essential to realize the function of the knowledge of socialization, externalization, combination, and internalization and their combination.

2) Cross-border flow. In figure 2, there exist the situation of mission overlap (the situation that SECIs with different missions partly overlap with each other) and the situation that mission cross the border (the situation that SECIs with different missions tangent with each other). For the second situation, the knowledge that across the border shares the uncertainty of explicit knowledge and implicit knowledge, and it is possible to realize the transformation among the mode of socialization, externalization, combination, and internalization according to the specific requirement of particular mission. Colleges and universities themselves are the clusters for knowledge creation and dissemination and the multiple roles that leading cadres play and the multiple responsibilities they shoulder provide the prerequisite for cross flow of knowledge.

4 The Optimization of the Evaluation Model of Knowledge Learning of Leading Cadres in Colleges and Universities.

By applying the classical Kirkpatrick Model and taking the characteristics of multiple SECI Model of knowledge learning of leading cadres in colleges and universities, this paper design the evaluation model of knowledge learning accordingly.

Table 1   The Evaluation Table of Knowledge Learning of Leading Cadres in Colleges and Universities

Content of Kirkpatrick Model		Knowledge learning evaluation		Knowledge learning evaluation of leading cadres in colleges and universities based on the multiple SECI Model
Reaction evaluation	→	Subjective cognition of knowledge	→	Validity of cognitive classification of explicit knowledge and implicit knowledge
Learning evaluation	→	Knowledge acquire	→	Transformation between explicit knowledge and implicit knowledge
Behavior evaluation	→	Transformation from knowledge to behavior	→	Application of SECI of explicit knowledge and implicit knowledge
Result evaluation	→	Value creation of knowledge	→	Hypercyclicity of SECI of explicit knowledge and implicit knowledge

1) Validity of cognitive classification of explicit knowledge and implicit knowledge. The first level

of Kirkpatrick Model is for the reaction evaluation, to be specific, the trainees judge the subjects, mediums, methods, and channels of knowledge dissemination initially. From the perspective of the subject (the trainees) of knowledge learning, the Kirkpatrick Model focuses on the external factors that influencing knowledge learning, not on the knowledge itself. So, the evaluation of the first stage of knowledge learning of leading cadres in colleges and universities is based on the subjective cognition of explicit and implicit knowledge. And it is necessary to scientifically classify explicit knowledge and implicit knowledge by taking the situation and mission into consideration. From the perspective of multiple SECI Model, the focus of knowledge learning evaluation in the first stage is that whether the leading cadres in colleges and universities effectively and efficiently understand and accept the explicit and implicit knowledge. The answer to this question decides whether the leading cadres can flexibly and efficiently utilize the knowledge in subsequent knowledge learning.

2) Transformation between explicit knowledge and implicit knowledge. The evaluation of knowledge learning of leading cadres in the second stage based on multiple SECI is different with that of Kirkpatrick Model. The Kirkpatrick Model was utilized to judge the acquired knowledge objectively, and it focuses on whether the amount and quality of knowledge the trainees acquired can meet the expected goals. However, from the perspective of multiple SECI Model, the object of knowledge learning evaluation in the second stage is the explicit and implicit knowledge after the process of socialization, externalization, combination, and internalization. In this stage, the knowledge learning evaluation of leading cadres in colleges and universities focuses on whether the different type of explicit and implicit knowledge can transform into each other according to the specific context and missions.

3) Application of SECI of explicit knowledge and implicit knowledge. Similar to the behavior evaluation in the third level of the classical Kirkpatrick Model, the knowledge learning of leading cadres in colleges and universities based on SECI also emphasizes the transformation from knowledge to behaviors. But the difference lies in the fact that the knowledge application in colleges and universities is not just the knowledge application in the low and general level as colleges and universities are the important platforms and bases for knowledge creation. It is based on whether the different kinds of explicit and implicit knowledge and their combination can be applied in specific context and missions. Accordingly, this stage can be seen as evaluation stage for the behaviors and the results of knowledge learning of leading cadres in colleges and universities based on the SECI Model, which is the necessary link for promoting the transformation from knowledge to ability and behaviors.

4) Hypercyclicity of SECI of explicit knowledge and implicit knowledge. As the context of knowledge learning turns out to be more complex and the missions that leading cadres have become more difficult, the multiple SECI Model continues to develop from catalytic cycle and reaction cycle to hyper-cycle. In other words, the factors like thinking mode and political enlightenment of leading cadres in colleges and universities are act as the catalyst in the process of promoting the upgrading of the SECI Model. Accordingly, the knowledge learning evaluation in this stage focuses on efficiency of SECI evolution achieved by the regeneration, duplication, selection and optimization of explicit knowledge and implicit knowledge. It should be mentioned that the evaluation of the hypercyclicity of SECI of explicit knowledge and implicit knowledge is based on learning ability, learning motivation and innovation ability of the leading cadres in colleges and universities.

5 Conclusions

The classical SECI knowledge learning model and Kirkpatrick Model have important enlightenments for knowledge learning and the evaluation of its effects of leading cadres in colleges and universities. However, it is very necessary to optimize these two models according to the characteristics of knowledge learning of leading cadres in colleges and universities. This paper optimizes the SECI knowledge learning model and Kirkpatrick Model from the perspectives of multiple context and multiple missions. Moreover, it explains the meaning and content of the optimized models, and it represents operating their mechanism in great detail. It is believed that this paper contributes to expand the research area and research perspective of knowledge learning of leading cadres. The limits of this paper lie in the fact that this paper concentrates on qualitative analysis, which fails to demonstrate the research results through empirical research.

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An Innovative Practice of English Corners at Guangdong Peizheng College

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Abstract: This paper is to discuss the innovative practice of English Corner associated with Guangdong Peizheng College (GPC), a private college in Guangzhou, China. As an observation, the questionnaire and interviews were conducted to explain what an effective English Corner can be and how to maintain or increase its vitality. Based on the research, it is confirmed that the learner-based organization of English Corner and the full-play of foreign teachers contribute a lot to increase students' self-confidence, language competence, and communicative skills. It also helps to increase the competitive ability of the students graduating from private colleges or universities in job markets.
Key words: English corner; GPC; Innovative practice; Foreign teachers

1 Introduction

English Corner has been assumed as the best example of Chinese EFL (English as a Foreign Language) learners' independent and autonomous learning (Martyn & Voller, 1995). For this reason, it is very popular with the people, particularly with the students in universities of China. From many journals and newspapers, reports and articles on English corners can be found. They are mainly about how many people the English corner has attracted, how it is functioning and what roles it can play in English study. However, very few systematic practices are done about it, let alone investigations on it.

GPC is a second-class college. As far as English is concerned, most students in GPC are "false beginners". That is to say, although most EFL students in private or vocational colleges arrive with a wealth of vocabulary and a grasp of basic grammar rules after an almost twelve-year study of English, they hardly know their performance (how well they actually speak it). Guangdong is a province vibrant with economic development. Thousands of foreign-owned enterprises, joint venture enterprises are settled here, which provide many job opportunities concerned with English. In order to satisfy the demand of society and enhance the students' competition at this level, GPC employs many more foreign teachers than other colleges to attain its aim of producing high quality talents with solid practical English. Thus English Corner has traditionally been considered as part and parcel of students' life on campus as well as the teaching tasks for foreign teachers. They are not only required to teach regular classes, but also to hold at least one English Corner per week or an alternative activity. English Corner is a time for them to have casual interaction/conversation/presentation with students who elect to come. It's equivalent to a college professor's office hours. The topics of discussion are wide open and often chosen by the students themselves.

As full observers and regular visitors of English Corner at GPC in the past 3 years, the authors worked together with the foreign teachers to innovate English Corner based on the demand from the students who are eager to improve their English language. Many data are collected from observations on which the analysis is made. Also, this study chooses four groups of students at random to do a written questionnaire to explore the effectiveness of the innovative practice of English Corners as case study. Special attention was given to the students' attitude toward English Corners, important benefits the students have received, such as, their confidence, English language competence and communicative skills. The study also includes personal interviews with 6 students who are frequent visitors of English Corners. Lessons learned should have theoretical and practical implications for other private colleges and universities in China.

2 Literature Review

English Corner is a place where people who have the common interest in English come voluntarily and autonomously to practice speaking English. The participants may not know each other before they meet and their English proficiency level may be different. English Corner conforms to the communicative functional theory. According to linguists, Halliday and Brown, language learning has to be obtained in the process of communication by means of language and when learners employ authentic language to achieve meaningful communication in certain specific social context (Halliday, 1973 &

Brown, 1994). The presence of English native speakers in GPC makes it possible to create a favorable and authentic environment for communication according to the needs of the students.

Language learning, especially the foreign language learning, needs large amount of input and practice (Shu, 2006). So it is necessary for EFL learners to learn English spontaneously. Learning motivation has been considered a key point in EFL learning. Generally speaking, there are two basic learning motivations, — integrative motivation and instrumental motivation. The former refers to the great desires the EFL learners have for acquiring the English language and getting to know the people who speak this language. Through the interaction with the native speakers, the EFL learners expect they can have a better communication with them and have a deeper contact with them culturally. The latter refers to the interests the EFL learners have in grasping the English language and using it to attain their goals as a tool (Larsen-Freeman, 2000). It is rather a practical motivation, because it can help the EFL learners to get a better job, increase their income and improve their social status. There is no doubt that English Corner may serve as a place to ensure the students a sufficient comprehensible input and output.

Many linguists believe that the best environment for second language learning is the authentic and natural one. Different people have different personalities, some being extravert, others introvert. In formal classroom teaching the introvert students tend to keep silent, because of being afraid of making mistakes. But in a natural learning environment, they would not be confined to the words or expressions or the sentences they are asked to practice. They would express themselves more confidently (Rod Ellis, 1999). In such an authentic learning environment as English Corner, EFL learners have many opportunities to interact with authentic listeners. Their talks have real meanings. They are free to give their feedbacks and probe into whatever they are interested in. In this sense, English corner allows students to be in a language environment which is close to a natural one and acquire language skills and overall application abilities through language practice so as to achieve beneficial results.

3 Research Methods

The research methods include observation, questionnaire and interviews. They will be discussed separately.

3.1 Observation

One author of this paper has supervised the foreign teachers' teaching affairs for 3 years. This offers her a good opportunity to observe them by any means and from any stance. Since every foreign teacher in GPC is required to have at least one English Corner per week, how to organize the English Corner, how to make these English native speakers happy with those "false beginners" of English, and how to attract those undergraduates to it have become questions for the organizers to answer and consider about.

Effective English Corner relies on foreigners who join it. Giving foreign teachers freedom to be creative in English Corners is essential to their success. In view of the fact that each foreign teacher has at least a few good ideas, and they highly value volunteering and creativity, they are allowed to decide day and time, location and topic for their own English Corners (See Table 1).

The foreign teachers are very happy with the schedule. For saving space, the schedule shown is only concerned with 20 foreign teachers, whose family names are shortened for their sake. Most of them choose to do "open" English Corners, while quite a few would like to do some special topics in their English Corners. Take the IELTS English Corner for example. The students who plan to go abroad after graduation are eager to improve their listening and speaking. The foreign teacher holding this corner knows much as to how an IELTS examiner tests an IELTS student. The interactions with the foreign teacher are like a real test in an IELTS. The frequent practice in the English Corner is very helpful to the students who want to have a good knowledge of a real testing environment. Open talk is very popular with the students in attendance. They show a great interest not only in English but in foreign culture as well. Very often they would discuss with the foreign teachers about study abroad opportunities, job search strategies, and relationship problems they are facing in their daily lives. But "open talk" English Corner sometimes is not quite "open" at all. Before students come to English Corner, they may think of a topic they like to discuss. Students may also choose to go to their favorite English Corners, in which, the "open" talk may vary with each teacher to best suit their personality, style, preferences and values.

Table 1 below shows part of the schedule of English Corners in the fall of 2015. For the purpose of keeping English Corners under supervision, the attendance tracking system is set up and remains to be updated. Some data will be used as the data in research findings.

Table 1   English Corner Schedule (September 2, 2015)

Day	Time	Instructor	Subject	Place
Monday	10:30-12:00	Charity B	Open Talk	2109
	16:30-18:00	Phyllis B	Open Talk	2106
	19:00-20:30	David O	Open Talk	Language Lab A
		Alfredo M	Dancing	Language Lab B
		Elisabeth G	Drama	Students' Center 113
Tuesday	12:30-14:00	Amy H	American Accents	2117
	16:30-18:00	Fadia B	Open Talk	2117
	19:00-20:30	Bradley W	Open Talk	Language Lab A
Wednesday	10:30-12:00	Ame P	Middle East History	2114
	12:30-14:00	Cole Y	Open Talk	2109
	16:30-18:00	Samir Y	World Geography	1301
		Tasha S	Creative Writing	2109
		Matthew B	Music History	3204
	19:00-20:30	Jeffrey B	Business Communications	1301
Thursday	16:30-18:00	Michael G	IELTS English	2109
	19:00-20:30	Daniel L	Acting Corner	2110
		John O	World History	2501
		Andy L	Documentaries	1212
		Kyle T	Short Story Writing	2117
Friday	12:30-14:00	Bryan G	Open Talk	2118

3.2 Questionnaire

This innovative practice of English Corners in GPC has been implemented ever since 2013. In order to find out students' attitude towards English Corners, their motivation to attend English Corners, the frequency for their participation and their preferred topics, as well as favorable outcomes the students have received, a questionnaire was done among freshmen, sophomores, juniors and seniors, which included 8 items in all. The first two items are about basic information like sex and the grade they are in. The third item is about whether they like or dislike English Corner with the foreign teachers' participation and organization. The fourth one is about how often they attend English Corners. The fifth one is about their purpose of going to English Corners. The sixth one is about their favorite topics to discuss in English Corners. The seventh is what they think have been learned from the English Corner. Finally, they are asked about the biggest problem existing in English Corners. Besides item 5 and 7 which are multiple choices with 4 points, the other 6 items are single choice. 160 questionnaires were released and 149 were valid. Among them, 38 were answered by freshmen, 35 by sophomores, 37 by juniors and 39 by seniors.

3.3 Interviews

Six frequent participants in English Corners were chosen randomly to be interviewed about their personal experience in English Corners, and their ideas about the kind of practice at English Corners. Two students are sophomores majoring in English; two are seniors majoring in law and art design respectively; and the other two are juniors majoring in business administration. The face-to-face interviews contribute much to collecting the first-hand information about whether the practice is effective or not.

4 Research Findings

According to the observation, questionnaire and interviews, some favorable feedbacks about the English Corners at GPC can be obviously found. These will be analyzed specially from the data gathered from the research methods mentioned above.

4.1 Favorable feedbacks

4.1.1 Enjoy English Corners

Information obtained on Item 3 in the questionnaire shows that most of the subjects are satisfied with GPC English Corners with 23% of the subjects thinking highly of them (See Table 2). Two of the interviewed sophomores expressed that they chose to study in GPC simply because they learned that it provides many different English Corners on campus. They put it that they sometimes would come to English Corners 4 times a week, or twice a day. First, it is chiefly attributed to the fact that EFL learners

have many time choices, place choices and more importantly, topic choices (See Table 1). After class, they can choose to go to any English Corner they like. Second, after attending several English Corners, they will finally find the one or two English Corners that can satisfy their needs or fit for their taste. It is evident that English Corners offer a favorable condition for EFL learners.

Table 2   Like or Dislike of English Corners

Like most	Like	Not much Like	Dislike
35	80	34	0
23%	54%	23%	0%

4.1.2 Benefits from English Corners

One of the interviewed juniors put it, "At first, I had much trouble getting across what I wanted to say, only to stop in the middle of the talk because of being laughed at by other students. But now, I could exchange my ideas with the foreign teachers, though I know my English is far from perfect. I like the feelings of talking with them by trying to use what I have just learned in the classroom and expressing it in a real situation". Item 7 in the questionnaire is a question about the benefits the subjects received from English Corner, to which they can give multiple answers. The statistics on the answer also reveals that the subjects place "to talk with the natives from English-speaking countries in English Corners could make them more confident" as the first important benefit, the improvement of English listening and speaking as the second and the enhancement of their communicative skills as the third important benefit, although 17% of the subjects confessed that they gained nothing from English Corners (See Figure 1). This is coincidently in accordance with item 5 of the questionnaire, in which most of the subjects expressed that their first purpose of coming to English Corner is to conquer their psychological barrier when talking with foreigners. The purpose of improving oral English ranks the second, making friends with foreign teachers the third, while, on the contrast, only 6 subjects said that their purpose is to find a girl or boy friend (See Figure 2). Based on Figure 1 and Figure 2, it is found that what benefit the subjects most from English Corner is the improvement of confidence to talk with native speakers.
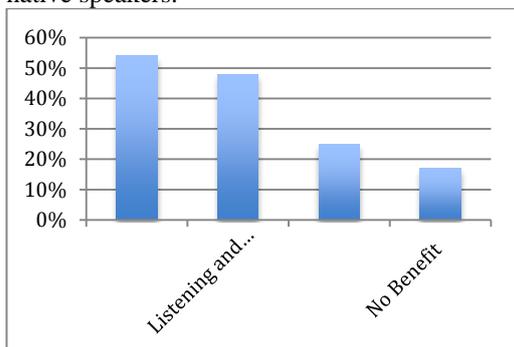
Figure 1   Benefits Received
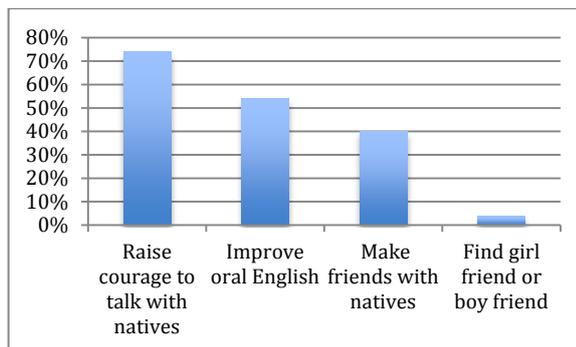
Figure 2   Purposes of Going to English Corner

4.1.3 Horizon widened

From the interviews with a senior who graduated last year and another senior who is going to graduate this year, the authors are happy to find that English Corners do play a great role in the turning point of their life. The graduated student is a girl who has great interests in art design. Her English is "poor", according to her, as she failed twice to pass CET4. Fortunately enough, she met a woman English teacher from America in the special topic English Corner (drama) who needed to find a student knowing how to do setting design for her drama play. She felt to be needed was a very nice thing. Her after-class time had been occupied by the activities organized by this English teacher ever since. When graduation was close, she found herself having no trouble talking with any foreign teachers at all. With the encouragement of the foreign teacher, she participated in a volunteer project in the United States. This girl, who had never been out of the boundary of Guangzhou, set her first foot on the land of Alaska alone. Four months later, she came back with many surprising stories. "It is a rewarding adventure," She explained very excited. "It is the first time I made a living by depending on myself in a completely strange country. My successful journey is owing to the practice in English Corners." Another girl who is going to graduate in June of 2016 said she had got a job offer in a foreign company where she was one of the three who successfully survived almost a hundred competitors. This foreign company did not take diplomas or school backgrounds as the important standard to judge its future employees. What they

cared was about practical ability and the fluency of oral English. "GPC," as she described, "offers students plenty of opportunities to realize their potentials, to a certain extent."

Special topics, such as business communication, and world geography in English Corners somehow, serve as the facilitators to attract the students to seek for the knowledge about other countries.

4.2 Existing problems

Though many favorable feedbacks have been mentioned, English Corners at GPC are far from satisfactory. The investigation on the frequency of attendance in the questionnaire shows that 4 subjects come to English Corner 4 times per week on average, 7 twice per week, 27 twice per month, 81 seldom come and 30 never come to it (See Table 3).

Table 3   Frequency of Attendance

Always 4 times per week	Often Twice per week	Occasionally Twice per month	Rarely	Never
4	7	27	81	30
2.6%	4.6%	18.1%	54.3%	20.1%

4.2.1 Motivation

More than 70% of the subjects confessed they rarely or never went to English Corner (See Table 3). This sounds contradictory with Table 2 where, most subjects expressed they liked English Corners. However, liking something doesn't mean doing it or involving in it personally. In this case "instrumental motivation," a concept introduced by Gardner and Lambert, in which the learner is motivated to learn another language for utilitarian purposes, such as furthering a career, improving social status or meeting an educational requirement (Larsen-Freeman, 2000), can be used to explain this matter. By observation, it is found that those learning English out of their own interest visit English Corner more frequently. According to the survey in the fall of 2015, about 42% of English Corner visitors were freshmen. It can be strongly inferred that they visited English Corners out of curiosity. When their curiosity is gone bit by bit, the number of students going to English Corner would decline definitely (See Table 4).

Table 4   Years (Unique Students)

Freshman	Sophomore	Junior	Senior	Super Senior	Unknown
529	313	271	136	2	0
42%	25%	22%	11%	0%	0%

The question of Item 8 the subjects answered in the questionnaire reveals that students know very well that they don't go to English Corner because of the lack of motivation (See Table 5). Most of them attribute the problem of English Corner to themselves, with only 25% of them thinking the fault should be found with foreign teachers and the organization of it. As most of the interviewed pointed out, "Many of our classmates are lazy enough." Distinctively, motivation is the biggest problem that has to be solved with the effort of everyone concerned.

Table 5   The Biggest Problem with English Corner

Problem with students	Problem with foreign teachers	Problem with organization	Problem with environment
112	24	13	0
75%	16%	9%	0%

English Corner is an extracurricular activity. As far as learning motivation is concerned, it is a rather complicated development of one's personality. How to make the learners of English interested in it remains to be a question for further discussion among not only the foreign teachers but the administrators of the school.

4.2.2 The problem with foreign teachers

Occasionally, some foreign teachers would complain that they would rather do formal English teaching in the classroom than English Corner, because they were often confronted with the same questions in English Corners, as "What is your name?" and "Where are you from?". They didn't like to answer the same questions again and again. It is not the fault of English learners, of course, because these are the questions they learned as beginners which were strongly rooted in their heart. They thought these were the very questions they should ask before starting the conversation as a new comer. Chinese education has produced many such mechanical students. So it is necessary for new foreign teachers who first come to China to learn something about English education in China and Chinese culture.

According to the interviewed, some foreign teachers would confine themselves to listening more

than guiding the students on the right way to express themselves in good English. It would be quite a waste of time for students at present listening to one student talk about some meaningless things for long. One of the interviewed reported in frustration that he once encountered a student struggling to tell a story about catching a cockroach in his dormitory at English Corner for more than 5 minutes. So a foreign teacher also needs innovations even in an English Corner. To be a good listener is a good quality. But to make an "open" talk a creative one may be the goal to pursue.

5 Conclusions

All of this being discussed above, it can be concluded that English Corner as an extracurricular activity in colleges is a beneficial and favorable means for those who desire to improve their English proficiency. In a private college like GPC, English Corner has not only attracted more students good at oral English to come, but provide an authentic environment for them to pursue their dreams. That is why most of the students like it in spite of the fact that many of them don't really visit it. Clearly, with the globalization of China, English Corner will not be out of date in a short period of time.

The research on observation, questionnaire and interviews indicates that the presence of foreign teachers from English-speaking countries at different times offers students alternative chances to speak English which meets the need of different participants. This helps the students find suitable topics to discuss and improve their English proficiency further. More importantly, EFL learners can gain confidence from the kind of English Corner.

No matter how popular English Corner at GPC is, it has some problems to be solved. With more than 40 foreign teachers present at English Corner once every week, the number of participants (See Table 4) seems a little small. Creating a study environment on campus is very imperative. On the part of the foreign teachers, they need to have a better knowledge of their students, the culture behind them and the education behind them.

As for the research itself, since the study is only limited to English Corners at GPC, it might not be fully applicable to other English Corners in other places. But in the authors' mind, the research of it may give rise to more innovative practices of it.

Though 3 years' innovative practice, the English Corner in Guangdong Peizheng College has formed its own distinctive features with a large number of foreign teachers involved in the participation and organization and a wide variety of topics covered in the discussion and presentation. However, to ensure a better future development, there's still a lot to do to maintain its advantages and improve its disadvantages. More reflections must be done as to how to take advantage of its abundant resources of foreign teachers, how to increase its popularity to attract more students with different learning motivations, both integrative and instrumental and how to meet the different demands of students. It is strongly advisable to regard English Corner as an effective means of second-classroom learning with its potential to provide a large amount of input and output, which is complementary with classroom learning with its insufficiency of listening and speaking practice due to the limitations of time and space as well as the obligations of curriculum. Meanwhile, in addition to its helping improve the students' English language competence and communicative skills, our attention can also be paid to the great chances English Corner may create to train and enhance the participants' ability of English thinking and critical reasoning.

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Applying Badrul Khan's Octagon Mode in the Construction and Management of College English Blended-Learning System

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Abstract: Combining the advantages of traditional learning and web-learning, Blended-learning emerges as a new approach and brings new challenges. This paper examines the characteristics of Blended-learning mode and analyses Badrul Khan's Octagon regarding the elements to be considered in the course of E-learning. On the basis of the analysis, it offers advice concerning the construction of College English Blended-learning environment, and suggests a multi-dimensional, dynamic managing mode of the system.

Key words: College english; Blended-learning; Construction; Octagon

1 Introduction

It is universally acknowledged that traditional classroom teaching mode has its disadvantages. With its monotonous content and boring teaching methods, traditional courses can hardly arouse students' interest. As far as College English course is concerned, this problem is especially acute. What we usually see in the classroom is teachers imparting knowledge to be passively received by the students. It is generally believed that the passive mode is not likely to develop students' independent learning ability and is responsible, at least in part, for their poor language competence. At this moment, the wide application of multimedia and network technology in education has made the blended-teaching mode possible.

Blended-learning originally means the combination of classroom-based learning patterns such as conferences, labs, books, etc. with other learning patterns. For example, we may combine audio-video media with blackboard, integrate CA learning with traditional mode, or incorporate autonomous study with collaborative study. In recent years, blended-learning has been paid much attention to promote the efficiency in college English teaching. With the widespread of internet and rapid development in E-learning, the terminology finally took its current form in the 1990s. Then in 2006, blended learning system was defined by Bonk and Graham as a learning system that combines "face-to-face instruction with computer mediated instruction" (Curtis. J. Bonk, Charles. R. Graham, 2005). People focus on how to design and development the network teaching platform or teacher-student interaction platform. I think Badrul Khan's Octagon may help us to find the way to construct and manage college English blended-learning system.

According to the most of researchers' opinions, I think the Blended-learning may be understood in the following ways:

1.1 The blending of learning theories

Blended-learning takes place under the guidance of various learning theories intended for different learners and different learning objectives. These theories include constructivism, situated cognition theory, activity theory, exploring learning theory, the theory of humanistic learning, virtuality and reality combination (Sheng Juan, 2013).

1.2 The blending of learning resources

Learning resources, from elaborately developed on-line courses to mouth-to-ear instruction, from experience sharing among students to full-scale data accumulation, are integrated on the one-stop learning platform.

1.3 The blending of learning environments

A blended-learning mode exists in a student-centered environment where learners can participate in multiple learning activities, formal and informal, online or offline, directed or self-paced.

1.4 The blending of learning patterns

The incorporation of E-learning and in-class teaching means the integration of real-time and non-real time instruction, synchronous and asynchronous teaching, group study based on cooperation and net-based autonomous study, as well as discussion and collaboration.

According to Sigh & Reed, blended learning focuses on optimizing achievement of learning objectives by applying the "right" learning technologies to match the "right" personal learning style to

transfer the "right" skills to the "right" person at the right "time".

2 Badrul Khan's Octagon

Various elements are to be reckoned with for the construction of an ideal learning System and the effective management of the environment, and blended-learning has even higher requirements. Indian company NIIT released its white book on blended learning in 2002 (Alexander J. Romiszowski, 2004), pointing out that blended learning mode is composed of face-to-face learning, E-learning and self-paced learning. E-learning part being the core component, it is highly advisable to refer to the Octagon designed by Badrul Khan as the guiding principles before constructing the College English Blended-learning mode.
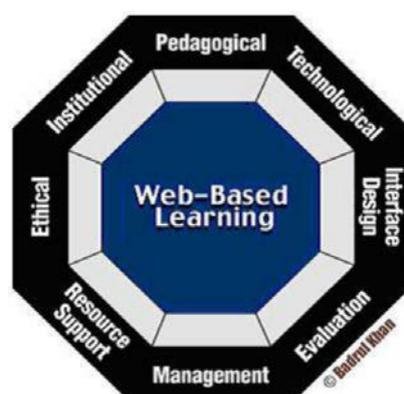
Figure 1   Badrul Khan's Octagon

According to Khan's Octagon shown above, the elements to be considered are as follows.
Institutional: organization, management, school affairs and support services.
Pedagogical: learning content analysis, learning objective analysis, web-learning design and strategies.
Technological: LCMS to supervise the learning content and LMS to control the transmission mode.
Interface Design: an interface to support all the composition elements and guarantee the switch from one into another.
Evaluation: assessment of curriculum materials and learner performance.
Management: management of all the learning activities as well as registration and authentification.
Resource Support: resources accessible for all the learners at any time.
Ethical: elements such as equality, multiculturalism and nationality.
Obviously, the construction and management of College English blended-learning system relies on the development in cross-discipline collaboration, involving instructional technologists, educational psychologists, cognitive scientists, computer scientists and engineers, data scientists, and assessment specialists.

3 The Construction of College English Blended-Learning Mode
3.1 Construction of web-teaching platform
Blended learning mode is a mode that combines in-class learning with web-learning. The critical part is the construction of the web-teaching platform (He Kekang, 2004). The first thing to do is establish a teaching resource database consisting blocks of knowledge. Secondly we should design the frame structure of network teaching platform that typically includes the following sections: 1) friendly interface to support all the composition elements; 2) web-learning navigation to specify curriculum resources, learning objectives, activities and tasks so that students won't get confused. 3) web-based materials as compensation and extension of the course book content, and websites for students to visit to find relevant information; 4) courseware section where students download PowerPoint teaching materials or watch video lectures, which is especially useful for students who want to review what they have learned and those who need to make up missed lessons; 5) on-line interaction module for communication between teachers and students, synchronous or asynchronous; 6) performance appraisal and self-testing section; 7) system management module.
3.2 Implementation of pedagogy

To efficiently improve the quality of College English teaching, it is advisable that teachers adopt task-driven teaching method as shown in figure 2.
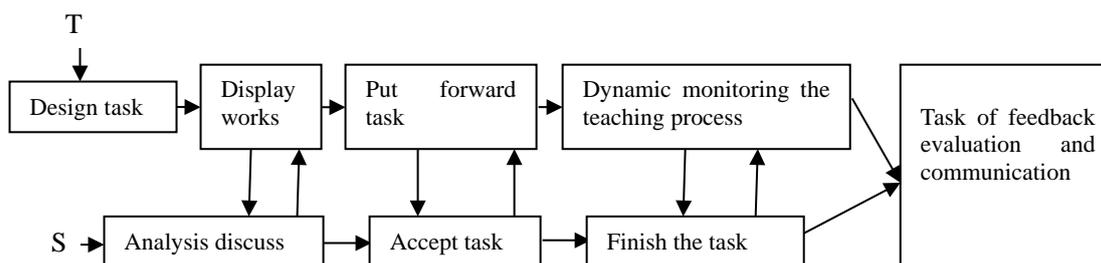
Figure 2   The Task-Driven Teaching Method

Teachers, after creating task situations, provide students with clues to solutions instead of telling them directly how to solve the problem. Students are no longer passive recipient of information from teachers. On the contrary, everyone has access to the database, can evaluate the accessible information independently, manage to accomplish the tasks on his own, and use the on-line testing system to test themselves. In other words, students can implement web-learning in different places any time they need as the system breaks the limits of time and space.

One disadvantage of web-learning is the lack of interaction between teachers and students, and communication among students, which may result in anxiety (Harvi Singh, 2001). Consequently, teachers are advised to adopt innovative teaching methods to avoid the problem. Teacher-student interaction, either synchronous or asynchronous, relies on various communication facilities such as BBS, messages, Q&A, or chat rooms (). Students pose questions on line at any time convenient for them, to be answered by teachers within a fixed amount of time. This guarantees balanced communication between teachers and students, and encourages students' active involvement in College English learning outside the classroom.

In traditional classroom, communication among students may take the form of debate, discussion, dialogue, or role play. In fact these can also be on the line. For example, teachers can encourage collaboration among students by setting up a virtual learning environment for a group of students to share their learning tasks. This is a private space where this group of students could study together, present their ideas, and load their learning tasks for others to review. Independent learning does not necessarily mean learning single-handed; instead, collaboration with others is an indispensible part of the learning process.

3.3 Feedback of students' performance

According to my teaching experience, students' performance indicate how well they have mastered the teaching content, and teachers' comment helps students adjust their learning strategies to improve learning efficiency. However, in the web-learning environment, the situation might be a little complicated. Since blended-learning means the mixture of traditional learning and e-learning, the performance assessment includes assessment of traditional assignments and that of e-assignments. Regarding the assessment of e-assignments, promptness is critical (Xia Yaowen, 2013). A student finishes the test on line or submits exercises on the platform, but the teacher fails to give a timely feedback. By the time the teacher does give the feedback, the student might have lost his enthusiasm or even forgotten about it. Thus feedback needs to be prompt, given soon after student completes a piece of assignment. In terms of web-learning, only when teachers incorporate their prompt feedback with students' e-portfolio can they have an all-round assessment of the students' abilities.

4 The Management of College English Blended-learning Mode

The management of the teaching process is one of the many important factors to decide the quality of education. Multimedia and web technology exerts profound influence on College English teaching, and brings new opportunities and challenges. In view of the characteristics and developing trend of Blended-learning system, it is recommended that universities implement a multi-dimensional, dynamic mode of management.

4.1 Teaching organization establishment

The management of Blended-learning mode involves various divisions and departments in the university: office of teaching affairs, finance section, state-owned property management office, modern

educational technology center, language labs, just to name a few (Yuan Pengfei, 1999). It is essential that all the sections join hands and work together to ensure the smooth running of the Blended-learning system. Under new circumstances of web-learning, the content and manners of management are subject to change, too. Administrators are expected to grasp the objective law of teaching and renew their ideas in accordance with the new trend. In order to do this, they need a good command of pedagogy, management and network techniques, and should communicate with technical support, teaching staff and students to take their advice.

4.2 Teaching process management

Blended-learning mode combines teacher-student communication with man-machine interaction, and supplement in-class teaching with independent study. It is vital that teachers change their concepts and abandon the old teaching manners (Bates. A.W. Technology, 2005). In the Blended learning environment, teachers are no longer the center of the teaching process, but the instructors and directors. They design and organize class activities, guide and supervise students' autonomous study, evaluate their performance and provide emotional support for them. Meanwhile, teachers should have a good command of PC operation skills and network technology, which means they have to update their knowledge so as to adapt to the new environment and meet the requirements of Blended-learning mode.

4.3 Multi-dimensional assessment system

A scientific and objective assessing system is extremely important to any teaching process. Student evaluation is given on the basis of in-class performance and web-learning experience. Weighting coefficients like learning time, learning content and learning effects are necessary quantitative indexes for internet autonomous study evaluation (Morrison G. R., Lowther D, 2005). For example, apart from one hour's in-class learning each week, students are supposed to spend at least two hours on web-learning each week, totaling 32 hours every semester. Autonomous study results take up 30% of the final score. What's more, students should be able to tell expected behavior from unexpected behavior. They need self-regulation to refrain from violating the rules of web-learning. If any one takes advantage of the web environment to do things irrelevant to College English teaching, he will be punished. Meanwhile, mutual assessment is encouraged between teachers and administrators, students and administrators, in the form of surveys, forums, seminars, and random interviews

Administrators play a leading role in the management of Blended-learning mode, but they are not the only ones responsible. Everyone, including administrators, teachers and students, should take an active part in the managing process.

5 Conclusions

College English teaching is meant to cultivate students' integrated language competence. But at present, traditional English teaching mode in China is being accused of failing to provide an efficient language learning environment. It goes without saying that in this new era of information when College English teaching calls for prompt improvement, Blended-learning mode offers a unique opportunity to blend learning theories, learning resources, learning environments, and learning patterns, to integrate traditional teaching with brand-new learning approaches. A well-designed and properly-managed College English Blended-learning mode should fully embody its rich resources and strong interactivity. Teachers implement student-oriented teaching to cultivate learners' innovation spirit; students carry out independent study to develop autonomous learning ability. Thus the design and management of a Blended-learning mode is of great importance to guaranteeing the efficiency of College English teaching.

A fact noteworthy is that Blended-learning is an emerging field that bridges the fields of education, technology and psychology. The construction and management of Blended-learning environment relies on the collaboration of everyone involved: administrators, technical staff, teachers, and students. While designing a College English Blended-learning mode, we need to attach great importance to the construction of web-teaching platform, the implementation of pedagogy and the student performance assessment system. In regard to the management of the mode, an all-involvement managing system is highly advisable.

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An Analysis of Influence Factors in Chinese College Students' Major Selection Based on ISM

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Abstract: On the basis of analyzing the related research on specialty-free recruitment and college students' major selection, the paper proposes 15 factors that influence Chinese college students' major selection, establishes interpretative structural model(ISM), analyzes the relationship of these factors, and summarizes them into personal factors, family and peer factors, major factors, and social factors. At last, the paper makes recommendations to collegiate specialty construction and guidance of college students' major selection.
Key words: Specialty-free recruitment; Chinese college students; Major selection; ISM

1 Introduction

Since the implementation of the "Yuanpei Program" in Peking University in 2001, the practice of specialty-free recruitment and training has received increasing attention. More and more domestic universities implement the specialty-free recruitment mode, that is, to change the traditional pattern of recruitment and training according to the specialty, instead is the new pattern that implement recruitment according to the subject (in college or department) and let students themselves select the major after a period of time of the entrance (Lv Cixian, Li Weihua, 2014). Morrow and Wirth (1989) defined major selection as "the degree of identification and involvement of a major. Yu Fang (2015) believes that college students' freedom to choose majors and courses is an important embodiment of their interest in learning, personal needs and interests. After a year of study since their enrollment, students have a deeper understanding of each major in their department. Therefore, they will rethink the professional choice according to their scores, interests, hobbies, expertise, and even consider the social demand and future life planning, thus avoiding the blindness of choose their major just after the college entrance examination and protect their learning autonomy and the right to choose the learning content.

However, under the specialty-free recruitment and training, there are still existing trend of blindly follow, bringing new challenges to the higher education institutions. Studying the influencing factors and the mutual relations in College Students' major selection can help colleges and universities adjust their professional setting and construction according to students' requirements. This paper analyzes the influencing factors of college students' major selection based on ISM and makes recommendations to collegiate specialty construction and guidance of college students' major selection.

2 Determination of Influence Factors in Major Selection

Through literature analysis, this paper reviewed the related literature of college students' major selection. Lv Cixian (2014) pointed out that Chinese students usually select major according to their characteristics, such as hobbies, discipline, family and peer factors etc., and professional status, such as professional employment situation, level of teachers, specialty strength. Fan Mingcheng (2013) believe that the main factors that influence major selection is their interest, job opportunities and career development potential and their ability to learn, and the influence of parents and family. WANG Zuojun (2014) argued that the influencing factors of college students' major selection mainly includes market outlook, the influence of others, personal and professional characteristics. Ma Liping (2016) found that there exists gender differences between male and female students in major selection through the investigation.

Through literature research, the factors that affect the major selection of college students are initially obtained, in order to draw a more reasonable influence factors, we set up an ISM group. The ISM team was made up of two vocational development teaching and research personnel, three employment guidance center teachers, three college counselors and three senior professors of different professions. At the same time, in order to verify the relationship between the factors, 100 questionnaires were recycled from colleges and universities full-time undergraduate students in Wuhan. In the end, 15 influencing factors and their correlation are identified, as shown in Table 1.

Table 1   Influence Factors in College Students' Major Selection

Number	Factor	Factors affected
S_1	Employment Situation	$S_2, S_3, S_4, S_5, S_6, S_7, S_8, S_9, S_{10}, S_{11}, S_{13}, S_{15}$
S_2	Career Development Potential	$S_3, S_4, S_5, S_6, S_7, S_8, S_{10}, S_{11}, S_{15}$
S_3	Major Social Popularity	$S_1, S_2, S_4, S_5, S_6, S_7, S_8, S_{10}, S_{11}, S_{13}, S_{15}$
S_4	Profession' Social Status	$S_1, S_2, S_3, S_5, S_6, S_8, S_9, S_{10}, S_{11}, S_{15}$
S_5	Profession' Salary Level	$S_6, S_7, S_8, S_{10}, S_{11}, S_{12}, S_{13}, S_{14}$
S_6	Teachers' Level	$S_7, S_8, S_{10}, S_{11}, S_{12}, S_{13}, S_{14}$
S_7	Learning Atmosphere	$S_6, S_{11}, S_{12}, S_{13}, S_{14}$
S_8	Curriculum	$S_6, S_{11}, S_{12}, S_{13}, S_{14}, S_{15}$
S_9	Family Background	S_{12}, S_{13}, S_{14}
S_{10}	Other People's Advice	S_{13}
S_{11}	Peer Selection	S_{13}
S_{12}	Personal Ability	S_{13}, S_{14}
S_{13}	Interest	S_{12}, S_{14}
S_{14}	Score Advantage	—
S_{15}	Gender Difference	—

3 Construction of ISM of Influencing Factors of College Students' Major Selection

Interpretative Structural Modeling Method(ISM) is used to decompose a complex system into a number of subsystems, and construct the system into a multistage ladder structure model using people's practical experience and knowledge as well as the computer (Zhou Dequn, 2005).

3.1 Construct the adjacency matrix

According to the relationship between the factors and the factors identified in Table 1, the adjacency matrix is $A = (a_{ij})_{15\times15}$. If S_i has effect on S_j, then $a_{ij} = 1$; else $a_{ij} = 0$. "Has effect" indicates a direct effect, not consider the indirect effect. And the adjacency matrix is as follow:

$$A + I = \begin{bmatrix}
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 \\
0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 \\
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 1 \\
0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1
\end{bmatrix}$$

3.2 Calculate reachable matrix

The reachable matrix M can be obtained by calculating the adjacency matrix A:

$$M = (A + I)^{n+1} = (A + I)^n \neq \cdots (A + I)^2 \neq (A + I)^1 \quad (1)$$

According to the Boolean operation rules, the reachable matrix M is obtained as follows:

$$M = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

3.3 Decompose reachable matrix

According to the reachability matrix M, reachable sets $R(S_i)$, antecedent sets $A(S_i)$ and intersection sets $C(S_i)$ can be obtained, in which $R(S_i)$ is the set of all the factors that can be reached by S_i, $A(S_i)$ is a collection of all the factors that can reach S_i, and $C(S_i) = R(S_i) \cap A(S_i)$.

According to $R(S_i) = C(S_i) = R(S_i) \cap A(S_i)$, determine the highest level of elements successively, and decompose reachable matrix, then the hierarchical structure of influencing factors of College Students' major selection is got. According to Table 2, $R(S_{14}) = C(S_{14}) = R(S_{14}) \cap A(S_{14})$, $R(S_{15}) = C(S_{15}) = R(S_{15}) \cap A(S_{15})$, the elements of first level $L_1 = \{S_{14}, S_{15}\}$ can be obtained. Remove corresponding rows and columns of S_{14}, S_{15} from the reachable matrix, second level of reachable sets and antecedent sets can be obtained, then the elements of second level is $L_2 = \{S_{12}, S_{13}\}$. Similarly, we can get $L_3 = \{S_9, S_{10}, S_{11}\}$, $L_4 = \{S_6, S_7, S_8\}$, $L_5 = \{S_5\}$, $L_6 = \{S_1, S_2, S_3, S_4\}$.

Table 2   First Level of Reachable Sets and Antecedent Sets

S_i	$R(S_i)$	$A(S_i)$	$C(S_i)$
S_1	$S_1 \sim S_{15}$	$S_1 \sim S_4$	$S_1 \sim S_4$
S_2	$S_1 \sim S_{15}$	$S_1 \sim S_4$	$S_1 \sim S_4$
S_3	$S_1 \sim S_{15}$	$S_1 \sim S_4$	$S_1 \sim S_4$
S_4	$S_1 \sim S_{15}$	$S_1 \sim S_4$	$S_1 \sim S_4$
S_5	$S_5 \sim S_8, S_{10} \sim S_{15}$	$S_1 \sim S_5$	S_5
S_6	$S_6 \sim S_8, S_{10} \sim S_{15}$	$S_1 \sim S_8$	$S_6 \sim S_8$
S_7	$S_6 \sim S_8, S_{10} \sim S_{14}$	$S_1 \sim S_8$	$S_6 \sim S_8$
S_8	$S_6 \sim S_8, S_{10} \sim S_{15}$	$S_1 \sim S_8$	$S_6 \sim S_8$
S_9	$S_9, S_{12}, S_{13}, S_{14}$	$S_1 \sim S_4, S_9$	S_9
S_{10}	$S_{10}, S_{12}, S_{13}, S_{14}$	$S_1 \sim S_8, S_{10}$	S_{10}
S_{11}	$S_{11}, S_{12}, S_{13}, S_{14}$	$S_1 \sim S_8, S_{11}$	S_{11}
S_{12}	S_{12}, S_{13}, S_{14}	$S_1 \sim S_{13}$	S_{12}, S_{13}
S_{13}	S_{12}, S_{13}, S_{14}	$S_1 \sim S_{13}$	S_{12}, S_{13}
S_{14}	S_{14}	$S_1 \sim S_{14}$	S_{14}
S_{15}	S_{15}	$S_1 \sim S_6, S_8, S_{15}$	S_{15}

3.4 Build ISM model

According to the reachable matrix, we can get the ISM model of the influencing factors of College Students' major selection, as shown in Figure 1.
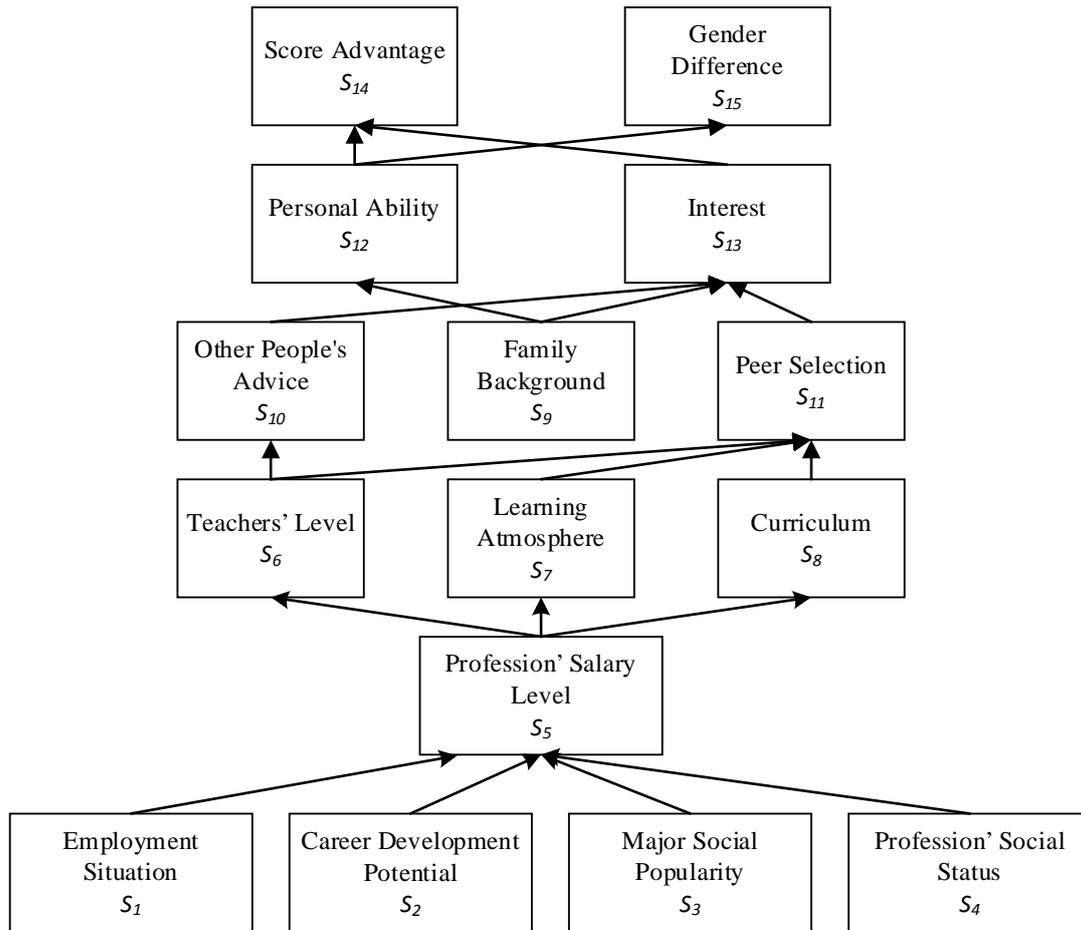
Figure 1   ISM of Influencing Factors of College Students' Major Selection

4 Results

According to the output of the structural model, the influencing factors of College Students' professional selection are summarized into four layers.

The first layer is the student's personal factor, including personal ability, interest, gender differences, and score advantage etc., is the most direct factors influencing college students' major selection. With the enhancement of College Students' self-consciousness, students have more independent consciousness in major selection, therefore, personal ability and interests are the decisive factors for students to choose the major. Influenced by different factors, such as the physiological differences, the education differences and the social roles differences, the choice of different genders of students in professional learning and employment is also different.

The second layer is the family and peer factor, including family background, other people's advice and peer selection, which is the indirect factor influencing the major selection. The important influence of parents and family reflects the characteristics of China's traditional culture, family centrism, and children receive higher education is seen as a family event, so students are easily affected by family when choosing profession.

The third layer is the major factor, including teachers' level, learning atmosphere and curriculum, which is the indirect factor. Specialty-free recruitment and training pattern gives the students more freedom to choose, and students can make major selection after considerable understanding of school subject status, professional setting, and training objectives.

The fourth layer is the social factor, including the employment situation, career development potential, major social popularity, profession social status and profession' salary level. It is the basic factor that affects the major selection of college students. Now China's overall employment situation is grim, college students have to bear huge employment pressure, thus professional employment situation

has become a factor that students have to consider in major selection. In particular, the profession' salary level is the direct embodiment of the employment situation, career development potential and occupation social status, so it is the most intuitive factor for college students to consider the professional employment prospects.

5 Conclusions

The paper proposes 15 factors that influence Chinese college students' major selection, including personal factors, family and peer factors, major factors, and social factors, and uses ISM model to determine the relationship and hierarchy between factors of college students' major selection under specialty-free recruitment. According to research results, the paper put forward 3 points to the construction of college major and guidance of student's major selection:

Firstly, being demand-oriented and strengthening the construction of professional strength. The demands mainly mean the demands of students to professional structure and select major, and the demands of labor market, that is what kinds of talent that society needs. And college should improve the curriculum system and teaching organization and strengthen students' independent study consciousness, and develop self-learning ability and lifelong learning habits.

Secondly, effective guidance is still needed to allow students recognize importance and necessity of selecting major to their future. So that students can select a major that helps students to achieve life goals and reinforce the knowledge base according to their strengths, aspirations, interests and hobbies.

Lastly, the major selection should enhance students' awareness of specialty and career. That is to guide students to make scientific development of career by "students-professional- career" match, and choose a major and occupation under their own situation, enhancing the scientific and loyalty of major selection.

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Empirical Study on the Correlation Between Basic Education Development and Public Libraries Development in China

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Abstract: National development and prosperity are closely related to the population quality. Basic education and public library are two basic causes of improving the population quality, so their development level has aroused extensive concern. In this paper, certain indicators are selected to measure the development of basic education and public libraries in China, then the relationship between them is analyzed by correlation analysis method. The results show that the development of basic education is closely related to the development of public libraries in China. It is, therefore, suggested that we should improve the quality of basic education and enhance the library consciousness of the citizens, thus promoting the harmonious development of basic education and public library in China.
Key words: Basic education; Public libraries; Development; National quality; SPSS

1 Introduction

With the rise of knowledge economy, countries in the world pay more and more attention to the promotion of nationals' quality. The basic education and the public library, two main causes of improving the quality of nationals, their development level has aroused extensive concern. Basic education is the foundation project of boosting the quality of the nationals, while the public library is the social device to improve the quality of people. School is the first classroom for students to study, in which students receive systematic education and obtain preliminary development and enlightenment of Dezhitimei; library, as a hub of human culture, becomes the second class of people to learn, through providing knowledge and information for individuals to create development opportunities. The development of basic education and public libraries are the key factors to measure the strength of national culture. Furthermore, the development of basic education and the library jointly promote the development of human and social progress.

The purpose of education is to enable everyone to exert his or her potential, creative and critical spirit, to realize their ambition and happiness, and to become a good citizen and producer. Basic education is the radical of education. The basic education stage is the key period of talent training, the cultivation of good habits and interests will affect the whole life of students, and restrict the student's activity, creativity. Just as the proverb says great oaks from little acorns grow, without good basic education, there is no first-class higher education. Therefore, basic education is a key part of the whole education system, which plays a very important role in our country's quality-oriented education and personal training. The Public Library Manifesto stated that the mission of the public library is to develop and to strengthen the early reading habits of the children, and to support the education of the individual's self and the formal education at all levels. Now the function of public library has been extended; its cultural atmosphere and educational value have played an important role in the development of people. Library is not only a social institution entity, but also a social literature and information transmission mechanism. In such a mechanism, people have free access to gain knowledge and information. Improving the quality and development level of basic education and public library is an effective way to improve the quality of people.

2 Literature Review

After the 1990's, the basic education of our country has made great progress in both quality and quantity and been basically popularized. At the same time, the number of public libraries in our country is increasing at an alarming rate. In theory, the relationship between basic education and public library should be mutual support and coordinated development. The two parties are interrelated unity, and they are complementary in function and thus forming a complementary relationship. As a systemic whole, the two must work together to support the development of human.

The research on the relationship between education and public library in China is still in its infancy and has little related research. Many of the existing articles are focused on a single category of education

(such as higher education, vocational education, lifelong education, etc.) rather than basic education or the whole education system. Yu Anyi (1988) puts forward a good library and information system can make the university education to achieve better results, but he is only focused on the relationship between higher education and the university library. Sima Lihua (2003) believes that the relationship between education and library is close. Education reform needs the library, and the library can update the expansion of classroom knowledge, promote the development of education. Yang Ming, Wei Meizhen and others look at the relationship between vocational education and the library. Xu Zhenyun (2005) focuses on the relationship between quality education and library. Sun Yihua (2010) explores the role of library in promoting quality education and put forward to cultivate the library consciousness and ability to promote the development of the two. Chen Yongmei (2011) points out that the ideas advocated by the great education such as the concept of integrated education, lifelong education of the whole people, and the autonomy and creativity of the study have lots of correspondence with the educational functions of the library. She also stressed that the educational function of the library should conform to the development trend of education. Gao Maixing (2012) mentions that library and higher vocational education is an interdependent relationship. On the one hand, higher vocational education depends on the library to obtain knowledge and accelerate the development of education; On the other hand, through the construction of higher vocational colleges, the library has promoted its own grade, and has enriched the quantity of the collection.

The research on the relationship between library and education mostly belongs to qualitative research; quantitative research is rare. Exploring the relationship between the development of basic education and public libraries has certain guiding significance for the better planning of the basic education and public libraries. Therefore, this paper analyzes the development level of the public library and the development level of basic education by looking up the data, and tries to study the correlation between the two parties, puts forward countermeasures and suggestions for coordinated development of the two.

3 Data and Method

We use and select some indicators to measure the development of education and public libraries. Based on the existing research, this paper designs the indicator of basic education development level and public libraries development level. The basic education development level indicators mainly include the elementary school and junior high school enrollment rate (V1), the rate of school age children in primary school (V2), average number of students in primary schools of one hundred thousand population (V3), number of ordinary primary schools (V4), primary school students' average operation expenses (V5), the number of ordinary primary school graduates (V6), Ratio of primary school teachers and students(V7); public library development level indicator includes number of public libraries(V8), total collection of public libraries (V9), number of employees in public libraries (V10), public library flow trips (V11), The number of books borrowed (V12), public library funds expenditure(V13) .

We collected the data from China Statistical Yearbook, China Library Yearbook and Educational Statistics Yearbook of China. Considering the comprehensiveness and availability of data, this paper selected the indicator data interval in 16 years between 1997 and 2012. After collecting the data, we use SPSS software to analyze the correlation of the indicators. Generally, in order to accurately describe the linear correlation between variables, the correlation coefficient can be calculated by calculating the correlation coefficient. In statistics, the correlation coefficient 'r' is generally used to infer the overall correlation coefficient. In this paper, Pearson simple correlation coefficient is used to express the linear relationship. The calculation formula is as follows:

$$r = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2 \sum_{i=1}^{n} (y_i - \bar{y})^2}} \tag{1}$$

Pearson simple correlation coefficient of the statistical test is to calculate the statistics, and the formula is:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \tag{2}$$

4 Results

Using SPSS19.0 analyzes the correlation between the 7 indicators of development level of basic education and the 6 indicators of the development level of public libraries. The results are shown in table1.

Table 1   Pearson Correlation Coefficient Between Indicators

	(V8)	(V9)	(V10)	(V11)	(V12)	(V13)
(V1)	.730**	.719**	.661**	.722**	.464	.710**
(V2)	.872**	.870**	.906**	.846**	.645**	.896**
(V3)	-.840**	-.854**	-.838**	-.866**	-.705**	-.854**
(V4)	-.867**	-.881**	-.850**	-.893**	-.728**	-.884**
(V5)	.977**	.990**	.972**	.993**	.830**	.994**
(V6)	.692**	.711**	.605*	.689**	.599*	.696
(V7)	-.848**	-.863**	-.851*	-.877**	-.719**	-.890**

Note: * *. At the level of.01 was significantly correlated (bilateral).
        *. At the 0.05 level (bilateral) significant correlation.

It is not difficult to find that most of the indicators between the development level of the public library and the development level of basic education show a moderate degree of correlation. Some of the indicators show a high positive correlation, while some shows a high negative correlation.

As we can see from the tables above, the elementary school and junior high school enrollment rate (V1), the rate of school-age children in primary school (V2), primary school students ' average operation expenses (V5), the number of ordinary primary school graduates (V6) respectively are highly or moderately positive correlation with the indicators of public library development level. Results demonstrated that with the popularization of compulsory education in our country, the education cause and library cause are developing forward. The popularization of education promotes people's learning and reading consciousness to a certain extent, and it plays a promoting role in the development of the library cause.

The table above shows that the average number of students in primary schools of one hundred thousand population (V3) and the indicators of public libraries are highly negative correlation, which is not to say that the development of the library has a negative effect on education. Through analysis we can find that, the reduction of school-age children and the increase in the number of schools have influence on these indicators. Because of improper selection of indicators and technical deficiencies, this indicator fails to explain the relation between the development level of education and public library. That means the relationship between the average number of students in primary schools of one hundred thousand population and the public library is uncertain, pending further study.

The teacher student ratio (V7) is highly negative correlation with the development level of the library. The reduction of teacher-student ratio reflects the improvement of the education quality in our country. That indicates our country's input to the basic education teachers has effect on the improvement of education. There is a positive correlation between the improvement of education quality and the development of the library.

5 Conclusions

According to the research, the development of basic education and the development of the public library show correlation. Although the conclusion of this paper has some limitations, it still has some guiding significance. The orderly development of education can effectively improve the degree of human civilization, inspire people's educational needs, such as the emergence of the idea of quality education and the concept of lifelong learning. To meet the education needs of citizens, the school is the first choice; while library, as a continuation and supplement of school education, is particularly important. Under the impact of lifelong education and the wave of quality education, the public library has obvious advantage in improving the basic education development level.

The development of basic education is highly consistent with the development of public library. It is not difficult to find that a country's education is developed, then the country's development of the public library is developed. Vice verse. Among all the countries that pay attention to education, we can conclude that it is necessary to pay attention to the role and function of the library. The public library

has become an important part of education, so we need to create conditions for the education and public library going hand in hand. When the education is still primitive in one country, the cause of the public library is bound to fall behind. But when they begin to pay more attention to education, the library will develop at a faster pace. However, the construction of public library in China lags behind education development, and has failed to meet the general and extensive education needs of the people. Therefore, in the process of improving the quality of basic education, we should also speed up the development of public library through cultivate citizen's library consciousness. Library consciousness means that the public can take the initiative to use and integrate into the library. We should make policy to coordinate the development of basic education and public library.

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Research on the Quality Evaluation of Employment Guidance for College Students Based on Fuzzy Mathematics

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Abstract: Under the circumstances that the employment difficulty of graduates is increasingly prominent, and on the basis of analyzing the existing problems of employment guidance work for college students, this article establishes the evaluation index system and uses AHP(Analytic Hierarchy Process)---fuzzy comprehensive evaluation to evaluate the quality of this work in the author's university, then puts forward key influencing factors and suggestions to improve college students' employment guidance.
Key words: Fuzzy mathematics; APH; Fuzzy comprehensive evaluation; Employment guidance for college students

1 Introduction

With the in-depth process of Chinese higher education system reform and the rapid development of educational popularity, the number of graduates has been increasing quickly. From 2005 to 2016, the number of graduates rose from 3.38 million to 7.65 million, which means the employment pressure of college students will keep in a high level in a quite long time. In this background, the college students' employment guidance becomes especially important. However, scientific evaluation on the quality of this work is the first step for further improvement. Establishment of Evaluation System of College Students' Employment by Zhang Peide (2007), sets out three levels for evaluation system，which the first level includes employment guidance, satisfactory procedure, service charge and supporting system; the second level includes 17 items, and the third level includes 49 items. Although there are different levels in the article, he just endows index with weight and point by experience. Research on the Comprehensive Evaluation Index System of College Students' Employment Work by Wang Pan (2009), adopts CIPP evaluation mode, which establishes evaluation system of college students' employment mode on the basis of four dimensions about background evaluation, inputting evaluation, process evaluation and achievement evaluation. Research on the Comprehensive Evaluation Index System of College Students' Employment Work by Wang Xiao (2010), analyzes synthetically four employment compositeness evaluation index system including background factor, knowledge structure, basic ability and quantity. It also determines each weight of index system from the perspective of employer. Construction of College Students' Employment Compositeness Evaluation System Based on Market Demand by Guan Liguo (2015), combs the gradual progress of college students employment compositeness from two aspects of theoretical research and qualitative research. Moreover, it also sorts out college students' employment compositeness system by Delphi technique method and draws conclusion of 10 dimensions and 47 indexes, such as knowledge level, professional competence, team work and scientific research innovation, which should be put great emphasis from the view of employment market demand. Empirical Study on the Evaluation System of Employment Quality of College Graduates Based on the Fuzzy Comprehensive Evaluation Method by Peng Jianzhang (2015), analyzes the existing problems of employment. It also leads to fuzzy comprehensive evaluation and establish evaluation system of college students employment from three aspects–the evaluation about employer to school, the evaluation about employer to college graduates and the evaluation about employer to employment guidance for college students of school (Peng Jianzhang, 2015).

2 Analysis on Existing Problems of Employment Guidance for College Students

2.1 Deficient in sustainable and long-term work

Many universities have set up relevant employment guidance courses, but most schools' courses are set in the senior year, and some are even taken during the "mutual selection". The contents of the guidance are often comparatively narrow and short of the forming of mind and ideas. Specifically, these courses are usually instilled into students' minds by graduate employment mobilization, employment situation report and so on, but few of them provide specialized guidance and consultation for students' personalities. It is very hard to take effect for the employment guidance lacking of chronicity since

universities do not regard it as a long-term job at all and the temporary tendency is serious.

2.2 Outmoded guidance ideas

From the deep learning of current employment guidance in China, most universities disregard the social needs and are used to focusing on the employment rates during the guidance work, believing that the higher the employment rates are, the more remarkable the effect of the guidance is. Under the outmoded ideas about guidance, the work often lacks the employment education and career direction for students, causing their plain professional consciousness and blind choices of the employment. In this situation, even though getting jobs, they will also face the layoff and re-employment soon, which leads to a lack of fine long-term cultivation for the students' abilities in the future as well as the inconsistency of their personalities and specialties with their jobs.

2.3 Unprofessional employment guidance personnel

At present, many universities have gradually established a special employment guidance department, in which the guidance personnel carry out the relevant works. However, it is not difficult to find from the investigation that many of the guidance personnel are transferred from administrative department, hence they are short of specialized learning, systematic training and abundant employment guidance experience, not to mention provide practical help for students. Their jobs are restricted to transmitting national employment policy and briefly introducing the employment situation. Yet the guidance personnel are evidently inexperienced on the self-positioning and employment choice, which causes a large obstacle for the guidance work.

2.4 Weak systematic ness of employment guidance

The college students' employment and the professional learning, the employment choice and future career are related to each other as a whole, so the systematic guidance is needed. However, the employment guidance work in many universities is developed only around graduation and employment and is indifferent to low-grade students. The guidance work does not care about aspects aside from employment, such as major, occupation and the development of career, nor do they track the career changes of students after graduation, lacking further understanding for the students' employment choices. Students who are short of systematic employment guidance cannot clear their life goals and career planning, unknowing how to strengthen and complete during the study, which will seriously affect their future employment and the achievement of their life goals.

3 The Introduction of Fuzzy Mathematics Method

Many phenomena are with characteristic of fuzziness in real life, which is evaluated by the fuzzy mathematics established by professor L.A.Zadeh, an American scientist in the 1960s. Fuzzy mathematics can synthetically consider various influencing factors and use the fuzzy statistical approach and the theory of fuzzy mathematics to evaluate the pros and cons of things. At present, university graduates hunting for jobs in China has been brought more and more to the attention of universities and the country. The quality of employment guidance work not only represents the level of universities, but also shows the attitude given to the students. However, how to evaluate the quality of employment guidance for college students is a difficult problem, and it has gradually become an issue to which many universities attach great importance. Now, the quality of employment work no longer compares with the employment rate, but it requires various levels and indexes to evaluate comprehensively and scientifically. But many of those indexes are qualitative and ambiguous, so how to transform these qualitative and fuzzy indexes into scientific and reasonable quantitative ones is a key problem to be solved in the evaluation of college students' employment guidance work. Moreover, the employment guidance is a highly comprehensive work affected by many aspects. Therefore, it can't be evaluated simply by a single figure, which also matches its characteristic of fuzziness. For different university graduates, the indexes used to evaluate the quality of employment guidance work are various, so is the process of choosing the indexes. Different types of universities lay different emphasis on the weight setting of each index as well. All these uncertainties show that it is feasible and suitable to use the fuzzy mathematics to evaluate the college students' employment guidance work.

4 Establishment of Quality Evaluation Index and Weight System of Employment Guidance for College Students

4.1 Establishment of quality evaluation index system

According to what is mentioned above, based on the index optimization and combination principle, practical principle, dynamic improvement principle and so on, this article mainly refers to Construction

of College Students' Employment Competitiveness Evaluation System Based on Market Demand by Guan Liguo (2015), Research on Evaluation Index System of College Graduates' Employment Competitiveness by Wangxiao (2010), and Research on the Construction Method of Comprehensive Quality Evaluation Index System of College Students' Employment Guidance Work by Wang Xuhui (2009), then modifies and verifies the evaluation system after fully collecting data and combining the experts' arguments in the author's university. From the four aspects up to 16 indexes including employment guidance and services, market organization and effect, infrastructure and team building, professional setting and demand, the article evaluates the quality of college students' employment guidance. As is shown in the following chart:
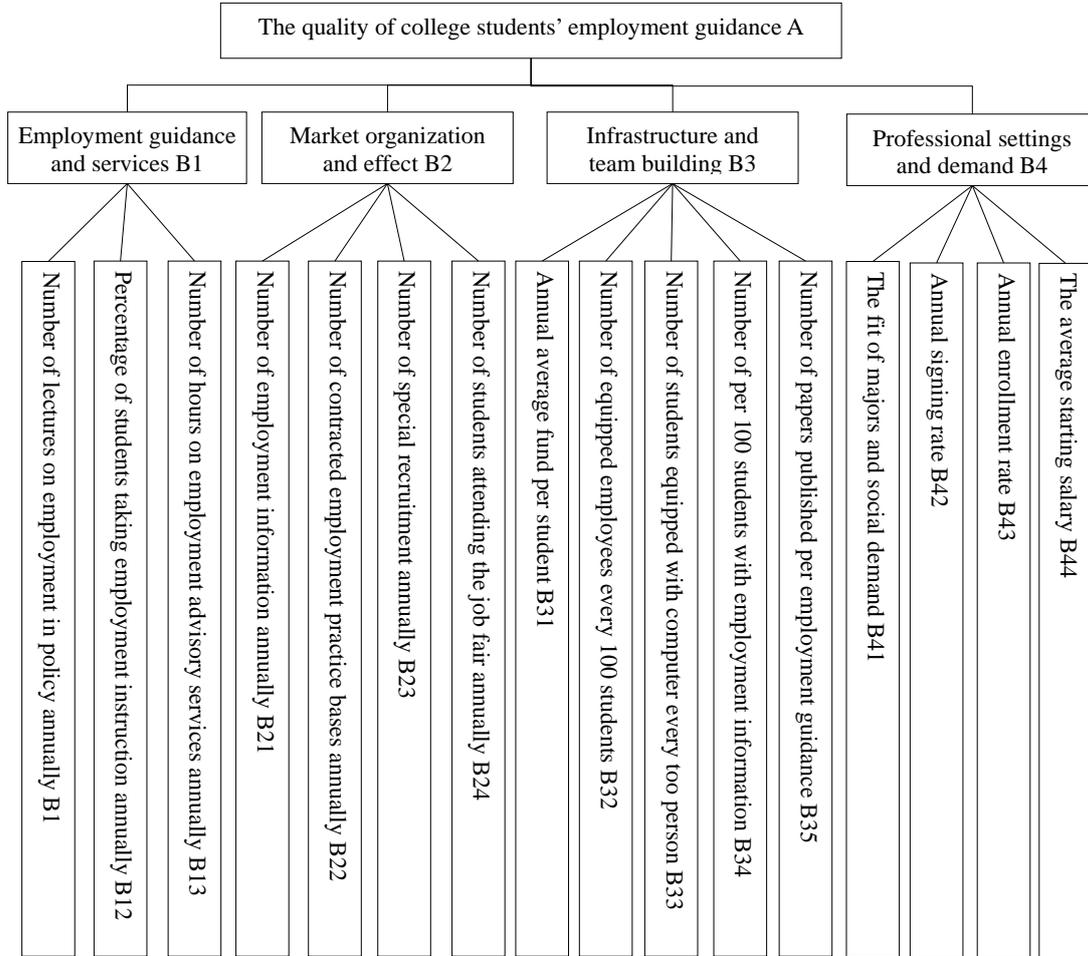
Figure 1   Evaluation Index System of College Students' Employment Guidance

4.2 Establishment of quality evaluation index weight system

This article uses AHP to confirm the weight of evaluation index weight system of college students' employment guidance work by adopting Saaty Nine Scale method. The author invites a specialist in college students' employment guidance to compare B1 and B4 in pairs and compares each secondary index of B1 and B4 in pairs. The judgment matrix is as follows:

Table 1   Target A Judgment Matrix

A	B1	B2	B3	B4	Normalized feature vector	CR figure
B1	1	2	1/3	1/6	0.10345	
B2	1/2	1	1/3	1/7	0.070012	0.052
B3	3	3	1	1/3	0.23435	
B4	6	7	3	1	0.59219	

Table 2 Index B1 Judgment Matrix

B1	B11	B12	B13	Normalized feature vector	CR figure
B11	1	1/2	5	0.32551	
B12	2	1	8	0.60436	0.008
B13	1/5	1/8	1	0.07013	

Table 3 Index B2 Judgment Matrix

B2	B21	B22	B23	B24	Normalized feature vector	CR figure
B21	1	1/2	2	2	0.27071	
B22	2	1	3	2	0.41816	
B23	1/2	1/3	1	1/2	0.1205	0.042
B24	1/2	1/2	2	1	0.19063	

Table 4 Index B3 Judgment Matrix

B3	B31	B32	B33	B34	B35	Normalized feature vector	CR figure
B31	1	2	8	9	9	0.49066	
B32	1/2	1	7	8	9	0.35147	
B33	1/8	1/7	1	2	3	0.074725	0.091
B34	1/9	1/8	1/2	1	2	0.048914	
B35	1/9	1/9	1/3	1/2	1	0.034228	

Table 5 Index B4 Judgment Matrix

B4	B41	B42	B43	B44	Normalized feature vector	CR figure
B41	1	2	7	3	0.47841	
B42	1/2	1	6	2	0.29179	
B43	1/7	1/6	1	1/5	0.049727	0.023
B44	1/3	1/2	5	1	0.18007	

Input[vi, di]= eigs (Ai) in the Matlab, and then normalize the above feature vector. The specific calculation is to input: Vi (: 1) /sum (Vi (: 1)) into the Matlab, the results are as follows:

$$W0= [0.10345 \quad 0.070012 \quad 0.23435 \quad 0.59219]; \qquad (1)$$
$$W1= [0.32551 \quad 0.60436 \quad 0.07013]; \qquad (2)$$
$$W2= [0.27071 \quad 0.41816 \quad 0.1205 \quad 0.19063]; \qquad (3)$$
$$W3= [0.49066 \quad 0.35147 \quad 0.07472 \quad 0.048914 \quad 0.034228]; \qquad (4)$$
$$W4= [0.47841 \quad 0.29179 \quad 0.049727 \quad 0.18007]. \qquad (5)$$

The above results are incorporated in chart 1 to chart 5.

When checking the consistency, make the random consistency ratio is CR:

$$CR = \frac{CI}{RI} \qquad (6)$$

The RI figure is checked by the table:

Table 6 Random Index Numbers

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.5

Note: the "n" in the chart indicates the order of the matrix.

Inspection: when CR<0.10, it is assumed that the judgment matrix is with satisfactory consistency, otherwise the matrix needs to be adjust to be with satisfactory consistency and the obtained data is incorporated into chart 1.

5 Empirical Analysis on Quality Evaluation of College Students' Employment Guidance

According to the targets of the evaluation, the author divides the results into four grades: a collection of comments about quality evaluation: V={v1(excellent), v2(good), v3(average), v4(poor)}. Take the author's university for example, 16 people including experts on college students' employment guidance and human resources personnel from enterprises are invited to comprehensively evaluate the quality of the work. The obtained data is as follow:

Table 7 Comment Index Collections of College Students' Employment Guidance in the Author's University

Index		The quality of college students' employment guidance work			
		Excellent	Good	Average	Poor
B1	B11	12/16	4/16	0	0
	B12	0	7/16	8/16	1/16
	B13	0	8/16	8/16	0
B2	B21	14/16	0	1/16	1/16
	B22	4/16	8/16	4/16	0
	B23	3/16	2/16	11/16	0
	B24	2/16	5/16	9/16	0
B3	B31	4/16	4/16	7/16	1/16
	B32	1/16	2/16	13/16	0
	B33	10/16	5/16	1/16	0
	B34	1/16	4/16	9/16	2/16
	B35	10/16	3/16	3/16	0
B4	B41	7/16	8/16	1/16	0
	B42	4/16	4/16	8/16	0
	B43	0	1/16	10/16	5/16
	B44	2/16	4/16	9/16	1/16

The fuzzy judgment matrix collected by above comments $\overline{R_1}$ 、 $\overline{R_2}$ 、 $\overline{R_3}$ 、 $\overline{R_4}$ are as follow:

$$\overline{R_1} = \begin{array}{c} B_{11} \\ B_{12} \\ B_{13} \end{array} \begin{bmatrix} \begin{array}{cccc} V_1 & V_2 & V_3 & V_4 \\ 0.7500 & 0.2500 & 0.0000 & 0.0000 \\ 0.0000 & 0.4375 & 0.5000 & 0.0625 \\ 0.0000 & 0.5000 & 0.5000 & 0.0000 \end{array} \end{bmatrix} \tag{7}$$

$$\overline{R_2} = \begin{array}{c} B_{21} \\ B_{22} \\ B_{23} \\ B_{24} \end{array} \begin{bmatrix} \begin{array}{cccc} V_1 & V_2 & V_3 & V_4 \\ 0.8750 & 0.0000 & 0.0625 & 0.0625 \\ 0.2500 & 0.5000 & 0.2500 & 0.0000 \\ 0.1875 & 0.1250 & 0.6875 & 0.0000 \\ 0.1250 & 0.3125 & 0.5625 & 0.0000 \end{array} \end{bmatrix} \tag{8}$$

$$\overline{R_3} = \begin{array}{c} B_{31} \\ B_{32} \\ B_{33} \\ B_{34} \\ B_{35} \end{array} \begin{bmatrix} \begin{array}{cccc} V_1 & V_2 & V_3 & V_4 \\ 0.2500 & 0.2500 & 0.4375 & 0.0625 \\ 0.0625 & 0.1250 & 0.8125 & 0.0000 \\ 0.6250 & 0.3125 & 0.0625 & 0.0000 \\ 0.0625 & 0.2500 & 0.5625 & 0.1250 \\ 0.6250 & 0.1875 & 0.1875 & 0.0000 \end{array} \end{bmatrix} \tag{9}$$

$$\overline{R_4} = \begin{array}{c} B_{41} \\ B_{42} \\ B_{43} \\ B_{44} \end{array} \begin{bmatrix} V_1 & V_2 & V_3 & V_4 \\ 0.4375 & 0.5000 & 0.0625 & 0.0000 \\ 0.2500 & 0.2500 & 0.5000 & 0.0000 \\ 0.0000 & 0.0625 & 0.6250 & 0.3125 \\ 0.1250 & 0.2500 & 0.5625 & 0.0625 \end{bmatrix} \tag{10}$$

Namely:

$$\overline{R} = \begin{pmatrix} W_1 \times \overline{R}_1 \\ W_2 \times \overline{R}_2 \\ W_3 \times \overline{R}_3 \\ W_4 \times \overline{R}_4 \end{pmatrix} = \begin{pmatrix} 0.2441 & 0.3808 & 0.3372 & 0.0378 \\ 0.3878 & 0.2837 & 0.3115 & 0.0169 \\ 0.2158 & 0.2086 & 0.5388 & 0.0368 \\ 0.3048 & 0.3603 & 0.3082 & 0.0268 \end{pmatrix} \tag{11}$$

The fuzzy comprehensive judgment vector is obtained with the synthetic operation between matrix W_0 and $\overline{R}$: $\overline{B} = W_0 \times \overline{R} = (0.2835 \quad 0.3215 \quad 0.3655 \quad 0.0296)$. (12)

6 Conclusions

1) Seen from the fuzzy comprehensive evaluation vector $\overline{B}$, 28.35% experts think the author's university's quality of employment guidance is excellent; 32.15% experts believe it is good; 36.55% experts deem it is average, 2.96% experts think it is poor. From the maximum subordination principle of fuzzy comprehensive evaluation, the author's university's quality of employment guidance is average.

2) According to the experts' suggestions, one weight is given to one comment:　V1 is 25, V2 is 50, V3 is 75, V4 is 100. The comprehensive score of Wuhan Huaxia University's quality of employment guidance is 53.535, it shows that the university's quality of employment guidance has been improved.

3) Through the comparison from chart1 to chart5, the weights of B4, B3 are 0.59219, 0.23435, and the largest weights in B4, B3 are B41, B42, B44, B31 and B32. Therefore, it has been analyzed that the important influencing factors of the quality of college students' employment guidance work are professional setting, social demand fit, annual signing rate, the average starting salary of employment, annual average fund per student, the number of equipped employees and so on, which is of certain reference significance in the guidance work.

4) From chart7, it can be easily seen that the author's university does poorly in job fairs, average fund per student, the number of employment guidance personnel, enrollment rate and starting salary, while these are the key factors to evaluate the employment guidance work of a university. To improve the work requires embarkation on these aspects.

5) A more comprehensive and objective understanding of the quality of a certain university's employment guidance work can be drawn by the quantitative research of the fuzzy thing---employment guidance work condition, thus taking some targeted improving measures accordingly, which has a great significance to the healthy long-term development of the quality evaluation of the college students' employment guidance work in our country.

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Analysis on the Methods to Foster the Social Responsibility of Contemporary University Students

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Abstract: In this research, the college students' sense of social responsibility is studied by cultivating the existence question and the countermeasure. This article uses the research method of literature analysis, combined with field survey and research. Through the questionnaire and the forum, we can grasp the new period college students' sense of social responsibility to cultivate the existing problems and to find the main problem of young college students' social responsibility in the new era. It made an analysis on the social responsibility of the modern university students from both quantitatively and qualitatively. Many effective strategies have been proposed including strengthening university students' ambitious and beliefs, fostering the great spirit of hard working and propagating the spirit of the era as well as that of the nation and develop social practices.

Key words: University students; Social responsibility; Methods to foster

1 Introduction

Responsibility it means the condition of being responsible: having the duty of looking after someone or something, so that one can be blamed (by the stated person) if things so wrong; of a person or his character) trustworthy ;(of a job)needing a trustworthy person to do it."(Longman English-Chinese Dictionary Of Contemporar,1988).UNESCO published report "learn to survive: to determine the basic ideas of a guiding education development direction" a person, as members of the citizens, family and society, to undertake a variety of expensive, deliver the development of human beings to gradually perfect."(UNESCO international education development committee,1996)

"Responsible citizens" this concept is proposed by the U.S. government in the 20th century 70 s. Colleges and universities in the United States put "responsibility citizen education as the main content, which can play a role of main channel of cultivating college students' social responsibility. The sense of responsibility education of colleges and universities stressed "four core", that is fair and reasonable, honesty and trustworthiness. France introduced the education of the main responsibility. Singapore carried out moral education in an all-round way to cultivate students' sense of social responsibility and social consciousness. (WuMan, 2015)

Since the 1950s, many psychologists in the world actively explore the strategies of cultivating college students' social responsibility from the relevant factors that affect college students' social responsibility and obtained remarkable results. But there are still some shortcomings: integrity and systemic is not strong, and it just emphasizes the research on one area or one side; Most studies are the list of the phenomenon, lacking of systematic and dialectical theoretical construction and empirical research.

In order to analyzing the social responsibility of the modern university students quantitatively and qualitatively, I made 30 multiple-choice questions, gave out 1200 questionnaires and did a research to those students who are in grade one, grade two and grade three from 6 universities of China. After analyzing the present situation of it objectively, some conclusions of the multiple-choice questions are shown as followings:

Table 1   The Statistics of Question: What is your Feeling about the Present Situation of the Social Responsibility to Modern University Students?

Choices	Having the social responsibility but confused	Lacking the social responsibility with a strong self-awareness	The social responsibility can be occurred in the time of emergency	Do not care about it at all
Percentages	48.1	35.7	10.5	5.8

Table 2   The Statistics of Question: What Methods do You use to Know the Social Responsibility of Modern University Students?

Choices	Mainly on watching news, reading newspapers and occasionally from class	From class occasionally	From others	Without knowledge
Percentages	60.6	17.2	15.0	7.2

Table 3   The Statistics of Question: Personally, what are the Patriotic Ways do You Think?

Choices	Studying and living well, doing your own duty well	Focus on the national affairs and actively engaged in the revitalization of China's patriotic cause	Attention to civilization and environmental protection, start with the little things around	With no feeling. Can not feel it in ordinary time, but can be inspired when others mention it.
Percentages	75.0	51.0	83.8	10.8

Table 4   The Statistics of Question: If You are Needed to Go to Those Areas like Northwest and Southwest Where Lack Developed Economy and Convenient Traffic, then What do You Think?

Choices	Go, because the nation needs me.	Go, because it is benefit to the future development	Stay, because of the family	Stay, because of the bad environment
Percentages	19.3	26.5	43.7	10.4

Table 5   The Statistics of Question: What are the Lacks do You Think to Modern University Students?

Choices	The hope to future	The enthusiasm to life	Belief	The serious attitude to things	Personal ideas
Percentages	17.5	20.6	28.2	28.1	5.7

Table 6   The Statistics of Question: What are the Reasons do You Think that Cause the Decrease of the Social Responsibility to Modern University Students?

Choices	Influenced by the social environment and other people	The conflicts among different ideas and cultures	The ignorance of the education about responsibility from family and school	The personal inner quality	The misleading of mass medias	School has the simple model educational administration without practice
Percentages	74.3	39.0	48.4	47.0	36.3	57.8

Table 7   The Statistics of Question: Do You Focus on National Affairs or Social Trends?

Choices	Always	Occasionally	Never	Only focus on the significant affairs
Percentages	33.0	55.8	4.5	6.7

Table 8   The Statistics of Question: What can Modern University Students do for the Realization of the National Dream?

Choices	Work hard and get further knowledge	Joining in work early and earning money to support family	Nothing can be done with tiny strength	Problems are exited in the education system
Percentages	60.0	57.5	40.4	14.6

Table 9   The Statistics of Question: What Campus Activities would you like Best to Join to Improve your Social Responsibility?

Choices	The volunteer activities organized by school	To improve the social responsibility through symposiums or lectures	Taking part in class activities like the CYL organizations(democratic) meetings	Volunteer services of other social qualities
Percentages	70.3	39.2	27.4	46.6

Table 10   The Statistics of Question: What are the Educational Ways do You Think that can Realize the National Dreams?

Choices	Fully develop the main channel of the Ideological and Political Theory Course, educating the university students with ideals and beliefs	Fostering diligent and strict style of study, strengthening the capability and skill of university students to realize dreams	Propagating the spirits of ethics and era, fostering the great quality of university students to work hard	Developing various practices and activities, strengthening the cohesion force and centripetal force of university students	Strengthening the legal quality of university students, avoiding the "nightmares"	Others
Percentages	53.1	72.7	66.1	72.3	44.3	16.5

2 Analysis on the Present Situation About the Social Responsibility of Modern University Students

The above statistics can show easily that modern university students have positive spirits, with enthusiasm to lives and hopes to futures. But part of them have some problems in the aspects of ideals and beliefs, value orientations, social ethics and sense of law as well as principles.

2.1 Some university students have unclear social responsibility with weak ideal and belief

In childhood, most people have great ideals and firm beliefs. With the growth of their age, many university students have lost their ideals and beliefs because of various realistic pressures and cruel social competitions. They don't talk about great ideals of futures any more but turn to focus on some more realistic things. They have the stronger utilitarian awareness and pay more attention to the present needs of materials, so how to make money has been the priority. Many university students cannot keep calm to do their studies, they addicted to play games on the internet and some other entertainments or busy doing part time jobs to earn few money. It is hard for them to calm to plan their own university lives for their ideals.

2.2 The value orientations of some university students have been distorted

With the influences of various social unhealthy atmospheres and the pressures of different social cruel competitions, part of university students have distorted value orientations. When the conflict among personal benefit, social benefit and other people's interest occurred, they pay more attention to the personal interest, choosing their own active ways from personal interests. They pursue self-independence, individual autonomy and personal dignity, and they focus on the self-value while ignore the social value. Their sights are restricted to their personal interests, but ignoring the necessary social responsibilities.

2.3 Some university students have weak social ethics and weak awareness of law and principle

Moral and law are the two basic methods to maintain the social order, it is the necessary obligation for everyone to obey the law and adhere morals. Those things of disobeying morals and disrupting law and principles of the contemporary university students occurred from time to time. Some college students lack of learning motivation, disrupting classroom discipline during classes, cheating in exams, breaking public properties, spreading unhealthy information on the internet and getting used to those things of breaking the law and discipline or disobeying morals.

2.4 Some university students confused to their social identities

People, as a social existence, need to assume certain social roles and fulfill certain social responsibilities. As Marx once said: "as a certain people, the real human being, you have principles, missions and tasks, it does not matter whether you have such an awareness or not."(Marx and Engels. German ideology, 2008). However, the contemporary university student is such a generation which grew up in the era background of the economic globalization, cultural diversity and a variety of values existed with each other. They not only advocate themselves, pursue their self-values and self-realizations, but also pursue the individuality and the various social lives. To some extent, that makes their expectations to the social responsibility full of many uncertainties, leading to confusion and mess of the social identities and making many university students just have the so called name, "university students", without knowing "the responsibility of university students.

3 The Methods to Foster the Social Responsibility of Contemporary University Students

3.1 Strengthening the education of ideals and beliefs to university students and improving their wills and determinations

Establishing lofty ideals and having great ambitions are the necessary prerequisites for any career success of contemporary college students. "Great accomplishments require ambition and tireless effort." Ideal shows the direction of life, faith determines success or failure of the career. Contemporary college students shoulder the hope of country and nation and bear the trust of the family and society. They should not only improve the level of knowledge, enhance practice ability, but also strengthen the scientific and lofty ideal and faith, clear the foundation of conducting themselves. (Editorial committee,2015)

Therefore, universities must focus on strengthening and improving the methods or strategies of the ideological and political work, enhancing the ideological and political education with effectiveness and pertinence. Ideological and political education in colleges should be combined with the revolutionary traditional education, hardworking education and student's studying life, realizing the connection among

the historical education and national education as well as the real life and the virtual life, solving the practical problems of students in learning, emotion, interpersonal communication and achieving the successful goals, improving the learning enthusiasm and initiative of the students. So that it can stimulate the deeper thinking on the social development and the social value to them, and finally they will sublime ideals and faiths to specific actions to achieve the prosperity of the country.

3.2 Fostering the good learning style of hard working, improving the knowledge and skills of university students

In the 30 years since the reform and opening up, China's comprehensive national power has strengthened gradually day by day and people's living standard has been greatly improved, with making remarkable achievements. But we must also clearly realize that socialism is still at the primary stage which will last for a long time, the main contradiction of the primary stage is still the contradiction between people's growing material as well as cultural needs and the backward social production. To completely change the backwardness of the state, a large number of innovative talents are needed to construct and develop their own countries.

College students should first cultivate diligence and rigorous good style of studying, calming down to devote themselves to science and hard working. They should work hard with practical skills and they should think independently, combine study with practices and learn with enlightenment. Contemporary college students should not only strive to learn their professional knowledge, but also to focus on the expansion and extension of knowledge, achieving the goal of independent study, innovative study, comprehensive learning and lifelong learning, strengthening the abilities and skills of knowledge to realize their own dreams.

3.3 Propagating the national spirit and the Era spirit, fostering the characteristics and qualities of university students

People should have such a spirit of struggling and hard working. General Secretary Xi jinping stressed: "Chinese dream must be carried forward with the propagation of the Chinese spirit, which is the national spirit with the core of patriotism and the era spirit with the core of reform and innovation. That is the cohesive spirit which is the soul that can strengthen the nation." (Editorial committee,2013) We should guide students to carry forward the national spirit and the spirit of the times, constantly learning, understanding and practicing it. In the classroom teaching and practical teaching in daily life, paying more attention to cultivate students' spirits of patriotism, solidarity, hardworking, brave and strong and the spirit of unremitting self-improvement as well as honesty and trustworthiness, guiding students to improve their own quality in science and technology, and meanwhile, strengthening the ideological and moral cultivation, learning to behave, act, coexist and learning how to learn. They should combine the theory and practice, knowledge and ability, scientific and technological as well as literature qualities together organically and foster the noble character to achieve the dreams of the nation.

3.4 Developing the social practical activities, strengthening the practical abilities of university students

"Fostering the will in actual combats and enhancing the ability in practices", it is the real reflection for Chinese to seek, pursue and achieve dreams. The opinion, practice is the priority, is the basic point of the Marxism epistemology, it is also a must in the education sector of university education. The Decision of CPC Central Committee and the State Councilon Deepening the Reform of Higher Education in a Comprehensive Way to Recommend Quality Education pointed out: "higher education should strengthen social practices, organize students to participate in scientific researches, technology development and promotion activities as well as social service activities."

We must guide the university students come out of schools and step into the society, letting them know the society in social practices as well as learning social knowledge, improving skills and practicing willpower. Making them conscientiously perform the necessary obligation and responsibility to others and the society in the process of practices.

4 Conclusions

Through questionnaires, I have analyzed the present situation about the social responsibility of the modern university students quantitatively and qualitatively, have discussed the existed problems on the ideals and faiths, value orientations, social ethics and law awareness of some university students and have proposed to educate and guide them from the education on beliefs, knowledge and skills, characteristics and qualities and the practical ability, etc.

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Study on the Relationship Between College Students' Psychological Capital and Physical Exercise Effects

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Abstract: Taking college students in Hubei Province as the research object, the article investigates the psychological capital level and the effect of physical exercise through the "Questionnaire on Psychological Capital Level of College Students", and has a general understanding of the status of physical exercise effect and psychological capital of college students, so as to further analyze the relationship between psychological capital and physical exercise effect and provide empirical evidence for enhancing the psychological capital level and physical exercise effect of college students. The research has shown that: there exists a positive correlation between psychological capital and physical exercise effect of college students.
Key words: College students; Psychological capital; Physical exercise; Exercise effect

1 Introduction

The research on psychological capital originates from the development of positive psychology, which advocates interpreting human's psychological phenomena and behaviors in a positive way of thinking, and focuses on human's emotional experience and positive personality traits. With the vigorous development of positive psychology at home and abroad, an increasing number of psychological researchers begin to focus on individuals' positive psychological strengths and virtues. Psychological Capital refers to a positive mental energy and resource that individuals manifest in their growth and development process, including self-efficacy, hope, optimism and tenacity in general (Karatepe om, Karadas G, 2014). The scholar Yang Zhao believed that college students could enhance their willpower and optimism and gain the competitive advantage of psychological capital through various forms of physical activities (Yang Zhao, 2008).

With the popularity of various fitness activities, fitness becomes a hot word in people's well-being, and studies have shown that psychological capital can effectively predict the level of mental health (Huang Hui, 2011). Sports have positive effects on the various dimensions of individual psychological qualities. Positive psychological capital is of great significance to either individual development of students or competitiveness enhancement of schools or social development (Ji Liu, Zhang Liwei,2007). This article attempts to investigate the status of physical exercise of college students and reveal the relationship between psychological capital and physical exercise effect, so as to provide empirical evidence for enhancing college students' psychological capital level.

2 Subject and Method

2.1 The respondents

The selected respondents in this article are college students in Hubei province, including students from Wuhan University of Technology, Central China Normal University, Wuhan University, and Wuhan Textile University. It randomly selects 800 students from different grades and issues a total of 800 questionnaires, with 768 valid ones and 96% effective rate, including which there are 398 boys and 370 girls.

2.2 Research tools

The measuring tool of college students' psychological capital used in this paper is "positive psychological capital questionnaire" (PPQ). Zhang et al followed Luthans' view, based on the related measurement tools and literature at home and abroad, and compiled "positive psychological capital questionnaire" (PPQ) containing self-efficacy, optimism, tenacity, and hope with 26 questions (Zhang Kuo, Zhang Qian,2010). The research group of all questions in the questionnaire is for domestic college students, which accord with the using standards of psychological questionnaires to higher reliability, validity, local appropriateness and stability. The adoption of this questionnaire is based on the consideration of the structural stability and the subject of college students.

2.3 Statistical analysis

This paper applies the statistical software SPSS17.0 to have a descriptive analysis of the collected

effective questionnaires, and carries out descriptive statistics, variance analysis, and correlation analysis of the data.

3 Result and Analysis

3.1 Overall condition of collegestudents' psychological capital level

In order to achieve the stability and reliability of psychological capital questionnaire, the article uses the statistical software SPSS17.0 to carry out a reliability test. The results show: the correlation coefficient R of psychological capital questionnaire is 0.87; P <0.001; the reliability test α value is 0.807; which fully proves the credibility of the content and data of psychological capital questionnaire.

Table 1   Reliability Test Results of Psychological Capital Questionnaire

	Psychological Capital
Questionnaire Item Number (item)	Cronbach's Alpha (α)
26	0.807

3.1.1 The gender differences of psychological capital in college students

The paper carries out an independent sample T-test on psychological capital of students with different genders, and the results are shown in Table 2: boys' scores in four dimensions of psychological capital are higher than girls'. The paper carries out a statistical test on the four dimensions of psychological capital, namely, self-confidence, hope, tenacity, and optimism, and calculates P value is less than 0.05, from which can be seen significant gender differences on self-confidence, hope, tenacity, and optimism of college students. Combined the psychological capital mean and standard deviation of male and female college students, it can be drawn: there exist differences on psychological capital (self-confidence, hope, tenacity, optimism) of male and female college students, boys relatively better than girls.

Table 2   Gender Differences of Psychological Capital in College Students

Variable dimension	Male (n = 398)	Female (n = 370)	P
Confident	28.37 ± 2.820	26.86 ± 3.209	0.003
Hope	21.93 ± 1.187	21.01 ± 1.715	0.018
Tenacity	23.20 ± 1.891	22.35 ± 1.437	0.010
Optimism	22.95 ± 2.023	21.89 ± 2.457	0.014

3.1.2 Grade differences of psychological capital in college students

The paper has a one-way anova analysis of psychological capital of students from different grades, and the results are shown in Table 3: the average value of psychological capital scores of college students with four grades are almost the same, among which the second-year college students' psychological capital scores highest.

Table 3   Grade Differences of Psychological Capital of College Students

	Grade	M+SD	F	P	Multiple Comparisons
Confidence	Freshman Sophomore Junior Senior	27.31±3.391 27.75±2.933 23.92±2.369 23.78±2.006	6.940	0.123	
Hope	Freshman Sophomore Junior Senior	21.29±1.830 22.51±1.393 21.91±2.096 21.78±1.732	5.438	0.726	
Tenacity	Freshman Sophomore Junior Senior	22.20±1.749 26.81±1.216 23.34±2.586 26.18±1.880	8.122	0.026	Junior: Freshman(P=0.018) Sophomore (P=0.008) Senior (P=0.138)
Optimism	Freshman Sophomore Junior Senior	22.32±2.596 22.44±2.183 21.70±2.099 22.00±1.320	5.243	0.866	

It regards four grades in college as independent variables, and carries out single-factor and multiple comparison analysis by defining four dimensions of college students' psychological capital as dependent

variables, including self-confidence, hope, tenacity, and optimism. The data shows that: the P values of self-confidence, hope, and optimism are greater than 0.05 on average, indicating that there is no difference on confidence, hope, and optimism. While the P value of tenacity is 0.026, less than 0.05, indicating that the tenacity of psychological capital of college students varies from different grades. The paper adopts LSD method of pairwise comparison to have multiple comparisons and finds out: the tenacity of freshmen and sophomores are significantly different from the ones of juniors and seniors tenacity (P = 0.018 <0.05, P = 0.008 <0.01, P = 0.138 <0.01), and no significant difference in other pairwise comparison groups. Therefore, the psychological capital of college students exist part diversity in different grades.

3.1.3 Native place differences of psychological capital of college students

The paper has an independent sample T-test on psychological capital of college students from different native places, and the results are shown in Table 4: non-rural students score higher than rural students in four dimensions of psychological capital.

The paper has statistical tests on the four dimensions of psychological capital, namely, self-confidence, hope, tenacity, and optimism, among which the P values of self-confidence, hope, and tenacity are greater than 0.05 on average. It can be seen that no difference existing on self-confidence, hope, and tenacity among college students from different native places.

The P value of optimism is 0.002, less than 0.05, indicating that there are significant differences in optimism and non-rural college students' psychological capital scores are higher than rural students'.

Table 4　Native Place Difference of Psychological Capital in College Students

Variable Dimensions	Non-rural (n = 345)	Rural (n = 423)	P
Confidence	28.07 ± 3.134	27.19 ± 3.021	0.085
Hope	21.60 ± 1.482	21.35 ± 1.527	0.484
Tenacity	22.80 ± 1.565	22.48 ± 1.241	0.362
Optimism	23.15 ± 2.060	21.81 ± 2.390	0.002

3.2 Correlation analysis on college students' psychological capital and exercise effect

In order to understand the relationship between psychological capital and physical exercise effect of college students, the article has correlation test by regarding exercise effect (exercise fun, health effect, ability effect, appearance effect, and social effect) and psychological capital (self-confidence, tenacity, hope, and optimism) as variables and the results are shown in Table 5.

Table 5　Correlation Analysis on Various Dimensions of Psychological Capital and Exercise Effect

Correlation						
		Exercise Fun	Health Effect	Ability Effect	Appearance Effect	Social Effect
Self-confidence	Pearson correlation	.652**	.588**	.499**	.462**	.416**
	Significance（bilateral）	.000	.000	.000	.000	.000
Hope	Pearson correlation	.481**	.518**	.528**	.394**	.401**
	Significance（bilateral）	.000	.000	.000	.000	.000
Tenacity	Pearson correlation	.567**	.609**	.537**	.342**	.358**
	Significance（bilateral）	.000	.000	.000	.000	.000
Optimism	Pearson correlation	.670**	.624**	.614**	.525**	.503**
	Significance（bilateral）	.000	.000	.000	.000	.000
**. Significant correlation on .01 level(bilateral)						

Table 5 lists in detail the correlation analysis results on various dimensions of psychological capital and physical exercise effect, from which can be seen: self-confidence, hope, tenacity, optimism and physical exercise effect (fun, health, ability, appearance, and social) have correlation. It also shows that obvious synthetic correlation exists between four dimensions of psychological capital and physical

exercise effect, namely, the higher four dimensions of psychological capital are, the better physical exercise effects are.

4 Recommendation

The study has shown that there exists a positive correlation between psychological capital and physical exercise effect of college students, and differences exist in the four dimensions of college students' psychological capital (self-confidence, hope, tenacity, and optimism). Therefore, in order to ensure the physical and mental health of college students and cultivate innovative talents with comprehensive qualities for the society, it is practical to develop and promote college students' psychological capital, envisage the differences of college students' psychological capital, and adopt the measures of individualized teaching to achieve the goal of improving physical exercise effect of college students.

4.1 Development and Promotion of College Students' Psychological Capital

1) Increase self-efficacy. Schools, families and society should create various conditions, focus on cultivating college students' awareness of actively participating in physical exercise, helping college students set workout goals in line with SMART principles and support their implementation. The continuous achievement of the stage goals strengthens the success experience of college students, so that students have over achievement motivation sense, and their self-confidence and sense of self-efficacy are improved.

2) Build a better hope. Concern about and pay attention to quality-oriented education of college students, and increase the confidence of college students in face of difficulties and pressure calmly and are hopeful to the future by raising the expectation level of college students.

3) Cultivate tough quality. Cultivate college students' ability to calmly face adversity, overcome adversity, achieve the ultimate goal, actively explore their inner potentials and combine with advantageous external resources to turn difficulties into challenges, so as to cultivate the tough quality of college students.

4) Establish a positive attitude. Improve the cognitive ability and level of college students, and guide them to face the challenges in life and learning with a more positive and optimistic attitude. Train their courage to deal with unexpected things in physical exercise, and convince that they have the ability to handle any problems, so as to establish the positive and optimistic attitude and anti-frustration ability of college students.

4.2 Envisage Differences and Teach Individually

1) Set reasonable work-out goals according to the differences of male and female students, and choose different exercise programs based on the different physical features between male and female students. Especially organizes regular sports competitions in light of girls' interests and hobbies, so as to urge girls to actively participate in sport activities and help shape their positive qualities.

2) Focus on cultivating freshmen and sophomores' adaptive capacity and anti-pressure ability, enhancing their tenacity and encourage their courage to complete the challenging tasks in exercise. Physical exercises with long time and high frequency can help college students to hone strong will, and cultivate the faith of perseverance, thereby enhancing their level of tenacity.

3) Targeted at students from different native places especially rural students, develop their optimistic attitude, learn to actively face learning and life, and dare to present their exercises to classmates and teachers to have a smooth experience. By taking exercise, master certain physical exercise skills, improve the ability of self-assessment, and enhance their self-confidence.

5 Conclusions

1) Male and female college students are different in psychological capital (self-confidence, hope, tenacity, and optimism), males are relatively better than females.

2) There are differences in psychological capital's tenacity of college students from different grades, and that is no difference in self-confidence, hope, and optimism. The tenacity of freshmen and sophomore year students is significantly different from that in senior year.

3) No difference exists in self-confidence, tenacity, and hope of college students from different native places, but there are differences in optimism, and the non-rural college students' psychological capital scores are higher than that of the rural students.

4) It can be drawn from correlation analysis that a positive correlation exists between psychological capital and physical exercise effect of college students.

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Exploration of a Social Work Model in Community-Based Physical Rehabilitation of Persons with Disabilities in China

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Abstract: As a highly effective community-based rehabilitation mode, community-based physical rehabilitation has been promoted in most areas in China. Yet in practice it faces many predicaments, which lead to exploration of the academy society into modes of social work intervention into community-based physical rehabilitation. Selecting a representative district Jianghan District in Hubei Province as object of study, taking reality as basis, this essay holds that intervention of empowerment-oriented social work model into community-based physical rehabilitation work is an important means of community-based physical rehabilitation on persons with disabilities in China. Therefore, this essay constructs a social work model which intervenes into community-based physical rehabilitation on persons with disabilities in China from individual, family, group, organization, community and country level.
Key words: Community-based physical rehabilitation; Social work model; Empowerment; Persons with disabilities

1 Introduction

1.1 Domestic and international research on the current situation of physical rehabilitation of persons with disabilities

Chinese scholar Jin Ning is the pioneer for Physical rehabilitation research in China. He believes that physical rehabilitation therapy rose in foreign countries as early as in the late 1940s, and it promoted development of sports for persons with disabilities. Physical rehabilitation therapy is a rehabilitation therapy through which physical function of persons with disabilities is improved by way of trainings in sports and entertainment, as well as their mental state. Also the therapy plays an important role in promoting interpersonal communication and their return to society. It is recognized internationally that persons with disabilities may improve their adaptability to life, explore their potentials, improve quality of life and integrate into society through physical rehabilitation trainings. Many countries have carried out physical rehabilitation trainings on persons with disabilities, and taken physical rehabilitation activities in the community as focus. In addition, Jin Ning also introduces physical rehabilitation work progress in Norway and Japan, and finds that physical rehabilitation of persons with disabilities and community are inextricably linked in foreign countries. (Jin Ning, 1998)

In The Development Status and Countermeasures of Physical Rehabilitation of Persons with Disabilities, Kong Fan, Yuan Feng and Wang Meichun suggest that physical rehabilitation is development and extension of exercise therapy: by means of PE and various sports, it treats diseases and injuries, prevents complications, brings an end to negative mental health, and promotes the comprehensive recovery of body functions, so as to achieve the goal of rehabilitation. They put forward countermeasures for the career of physical rehabilitation for persons with disabilities, including establishment of correct physical rehabilitation view, training of physical rehabilitation talents, providing support on policy and funds, and research and development of sports suitable for rehabilitation of persons with disabilities. (Kong Fan, Yuan Feng, Wang Meichun, 2007)

Other scholars have conducted in-depth research on special physical rehabilitation therapy for various disabilities or illnesses. For example, Liu Qingshan has indicated in *Physical Rehabilitation Method for Ankylosing Spondylitis* that the purpose of physical rehabilitation training is that through active movement combined with whole body movement and parts movement, increasing the movement of the joints up, down or surrounding the ankylosing joints, so as to develop compensation function; enhancing muscle strengthen and stretching training, so as to further protect the joints and improve the function of the body. And the main rehabilitation methods are: Taijiquan, Qigong, Ba Duan Jin, Qu Qin Xi etc. (Liu Qingshan, 1994)

It can be concluded that, physical rehabilitation is an important part of physical education, which is the combination of physical education and medical science. The key point of physical rehabilitation of

persons with disabilities lies not in competition but in the nature of rehabilitation. By participating in physical rehabilitation exercises, persons with disabilities may improve the functions of all organs and systems, improve capabilities of the body, and maximally compensate the difficulties which have been brought to them with disabilities. Especially in teenager period, possibilities of development of the body are quite huge, and even disabled parts may not be set completely, and there is possibility for transformation.

Foreign scholars generally believe that one quite important standard to measure service quality is "life quality". Schalock etc. (2002) say that quality of life is overall feeling for life, and positive experience in socializing and opportunities. Obviously, personal subjective feeling and sense of worth are key factors of quality of life. That is to say, quality of life is subjective experience, which is the satisfactory degree of one person for the experiences of his/her whole life, inner sense of satisfaction, and the opportunity for self-fulfillment in society.

Moreover, what is equally important is that, change of environment arrangement has direct impact on the quality of life of persons with disabilities. Stancliffe and Keane (2000) believe that only if with sufficient support and services, can living environment exert positive impact on life style and satisfaction. Duvdevany etc. (2002) put forward that development of community environment arrangement plan after the 60s are caused by "de-organization" movement and the importance people attach to the ability of "self-determination". Self-determination is one of the important connotations of quality of life. It is an ability with which a person makes choices according to his/her own will and take actions accordingly, the hypothesis of which is that every grown-up can grasp his own life with certain support. Therefore, support and services should be provided so as that persons with disabilities may make choices in the following fields: (1) select communities for residence and neighbors; (2) determine to live alone or with others; (3) determine whether or not to participate in community activities or join community organizations and make friends; (4) know where and how to get help and support; (5) be able to associate with persons of the opposite sex and deal with relations with them; (6) choose where to work; (7) select medical and therapeutic services.

Felce etc. (2000) hold the opinion that whether or not to provide necessary support for persons with disabilities to live in normal community environment is not only an important indicator to measure the quality of life of persons with disabilities, but also an important standard to judge service efficiency for persons with disabilities. The quality of life of persons with disabilities is determined by the types of services and the attitudes and strategy of relevant service providers. On the one hand, quality of life reflects the satisfaction of persons with disabilities on certain kind of services; on the other hand, the satisfaction of persons with disabilities on quality of life shows their satisfaction on certain type of services. Quality of life is the main indicator for countries all over the world to plan, service and evaluate the effectiveness of service models targeted for persons with disabilities.

It can be concluded that foreign scholars focus their researches on how to improve the quality of life of persons with disabilities and provide services for them (including rehabilitation services).

1.2 The current situation of community-based physical rehabilitation of persons with disabilities in China

With rapid expansion of global economy, social pressure multiplies daily, and it is gradually realized by the society and the government that persons with disabilities as a social vulnerable group, restricted by physical and psychological factors etc., suffer much inconvenience in their life, study, employment, interpersonal interaction and social participation etc., which results in their vulnerable position in society, so it is decided to promote development of the cause of rehabilitation of persons with disabilities. Combining foreign experience with localization, we use a community-based comprehensive rehabilitation model, associating with different organizations and institutions to provide comprehensive services on health care, education, employment, psychology consultation etc., and make it a predominant model for rehabilitation of persons with disabilities in China. To support the development of community-based rehabilitation of persons with disabilities, China has in recent years enacted a series of documents related to rehabilitation of persons with disabilities, which has played a huge role in promoting community-based rehabilitation of persons with disabilities.

Though community-based rehabilitation of persons with disabilities is developing very fast in China, the rehabilitation demands of most persons with disabilities in China are not satisfied, they are not able to enjoy rehabilitation opportunities and conditions. In the process of performing the cause of community-based rehabilitation of persons with disabilities, work staff from the government and the community gradually become aware of the significance of community-based physical rehabilitation, including overcoming their self-obstacles, improving the ability to adapt to life and improving health,

enhancing immunity, improving physical fitness of persons with disabilities for various sports, improving mental state, promoting social integration, showing equal opportunities and improving quality of life etc. However, since development of community-based rehabilitation of persons with disabilities is still not mature in China, and the physical rehabilitation work is not professional or targeted, physical rehabilitation work becomes a mere formality, which affects the service quality and efficiency of community-based rehabilitation of persons with Disabilities. In western developed countries, professional social work values and work methods play a significant role in community-based rehabilitation of persons with disabilities; while in China, community-based rehabilitation of persons with disabilities is lack of effective intervention of professional social work, thus it fails to engage in social work as an active role in the field of community-based rehabilitation of persons with disabilities. Among current researches, researches on how to engage social work into community-based physical rehabilitation of persons with disabilities are quite rare; while to improve the quality and efficiency of community-based physical rehabilitation of persons with disabilities in China, it is indeed necessary to explore how social work engages in community-based physical rehabilitation of persons with disabilities in China. Taking Jianghan District of Wuhan City as an example, this essay explores a social work model for community-based physical rehabilitation of persons with disabilities in China.

2 Development of Community-Based Physical Rehabilitation in China

Physical rehabilitation therapy rose in foreign countries as early as in the late 1940s, and it promoted development of sports for persons with disabilities. Physical rehabilitation therapy is a rehabilitation therapy through which physical function of persons with disabilities is improved by way of trainings in sports and entertainment, as well as their mental state. Also the therapy plays an important role in promoting interpersonal communication and their return to society. It is recognized internationally that persons with disabilities may improve their adaptability to life, explore their potentials, improve quality of life and integrate into society through physical rehabilitation trainings. Many countries have carried out physical rehabilitation trainings on persons with disabilities, and taken physical rehabilitation activities in the community as focus, since carrying out physical rehabilitation in the community may combine rehabilitation, physical training and health care etc. of the community organically, make their unique roles displayed.

Community sports have developed in China in the late 1980s when there was a strategic shift taking economic construction as the center. Currently, men of insight in the sports community have become fully aware that community is a bridge to connect family sports, school sports and community sports and the carrier for implementation of the national fitness program. Developing community sports is an important way to carry out construction of two civilizations at the grassroots level. (Gu Yuanyan, 2001) Although promulgation of the law of physical culture and sports and implementation of the national fitness program have, to a certain extent, promoted the development of community sports, China is a developing country at the primary stage of socialism, there are not sufficient conditions for development of community sports, whether from the perspective of economic development or social development. The prevailing problems in current community sports are: First, the lack of sports facilities. At present, public sports facilities for community residents are extremely limited in China, and there is a large gap between economically developed areas and underdeveloped regions, which is not able to meet the demands for national fitness. Second, the lack of participants. At present, sports groups involved in community sports in China are mainly the elderly; young and mid-aged people are fewer and persons with disabilities are even fewer. Third, the lack of theoretical and empirical guidance, materialized sports societies in China have not yet reached the grass-roots level so far, thus it is difficult to find organizational reliance or technical guidance for community sports work; the "social sports instructor techniques level system" under implementation has not gone deep to the grassroots level, resulting in a lack of instructors and training opportunities. The above three points hamper the development of community sports, and affect the development for fitness of persons with disabilities at the same time.

In Article 71 of *The World Program of Action Concerning Disabled Persons* (adopted by the United Nations General Assembly at its 37th regular session on 3 December 1982, by its resolution 37/52), it explicitly mentions that "it is basic requirements of life to fully participate in the activities of basic units of the society—family, social groups and community". Such opportunity of participation and right of equality are stipulated in the *Universal Declaration of Human Rights*, therefore each and every one shall enjoy such right, including persons with disabilities. Along with the reform of the political system and economic system, the implementation of the national fitness program, the foothold of mass

sports must be the most basic unit of society—community sports. With 60 million people with disabilities, their participation in physical fitness in the community directly affects the development of community sports. Over the past decade, the state has issued a number of regulations and policies relating to protection of the interests of persons with disabilities, such as *Law of the People's Republic of China on the Protection of Disabled Persons*, *Tenth Five-Year Implementation Plan for Sports Work of Persons With Disabilities*, *Law Of the People's Republic of China on Physical Culture and Sport*, *National Fitness Program*, etc. all of which have provided a good spiritual environment for persons with disabilities in China to take part in sports activities and sports competitions. Together with the active participation and joint efforts of the majority of persons with disabilities, service providers for persons with disabilities and physical educators, the sports work of persons with disabilities has stepped on the road of rapid development, and has made historic progress. Since 1982, China has participated in five sessions of Paralympic Games, five sessions of "Far South" Games for the Disabled, four sessions of Special Olympics, two sessions of Olympic Games for the Deaf as well as sports meeting for the blind and a number of world championships, winning more than 1600 gold medals, breaking (surpassing) 185 world records. Chinese sports delegation of persons with disabilities entered the world sports "top ten" of persons with disabilities for the first time at the 10th Paralympic Games held at Atlanta in 1996; the Chinese sports delegation ranked sixth at the gold medal table at the 11th Paralympic Games in 2000. Chinese delegation kept ranking first in the number of gold medals and all medals at the 5th , 6th and 7th sessions of the "Far South" Games for the Disabled. With high competitive level, through competitive sports for the disabled, persons with disabilities achieve better results in international competitions; this improves the awareness of sports in more ordinary people with disabilities, motivate them to actively take part in physical exercises, so that mass sports develop constantly. At present, sports activities for persons with disabilities are not popular enough in China, especially in the community (Luo Yong, 2008), such situation has a lot to do with the level of education, the economic situation, and motives for taking part in community sports of persons with disabilities, forms of participation and participating items. Fitness of persons with disabilities in community sports still has a long way to go.

To construct a fitness mode in community sports for persons with disabilities is the need for development of community sports, and also the requirement for development of sports undertaking among persons with disabilities. As vulnerable groups in society, persons with disabilities need more care than normal people in the context of national fitness and community sports development; they need more fitness venues, instruments and methods in community sports. However, survey shows that, fitness situation of persons with disabilities is not optimistic, even in economically developed regions (such as Beijing, Shanghai, Guangzhou) there is still lack of fitness devices and methods for persons with disabilities. Today, disability is already a global problem, and one person in four in the world has disability issues of different degrees, whether for congenital cause or acquired cause, no matter from the perspective of economics or sociology or medical science, the final means is sports, which is the most effective way (Lu Yuanzhen, 2000). With the continuous development and deepening of community sports, fitness and rehabilitation of persons with disabilities is inevitable in community sports, it is also implementation of fitness and rehabilitation of persons with disabilities at the most basic level, which to some extent reflects the significance of community-based physical rehabilitation of persons with disabilities.

3 Present Situation and Problems of Community-Based Physical Rehabilitation of Persons with Disabilities in Jianghan District

Under the guidance of government policies, Disabled Persons' Federation of Jianghan District and all sub-districts attach considerable importance to the cause of community-based physical rehabilitation of persons with disabilities, yet for residents in China lacking understanding for community-based physical rehabilitation and insufficiency of professional and theoretical knowledge of work staff in implementation of physical rehabilitation, problems occur frequently in present community-based physical rehabilitation, mainly in the following aspects:

1) Residents' lack of knowledge on community-based physical rehabilitation and enthusiasm for participation

Even though a number of activities have been carried out and lectures have been given on community-based physical rehabilitation in Jianghan District, most residents still have no idea about the substantial effect of it, so they are more prone to resorting to traditional medical model such as medicine treatment, not to mention going for community help on initiative, and receive physical rehabilitation

services of the community. Meantime, common residents lack understanding for community-based physical rehabilitation, and community work staff do not publicize relevant information in time, instead, they just work following the policies, and this results in persons with disabilities, even community work staff lacking knowledge on community-based physical rehabilitation of persons with disabilities, thus lacking enthusiasm in organizing or participating in community-based physical rehabilitation activities.

2) Lack of professional talents team for community-based physical rehabilitation

Community-based physical rehabilitation services require not only community work staff and volunteers, but also medical workers, PE teachers, social work talents and relevant government departments to cooperate and participate together. While the community-based physical rehabilitation work in Jianghan District suffer from talents shortage: the work staff generally haven't received much education and provide poor quality service, and a high-level high-quality professional talents team for community-based physical rehabilitation hasn't been constructed. In addition, more often than not front-line field workers such as community facilitators are engaged, lack of engagement of professional social workers and PE specialists, so it is difficult to make experience rise to the height of theory but stay a mere formality, and it cannot be guaranteed that persons with disabilities will get exercises in body and mind from community-based physical rehabilitation.

3) Insufficient funds support for community-based physical rehabilitation

Community-based physical rehabilitation of persons with disabilities belongs to social welfare services, with "diverse investment subjects, public service objects, diversified service modes and professional service teams". But socialized funds raising channels for community-based rehabilitation haven't been established in China, we don't have "diverse investment subjects"; besides, the state funding is limited and difficult to arrive in place in time, and the investment of China Disabled Persons' Federation is limited, local governments have little incentive to implement community-based rehabilitation, hardware such as space, equipment, etc. are in quite shortage, etc. for lack of strong material guarantee, it is difficult to carry on community-based rehabilitation in China smoothly. Thus, the establishment of an effective funding mechanism is imperative in China.

4) Lack of vitality for exclusive control

First, community-based physical rehabilitation in China is lack of standardized management system and job description, physical rehabilitation services are lack of technical specifications, and a system of two-way referral with superior medical institutions has not been established. Then, community-based physical rehabilitation requires cooperation between government departments and other non-government institutions or other government departments, but in China such "multisector cooperation" mechanism has not been developed. Last, the power of civil society organizations has been neglected by our government, thus it is not made full use of in community-based rehabilitation programmes, and only a part of communities has carried out community-based rehabilitation with cooperation with non-government institutions.

5) Unsound community-based rehabilitation network

First of all, resource sharing for community-based rehabilitation hasn't been achieved in China, which is not conducive to the rehabilitation of persons with disabilities to find appropriate community rehabilitation resources and get access to the services. Secondly, mutual support network for persons with disabilities has not yet formed; such mutual support organizations in Jianghan District are very rare, and have not played substantial roles, which is not conducive to the cause of rehabilitation of persons with disabilities in the community. Finally, a network of volunteers for community-based rehabilitation has not yet been established. Although numerous volunteer activities for community-based physical rehabilitation haven been carried out, in each activity the volunteers are "new faces", who lack sufficient knowledge for the recipients and on physical rehabilitation services, a service network is not formed yet.

4 Intervention of Social Work into Community-Based Physical Rehabilitation of Persons with Disabilities

4.1 Significance and fundamental principles of social work intervention

4.1.1 Significance of social work intervention

Community-based physical rehabilitation has always been holding on to social work professional values, which play an important role in community-based rehabilitation: social workers establish a good professional relationship with persons with disabilities; this is conductive to identifying the rehabilitation demand and objective of persons with disabilities. In the very beginning, persons with disabilities may have limited knowledge on their own situation and surroundings, or their knowledge on

such issues is hidden behind the most desperate demand at the moment, not showing out. Social workers need to establish a further professional relationship with persons with disabilities, become their companions, and learn about their opinions on themselves and community-based rehabilitation and community-based rehabilitation consciousness of them and their family members through in-depth communication with them. Moreover, social workers will assess the power the persons with disabilities perceive with which they could handle these issues or not. Intervention in this level will lay a solid foundation for social work intervention into community-based rehabilitation in the future. The overall goal of community-based physical rehabilitation of persons with disabilities in China is consistent with that in international community, which is to promote the comprehensive rehabilitation of all persons with disabilities, make them enjoy equal opportunities and return to social mainstream. While the objective of social work intervention into community-based rehabilitation of persons with disabilities in this essay is to use the concept and methods of social work to solve the above-mentioned problems in community-based rehabilitation of persons with disabilities in China, and provide reference for the formation of a community-based rehabilitation mode of persons with disabilities suitable to China.

4.1.2 Fundamental principles

1) Socialized work principle

The principle of so-called socialized work principle is brought up mainly targeted for the closed, isolated and taking-on-all-things work style. In specific, it means such a principle: under the unified leadership of the government, relevant departments perform their separate duties while closely cooperating with each other, mine and make use of community resources, mobilize and organize social forces to work together to promote the work. Community-based physical rehabilitation should follow this principle all the way.

2) Low cost, wide coverage principle

"Low cost, wide coverage" means with relatively less manpower, material resources and financial input, most service objects can enjoy services, that is, gain a wide coverage of services. Enhance the effective use of rehabilitation resources, and improve quality of rehabilitation services, go on the road of low cost with wide coverage and low input with high effectiveness. On facilities, make use of the existing places or use one room for multi-purposes to provide rehabilitation services; on equipment, focus on self-made easy training instruments; on training locations, make house training the principal one.

3) Rehabilitation objects taking initiative participation principle

One of the differences between community-based physical rehabilitation service and traditional medical rehabilitation service is the role transformation of rehabilitation objects: from a passive receiving role to an active participating role, they will participate in making rehabilitation physical fitness plans, setting objectives and implementing trainings etc. Persons with disabilities should establish self-rehabilitation consciousness, take the initiative, follow instructions of rehabilitation instructors, and focus on self-training.

4.2 Model selection taking Jianghan District as an example

It is observed from the existing problems of community-based physical rehabilitation in Jianghan District that to empower persons with disabilities in the community, improve their living standard and quality of life is the ultimate goal of community-based physical rehabilitation, therefore, we choose empowerment-oriented social work model to intervene into community-based physical rehabilitation of persons with disabilities in Jianghan District.

4.2.1 Empowerment-oriented social work model

When tracing the historical development of empowerment oriented practice, Simon points out that, social work empowerment practitioners since the 1890s, use different languages in different ages to describe their work, taking the clients as individuals, families, groups and communities with various skills or potentials, no matter how much inferior, incapable, depreciated or self-destructive they may be or actually are. Those social workers design a work relationship with their clients, taking special abilities, resources or demands of clients as precondition, support the clients or client groups in making their daily life more remunerative or in exerting sharing power in their companionship. The purpose of the companionship is to encourage clients to make use of their strengths in the process of pursuing and consolidating their improved self-esteem, health, community, safety, individual and social power. These social workers also try to open the source of power existing in the clients' personality, and resources and restorability that may exist in their family, friends, neighborhood and sub-culture. By guiding the clients and client groups to seriously be the specialist of their own life and be citizen and the demander, they encourage the clients to empower themselves. This empowerment-oriented social work presupposes that,

the core "story" to tell, historically or currently, is a story about the client himself obtaining resources that shall improve his control over his own business. Such social work model is one model that assists clients in finding and making the meanings of their situations, relations and problems. The model believes that, only group members who are devalued or branded stigma are the leading roles. In short, Simon holds that the characteristics of empowerment-oriented social work are: first, establish companionship with clients, client groups and community leaders etc.; second, emphasize the capability of clients and client groups instead of incapability; third, support double focus on individuals as well as his social or physical environment; fourth, admit that clients and client groups are active subjects, and they have interconnected rights, obligations, demands and requirements; five, target professional energy to historically disempowered groups and their members through conscious selection.
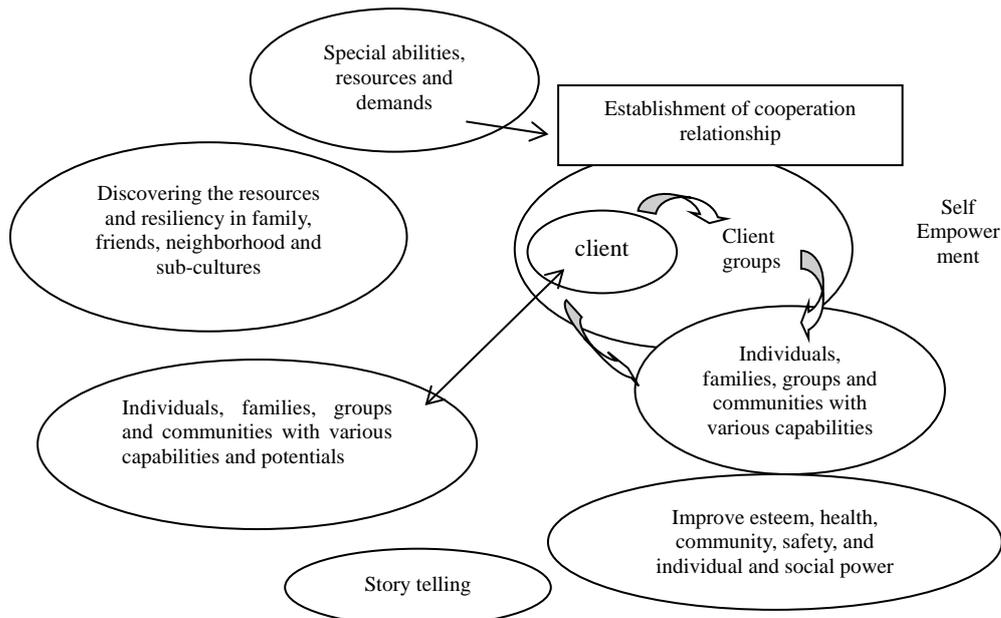
Figure 1　Empowerment-Oriented Social Work Model

4.2.2 Intervention strategies

Among the intervention methods and strategies, we choose to intervene in individual, family, group, organization, community and country level from the following aspects:

1) Social workers establish a good professional relationship with persons with disabilities in the community, and define their rehabilitation demands and objectives. The professional relationship between social workers and clients is critical to successful intervention, so establishment of a professional relationship between social workers and clients is attached great importance in social work practice. That is to say, social workers need to establish a good work relationship with persons with disabilities, assess their demand for community-based rehabilitation and rehabilitation resources, and determine the objectives of community-based rehabilitation of the persons with disabilities. In the very beginning, persons with disabilities may have limited knowledge on their own situation and surroundings, or their knowledge on such issues is hidden behind the most desperate demand at the moment, not showing out. Social workers need to establish a further professional relationship with persons with disabilities, become their companions, and learn about their opinions on themselves and community-based rehabilitation and community-based rehabilitation consciousness of them and their family members through in-depth communication with them. Moreover, social workers will assess the power the persons with disabilities perceive with which they could handle these issues or not. Intervention in this level will lay a solid foundation for social work intervention into community-based rehabilitation in the future.

2) Provide necessary community-based rehabilitation knowledge and skills for community residents, so as to control problems in community-based rehabilitation. To make clients get rid of the feeling of helplessness, we may start from improving the self-efficacy of clients and the role of groups. Promote the concept of community-based physical rehabilitation and enhance education on community-based physical rehabilitation of persons with disabilities. Currently community residents

lack understanding for community-based physical rehabilitation, and have cognitive bias on it with weak consciousness on rehabilitation. Social workers may use group social work method, such as meetings, courses, etc. to carry out community-based physical rehabilitation work, improve the self-efficacy of persons with disabilities so that community residents can correctly understand physical rehabilitation, enhance their awareness of rehabilitation, thus a community-based rehabilitation support network will be established. Social workers may also make use of Day of Persons with Disabilities to strengthen propaganda on physical rehabilitation; make in-depth and persistent propaganda to persons with disabilities and the masses of the whole society on concept, content and function of community-based physical rehabilitation by means of television, broadcast, network and newspaper etc., popularize knowledge of physical rehabilitation on community residents, and enhance their consciousness on physical rehabilitation, to create a public good that is favorable to community-based rehabilitation of persons with disabilities.

3) Establish a sound community-based rehabilitation service network based on community. To empower persons with disabilities, we need to make the current resources in the community, people in the community and the groups of persons with disabilities play their roles, to establish a sound community-based rehabilitation service network, so as to ensure rehabilitation of persons with disabilities can be realized within the community. First, establish a sharing network for community-based rehabilitation resources: based on community, integrate community residents' committees, community service centers and community health service institutions etc., to form of community-based rehabilitation network resources, make full use of existing resources within the community such as enterprises, activity places for persons with disabilities etc., perform well prevention of disabilities and rehabilitation work of persons with disabilities. Social workers should integrate varieties of resources of all institutions in the community, introduce physical rehabilitation into families, make full use of community committees, community service centers, community health care institutions, professional rehabilitation workers, activity places for persons with disabilities, rehabilitation equipment and facilities and relevant staff etc., to form a community rehabilitation resources sharing network, and realize comprehensive community-based rehabilitation. Second, strive to develop mutual support networks among persons with disabilities. Social workers need to provide impetus to formation, consultation, preliminary training etc. of mutual support organizations in the form of group work, provide support to members of the organization, and help them to discover and determine leaders, to promote establishment of mutual support organizations network of persons with disabilities. Social workers do not assume the role of "leaders" in the mutual support organizations, but "outsiders". Third, improve volunteer service network for community-based rehabilitation. The implementation of community-based rehabilitation services should first rely on members of the community. So social workers shall publicize community-based rehabilitation knowledge to community residents, motivate community members to engage in community-based rehabilitation work of persons with disabilities, form volunteer service network for community-based rehabilitation, to support implementation of community-based rehabilitation of persons with disabilities.

4) Take change or adjustment of community environment as the core to intervene. Social issues do not stem from defect of individuals, but from failure of the society to satisfy the demands of all members. As a result, in the practice of empowerment, we do not only work towards individuals, but should also be committed to improving the community environment in which the individual stays. This requires us to pay attention to exploring the impact of community environment in which the persons with disabilities stay to community-based rehabilitation when making social work intervene into community-based rehabilitation of persons with disabilities, and improve the community environment so as to make it promote community-based rehabilitation of persons with disabilities. First, enhance team building of community-based rehabilitation staff, especially to build a professional social workers team for community-based rehabilitation. Social workers shall enhance coordination and cooperation between all medical and health departments and professional PE teachers, to provide technical training and instructions to community-based rehabilitation staff, to improve physical rehabilitation service and management level of the staff, and build one high-quality community-based rehabilitation team of clear division of labor and high quality of services. Then, establish "multi-layer" technical instruction networks in the community. Social workers of community-based physical rehabilitation may organize family members of persons with disabilities and volunteers to conduct physical rehabilitation trainings, make persons with disabilities, their family members and volunteers all master simple rehabilitation training methods, then professional PE teachers manage and assess the rehabilitation services they provide, to establish a rational multi-layer rehabilitation technical system finally, thus to assist persons

with disabilities in physical rehabilitation. Last, establish an effective socialized fund raising mechanism, and increase the fund input to community-based rehabilitation of persons with disabilities. Social workers should pass on the fund demand on community-based rehabilitation of persons with disabilities to relevant superior departments, impel governments of all levels to increase special fund input to community-based rehabilitation, and make government rehabilitation funds put to grassroots communities as focus. In addition, make active propaganda on the financial situation of community-based rehabilitation of persons with disabilities in China. Mobilize all sectors of society, especially the non-government organizations and celebrities to participate in the cause of community-based physical rehabilitation, and raise funds for community-based rehabilitation.

5 Conclusions and Reflection

With the development of the cause of community-based rehabilitation of persons with disabilities, the concept of community-based rehabilitation of persons with disabilities has undergone major changes, community-based rehabilitation of persons with disabilities has transformed from medical method which only pays attention to the physiological function rehabilitation to more comprehensive method which focuses on the overall demands of persons with disabilities, and helps persons with disabilities return to the main stream of society successfully. Community-based physical rehabilitation of persons with disabilities is a successful example guided by comprehensive demands. In the process of professional social work intervening into community-based physical rehabilitation of persons with disabilities, to ensure the smooth implementation and effective development of community-based physical rehabilitation services, it is not only the persons with disabilities that are needed, but also joint efforts from their families and friends, and departments of health, education, labor and employment, and social security etc., as well as care and concern of the public. With support of the government, together with health, civil affairs, public security, education, CDPF etc. other relevant departments of the government or social organizations, taking community as work platform, bring rehabilitation of persons with disabilities into social public service system, make it integrated into construction of community service network, urban and rural primary health care network, comprehensive security management network, grassroots masses spiritual civilization and cultural and recreational services network. Make full use of community service centers, community health service centers, community schools, community cultural centers, and other community organizations to enhance the radiation and guidance of professional organizations to community-based rehabilitation of persons with disabilities, make survey registration on rehabilitation demands of persons with disabilities, establish rehabilitation archives, provide rehabilitation counseling, training and instructions etc., publicize correct concepts of rehabilitation through education and propaganda, so that persons with disabilities can get convenient, effective and practical rehabilitation services and the goal of improving the quality of life of persons with disabilities may be realized more easily.

Yet, community-based physical rehabilitation is dynamic, which requires localization and adaptation to local conditions. China has a vast territory, and different regions have different cultural backgrounds and customs; therefore, it requires constant practice and test to establish a nationally suitable social work intervention model, and the empowerment-oriented social work model selected in this essay is also subject to the test of practice and time.

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Review of Chinese Entrepreneurship Education: Based on the Statistical Analysis of Social Science Fund

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Abstract: Venture tendency of the whole society is in the ascendant, which provides new challenges and demands for Entrepreneurship Education in China. As key funding sources of social science research, National Social Science Fund and Humanities and Social Sciences Fund of Education Ministry play a positive role in promoting relative research in the field of Entrepreneurship education. Based on statistical analysis of projects from the two funds, this paper summarizes the basic framework for entrepreneurship education research, including aspects of object, content, background, theory and methods，which may provide guidance and reference for further research.
Key words: Entrepreneurship education; National social science fund; Humanities and social sciences fund of education ministry; Statistics

1 Introduction

In early 2014, Tsinghua University Center for Entrepreneurship Research definitely pointed out that entrepreneurship education and training was weak in China, in the report "Global Entrepreneurship Monitor Report of China: business environment and Policies". Specifically, the primary and secondary education pays less attention to creativity of students. Education and training for entrepreneurship for market economics is obviously insufficient, which cannot meet the needs of entrepreneurs. "Opinions on Deepening the Reform of Higher Education in Innovation and Entrepreneurship" (2015) also clearly made statement that innovation and entrepreneurship education is the urgent need to implement innovation-driven strategy for national development and to promote the upgrade of the economy quality and efficiency. It is also an important measure to promote the comprehensive reform of higher education, and to increase quality of Employment and Entrepreneurship for college graduates. Therefore entrepreneurship education meets new challenges and requirements.

Since entrepreneurship education experiment official carried out in 1992, at Sichuan Hechuan of China, it has been over 20 years for conducting relative research of entrepreneurship theory and practice (Wang Zhanren, 2015), which made rich accumulation in definition and connotation, necessity and feasibility, problems and countermeasures and other aspects of the entrepreneurship education research results (Zhang Kejing, 2015). To further explore the reviews and methods, paper collected funded project data from the National Social Science Fund, Humanities and Social Sciences Research Fund of Education Ministry (hereinafter referred to as NSSF and HSSFEM) for statistical analysis, and made a conclusive summary about existing framework, hoping to provide reference for researchers.

2 Data and Statistics

2.1 Data sources

This study selected project from the National Social Science Fund, Humanities and Social Science Fund of Education Ministry. Project information came from the official website. Information retrieval carried out twice. First, using the "Entrepreneurship" as a keyword got a total of 893 research projects at searchable database of two funds. Thereafter, using "education", "training", "guidance", "consultation", "cultivation", "counseling" as key words, the "OR" as logical relationship got a total of 246 research projects.

2.2 Statistics

Conduct statistical analysis by Microsoft Office Excel 2007 software.

3 Results and Analysis

3.1 Entrepreneurship education research is an important part of entrepreneurship research

Table 1 shows the number of items for the entrepreneurship and entrepreneurship education in two steps of search, which reflects entrepreneurship education research an important part of entrepreneurship research. Relationship between entrepreneurship and entrepreneurship education is mainly reflected in: 1) Venture practices are the starting point and ending point of entrepreneurship education. The

fundamental goal to strengthen Enterprise Education in China is to develop the entrepreneurial awareness, entrepreneurial thinking, entrepreneurial skills, and other entrepreneurial overall quality, and ultimately being able to engage in entrepreneurship. 2) Entrepreneurship education is an important support for venture practice. With the rapid development of China's economy and the popularization of higher education in recent years, the employment of college students faces serious challenges (Zhang Jin, 2007). As specialized personnel with a higher quality of innovation and entrepreneurship, students are encouraged to start up business, which can not only promote their own survival and development, but also create more employment opportunities for the country. However, college students lack of understanding of social experience, interpersonal skills, business management and other aspects (Mu Zhirong, 2006). Driven by the external and internal factors, such as economic and social development and necessity of self-worth, education reform of higher education aims directly to cultivate the entrepreneurial awareness and ability, which also promotes a higher quality of college graduates start employment initiatives.

Table 1　Number and Percentage of Funded Projects in Two Steps of Search

	First retrieval number	Second retrieval number	Percentage
NSSF	123	19	15.45%
HSSFEM	770	227	29.48%
Total number of items	893	246	27.55%

3.2 Logical basis: entrepreneurship education and training is a major manifestation of entrepreneur cultivation

In order to retrieve as much as possible to complete the study of entrepreneurship and entrepreneurship education in entrepreneurship training-related research projects in the second retrieval process, the paper in a variety of forms of entrepreneurship education practices for keyword search to try to finalize "education", "training", "guidance", "consultation", "cultivation", "counseling" six key words. Figure 1 is the various criteria in the two funds in the project name to retrieve the number of cases.

Conclusively the keyword for "education", "culture" and "training" show the higher frequencies. There is 211 items during searching for "education" and "training" or "talent", which accounts for 86% of the total fund projects. From the point of view of the whole society, entrepreneurship education and training meet the diverse needs of the times for entrepreneurial talent. It also formed the basic logical entry point for research scholars.
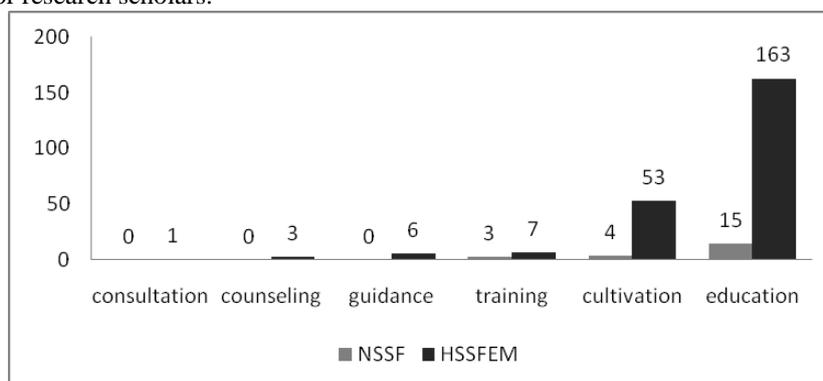
Figure 1　Entrepreneurship Education-Related Keyword Searching Case from National Social Science, Ministry of Education, Humanities and Social Sciences Project

There is 36 items for "Talent", "character" and "human development". Drucker made a point pioneering quality must be promoted through learning and innovation. Researchers focus on the research of entrepreneurship skills, entrepreneurial research ideas, entrepreneurial psychological and entrepreneurial spirit, and many other factors, which contribute to start a business. Based on the goal-oriented principle, the researchers consequently investigate the principles and requirements for entrepreneurship education; expand research methods, implementation patterns and so on. Study logic shown in Figure 2.
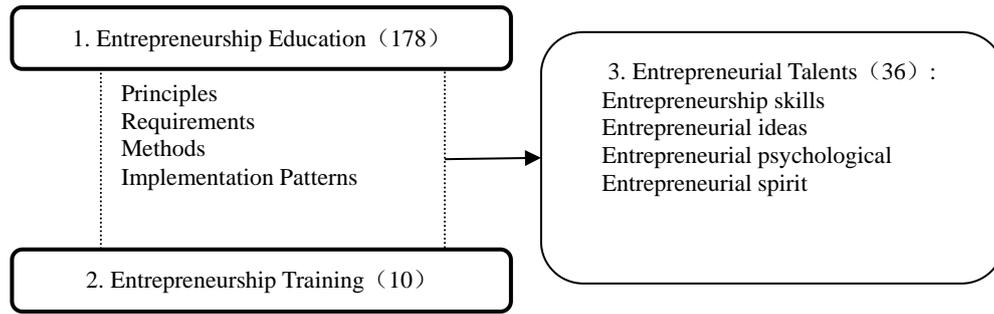
Note: Figures in brackets is the number project (the same below)
Figure 2　Research Schematic Logic Diagram for Entrepreneurship Education and Training

Entrepreneurship education and entrepreneurship training are important forms of cultivating entrepreneurial talents. However, some scholars believe that the concept of entrepreneurship education and entrepreneurship training has a different focus and characteristics, which is shown at Table 2.

Table 2　Comparison of Entrepreneurship Education and Entrepreneurship Training

	Entrepreneurship Education	Entrepreneurship Training
Relation	Entrepreneurship education is the foundation of entrepreneurship training	Entrepreneurship training is supplement of entrepreneurship education
Emphasis	Development of entrepreneurship and comprehensive literacy, emphasizing process orientation	Systems knowledge transfer, skills training, focus on practicality and timeliness
Feature	Long-term, popularity, normality, early staged	Timeliness, short-term, targeted, informality
Content	The opportunity to discover and vision ability, dedication and courage, innovation and change, responsibility and perseverance, leadership and coordination	Understanding enterprise, self-assessment, generate entrepreneurial ideas, assessing business idea, business plan formulation
Organization	education sector	human resources and social security departments, associations and social training institutions
Practice Status	"21st Century Education Revitalization Action Plan" (1999), in 2002 the Ministry of Education to determine the nine pilot institutions entrepreneurship education in 2005, KAB entrepreneurship education cooperation projects, "comments on the self-employed work vigorously promote innovation and entrepreneurship education students" (2010) "regular undergraduate school entrepreneurship education teaching basic requirements (trial)" (2012)	1998, Beijing, Shanghai, Suzhou entrepreneurship training pilot "entrepreneurship training pilot guidance" (1999), 1999 students "Challenge Cup" Business Plan Competition in 2010, the "National Students' outstanding entrepreneurial team Competition" in 2011 in Baotou, Jilin Zhangjiakou city employment Promotion pilot project, SYE entrepreneurship training, SIYE entrepreneurship training, Maple billion square "Students' entrepreneurship training systems", YEC program

3.3 Association study of entrepreneurship education and other education

Using "Education" as the key words, there are 165 items, up to 67% of the total number of items. Entrepreneurship education-related research has the maximum number of retrieved projects. Fund research projects also involved other keywords professional education, quality education, vocational education. Putting entrepreneurship education as the core, draw its schematic diagram associated with other types of education, and mark the number of items, as shown in Figure 3.
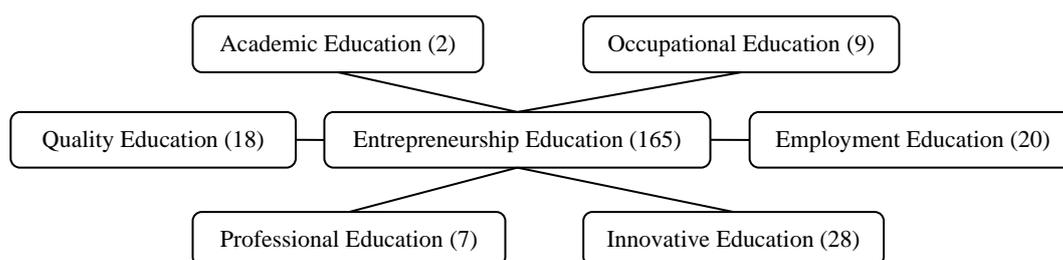
Figure 3　Schematic Figure Showing Connection Between Entrepreneurship Education and Other Ones

National Social Science and Humanities and Social Sciences of Education Ministry project for entrepreneurship education and other types of education in the form of association studies carried out as follows:

1) Entrepreneurship Education and Professional Education

It mainly includes two aspects. Firstly, the systematic study of the integration of both linkage and promotion. The second part is the proposed research about entrepreneurship education theory and practice issues for a particular professional.

2) Entrepreneurship Education: the third passports for the Education

In 1989 at International Symposium for the 21st Century Education of the UN, Dr. Alidade, chairman of the Australia's future Committee, introduced Colin Boll elaboration on education three passports: the academic education, vocational education and entrepreneurship education. So researchers firstly highlighted the important role of entrepreneurship education in personnel education, and raised it to the academic education, vocational education equal importance. Secondly, the researchers focused on the "complex model" questions among entrepreneurship education and academic education, vocational education, emphasized learning in practice and using of professional knowledge and professional skills, achieving comprehensive development of human through employment and entrepreneurship.

3) Entrepreneurship Education and Innovative Education

Innovative education is global and structural education reform and development, pursuing cultivation of creative spirit, innovation, innovation ability. Innovative education must launch from childhood, and is an important basis for entrepreneurship education. Entrepreneurship education is the best path to achieve and reflect innovative education. Some scholars conduct comparative study about differences between innovation education and entrepreneurship education on the analogy of the relationship between innovation and entrepreneurship.

4) Entrepreneurship Education and Quality Education

Quality Education pays attention to people's ideological and moral cultivation, ability, personality, overall physical and mental development. In 2002 on "Entrepreneurship Education" pilot work conference of Education Ministry, experts generally believe that entrepreneurship education is an important aspect of quality education. Entrepreneurial qualities as an important component of overall quality of students, scholars summarized the issues like connotation of employment quality, classification and culture and overall quality of the interaction.

5) Entrepreneurship education and employment education

Research bases on two modes of thinking. Firstly, education and training for employment and entrepreneurship is a whole system, which leads comprehensive studies. Secondly, theoretical studies suggest that entrepreneurship contributes to creating jobs. Scholars have studied the positive effects on the employment impact of entrepreneurship education, including the ability to enhance the employability, to ease the employment difficulties, embedding and deepening for employment education.

3.4 Research subjects: Classification of entrepreneurship education and training

After nearly 20-year development, China's pattern of entrepreneurship education and training has been basically formed, and covered a full range of college students and social groups. Through classifying object of study, summarize project case from the National Social Science Fund and the Humanities and Social Sciences Research of Education Ministry, as shown in Table 3.

By classification, researchers hope to conduct more personalized entrepreneurship education and training, based on the educational philosophy of University, subject characteristics, professional characteristics and stages of study and practice, and investigate the model system design, ways and means of selection, process control and other aspects, thereby improve the overall entrepreneurship

education research system.

Table 3　Research Object Classification of Project Case from NSSF and HSSFEM

Subject	Classification Content
Colleges and Universities	Comprehensive research, Billing Division of characteristics, application technology (science) type, type of teacher education, vocational skills type; Public colleges, private colleges and universities; Colleges, vocational; Research universities, teaching and research university, teaching university; Engineering, science, business, medicine, the arts, political science, etc.
student	Students, undergraduates, graduate students, graduates; Business Administration, tourism professionals, professional e-commerce, traditional Chinese medicine, agricultural professional, music
Social groups	Farmers, migrant workers, women

3.5 Research contents: entrepreneurship education model and system

With keyword searching, make respectively statistical data. Funded by project funds, based on the analysis of current conditions of entrepreneurship education in our country, scholars summarize experiences and lessons from domestic and foreign study. Relative research content includes the design of national and university entrepreneurship education system, as well as the implementation of a planned, step by step to optimize sound process. As shown in Figure 4, enterprise education system consists mainly of the curriculum system of entrepreneurship education, business practices system, teachers system, education system mode, entrepreneurship education assessment system of five parts (Li Weiming, Li Chunyan, etc., 2013). Research results are rich and varied. For example, in the study of curriculum system of entrepreneurship education, the researchers studied the entrepreneurial class of general education curriculum to cultivate professional class entrepreneurship curriculum innovation and penetration, job entrepreneurial practice teaching convergence and other issues; entrepreneurship education model design, the researchers summarized the whole school from practice entrepreneurship education model design experience, and from the perspective of the organization are summarized as follows: magnet mode and radiation mode, mixed mode three (Mei Weihui, 2012).
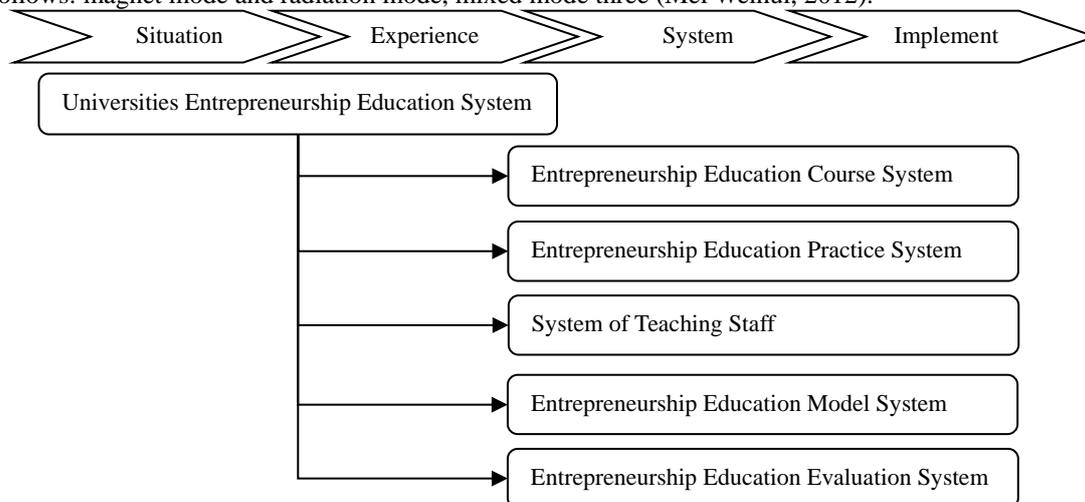
Figure 4　Research Process and Content of Entrepreneurship Education System

3.6 Background, theory and method of the study

Some new trends appear in contemporary higher education. Under this background, Scholars study technology incubators, business incubators, and cooperative Innovation triple helix problems for Entrepreneurship Education and docking practice to make a positive contribution to the promotion of the socio-economic functions and college entrepreneurship service functions (Zhang Tianhua, Liu Yanliang, 2015). In addition, scholars have studied the economic crisis, economic restructuring and university enrollment and other factors, the employment pressure on university students increased impact on students' education, demonstrate entrepreneurship, positive role in employment and entrepreneurship education to ease the employment pressure and do in the implementation of the path, quality assurance, etc. Overall, more research is based on the reality of our society, emphasizing experiential learning; continue to seek the reform and development of entrepreneurship education.

As for the theory and methods, scholars pedagogy theory, entrepreneurship education system design and optimization, in the process, emphasizing the social survey, environmental analysis, management control and quality assessment, the main use of a comparative study, correlation study the method of case studies, qualitative research-based, supplemented by quantitative analysis.

4 Conclusions
4.1 Summary

The research of the National Social Science Fund and Humanities and Social Science Fund of Education Ministry in the field of entrepreneurship education has a significant promoting effect on both theoretical research and practical guidance. Through the National Social Science and the Ministry of Education, Humanities and Social Sciences funded research project statistical analysis, we can learn: After 20 years of exploring the theory and practice of entrepreneurship education, China has basically formed the framework of entrepreneurship education, as shown in Figure5.

On the basis of this framework, scholars mainly studied in three aspects: 1) entrepreneurial economy, innovative culture, science and technology development and national policy guidance and other forces that promote the rise of entrepreneurship. Through the empirical analysis of the macro environment, it is found that the scholars study plays an important role in promoting entrepreneurship education and the development of social economy in China, and set up the guiding ideology of entrepreneurship education, basic principles and overall objectives. 2) Business practices and educational practice in the integration process, the feasibility and necessity entrepreneurship education practice specialties argument. 3) Under the cross of entrepreneurship and education, carry out entrepreneurship education model design, system implementation system and the construction quality assessment.

During the research of Social Science Foundation funded project, scholars tend to the macro-level of the integrity of the analysis and design, the pedagogy theory, the comparative study on practice of entrepreneurship, the correlation studies and case studies. In the study, researchers emphasized the leading role of the State, and local colleges and universities, ignoring the process of teaching instructors and students involved in the role. Studies on Mechanism of Guiding affect both educational effect of entrepreneurship research, education teaching effect during the start-control studies comparing the lack of micro-level. That is, by the introduction of new disciplines theories and methods of entrepreneurship education system dynamics studies.
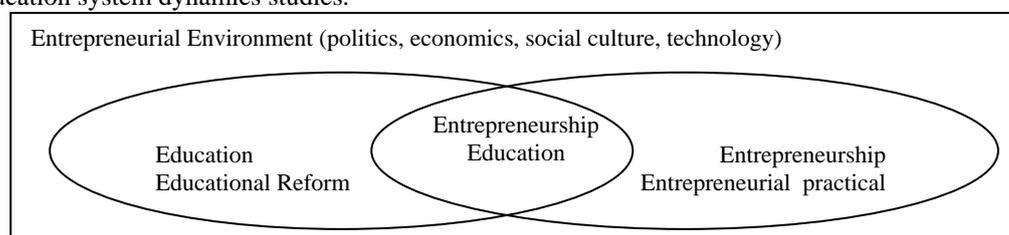
Figure 5　Entrepreneurship Education Research Framework

4.2 Discussion

Under the current framework, the research on entrepreneurship education has a certain level and scale, to enhance the depth and breadth of the research subjects, the theory and method of research and innovation must be achieved, including:

1) Adapt to interdisciplinary research trends, strengthen the theory of management, psychology, sociology and other research applications in the field of entrepreneurship education. In the framework of existing research based pedagogy, the institutional mechanisms to improve innovation and entrepreneurship education in universities as an important entry point, gathering elements and resources, rich curriculum, innovative teaching methods, strengthening of teachers, helping to improve and promote teaching, research, practice closely, breakthrough talent cultivation weaknesses, and enhance students' innovative spirit, entrepreneurial innovation and entrepreneurship awareness. Interdisciplinary research will help to identify problems in the various aspects of the process, padded short board, thinking and perspectives to achieve innovation.

2) Strengthen the joint participation of multiple subjects' entrepreneurship education process. Existing studies emphasize training programs for government educational institutions and universities entrepreneurship education, design and implementation of practice models and evaluation system and

optimization, pay less attention to the study of the interaction between tutors and students of teaching, teaching supervision of third parties and social forces. Through research on entrepreneurship education to introduce new subject, the reform and development of innovation and entrepreneurship education has a positive role in guiding.

3) Enhance research and empirical studies of mutual promotion and complement each other. In theory part, to strengthen the concept of entrepreneurship education training, system design, and implementation, control effectiveness studies, research and other foreign experience of business practice adaptability. In empirical research, to strengthen entrepreneurship education practice tracking investigation, the variable level to strengthen collection and observation raw data statistical tests.

4) Strengthen the research process problems focusing and problem solving in the process of practice-oriented. Innovation and entrepreneurship education Universities discovery and solve outstanding problems are deepening an important focal point of University innovation and entrepreneurship education reform, including issues to explore, question focus, problem analysis and problem solving on the theory and practice of other processes. Among them, the issues of focus and practice-oriented, focusing on in-depth research and refinement, as well as optimization practice has an important role in promoting.

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Research on MCDA Approach for Library Ranking: A Case Study on University Libraries in Sri Lanka

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Abstract: This paper presents the nutshells of undergoing survey about the development of a multivariate ranking system for academic libraries in Sri Lanka using MCDA (Multiple Criteria Decision Analysis) approach. Ranking libraries is an interesting topic nowadays, due to most of institutes follow this to evaluate their services and recognize their current passions. There is no any systematic performance evaluation or ranking system for Sri Lankan library context, therefore proposed study will be most innovative among the library leaders of Sri Lanka. The library performance evaluation indicators found from the literature and Analytic Hierarchical Process (AHP) with FUZZY logic used as the tools of this study.
Key words: Library ranking; AHP and FUZZY; MCDA approach; Academic Libraries; Sri Lanka

1 Introduction

Over Thousand years, the library is considered as the heaven of information sources. It exists to collect the record of human experience and to provide intellectual and physical access to that record. The word "Library" was exclusively in bond with three other words; "Silence", "Classical" and "Books". However, in this super speed information era, the importance of libraries is gradually swallowed up by the profit oriented, third party information delivery institutions. Electronic resources, the Internet and World Wide Web (WWW) have substituted into the traditional library resources such as books, newspapers, and periodicals. Rapidly, libraries are fully loaded with e-books, e-journals, and bibliographic databases while the size of the library buildings are reducing accordingly. Their physical space requirements will shape up according to the virtual context.

Librarians are supposed to be recruiting after testing their managerial level problem solving aptitudes and ICT skills. Most of the "Chief Librarians" now more like to call them as "Library Managers" (Calvert, 2008). Meanwhile, the increasing expectations of users have challenged libraries to improve their quality of services. Day by day, library managers feel more pressure to exploit available resources entirely. As a result, several libraries and information services have adopted quality management evaluation practices in recent years among the various initiatives implemented ISO 9000 standards, 5S movement, bench marking (Hsieh, Chang & Lu, 2000) and LibQUAL(Fagan, 2014). Therefore, three-fold aspects; "Books", "Readers" and "Staff" which had assumed as the "Library" by Ranganathan at medieval library era, has typically changed into "e-resources," "Patrons" and "Managers" respectively (Illangarathne & Yingming, 2014). As a result, they have to practice continuous assessment about their services and customer satisfaction.

When considering the academic libraries, they play the vital role at high education institutes throughout the various ways such as from acquisition the information up to checking the plagiaries issues of their stakeholders' scholarly works. According to the Miller, for academic libraries, in particular, has a responsibility to conserve scholarly communications as well as be the systematic agent of primary resources (Miller, 2008). Due to the many services provided by the academic library at their institutes, it has long enjoyed their status as the "heart of the university." (Oakleaf, 2010).

Evaluating the library efficiency and effectiveness is not the novel concept. Most of the standard libraries are always update with the modern library functions and engaged in various dimensions of evaluations to get an idea about what kind of enhancements they achieved and which kind of satisfaction levels of their customers expected. Those library assessments will help the library management to assure the satisfaction levels of their stakeholders as well as nature of their competitors.

Ranking libraries are the ultimate stage of evaluation, and it can be applied to achieve a lot of benefits. Evaluation, the bunch of libraries instead of single library assessment, would be helped library management to understand their proper place which they are among their competitor libraries. Libraries must demonstrate their value and document their contributions to overall institutional effectiveness and be prepared to address changes in higher education (ASQAL, 2011).

1.1 Problem statement

Library evaluation has investigated in various ways. Library physical resource, website, electronic

resources, and library building space assessments are necessary. Library reference service, online services, staff, and some other service quality evaluations are prominent. Library customer satisfaction, user perceptions, and user need investigations and assessments also taken place. Most of the studies based on a single aspect of above and limit to own library evaluations. Recently, some researchers investigated the performances of the libraries using various approaches. Most of the studies are comparisons between two libraries. There are no adequate studies find for library comprehensive performance evaluations towards rankings. Therefore, it can be seen a gap between library overall performance assessments and rank based on it.

1.2 Objectives of the study

The general objective of this study is to develop a library ranking system based on the library resources, service quality & customer satisfaction for the academic library context in Sri Lanka. Other specific objectives of the study are;

   a) To study the existing quantitative and qualitative library evaluation processes.
   b) To distinguish the appropriate criteria for applying as input to measure the library service quality
   c) To investigate the impact of library service quality on the customer satisfaction.
   d) To apply the MCDA methods to rank libraries.

The proposed study aims to develop a novel library ranking system for Sri Lankan University libraries throughout the multi variable ranking methods such as AHP and FUZZY after investigating the existing literature. This study will be most significant by two ways; using Multiple Criteria Decision Analysis- MCDA approach to measure the values of KPI-Key Performance Indicators of libraries and apply this approach to Sri Lankan University library context.

2 Review of Literature

2.1 Library performance evaluation initiatives and model implications

When search literature it was found several library performance evaluation methods and library assessment models. Major highlighting of them is described as follows;

The list-checking method was used very beginning to evaluate the library collections. By this approach, the third party pre-prepared library book lists such as ALA (American Library Association) book list, Choice's opening day collection, and H. W. Wilson's five catalogs have being used to evaluate the existing collections of the libraries (Hyödynmaa, Kannisto & Nurminen, 2010). Kassim and Kochtanek evaluated library digital resources using five levels; (i) focus group evaluation, (ii) database usage, (iii) weblog analysis, (iv) the web survey and (v) remote usability evaluation (Kassim & Kochtanek, 2003). Nicholson introduced a conceptual framework for the holistic measurement and cumulative evaluation of library services. Satoh et. al. used four dimensions derived from the GAP theory of SERVQUAL assessment; (i) personal effects of service, (ii) library as place, (iii) collections, and (iv) access to evaluate the library service quality (Satoh et. al, 2005). Nejati and Nejati measured the service quality at University of Tehran Library using the SERVPERF service quality evaluation model. The author used 20 different kinds of service quality aspects to evaluate the service quality at libraries (Nejati & Nejati, 2008).

Association of Research Libraries - ARL introduced the library service quality assessment model to measure the customers' perceptions about the services of libraries called LibQUAL (Davis & Kyrillidou, 2011). Alemna proposed the eight criteria for evaluation libraries; (i) library resources; (ii) Effectiveness, (iii) Efficiency, (iv) Cost-effectiveness, (v) Benefit, (vi) Time saved, (vii) Satisfaction, and (viii) Cost-benefit analysis (Alemna, 2012). Noh evaluated electronic resources in academic libraries using an input-output analysis of evaluation indicators. Inputs refer acquisitions of e-resources such as web databases, e-books, e-journals, and outputs refer their usage (Noh, 2012). Asogwa assessed the academic library performance in Nigerian Universities using the eight performance evaluation principles (Asogwa, 2014). Pant evaluates academic library websites based on six variables; (i) usefulness, (ii) efficiency, (iii) effectiveness, (iv) learnability, (v) Satisfaction, and (vi) accessibility to evaluate the library websites (Pant, 2015).

Berndtson & Öström rank public libraries in the European Union throughout six dimensions using more than 65 000 public libraries. The authors calculate the final score from more than 38 inputs and issue a star level 1-6 for good library accordingly (Berndtson & Öström, 2015). American Library Association[1] (ALA) ranks libraries based on four measures; (i) By the size of population served, (ii) By the size of the library collection, (iii). By the number of times items in the collection were checked out, and (iv) By the Number of visits to the library. www.thebestcolleges.org[2] ranks libraries based on

architectural interest of library buildings and collections interest of library users. www.haplr-index.com[3] ranks 7,930 public libraries in the United States using the federal data, which obtained through five inputs and ten outputs measures.

2.2 Library performance evaluation initiatives within Sri Lankan library context

Ranaweera evaluated the collection and service quality of the national library of Sri Lanka based on the user satisfaction (Ranaweera, 1996). Wijerathne evaluated the university library websites using seven criteria. The author mainly focused on the content elements and design features of web site and allocated scores to individual aspects. Finally according to the obtained scores ordered the website accessibility (Wijerathne, 2013). Gamage examined the library resources and services provided by libraries specializing in indigenous medicine in Sri Lanka based on their existing resources and services (Gamage, 2009). QAA - Quality Assurance & Accreditation Council of the University Grants Commission, Sri Lanka introduced the quality review process to the University libraries through five aspects; (i) Vision, Mission and Objectives, (ii) Management, (iii) Resources, (iv) Services, (v) Integration, (vi) Contribution to Academic Output,(vii) Networking and (viii) Evaluation (University of Peradeniya, 2007).

Based on the discussion above, it is noted that library evaluation takes place in every kind of aspects in the library context and it is counts as an essential part of the library service which can improve the performance while competing with others. Library resources, services provided and user satisfaction are counted as the most considerable aspects at evaluation. Reviewer observations, customers' perceptions via likert scales and given score methods have being vastly used to measure the actual level of performance. Evaluating these outcomes and based on them a graphical explanation (figure 1) is drawn to depict the proposed conceptual model.
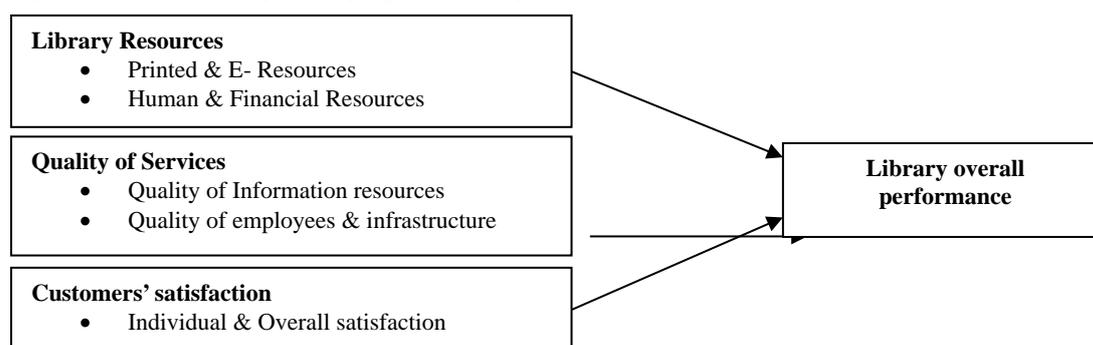
Figure 1   Proposed Conceptual Framework of the Study

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[2].http://www.thebestcolleges.org /amazing-libraries
[3].http://www.haplr-index.com/haplr100.htm
[4].http://www.mohe.gov.lk /index.php/en/about-ministry/overview

3 Methodology

Based on the above conceptual framework it is supposed to evaluate overall performance of the context libraries through their available resources, assured quality of the service and level of the customer satisfaction. To test the model, it is expected to conduct the overall performance evaluation survey using two types questionnaires which distributed to the sample find from Sri Lankan University libraries. After measure the individual library performance it is expected to give an overall performance indicator to the appropriate library.

Based on the proposed MCDA approach which combined with FUZZY logic and AHP – Analytic Hierarchical Process, and using above mentioned case wise performance indicators, it is expected to solve the following metrix.

After calculate above pairwise AHP metrix, it is expected to derive a list of most highly performed libraries accordingly.

Table 1   Pairwise Comparison Matrix for Library Ranking

	L_1	L_2	L_n
L_1	1	a_{12}	a_{1n}
L_2	$a_{21} = \dfrac{1}{a_{12}}$	1	a_{2n}
L_n	$a_{n1} = \dfrac{1}{a_{1n}}$	$a_{n2} = \dfrac{1}{a_{2n}}$	1

4 Conclusions

Libraries act as the disseminates of information. They are doing this systematically. If they have a picture about their current service level, it can be easily maintained their customers' perceptions and compatibility. Most of the ranking systems are catering on this manner and some of them are help to make the decisions in both ways; customer level and management level. Based on that it can be determined that ranking libraries are most significant on this information era. Today customers are highly expected quality service and recognition of the service among the similar organizations as well. Therefore, it can be predicted that proposed study based on library overall performance through the identified criteria will be the benchmark as well as innovative outcome of the LIS industry.

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An Interdisciplinary Educational Approach for Dealing with Autist Students in Brazil

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Abstract: This Paper shows a synthesis of the research project related to the Educational Vision /Approach used at AUMA – Association of the Friends of the Autist Child- a Non-Governmental Brazilian Organization founded in 1990 seeking to find out to what extent it may be possible to use an interdisciplinarity approach and the Jacques Delors UNESCO Education for 21st Century Report to deal with Brazilian National Educational Plan recommendations with the purpose to bring some contribution to any other Institutions which offer educational services to autistic children.
Key words: Autistic children; Education; Interdisciplinarity; Specialized care

1 Introduction

According to the Centers for Diseases Control and Prevention about 1 percent of the world population has autism spectrum disorder- ASD. (CDC, 2014); and in particular prevalence of autism in U.S. children increased by 119.4 percent from 2000 (1 in 150) to 2010 (1 in 68). Moreover almost half (about 44%) of children identified with ASD has average to above average intellectual ability. So there is growing interest in knowing the best way to deal with education for these children everywhere in the world.

AUMA Association of the Friends of the Autist Child is a Non-Governmental Brazilian Organization founded in 1990 based on an interdisciplinary approach in order to fill part of the gap in the Brazilian educational system, regarding specialized care for people with autism. The lack of vacancies, specificity, the existence of mistakes and inadequacies were very disturbing. In addition, to find out whether it was possible for educators to regard an autistic child with as a whole being, and what may be the framework for that purpose.

The learning process of autistic people has very peculiar characteristics and understanding the variations of these characteristics is very important to distinguish them, in order to better help each autistic child in the cognitive process. That will imply in the precise determination of the need of specificity, with direct consequences in practice. The purpose of the research concerns the vision and educational approach on work at AUMA, compared with the vision and principles of interdisciplinarity, to seek convergence. In particular, seeks to contribute to the development of the educator who works with autistic children, so that his/her vision and practice is not limited to transmission of knowledge and skills, but rather help develop the student as a person. In fact interdisciplinarity deals also with the way the Being is regarded: with infinite possibilities; and moreover the ontological aspects, praxeological and epistemic weave the methodology. As mentioned by SYRGIANNIS (2010): "In everything we do, there will be something that reflects our being."

Society benefits when it can enjoy a more humanistic view of work, especially when it refers to autistic children, different from the forms of intervention which tend to be adopted in Brazil and many other countries of the world, placing them in the position of mere objects receiving commands.

Pedagogical approaches in the Brazilian education are the expression of certain conceptions of man, the world and education, which derive from social development approaches translated into educational policies. They shape the organization of the school system and the school, with particular methods, choice of content, assessment and teacher-student relationship.

The periods in which each of the education trends marked education are close and, as explained by SAVIANI (1987), they do not constitute a homogeneous and stationary phases, but rather periods in which their characteristics prevailed or still prevail. The traditional humanistic pedagogical trend was prevailing in Brazil, from 1554 to 1920. The modern humanist trend marked the education, from that date until 1971, and thereafter the prevailing trend was the technicist. Each of these approaches depends on a particular conception of man and the world, influenced the organization of the school system and school in a particular way.

The approach selected, which is apparently made "a priori," the guiding categories, that is, the organization of the school system and school, the selection of content, the teaching-learning methods,

forms of assessment and the teacher-student relationship come from the recognition that they were present from Jesuit education, in the historical process of education in Brazil. SAVIANI (1987), explains that the periods of education do not constitute homogeneous and fixed factors.

BORALLI (1997) identifies the main feature in the work at AUMA as the way the autistic students are regarded, as integral beings: a view that is not based on passion, or the innocence or ignorance, but in careful and systematic observation of the daily life and the findings collected along the time.

Since 1943, when autism received its name by Dr. Leo Kanner, little has been shared on the subject in our society. Some people have heard about the issue, others never. It looks like a Tabu. No one knows for sure what the Disorder of the Autism Spectrum is. Even within the scientific community, the number of skilled professionals is scarce, to fulfill the demand affected by autism. But the limitations of actions in the field with predominantly behavioristic view where what matters is the doing disregarding the being and knowing, have led to the construction of educational processes that ignore the fact that autistic people are people before being autist.

BORALLI (1997) started trusting in the ability of autist children and, from this perspective, the entire educational process offered has been directing education to strengthen the capacity of thinking, concomitantly with the ability of doing of each student. Doing should not simply be a mechanic doing. Students' ability to think is encouraged in the educational process so that they develop more autonomous thinking. Concerning the type of education that actually drives the development of students, we could mention REGO (1994), based on the assumptions by Vygotsky, made by the Russian Davidov (1988, p.3):

"The school should not be restricted to the transmission of content, but mainly teach students to think, teach forms of access and appropriation of elaborated knowledge, so that the student can autonomously practice them throughout the life, besides the school time."

So according to him, this is the main task of contemporary school facing the requirements of modern societies, which drives the view of this project.

According to FAZENDA (2015), interdisciplinarity is a course of action, seeking for inclusion, agreement, an attitude towards knowledge, to know more and better. There is a transition from a fragmented perception to a unitary conception of knowledge. Education only has meaning in the encounter and exchange of knowledge, emerging from an anonymous condition, through with dialogue, accepting the thinking of the other. What characterizes the interdisciplinar attitude is the boldness of research, the search: it is the transformation of lack of confidence in an exercise of thinking, a constant construction. Its principles are: humility, knowing how to listen and respecting other ideas, coherence, detachment and respect. The action can't be taught, but must be lived.

In Brazil it was recognized in 1998 by the Ministry of Education and Culture in Brazil, as a fundamental concept in contemporary education for Elementary and High School. However is still not yet fully reflected in practice as educators have to feel the meaning of the proposal, it allows the educator to become conscious   of his/her own vision of the action, which   is essential for those who intend to develop a conscious practice projected with the power of transformation for the receiver.

The Report to UNESCO for the International Commission on Education for the 21st Century by Jacques Delors in1996 is a reference for the Project. In the report the education mission encompasses all the processes that raise people from childhood to the end of life, a dynamic knowledge of the world, the others and themselves, combining in a flexible way four fundamental learning processes: Learning to know, learning to do, learning together and learning to be. The report also mentions that the mission of education is to transmit knowledge about the diversity of the human kind and lead to the awareness of the similarities and interdependence among human beings on the planet. Education should help us discover ourselves. Only then can we truly put ourselves in the place of others and understand the meaning of their reactions

Some other authors contribute to the idea that the autist person is regarded as an integral being. The whole being as described by authors such as Ken Wilber whose purpose is to integrate all areas of knowledge, Fritjof Capra, for whom the study of the parts does not allow to know the functioning of the whole, and Edgar Morin who says that it is necessary to overcome fragmentation of knowledge in restricted fields.

2 Development

AUMA - Association of the Friends of the Autist Child manages to get the approval from the Education Secretariat of São Paulo State to operate as the Elementary School - 1st to 5th grade, special

education mode, with the CEAACA - Educational Center of the Association of the Friends of the Autist Child 'Nathália Boralli', for the care of students with ASD - Autism Spectrum Disorder. This work and research may contribute with education, in that it will create an opportunity for teachers that work with people with autism and other interested professionals to approach this universe, with possibilities of theoretical / reflective direction. The production of specific knowledge ensures its usefulness to other academic and practical work for their cumulative contribution.

Goal 4 from the National Educational Plan in Brazil refers to inclusion stating   that Education should be   provided universally, for the population of 4 (four) to 17 (seventeen) years of age with disabilities, pervasive developmental disorders and high skills or giftedness, access to basic education and specialized education, preferably in the regular school system with the inclusive education system assurance, multi-functional resources, classes, schools or specialized services, public or licensed. Moreover in 4.4 item the goal intends to ensure specialized educational services in cross-functional resource rooms, classes, schools or specialized, public or licensed services, the complementary and supplementary forms to all students with disabilities, pervasive developmental disorders and high skills or giftedness, enrolled in public basic education, according to the need identified through assessment, and after the family and the student are heard.

In the 4.9 item the goal   strengthens the importance of monitoring and monitoring of access to school, specialized educational services, as well as the permanence and school development of students with disabilities, pervasive developmental disorders and high skills or giftedness beneficiaries, together with income transfer programs, fighting   situations of discrimination, prejudice and violence, with a view to establishing appropriate conditions for educational success, in collaboration with families and public agencies of social welfare, health and child protection , adolescence and youth; while in the 4:10 the direction is the fostering of research for the development of methodologies, teaching materials, equipment and assistive technology resources, with a view to promoting the teaching and learning as well as the accessibility conditions of students with disabilities, *pervasive developmental disorders* and high skills or giftedness; and moreover   and most relevant at the 4:11 the goal is to promote the development of interdisciplinary research to support the development of interpectoral public policies that address the educational characteristics of students with disabilities, global development disorders and high skills or giftedness that require specialized care measures

Finally the 4.18 item focuses the promotion of partnerships with community, religious or philanthropic non-profit institutions which have agreements with the government, aiming to expand the supply of continuous education and the production of accessible educational materials, as well as accessibility services necessary for full access , participation and learning of students with disabilities, *global development disorders* and high skills or giftedness enrolled in the public school system; and in the 4.19 the goal focuses the promotion of partnerships with community institutions, religious or philanthropic nonprofit organizations contracted out by the government in order to encourage the participation of families and society in the construction of the inclusive education system.

3 Brazilian Educational Matrices

Concerning the possible influences of the historical educational development in Brazil follows some briefing bout the Brazilian educational matrices.

3.1 Christian matrix

In the history of Brazilian education, the religious institutions and the educational process have always been in a steady relationship. Soon from the occupation of the country by the Portuguese, the education in Brazil was   managed by the Jesuits.

The Jesuits were responsible for the first schools and universities in the Western world. Although they had intended to introduce the integral education of the student, regarding the humanist character, scientific, literary and philosophical inheritance of an ancient tradition, they turned, solely for the purpose of theological education, in which predominated the God-centered thinking, in order to direct the student to a unique and unquestionable way, belief in God.

The school functioned based on the normative logic of traditional thinking as a kind of categorical imperative that everyone should follow and not question, including all members of the school. In this sense, the school had as the supreme domain ***Jesus Company***, who manipulated, dictated and directed the man of that time to the intellectual and social conformism, accepting that guidance as if their place in society had been appointed by God. Based on the imperative commandments of the *Ratio Studiorum* - set of norms designed to regulate education in the Jesuit Schools, the syllabus organized by the Jesuits,

the content that was taught by the traditional school resulted in the set of chosen subjects considered as upper and lower, which were taught from high school to further education in an attempt to prepare students for the practice of virtue and the recognition of divine power. The syllabus was formed by hierarchical disciplines according to the grades proposed, with the purpose to keep man under a theological belief in a supernatural order.

In the period of colonial Brazil, the colonial elite was educated in Christian moral values well within the logic of the Catholic Reformation of the sixteenth century. Thus, there was the same school but with very different objectives: to the elite, the moral and administrative instruction; for the natives the catechesis. The pedagogical structure of the *Studiorum Ratio* schools was identical to our schools of contemporary Brazil, as the students learn in classrooms, divided into levels and perform tests.

It would be around 1890 that the State took over with the reform by Benjamin Constant influenced by the positivist ideas.

3.2 Liberal matrix

The Liberal Mother left as greatest legacy to society of the late nineteenth and twentieth centuries, the search for a State of welfare, market economy, competitiveness and freedom, but has continued to be an unfair society, where production sources wealth remained in the hands of a small bourgeois group. To the proletariat the workforce was left, always paid below its real value. Within the liberal school proposal, the new school also encompassed Anísio Teixeira ideas in favor of an education to gratuity, universality and obligatory, which, happens to be a common good for all Brazilians, not just for the high privileged class of society. The liberal and capitalist model of education thought by Anísio Teixeira intended to integrate the population to the needs of the industrial society and that they were able to achieve a reasonable standard of quality of life, thus contributing to the country's growth.

Anísio Teixeira can be defined as one of the greatest thinkers and advocates of public education in Brazil. As an educator, philosopher and lawyer, he was one of the most important characters in the history of education, for besides being part of the movement for the new school pioneers he held several important positions from the 20s to the 60s. Teixeira was in favor to the idea that the school would have to prepare the　new man　to be introduced in the society of scientific work, liberal professions, such as medicine, law and engineering, so that from these conditions, the task of the nation would be directed to the construction of Brazil.

"That society would have to prepare ordinary workers, skilled workers and workers with expertise in technical abilities of all kinds. (TEIXEIRA, 1994, p. 54-45).

His criticism to the privileged or representatives of the Brazilian elite, the only ones who had access to secondary education and the university, was precisely because it was one of the reasons for the delay of Brazil, for the privileged, as well as the contents and methods the traditional school, contributed according to Teixeira to the archaic education system. For him, the school in the old model allowed for the Brazilian social dualism, as its curriculum was only for the privileged. It is in this sense that the common education would be a way of enabling the poor access education to join the elite.

"Education is not a privilege" (1994) is one of the most important books on Brazilian education produced in the last century because it shows the intention of consolidating the proposal of an education that had already been conceived from the beginning of the Republic, but that only came to effect in the second half of the twentieth century. Although the new education was directed to serve the capitalist economy, it meant the first opportunity of access of the poor to the public school system, which was free and had good quality.

3.3 Critical matrix

The critical school comes with the book by Alvaro Vieira Pinto (2002), Paschoal Lemme (1988) and Dermeval Saviani (2009), addressing the ways of education, distinguishing the concept of school based on two types of critical awareness. They argue that true education incites the subjects of the pedagogical act to transform their reality. That is why there is the need to awaken in the student that the social reality is structured through power relations reflected in the organization of social classes.

Paschal Lemme admits that the task of educators is to make people identify that illiteracy and the problem of education in general is a result of external and internal forces, and that it will only find solution, as the economic structure of the country is changed. Thus, the educational and health level of a people depends on the level of development of its economy. The author of Memories (1988) in the context of a turbulent time of political persecution, participated in the struggle for better living conditions for the Brazilian population, so it could be provided by public education, and thus continue to struggle for these ideals.

In the same perspective of social and educational change, it is necessary to establish a dialogue

with Álvaro Vieira Pinto in his book "Seven lessons on adult education" (2010). The author believed that the critical consciousness of the student would only be perceived when the school and the adults improved their   understanding of the material conditions of existence of the population.   However, for this change of man's situation and reality to take place, there had to be a dialogic education, in such a way that the role of the student-object became student-subject.

In general, the true criterion of education like that starts with the interest of the people. Therefore, living conditions may only be changed if the people understand and act on the social conditions of the country. Only then could the educational system provide change in the human condition. The critical educator interferes in   the educational process contributing to the extinction of inequalities between educator and student, on the belief that one day a society can be built without social classes, and for that to happen consciousness of the self   and the world are necessary.

Dermeval Saviani may be a reference of the Marxist critique of social reality to the field of education. In the book "School and Democracy" (2009), Saviani emphasizes the importance that society has in school education. For him, education should be directed to social practice as a transformation of the social structure. Being a critic of non-critical theories and critical-reproductivist, Saviani directs the pedagogical practice to a critical-revolutionary attitude; for him the school can´t be thought of as being external and disconnected from the social historical context, nor be considered as compensatory of all social responsibilities. For thinking about education as a social equalizer instrument, as advocated by the traditional pedagogy, is too naïve to believe in the power of school as the only solution to social problems, while thinking the school also as a reproducer of inequalities is to believe that there can be no transformation in social structure and that the capitalist system is definitely consolidated with no prospect of social change, that is, class struggle. So the proposal of the author is to think beyond the two theories and point the way that education should follow, giving relevance to the transmission of knowledge, with the content starting in the social practice of students so that they understand the true reality. Only this way can they succeed in transforming society, in the sense that democracy and political participation are exercised.

However, while there is no respect for the rights of the people, school can't be expected to have political and democratic awareness, on the part of the teachers or students, as the school structure is organized like the social dynamics. So thinking beyond the pedagogies of essence and existence, to Saviani is emerging from the naive consciousness to critical consciousness, fostering the pedagogical discussion in the political dimension in the broad and democratic sense. In short, work developed in schools should be articulates with the process of democratization of society. The author understands that to achieve the true sense of the pedagogical act it is important to consider that education is the passage from inequality to equality. For this to happen it is necessary to implement the processes needed to turn the possibility into reality (SAVIANI 2009, p. 70).

Finally, regarding most important Educational thinkers from Brazil, it's essential to mention "Paulo Freire" in this context. Antonio Novoa (1998), professor at the University of Lisbon, Portugal, author of several scientific works in the field of education writes:

Freire's life and work are inscribed on the pedagogic imaginary of the twentieth century constituting main reference for several generations of educators. [...] His proposals have been used by different groups, relocated in various social and political contexts. [...] From a particular educational concept that crosses the social theory, moral commitment and political participation, Paulo Freire is himself, an essential asset of pedagogical reflection. His work is like a kind of   critical consciousness, which puts us on guard against the politicization of the educational thinking and pedagogical reflection. (P. 185).

The emergence of a new paradigm, which some call post-modernity, in the sense of overcoming the dominant paradigm, begins to show a strong influence in education, with a growing number of academic research and, in a special way, changing the concepts of the school curriculum (CAPRA, 2001; MORAES, 1997; Santos, 1997; 1999). It's in this context that the Paulo Freire's ideas could make a great contribution to this educational matrix which has being developed along the time and may have a decisive influence on educational policies that governments should adopt in the coming years and (who knows?) in the coming decades in particular regarding the way we deal with Educational Plan concerning Inclusion in Brazil, and in particular with Autism Spectrum Disorder Children.

4 Conclusions

To understand the educational problems in schools and the influence in the current social reality, it

is important to know that the true purposes built around school during the past centuries form the main factors for a coherent and critical analysis of school nowadays. It is possible to identify around the school structure the inheritance of both the positive and negative aspects, or even continuities and ruptures that the various kinds of thoughts left to the present context of the Brazilian education. It is possible to identify even in the project structure, the inheritance reverberated in many aspects of the various kinds of thoughts, if we analyze this structure from the idea of the social historical individual, collectively constructed in context

Moreover there is no doubt that we need to understand more deeply the local context or roots to build a work that strengthens the ability of thinking, creating literacy methods that may help students to become as autonomous as possible, identifying influences coming from the Christian and Critical Educational Matrixes; but in order to walk in the direction of a more human vision of autism it's important to consider the ideas coming from new inter and transdisciplinary thinkers like Ken Wilber, Fritjof Capra and Edgar Morin.

In this way and following Jacques Delors UNESCO Educational report one may be able to understand better the diversity of the human species and become aware of the similarities and interdependence among human beings on the planet. Education could help us become more aware of ourselves; and then one may be able to truly put ourselves in the place of others like the Autism Spectrum Disorder Children and understand better their feelings and the meaning of their reactions.

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Significant of Lab Equipment Size and Location on Lab Design

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Abstract: This paper discussed the significance of lab equipment size and location in determining the laboratory design. The reviewed article "Insight of Laboratory Design" have pointed out some view on lab design. In perspective of physical asset management, the size and location of lab equipment needs to be considered as well in determining how the lab design should look like. The criteria such as good airflows, daylights and smooth walking traffic are important in lab work-flows. Based on few literatures, several lessons recently discussed those factors has influenced on laboratory design greatly, while there are few gaps found need to be clear-cut upon the views on the article. As conclusion, the findings from some argument have elaborated the important keys in considering the lab design.
Key words: PAM; Lab design; Lab equipment

1 Introduction

De Palma, Angelo. "Insights on Laboratory Design." Lab Manager Vol 1: No 7 Dec (2012): 4-19. The article, "Insights on Laboratory Design" was written by Angelo, De Palma (PhD) who is freelance writer living in Newton, NJ. In his article, there were three scopes discussed regarding the laboratory design. Starting up the design, he did mention a few elements which were related closely to the topic with begun by securing the fund until laboratory planning. Whereas, Green lab design also been discussed as one of the main element since the power source are the main components of a lab's operating expenses. The third scope however mentioned about the criteria of lab expansion in lab design based on three case studies output which can be as a good guidelines and from the input of lab design experts, there were some advices to be considered as lab manager in deciding a good lab design. Without a doubt the author has good points in his article; however the significance of lab equipment size and location in lab design need to be discussed further.

2 Insights on Laboratory Design

Seven elements to be considered on starting-up the lab design, the first thing in designing the lab is project fund. It needs to be secured in order to maintain the enough momentum of the project while the safety element is considered as the core element when designing the workflows and also with no excuses do not exclude the human factors in design as for staff satisfactory. Meanwhile, it cannot be a preconception in determining the lab design because the concept should be constructed by looking into the client's 'science' work description practiced. Understood that, it is necessary to looking into work-flow as well to confirm the design needs as lab workers are lacking on skills to define their own space and equipment size requirement. On top of that, flexibility in lab design has become trend and an important element in research lab area because the lab cannot be designed without the element of flexibility in order to fulfil the future needs of furniture, mechanical capabilities, systems, and cleaning modules while in the same time achieves the term of sustainability which drive toward austerity. In addition when it comes to lab design, the designer shouldn't propose the other design to be implementing on another one because the lab design is dependable to theirs work-culture, listen to the client and convert the idea into design. Same goes to when deciding whether the design is best for renovation or build new, the idea was guided through good laboratory planning which involves three steps (due diligence, analysis, proposal) that provide the road map approach which is more cost effective.

Green lab nowadays is not the isolated issue in designing the lab, it is because the power and natural source consumption took more three-quarter from the cake of lab operating budget currently. One of the main reasons is the huge amount of air-changes per hour (ACH) which contribute to 24 hours power consumption whether the laboratory is occupied or not, in line with requirement of fume hood which are varies widely. One of the strategies is to occupy the Acuity to monitor air, providing relative measurements and to collect data which can use to maintain safe and comfortable environments. Whereas, the other strategy is using pyramid HVAC control hierarchy as shown by Figure 1 which started from the bottom by installing high-efficiency lighting to lower the cooling load, using low-flow fume hoods and lowering the air change rate. The next step is by using variable air volume (VAV)

systems that can lower exhaust and air change requirements. Another strategy is by installing low-pressure drop HVAC systems at early design stage. The last control measure is to involve reducing or eliminating reheats energy and/or adding some heat recovery (). Besides that, other utilities such as water and lighting also were in control measures in maximizing the 'green' goal in lab design.
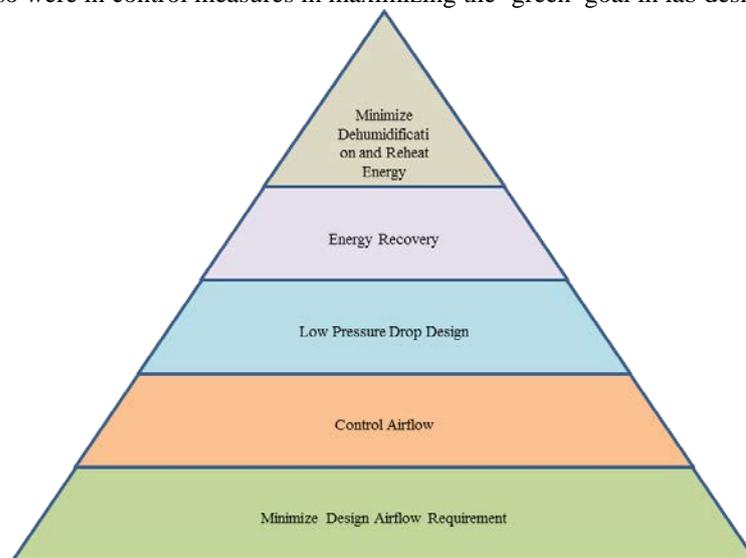
Figure 1   Air HVAC System

The scenario from three case studies on lab expansion given to the article supporting information and the same time added some value for determining the lab design. What can we learnt from first case-study, to do lab expansion it is necessary to hire an advisor early to identify any municipal, state, and federal compliance involved where those procedures also takes time to deal with. Meanwhile, from the second case-study it's very useful for those has problem with budget and urgency. Lab expansion can be done by someone who has experiences in constructing the lab before. By doing that, the cost for lab expansion can be reduce to almost 60% without ignoring the quality with provision, consult vendors and trades to help in deciding the specification and material. The third case study, the findings more or less support the points discussed on Green lab design. The project model of 'smart labs' which integrated features which are real-time air quality sensing, reduced fan, filtration, duct, stack discharge airspeeds, reduced internal heat load and reduced thermal inputs during setback periods can reduce until 50% of energy consumption.

At the bottom line of the article, the Q&A session held by the authors regarding the lab design had points out a few advises that should be followed by lab manager. In early stage is recommended to develop a good working team, get as much as information needed while communication is important so much so the isolated issue also could be uncovered. In the same time, the involvement of representative scientist is a good step for design 'artwork' at drafting session. Last but not least, the relationship with supplier also not less importance in order to make sure the project goes well in progress. (DePalma A.,2012)

It can be concluded that according to the author, to do a laboratory design there a few disciplines or parameters that should be followed as procedures. Where, it's involved about a few elements at starting stage which are fund, safety, human factors, concept, work-flow, flexibility, culture of the work, retrofit or build new and lab planning. In addition, without denial the concept of green lab also needs to be considered as the element is global issue nowadays. Furthermore, make the previous studies as the outlines and get some expert advices to guide on decision making.

3 Point of Review

The author has discussed the topic in proper manner, while the subsequent section paragraph has been arranged nicely in order to address the concept and idea how the lab design should being determined. Furthermore, the few case studies and Q&A session with experts has supported the arguments at almost above sections and in the same time conclude the author claim statement. Although the article has addressed all of the element to start the lab design, one of the element was lightly

discussed even though it's consider as prime consideration which is safety. The author only mentioned about emergency devices and how materials enter and leave the space. Where, the safety element in terms of protecting human health and life in line with protecting a facility from unauthorized access is also paramount in design (Daniel Watch, et al, 2012). Without any doubt sufficient circulation space is also a critical issue to maintain a safe working environment when the arrangement of fixed and loose furnishings needs to support the user freedom to go around the working area. (Innova,2014)

However, the element such as design according to human factors for staff satisfactory has clearly stated that the main design challenge is to create maximum comfort, and find elements that will make the working area attractive which Symrise Studio and Fragrance Laboratory, New York design has created today. (Wilk P.2016) The article also linked-well the element of flexibility with sustainability which makes the element at the top list of lab design trends. He says that flexibility should be built into casework design and layouts, to assume of electrical and heat loads and to speculate for air exchanges. It means that, flexibility which understands also as adaptability is the capability of the lab design to fulfil the necessity of both current and unforeseen future needs such as retrofits and modification which can save the cost effectively. (N. R. C.2000)

Meanwhile, the emphasis on green lab issue given a significantly impact on lab design nowadays which has been implemented by some of the lab such as Chemistry Biology building, University of Wiscorsin-Stevens Point, Wisc where the building will assimilated green design by installing large window to enhance the daylighting instead of using lamp and also using mechanical and electrical systems which are highly efficient. (Ostafi J.,2016) While, the PACCAR Environmental Technology Building at Washington State University been constructed using renewable materials and technologies including wood composites, recycled concrete and pervious pavement. (J. Lannigan,2016)

The case study has revealed that it is important to familiar with local regulatory body in order to make the task ease, because across the nation the municipal state has their own requirements specifically on lab. It usually more stringent compare to another building because of the dangerous contained of volatile chemical and fumes. (Manley M.,2013) While to do the lab expansion as 'do it yourself' instead of experiences, sometimes it need to create a small group and maybe skunkworks model need to be used. But to success, its need to understand the model, because sometimes it needs distance to make space to explore, but also need to be close to the 'mothership' in order to stay relevant. (George Wainwright P., 2013)

4 Significance of Lab Equipment

On the sight of Physical Asset Management (PAM), lab equipment sizes and location also plays an important role to ensure the lab design still on the right track during the early stage. For instance of previous outline for size and area of fume hood in the lab makes the hood subjected to wind stream unsettling influence from close-by strolling activity, involving the premium area, blocking access to sunlight and making risky "deadlock" condition. By moving the hood independently from lab area, it will expanded wellbeing because of isolation of hazardous materials necessitating hoods, enhanced adaptability and condenses ventilation work associating the hood to fumes frameworks. (Roger N.Goldstein G. C. & Arjun H. mande, 2016)

Special condition needs if design is for laboratory that working on biological research. In term of equipment size, there must be a space between benches, cabinets and equipment for cleaning purpose accessibility. Whereas, the location of certain equipment also needs to be specified because some of the equipment for example electron microscopy or mass spectrometry required special utilities and environment control. (U. of S. Carolina,2010) so the lab design must not overlook this criterion before jump to real work because usually this element is irreversible.

The other thing to be considered is the equivalent linear feet (ELF) of work surface inside the laboratory. ELF is meant the required length of benchtop for equipment size to be placed and space for preparation work. While for the equipment which does not fit to benchtop, the ELF is the length of the floor required to place the equipment on. Usually, the ELF for fume hood also needs to be counted as it was always the requirement in any of lab design for personnel involves with hazardous chemicals. (N. R. C.,2011)

So, it is significant to discuss the particular of equipment size and location on planning the laboratory design. Yet it has certain influenced on lab workflows which cannot be denial where the elements are applicable and undeniable at any of labs and research facilities. Due to the seriousness of this parameter, most of research team now are towards resource sharing to reduce the quantity and cost

of lab equipment in the same time less space is needed which brings to low operational and maintenance expenses. (J. K. Blake Jackson, Stephen Palumbo,2015)

5 Conclusions

     This article review has evaluated the article "Insights on Laboratory Design" by De Palma, Angelo. Most of points addressed in the article had shown the strong arguments in discussing about the element in determining the lab design. The output from the article has given a significant output to the people inside this area. Despite that, some of the point has lightly stressed such as safety which considered as a main element in designing the lab workflow. The section on Green Lab however has been described precisely with support of input from case study and also Q&A session with the expert. Nonetheless, the lab equipment size and location also has significant impact on deciding how the lab should be designed. The future study is hoped to discuss more thorough about this element.

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Research on Chinese EFL Undergraduates' Personality Traits and Their Foreign Language Learning Styles

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Abstract: The study is aimed to identify predominant personality types and learning styles, investigate the relationship between the participants' personality classifications and their learning styles. We look into how the participants' personality variables affect their foreign language learning style choice and find out whether different personality types may affect the way students establish their learning styles when learning English as a foreign language. The study enriches the content of domestic research on college EFL learners' learning styles. It may also offer the explanatory power of Bandura's Social Cognitive theory in analyzing the relationship between Chinese EFL students' personality traits and their learning styles. We hope this research can provide some references to other related studies in this field.

Key words: Chinese EFL Undergraduates; Personality Traits; Foreign Language Learning Styles

1 Introduction

In recent thirty years, the study on students' personality types and learning styles during their foreign language learning process has drawn scholars' wide concern. Studies abroad are dominantly guided by psychology and ethnology. Instrument used in these studies is mainly Myers-Briggs Type Indicator which is based on psychology. Teacher-centered methods are no longer considered as the key factor in determining the success or failure of teaching and learning English as a Foreign Language (EFL) (Richards & Rodgers, 2008). Learners shape their own learning process enormously. Nunan and Kathleen (2010) observed that good language learners find their own way. Foreign language teaching and research has returned to how to learn, that is, the student's learning strategies and learning styles, and its focus has also shifted to the student-oriented studying in students' learning process, cognitive process and psychological process. Considerable research deeply probes into the factors that influence students' academic achievements, one of which is the study of their learning styles (Ayersman & Minden, 1995; Chen Shao-hua & Zeng Yi, 2004; Reid, 2002; Zimmerman, et al, 2006; HE Xiaohong, 2005; LI Donggeng, 2005; LI Yan, 2009). Most domestic studies in this field focus on the relationship between learning styles and teaching strategies, the relationship between learning styles and students' achievements and the choice of learning styles and learning strategies. In the existing literature in China, there are few studies concerning the relationship between students' personality traits and their foreign language learning styles.

2 Data and Methodology

2.1 Subjects

Subjects of this study are 110 first-year undergraduate EFL learners from Wuhan University of Technology (WUI), among which 50 are majoring in science (45%), including Mechanism, Applied Physics and Software Engineering, and 60 are majoring in Arts (55%), including International Trade, Marketing and Financial Management. The participants are made up of 53 male students (48%) and 57 females (52%). (See Table 1)

Table 1   Subjects of the Study

		N	Percentage
Major	Art	60	55%
	Science	50	45%
Gender	Male	53	48%
	Female	57	52%

The participants, with one-year-long college English learning experience, have been taught and investigated by the author and one of his colleagues, Leilei, for one year in WUT. Among the subjects, sixty students majoring in Arts are taught by the author and fifty who major in science are taught by his female colleague.

2.2 Instruments

The instruments employed in the study were two complicated questionnaires. One of the questionnaires is the NEO-Five Factor Inventory (NEO-FFI) revised by Costa and McCrae (2004) with 60 randomly arranged items to elicit respondents' personality traits among five categories: neuroticism (N), extraversion (E), openness to experience (0), agreeableness (A) and conscientiousness (C). The other questionnaire is Reid's Perceptual Learning Styles Preference questionnaire (PLSP) (2002) which consists of 30 items to investigate EFL learners' learning style preferences among six categories: visual, auditory, kinesthetic, tactile, group, and individual.

Table 2   The Structure of NEO-FFI

Parts	Contents	Item No.
Parts1	Neuroticism	1,2,3,4,5,6,7,8,9,10,11,12
Parts2	Extraversion	13,14,15,16,17,18,19,20,21,22,23,24
Parts3	Openness	25,26,27,28,29,30,31,32,33,34,35,36
Parts4	Agreeableness	37,38,39,40,41,42,43,44,45,46,47,48
Parts5	Conscientiousness	49,50,51,52,53,54,55,56,57,58,59,60

2.3 Data collection and analysis

In an anonymous way, participants in the study completed the two questionnaires administered by the author in their classroom settings in the first semester of the year 2013. Before students were invited to answer the questionnaire, the author of the study briefly introduced and explained the purpose of the research. Students were informed that their participation was voluntary and their identity would be kept confidential. The response rate from the 110 sample participants was 100%.

The collected data were input in to the computer and processed by the Statistical Package for the Social Sciences (SPSS 19.0) to examine possible statistical significance and the correlation between subjects' dominating personality and their language learning styles.

3 Results and Discussion

3.1 Subjects' predominant personality traits

The data of NEO-FFI are input into the SPSS and then analyzed by means of Single Sample test. Table 3 shows the general types of the subjects' personality traits.

Table 3   Descriptive Statistics on NEO-FFI of All the Subjects Investigated

Sector	N	Mean	Std.Deviation	Std.Error Mean
Neuroticism	110	32.20	5.530	.527
Extraversion	110	42.21	5.597	.534
Openness	110	42.95	4.552	.434
Agreeableness	110	42.95	5.138	.490
Conscientiousness	110	40.24	5.102	.487

As is shown in Table 3, the first three personality traits of the subjects are Agreeableness (mean= 42.95), Extraversion (mean= 42.21) and Conscientiousness (mean= 40.24). These comparatively high figures indicate that the predominant types of the subjects' personality traits are agreeableness, extraversion and conscientiousness. The results generally mirror the findings of Ibrahimoglu and Unaldi, et al. (2013) who reported that the participants in their study reveal a high level of extraversion, agreeableness and conscientiousness. From the results in Table-3, it is shown that all the subjects have an optimistic view of human nature and appreciate getting along with others.

3.2 Subjects' dominating learning styles

The data of PLSP are input into the SPSS and then analyzed by means of Single Sample test. The general trend of the subjects' learning styles is shown in Table 4.

Table 4   Descriptive Statistics on PLSP of All the Subjects Investigated

Sector	N	Mean	Std.Deviation	Std.Error Mean
Visual	110	33.42	5.277	.503
Auditory	110	35.13	4.538	433
Kinesthetic	110	37.00	5.636	.537
Tactile	110	35.58	5.696	.543
Group	110	35.07	6.276	.598
Individual	110	33.24	7.619	.726

The statistics in Table 4 simply all the subjects investigated predominantly prefer Kinesthetic learning style (mean= 37.00) and Tactile learning style (mean: 35.58), then the next two learning styles preferred by all the students are Auditory learning style (mean: 35.80) and Group learning style (mean: 35.07), while the least preferences of all the students are Visual learning style (mean: 33.42) and Individual learning style (mean= 33.24). We can see from the results in Table-4 that kinesthetic and tactile learning styles are two predominant preferences of Chinese college students. This finding suggests that Chinese EFL learners tend to apply kinesthetic and tactile learning styles to English learning, which also indicates that college students learn English effectively through concrete and complete body experience and touch.

3.3 Differences of personality traits and learning styles between students of science and technology and those majoring in arts

The data of NEO-FFI and PLSP are input into the SPSS and then analyzed by means of Independent Sample test. Personality of college students of arts and those majoring in science and technology is shown in Table 5.

Table 5   Descriptive Statistics on NEO-FFI of College Students of Science and Those Majoring in Arts

	Major	N	Mean	Std.Deviation	Std.Error Mean	t
Neuroticism	Art	60	32.78	5.752	.743	1.215
	Science	50	31.50	5.223	.739	1.225
Extraversion	Art	60	41.93	5.983	.772	-.564
	Science	50	42.54	5.136	.726	-.572
Openness	Art	60	38.62	4.723	.610	.499
	Science	50	38.18	4.374	.619	.503
Agreeableness	Art	60	43.00	5.421	.700	.121
	Science	50	42.88	4.830	.683	.123
Conscientiousness	Art	60	40.22	4.404	.569	-.044
	Science	50	40.26	5.879	.831	.043

According to the results in Table 5, college students of arts displayed the highest mean score of personality traits in Agreeableness (mean= 43.00) in which the students majoring in science and technology also got as the highest one (mean= 42.88). Then students of arts displayed the second and third highest mean scores of personality traits in Extraversion (mean= 41.93) and Conscientiousness (mean= 40.22) respectively, and, all the same, the students majoring in science and technology also did in Extraversion (mean= 42.54) and Conscientiousness (mean= 40.26) respectively.

This finding suggests that the predominant personality traits of college students majoring both in Arts and in Science are agreeableness, extraversion and conscientiousness, and there's no evident difference of personality traits between students of arts and those majoring in science and technology. In brief, all the college students investigated tend to be enthusiastic, responsible, cooperative and talkative.

3.4 Differences of personality traits and learning styles between male and female students

The data of NEO-FFI and PLSP are input into the SPSS and then analyzed by means of Independent Sample test. Table 6 shows personality traits of male and female students.

Table 6   Descriptive Statistics on NEO-FFI of Male and Female College Students

	Major	N	Mean	Std.Deviation	Std. Mean	Error	t
Neuroticism	Male	53	31.68	4.914	.675		.952
	Female	57	32.68	6.051	.801		.959
Extraversion	Male	53	42.06	5.597	.769		.274
	Female	57	42.35	5.643	.747		.274
Openness	Male	53	38.49	4.535	.623		.160
	Female	57	38.35	4.608	.610		.160
Agreeableness	Male	53	42.02	4.664	.641		-1.844
	Female	57	43.81	5.443	.721		1.854
Conscientiousness	Male	53	39.87	5.424	.745		.729
	Female	57	40.58	4.807	.637		-.725

As is shown in Table 6, the mean value of the five personality types of the male and female college students investigated is fairly close to each other. The first two personality types with biggest mean value are Agreeableness with the value of male (mean= 42.02) and female (mean— 43.81), and

Extraversion with the value of male (mean= 42.06) and female (mean= 42.35). Then the next two main personality types are Conscientiousness with the value of male (mean= 39.87) and female (mean= 40.58) and Openness with the value of male (mean: 38.49) and female (mean= 38.35). Finally, Neuroticism with the value of male (mean= 31.68) and female (mean= 32.68) ranks the least personality type among the male and female college students. The results in Table-9 indicate that there is no clear difference of personality traits between male and female students whose predominant personality traits are agreeableness, extraversion and conscientiousness.

Table 7   Descriptive Statistics on PLSP of Male and Female College Students

	Gender	N	Mean	Std.Deviation	Std. Mean	Error	t
Visual	Male	53	34.75	4.965	.682		2.630
	Female	57	32.18	5.295	.701		2.637
Auditory	Male	53	34.34	4.719	.648		-1.773
	Female	57	35.86	4.274	.566		-1.766
Kinesthetic	Male	53	37.17	5.690	.782		.303
	Female	57	36.84	5.631	.746		.303
Tactile	Male	53	35.25	5.860	.805		-.596
	Female	57	35.89	5.573	.738		-.596
Group	Male	53	35.58	5.783	.794		.824
	Female	57	34.60	6.718	.890		.829
Individual	Male	53	36.19	7.330	1.007		4.208
	Female	57	30.49	6.869	.910		4.198

The results in Table 7 shows that the vast majority of the male and female college students investigated prefer kinesthetic learning style, which means that they tend to learn more effectively through concrete and complete body experience, for example, physical responses, participating, activities, role-playing. In addition, the second and third learning styles preferred by male students are individual and group learning styles, that is, male students tend to learn more effectively both through learning with others and alone. On the contrary, female students prefer tactile and auditory learning styles respectively.

3.5 Relationship between personality traits and learning style choices among low achievers and high achievers

The fifth question of this study to be dealt with is whether there is a meaningful relationship between personality traits and learning style choices among low achievers and high achievers.

Table 8   Correlation Between Personality Traits and Learning Style Choices among Low Achievers

		Visual	Auditory	Kinesthetic	Tactile	Group	Individual
Neuroticism	Pearson Correlation	-.181	.229	-.137	.521**	.017	-.393
	Sig.(2-tailed)	.376	.260	.503	.006	.933	.047
	N	27	27	27	27	27	27
Extraversion	Pearson Correlation	.188	.159	.426	.529**	.340	.063
	Sig.(2-tailed)	.358	.438	.030	.005	.089	.760
	N	27	27	27	27	27	27
Openness	Pearson Correlation	.213	.347	.290	.221	.127	.463*
	Sig.(2-tailed)	.297	.083	.150	.277	.537	.017
	N	27	27	27	27	27	27
Agreeableness	Pearson Correlation	-.329	.235	-.204	.098	-.018	-.236
	Sig.(2-tailed)	.100	.247	.317	.634	.932	.245
	N	27	27	27	27	27	27
Conscientiousness	Pearson Correlation	.158	.221	.511**	.227	.242	.062
	Sig.(2-tailed)	.440	.278	.008	.265	.233	.762
	N	27	27	27	27	27	27

*.Correlation is significant at the 0.05 level (2-tailed).
**.Correlation is significant at the 0.01 level (2-tailed).

According to Table 8, Neuroticism negatively correlates with Tactile learning style (r =-.521, P < .01) and Individual learning style (r = - .393, P < .05). Extraversion positively correlates with Kinesthetic learning style (r = .426, P < .05) and significantly with Tactile learning style (r = .529, P < .01). Openness positively correlates with Individual learning style (r = .463, P < .05). There is a strong correlation between Conscientiousness and Kinesthetic learning style (r = .511, P < .01). Interestingly, Agreeableness does not correlate with any of the six learning styles among low achievers.

Table 9 Relationship between Personality Traits and Learning Style Choices among High Achievers

		Visual	Auditory	Kinesthetic	Tactile	Group	Individual
Neuroticism	Pearson Correlation	.147	-.043	.090	-.067	-.289	-.196
	Sig.(2-tailed)	.464	.831	.655	.739	.143	.327
	N	28	28	28	28	28	28
Extraversion	Pearson Correlation	-.070	.123	.381*	.226	.518**	.304
	Sig.(2-tailed)	.728	.541	.048	.256	.006	.123
	N	28	28	28	28	28	28
Openness	Pearson Correlation	-.043	.072	.238	-.002	.178	.147
	Sig.(2-tailed)	.831	.721	.232	.993	.373	.465
	N	28	28	28	28	28	28
Agreeableness	Pearson Correlation	.267	.029	.008	.291	.145	.024
	Sig.(2-tailed)	.178	.887	.970	.141	.469	.905
	N	28	28	28	28	28	28
Conscientiousness	Pearson Correlation	.227	.301	.313	.498**	.496**	.096
	Sig.(2-tailed)	.254	.127	.111	.008	.009	.633
	N	28	28	28	28	28	28

*.Correlation is significant at the 0.05 level (2-tailed).
**.Correlation is significant at the 0.01 level (2-tailed).

As is shown in Table 9, Extraversion positively correlates with Kinesthetic learning style (r = .381, P < .05) and significantly with Group learning style (r = .518, P < .01). Conscientiousness highly correlates with Tactile learning style (r = .498, P < .01) and there is a strong correlation between Conscientiousness and Group learning style (r = .496, P < .01). What is fairly interesting is that Neuroticism, Openness and Agreeableness correlate with none of the six learning styles among high achievers. According to the statistics in Table-11 and Table-12, we can easily obtain the information about the relationship between personality traits and learning style choices. Among low achievers and high achievers as follows. On the one hand, among low achievers, 1) the neurotic students favor tactile and individual learning styles, which shows that those students who experience negative emotions prefer learning alone through touch; 2) the extraverted students prefer kinesthetic and tactile learning styles, which suggests that those who are enthusiastic and talkative prefer learning through concrete and complete body experience and touch; 3) individual learning style is preferred by the open students, which means that those who are open, creative and curious prefer learning alone; 4) the conscientious students favor kinesthetic learning style, which indicates that those who show self-discipline, act dutifully, and aim for achievement prefer learning through concrete and complete body experience.

4 Conclusions

The predominant personality types of the subjects were agreeableness, extraversion and conscientiousness. The subjects' dominating learning styles were kinesthetic and tactile learning styles. There was no evident difference of personality traits and learning styles between the students majoring in arts and those of science and technology. There was no clear difference of personality traits between male and female students. As for learning style choices, the vast majority of the male and female college students investigated preferred kinesthetic learning style. Meanwhile, male students also preferred individual and group learning styles and female students also preferred tactile and auditory learning styles. There was a meaningful relationship between personality traits and learning style choices among low achievers and

high achievers. As for low achievers, the neurotic students favored tactile and individual learning styles; the extraverted students preferred kinesthetic and tactile learning styles; Individual learning style was preferred by the open students, and the conscientious students favored kinesthetic learning style. In terms of high achievers, the extraverted students preferred kinesthetic and group learning styles; and the conscientious students favored tactile and group learning styles. The main personality factors that may affect students' language learning styles were neuroticism, extraversion and conscientiousness.

In future study, abundant material should be collected to have fill coverage of Chinese college students from as many majors as possible. Moreover, a study covering both questioners and interviews is worth future endeavors.

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A Case Study of Innovative Application of CAT in Translation Project Management

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Abstract: With the expedite process of economic globalization, the international language service industry has developed rapidly, which asks for more requirements on the translation talents and translation quality and efficiency. Computer-Aided Translation (CAT) technology has been applied in translation practice and translation project management as well as translation teaching to facilitate the innovation and revolution in translation teaching methods and translation project management methods. This paper engages a case study on Transn Translation Practice Base of Wuhan University of Technology to analyze innovative application of Computer-Aided Translation Technology in translation teaching and translation project management. And from the perspective of quality management, cost management, and time management, it analyzes some inspirations on translation teaching and translation project management, and provides some guidance for translation teaching and translation project management.
Key words: Computer-aided translation; Translation teaching; Translation project management; MTI practice base

1 Introduction

"With the development of information technology, artificial intelligence, and natural language processing technology, translation technology advances rapidly, the translation has shown professional features like informatization, diversification, processize, collaboration, professionalization and so on, challenging the traditional model of a pen, a piece of paper, and a dictionary" (Zhang Zheng, 2015). With the progress of Computer-Aided Translation (CAT) technology, which has been applied in translation practice and translation project management as well as translation teaching to facilitate the innovation and revolution in translation teaching methods and translation project management methods.

In China, the research concerning this area starts late, but with the development of network information technology in recent years and the setting of Chinese MTI programs, tremendous achievements have been achieved in the related research. Through researching from the website of National Knowledge Infrastructure (CNKI) on the Subject Headings of "Computer-Aided Translation" (June 25, 2016), a total of 964 relevant literatures have been found, among them there are 123 papers in 2015, which is almost the same amount with that of 2014(106 papers) and 2013(123 papers). And most of the papers are published in core journals of the related fields such as Chinese Translators Journal, Shanghai Journal of Translators, and Computer-assisted Foreign Language Education. From CNKI's academic attention data, concern about the relevant areas of "Computer-Aided Translation" is showing an overall increase year by year, the number of documents downloaded concerning this area is up to 5574 in May, 2016.

Research by Chinese scholars concerning this field can be found as: Introduction, history, and prospects of Computer-Aided Translation (Wang Huashu, 2015); Cui Qiliang (2014), from the concept of post-editing, analyzes the application and research status of post-editing, summarizes up the motive force of post-editing development, studies the types of topics suitable for post-editing, and proposes the practice code to improve post-editing quality and efficiency. Xu Bin, Guo Hongmei (2015), starting from analysis of the nature of the CAT, and with the help of actual publishing translation cases, illustrates that CAT can also be used for non-technical text translation; combined with high-quality machine translation (MT) and post-editing (PE), the adoption of "machine translation + computer-aided tools + post-editing" (MT + CAT + PE) mode has value for some non-technical text translation. Wang Huashu (2013), having comparatively analyzed the typical translation technology courses at home and abroad, points out the problems existed in computer-aided translation courses of the current MTI education, which is unable to meet the demand for modern language service and technical personnel; and thus he builds a MTI technical curriculum system faced with industry-oriented requirements. Xu Bin (2012), through analyzing tourist brochure translation projects, explores the translation project management issues involved in publishing translations, especially the translation process of books that value both diagrams and words, and describes the application of a variety of related technology of

computer-aided translation (CAT) in complex layout books translation.

With the development of science and technology and social economy, research on computer-aided translation technology and its applications is increasing year by year, and scholars' attention on related issues is also increasing, the research on related issues by domestic and foreign scholars is gradually deepening; The application of Computer Aided translation in translation teaching and the future trend of the development of the technology itself have become the focus of attention of scholars.

The rise of MTI in Chinese colleges and universities was rouse in 2007, and after years of development until so far, there are 206 Chinese universities having established MTI training bases enrolling MTI Masters, involving almost 10,000 people to be trained each year. And the vast majority of colleges and universities in China have set up computer-aided translation related courses. From 2012, the Translators Association of China and China National Committee for MTI Education add "translation and localization technology and project management, etc.," in training courses for translation major teachers of national colleges and universities, which highlights the importance of computer-aided translation technology in translation practice, translation teaching and translation project management.

2 Computer-Aided Translation Technologies and Applications
2.1 Computer-aided translation
"Computer-aided translation" (CAT) covers a wide variety of contends and its very complex structure is easy to be confused of. Although most scholars distinguish the concept of CAT in terms of the broad sense and the narrow sense, in view of individual differences in understanding, a broader concept of "technical translation" is adopted, that is the information technology used in the process of language communication, and cultural communication. If translation process is divided into three stages, say before translation, during translation, and after translation, then translation technologies refer to the information technology used in each stages, such as the pre- translation document encoding format conversion, the terminology extraction, bilingual alignment technology, repeating segments extraction technology, the machine pre-translation technology; the auxiliary spelling, auxiliary input, electronic dictionaries and parallel corpora inquiry and verification, translation memory matches, terminology recognition during translation; and Quality Assurance (QA) , translation format conversion, bilingual or multilingual typesetting, translation product function and language testing after translation."(Wang Huashu, 2015). Concluded from Wang Huashu's research (2015), the author of this paper summarizes and gives the following definition on CAT: Computer-aided translation refers to the information technology used in the process of translating to assist human translation, to improve translation efficiency and translation quality, before, during, and after translation. Its main function includes pre-translation document processing, machine translation during the translation process, quality control and other auxiliary functions after translation.

2.2 Major computer-aided translation tools
Broadly speaking, computer-aided translation tools include a large variety of CAT software, electronic dictionaries, online search engine, search tools, online searchable database, machine translation tools, word processing software, optical recognition software (OCR), format conversion software, content replacement tools, quality assurance (QA) tools, etc. In a narrow sense it refers to the translation tool directly used by translators in the translation practice to assist their translation performance. Such as SDL Trados (Translation, documentation and Software, also known as "TRADOS", is one of the world's most popular computer-aided translation (CAT) software in the world with more than 200,000 customers; statistics show that more than 90% of the Fortune Global 500 companies are using SDL Trsdos for everyday localization translation services. SDL Trados is headquartered in Maidenhead, UK. Yaxin (Yaxin CAT is a newly developed Chinese-English & English - Chinese translation platform by Beijing Dongfang Yaxin Software Company (www.yiba.com) , it is a specific software tool developed for organizations and individuals with translation tasks). Huajian (Huajian Group is a direct investment and holding high-tech enterprise of the Chinese Academy of Sciences; it mainly engages in technical research, and product development in the field of computer language information processing.) In terms of the market share of global CAT software, SDL Trados ranks the first, Logos Wordfast comes after it, while Star Transit, and Deja Vu rank the third and the fourth respectively. In which Transit mainly serves auto mechanics customers in German, and Deja Vu mainly serves French customers. And SDL's acquisition of Trados and other companies have let SDL itself to become the only giant in CAT markets. However Across and Alchemy are two of the companies that can compete with it. Wordfast used to present applications for Italian, but now is has been used by

companies who do not willing to let Trados to become the big company to monopolize the market.

2.3 Computer-aided translation technology and translation teaching

"Chinese translation education reform is imperative. That to include the translation technology and translation management education into the translation classroom is overwhelming." (Wang Huashu, 2015)."On one hand, the traditional translation ability is the foundation of translation technology ability. On the other hand, enhance the technological capabilities of translation can facilitate the progress of traditional translation capabilities"(Wang Huashu, 2015). Development of computer-aided translation technology has promoted the reform of translation teaching. With the rapid economic and technological development, the requirement of the professional quality on practitioners of language service industry has increased significantly, which does not only limit to the basic bilingual conversion capability, namely the traditional translation capabilities, but also requires practitioners of language services industry to master the most advanced information processing tools and machine translation software, and building of Corpus and other advanced professional skills, which raises new and higher requirements for the translation teaching in Colleges and Universities. In order to train senior translators that meet the social needs, colleges and universities translation teaching have begun a bold attempt to make progressive reforms on translation teaching. "In order to ecologically integrate the traditional translation ability with the training of translation technology ability, the cultivating of traditional translation capabilities and translation technology capabilities in actual translation teaching practice shall be balanced. Also, the teaching mode shall take the student as the subject, faculty as the guidance, and technology-driven mode shall be implemented; What's more, course content and teaching methods of translation technology ability shall be adjusted timely"(Wang Huashu, 2015).

2.4 Computer-aided translation technology and translation project management

Project management means that "the manager within a specific organization, within limited time and resources, scientifically use systematic theories and methods to implement a proactive and effective management for all the work involved in the project in order to achieve the ultimate goal of the project" (Wang Chuanying, 2011). Translation project management can be referred as that the organizer of a translation or the leader of a translation team, using of existing resources, scientifically manage the entire process of a translation practice to optimize the project's objectives. Wang Huashu (2015) pointed out that the core elements of a translation project management can be explained in the following three aspects: quality management, time management, and cost management; and it can be divided into five sub-capacity: project management knowledge; organization and coordination; communication; time control; cost calculation and control. Thus in the process of implementation of the translation project management, the project managers shall consider the importance of the "Three elements", and reasonably use the "Five sub-capabilities" at the same time to achieve optimal results of the translation project. Only when a translation project is quality guaranteed, timely, and within reasonable cost, should the project management be regarded as a successful one.

3 A Case Study

3.1 Establishment of translation project management model

When exploring graduate education reform, School of Foreign Languages of Wuhan University of Technology, combining the trend of the times and social latest requirements for translation professionals, makes bold innovation, reforms training methods, and tries to cooperate with enterprises. Then a pilot translation practice base for master students' education has been jointly established by WUT and Transn (Wuhan) Translation Company (Transn or Transn Company) which provides a rich professional practice platform for postgraduates, and enhances our school postgraduates' professional practice ability. Hereinafter, this paper will analyze the application of computer-aided translation technology in translation project management through quality management, time management and cost management.

3.1.1 Quality management

Quality is the core. As a college intern team, the translation project team has two tasks: teaching and translation; as the core of the project, the translation quality runs through the whole process; it has been one of the most important indicators to measure students' learning outcomes. Reasonable control of translation quality does not only enhance students' learning effect, but also can be a prerequisite for the smooth development of the project.

The first step is the quality control of pre-translation. The project manager will dispatch the translation work to best matched translators according to the actual project document type, the degree of difficulty, delivery time, areas of expertise involved, the specific requirements of customers, and the

translator's abilities and preferences, and the original texts will be distributed to the translator together with the relevant requirements through TQ platform, where the translators' ability and the quality of the translation is expected to be ensured. At the same time after the translators receive the task; the text will be preprocessed in advance by ICAT terms, corpus, documentation and other tools to reduce the occurrence of errors.

Quality control during translation is the key of a successful translation project. With the help of ICAT software's corpus management, corpus synchronization, and built-in Google, Youdao and other search engine, as well other functions, the consistency of the translation can be ensured in a proper way, and the terminology can be standardized, and the translators could interact with each other directly. Through joining in translation team, translators can share corpus with each other; and the same task can be undertaken by many translators at the same time to achieve consistency of technical terms, thus the translation quality is ensured.

The main contents of quality control after translation shall be that: after the completion of the translation, the translation will be uploaded through TQ systems before quality tested and proofread by experienced quality inspector. After the translation quality control, corpus alignment, as well as artificial proofreading, quality control, and layout formation, the final version of the translation can be delivered to customers directly without any errors. After the completion of quality control, quality inspector will summarize various errors and unreasonable parts of the translation appeared, and feed back to part-time translators, and they are required to make a summarize each time, thereby enhancing the ability of translators and improve the translation corpus to improve the quality of future translations.

3.1.2 Time management

Time is guarantee, only when the project is completed on schedule should it be considered to be successful. Rational management of the time shall take every aspect into consideration including the degree of difficulty of the project, and the translators' ability, and the project delivery time will be decided according to those factors, and translators' progress will be followed up in a timely manner. Through Transn Company's TQ software online dispatch and hand over of jobs, translators can accept the works and translation jobs anywhere at any time, which saves a lot of time and the auxiliary applications of ICAT corpus and machine translation, improve the translation efficiency, and effectively save the time for translation.

3.1.3 Cost management

Cost is the essence. Profit is the premise for the enterprise to survive and develop. Only when a translation project is completed within the range of costs should it be considered as a successful one. Therefore, costs shall be controlled in a reasonable range in the translation process. TQ and ICAT software do not only save transportation costs and practice cost of the translators, free software also reduces the cost of materials.

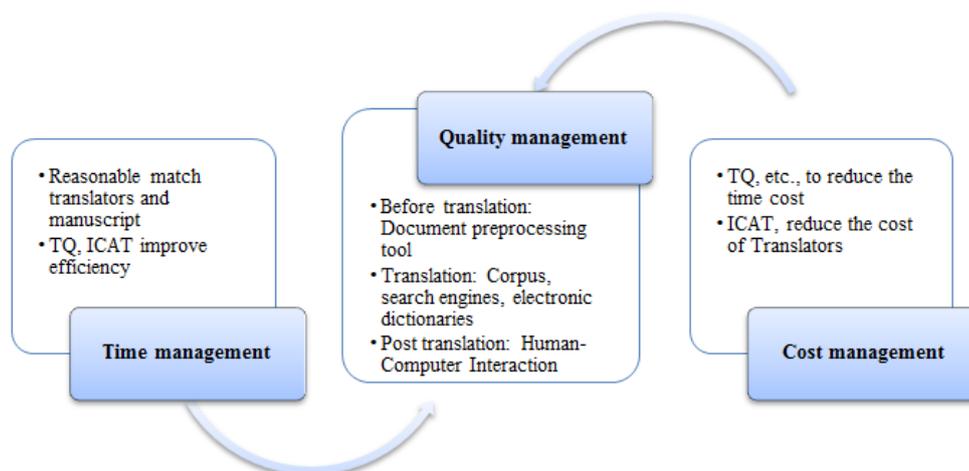**Figure 1   Flowchart of Translation Project Management**

3.2 Application of translation project management model

Computer-aided translation project management has been introduced into the training of translation talents by Wuhan University of Technology, tutors include professors of School of Foreign Languages of WUT who have years of experience in translation theory and translation practice teaching and

experienced senior translators from Transn Company. School of Foreign Languages of WUT provide studio for MTI students with the necessary hardware and software facilities for teaching, including computers and a variety of necessary computer-aided translation software, which has provided a guarantee of personnel, finance, and material; and training on translators starts in accordance with project management mode of quality management, time management and cost management.

First, after a rigorous and detailed evaluation (assessment methods used are test papers from Transn Translation Company, and the test was read and appraised by experienced translators of Transn. And the test was taken in WUT classroom), fifteen students with the highest scores are selected from postgraduate students to join in the Transn translation project, and based on the project team, the practice base is constructed in the form of a pilot project. The project is in charged by the Finance and Legal Department of Transn (Wuhan) Company. An experienced translation expert is volunteered to be as instructors to help students with translation problems and team building. After team project manager dispatch a translation job to the translation team according to the specific circumstances, the team leader (team leader is one of the members of the 15 translators appointed by Transn company and WUT) will split it into several parts and assign them to each team members to be translated. The team shall finish the translation work on time and send the completed translation to the project manager, and after been quality tested by Transn, the translation will be sent directly to the customer. Feedback will also be delivered to every member of the team in order to help each member to make up the deficiencies and improve their translation ability.

An experienced outstanding young teachers is selected as instructor of this team; in addition to the daily tasks based on the amount of translation team can accept, Transn will conduct a 1.5-hour training for translation problems occurred during the translation practice and answering questions of the students as well as teaching the students with a variety of new translation experience and skills acquired in their constant practice. The whole project is done with the assistance of computer-aided translation software which have been independently researched and developed by Transn Company; TQ (integrated TPM translation management platform) is mainly used for messaging, order management, and dispatching and submitting of the translation manuscript; ICAT (Huoyunyike) Software aids translators through machine translation, terminology management, and post-editing.

In time management, the team leader takes the responsibility. The project manager dispatches the project to the team leader according to the difficulty of the task, the number of members of the group and translators' translation ability and other specific circumstances. The tasks are assigned to the team leader directly through TQ, as well as the reasonable submission deadline of the project. After receiving the project, the team leader will assign the task to members and work together with the team to complete the translation within the specified time. TQ and ICAT software developed by Transn Company allow timely communication among translators, where the team leader is able track of the real-time progress of the translation, urging the members to complete the translation task on time which ensure that the project can be completed on time. These online job dispatching and online translation have greatly improved the efficiency of document distribution, reduced the communication barriers between translators, and have improved the overall efficiency of the translation. Meanwhile, reasonable pre-editing and post-layout translation tools and other intelligent document processing application provided by ICAT allow the translators to quickly complete manuscript processing work, and greatly improve the efficiency of the project.

Quality management is responsible by the translators with the assistance of machine translation, ICAT Corpus, and terminology bank which ensure the consistency of terminology in the whole texts, while avoiding each kinds of low errors occurrence among. And also Transn instructor and college instructor collaboratively instruct the translators. When faced with difficult sentences, translators can real-time communicate with other team members through TQ anywhere at any time. If some specific works that cannot be solved after mutual discussion between members of the team, they can seek help from the instructors, thus greatly improve the translation quality. After being submitted to the Transn Company through TQ, the translation work will be quality inspected and proofread by a senior quality inspector which will largely ensure the quality of the translation submitted to the customer. When errors found, they will be feedback to the translator directly, and the tutors will explain the relevant translation errors in the training courses to be held regularly to avoid the same mistakes next time. Through comprehending by analogy, and analysis of translation practice experience, the translation quality of the team has been largely improved, and the practice capability of the translation team members has also been enhanced.

Because of the involvement of the project managers from Transn Company, the project cost

management has been following economic principles which pursue the maxim of profits. Rational use of TQ, ICAT software has significantly reduced the manuscript processing period, thus the time cost has been saved. Translators are postgraduate students, and they are required to finish the jobs anywhere they want including teaching equipment provided by the WUT, which has largely reduced the equipment costs. ICAT and TQ are software entirely and independently researched and developed by Transn Company, which greatly reduce the cost in purchasing additional computer-aided translation software.

In short, Transn practice base of Wuhan University of Technology is very successful in exploring MTI translation teaching and Transn Company translation project management. In virtue of computer-aided translation technology, the innovation and development of MTI translation teaching have been achieved, MTI students' translation practice ability has been improved, and new innovative ideas for translation project management of Transn Company are also highlighted.

4 Conclusions

The professional practice base has promoted the smooth development of translation teaching and translation practice of post graduate students of School of Foreign Languages, opening up a set of new translation of teaching and training methods. The translation team composed of postgraduate students, through self-management, and self-improvement in translation practice, not only improves their own translation ability, but also has a much more profound understanding of the translation operation and translation management in companies which lay a good foundation for their future translation practice, translation management, and translation teaching. In addition to promoting the development of translation teaching, Computer-aided translation technology also has a remarkable effect in translation project quality control, time control, and cost control. Universities shall properly add translation practice courses and computer-aided translation practice courses in Translation Teaching, and try to take the road of innovative cooperation with enterprises. Besides, in the process of exploring their own development, language services enterprises shall innovate actively. When providing high-quality language services for the society, they are also obliged to cultivate high-quality language services personnel. They shall actively cooperate with colleges and universities to give full play to their premium hardware and software facilities, as well as large numbers of potential young student translators, to save cost of enterprise and make contributions for university MTI education, so that a win-win situation can be achieved for all parties.

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Application of Senior and Mentor Team in College Dormitory Culture Construction under the Credit System: An Empirical Study

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Abstract: Based on literature analysis, this paper compiles a questionnaire about the effect of college dormitory culture construction on university life. Relative investigations and data analysis are conducted about the effect of dormitory culture construction, daily lifestyle, individual development and other aspects of university students under credit system. The survey shows that there is a close connection between the dormitory culture construction and dormitory members' study, lifestyle, psychological status and individual development, and the dormitory cohesiveness is the essential part of the culture construction. On the basis of survey data, according to problems reflected by students, this paper tries to deepen and refine the student management, and then build the management mode of senior and mentor team for dormitory, and focus on promoting the daily education management of college students by taking a dormitory as an unit. One dormitory corresponds to multi-category dormitory guides, and every senior student and mentor is individually responsible for one or more items of related works, implementing six kinds of quality-oriented education in scientific and technological, psychological health, academic guidance, career exploration, voluntary practice and cultural activities on campus, helping students understand the frontier of specialties, to make the development plan clear, to ease the psychological pressure and to adapt the college life as well as improving the comprehensive competitiveness by shaping great dormitory culture.
Key words: Credit system; Senior and mentor team; Student management; Dormitory culture

1 Introduction

In 1918, Peking University established the elective system, which becomes a symbol of establishing China's credit system. Then, Southeast University and Tsinghua University put forward credit systems with their own characteristics, according to the actual situation (HanHong, 2013). At present, credit systems implemented by most Chinese Colleges is equipped with Chinese characteristics, and the actual development is different among colleges.

Compared with the teaching plan for fixed academic year system, the credit system holds features like flexibility, mobility and personalization. The reform and implementation of the credit system, at the same time of breaking the academic year system as the inherent pattern in colleges, is also facing challenges from modes and means of management. Under the original model, we usually manage students according to executive classes, and the stationarity of executive classes is conducive to the unified arrangement and management by colleges. But the credit system weakens the management mode of executive classes, reduces collective activities and weakens the collective sense of honor. Under the implementing of the credit system reform and autonomous course selection system, students face various challenges of the diversity of the class time, places and instructors; meanwhile the examination-oriented education before the college entrance makes freshmen become unadapted in habits, study styles, human communication, psychological gap, missing study goals and many other aspects(Han Hong,2013;Yu Jinghua,2014).The school of automation combines the senior student system and the mentor system, and actively explores for building the student management mode adapting to the credit system.

2 The College Dormitory Culture Construction

As the basic unit of college, dormitory is an important place for students to study, live in and communicate, as well as a key position for college to educate, manage and serve. At present, the large number of dormitories in college brings large challenges to management and education.

The college dormitory culture construction is an important window of developing socialist culture and ethics in college as well as an indispensable part of students' lives and studies. As an important part of promoting academic atmosphere construction, the dormitory culture construction has obvious features which differ from disciplines construction, gaining more and more attention in schools and society. The healthy, progressive and harmonious dormitory culture not only relates the daily life order of each

student, but also influences students on learning situation, learning attitude, personal development and other aspects. In order to make clearer the function of dormitory culture construction in Study Style Construction, explore how to promote overall study style by elevating the level of dormitory culture construction and implement delicacy management for students; we particularly conduct this survey on this school's college students.

The survey employed anonymous questionnaire focusing on four aspects including dormitory relations as well as how students deal with dormitory affairs; assessment of effects brought by communists and student cadres on dormitory culture construction; assessment of what effects brought by dormitory culture construction on students' study; ways of improving dormitory culture construction The survey was targeted at the undergraduate students of the school of automation. The amount of questionnaires sent out was 1400, and 1394 of them were retrieved. The amount of effective questionnaires was 1318, constituting 94.5% of the retrieved questionnaires. Basic information is as shown in Table 1.

Table 1   Survey Sample's Basic Features

Sample Gender Distribution	Male	80.2%
	Female	19.8%
Sample Grade Distribution	Freshman	30.5%
	Sophomore	25.2%
	Junior	27.5%
	Senior	13.4%
Sample Political Status	Communists	6.8%
	Non-communists	93.2%

According to the questionnaire, based on the analysis of data, it is founded that dormitory culture construction exerts obvious effects on students' study and daily life. To be specific, excellent dormitory culture provides good learning environment and driving force for roommates, and positive learning atmosphere will play an active role in promoting every roommate's performance in study, as well dormitory members living habits also have a greater impact on their academic performance. What's more, construction of dormitory cohesion is a key part of dormitory culture construction. If you live in a dormitory with good cohesion, dormitory members are more inclined to contribute a lot of energy to elevating level of dormitory culture construction and stimulate learning as well. As shown in Table 1, in dormitory which enjoys a high reputation in the areas of personalized decoration style in the same-grade dorms, the frequency of discussion about study every day reaches 50%, obviously higher than those dormitories with few decorations. As the input of dorm decoration gets lower, the frequency of discussion every day is reduced as well, while the frequency of little discussion and no discussion increased. Students, who stay in a dormitory where roommates object to the personalized decoration, will have least frequency of discussing study and have highest frequency of no discussion about study in their dorms.
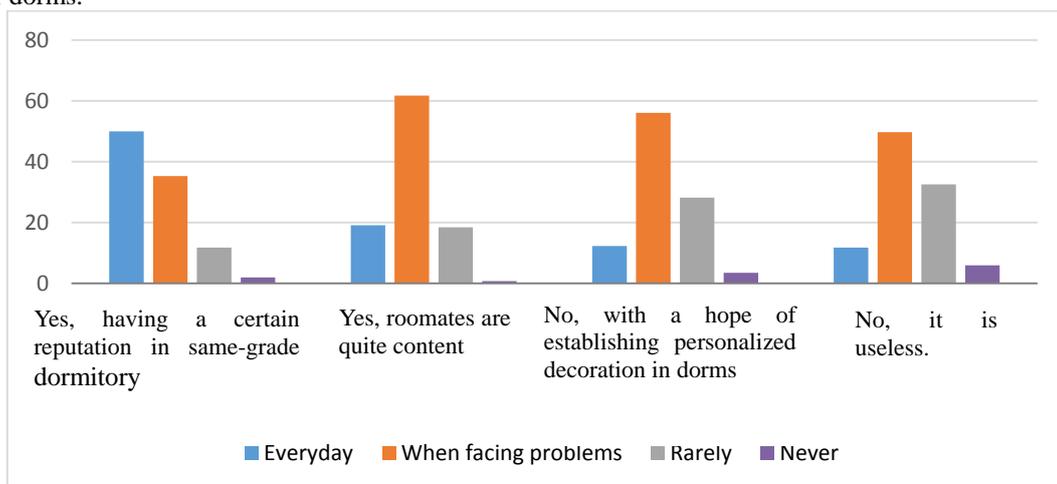

Figure 1   Do You Have Personalized Decorations in Your Own Dormitory? How Often You Discuss about Study in Dormitory?

In the aspect of exploring how many ways of improving dormitory culture construction, students are eager to have more chances to communicate with high-grade seniors. And great attention should be paid to daily management and culture construction of dormitory.

3 Senior and Mentor Team

3.1 Senior system

"Student Mentoring Scheme" (SNS for short) first appeared in 15th century England Eton. So far, seniors mentoring system has always remained popular in European and American Universities. In 1988, "Student Mentoring Scheme" started its trials from City University of Hong Kong (CUHK) and it was widely used by various colleges and universities later (Yu Jinghua, Xie Jing, 2014; Su Xudong, 2010).

Multilevel maladjustment were easily existed in freshmen after the beginning of term, and deeper understanding of learned majors is needed for students. Also, reasonable plan of their careers is of significance to them. Among high-grades students, we select and train a group of senior students who are having high-political quality, good at learning and experienced in practice to be served as dormitory seniors. The reason is that they are close to freshmen in the aspects of ages, life experiences, growth environment and so on, which makes moral education between both parties more attractive and acceptable during their process of communication. In the unit of dormitory, dormitory seniors use their own experience to guide low-grade students to adapt college's life as soon as possible and overcome their interpersonal communication obstacles. Besides, they utilize what they learned to help low-grade students gain academic counseling; meanwhile it also has far-reaching influence on comprehensive development of seniors during communication between both sides.

On the basis of Senior System, Interpersonal circle is formed to break transverse student relationships, achieving the diversification of ways of communication between students and facilitating heritage of school culture. Under this mode, self-governance, self-education and self-service can be realized by students, which form a good and supportive atmosphere among students.

3.2 Mentor system

Mentor System is originated in Oxford and Cambridge. It is said that William Wickham Bishop of Winchester creates mentor system who founded "new college" in 14th century. A mentor is assigned by colleges to students after check-in. A mentor is the scholar who guides students choose subjects and responsible for students' academic study and characters' shaping. Face-to-face communication between mentor and student can be useful in assisting students make study plans and guiding students how to make improvements(Yu Jinghua, Xie Jing, 2014; Pang Ran, 2013; Liu Zhaoxia, 2005).

Students have greater rights in choosing and decision-making power under complete credit system, but owing to the lack of self-planning and self-design capability, no matter what study or life of students will be badly affected without the guidance of mentor. Therefore, it is necessary to carry out this system. Ideal mentors come from excellent teachers, management personnel and scientific researchers, who accomplish their jobs through guidance in students' extra-curricular learning and research practices, assistance in solving problems in academics, thinking and life, reasonable careers planning and bringing subtle influence on students with mentors' good morals and characters. In a word, the development and growth of students will be affected by mentor's character, opinions, research ability and academic status anywhere, any time.

3.3 Construction of senior and mentor team

Construction of Senior and Mentor team is aimed at realizing integration of mentor system and senior system, forming educational power and bring better education effects (Wang Haiyan, 2012).

3.3.1 Selection

A group of excellent teachers and good high-grade students are purposefully selected to form a senior and mentor team in principle of independent-enrollment and merits chosen. And relative jobs are conducted by the leading of grade counselors. Every class is equipped with a head teacher, two postgraduates, seniors, juniors and sophomores respectively, among whom postgraduates are mainly in charge of affairs of scientific innovations and professional skills; seniors are mainly responsible for the affairs of further studies overseas and finding jobs or staring business; juniors are responsible for affairs of campus activities and daily life; and sophomores are mainly responsible for affairs of how to adapt college life and make reasonable time management.

3.3.2 Training

After establishment of this team, various targeted trainings are periodically organized in accordance with 3D training mode which is characterized by experts-training, teacher-exchanging and peer

counseling. The training content involves several parts such as the introduction of college history, academic development, interpersonal communication skills, lectures on psychology, majors introduction, social practice, campus life guide, dormitory safety lectures, academic development   and counseling, a second classroom instruction, contest training about science and technology innovation, dormitory culture construction etc. The sharing meeting is carried out at regular intervals on which grade counselors and students representatives proceed deeper discussions.

3.3.3 Assessment

The establishment of the meeting, monitoring, assessment and other related systems can enhance the professional level of the team. The first thing is to standardize the responsibilities of "Famous teachers" Involving regulations should be strictly implemented to the performance of class directors. Outstanding directors should be invited to give speech and share their experience. The second thing is to create student leaders echelon. Senior students should be give training according to the requirements of the Rules for Student Cadres to carry out meeting monthly, summarize the work result and focus, analyze difficulties, explore and share experience together. Senior students should conduct student satisfaction evaluation, the test of students' basic situation, and check the team's familiarity with students.

4 Application of the Team of Student Mentors and Supervisors in the Management of University Students

4.1 Create "1+1" mode of dormitory daily service

A contact is required for every dormitory, which normally should be director teacher or senior students, responsible for dormitory daily management. Contact should regularly check sanitation and safety of the dormitory, get close to the thought and abnormal situation of students, and truly understand their needs, urgency, pleasure and troubles. Culture construction is the core of dormitory construction. The team is supposed to lead students to design, discuss, propaganda and consolidated their dormitory symbol. It's also team's responsibility to integrate school's spirit of "profound, authentic and cultivation" into dormitory's common dream and internalize it to the value that students pursue after.

4.2 Create "1+6" mode of dormitory culture construction

Under quality-oriented education, each senior student and mentor is respectively responsible for one or more transactions to meet six kinds of cultural needs of students in a dormitory which are science and technology innovation, mental health, academic guidance, career exploration, voluntary practice, and campus cultural activities, in order to help students know the professional front, clear development plan, alleviate psychological pressure, adapt to college life, and grew up in an all-round way.

4.3 Create multilevel education mode according to the difference of students' needs at each grade

In the unit of dormitory, education for academic career should be focused on freshmen; subject competition should be emphasized on sophomore; professional quality should be cultivated for junior; career guidance should be given to senior. Covering number of students will be adjusted from freshman year to senior year, and education will also convert gradually from general to personalized, so as to meet the needs of each grade.

5 Practical Effects

The management mode of senior and mentor team could bridge the gap between teacher and students, high-grade students and low-grade students in inheriting school culture. It not only performs education and conduction for low-grade students, but also make senior achieve self-identification. Students could satisfy their spirit of growing, and reposition themselves under the motivation of external honor, to complete a continuous and benign circulation of self-education, self-monitoring and self management.

The management mode of senior and mentor team can enable the daily management and quality-oriented education accessible for the widest range of students and their daily life. As an innovative education mode for dormitory management, it serves as a supplement of counselor's work, and respects students' individuality development as well, which is in favor of growth and success for students. The contact between students and school does not break after the seniors' leaving as it forms the resources of alumni and talents cultivation.

6 Conclusions

In order to renovate the education management of students in colleges and universities, The

management mode of senior and mentor team implemented by colleges and universities is an inevitable trend, which can not only meet the objective requirements of comprehensive development of college students, but also satisfy the real needs of enhancing effectiveness in the ideological and political education.

During the later period, great efforts should be made to improve the effective combination of tutorial system and student mentoring scheme, and to standardize and perfect the implementing regulations including four specific points: Firstly, based on grades or faculty, building up supporting senior mentoring teams and defining professional teachers who are responsible for relative jobs such as guiding, training and evaluation; Secondly, designing targeted and strong real-time training scheme of senior and mentor team, according to different needs of students in various regions, cultural backgrounds and subject majors; Thirdly, establishing more scientific and reasonable management system from the aspects of choosing, managing, testing and publicizing the senior and mentor; Finally, enriching the working contents and methods of senior and mentor team in time through feedbacks from the accepted audience.

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A Study of Postgraduates Entrepreneurship Education Practice under the Popularization of Higher Education

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Abstract. In the knowledge-based economy, innovation is the soul of a nation. Under this background, the postgraduate's entrepreneurship education practice has attracted more and more attention and has gained a lot of support. However, there exist many problems in these activities. This research aims to survey the current situation of postgraduate's entrepreneurship and analyze the problems encountered in order to improve the guidance efficiency. With the method of questionnaire and interviewing, the author brings forward comments and suggestions on the basis of the results.

Key words: Popularization of higher education; Postgraduates; Entrepreneurship; Survey

1 Introduction

The entrepreneurship practice of college students can date back to the 1980s, when the University of Texas at Austin in 1983 held the first university student entrepreneurship competition (Xu Xianping, 2001). Developed countries have accumulated rich experience in the theoretical research and the practice of entrepreneurship education (Fang Yufei, 2006). Moreover, they have succeeded in breeding a large number of talents with entrepreneurial innovation capability (Xu Juan, 2005), which promotes their economic development and social progress. Compared with developed countries, Chinese student's entrepreneurship education practice started relatively late (Li Chengxian, 2004). In May 1998, Tsinghua University "Business Plan Competition" set off a fever of entrepreneurship among college students (Li Yue, 2006). As postgraduates, how to better play to professional advantages and comprehensive abilities and to join the current of "public entrepreneurship and innovation," has become the purpose and significance of this research (Liu Chengbo, 2004).

2 Methodology and Discussion

Questionnaire, interview and literature methods are adopted in this research. The respondents are current postgraduates.

The main contents of the investigation are: (i)The status quotes of postgraduates entrepreneurship education practice under the popularization of higher education(Zhong Ronghui, 2008); (ii) Postgraduates' cognition to the policies and situation of postgraduates entrepreneurship; (iii)The internal and external factors that restrict the theoretical development and practice of postgraduate entrepreneurship; (iv)The necessity and feasibility analysis of postgraduates entrepreneurship education(Wang Shuang ,2015).

Table 1　The Statistical Description of Each Dimension Level

Level of factor	Grade			Gender		Profession		Home Address			
	1st year	2nd year	3rd year	Male	Female	Humanities &social sciences	Engineering& agriculture a& medicine	Metropolis	Middle-sized and small cities	Cities & towns	Rural areas
Frequency	293	255	97	273	372	141	498	86	309	141	108

From the demographic variables, the number of valid questionnaires respectively on grade, gender, profession and home address were 763, 757, 741 and 754. To be specific, from the grade, the number of effective questionnaires is 763. Different grades of postgraduates are respectively 350, 295, 118, with each accounting for 44.4%, 37.4% and 15% of the total. From the gender, there are 757 valid questionnaires. Male and female respectively are 313 and 444, accounting for 39.7% and 56.3%. From the types of profession, there are 741 valid questionnaires, 178 of humanities and social sciences, 563 of engineering, agriculture and medicine, accounting for 22.5% and 71.4% respectively. From the home address, there are 754 valid questionnaires. Based on different size of cities, metropolis, middle-sized cities, towns and rural areas respectively are 100, 354, 161 and 139, accounting for 12.7%, 44.9%, 20.4% and 17.6%.

Table 2   The Correlation Analysis of Demographic Variables

		Grade	Gender	Profession	Home Address
Grade	Pearson simple correlation coefficient	1	.072*	.093*	-.075*
	P		.048	.012	.039
Gender	Pearson simple correlation coefficient	.072*	1	-.137**	.008
	P	.048		.000	.832
Profession	Pearson simple correlation coefficient	.093*	-.137**	1	.116**
	P	.012	.000		.002
Home Address	Pearson simple correlation coefficient	-.075*	.008	.116**	1
	P	.039	.832	.002	

*. Correlation is significant at the 0.05 level

**. Correlation is significant at the 0.01 level

By the use of Pearson product-moment correlation coefficient, the correlations among various demographic dimensions are obtained as is shown above.

Table 3   The Correlation Analysis of Each Dimension

		Family	Qualification	Cognition	School	Emotion	Society
Family	Pears on simple correlation coefficient	1	825**	837**	838**	836**	858**
	P		000	000	000	000	000
Qualification	Pears on simple correlation coefficient	825**	1	846**	771**	857**	833**
	P	000		000	000	000	000
Cognition	Pears on simple correlation coefficient	837**	846**	1	820**	843**	836**
	P	000	000		000	000	000
School	Pears on simple correlation coefficient	838**	771**	820**	1	814**	852**
	P	000	000	000		000	000
Emotion	Pears on simple correlation coefficient	836**	857**	843**	814**	1	844**
	P	000	000	000	000		000
Society	Pears on simple correlation coefficient	858**	833**	836**	852**	844**	1
	P	000	000	000	000	000	

**.Correlation is significant at the 0.01 level（2-tailed）.

It is observed that the six dimensions have reached a very significant level of correlation. In a sense, these six dimensions have closely related to postgraduates' entrepreneurship. Moreover, it can reflect the problems in the process of undertaking. In other words, these six aspects can be measured, and the results are both credible and effective.

The analysis of specific factors

Firstly, the family dimension is analyzed. The figure below shows respondents' views on how the enlightened level of family members impacts the postgraduate's entrepreneurship.
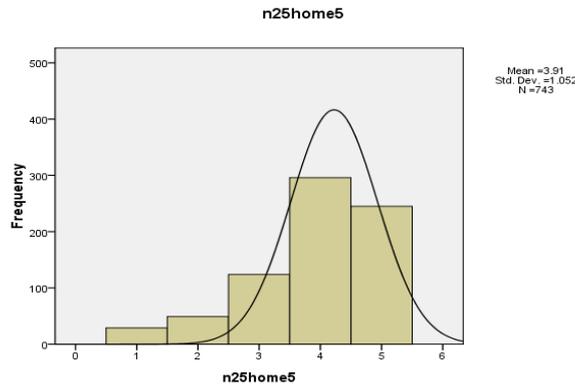
Figure 1 Family Dimension

From figure 1, it is observed that nearly 4% of the respondents believe that the enlightened level has nothing to do with students' undertaking while 6.2% believe it effects to some degree, and approximately 70% of the respondents think that the enlightened level can influence one's entrepreneurship. Among them, 31.1% of the respondents think it has a significant influence.

Secondly, the school dimension is analyzed. The figure below shows the respondents attitudes towards how entrepreneurship education in schools affects entrepreneurship.
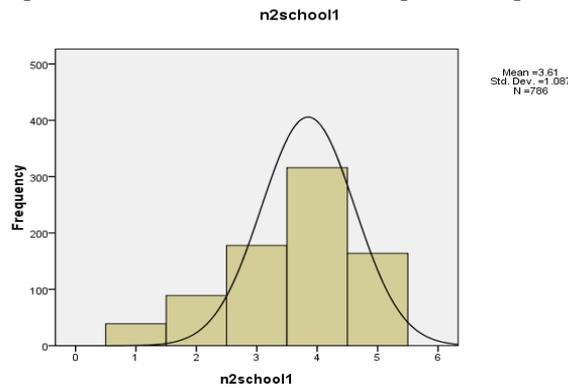
Figure 2 The Entrepreneurship Education System of School

Combined with the related data, it can be seen that around 20.9% of the respondents consider that the entrepreneurship education of school has a great impact on postgraduates' entrepreneurship, 16.3% think that it has little influence, while 22.6% of the total hold the neutral opinion. There are 40.2% of the respondents think that school entrepreneurship education has an influence on entrepreneurship to a certain degree. To sum up, there are about 60% of people believe that the practice of entrepreneurship education of school can influence postgraduate entrepreneurship.
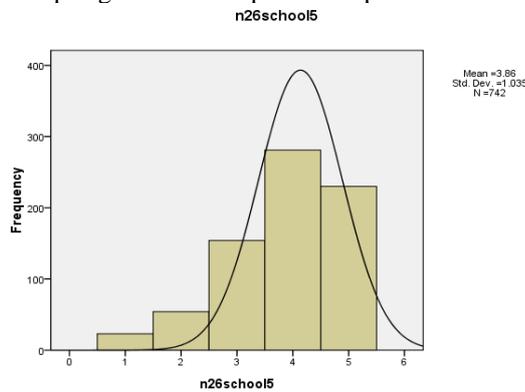
Figure 3 School's Attitude to Entrepreneurship

However, in the above figure, there are 31% of the respondents hold the opinion that school's attitude has a great influence on postgraduate entrepreneurship. Compared with the school's educational practice, it has a larger proportion. This means that more students consider that school's attitude has a more significant impact on postgraduate entrepreneurship.

Thirdly, the Society dimension is analyzed. The figure below shows the respondents attitudes towards how the employment status of postgraduates and the financial support affect entrepreneurship.
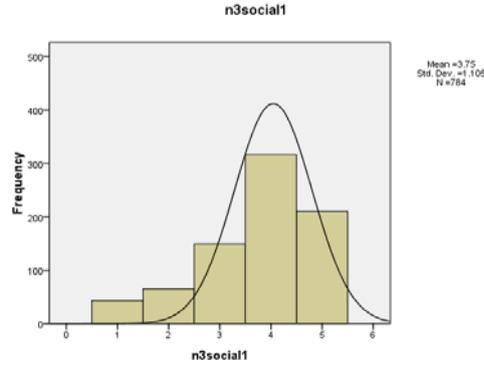
Figure 4   The Employment Status of Postgraduates to Entrepreneurship

In the figure above, only 26.8% of the respondents think that the risk safeguard mechanism has a great impact on postgraduate entrepreneurship. This is the smallest proportion among these five factors in society dimension. 5.5% think the mechanism has nothing to do with entrepreneurship, which is the largest of the five. In short, there are a large amount of people consider the risk safeguard mechanism has little impact on postgraduate entrepreneurship.
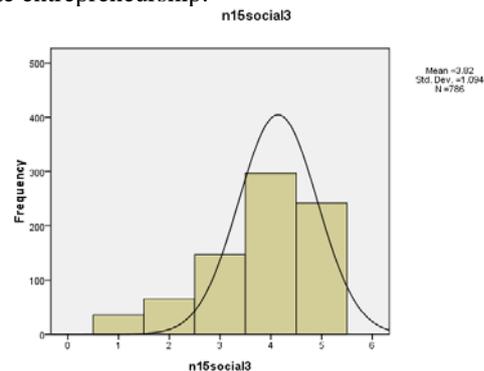
Figure 5   Financial Support to Entrepreneurship

Nevertheless, in figure 5, there are many people think financial support can affect postgraduate entrepreneurship. Merely 3.4% of the respondents think financial support has no influence on it.

Fourthly, the cognition dimension is analyzed. The figure below shows the respondents attitudes towards how the relevant policies and their understanding of their own profession affect entrepreneurship.
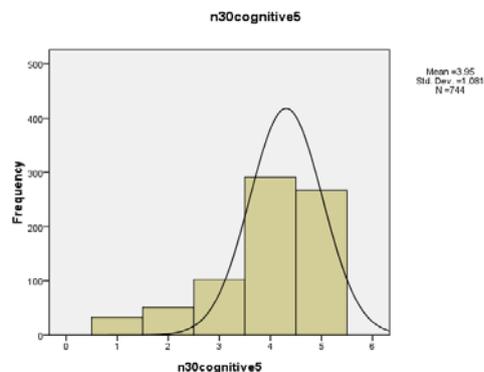
Figure 6   Postgraduates' Cognition to Relevant Policies

In the above figure, a large amount of people think that students' cognition to relevant policies can significantly affect entrepreneurship, which accounts for 75% of the total.
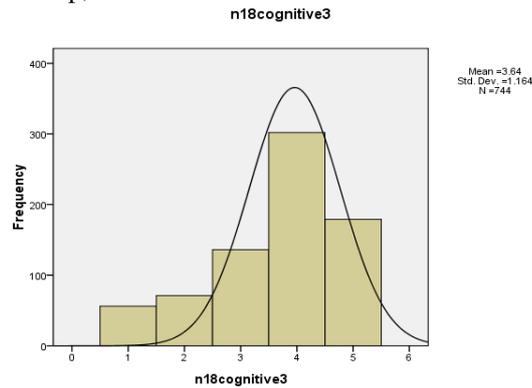
Figure 7   Postgraduates' understanding of their Own Profession

While in figure 7, both of the proportions are lower than the other four factors in society dimension, which accounting for 7.5% and 64% of the total.

Fifthly, The emotion dimension is analyzed. The figure below shows the respondents attitudes towards how the consciousness of innovation and interest to entrepreneurship affect entrepreneurship.
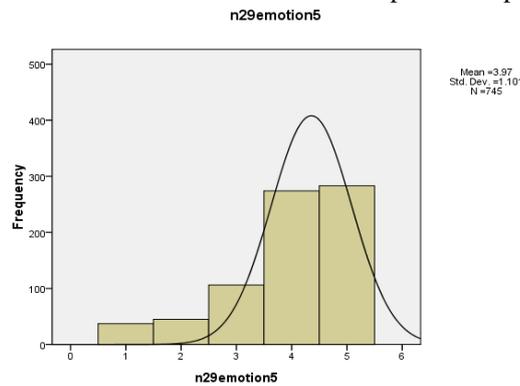
Figure 8   Consciousness of Innovation to Postgraduate Entrepreneurship

The figure above shows that there are 38% of the respondents believe that students' consciousness of innovation can significantly affect postgraduate entrepreneurship, and another 38.6% of people believe it affects to some degree. Therefore, it can be concluded that there are 76.6% of the people in total believe that students' innovation counts.
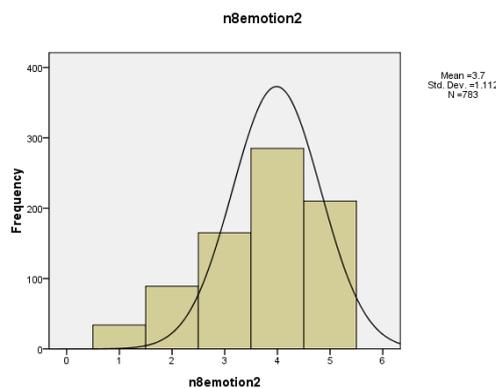
Figure 9   Interest to Entrepreneurship

In figure 9, there are merely 26.8% of the respondents believe that students' consciousness of innovation can significantly affect postgraduate entrepreneurship. This proportion is much lower than figure 8. To sum up, there are more students believe that the consciousness of innovation can more

significantly influence postgraduate entrepreneurship than interest does.

Six, the capacities and qualities dimension is analyzed. The figure below shows the respondents attitudes towards how qualities of students and knowledge and skills of students affect entrepreneurship.
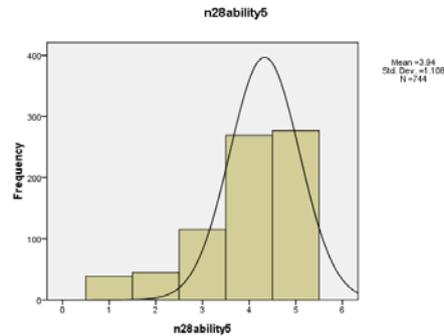
Figure 10   Faith to Postgraduate Entrepreneurship

In figure 10, there are 39.8% of the respondents believe that students' faith can significantly affect postgraduate entrepreneurship, and another 34.9% of people believe it affects to some degree. Therefore, it can be concluded that there are 74.9% of the people in total believe that students' faith counts.
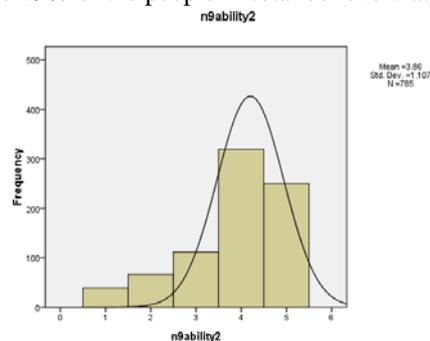
Figure 11   Knowledge and Skills to Postgraduate Entrepreneurship

However, in figure 11, there are 28.6% of the of the respondents believe that students' knowledge and skills can significantly affect postgraduate entrepreneurship, and another 38.8% of people believe it affects to some degree. Therefore, it can be concluded that there are 65.4% of the people in total believe that students' knowledge and skills counts.

3 Conclusions

To take these six dimensions above (including 30 factors) as a whole, the faith in entrepreneurship has the largest proportion, which is up to 39.8%. This indicates that more people think the faith is of great significance to postgraduate entrepreneurship. Even though all of these six dimensions have a relatively large impact on entrepreneurs in the respondent, the personal capacities and qualities have a larger impact. That is to say, people generally think highly of the capacities and qualities. Therefore, it is urgent enough for the government and the community to improve their risk protection mechanism for postgraduate entrepreneurship, so that the risks can be reduced, accepted and even transferred. As for the schools, the campus culture of innovation should be created and activities like entrepreneurship education should be carried out. As for postgraduates, they need to focus on their practical knowledge as well as practical abilities.

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A Survey on Guidance on Dictionary Use as a Tool for Online Self-Correction in EFL Writing

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Abstract: Recent years have witnessed the fast and steady growth in the research into dictionary use, especially the use of learner's dictionary. 62 students participated in an instructional experiment which was designed to explore whether dictionary use guidance could work well in helping users improve their performance on essay self-correction. A post-task survey was also carried out to investigate students' lookup behavior and in what ways dictionary affect self-correction in writing. Results of the study revealed guidance on dictionary use could play a great role in improving essay score and guide students into autonomous learning. It is suggested that EFL professionals incorporate dictionary use guidance into EFL writing pedagogical programs.

Key words: Dictionary use; Learner's dictionary; Online feedback; Self-correction; EFL writing

1 Introduction

An increasing number of empirical studies (e.g., Cowie, 1999; McCreary & Dolezal, 1999; Tono, 2001; Tarp, 2009; Welker, 2010) have been carried out worldwide to investigate dictionary users' reference needs and reference skills and examine the role of dictionary use in language pedagogy (Chen, Yuzhen, 2012). Meanwhile, Chinese scholars (Wu Jianping, 2001; Luo Siming, 2005; He Jianing, 2008; Wei Xiangqing, 2009; Xu Hai, 2009; Zhang Yihua, 2015) have proposed feasible suggestions to guide Chinese EFL learners to make the best use of dictionary, especially learner's dictionary. British lexicographers Hartmann and James (1998) defined learner's dictionary as "a pedagogical dictionary aimed primarily at non-native learners of a language. The degree to which dictionaries have been integrated into the learning process varies from culture to culture…" The core design features of learner's dictionary and the pedagogical assumptions which underlie it are demanded to be aligned with dictionary users' needs. However, the attempt to apply the research findings of dictionary use studies to EFL learning and teaching has been a compelling challenge. These exactly learner-targeted dictionaries haven't received attention from teachers and advanced EFL learners as much as lexicographers expected. (Wei Xiangqing, 2016) With focus on learner's dictionary use guidance, the present study endeavors to explore whether guidance on dictionary use can be regarded as one of the influential and effective strategies to motivate EFL learners to improve their writing through online autonomous self-correction. And if so, in what ways a learner's dictionary works in doing this?

2 Literature Review

Being an integral part of EFL teaching, feedback is generally recognized as an effective way to help students perform well in writing. Feedback is defined as an input from readers to writers, and the purpose of it is to give useful suggestions for correction. (Cai Jigang, 2011). The research on feedback started in 1950s and then foreign and Chinese scholars conducted a large number of systematic studies on peer review (Zamel, 1985; Keh, 1990; Mangelsdorf, 1992; Nelson, 1993; Jiang Yuhong, 2005; Yang Miao, 2006; Mo Junhua, 2007; Yu Shulin, 2013). They explored the different effects of teacher feedback and peer feedback on college students' writing, and investigated the reasons underlying those differences. The results indicated that peer feedback can be used as a useful supplement to teacher feedback in EFL writing classroom since teacher feedback is considered more authoritative while peer feedback is more effective in reducing students' anxiety and significantly improving their learning autonomy. Furthermore, some scholars (Xu Yueting & Liujun, 2010) conducted experiments to analyze peers' and teachers' specific differences in comment making and found that students could accept the feedback from their teacher and peers equally.

Thanks to the speedy development of information and modern educational technology, automated scoring systems in foreign countries have been developed, including PEG (Project Essay Grade), Intelligent Essay and Electronic Essay Rater (E-rater) (Liang Maocheng, 2007). With the powerful influence of the systems, Chinese technologists and educators have developed Chinese EFL learner-targeted automated scoring system: Juku Correcting Network created by Beijing word Network Technology Co., Ltd and

"i-write" developed by Foreign Language Teaching and Research Press. Soon an increasingly number of scholars (Cai Jigang, 2011; Wang Ying & Li Zhenyang, 2012; Zhou Yishu, 2013; Yang Xiaoqiong & Dai Yuncai, 2015; Wang Zhe & Zhang Yue, 2015) have shifted their attention to feedback based on automated essay scoring system. They compared online feedback with traditional types of feedback, investigated merits and demerits of the feedback given by the automated system, and especially explored the influence brought by the system on EFL writing. The results revealed that "Juku Correcting Network, the automated essay scoring system, can highlight appropriate expressions enlarge knowledge of synonyms and distinguish confusing words but it cannot accurately identify errors and provide good suggestions all the time"(Zhang Li & Sheng Yue, 2015). The results also demonstrated that the online automated feedback can effectively promote students' autonomous learning and enhance their writing proficiency. It has been proved that "self-correction based on the system can significantly increase the final scores and quality of essays although there is no correlation between number of self-correction and increase of essay score" (Hu Xuewen, 2015). While the body of research has enriched our knowledge about automated feedback, little research has addressed the specific strategies EFL learners used after having received online feedback. The present research intends to explore whether guidance on dictionary use can be used as a strategy to improve the students' performance on essay self-correction. It tries to integrate lexicographical results into EFL learning and teaching.

3 Research Methodology

3.1 Research questions

The experiment is designed to explore whether guidance on dictionary use can play a significant role in online essay self-correction. The specific research questions are as follows: 1) Can students having received instruction on dictionary use get higher score through self-correcting than those who have not? 2) Does the instruction make any differences in students' improvement in writing? 3) If so, in what ways the instruction motivates students to make self-correction effectively?

3.2 Participants

The study is conducted in two EFL classes selected from a university of science and technology in central Hubei, China. Group A, consisting of 30 students, is the experiment group while group B, including 32 students, is the control group. All of them are first year science and engineering graduates and they are taught by the same English teacher. In addition, they have a similar language background: 1) Chinese is their mother tongue; 2) They have been learning English for 8-12 years, 70% of them have passed *College English Test* Band 6, a national English as a foreign language test in China.

3.3 Instruments

3.3.1 Juku correcting network

The entire experiment is based on Juku Correcting Network, an automated essay scoring System. The system is designed to improve users' writing through online feedback：automated feedback, online teacher feedback and online peer feedback. The present study only adopts automated feedback. When users submit their first drafts to the system, the essays are graded immediately and suggestions for correction are given in four aspects, including task response, coherence and cohesion, vocabulary choice, and sentence building. Users get the feedback and evaluate those suggestions and decided whether they are helpful for essay improvement. Users are allowed to make correction as much as they need before the deadline. Each edit is saved in the system which is not only for users to observe their self-correcting process, but also for researchers to monitor users' behaviors online. Researchers are able to compare different versions of an essay. Newly added words are highlighted in yellow and the deleted words are crossed out in grey.

3.3.2 Survey

A semi-open after-writing survey on learning strategy is carried out. 62 participants are required to fill out a questionnaire with 10 questions which emphasizes two aspects: 1) What do you choose to regard as an effective learning strategy when you are stuck with an encoding task? 2) Which parts in the learner's dictionary work best for your essay self-correction?

3.4 Dictionary use guidance

The guidance targeted on how to obtain encoding information from dictionary. 30 students in group A (experiment class) have received instruction on dictionary use in two 45-minute regular classes. The researcher guided them to make appropriate dictionary choice to meet their own consultation needs and to understand what is the encoding information in learner's dictionaries and how to use them in actual learning activities. In addition to those, examples of influential and authoritative learner's dictionaries

on writing and collocations have been introduced. These subjects were expected to get familiar with reference skills through a series of carefully designed activities. Compared with group A (experiment class), group B (control class) has not received any instruction on dictionary use.

3.5 Data gathering

The participants have been required to complete four tasks, involving nice teachers or tough teachers, cosmetic surgery, environment and language purification. Each task took two weeks so that participants could complete the whole experimental cycle in approximately 8 weeks. Given the learners in group A (experiment class) may need longer time to practice dictionary reference skills through self-correcting, the data extracted from the last task was applied for the research. Students were asked to write an argumentative essay about the following topic: "Some Chinese scholars suggest that the Chinese language should be purified because it is being seriously contaminated. Do you agree or disagree?" They were supposed to write at least 200 words to give reasons and use relevant examples from their own knowledge or experience within 30 minutes. Within two weeks, all of the students in the two groups submitted their frequently self-corrected essays. Based on the statistics provided by the system, users' strategies for essay improvement could be examined by SPSS17.0.

4 Results and Discussion

4.1 Guidance on dictionary use and score increase

Table 1 Independent Samples -T test (First Score and Last Score)

Group	First Score					Last Score			
	N	Mean	Std. Deviation	t	Sig.	Mean	Std. Deviation	t	Sig.
A	30	79.5333	4.28094	1.565	0.123	86.4333	3.04770	-2.826	0.006
B	32	81.1563	3.88636			84.4375	2.50080		

Independent Samples- T test was conducted to compare the scores for the first editions of the essay submitted by group A (experiment group) and group B (control group). Table 1 shows that there was no statistical difference between the initial scores of the two classes (P=0.123 >0 .05), indicating two groups performed in the similar way before they made any self-correction on their essays.

Another Independent Samples- T test was performed to make a comparison between the last editions of the essay revised by group A and group B. As indicated in Table 1, the mean difference between the two groups reached the significance level (P=0.006 < 0.05). Obviously, group A outperformed significantly group B which could suggest instruction on dictionary use really worked in helping learners improve writing scores by a few points.

4.2 Guidance on dictionary use, times of correction and score increase scale

Table 2 Independent Samples -T test (Times of Correction and Increase Scale)

Group	Times of Correction					Increase Scale			
	N	Mean	Std. Deviation	t	Sig.	Mean	Std. Deviation	t	Sig.
A	30	19.1000	15.65215	-4.306	.000	6.8667	3.52070	-4.454	0.000
B	32	6.2813	4.71945			3.2813	2.79670		

Times of correction and score increase scale also went through Independent Samples- T test. As can be seen in Table 2, there was a significant difference between the two groups when it came to how many times they corrected and submitted the essays (P=0.000 <0 .05). This p value was not meaningful in the research field, but it was encouraging in pedagogy. In terms of score increase scale, group A fared better than group B. (P=0.000 <0 .05). It seems that group A attempted harder to revise their essays in various ways.

4.3 Learning strategy choice
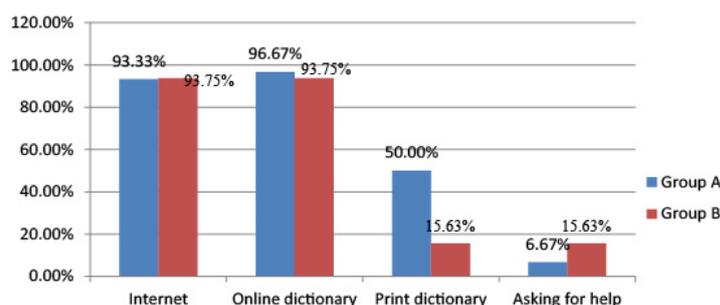
Figure 1   What You Turn to for Help in Essay Self-correction

Figure 1 shows different learning strategies group A (experiment group) and group B (control group) chose when they were struggling in seeking a better way to correct their essays. It is no surprising that both of the groups set internet and online dictionary as their priorities since they had quick and reliable access to them. Interestingly, compared with group B, half of group A chose print dictionary as a strategy. Asking for help was the last solution for them, but in light of their academic background, it is understandable that students who are more proficient in English are less likely to ask for suggestions from others.
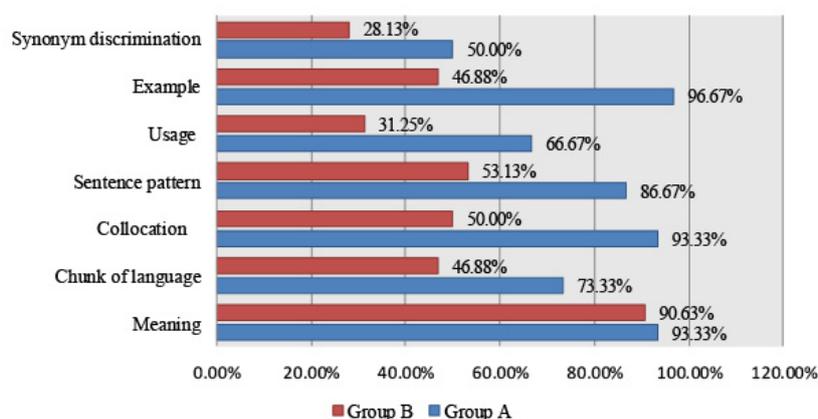
Figure 2   What Designs of Dictionary Work well for Your Essay Self-correction

As presented in Figure 2, the two groups reached an agreement on the vital and basic role of meaning in learner's dictionary, with 93.33% and 90.63% respectively. Except meaning, it is startling to see that example, collocation and sentence patterns were considered the most useful information for both of the groups consistently. Synonym discrimination and usage attracted relatively less attention from the participants.

From figure 1 and figure 2, it can be seen obviously that the students of group A (experiment group) were influenced by the instructor and the guidance on dictionary use. Compared with group B, it appears that they start to view the microstructure and macrostructure of learner's dictionary from a totally new perspective and endeavor to use the knowledge and reference skills gotten from the guidance to improve their essay self-correction.

5 Conclusions

The empirical research was designed to make clear the relationship between guidance on dictionary use and online essay self-correction. The statistical analysis of 62 online essays and questionnaires demonstrated that: 1) students who have received instruction on dictionary use could get higher score through self-correcting than those who have not; 2) the guidance also motivated students to consult dictionary more frequently and correct their essays more appropriately, thus improving their autonomous learning ability; 3) the guidance on dictionary use directed students' lookup behavior, making them aware of those various ways in which they could possibly obtain useful information from dictionaries. In short, guidance on dictionary use can play a great role in self-correction improvement. Given the limited size of the subjects, there is still room for improvement in designing the whole

research. Furthermore, the instruction on dictionary use needs to be optimized in terms of content, method and time length. The present study has implications for integrating lexicographical achievements into EFL teaching and learning. And foreign language teachers are encouraged to think outside the box and develop creative solutions.

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The Actuality and Countermeasure in the College Education Management under New Situation

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Abstract: After the Ministry of Education introduce "Revitalizational Action plan facing 21 at century" in 1999.The tech and university began to increase the recruits .We have made great progress in high education, achieved great achievements in the development of education ,but our college education management could hardly adjust to the new situation, and caused a series of problem .This Article starts with the present college education, synthesize every kinds of factors, analyses the college education management problems ,and come up with specific suggestions.

Key words: New situation; College education management; Countermeasure

1 Introduction

The Ministry of Education carried out the plan introduced "Revitalizational Action plan facing 21 st century", which was a spring thunder in the history of college education, and began the transitions from elite education to the public education. With the plan carried out, the number of recruits keeps increasing year by year. According to the dates, the number of recruits was 1,080,000,the acceptance rate was 34%。 Chen weixiu (2015) put forward that with the rapid development of society and improvement of the quality of education, China's higher education has entered the popular stage. The traditional management mode has been unable to adapt to the needs of high-quality personnel training. Under such a situation, it is necessary to carry on the reform and innovation of higher education management. This paper describes the main problems in the management of colleges and universities and puts forward the corresponding measures. After implementing college policy up to 2011, the number of recruits reaches to 6,850,000, the acceptance rate was 75%, The is the importance achievement of our country, achieving the leap of the higher education stages, playing a positive role in the national overall quality and the development of education. But as the enrollment expansion of colleges, the students in colleges increase faster, bring some new problems for the college education management. Facing to the new situation, college education management should be based on the practice, innovate the education management solution, solve the emerging problems in the work, improve the quality of high education study, and promote the normal development of college education.

2 University Education Management Problem Analysis under the New Situation

With the development of times, our college education situation changes continually. After entering 21 century, it faces more complex education situation. With the college entering new development period. Some education management problems emerge and become the first for college to deal with.

2.1 Lacking faculty and hardly meet the development of modern education needs

Because of the increasing enrollment. More faulty should be devoted for meeting the needs of education development. Before carrying out the plan, the ability to enroll students of school is strong, have big education space. At that time a teacher only instructs seven students, by 2012, the number of teachers has been increasing a lot, but couldn't accord with students on average, faculties' lack has blocked the development of college education (Wang Qun, 2005). Besides, With the development of science and technology, education method has been advancing and most of colleges have made advantages of modernized education method. The development also provides college education with modernized idea.AS the concept of education practitioners, the teachers' personal qualities have an effect on teaching. Now many colleges lack good teacher assessment and incentive mechanism, many teachers follow tradition, keeping the old education and teaching method which can't adjust to the needs of modernized education development. That assign contradiction causes the lack of college faculty and hardly adjust to modernized education, becoming an important factor to restrict development of it.

2.2 Lacking scientific education management mechanism

Most of colleges keep following traditional management mechanism, the effect of traditional economical mechanism on school, only follow the nation's indicting to organize teaching, emerge serious administrative tendency, regard education management as to teacher and students' management, and old content and

management method. This management mechanism ignore the appearance of school ,not fully effecting teachers, professions and other educators, causing work lag and inefficiency .Otherwise, single management method, regardless of the specific circumstances, not combined with the concrete practice, lack system and flexibility which blocks the college management work(Wang Zhiqiang, 2009). Now, concentrating on systematic and standardized problems exist in our colleges education management, single management, old method and can't meet the needs of high education management.

Administration tendency of management cause mechanical management, lack communication, democracy management flexibility is insufficient, can't solve the complex problem facing now in the university education management and some specific situation. Secondly, education management lacks science. With the constant improvement of the school-running system, the functions of the management of college education is toward service and guidance, which requires colleges is equipped with a compact high education team, enhance the consciousness of the management, get out of the misunderstanding of management, and achieve the highest goal of "management is in order for not managing (Sheng Jian, 2013). However, one of the problem existing in the current university is a lack of scientific management, many management systems become a mere formality, not plying its proper role. There for, colleges in our country should learn advanced education management experiences from some foreign colleges, guided by the scientific outlook on the development, combined with the actual domestic and school and walking the road of scientific education management.

2.3 Undefined talents cultivation plan

College education should be based on talents cultivation, which is the final reflection for the college value. If not provided with the useful talents, college education could be defined failing education. Now, the problem still exists in college education. With the blind increasing in recruits, the number of people who are educated does increase. But the qualities of education don't accord with the growth. Because of the change of University management model, college education appears to be hit or miss in the freedom mechanism, confused about the talents cultivation. Many universities still follow 90 centuries' teaching subject, or the foreign, independent on undergraduate education, and not establish specific aim. Only paying attention to the students' practical applied ability. In other words, the inadequacy of cultivating students' talents. After entering the society, most of students hardly combine knowledge with work especially to resume learning. Colleges pay attention to cultivate learning talents so that they ignore to cultivate the actual ability after talents enter society. Under the new situation, university needs to concentrate on improving student's comprehensive quality, strengthening students' independent ability, and cultivating practical talents for society (Wang Yisheng, 2003).

2.4 Emerging problem of college graduates' employment.

With the improvement of the recruits and acceptance rate, the number of students increases rapidly which cause the college graduates face the severe problem .According to the dates the acceptance rate of graduates in 2009 is 35.6%，by2012,only 14%.The number of college graduates reaches up to several million annually. The phenomenon, graduates have difficulty looking for job, exist generally. The reason for it is that blind expansion on college education couldn't meet the needs of talents which is another problem that require to be solved in the higher education management work. A lot of Universities open new professions in order to attract new recruits, but these professions don't take market demands into consideration, especially some unpopular professions don't consider the market demands, blind expansion, upon coupled with not updating course content techniques, etc, leading to graduates being unemployed before employed. On the other hand, the number of graduates doesn't accord with job vacancy (JiaEna, 2009). The reason for the contradiction is numerous talents. Nevertheless, demands actually. Otherwise undergraduates expect too much of their employments and aren't willing to work on some physical labor, many company express, which also cause graduates' difficulty in employment (Yang Deguang ,2001) (as showed in Figure 1).
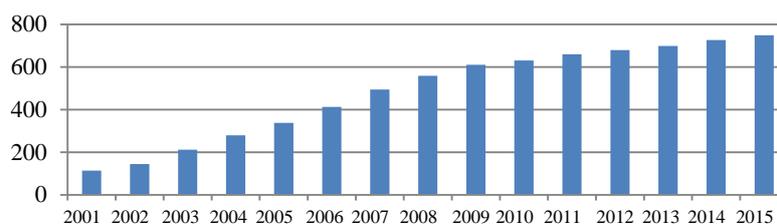
Figure 1   2015 - 2001 National College Graduates(ten thousand people)

3 Education in Our Colleges Management Countermeasure Analysis

To comprehensively promote the reform of higher education, provide high quality for the society, the education management mode needs to be changed radically and campaign real reform to the education management. In order to cultivate high quality talents, we should adapt to new situation, innovate the education management continually, and fully play a role in education management.

3.1 Transform education management idea

To deal with new present problem in higher education management, the college education management should be required to transform idea constantly, innovate management idea, put forward idea that will adapt to social changes. And ,the college education in our country needs to learn advanced education experiences and idea in a broad　platform, combine with the concrete practice, have creative thinking and implement innovation education in order to be in line with international standards and achieve internal education; The managers of college education should transform education management concepts , which means understanding the present situation, of which the most important thing is to have the service idea and consciousness. Serving people is the ultimate source of college management education and people has a positive position. Managers should set out from the era demand, give top priority to human factors, set up service concepts and consciousness, transform state controls and restrict on students to thinking actively about how to manage guide students and create conditions for students to realize their value.　Otherwise with internationalization of the college education, the managers also build company awareness. In the modern economic society, the development of college education and talents cultivation should be based on market-oriented, college education must according to the social demand for talents cultivation, master the demand change and according to the demand to adjust to the direction of personal training, to meet the social meets. On the other hand, the development of colleges can't be without adequate financial support. In the market economy environment, the investment subject will also develop from single to diversity. The development of colleges gets rid of the pattern where s single rely on state founding in the past, taking the marketability path. To establish a perfect found chain, from a variety of channels to raise funds and combine the development of colleges with market and society, facing to market for survival and future for development. So managers in colleges are not only educators, but also entrepreneurs having a strong sense of market and a keen vision and drive playing a key role in commanding the overall situation so as to make the colleges play a bigger role. This aspect has reflected in many colleges, such as many colleges to set up business schools now.

Facing to successful people, EMBA programmers attracting a large number of successful business people to study has obtained the good economic benefits of which the most famous is the Yangtze River business school (GuoWujun, 2007).

3.2 Promote the reform in teaching management institution

Promoting the reform in teaching management institution is the necessary choose for managers and college leader to complete education management work under the new situation. For a long time, our college education management has been restrained by old system and idea, not keeping pace with the reform of university. Although colleges enroll recruits continually and loose the admission age constraint, there is no marked improvement and innovation in education management work directly causing the wrong foot in it and full of contradiction. It must conform to the trend of The Times and constantly promote reform in teaching management institution in order to make a great progress on college education under the new situation. First, strongly carrying out credit system and creating the environment that is benefit for the improvement of students' study. School formulates course credits for students, student can select course that they like according to credit, in addition also can be according to their interest, habits and personal will, taking their professional course. This can not only improve the students' passion, give students independent development, also can save the students' learning time and costs Two, Promoting reform in the quality of education assessment system. Original education can hardly adjust to the needs of college education teaching management. Only paying attention to the performance of teachers' teaching plan, ignoring role among students, causing the quality of college teachers' teaching evaluation unreasonable, and some teachers' teaching achievement being ignored. So all-round education quality evaluation system should be established. It includes the education development level evaluation, supervision and evaluation management assessment. Promoting reform in education quality system and setting up comprehensive target system is helpful to form a comprehensive management, teaching and Incentive study mechanism.

3.3 Establish the status of students

College education aims to provide society with talents, comprehensively promote the level of

people educated and the quality. Because students are the subject status to accept education, college education ought to focus on students. But the severe administration phenomenon still exists in many colleges, they give priority to their own interests, not considering student' interests, making college education put the incident before the fundamental, hardly achieving favorable effects. To fundamentally change the situation .it requires to give priority to students. Schools' work ought to focus on solving students' present problem among learning and life, giving priority to education management. Setting up the status of students, basically is that colleges establish the concept of people-oriented, fully playing the positive role of human in the education teaching management. Giving priority to students is the necessary people-oriented outlook of scientific development, is helpful for colleges to solve students' present problem in the education work, promoting teaching quality, strengthen teaching achievement and promote the all-round development of all aspects of school work. On the other hand, giving the priority to students, or cultivating students' self-management awareness, improving students' self-discipline and self-management, cultivating students' responsibility consciousness, which is the necessary choice for students to develop roundly.

4 Conclusions

Problems existing in current university education management and specific measures are definitely not limited to it. With the development of The Times and the changes of education concept, varieties of new problems emerge in the college education management. In order to solve the present problems and the problems that will appear, administrator and college leaders need to adjust to The Times continually, combining with practical situation and absorb advanced management experiences, exploring a way to accord with the actual management of colleges. Only in this way, the progress and development of college education will be better promoted.

Acknowledgement

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A Research on the Development Mode of Campus Culture in Colleges on the Basis of Synergetic Theory

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Abstract： Cultural inheritance and innovation serves as an important function of colleges in the new era. However, incoordination remains in the development of campus culture in colleges. By utilizing the viewpoint of synergetic theory, the paper reveals the feasibility of introducing the development of campus culture in colleges, forms internal mechanism of synergy from such aspects as key elements, layer of structure, evolutionary process of self-organization and framework of mode, and discovers order parameter, evolutionary impetus as well as phenomena of competition and synergy that facilitate the evolution of systematic, so as to promote the contact motion between subjects and objects in the system for development of campus culture in colleges, form synergetic effect, and help achieve the maximization of effect of development of campus culture in colleges.
Key words: Development of campus culture; System; Synergetic theory; Mode

1 Introduction

Culture is something through which one can pursue and enjoy the spiritual freedom by developing one's own "survival will" and "freedom will" to the largest extent (He Mingsheng, 2014). The history of social development indicates that culture is the achievement of civilization produced by mankind's implementation of practices of social activities and the integrated manifestation of human survival. With uniqueness and innovativeness, campus culture in colleges presents as the peculiar achievement of civilization produced by the college teachers and students in the process of talents cultivation. Along with the reform of cultural system, it becomes an important question of cultural reform and innovation for colleges, the carrier of inheritance of fine culture and the important source of ideological and cultural innovation, how to assume the functions of cultural inheritance and innovation in the new era. The synergetic theory has revealed how the open system in imbalance, under the circumstance of exchanging material or energy with the outside world, presents its orderly temporal, spatial and functional structure in a spontaneous way by its own internal synergy. Therefore, from the perspective of synergetic theory, the paper, in accordance with the views of systematic thought in the development of campus culture in colleges, dissects the problems existing in the development of campus culture in colleges, reveals the mechanism of self-organization evolution in the system of development of campus culture in colleges, and attempts to build the development mode of campus culture in colleges from the perspective of synergetic theory, in order to explore the internal relation between the subjects of the development of campus culture in colleges and enhance the efficiency of the development of campus culture in colleges.

2 The Status Quo of Development of Campus Culture in Colleges from the Perspective of Synergetic Theory

For the past few years, as the function of student-cultivation of higher education institutions has been strengthening, increasing colleges and universities began to realize the importance of synergetic innovation in the new situation. It has become an urgent issue for many higher education institutions to address how they assemble their own resources and abilities to achieve the function of talent cultivation and society-oriented service. Campus culture influences the all-round development, including morality, intelligence and physique, of the students in colleges in an imperceptible way. However, from the perspective of synergy, disorder exists in the system of development of campus culture in colleges, the subjects of participation are failed to give play to synergetic effect, and the in coordination remains.

1) The development of internet culture has greatly impacted on the development of traditional culture. The development of campus culture in colleges is based on the teaching and managing activities of schools and is born in higher education institutions, a specific growing circumstance. From the perspective of synergy, on the one hand, spatially, the campus culture of colleges develops by focusing on the space of "higher education institution". On the other hand, temporally, the campus culture of colleges is unique values developed by a college through a certain historical period and a series of historical incidents. From the perspective of self-organization evolution, the campus culture of colleges

continuously produces the driving force and resistance which help accelerate the evolution of system in the process of evolution, so that enable the system of campus culture to exchange its energy with its counterpart in the outside world and to selectively absorb or repel the impacts from the culture of the outside world, which helps the campus culture in colleges to form a relatively closed system of development in a traditional pattern. Meanwhile, the development of internet technology influences the development of campus culture in technology and methods. Such platforms as mobile phone, micro-blog, Wechat, QQ group and website forum have become the platforms to transmit the campus culture in colleges. Without the traditional restrictions of space and time, college students obtain an access to know dynamic situation of cultural development by using the internet, implement activities of internet culture and club activities for the purposes of meeting the demands of self-worth and society, all of which exerts a great impact on the progress of traditional system for cultural development. These transformations illustrate that it is a big challenge for campus culture of colleges how to realize the synergy, in the system for the development of campus culture of colleges, an open system for cultural development which constantly exchanges information with the outside world, between the "offline" traditional culture and the "online" internet culture in campus.

2) The coexistence of diversified forms of culture results in the decline of educational function of the system. Currently, along with the development of globalization, different cultures and nationalities are fused in a highly intensive way. Various cultures can be seen in the system for development of campus culture in colleges in the same space time, which enables diversified cultures to be transmitted among colleges, which embodies in the coexistence of traditional Chinese culture and western culture, in the company of mainstream culture and sub-culture, and in the coexistence of mass culture and elite culture. The fusion and competition of diversified cultures promote the formation of particularly cultural atmosphere in colleges, which exerts great influence on the view of life and values of the teachers and students in colleges. It is easy for some students to harbor extreme emotions and thoughts due to the unclear understanding of reality, and to be devoid of cultural identity in the process of their realization of individual value by means of so various accesses as clubs and internet after they get rid of traditional restraints of time space, so that they may fall into the confusion of morality and values, which is detrimental to the sound development of college students. At the same time, the socialist culture with Chinese characteristics guided by the Marxism remains the dominant role in campus culture. It is a significant test for current development of campus culture how to uphold the dominant role of socialist culture with Chinese characteristics guided by the Marxism and enhance the educational function of the system for development of campus culture in colleges in the situation of coexistence of diversified cultures

3) The self-organization evolution of the system for development of campus culture in colleges is facing with various challenges.

The evolution and development of self-organization of the system for development of campus culture in colleges rely on the synthetic effect produced by the subjects in the system. Owing to different philosophies of schooling and courses of development, diversified sediment was formed in the system for development of campus culture in colleges. Such disparities as value guidance of campus culture, distribution of research resources, division of disciplines, characteristics of talent cultivation, practices of specialties and students' activities among universities and colleges make it possible that disparities exist among the subsystems for cultural development of colleges. Hence, resistance exists in the internal coordination of the system for development of campus culture. In the meanwhile, under the influences of "diversified cultures" and "internet culture", problems including out-of-control of behavior, moral disorder and crisis of psychological health emerge among the young students in campus due to the introduction of part of unhealthy culture and thoughts, which stores the potential conflicts in the system for development of campus culture. The production of various conflicts is bound to push forward the mutual "competition" or "synergy" among the subjects in the system for campus culture and the incessant evolution of self-organization in the system for campus culture in colleges. It becomes a major challenge for the development of campus culture in colleges how to maintain the orderly and steady development for the system of self-organization evolution and to enable the self-organization evolution of the system for campus culture in colleges to hold the predominating direction of advanced socialist culture guided by the Marxism.

3 The Internal Mechanism of Development Mode of Campus Culture in Colleges on the Basis of Synergetic Theory

3.1 The key elements of synergy of development of campus culture in colleges

From the perspective of synergetic theory, the development mode of campus culture in colleges is essentially a cross-systematic management system for development of campus culture, whose elements of management constitute the framework of development mode of campus culture in colleges, and whose operating mechanism is the interactively operating process of management elements within the framework of development mode of campus culture in colleges. From the perspective of knowledge management, culture is the new blocks of knowledge formed by a mass of knowledge blocks through gathering and innovation. The elements of synergy can be divided into four categories, namely, subject, object, process and circumstance (Zhang Xifeng, 2012). The subjects of development of campus culture are educators and educational organizations. The objects are objects of management in the process of development of campus culture, such as educatees, experimental facilities, capitals, knowledge and other resources. The synergetic process of development of campus culture is the interactive process among the participants of development of campus culture in system, resources and actions. And the circumstances of development of campus culture include internal and external situations in which the organizations of development of campus culture exist.

3.2 The synergetic structure of development of campus culture in colleges

From the perspective of synergetic theory, the synergetic structure of development mode of campus culture in colleges lays more emphasis on the interactive relations between different subjects and objects. The development of high technology, whose carrier is the information communication technology, facilitates the birth of network organizations which, as a new organization pattern to suit knowledge-oriented society, information economy and organizational innovation, makes it possible to realize the synergetic development among key elements. The development mode of campus culture on the basis of synergetic theory attaches importance to the building of strategic relation of network organization, interactive relation of activities and actions, and relation of resources sharing between different subjects. Hence, the corresponding operating mechanism needs to be formed between each layer of relations to promote the integral development of system for development of campus culture. Therefore, having built the framework of synergetic structure for the development mode of campus culture in colleges from such three layers as strategy, business and implementation, the paper realizes the synergy of "human-human" and "human-mechanism" in the process of campus culture of colleges by taking network organization as the major form of structure, so as to obtain the synergetic structure of development of campus culture in colleges as shown in the Figure 1.
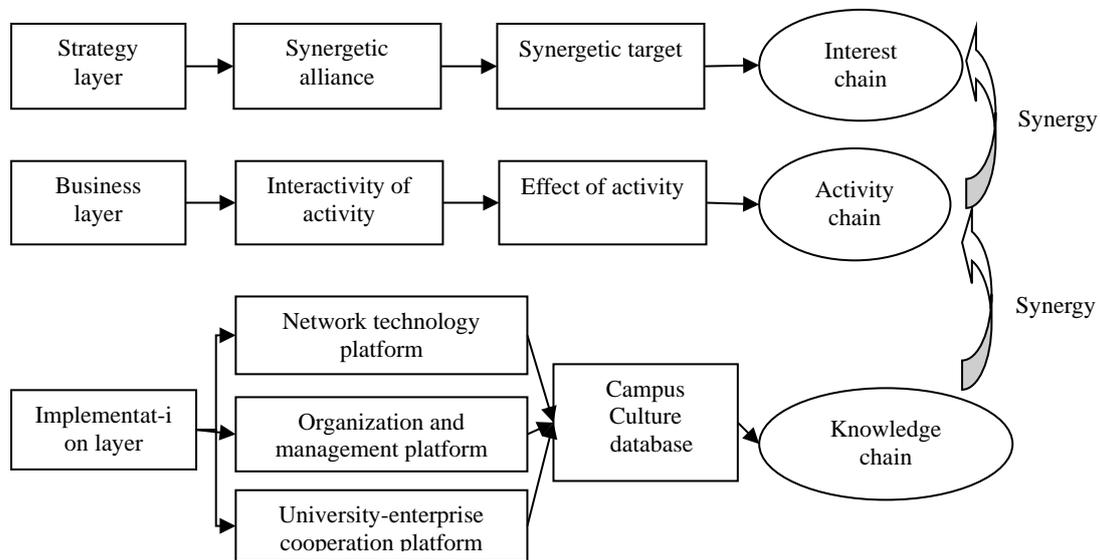
Figure 1   The Layers of Synergetic Structure of Campus Culture Development in College

As illustrated in the Figure 1, the framework of development of campus culture in colleges is a universally hierarchical structure. The synergetic structure of development of campus culture in colleges includes three layers of synergy, namely, strategy synergy, business synergy and implementation synergy. The subjects of development of campus culture in colleges allay with each other as an alliance of

development of campus culture in colleges in the interest of common good, and then set specific target and itinerary of development of campus culture in accordance with overall strategic objective. Since knowledge is able to drive forward the practice of cultural activities, the knowledge innovation of culture pool of colleges is equipped with the capability to promote the activities of cultural development to achieve effect so as to realize synergetic target. At the macro level, the culture pool, performing as the expansion or extension of knowledge chain, advances the production of activity chain of campus culture and, progressively, facilitates the development of interest chain of involved subjects, and finally promotes the development of network organizations for development of campus culture in colleges.

3.3 The process of self-organization evolution of development of campus culture in colleges

The system for development of campus culture in colleges consists of such subsystems as system of campus material culture, system of campus regulatory culture and system of campus spiritual culture. The movement of self-organization in the development of campus culture mainly exists in the integration of various resources in the system for development of campus culture in colleges. It involves in the system for movement of self-organization through order parameters including university spirit and philosophy of education, activates the flow of interior information in the development of campus culture by using media vehicles such as resources sharing, education transmission, innovation practice and cultural experience. By multi-layer communicative coordination, it creates the impetus for self-organization evolution of system and overcomes the resistance of self-organization evolution in order to enable the system of development of campus culture to give full play to its synergetic effect.

4 The Development Mode of Campus Culture in Colleges on the Basis of Synergetic Theory

Based on the above, the paper, under the guidance of the synergetic theory as well as the training program and target of innovation-oriented talent cultivation for higher education institutions, sums up the highly theoretical and abstract system for development of campus culture in colleges, which can be seen in Figure 2. The subjects and objects of synergetic development of campus culture are various kinds of "people" in campus culture. The content of synergy is the system of media dissemination which consists of four factors as a whole including resources sharing, education transmission, innovation practice and cultural experience. The process of synergetic is the process constituted by three elements as a whole including resources, system and actions. Through the self-organization evolution of the system for development of campus culture, the synergetic effect of system for development of campus culture in colleges is released in order to guide college students' in such respects as behavior, concept, norms and values in a correct way, strengthen students' capability of combining theory with practice, facilitate the matching between talents cultivation and social demands, promote cultural innovation and inheritance in colleges, advance the implementation of student-cultivation program of colleges, enhance the ability of students in innovation practice, facilitate the matching between talents cultivation and social demands, and fulfill the target of talent cultivation of colleges.

As it is shown in Figure 2, in order to further optimize the development mode of campus culture in colleges, strategy has been formulated under the guidance of training objective and program for innovation-oriented talents in colleges as well as synergetic theory as follows:

1) We need to carry out the synergetic philosophy of development of campus culture and strengthen the impetus of system for development of campus culture in colleges.

In accordance with the force condition of self-organization movement of the system for development of campus culture in colleges, in order to promote the exchange between the system and the outside world in material, information and energy, we need to, in the process of development of campus culture in colleges, insist on implementing synergetic philosophy, break up primitive equilibrium state, incessantly create the platforms for implementing resource sharing, information exchange and interactive communication with the outside world, diminish the frictions in the development of campus culture in colleges, strengthen the systematic impetus which is needed by the evolution of the system for development of campus culture in colleges. First, the activities of resources sharing should be implemented. We need to advance associated activity of talent cultivation on the aspects including curriculum and courseware, online teaching resources, resources of teaching staff, university-enterprise joint cultivation, and international exchange and cooperation, promote resources sharing both at home and abroad as well as at school and outside school, strengthen the coordination in resource sharing between the subjects and objects in the system for development of campus culture in colleges. Second, communicative platform of campus culture should be built. We need to, by organizing

activities of scientific and technological innovation, activities of cultural experience, and lectures of culture, explore common factors of cultural values, strengthen the cohesion of dominant values, reduce the friction produced by island effect, and facilitate the general driving force of development of campus culture in colleges.
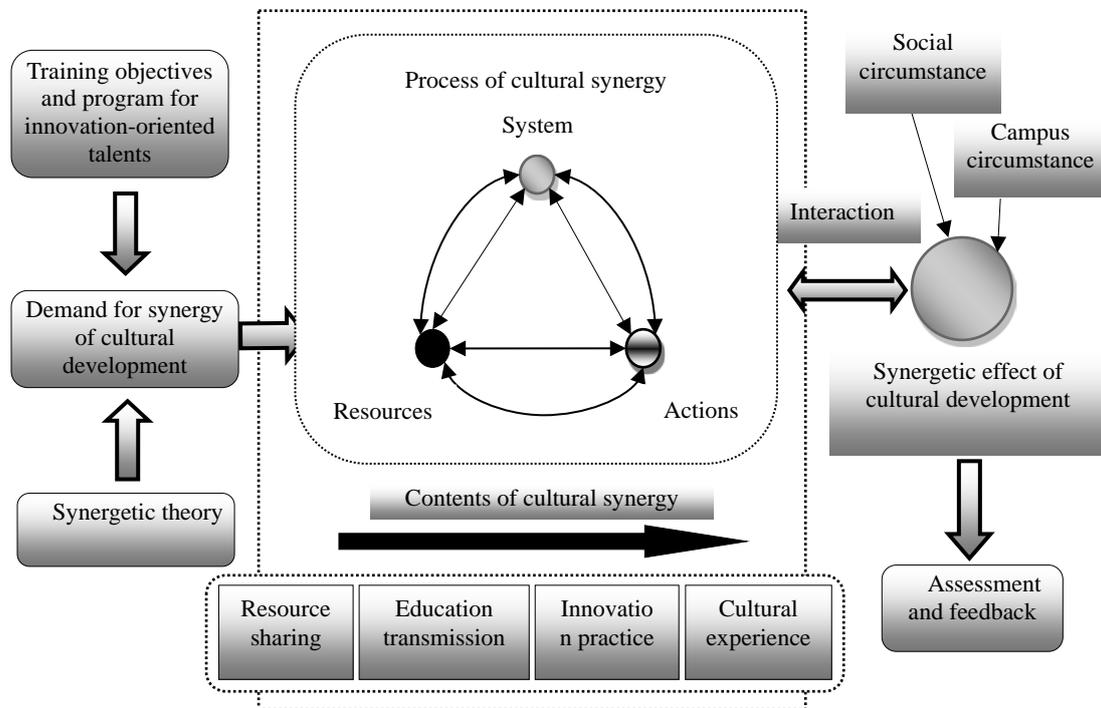
Figure 2   The Framework of Development Mode of Automobile Culture in College Campus on the Basis of Synergetic Theory

2) We need to make full advantage of the phenomena of competition and synergy in the synergetic so as to facilitate the self-organization evolution of the system for development of campus culture. In line with the result of self-organization movement of development of campus culture in colleges, the final state of self-organization evolution system presents as two phenomena, namely, competition and synergy. Competition makes the evolution of system tend to be imbalanced, while synergy among subsystems helps enhance their momentum and hold advantage. Therefore, in the process of development of campus culture in colleges, competition and synergy should be take full advantage. First, we need to encourage the relevant departments in the system of development of campus culture in colleges and the various kinds of students to implement benign competitions, reform the systems of quality assurance and assessment for talents cultivation in colleges, adopt the incentive mechanism and the measure of management by objectives to mobilize the subjective initiative of subjects and objects participating in the development of campus culture. Second, we need to advance the synergetic innovation on the aspects of resources, system and actions. The synergetic innovation of resources requires the relevant departments in colleges to break up the boundary between them and students, strengthen the integration of resources of teaching and practice, intensify the coordination of resources both at schools and outside schools, reinforce the exchange and cooperation in resources between China and other country, and provide resource pool for the development of campus culture. The synergetic innovation of system demands of the building of system of synergetic innovation for education and culture transmission, the formulation of measures and detailed rules of implementation, the advance of implementation of talent cultivation policies as well as relevant policies targeting education and culture transmission. The synergetic innovation of actions requests to bring into full play the characteristics and advantages of colleges to jointly build the base of social practice and scientific research, achieve the practice of university-enterprise interaction, and cultivate students' healthy value orientation.

3) We need to release the order parameters of development of campus culture and drive the operation of development mode of campus culture in colleges.

    In the development mode of campus culture in colleges, order parameters play a core role in the system of cultural development. The system of socialist core value, with high degree of stability, is the most essential state of development of campus culture in Chinese colleges. Therefore, in the practice of development of campus culture in colleges, we need to use the system of socialist core value as guidance to direct the activities of development of campus culture, optimize the top-level design of development of campus culture, pay attention to the guidance of public opinion, strengthen the radiant and driving roles of club activities, and cultivate students' awareness of innovation and concept of collectivism. All these will help drive the self-organization evolution of development mode of campus culture in colleges.

5 Conclusions

    The building of development mode of campus culture in colleges on the basis of synergetic theory, as a complex system project, implements the philosophy of development of campus culture by using synergetic theory. It also releases the order parameters of development of campus culture by taking full advantage of coexistence phenomenon of "competition" and "synergy" in the system for development of campus culture, which can effectively promote the interactive synergy among such aspects as information and resources sharing, education and culture transmission, technological innovation and practice, and cultural experience, so as to build a brand-new development mode of campus culture in colleges.

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Analysis of the Intention of Selecting University for Postgraduate Study and Its Influencing Factors- Illustrated by the Example of a University

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Abstract: This paper, by investigating into the condition of 4210 graduating students taking postgraduate entrance exams and acquiring exam-free admissions in a MOE-administered university, analyzes the intention of the graduating students to select a college or university for postgraduate study. Optimal-scale model is applied to the study and the paper analyzes the influence consisting of the soft power, the hard power and self-evaluation on selecting a college or university for students. The paper finds that while selecting a college or university for postgraduate study, the students attach importance to the strength of major, qualification of faculty, influence of a university at home, chances of going abroad for exchange, etc. Based on the findings, the paper proposes that colleges and universities attract quality student sources by fortifying condition construction, reforming postgraduate training pattern and improving awarding and subsidizing systems, etc.
Key words: Selecting a college or university for postgraduate study; Intention; Influencing factor

1 Introduction

In order to adapt to the new normal of internal development of postgraduate education, General Office of the Ministry of Education dispatched a series of documents to reform the postgraduate admission system, especially the exam-free admission system, among which "Notice on Further Reinforcing the Work of Recommending Excellent Undergraduate Student for Postgraduate Exam-Free Admission" and "Notice on Further Improving the Work of Postgraduate Exam-Free Admission for Graduating Students" exerted a significant influence on college and university selection for graduating students. Scholars at home and abroad made analyses on the influencing factors of college and university selection from various perspectives. Some studies point out that students' intention of selecting a college or university is affected by its social cognition (Zhang Xindan, 2012), the degree of its social recognition (Li Yuqiong, Cheng Ying, 2015), the extension of its social relations, the degree of its internationalization, and ranking (Ding Lan, Li Haizheng, 2010), etc. Some studies abroad find that the instruction for innovation (Hartzell, 2014) and salary expectations have a greater impact on students as they are choosing colleges or universities for postgraduate study.

This study, by selecting 4210 students from the university as objects for investigation, aims to analyze the factors such as the soft power, the hard power of the university, etc. that react upon the undergraduate students in school selection.

2 Research Design and Measurement Model

2.1 Research design

In questionnaire design, the graduating students took into account the soft power, the hard power of a college, and self-evaluation while selecting a college for postgraduate study. In terms of the soft power the major influencing factors comprise the treatment of postgraduates, the influence at home, chances of going abroad for exchange, school-enterprise cooperation mechanism, alumni resources, academic resources and social resources, etc. The influencing factors about the hard power include the level of platform (whether or not the college or university is a member of Project 985 or 211), strength of discipline, qualification of faculty, condition of laboratory, infrastructure (e.g. teaching building and accommodations), employment rate, etc. The students' self-evaluation is demonstrated from the aspects consisting of supervisor's academic influence, sense of belonging, preference to certain cities, learning environment and connection with assistive personnel (head teacher, counselor, etc.) The above three aspects contain both horizontal and vertical comparison, thus completely reflecting the influencing factors for students' selecting school.

2.2 Validity of measuring index system

The measuring index system for the graduating students is composed of level I, II, and III. Level I is the objects of measurement – the influencing factors of selecting a college for the fresh graduates; Level II includes the soft power, the hard power and self-evaluation; Level III is the specific measuring index decomposed from level II. The paper accumulated the total score of each measuring level in order to reflect the validity of measuring levels and specific index. The correlation test between the objects of measurement of Level I and each of the factors of Level II (soft power, hard power and self-evaluation) passed the test of significance, and the value of correlation intensity is higher than 0.80 (the results are 0.87, 0.91 and 0.82 respectively). The paper also verified the correlation between Level I and Level II, and the value of the test of significance is lower than 0.001, the correlation intensity higher than 0.70.

2.3 Collection of questionnaire data and evaluation of sample

The study distributed 4210 questionnaires in total and retrieved them all, among which 3601 questionnaires were completely finished. The statistical result was calculated by statistics analysis software Stata 12.0. In order to confirm the validity of the sample, the paper compared the actual data of the number of students taking postgraduate entrance exams and getting exam-free admission provided by School of Graduate of the university. Among 3601 copies of valid questionnaires, the number of students taking postgraduate entrance exams is 2449, and the number of those having acquired exam-free recommendation is 1152. The number of students who applied for their own university is 1338, and the number of those who applied for other colleges and universities is 1111. The number of students having acquired exam-free recommendation from their own university is 600, and the number of those having acquired exam-free recommendation from other colleges and universities is 552. The data is shown in Table 1.

Table 1   Data of Students Taking Postgraduate Entrance Exams and Getting Exam-Free Admissions

College Selection	Taking Postgraduate Entrance Exams			Getting Exam-Free Admissions		
	Selecting Their Own University	Selecting Other Colleges and Universities	Total		Other Colleges and Universities	Total
Sample Percentage	54.63%	45.37%	100%	52.08%	47.92%	100%
Actual Percentage	55.24%	44.76%	100%	50.38%	49.62%	100%

It is known from Table 1 that the percentage of the number of the students in the sample is basically in conformity with the actual data with the maximum deviation of 3.4%. The result is credible as the deviation is within a reasonable range.

3 Research Findings

3.1 Distribution of graduating students' intention of selecting a college or university

The data shows that in this university the number of students taking postgraduate entrance exam is 3027, and the number of those getting exam-free recommendation is 1183. The ratio of the former to the latter is 2.56:1. The number of students who applied their own university is 1672, and the number of those who applied for other colleges and universities is 1355. The ratio of the former to the latter is 1.23:1. The number of students acquiring exam-free admission from their own university is 596 and from other colleges and universities 587, and the ratio is 1.02:1. Table 2 shows the specific data.

Table 2   The Actual Data of the Number of Students Taking Postgraduate Entrance Exams and Getting Exam-Free Admission

	Taking Postgraduate Entrance Exams	Getting Exam-Free Admission	Total	Percentage
Students Who Chose Their Own University	1672	596	2268	53.87%
Students Who Chose Other Colleges and Universities	1355	587	1942	46.13%
Total	3027	1183	4210	100%
Percentage	71.90%	28.10%	100%	

Based on the data of the students applying for a college or university as their first choice, the percentages of students applying for colleges and universities of Project 985, Project 211 and other research institutes are 35.05%, 61.51% and 3.44% respectively. For the students of exam-free admission, the percentages are: 41.76%, 54.61% and 3.63%, as is shown in Table 3.

Table 3   Data of Colleges and Universities Which Students Applied for and Were Admitted

Levels	Colleges and Universities of Project 985	Colleges and Universities of Project 211	Others	Colleges and Universities of Project 985	Colleges and Universities of Project 211	Others
Number of Students	1061	1862	104	494	646	43
Percentage	35.05%	61.51%	3.44%	41.76%	54.61%	3.63%

Table 2 and Table 3 have shown that students inclined to move to colleges or universities of higher levels.

3.2 Analysis of influencing factor

3.2.1 Comparative analysis of the soft power, the hard power and self-evaluation

As is demonstrated by the result of the optimal scale model, the scores of three influencing factors, namely the hard power, the soft power and self-evaluation in terms of selecting other colleges and universities are: 78.6, 71.6 and 66.1. Therefore, the hard power of other colleges and universities is the most crucial factor for students to choose them and self-evaluation is nevertheless less influential.

The scores of three influencing factors, namely the hard power, the soft power and self-evaluation for students who selected their own university are: 69.6, 67.5 and 66.4. Therefore, the hard power is still the key factor but self-evaluation ranks the second.

By conducting a comparative analysis, it can be concluded that the students, while selecting a college or university for their postgraduate study, lay more emphasis on the strength of a college or university. The difference is made on the factor of self-evaluation, which exerts a great influence on the students who selected their own university for their postgraduate study.

3.2.2 Influential condition of university's hard power

Through adopting the optimal scaling model, this paper measures and calculates influences of concrete indexes of university's hard power on students faced with the fact that they have to choose to pursue their graduate study in their own universities where they finish undergraduate study or start their graduate study in other universities. Concrete statistics are shown in Table 4.

Table 4   Hard Power Indexes' Influences on Students' Intention of Choosing Universities

Influence of Hard Power on Students' Intention of Choosing other Universities to Start Graduate Study						
Specific Indexes	Very Little	Little	Normal	Large	Very Large	Mean Value	Influencing Factors Score
Strong Competence of Majors	0.91%	2.49%	17.15%	42.70%	36.74%	4.119	82.38
Faculty with Excellent Profession	1.09%	2.19%	18.55%	45.44%	32.73%	4.065	81.30
High-level Platform	3%	2.75%	16.16%	42.84%	35.25%	4.046	80.92
Better-equipped Laboratories	1.78%	4.11%	24.85%	41.84%	27.42%	3.890	77.80
High Employment Rate	2.01%	4.21%	24.94%	41.83%	27.01%	3.876	77.52
Fully Functional Infrastructure	4.28%	8.13%	33.76%	33.21%	20.61%	3.577	71.54

Influence of Hard Power on Students' Will of Choosing Their own Universities to Start Graduate Study						
Specific Indexes	Very Little	Little	Normal	Large	Very Large	Mean Value	Influencing Factors Score
High Employment Rate	2.69%	4.95%	31.24%	41.36%	19.76%	3.705	74.10
Faculty with Excellent Profession	2.32%	5.75%	36.11%	43.02%	12.81%	3.582	71.64
Strong Competence of Majors	4%	5.53%	36.46%	39.41%	14.59%	3.551	71.02
Better-equipped Laboratories	4.38%	9.08%	43.43%	33.77%	9.34%	3.346	66.92
Fully Functional Infrastructure	6.79%	10.8%	43.65%	30.44%	8.32%	3.227	64.54

As is shown in the result, among all the factors within hard power on students' will of choosing other universities, the following three factors ranks Top Three: Competence of majors, faculty with excellent profession and the platform level of the universities that students choose. Their scores are 82.38, 81.30 and 80.92 respectively. The next two factors following the top three are laboratory conditions and employment rate. The index of infrastructure scores relatively low at 71.54. Among all the factors within hard power on students' will of choosing their own universities, employment rate, faculty with excellent profession and competence of majors rank Top Three. Their scores are 74.1, 71.64 and 71.02. Comparatively speaking, laboratory conditions and infrastructure score lower at 66.92 and 64.54. In comparison, the paper finds out that students attach more importance on competence of majors, faculty with excellent profession and the platform level of the universities when they choose to start their graduate study in other universities. Meanwhile, students attach more importance on employment rate, faculty with excellent profession and competence of majors.

3.2.3 Influential condition of university's soft power

Through adopting the optimal scaling model, this paper measures and calculates influences of concrete indexes of university's soft power on students faced with the fact that they have to choose to pursue their graduate study in their own universities where they finish undergraduate study or start their graduate study in other universities. Concrete statistics are shown in Table 5.

Table 5　Soft Power Indexes' Influences on Students' Intention of Choosing Universities

Influence of Soft Power on Students' Intention of Choosing other Universities to Start Graduate Study						
Specific Indexes	Very Little	Little	Normal	Large	Very Large	Mean Value	Influencing Factors Score
Relatively Large Domestic Influence	1.16%	3.16%	18.13%	48.36%	29.20%	4.013	80.26
Abundant Alumni Resource	2.14%	4.09%	27.98%	42.15%	23.64%	3.811	76.22
Fairly More Exchange Programs with Foreign Universities	4.21%	6.11%	32.48%	36.32%	20.88%	3.636	72.72
Fully Functional University-Enterprise Cooperation Mechanism	2.94%	6.00%	35.91%	37.13%	18.01%	3.613	72.26
Better Allowance and Treatment for Graduate Students	6.04%	5.92%	44.72%	30.45%	12.87%	3.382	67.64
Successive Postgraduate-Doctoral Program of Specific Majors	15.02%	13.92%	39.61%	20.85%	10.61%	2.981	59.62

Influence of Soft Power on Students' Intention of Choosing Their own Universities to Start Graduate Study						
Specific Indexes	Very Little	Little	Normal	Large	Very Large	Mean Value	Influencing Factors Score
Academic and Social Resource	2.93%	6.66%	39.14%	40.89%	10.38%	3.491	69.82
Abundant Alumni Resource	3.09%	6.97%	39.28%	40.07%	10.59%	3.481	69.62
Relatively Large Domestic Influence	3.62%	9.21%	45.79%	33.12%	8.25%	3.331	66.62
Fully Functional University-Enterprise Cooperation Mechanism	3.95%	8.96%	45.84%	34.53%	6.72%	3.311	66.22
Better Allowance and Treatment for Graduate Students	4.9%	10.81%	46.27%	30.4%	7.61%	3.250	65.00
Fairly More Exchange Programs with Foreign Universities	7.25%	14.99%	51.52%	20.59%	5.65%	3.024	60.48

As is shown in the statistical result, among all the factors within soft power on students' will of choosing other universities, the index of other universities' domestic influences ranks the first with the score of 80.26. The next three following factors are exchange programs with foreign universities, alumni resource and university- enterprise cooperation. As for those students choosing their own university to start their graduate study, they attach more importance on academic and social resource and fully functional university- enterprise cooperation mechanism.

3.2.4 Influential condition of self-evaluation factor

Through adopting the optimal scaling model, this paper measures and calculates influences of self-evaluation index on students faced with the fact that they have to choose to pursue their graduate study in their own universities where they finish undergraduate study or start their graduate study in other universities. Concrete statistics are shown in Table 6.

Table 6   Self-Evaluation Indexes' Influences on Students' Intention of Choosing Universities

Influence of Self- Evaluation on Students' Intention of Choosing other Universities to Start Graduate Study

Specific Indexes	Very Little	Little	Normal	Large	Very Large	Mean Value	Influencing Factors Score
Supervisors' Academic Influence	2.32%	3.66%	25.89%	44.20%	23.93%	3.837	76.74
Personal Favor towards the City that the University Locates	4.43%	6.55%	26.64%	35.25%	27.12%	3.741	74.82
Unsatisfactory Academic Atmosphere of their own University	14.14%	16.98%	42.05%	18.75%	8.08%	2.896	57.92
Weak Sense of Belonging to Their own University	18.41%	17.13%	40.67%	15.60%	8.20%	2.780	55.60

Influence of Self- Evaluation on Students' Will of Choosing Their own Universities to Start Graduate Study

Specific Indexes	Very Little	Little	Normal	Large	Very Large	Mean Value	Influencing Factors Score
Weak Sense of Belonging to Their own University	2.08%	6.92%	29.48%	45.93%	15.59%	3.660	73.20
Supervisors' Academic Influence	4.36%	9.99%	40.94%	34.08%	10.63%	3.366	67.32
Unsatisfactory Academic Atmosphere of their own University	4.29%	9.45%	43.91%	33.66%	8.7%	3.330	66.60
Personal Favor towards the City that the University Locates	6.93%	12.57%	34.74%	32.18%	13.59%	3.329	66.58
Influences from Instructors and Faculty Within Their own University	6.06%	13.03%	45.11%	27.87%	7.93%	2.707	54.14

As is shown in the statistical result, among influences of all the factors within self-evaluation indexes on students' will of choosing other universities, the index of supervisors' academic influences and the city where the university locates rank top two with the score of 76.74 and 74.82 respectively. As for the self-evaluation indexes influences on students' will of choosing their other universities, sense of belonging to the university, supervisors' influence of students' own universities, the city where the university locates and academic and scientific research atmosphere get high scores.

4 Conclusions

Recently, a university directly under the administration of the Ministry of Education has developed in high speed and cultivated its own feature. From the survey and analysis on the university comes the findings which have typical significance on the inclination and influential factors of the university selection for undergraduates who want to pursue a master's degree. Based on the results of the research, the author holds the opinion that in order to attract more excellent students in the background in which the postgraduate enrollment mechanism has been reformed, the decision maker of postgraduate education in universities should make some adjustments from the following aspects:

1) To promote the hardware and software conditions in university so that the postgraduates can be provided a benign fundamental guarantee for academic research. As is shown in the result, the two influential factors with highest scores are the competence of majors in hard power and domestic impact in soft power. Thus famous universities and well-known supervisors are not the only factors taken into considerations when undergraduates select university to pursue a master's degree. Based on the publicity of university and supervisor, undergraduates pay more attention to the discipline competence and whole faculty. Additionally, indexes such as teaching quality, study depth of majors and course design get relatively low scores, which indicates that the teaching mechanism reform should be deepen and the teaching system should be improved in order to promote the education level. With the purpose of solving the problems reflected in the survey, the academic research atmosphere in universities should be cultivated and the laboratory conditions and fundamental facilitates should be improved. In this way postgraduates can be provided a better environment for academic research.

2) To adjust the cultivation mode and provide multiple cultivating patterns and vocational guarantee for postgraduates. From the research comes the finding that not only the discipline competence and the platform level of universities are taken into consideration when undergraduates select a university for master's degree. The major employment rate and schoolmate resources also attracted much attention. Thus the selection of university is relevant to the career planning of undergraduates. Hence, the postgraduates cultivating mode should be reformed: on the one hand, aiming at the international academic frontier, university should broaden the channel for international exchange and cooperation and propel the international cooperated cultivation to nurture a multitude of academic talents. On the other hand, universities shall establish University- Enterprise Cooperation Mechanism and enhance the cultivation of applied talents in order to adjust to the urgent demand of the transformation of economic mode and adjustment of industrial structure. Universities shall start the postgraduate cultivation mode reform by grade and sort and improve the quality the cultivation of postgraduates in order to provide conditional guarantee for postgraduates' career plan and attract more excellent students with universities quality advantages.

3) Enlarge the publicity when recruiting new graduates and improve the Scholarship and Aid System with the purpose of providing life guarantees for graduate during their study. With the reform of Graduate Education Investment Mechanism in China, universities will charge fees from graduates within National Graduate Enrollment Plan since the autumn semester in 2014. This reform has directed students to pay attention to the Scholarship and Aid System when they choose the university to start their graduate study. Therefore, universities shall design attractive Scholarship and Aid System and formulate Scholarship and Aid Mechanism with own characteristics of the universities. The survey also finds out that many students are not likely to choose one university given the condition that they do not well understand the Scholarship and Aid System and Policy or they lack interest in Scholarship and Aid System of the university. Therefore, universities shall take various measures in the same time and enhance the publicity particularly on prominent advantages of discipline and Scholarship and Aid System so that students can make rational decisions after fully understanding them.

Acknowledgement

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Analysis of Health Status of University Teachers: Based on Physical Examination Data

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Abstract: To understand the disease characteristics and establish family health records of the highly-educated and senior cadre in Wuhan University of Technology. In 2012 and 2013, the highly-educated and senior cadre in Wuhan University of Technology received medical examination in internal medicine, surgery, gynaecology, ophthalmology, otorhinolaryngology, stomatology and radiology as well as electrocardiography, B-ultrasound, blood pressure test, liver and kidney function tests, blood tests and so on. Disease distribution and tendency were analyzed in detail. According to the physical examination results, we found that chronic pharyngitis, fatty liver and hypertension were the top three diseases in 2012. In 2013, the top three diseases were hyperlipaemia, hypertension and fatty liver. With the college enrollment expanding, the staff members are over-burdened, and many of them keep bad habits, which leads to increased incidence of various diseases among the staff members. So relieving their stress and offering health education would be the priorities in the future. At the same time, the self-protecting and health care consciousness should be elevated.
Key words: Staff members; Medical examination; Health care

1 Introduction

Along with the rapid economic development and the changing of China's population constitution, the incidence and mortality of cardiovascular disease (CVD) have been rising constantly (Murray, 1996). Although the current medical technology is more and more mature, but the number of patients died of cardiovascular disease is up to 15 million each year (Gao, 2014). Cardiovascular disease has become the leading cause of death in the world (Yao, 2013). At present, the number of cardiovascular disease patients in our country is as high as 300 million, and 3 million people died of cardiovascular disease every year, which accounted for 51% of the total causes of death (Ma, 2012). According to this calculation, 1 people were killed by heart disease in every 10 seconds. Hypertension is a common chronic disease, which is characterized by sustained increase of arterial blood pressure "cardiovascular syndrome", it is the most important risk factors of cardiovascular disease, and is a major cause of death of cardiovascular disease in China (Revision committee of the Chinese hypertension management guidelines ,2014) For either the western or Asian population, hypertension is considered one of the most important but also preventable causes of CVD and renal disease(Klag,1996;Collaborative ,1998). In the past decades, the prevalence and total number of patients suffering from hypertension have been increasing. The number of Chinese adults with hypertension grew from 30 million 1960 to 59 million in 1980, and it further rose to 94 million in 1991(Gu, 2003). In recent years, the prevalence rate of hypertension increased rapidly, according to the previous adult hypertension prevalence rate of 3% average annual growth projections, the 2012 hypertension prevalence rate was 24% (Yang, 2014). According to the growth rate projections, 2016 hypertension prevalence rate will up to 36%. Highly-educated and senior cadre of Wuhan University of Technology is the backbone of the research and teaching activities. To understand the health status and to build the family health records of highly-educated and senior cadre, medical examination was administered in 2012 and 2013. On this basis, the preventive health care strategies can be formulated to promote the general health level of the staff members of our university.

2 Subjects and Method

2.1 Basic characteristics

A total of 933 staff members in the three campuses received medical examination (252, 426 and 253 staff members from east campus, west campus and other campus, respectively). The data of 897 staff members were complete, while the data of 36 staff members were incomplete. The composition of participants with complete medical records is shown in Table 1. The total number of staff members expected to receive medical examination in 2013 was 1261 and 984 of them received the medical examination. Thus the participation rate was 78.03%, as shown in Table 2.

2.2 Items of medical examination

The medical examination was thoroughly planned and the equipments and materials needed were purchased according to the plan. The medical examination form was redesigned for the convenience of building family health records. The newly added information included ID number, residence, contact number, previous medical history and life style. Therefore, the medical staff can timely inform the participants of the medical examination results. Moreover, the test report number was identical with the medical examination form number in order to avoid potential errors. Health education prescription was attached to the medical examination form so that the staff members could take appropriate countermeasures based on the medical examination result. The items of medical examination were as follows: general items, examinations in internal medicine, surgery, dermatology, neurology, gynaecology, ophthalmology, otorhinolaryngology, and stomatology. The tests taken included digital radiography, anterioposterior chest radiography, 12-lead electrocardiography, B-ultrasound of liver, gallbladder, pancreas, kidney and spleen, routine blood test, blood lipid test (4 items), liver function test (2 items), urine acid (UA), kidney function test (2 items, UREA, Cr), glucose test (Glu), hepatitis B virus test, alfa feta protein (AFP) rapid test and routine urine test (10 items).

Table 1   Basic Information of Staff Members Receiving Medical Examination in 2012

	Retired with honors	Retired	On the job	Total
Number of participants	107	374	416	897
Female	28	55	78	161
Gender ratio (male/female)	2.82/1	5.80/1	4.33/1	4.57/1
Average age (years)	80.0	69.8	48.0	60.9

Table 2   Distribution of Staff Members Receiving Medical Examination in 2013

	Number of retired staff members expected to receive medical examination	Number of in-service staff members expected to receive medical examination	Total		
			Total number of staff members expected to receive medical examination	Total number of staff members having received medical examination	Participation rate
East campus	185	164	349	256	73.35
West campus	242	332	574	471	82.05
Yujiatou	236	102	338	257	76.03
Total	663	598	1261	984	78.03

3 Result and Analysis

Table 3 and Table 4 show the result of medical examination among highly-educated and senior cadre of Wuhan University of Technology in 2012 and 2013.

3.1 Expenses

The total expense of medical examination was 311087.9 yuan in 2012. The charge for basic items was 260yuan per person, and the total was 242580 yuan. The charge for additional items was 68507.9 yuan and the charge per person was 333.43 yuan. The charge for additional items per person was 73.43 yuan. The charge for additional items per person among staff members retired with honor was 282.5yuan and that for ordinary retired staff members was 72.33 yuan. The charge for additional items per person among in-service staff members was 44.54 yuan. The expense was the highest for staff members retired with honor and the younger the age, the lower the expense was. This is because the health conditions usually deteriorate with age and the risk of various diseases increases (as seen from the result of medical examination).

3.2 Disease distribution

As shown in Table 3, hypertension had the highest prevalence among 6 major chronic diseases. The prevalence reached 51.40% among staff members retired with honor. The prevalence of malignant tumors was not calculated and that of chronic obstructive pulmonary disease was not calculated either due to very low incidence. The prevalence of hypertension, diabetes, coronary heart disease and cerebravascular disease increased with age (participants retired with honor, ordinary retired participants and in-service participants were considered as three age groups). This is obviously seen from the

difference of statistical significance in disease distribution and the charge per person among the three groups. Fatty liver (43.75%) and chronic pharyngitis (51.20%) were the most prevalent diseases among in-service participants and the prevalence increased significantly at younger age. About 20% of the participants had hyperuricemia and the prevalence of all six major chronic diseases increased with age, as was generally expected. The high prevalence of chronic pharyngitis among in-service staff members can be explained by the nature of the teaching occupation, and this indicates the need for a more proper schedule of teaching time. The high prevalence of fatty liver and hyperlipidemia (19.95%) among in-service staff members was associated with occupation, life style and dietary habits. To prevent and control the major chronic diseases, it is crucial to strengthen physical exercises, control body weight and refrain from eating too much or food high in animal fat and sugar. Fresh vegetables and fruits are highly recommended and smoking and excessive drinking should be stopped. As seen from the medical examination result in 2013 in Table 4, chronic diseases were also prevalent, especially metabolic disorders including hyperlipidemia, hyperuricemia and fatty liver. All of these chronic diseases are associated with bad habits and poor prognosis of cardiovascular and cerebrovascular diseases. However, hypertension, diabetes, coronary heart disease and cardiovascular events can be prevented and controlled. To promote overall health, health education is needed to reiterate the importance of reasonable diet (food low in sugar, salt and fat) and routine aerobic exercises. As to the prevalence of malignant tumors, 5 participants were suspected of cancers in 2013, 2 participants were scheduled for selective surgery followed by pathological confirmation, and 3 participants were not yet contacted.

Table 3   Result of Medical Examination Among Highly-educated and Senior Cadre of Wuhan University of Technology in 2012

Disease	Retired with honor		Retired		On the job		Total	
	Number of cases	Prevalence (%)	Number of cases	Prevalence (%)	Number of cases	Prevalence (%)	Number of cases	Prevalence (%)
Hypertension	55	51.40	140	37.43	50	12.02	245	27.31
Diabetes	19	17.76	33	8.82	14	3.37	66	7.36
Coronary heart disease	16	14.95	17	4.55	0	0.00	33	3.68
Chronic obstructive pulmonary disease	1	0.93	1	0.27	1	0.24	3	0.33
Cerebrovascular disease	10	9.35	11	2.94	3	0.72	24	2.68
Malignant tumors	0	0.00	2	0.53	0	0.00	2	0.22
Hyperlipidemia	12	11.21	80	21.39	83	19.95	175	19.51
Fatty liver	26	24.30	119	31.82	182	43.75	327	36.45
Hyperuricemia	20	18.69	82	21.93	70	16.83	172	19.18
Hepatobiliary stones	10	9.35	25	6.68	18	4.33	53	5.91
Liver cyst	28	26.17	103	27.54	78	18.75	209	23.30
Kidney stones	6	5.61	32	8.56	36	8.65	74	8.25
Kidney cyst	27	25.23	74	19.79	38	9.13	139	15.50
Chronic pharyngitis	23	21.50	172	45.99	213	51.20	408	45.48

Table 4   Result of Medical Examination among Highly-educated and Senior Cadre of Wuhan University of Technology in 2013

Disease		West campus	Yujiaotou	East campus	Total	Prevalence %
Type Ⅱ diabetes	Diabetes	19	22	20	61	6.20
	Abnormal fasting blood glucose	37	28	32	97	9.85
Hypertension	Hypertension	131	98	65	294	29.87
	Hypertension？	75	47	53	175	17.78

Coronary heart disease		22	11	11	44	4.47
Cerebral stroke	Cerebral infarction	8	10	3	21	2.14
	Cerebral hemorrhage		1			0.1
Chronic obstructive pulmonary disease		6	2	2	10	1.01
Hyperlipidemia		256	144	159	559	56.81
Hyperuricemia		69	32	35	136	13.82
Fatty liver		158	89	88	335	34.04
Liver function deterioration		132	58	53	243	24.7
Hepatitis B		21	21	14	56	5.69
Kidney function deterioration	Cr	57	39	31	127	17.28
	UREA	22	8	13	43	

3.3 Comparison of prevalence of chronic diseases in 2012 and 2013

Fig. 1 shows the comparison of prevalence of chronic diseases in 2012 and 2013. The proportion of staff members having hypertension and fatty liver declined in 2013, especially fatty liver, but the prevalence of hyperlipidemia increased slightly. Excess calorie intake, insufficient physical exercise, high sodium chloride intake and excess drinking are the major causes of hypertension (Wan, 2000). Patients with alcoholic fatty liver should stop drinking and those with dystrophic fatty liver should increase the intake of proteins, amino acids and choline. Supplementation of polyene lecithin is effective against fatty liver, while patients with drug-induced fatty liver should stop medication immediately. In recent years, the prevalence of hyperlipidemia has been rising in China (Li, 1996) because of high-fat, high-cholesterol and high-sugar diet and lack of physical exercise (Liu, 1997). Chen adopted non-drug interventions combined with knowledge-attitude-behavior therapy for hyperlipidemia patients so as to fundamentally change the life style (reasonable diet, proper physical exercise and losing weight) (Chen, 2002) and thus to reduce the blood lipid level.
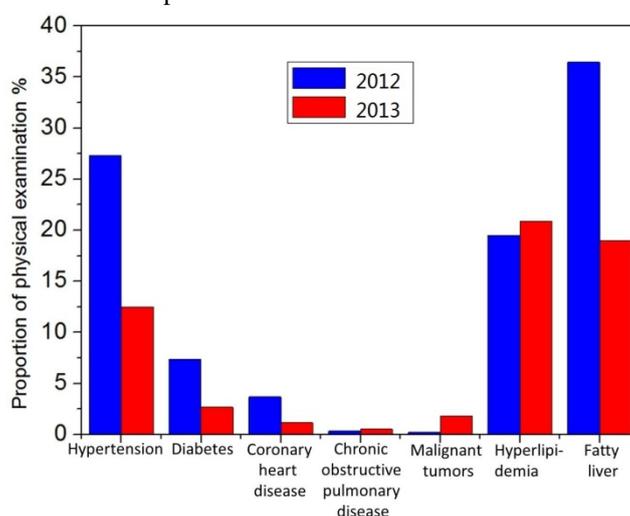
Figure 1   Comparison of Prevalence of Various Diseases in 2012 and 2013

4 Conclusions

Through medical examination, we have gained a comprehensive understanding of the heath conditions of highly-educated senior cadre of our university. The family health records are built and the health education program is also underway. Except the increasing prevalence of hyperlipidemia, chronic obstructive pulmonary disease and malignant tumors compared with 2012, the prevalence of all other diseases declined in 2013. This indicates effectiveness of the health-promoting countermeasures implemented at school. But some defects still exist. For example, the propaganda before medical examination is not enough, the equipments for medical examination are outdated and the participants have to go to different places for different examination items. So more investments in equipments and more medical staff are needed and the rules and regulations of medical examination should be perfected.

The participants should receive medical examination at the university hospital according to the time notified. Finally, health education program should be enhanced to raise the awareness of control and prevention of six major chronic diseases.

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The Relationship Between Second Cultural Acquisition and College English Teaching for Non-English Majors

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Abstract: Language and culture are inseparable, and they can influence each other. Learners always learn language and culture of the target language on the basis of understanding their native language and culture. This paper discusses the importance of cultural acquisition for language acquisition and analyze the relationship between the first and the second cultures of English learners, to drive language acquisition by cultural acquisition and to put forward some suggestions to promote the level of college English teaching for non-English majors.
Key words: First culture; Second culture; Non-English majors; English teaching

1 Introduction

The process of language acquisition is inevitably accompanied by the process of cultural acquisition. Acquiring a foreign language means the acquisition of the culture carried by it. On the other hand, cultural acquisition also affects the level of language acquisition. Sapir-Whorf theory believes that speaking a foreign language means a transformation of cultural perspective (Carrol, J.B, 1956). Learners' second cultural acquisition is always on the basis of their first culture, so improving English learners' abilities to understand and use the target language and culture in the native language environment is the key to English culture teaching.

The second culture acquisition is an emerging discipline. In the west, Hamers & Blanc (1989) put forward the success of second language acquisition is bound to be accompanied by second culture acquisition. Acculturation model created by J.Schuman is one of the main theories of modern foreign language learning. In China, "cultural studies" began in the 1980s, triggering a discussion in the field of language and culture teaching. At present, second language cultural acquisition has still been leading to the attention of researchers. Cao Luman (2011) analyzed the influence of the deep cultural migration on second language learners' pragmatic competence. Meng Ruoyu (2013) combed the development of second language acquisition research in the west. Gao Yuanyuan (2013) put forward the combination of cultural acquisition and the teaching goal. Tan Huiming (2014) emphasized the necessity of the cross-cultural foreign language teaching, and emphatically discussed the teaching goal, content and method of the cross-cultural foreign language teaching.

2 Language Acquisition and Cultural Acquisition

Current research on the relationship between language and culture is divided into two main categories: linguistic determinism and cultural relativism. Linguistic determinism holds that language and culture are relatively independent and different cultural societies use language in their unique ways, while cultural relativism believes that the ways people perceive the world are so similar that the communication between cultures and races is well-reasoned. Although there is a divergence between those categories, they both admit the inseparable relationship between language and culture. Every language carries corresponding cultural connotation and every culture conceives a unique language. Language is flexible because of culture. Meanwhile, culture is real because of language.

Language acquisition and cultural acquisition make each other possible. They are mutual development. Language acquisition must be accompanied by the corresponding cultural acquisition in the process. If it adapts the culture, language acquisition will be promoted. If not, language acquisition will be impeded. Cultural factors in language can affect the process and result of language acquisition. The appropriateness of language use is also inseparable from the social cultural knowledge.

Under normal circumstances, foreign language learners have already had a complete set of the first cultural system before they begin to know the second culture. Because of the cultural concept based on the first cultural system, social distance and psychological distance towards the second culture will become the key factors that influence the second language acquisition. Therefore, the cultural acquisition plays an important role in language acquisition. The differences between learners' native language culture and the target language culture and learners' intercultural communicative competence

will directly influence the second language acquisition. Language acquisition is a process of communication with another culture. Only abstract and blunt language knowledge is not enough. Cultural awareness in language acquisition (cultural acquisition) is the main content of cultural studies in recent years (Fiske, John, 1989).

3 The First Culture and the Second Cultural Acquisition

The first culture refers to cultural information in native language while the second culture refers to that in the target language. Under normal circumstances, the learners can acquire native language culture in the process of the first language acquisition. The process of second cultural acquisition is different from the first cultural acquisition. Learners have had a complete system of the first culture before they acquire the second culture. However, every culture system contains two types of cultural orientation, "central culture" and "marginal culture". Central culture refers to the formation of world outlook, values and outlook on life in the specific cultural background for a long time. Generally speaking, it is difficult to change; marginal culture usually refers to a person's daily living habits and behaviors which are easily affected by the outside world. Therefore, the process of second cultural acquisition is mainly embodied in the learners' transformation and extension towards the first culture system, especially the marginal culture in it. If learners' first culture and second culture are similar or learners are familiar with the second culture, their abilities of second cultural acquisition will be stronger.

According to the relationship between the first and second cultures, stages of the second cultural acquisition generally include cognition, conflict, selection and fusion:

1) Cognition. Contact with the second culture with curiosity and absorb some of it.

2) Conflict. Understand the second culture deeply and find personal conflicts between two cultures to show anxiety and depression in process of adapting to the new culture.

3) Selection. Make choices from the cultural conflicts.

4) Fusion. Blend two kinds of cultural concepts; accept the second culture without giving up the first culture and apply different cultural concepts in different cultural environment.

To study the four stages of the second cultural acquisition, 50 English learners are interviewed and analyzed to show the process of learning and understanding the foreign culture. We obtain a general result from the survey in which emotion and time are the two main parameters.
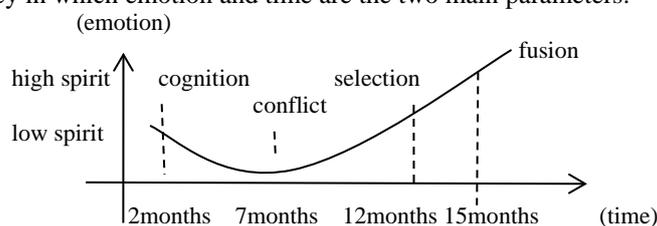
Figure 1   Stages of The Second Cultural Acquisition

As Figure1 shows, students in contact with the second culture around two months will enter the first stage, in which with preliminary acquaintance with the new culture, they feel very curious about everything, and want to know more about the new culture with a high spirit. Seven months later, they gradually encounter a number of conflicts between their native culture and the new culture. In this stage, students can't adapt to some of the new culture and show depression and anxiety about it. Then after a period of depression, they must learn to choose between the two cultures in order to avoid those conflicts. Generally speaking, about fifteen months later, a few students will finally adapt to the new culture, and enjoy high spirit of learning.

There is a certain degree of similarity and individuality in both cultures. Similarity and individuality between different languages and cultures may become the motivation of learning foreign language for learners. At the same time, it also can be the obstacles of learning. In terms of cultivation of cross-cultural ability, the exclusiveness of culture, namely "psychological rejection of the native culture (especially spiritual cultural part) towards a foreign culture different in certain degree" (Gu Jiazu, 2000), can be either the interference factors for foreign language learners or the favorable opportunity to cultivate the students' cross-cultural awareness and sensibility to the cultural differences. In the process of learning and using the second language, learners always try to replace corresponding concepts in two languages. Because of lack of cultural equivalence as well as ingrained habits and influence in the native language, it is not easy. Therefore, on the basis of knowing similarities and differences between the first

and second cultures, taking examples by the first cultural acquisition, foreign language teaching is consciously cultivating the second cultural acquisition ability and cross-culture ability.

4 The Current Situation of College English Teaching for Non-English majors and Some Recommendations

With the deep research about the relationship between language and culture, and the combination of language and culture in foreign language teaching, more and more people have realized the importance of culture teaching in foreign language teaching. This paper attempts to combine culture and language, and puts forward some suggestions for English teaching based on the analysis of the present situation of college English teaching for non-English majors.

4.1 Improving the traditional teaching method and combining language teaching and culture teaching

Basic English has always been the target in college English teaching in China, resulting in mechanical teaching of teachers, and passive learning of students. Under such condition, English teaching takes enormous effort but produces low effect. In recent years, the embarrassing situation of "high scores and low abilities" in English teaching is obvious. Although colleges have made a series of reforms, the major teaching mode still takes "listening, speaking, reading, writing and translating" as the main teaching content. In the process of second language acquisition, one will inevitably experience "cultural conflict" or "culture shock", if he only pays attention to the semantic equivalence, but ignores the cultural characteristics of language domain (Du Xuezeng, 1999).

In English teaching, educators should pay attention to the cultivation and improvement of learners' second cultural acquisition, and add culture communication function to the traditional teaching method in language skill training. Educators should design classroom teaching in different ways according to learners' professional interests. Meanwhile, they should make students feel the charm of culture in the osmosis by combining cultural teaching and language teaching in class. At the same time, educators should guide students to see different languages and cultures in an equal way, and adjust the conflict between the target language and native language culture to cultivate students' cross-cultural awareness, improve learners' cultural adaptability, and promote their second language learning.

4.2 Transferring the thinking mode and setting up correct learning concept

Because of the influence of school education, social environment, personal values and other aspects, the concept of "language is a tool" is still prevailing. Especially in college English teaching for non-English majors, most learners, even the educators see English only as a communication tool, a means to make money or obtain employment. Learners always learn English passively. Most of them only pay attention to the language knowledge which is useful to the test, but ignore the knowledge related to culture.

In vision of current globalization, along with foreign language teaching reform developing into a deeper level, foreign language researchers have a more profound understanding about foreign language teaching: a foreign language is not just a "tool" of communication, but a carrier of culture; foreign language teaching should not be narrowly limited as a "tool", and we should hold "foreign language professional view" and "foreign language education view" (Hu Zhuanglin, 2002).

Educators and learners should abandon the concept that "language is a tool", and establish a correct concept of foreign language teaching. We must pay more attention to the culture related to language, when we learn basic language knowledge and skills. Foreign language learning is not merely a tool to obtain a specific "earnings", but a process of understanding the target language culture, expanding the way of thinking, and improving our overall quality.

4.3 Dealing with the relationship between the two cultures correctly and creating an atmosphere of "Inter-lingual Culture"

Today, academia advocates cultural teaching, and emphasizes the contact between learners and the target language culture. But there must be some differences between two cultures. Sometimes excessive emphasis on the culture of the target language seems to force learners to make a choice between the two cultures, and even force them to abandon their native language culture. It will increase the learners' psychological stress and emotional obstacles of foreign language learning. All cultures are equal. When faced with the conflicts between the first and second cultures, we need not to make a choice between them. The best effect of culture teaching is achieving an effective interaction between two cultures by using different cultural values in different communication environments.

Thus, in the process of culture teaching, educators should guide the learners to strengthen their

cultural sensitivity, and maintain an objective attitude towards the two cultures, rather than push learners to identify or criticize any culture. Culture teaching is to cultivate students' cross-cultural awareness instead of a simple interpretation of cultural knowledge. Acton puts forward the theory of perceived social distance in the process of learners' second language cultural adaptation. He believes that there is an optimal timing of perceived social distance during the period of the second language learning in a second culture. Despite distance between learners and native language culture or between learners and target language culture is either too close or too far, which is not conducive to learning. Keeping a certain distance is helpful to second language learning (Bi Jiwan, 2009).

"Inter-lingual culture" is the integration of first and second culture. In this cultural atmosphere, it requires learners not only to acquire second culture, but also to keep up the first culture. When faced with cultural conflicts, learners should see the similarities and differences between the two cultures with a tolerant attitude and an expanded thinking, not as a simple trade-off. In classroom, educators build an atmosphere of "inter-lingual culture", which can not only help learners to get rid of the "stereotype", but also avoid "cultural conflicts" and "culture shock". Providing good psychological and emotional premise for learners makes sure a further improvement of their language abilities.

5 Conclusions

The research of second cultural acquisition has been the most important aspect in the second language acquisition and teaching. It is very necessary for the healthy development of foreign language teaching to identify the relationship between language acquisition and cultural acquisition and to emphasize the importance of cultural acquisition in foreign language teaching. On the other hand, from the perspective of the relationship between the first culture and second culture, studies of the second culture must start from the first culture in order to achieve dynamic balance between the two cultures. In the end, promoting language acquisition by cultural acquisition further improves the level of college English teaching in China.

Acknowledgement

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Reflections and Countermeasures for the Guiding Role on University Graduate Employment

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Abstract: Difficult employment for university students has become a prominent social problem in recent years, which is inadequate to blame on the university expansion or employment structure defects. The employment of university students is greatly influenced by the changed conception of university students employment. This thesis briefly makes analyses of the current employment situations and issues on employment conception of Chinese college students. The underlying reasons are analyzed from the perspective of college students and higher institutions, countermeasures are put forward from the perspective of college students, college counselors and higher institutions. All of these are based on the current tough employment status of college students and the features of market economy under the new situation.
Key words: Chinese college students; Employment; Employment status

1 Introduction

The issue on the difficulty of university students employment comes with the university expansion, which was not so prominent to draw the attention of the public before. It was not until 1999 that this issue gradually become the focus of societies and public opinion and eventually become a prominent social problem. The development of China's economy inevitably contributes to the demand for talents, economic restructure will facilitate adjustment in personnel structure accordingly. The increasing number of college students and unreasonable talented person system, etc. College counselor, the guider of students in ideology and behavior, is an important bridge between students and the society. Faced with the tough job market, college counselors should play an active role and carry out employment guidance work better. It's of great significance and necessity to help foster in university students the correct outlook on careers, values, life and even the world, which is the most important mission when carrying out the guidance work of university students employment.

After searching in China National Knowledge Infrastructure, university students employment as the keywords, we find four typical theses that have great significance in guiding university students employment, whose time span is between 2007 and 2011.

Dong Shijie (2007) adopts the method of empirical investigation and document analysis aiming at the situations and development tendency of the decreased university students' successful employment in his article<University Students' Successful Employment Research>, which analyzes the reasons for university students' failed employment in terms of the changing conceptions in employment, methods of employment guidance, specialized establishment in universities and the situations of job markets.

Zhao Mingjun (2010) puts forward an idea that the situations of university students employment are resulted from four factors including society, school, family and students themselves in <Analyses the Current Situation Analysis of University Students' Employment and Education Countermeasures>.

In <Analysis of University Students Employment and Countermeasures Research>, Wu yi (2011) says that in order to further implement the combination of micro employment guidance and macro employment guidance, we should Improve the pertinence and effectiveness of employment guidance work and make counselors play their fundamental roles.

Wu bing, Duan Jinyun and Luo Shoujian(2010) draw some conclusions in<Literature Review of University Graduates Abroad Employment: Traditional Factor Analysis>[4]by summarizing the documents of Saks, Ashforth(1999)，B.E.Saks(2006) and so on. It points out that foreign countries focus most on the characteristics of graduates themselves and analyzes the factors that influences college graduates' employment from the perspective of psychology, pedagogy, economics, sociology and management science.

2 Current Employment Status of College Students

As the increasing of university enrollments, the number of college graduates is constantly rising.

However, the society has not yet ready for the employment of college graduates when the number of college graduates is increasing rapidly.
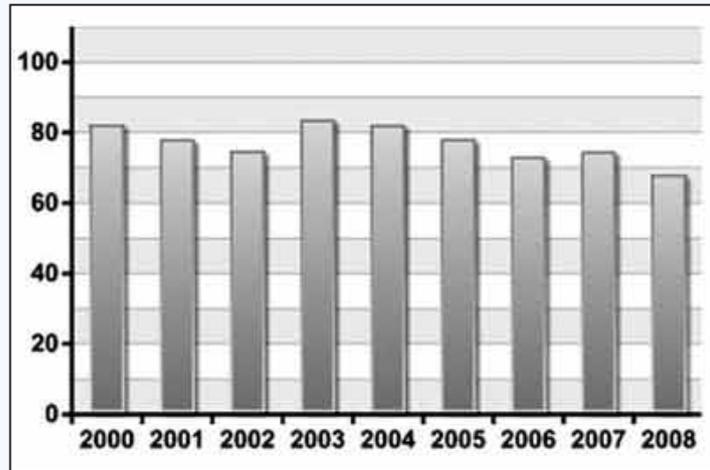
Figure 1   The Employment Trend of Colleges and Universities in Wuhan

To put it in a more simple way, the supply is far below the demand. At the same time, unreasonable employment structure also leads to the increasing difficulty to obtain a job for college students. According to statistics, the number of college students across the nation is estimated to reach 7.5 million in the year of 2015, which are called "the hardest year for job-hunting" by the net group. Data in 2013 shows that the number of employed college student accounts for 43.5% of the total of graduates, while the number of unemployed college students is 23.4%. Above data intuitively indicate that the current employment status of Chinese college students is getting more and more severe. Some scholars refer to the difficulty of university students employment as structural unemployment, they hold the view that university students are reluctant to go somewhere like small and medium-sized cites, county and especially western districts where the disparity of wages, working environment and welfare is relatively large between the real labor market and what they require. Therefore, to resolve the problems of university students employment, we need to find out the primary contradiction existing in the process of their obtaining employment.

Table 1   Employment Status of Students in the School of Materials Science and Engineering of Wuhan University of Technology in 2010 to 2015 [②]

	2010	2011	2012	2013	2014	2015
Employment Rate	91.72%	94.95%	96.75%	94.80%	93.15%	94.79%
Acceptance Rate of Postgraduates	35.06%	34.04%	46.16%	44.80%	48.07%	52.7%
Rate of Flexible Employment	2.20%	4.65%	4.03%	3.60%	2.74%	Not Available

--Data From White Paper on the Employment Status of Graduates in Wuhan University of Technology

The School of Materials Science and Engineering has been the key development department in Wuhan University of Technology. Majors like Material Chemistry, Material Engineering and Material Physics in the School of Materials Science and Engineering have cultivated urgently-needed talents for the society. The table below shows the employment status of undergraduates in the School of Materials Science and Engineering in the last five years. The percentage of employed undergraduates is obviously higher than that of the unemployed. All of these are closely related to the professional training of students in the School of Materials Science and Engineering, which offers majors confronting to the urgent need in the society. It is obvious that the employment status of college students in the School of

Materials Science and Engineering of Wuhan University of Technology has been better than the average of Chinese college graduates. However, when we guide students of Materials Science and Engineering School in Wuhan University of Technology employment, we find that it's not the decreasing employment positions but the deviation between students' expectations of obtaining jobs and realistic demand——Their employment conception can not keep pace with the fast-changing market that basically cause the difficulty of university students employment. The students should be guided to form a correct view of obtaining employment by universities, or a series of problems will do harm to the development of these students in the aftermath.

Overall, the phenomenon of the difficulty for graduates to get jobs will lead to idle resources of human talents, which is a kind of waste and a loss to the society. Difficult to find a job will be extremely traumatic to the students, along with a series of mental issues. In this severe employment situation, college counselors should guide college students to apply for a job reasonably and take a correct attitude towards employment.

3 Reasons for the Austere Employment Status
3.1 Deficiencies of the plan and model of talent cultivation in higher institutions
3.1.1 Lagging adjustment in specialty structure

The specialty structure arrangement seriously disconnects with the structure of talents demanded, which is highlighted by structural unemployment among college graduates. On the one hand, relatively insufficient graduates of practical majors can not meet social demand. On the other hand, graduates of theoretical majors are relatively surplus. Due to the unreasonable education structure, there is a mismatch between the structure of talent cultivated by universities and the structure of talents demanded. As a result, structural surplus arises and a part of college students find it difficult to get employed.

3.1.2 Low proportion of practical teaching

What employers value traditionally was book knowledge rather than abilities? However, today the employers' focus has shifted to the combination of ability and knowledge. Chinese colleges basically follow the objective of personnel cultivation which puts emphases on imparting knowledge, and the students can not apply what they have learned into practice in this traditional class.

3.1.3 Inadequate employment guidance

Colleges servers for the graduates, mainly in areas like providing employment information, helping them go through procedures for employment, interpreting employment policies. However, what college graduates really need in job hunting are scarce, such as basic training of professional skills, cultivation of qualities required in workplace, career planning for college students and courses of professional etiquette. Especially how to provide the students with effective and high-equality employment guidance and information services and help them to establish a correct attitude in job hunting, which is what university students exactly needed.

3.2 College students themselves influencing employment
3.2.1 View of choosing and obtaining employment being out of line with the society

College students' view of choosing and obtaining employment is seriously out of line with the reality. There is a tendency in college students to follow the general trend, and division of distinction or distinction in labor inwardly. When they choose jobs, it's a general phenomenon that they would choose the positions of civil servant, public institution and overseas-funded enterprises in coastal developed areas and big cities like Beijing, Shanghai, and Guangzhou rather than choose the entry-level position like a village official in western districts that provide enough employment positions.

3.2.2 The lack of capacities and qualities in college graduates

Different levels of requirement are made by employers in ideological and ethical standards, professional quality, team spirit, interpersonal skills and practical ability to college graduates. What college students have learned in school is basically purely theoretical knowledge, and they are lack of the opportunity to apply the theories into practice. Exercises of capacities in adapting to new social environment and interpersonal communication are scarce in college graduates. As a result, college graduates fresh from the school are worse in practical capacities and qualities than those who entered workplaces earlier, which increases the training cost of enterprise.

4 Suggestions on Guiding Reasonable Employment for College Students
4.1 Guiding reasonable employment from the perspective of higher institutions
4.1.1 Reforming traditional education model and improving education system

"We need to comprehensively advance quality education, follow the law of education and the law of students' physical and mental development, adhere to the principle of moral education first and capacity as the most important, so as to promote students to develop morally, intellectually, physically and aesthetically in an all-round way." Higher institutions should speed up the transformation of the model of traditional exam-oriented education, and put emphasis on promoting the transformation towards quality education model. Higher institutions should innovate talents training system, teaching management system and school-running system. Reforms should be made in teaching content, teaching method, quality evaluation and college enrollment system. Comprehensive quality of students should be given a greater percentage, so as to evoke attention to self-quality among students. Higher institutions should not only value academic scores of students, but pay equal attention to improvements in academic scores and qualities, aiming at cultivating modern talents having revolutionary ideals, sound morals, good education and a strong sense of discipline.

4.1.2 Putting emphasis on education in practice, and combining theories with practice

We should vigorously develop vocational education, which combines theories and practice together. Thus vocational education students can apply their knowledge into practice. Investments in the education of graduates should be enlarged, better conditions and environment should be created and constructed. In this way, graduates could master a wider range of skills through study and exercise, such as technical skills, interpersonal skills and problem-solving skills. These skills can help graduates better prepared for employment. Free opportunities for studying in a given time enable college graduates develop comprehensive skills for effectively adapting to constantly changing market demand. Higher institutions should improve the quality of teachers. Major courses should be reasonably arranged, which combine professional theories and practice closely. Education in practical link should be strengthened to improve the practical capacity of students. In the course of teaching, emphasis should be put in cultivating the flexibility and adaptability of college students, and fostering high-quality applied, technical and compound talents suitable for social need.

4.2 Guiding reasonable employment from the perspective of college counselors

4.2.1 Improving their professional skills

College counselors, who play an important role in students' college period, guide students all the time in both study and life. And college counselors need to perform their important duty to guide college students to obtain employment reasonably. As the development of society, job demand of the society for college students has become more and more strict. As a result, college counselors should help students to fully understand their career planning when guiding them to obtain employment reasonably. College counselors should help college students pinpoint the way of employment by using their rich experience. And, college counselors should have a professional and further development.

4.2.2 Helping the education of career planning and guiding students to establish a correct attitude towards employment

First, occupational assessment should be carried out to make the career orientation clear. Through doing occupational assessment, students can better understand his or her occupational interest and personality. Then when choosing a job, students can consider factors like interests, capacity, and knowledge storage. Thus, an optimum matching between the employee and the job can be achieved. Second, demand standards from the employers should be made clear by involving students themselves in employment. Low-grade students should be arranged to attend careers fairs to improve their sense of participation Data sources: Wuhan polytechnic university graduates employment situation, the white paper in employment. In careers fairs, the students can communication directly with the employers and get to know standards and requirements of professional demand, thus adjusting their career planning. Third, professional career designs should be carried out to make out career routes. Professional career designs should be carried out, aiming at equipping very student with his or her own career planning. Professional career designs should be planed, prepared and completed early. Hence, college students could be fully and mentally prepared before hunting a job, so as to achieve rational employment.

4.2.3 Tracking the follow-up services after the graduates take up occupations

Work on the employment of graduates does not come to an end even after the students takes up occupations. Follow-up survey ad feedback about the graduates should be collected by college counselors, who need to have a master of the working situation of the graduates in time. Gathering advice from the employers and graduates in of great importance in the work of college graduate employment. As a result, college counselors should do well in collecting follow-up survey and feedback, which is not only an inspection of the preliminary work, but also basis for future work.

4.3 Guiding reasonable employment from the perspective of college students

4.3.1 To establish a correct view of choosing and obtaining employment

College students should establish a correct view of choosing and obtaining employment, which claims choosing a job b being employed first. College students should take a right attitude towards employment, endeavoring to broaden employment channel and employment area. A long-term development, instead of a better platform should be attached more importance by college graduates, who need to plan for their future from a higher viewpoint. When choosing a job, college students should decide a reasonable expectation about employment based on their personal conditions. What's more, they should decide their professional orientations in stages and step by step. And, the deviation between expectation about employment and realistic job opportunities should be narrowed down constantly. College students should take an initiative to create job opportunities, bear the concept of entrepreneurship in mind, and have the dedication and courage to start business.

4.3.2 To strive to improve capacity and self-quality and offer to participate in social practice activities

College students should attach importance to foster job-hunting ability and comprehensive quality. To be a qualified builder and successor in the new century, college students should enhance scientific and cultural qualities and professional skills in an all-round way. At the same time, college students should try to adapt to the rapid development in science and technology and profound adjustment in industrial structure in contemporary China. Apart from fully mastering professional knowledge in class, the participation in class and school activities should not be ignored. College students, enthusiastic in these activities and public benefit activities, can get their teamwork spirit cultivated and exercise the abilities to organize, coordinate and associate. The possibility of obtaining employment successfully will be greater after the improvement of practice ability and comprehensive quality of college students in every aspect. On school days, college students can take part-time jobs in their spare time to accumulate social work experience. While hunting for a job, full preparation should be made to increase the chance of getting a job. Advantages should be made full use of and disadvantages should be avoided in job-hunting.

5 Conclusions

Employment of college students can not be solved in a short period. As a result, faced with increasing severe employment status, college students are supposed to treat problems in employment positively, endeavor to improve self-quality and adjust their attitudes towards employment. In order to make the knowledge structure of students educated match with the requirement of societies as well as possible and ease employment tension, universities should guarantee the education teaching qualities and better serve college students by adjusting information concerned timely according to social development needed, they also should establish students' employment information system rapidly and actively and work hard on offering equal and adequate employment information and guidance services that can help students make career decisions. Meanwhile, Counselors ought to strengthen the employment education and guidance of graduates and undergraduates, help foster students' scientific and reasonable employment conception, set up a sense of "get a job first, and then choose", change the conception of employment and position themselves correctly and don't aim too high.

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Research and Exploration of Campus Informatization Construction in China

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Abstract: By analyzing current China's situations in informatization construction, major problems of informatization construction of China's colleges are analyzed: "focus on hardware upgrades, ignore software development", "focus on equipment assembly, ignore talent cultivation", "focus on sector development, ignored overall architecture". Three solutions are put forward to solve these problems in this paper:" clearly define overall plan, unify the standards ", "build up professional teams, strengthen talent construction", "share data centers, standardize systems development", in order to play a guiding role in future informatization construction of China's colleges.
Key words: Campus informatization; Campus digitization; Data center; Data share

1 Introduction

Campus informatization is an important part of China's national informatization and social informatization, as well as the technical support for reform and development of higher education institutions. Campus informatization refers to advanced information technologies such as computer technology, network technology, multimedia technology and etc, which are introduced from all areas of university teaching, management, scientific research, service life and etc. The use of these technologies will assist in teaching, research and management activities, achieve efficient scientific and standardized management, assist with school management objectives, enhance the teaching, research, management level and work efficiency.

The colleges informational construction in our country has made breakthrough progress in recent years. Competent departments and colleges attach great importance to the informational construction, they have invested a lot of time, energy and financial resources. According to statistics from ministry of science and technology development center, 92.7% of university has built their own campus network, and thousands of universities are in the construction. Among the universities which have their own campus network, 98.4% has realized office automation and scientific research network. In addition, 90.5% of the classroom has connected to the network, 74.3% of the students' dormitory implements the networking. Thus, the colleges informational construction in our country has begun to take shape, the way and details in informational construction are increasingly rich.

In the last century 90s, China is striving to build information colleges. The network information technique is ransforming the management thought and manner in tertiary institutions in a revolutionary way. At present, the information technology in China has been widely applied in college education, management, scientific research. The main research contents for colleges informational construction in our country are "Campus One-Card-Through System", "Virtual Campus", "Digital school" and so on. On the whole, colleges informational construction in China has completed the hardware infrastructure research stage, entered into a new stage of comprehensive application resources research. Compared with the colleges informational construction in our country, foreign more earlier, and they have a stable, large-scale technical team. Such as Sweden, Britain, the United States focus on the investment of colleges informational construction, especially for the United States, the campus informatization development in the developed countries abroad headed by the United States, started earlier, planned farther, invested more and led our country by near a decade. In general, pay attention to share and manage network teaching resources, develop and use remote teaching system, share education resources by means of information technology is the main research way for colleges informational construction in foreign countries (Ji Hongfang, 2015).

2 The College Informatization Status

In recent years, China's universities have a relatively rapid development in informatization infrastructure construction. The construction of Chinese Education and Research Network has connected

more than 2,000 colleges nationwide. Modern distant education network has been built, which is providing services to more than 100 colleges.

Currently, all colleges have access to the Internet, the vast majority of colleges have set up their own campus network, whose speed of backbone network has reached 100Meven 100Gigabit.China's campus informatization system has begun to take shape. The relevant authorities and universities attach great importance to their own informatization construction. The input of all aspects such as manpower, financial capacity and material resources are great. The long-term planning has been developed and the content of informatization technology gradually become rich.

3 The Main Problems Existing in the Construction of Campus Informatization

After years of infrastructure construction, China's campus informatization has indeed made great progress. The speed of informatization is accelerating and the momentum is also very rapid. But there are some problems as seen in Figure 1 in the informatization construction process of Chinese colleges and a lot of hidden dangers are exposed, which hinders the development of campus informatization to a deeper level (Zhang Guanghui, 2005).
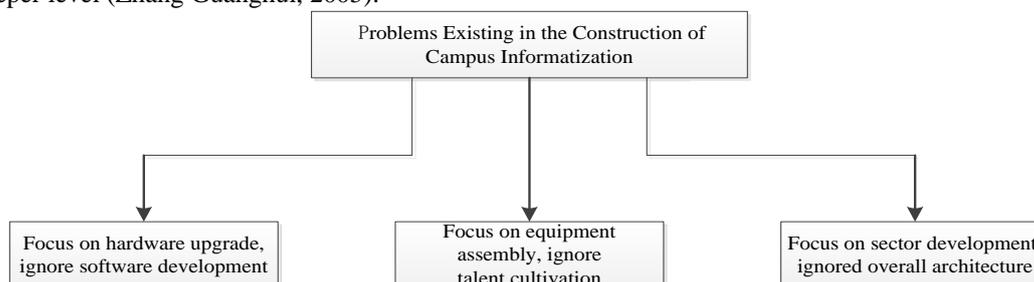
Figure 1   Main Problems Existing in the Construction of Campus Informatization

3.1 Focus on hardware upgrades, ignore software development

First, "focus on hardware upgrades, ignore software development" is a common problem in the informatization construction of higher education institutions. Pay attention to the purchase of equipment and upgrade hardware, contempt and ignore the investment of software development, which has been a very obvious trend in the informatization construction of present campus. The utilization of network resources is low and many sources such as teachers, students, administration and etc are not timely to be integrated, which makes the intensity of the informatization service is too large.

Second, the school invests heavily in the construction of the underlying hardware infrastructure but ignores the system maintenance and updating, and the processing depth is not far from enough. There is no further research and secondary development of system potential and another system is re-started, which puts a lot of funds, manpower. But because the costs of maintenance, updating and development are not in place, the device or system is not able to fully play the investment benefit, thus indirectly caused the failure of investment.

Moreover, many colleges ignore the construction of the campus informatization norms and institutions. The relevant norms and institutions are not perfect. The lack of information exchange standards and information exchange regulations further restrict the development of informatization.

3.2 Focus on equipment assembly, ignore talent cultivation

The second main problem that restricts the construction of campus informatization is that the colleges only focus on the construction and equipment assembly, but ignore the construction of the information group and the cultivation of the information quality of the teaching staff (Yu Feng, 2008). Foremost equipment need a team for professional management and maintenance, which has been overlooked by the current colleges in construction. There is a lack of a specialized technical team, especially the quantity, quality and technical ability of the management and maintenance personnel, who can not meet the needs of the informatization construction in colleges.

In the process of the informatization construction in colleges, along with the continuous development and innovation of technology, information platform gradually increased, and information facilities are also constantly in upgrading and replacement, so for college teaching and administrative staff especially older workers, requirements in information quality become more and more rigid. Many colleges ignore training and upgrading of the informatization quality in college staff after the construction of information environment, making the campus informatization environment become a

decoration.

　　Therefore, talent cultivation is the most important in the informatization construction. Only leaders at all levels attach importance to informatization construction, pay attention to the introduction of professional talent, training and improving the staff related ability, management and maintenance of the informatization hardware and software facilities, the construction of development team, can the investment benefit of informatization construction to be ensured.

3.3 Focus on sector development, ignored overall architecture

　　At present, the third problem existing in the process of campus informatization construction is lack of consideration of the overall architecture.　Attentions are only paid to the department development, but the unified planning and resource sharing are ignored, resulting in the disunity of standards, poor overall coordination ability, waste of resources and inefficiency. Due to the various demand of every department for the system and other factors, the development of various sectors of information is not balanced, and each sector is relatively independent of the development of their respective independent application system. The data linkage between systems is very poor and the resource sharing is restricted.

　　The existence of "information isolated island", the disunity of standards of resource construction and the lack of the overall framework restrict the further development of the campus informatization. Software and data structure of the system was inconsistent between the school and the college in the university, between colleges in the university, between the colleges with the functions of the department and between departments. Disability to share information resources makes some of the information resources become the "information isolated island". Departments of the school have poor coordination and lack of an overall development direction. And there are many problems in information resource sharing. All the reasons make low efficiency of management and office work, and greatly reduction of the benefits of informatization investment.

4 Solutions to the Problem of Campus Informatization

　　Campus informatization is a systematic project which is long-term, great and complex (Zhang Jin, 2011). Here are some solutions to the problems existing in the present construction as seen in Figure 2.
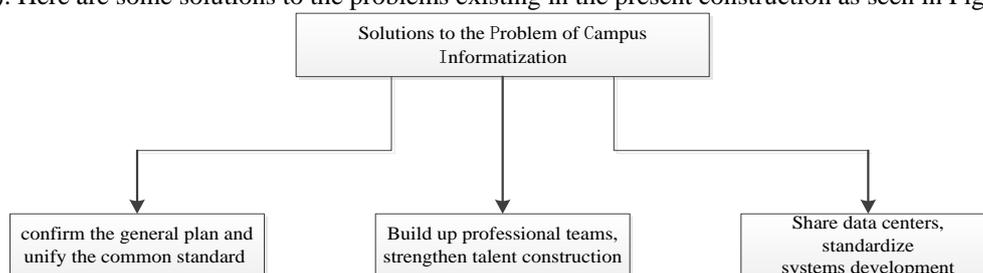
Figure 2　Solutions to the Problem of Campus Informatization

4.1 Confirm the general plan and unify the common standard

　　A good overall plan is indispensably needed in informatization construction. The colleges should build a united standards and norms, complete relevant system according to the characteristics of running a school and dominant subjects of each college. The build of standards and norms is propitious to unified leadership in informatization construction and it can make sure there is a united standard during the information collecting, handling, switching and transmitting. Besides, it can maximize the share of information resource and promote the collaborative development of college information system (Jiang Dongxing, 2011).

　　The global awareness about management informatization of departments needs further improvement. With the united guide and requirement of college, the system construction of various departments needs to be planned rationally and relevant database needs to be built to establish the foundation of data sharing and data interconnection barriers breaking. Apartments should put forward the requirements of data excavation and analysis according to actual requirement as early as possible. Meantime, the network center should enhance the technology guidance to each apartment about the actual application of information technology such as data excavation.

4.2 Build up professional teams, strengthen talent construction

　　Although the construction of campus informatization has a certain foundation, many colleges lack a professional group majoring in informatization technology and the training towards staff about informatization technology is far from enough. A group in which people are clarified, professional and

strong in technology power is necessary for campus informatization. In addition, the development and improvement of staffs informatization quality must be upgraded.

The construction of informatization is in an urgent desire of relevant talent. To improve the group construction of campus informatization talent, the "human-oriented" concept should be set up and the development and improvement of informatization professional talent group need to be valued by the leadership in colleges. In addition, it's important to improve the informatization ability of all builder, especially the leader and manager in colleges. The colleges should organize some training for all staffs to build their informatization concept and service consciousness, strengthen the training, teaching and management towards people who engaged in the informatization system in each department. The relevant people's ability about collecting, screening and managing the information should be upgraded and a united and healthy system maintenance and operation norm for each department should be completed as soon as possible. Thus, the work efficiency and service quality will be improved and it will lead to a high speed development of campus informatization construction.

4.3 Share data centers, standardize systems development

The data is core and key in campus informatization construction. Many colleges end up with redundant data, waste of information and repeat of effort for the reason of lacking of an united standard and data center (Wang Zirong, 2005).

The colleges can build large scale server and enterprise class database system to make up the basis of the whole informatization platform. This database basis may consist of students database, teacher database, file database, teaching resource database and manage resource database. There is a strong relevance between different databases. A specialized apartment is in charge of the maintain of the core data to confirm the normative and integrity of the data. Other apartments who need the relevant data should apply for the right of maintenance and use.

All apartments should follow a united standard engage in system development on the basis of an united data center to ensure that the system should fulfill the requirements as below: the unique identity of users; the unity of database development tools and development environment; the define of common interface for data sharing; the overall wholeness in application system construction and etc. Thus, the extend quality of the system will be improved.

5 Conclusions

All in all, there are some misunderstandings and problems in China's campus informatization construction at present. To solve these problems, the leaders in colleges should ascertain the overall plan about campus informatization construction according to the need and characteristics of the college. To coordinate, introduce professional talent, unify the standard and make the overall advancement of campus informatization and digitization construction, the management should be done by an authoritative organization.

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Research on Grid-Based Student Dormitory Safety Management in Universities

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Abstract: As a result of a high population density in university student dormitories, it is susceptible to accidents that threaten personal and property safety of the students, which poses great challenges for security management in universities. It is an important initiative to introduce grid-based management for innovation of campus security management. By analyzing the current university students' characteristics and problems found in safety Management of college dormitories, this paper has put forward student safety grid-based management concepts and patterns with dormitories as base units according to the work reality and explored concrete grid-based management methods and measures to deal with all kinds of campus crisis and ensure student safety.
Key words: Grid-based management; Dormitory safety; University students; Safety management

1 Introduction

With the progress of China's modernization in higher education and expansion of the education scale, the traditional way to manage the school and provide a service to students is unable to meet the new demands (Wu Y, 2015). As there are some weaknesses in student education, service and management, in addition, ideological and political work in schools and school safety and stability management are confronted by more difficulties and challenges, these problems have to be solved by advancing education information using modem communication technology (Hao V Q, 2013).

At present, the university students' safety management, mainly including the crime, food poisoning, fire and other aspects of the management issues were researched by scholars from different angles (Yan X U, 2014). In foreign countries, many college students' dormitory security management can be used for reference to our country, especially Britain and the United States and other developed countries. Their national higher education develops relatively early. It is an important reference for the safety management of our college students' dormitory that they have a relatively perfect student dormitory safety management system and rich experience.

In recent years, our research on College Students' dormitory safety management, has become a multi subject auxiliary, qualitative and quantitative phase, the government began to pay attention to the safety of college dormitory management, but due to a late start, there are still many problems (Yang J J, 2014).

Grid-based management is a modern management thought based on division of the managed objects into a number of grid units according to certain standard to enable grid units to communicate information effectively between each other and share organizational resources transparently by using the modern information technology and coordination mechanism between the grid units, so as to integrate organizational resources, improve management efficiency (Fang L J, 2013). The concept of grid-based management was early applied in the city management, where grid administrators went on a tour of inspection within certain grids, they would report the detected problems if any and checked the solved problems with result feedback. With prompt feedback by grid-based management and targeted solution can be made to such problems, which is helpful for the college dormitory management. To explore grid-based student dormitory management in universities helps fully acquire information about students in universities, manage student service in a more timely, targeted and scientific ay, which is an effective way to realize modernization of university management systems and abilities.

2 Existing Problems in Current Dormitory Safety Management Pattern

Since college-system management model was introduced, all colleges have been exploring new methods for safety management and they have built a safety management system with student work forces and student cadres at the core (Zhen-Jiang, 2016). However, there are still many problems in

safety management such as heavy workload and delayed information feedback, which are mainly caused by the following points:

2.1 No safety responsibility extending to students

At present, safety responsibility in universities is mainly taken by school, then down to college and instructor or teacher in charge of a class. However, students have no pressure of safety responsibility, so when they meet safety problems they fail to pay deep consideration, take heed of safety risks and have no self-responsibility consciousness for safety accidents.

2.2 Lack of staffs in charge of safety education, supervision and feedback

The safety work now mainly relies on school staffs responsible for logistics, security and student affairs, instead of giving full play to the role of the students. As staffs responsible for safety management have to take care of a lot of other work, they often cannot go deep among students to learn about safety situation of the students. Since students knows well about each other, to give full play to the role of students in safety responsibility will not only lessen workload of the school staffs but improve accuracy and timeliness of the information.

2.3 Limitation with student safety guards

At present, student safety Management is mainly based on class as the smallest unit. Because of limited knowledge about the whole class, the monitor gives the class safety education and feedback in a small scale as before with gaps.

2.4 Low initiative of student safety guards

At present, due to lack of effective drive mechanism in the safety Management, student safety guards generally have low initiative, for example, there is a case where a serious safety accident was caused as a result of failure to report a small safety risk (Chen Z F, 2014).

3 Exploration of Applying Grid-Based Student Dormitory Safety Management Model in Universities

3.1 Construction of basic platform for grid-based management

3.1.1 Building grids

One or more adjacent dormitories are brought into a grid according to division based on student dormitories. Dormitories are taken as the first layer of grids, which are also basic grids, and heads of the dormitories are appointed as persons-in-charge of grid safety, namely grid members, responsible for the safety education and feedback of their own dormitories.

Classes are brought into the second layer of grids and class monitors are appointed as persons-in-charge, responsible for feedback of safety information of the whole class. Safety information of the class can be obtained from feedback made by heads of dormitories or from personal visits by monitors.

As persons-in-charge of grids, instructors are responsible for receiving, giving feedback of and dealing with safety information of their own grades of students. College secretaries in charge of student affairs are brought into the fourth layer of grids, responsible for receiving and dealing with significant safety information.

3.1.2 Setting up teams of grid members

Set up grid member team systems with involvement of dormitory administrators, student instructors and teachers in charge of a class based on a mix of full-time and part-time work. A dormitory head is appointed for each grid to serve as a full-time grid member. Basic requirement of a grid member is that he must be politically reliable, have strong sense of responsibility, love student management work, and have computer experience; his main responsibility is to collect and analyze different types of relevant information, and implement superior service management of students in the grid.

3.1.3 Building information networks

Build internet-working, interconnecting and inter-operating information networks based on campus networks and by using VLAN technology.

3.1.4 Building an integrated information system

An integrated data base was build base on fully acquire information about students and grid-based management. Student information includes information of ID cards, household registration, student status, family, physical and mental health and actual performance in school as well as other basic information and application information of students. And then build an integrated information system for grid service management of university students in accordance with the design requirements for "institutionalization, modulation and integration".

3.1.5 Building operation mechanism

Develop working system and operation procedures related to grid-based management of university students.

3.2 Goals of application of grid-based dormitory management

3.2.1 Acquiring information

Give play to the role of grid members, university and college leadership, staffs in charge of student affairs, staffs in charge of teaching affairs, and security officers to comprehensively and accurately collect student information in a timely manner. The system of grid-based management of student dormitories is a closed working link, which is a scientific problem solving system, as shown in Figure 1.
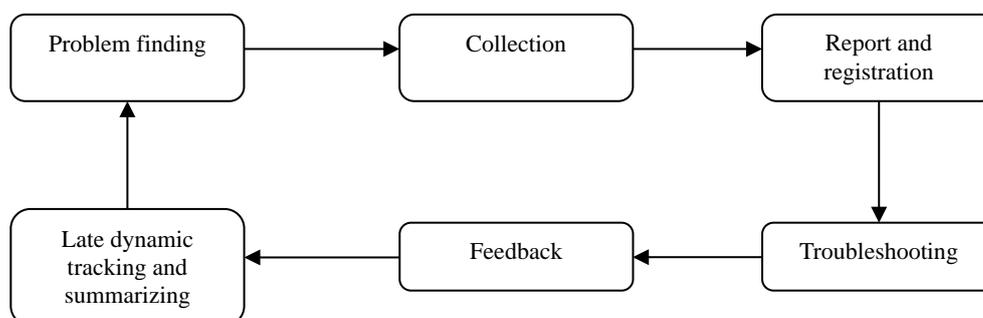
Figure 1   The System of Grid-Based Management of Student Dormitories

3.2.2 Management implementation

Fully use grid-based management tools to improve and strengthen daily management of students, so as to ensure their safety. Try to find and resolve disputes, give a timely report and take effective measures for management through analysis and comparison of related information.

3.2.3 Providing service

Include studies, life, health and safety, career guidance, subsidization and other service items of students in the service management platform, realizing "one-platform management, one-stop service and all-in-one transaction".

3.3 Grid-based dormitory management ideas and methods

Reasonably classify responsibility grids according to the number of class leaders and the quantity of student dormitories to establish management systems at the level of department, class and dormitory. Grid-based management is based on division of grids, which is in accordance with the principle of "full coverage, clear definition, no blank, no overlapping", requiring that grid division should be conducive to responsibility assignment and facilitate investigation into students and reasonable solution of the problems efficiently. Colleges and departments appropriately allocate figures within grids to establish high quality management service teams with good traits. Members of each team have to pay regular to visit to dormitories of the students within the grid for talks to collect and deal with questions and comments presented by students. Grid-based dormitory management system runs mainly by relying on the following mechanisms:

3.3.1 Information collection mechanism

Heads of dormitories of each class should collect dynamic information in time about students within the grids by conversation, observation, etc., and keep in contact with teacher in charge of the class and institution by email, QQ, We-chat, short message and call, to make the channel of information feedback unblocked.

3.3.2 Regulating handling mechanism

In accordance with the principle that "persons-in-charge of students gather collected information, college or department dormitory managers coordinately solve problems", appoint specialized staffs for dormitory management within the department and record received information in time, to ensure that the problems can be effectively handled in a timely manner.

3.3.3 Supervision and feedback mechanism

Recorded incidents are subject to a supervision system, and the solved problems should be marked in the register book; as for any problems that fail to be solved in time a result of objective condition restriction, dormitory managers should make timely coordination and report to leadership in a timely manner, so that the problems reported by students can be settled and answered.

4 Significance of Grid-based Dormitory Management Model on Management of University Students

4.1 Having realized transformation of student management from extensive style to refine style

As the students born after 1990 enter universities, campus life is becoming richer as those students have strong curiosity and a wide range of knowledge with excellent ability of learning, critical thinking and expression, but they are lack of sense of social responsibility and times mission. Besides desiring to learn knowledge at school, they have increasingly diverse and personalized demands, so management of students is required to change from extensive style to refine style. The grid-based student dormitory management system with advanced foreign grid-based management concepts, based on segments of responsibility grids to carry out meticulous management of students in dormitories, has greatly enhanced effectiveness of management and contentedness of service.

4.2 Having realized transformation of student management resources from "strip-strip" based style to "strip-block" based style

For a long time, there have been limited resources for student management as it is the most grass-root work for the resources are not organically integrated at the lowest level. By introduction of grid-based management to integrate resources to the grass-root level, the transformation from solely relying on department student managers to integrating all forces including student cadres across the department, maximizing the Party's organizational advantage and improving the efficiency of student management work.

4.3 Having realized transformation of student management from experience based style to democracy and science based style in decision making process

As there are more secrets, interests and other issues of students are involved in dormitory management, how to fully respect students and take into account of interests of students in all aspects in decision making process is a quite practical problem. Although opinions of students were emphasized in decision making process before, there were some problems such as insufficiency and incompleteness of their opinions and acquired information resulting in flawed decisions and execution block. Introduction of grid-based management system of student dormitories requires student cadres to go deep among students to listen to opinions face to face, so as to make decisions on the basis of opinions and wisdom's of a wide range of people, to promote democratic and scientific decision-making process.

4.4 Having realized transformation of student management patterns from relatively closed style to more open style

Grid-based student dormitory management system further promotes openness of the college in student management patterns. The ideas of taking students as the core and doing practical and good things for students are followed to integrate resources and innovate student management mechanism, so as to maintain stability and safety on campus. Through this model, efforts are made to establish a full-coverage and full-service dynamic management mechanism in the work of managing students, to enhance the vitality of student cadres in student management and further improve the mechanism of management of students.

5 Conclusions and Expectation

Compared with the traditional management thought, problems arising from management activities can be detected in a timely manner with prompt feedback by grid-based management, and targeted solution can be made to such problems, which is helpful to overall and comprehensive management of the organizational resources.

Grid-based dormitory safety management is implemented to establish a grid-based management mechanism "horizontal to side, longitudinal to bottom, crisis-cross, fully covering, grading managed, responsibility well defined, layer based responsibly performing with responsibility assigned to individual", where each performs its own functions, interacts with each other, and performs comprehensive supervision; establish and perfect all management systems, strengthen supervision systems, realize transformation of student dormitory management from working by a few to working together, from extensive style to refine style, from periodic movement to normalization; develop a long-term mechanism of institutionalized, standardized and normalized student dormitory management, so as to continuously improve safety management of universities and realize the goal of establishing a safe and harmonious campus.

In the near future, with the combination of artificial prevention and technical prevention, the Grid-based dormitory safety management system will be established to optimize the process

management constantly, and improve the scientific level of college dormitory management.

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Soft Power in Wuhan: Results of A Survey of Building the World City and Attracting Overseas Talents

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Abstract: This paper investigates the soft power in Wuhan from building the world city and attracting the overseas talents. It based on a sample of urban construction in Wuhan for recently years. The findings show that there are some unbeneficial factors for Wuhan to become the world city like weak innovation ability, undeveloped international capabilities, severe ecological environment and low quality of human resource and other issues. And the conclusion is drown that Wuhan should learn from international practices, establish international talent resource, improve the multicultural capacity of personnel structure, and attract overseas talent through multiple approaches in order to achieve an international talent market allocation.

Key words: Wuhan; Word city; Soft power; Overseas talent

1 Introduction

In 1990, Joseph, a professor at the Kennedy School of government at Harvard University, published the article "power soft" in the famous American magazine "foreign policy", which declared the birth of the concept of "soft power". He argued that soft power was the ability of a country to build a state of affairs, with the aid of this situation, which enables other nations to develop their own tendencies in a manner consistent accordance to their own tendencies and interests. Joseph Nye proposed the concept of soft power, in the international competition pioneered the new field, in a certain extent, long-term latent in the international relations thought, culture, value outlook and political system of fighting clear open and the formation of the theory, so as to promote this series of disputes by ideological differences to the evolution of the cultural field (Joseph S. Nye Jr., 1990). In this sense, soft power is an important performance of the national comprehensive competitiveness.

The concept of urban soft power is mainly used in the academic circles, and it is mainly used to explain the resources or elements of soft power. Ma Qingguo scholars put forward: "in the city competition, through the construction elements of non-material culture, government management, citizen quality, constantly enhance the culture of influence, the political attraction, public cohesion and city image of affinity, thereby enhancing the overall urban competitiveness." (Ma Qingguo, 2007). the city's soft power is defined as "the city with its culture and philosophy as the essence of the cultural soft power, social soft power and the soft power of the environment" (Chen Zhi, Yang Lake,2008). The above scholars incline to explain urban soft power from the elements, but the soft strength emphasis on inner city soft power, for the globalization of today, how to help the city into the global urban network in the external soft power is also very important, and this external city soft power manifestation is the international communication. Therefore, Zhuang Delin scholars proposed "international metropolis of soft power should be both a city soft power of common features and the international metropolis of personality characteristics. There are 6 main sources of soft power in international metropolis: urban culture, public management, human capital, urban innovation, quality of life and international communication." (Zhang Delin, Chen Xinkang, 2009)

2 The Basic Features of the World City

As we all know, the world city is the high-end form of international metropolis, in the global political, economic and cultural aspects, all show its tremendous influence. From the world recognized world cities, such as New York, London, Paris and Tokyo, can be summed up the basic features of the world's cities: the strong economic strength. The specific performance is that the economy is large, the per capita GDP is high with high degree of aggregation of international headquarters, and the economic structure is the core of the modern industrial system. The second, the international high-end resources flow and trading is huge. Because the world city as the international metropolis of high-end form, itself is a resources sufficient liquidity, efficient allocation of state and space, mainly in the convergence of top talent, high levels of information, strong international competitiveness, and the three-dimensional traffic system with high speed. Third is a huge global influence. As the external performance of the city's

soft power, the influence of the world city shows the cultural and public opinion, and reflects the organization and system of binding (Zhuang Delin, Yang Ying, 2010).

3 Analysis on the Soft Power of Wuhan's Construction of the World City

3.1 Profound cultural heritage

Cultural atmosphere of the city is a city of psychological formation and plays a role in the process, as long as people enter the city, you will feel and enjoy a "cultural city", it is infectious, virtually pervaded the city space society "climate" (Lian Yuming,2010). Wuhan historical and cultural heritage are too numerous to enumerate, such as the Yellow Crane Tower which is called "the first floor in the world", and the Qingchuan of China Pavilion which is famous in Hubei. They are all the true portrayal that Wuhan is China's famous historical and cultural city. Wuhan has the Hubei Province Museum, Wuhan Museum, Panlong of China city museum and other famous museums, including Panlong of China city museum was discovered for the first time in the middle reaches of the Yangtze River region of China which the city site was the early Shang Dynasty (Wang Xingchang, 2006). City cultural atmosphere is so, and it is the result of a number of things to play a role beyond these specific matters and as an "impression" left in people's minds.

3.2 Superior geographical position and rich resources

The city's cultural soft power is built on the basis of the hard power, which is the economic foundation of the city, and the premise of economic development and city's cultural soft power is convenient transportation, Wuhan has obvious advantages in this aspect[1]. Because of Wuhan since ancient times enjoy the title of "thoroughfare of nine provinces". This is due to its geographical location within the city richly endowed by nature, from rivers, lakes and mountains together, land and air traffic is very convenient. In 2009, Wuhan has become the country's first comprehensive transportation hub of the pilot city. In addition, as a core element of the construction of city soft power, the development of science technology and education, especially the cultivation of innovation is essential talents. Wuhan has abundant educational resources according to incomplete statistics, and up to 2014 there were 98 colleges and more than 1.0726 million graduate students in Wuhan, which was the number one in the world big cities. See the table1: list table of patent applications in Wuhan (2014)[2].

Table 1   List of Patent Applications in Wuhan (2014)

Category of patent application	number	compared to 2013	Percentage
Invention patent application	11871	21.9%	42.7%
Utility model patent application	13783	-1.9%	49.6%
Design patent application	2148	13.2%	7.7%

3.3 Underdeveloped function of internationalization

The development of non-governmental organizations is imbalance, and the lack of international influence is the weakness of Wuhan City, intergovernmental organization and the international meeting industry development is relatively backward, which great limits the Wuhan City soft power promotion. For example, to attract the world's top 500 settled in the measure, the gap is obvious compared with some domestic city. Up to now, the world's top 500 enterprises reached 228 which settled in Wuhan, but lower than Chengdu (283) and other cities; at the same time, there were only 2 regional headquarters overseas top 500 and 6 foreign bank branches or offices in Wuhan, and there were large gaps compared with Beijing (the regional headquarters of a Multi-National Corporation were 82) and Shanghai (which were 347) (Zhang Zhen, 2013).

3.4 Inconspicuous talent advantage

According to the number of the sixth national population census summary, the number of college students was 25191 that the educational level of the resident population per 10 million people in Wuhan ranked third in the country, the educated population was 3.8 times the national average, which was Tianjin's 1.4 times and Shanghai's 1.1 times. But there was still a big gap compared with the developed countries. The proportion of college graduates in the United States was 60%, equivalent to 4.3 times

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[1] Li Mo.2049 Wuhan to Build the World City will Present the "1+4" Layout [EB/OL], http://news.cnhubei.com/xw/wuhan/201311/t2770807.shtml

[2] Wuhan Municipal Bureau of Statistics.2013 Wuhan national economic and social development statistics bulletin [R], http://www.stats-hb.gov.cn/wzlm/tjgb/ndtjgb/whs/whs/108937.htm

higher than that of Wuhan; Japan and South Korea both was 30%, equivalent to 2.1 times that of Wuhan.

However, there are some problems about talent structure in Wuhan, some talented people who are specialized personnel in different fields are too many to waste, and some talent shortage can not meet the social needs. At present, the advantage in the world city is very obvious among high-tech industries, the financial industry and the cultural and creative industries. For example, there are 50%~55% employees staff were concentrated in these three industries in New York, London and Tokyo, Wuhan accounted for only 1.25% in the financial industry and cultural creative industry personnel, especially in the financial industry, while New York and London were more than 10%. Such a disparity gap proved strongly that talent industry distribution was not reasonable in Wuhan, especially in the macro industry and key personnel the industrial distribution.

3.5 Lack of scientific and technological innovation ability

R&D funds account for the proportion of GDP; R&D intensity is an important indicator of a country's level of investment in science and technology. In 2013, the high-tech industrial output values were more than 56.0447 billions¥ which increased 23% in Wuhan, and the value of high-tech industries increased 17.019 billions¥ which increased 25.6%. In the first quarter of 2014, the high-tech industry output value of the implementation was 2.55 billions¥ which increased 22.35% in the first quarter in Wuhan. The funds for research and development invested were a substantial promotion, and research and development expenses expenditure were 255 billion¥ which accounted for the proportion of the city's GDP reached 2.74% in 2013, although the total progress of R&D was larger, R&D investment in structural was obviously insufficient in Wuhan, because according to the international accepted standards, enterprises would be strong competitiveness if only corporate R&D funds accounted for operating income were more than 5%. But in 2013, there were only four enterprises that the proportion was more than 5%, and 33 Enterprises that R&D cost less than 1%, even 32 Enterprises that R&D was "zero investment" phenomenon. There was still a big gap between the world 500 strong enterprises in 5% to 10% level and Wuhan.

3.6 Worrying habitat environment

The greatest feature of Wuhan city is lakes and rivers crisscross, dotted. Existing total surface area is 2117.6km^2, accounting about 25.0% of Wuhan city land area. But its lake pollution situation is very serious, the specific data see table 2. Secondly, in the emissions of pollutants and waste gas, the total emission of industrial waste gas to 5873.2 billion standard cubic meters, and this increased 4.27% than in 2013. Motor vehicle emissions were 5.14 million tons, and this increased 2.8% than in 2013. Smoke (powder) dust emissions reached 2.75 million tons and this increased 7% than in 2013; the industrial smoke (powder) dust emissions 2.16 million tons, and this increased 9.1% compared to last year[1].

Table 2   Wuhan City Lake Status Monitoring List (2014)

Comply with the standard of grade II	Comply with the standard of gradeⅢ	Comply with the standard of gradeⅣ	Comply with the standard of grade V	Below the standard of Grade V	total
3	3	44	22	15	87
3.4%	3.4%	50.6%	25.3%	17.3%	100%

4 Results

4.1 Establish the international talent Heights to attract overseas talent return

Wuhan government should establish the open concept of talent in line with the international rules, think the problem of talents in the global open environment, and attract overseas talent to return to work, change the past "rigid management" into "flexible flow" to talent as the goal, make full use of global resources through the "flexible flow", and really construct the open international highland of talents in Wuhan. At the same time, the government should accelerate the establishment of the socialist market economic system to adapt to the talent, innovation and personnel system from the "policy" to "institutional innovation". One is to really form the employment standard with "paying more attention to capable and performance", and improve the selection and appointment of personnel. On the other hand, in order to Firstly, the government should study the internal distribution equalitarianism of entrepreneurs for innovation the distribution system to effectively stimulate. Second, we should actively explore the implementation of technology shares, intellectual capital and other elements of the incentive to

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[1] Environmental Protection Bureau of Wuhan City, Wuhan City, City, the State of the Environment Bulletin.2014, http://cjrb.cjn.cn/html/2015-03/20/content_5426931.htm

participate in the distribution of the form for the scientific and technological innovation talents.

4.2 Focus on the integration of Eastern and Western culture

With the acceleration of the trend of economic globalization intensifies and international talent flow, the leap of global culture and Western culture fusion is inevitable. First of all, in the talent management culture, we must overcome the past concept that Education equals talent, advocate "performance culture", and establish a scientific, objective and fair performance appraisal system (Wang Weiyi, Wan Xiaolan, 2005). Secondly, we should establish "using talents culture overseas". In the introduction of talent, we should be tolerant to the culture identity difference on some overseas talent, truly tolerant people and retain people; in the selection of personnel, we should pay attention to the elite stage of elite talent and insist on promotion for merit rather than for seniority. Finally, we should the implement a "win-win" talent management culture and carry out cooperation and exchanges with the international talents in accordance with the principle of mutual benefit and common development.

4.3 Set up the international talent market

In the international talent market, we should establish the Wuhan international talent agencies in New York, London, Paris, Tokyo and other international metropolis, participating in the competition for talents in the world with a positive attitude and spirit. We should speed up the selection of high level talent and "international intelligence", and introduce the world-class masters. Therefore, Wuhan should first develop and build an international level advantage and potential of the park and the industry, and provide excellent working environment and high-end platform to attract the world's highest level of experts and personnel; secondly, Wuhan should establish and improve the information base overseas senior talents, which included overseas senior experts database, senior experts overseas project library, overseas cooperative venture capital enterprise database, and so on, understand and master the international Talent dynamics in time. At the same time, we should set up a number of highly flexible head hunting company, as well as open and transparent bidding mechanism, and format the talent selection mechanism in line with the world trend, introducing the world-class master (Xu Wanqiang, Lan Lan, 2014).

4.4 Learn from international practice in attracting overseas talent

The developed countries are inclined to attract overseas talent who are in urgent need in the immigration policy of their talents. One is the high salary system, let science and technology people can realize their own value; Wuhan government should allocate special funds to improve scientific and technological personnel wages, especially to ensure the outstanding talents a good salary level. The other is to give the promotion opportunity, let employees feel attractive, such as foreign experts in Singapore now can participate in the administrative and business management from the past to undertake consulting work, and some even have served in the government department or bureau level cadres, served as president of the important duties in colleges and universities. Wuhan should innovate boldly on the nationality issue, only to see whether it is suitable for the post before the election, also should emphasize the performance in the promotion regardless of nationality; the third is to provide a good social welfare, Such as the Canadian government want to strengthen the "Silicon Valley of the north" high-tech industry in Ottawa, and build specialized kindergarten for the "Silicon Valley of the north" young workers which let high-tech talent to systemic heart into work (Li Xiangqian, Xiang Hong,2005). The fourth is to create a good environment and opportunity. Such as the Singapore government to vigorously carry out job training and foreigners in Singapore the financial sector can attend funded by the government of domestic and foreign training, and so on.

5 Conclusions

As an ancient city with deep historical and cultural traditions, Wuhan must be built up from the traditional culture of Confucianism to the integration of the cultural construction of the western culture, to achieve a qualitative leap in the world city. In a word, in order to build a world city for Wuhan, we must take positive measures to attract overseas talent to return, avoiding the permanent loss of talent, and making it become the ultimate destination of talent.

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Research on the Development of Social Organizations of Persons with Disabilities Based on AGIL Model

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Abstract: Based on Parsons AGIL model, this paper analyzes the current situation and problems of the development of social organizations of persons with disabilities in China. We argue that an AGIL model which dynamically takes four parts "adaptation", "goal achievement", "integration" and "mode latency" as a coherent whole is an important tool to analyze the development of social organizations of persons with disabilities in China. First, we analyze the current environment of these organizations and the problems, and define the development goal of them, then we bring up solutions according to the goals, that is, integrating resources based on the existing community grid management system, with the cultivation of professional social workers, establishing micro societies of persons with disabilities and social support networks with persons with disabilities as the principal part, so as to solve the problems of social capital shortage of persons with disabilities, and their lack of care after disintegration of unit system and the government withdrawal from specific social services, thus to empower persons with disabilities and social organizations of them. In this paper, a development framework of social organizations of persons with disabilities is constructed, and a development model of social organizations of persons with disabilities was brought up in a dynamic analysis way. Findings show that, the analysis based on AGIL and its application is conductive to the development of social organizations of persons with disabilities.

Key words: AGIL model; Social organizations; Persons with disabilities

1 Introduction

The cause of persons with disabilities in China has made remarkable achievements ever since the reform and opening up. The state has promulgated laws for protection of persons with disabilities, government of all levels have established a range of institutions involved in work of persons with disabilities, and formulated and implemented work plans for developing the cause of persons with disabilities; under such circumstances, persons with disabilities have been improving their quality constantly, and their living conditions have also been significantly improved; in the meantime, a good social custom of supporting and helping persons with disabilities has further formed. Development of social organizations of persons with disabilities has made certain progress in China.

Studies have shown that current development of the cause of persons with disabilities is still facing a severe situation. According to statistics, in 2010, China's per capita disposable income of families of persons with disabilities is merely equivalent to 59% of the national average level; Engel coefficient of families of persons with disabilities is 8.1% higher; unemployment rate of urban persons with disabilities is twice higher; the proportion of well-off people among persons with disabilities is 20% lower; 28.6 percent of school-age children with disabilities do not receive compulsory education; 38% of urban and 70% of rural persons with disabilities rely on family support. To ensure the long term development of the cause of persons with disabilities in China in this ever changing new era, social organizations of persons with disabilities will play an increasingly important role. Under the background of the government relaxing control over social organizations and issuing encouraging and supporting policies, introduction and popularization of the concept of "big society, small government", and improvement of citizenship consciousness of the masses, the number of new style social organizations of persons with disabilities (mainly in the form of non-profit and non-government organizations) different from traditional ones will increase, and they will also develop in both vertical and horizontal dimensions. The impact of social organizations of persons with disabilities on the development and welfare of persons with disabilities will be increasing. Therefore, it appears more and more important to conduct researches on social organizations of persons with disabilities.

Based on system theory and "quartering" of behavior system, sociologist Parsons established the famous "AGIL" functional analysis framework. The domestic academic circles have made a lot of achievements on AGIL Model and application research of it on analysis of social organizations so far.

AGIL Model analysis and application research on social organizations mainly focus on enterprises, economic and educational organizations in rural areas and areas inhibited by the minority nationalities. Research on social organizations of persons with disabilities has started, and has made a small amount of achievements. Yet, now research on social organizations of persons with disabilities with AGIL Model analysis and application research is still blank. Therefore, this research is conductive to fill the blank of research on social organizations of persons with disabilities from different aspects, is quite innovative; and extends the application research of AGIL Model to some extent.

2 Relevant Concepts and Reconstruction of AGIL Paradigm

2.1 Several relevant concepts

2.1.1 Social organizations of persons with disabilities

Foreign scholar David Popenoe gives the definition of organization from group in his works *Sociology*. He holds that "A group is a collection of two or more persons having a common identity and a sense of solidarity, members within a group interact and influence with each other, and share specific goals and expectations (David Popenoe, 2011)." Thus it is deduced that "in human society, people have united into groups for a certain goal, and those groups with certain goals are organizations. (David Popenoe, 2011)". While Chinese scholar Zheng Hangsheng divides organizations to two types, "Generally there are two kinds of understanding for social organizations, one is social organization in a broad way, which covers all groups for common human activities; and the other is organization in a narrow way, which means secondary group organization form in respect to primary group, and it can also be called formal social organizations. Such organizations are referred to as groups that people form by coordinating and connecting their actions to realize a certain common goal."

In this research, for the limit of time and data, the definition of social organizations we adopt is the narrow one. Here, social organizations of persons with disabilities only refer to those public and non-profit organizations related to services provided to persons with disabilities, and relevant organizations established by persons with disabilities voluntarily, but not include business organizations that employ persons with disabilities or other organizations.

2.1.2 Empowerment

"Empowerment" is a word used in social welfare, which means to make people feel greater and more sense of responsibility, and have the ability to do what one should do. The use of "empowerment" can date back to 1970s, when Solomon, a scholar of Columbia University of the United States, suggests empowering discriminated African-American black people, thus introduces the concept of "empower" into social work research. Even in the agenda of community work, this concept is often brought up. And it has become one important value concept and work mode promoted in social work and the practice. "Empowerment" is a process in which an individual gain more confidence and control ability over the life space in the active interaction with others and the environment, and promotes the use of opportunities and environment resources, so that more individuals could get help to gain more "power".

In the research, we will propose to empower persons with disabilities through analysis and route of AGIL Model, to make them improve their "all power", and survive and live better in society.

2.2 Application of reconstruction of AGIL model into the research

2.2.1 AGIL analytical model and its application

AGIL model is an analysis model which is the exploration result of Parsons when he studies on and describes the social system. It is widely applied into analysis and study on organizations. Parsons' theory of action systems holds that the "action system" is divided into "behavior organic system", "personality system", "social system" and "culture system" four subsystems. In social system theory, the social system is the focus of Parsons' analysis. He defines "social system" as: the social system is constituted of many interconnected individual actors, and it exists in at least one natural or social environment. Actors in the social system take "happiness maximization" as their behavior orientation, and they are closely connected to the surroundings (including other actors). Symbols exist inside the social system, which are constructed by culture and have won universal recognition of the members, and they define and coordinate the relationship between behavior orientation of actors and the surroundings. (Parson, 2008)

The author thinks that, a dynamic relationship exists among the four basic elements: A (adaptation) means adaptation to surroundings, within a certain period of time, social organizations and surroundings involving persons with disabilities are adaptable to each other to some extent, since surroundings are changing constantly, to respond to new challenges and opportunities brought about by change of

environment, organizations of persons with disabilities must make corresponding changes to achieve development. Therefore, it is quite necessary to make analysis on surroundings. Based on such analysis, social organizations of persons with disabilities need to determine new G (goal) for development, that is to say, we may determine the development goal of social organizations of persons with disabilities through analysis. Then, with the idea of I (integration), put forward development mode of organizations of persons with disabilities based on grid community management, and the mode will impact cultural and legislative institutions, that is L (latency). Such latency will form a new culture, new surrounding (A). Social organizations of persons with disabilities will develop in this dynamic loop.

A Behavior Organic System	G Personality System			
L Culture System	A Economy I:	G Politics		

	L
	   Socialization
		A I:
		     Co
			G	

		L	I	
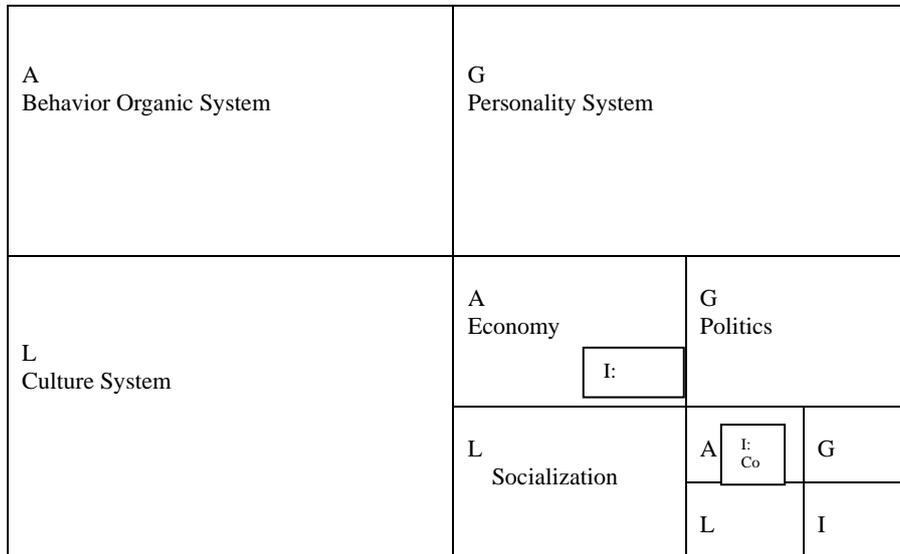
Figure 1   AGIL Functional Analysis Model

A-Adaptation, acquiring sufficient resources
G-Goal Attainment, settling and implementing goals
I-Integration, maintaining solidarity or coordination among the subunits of the system
L-Latency, creating, preserving, and transmitting the system's distinctive culture and values
Source of data: Hou Junsheng: Western Sociological Theory Course, Nankai University Press, 2001

Table 1   Four Basic Elements

A adaptation	G goal attainment
Present surroundings of organizations	Goals organizations need to achieve
Impact of goal attainment to culture and institutions	Ways for goal attainment of organizations—establishment of social organizations of persons with disabilities based on grid
L latency of mode	I integration

Here, A means the develop surroundings of social organizations of persons with disabilities; G means the development goal of social organizations of persons with disabilities; I means construction of social organizations of persons with disabilities based on grid; L means mode latency and the impact on surroundings. (Table 2)

3 Development of Social Organizations of Persons with Disabilities in AGIL Model

3.1 Development environment of social organizations of persons with disabilities

3.1.1 The roles of government, law etc. in construction of social organizations of persons with disabilities

In construction of social organizations of persons with disabilities, the government is one of the key factors in fulfilling the responsibilities of providing public services; it rests on the protective level of setting the demands of service objects, or persons with disabilities, making a comprehensive consideration in the supply capacity of fulfilling the demands in realistic level, and protection to the rational interests of service producers; it takes various factors into comprehensive consideration and

formulate reasonable laws and regulations and policies. Since 1991, at the level of laws, special stipulations on services for persons with disabilities in China mainly concentrate in Law of the People's Republic of China on the Protection of Disabled Persons (as of effective in 1991). In addition to that, 36 laws have stipulations on services for persons with disabilities including the Marriage Law of the People's Republic of China, the Law of the People's Republic of China on the Guarantee of the Rights and Interests of Women, Labor Law of the People's Republic of China etc. At the level of administrative regulations, there are Regulation on the Education of the Disabled, Regulation on the Employment of the Disabled (May 2007), Deductions and Exemptions of Taxes for the Disabled etc. formulated by the State Council. Moreover, some rules and regulations issued by relevant departments and rules and regulatory documents issued by local governments of all levels have made specific requirements on services for persons with disabilities in accordance with local conditions; and institutions of all levels of the central government and local governments have formulated proportional policy for the disabled, preferential policy for the disabled, and stipulations of barrier-free for persons with disabilities etc. (Liu Qionglian,2011)

Besides, the disabled persons' federations of all levels, as an actual part of the government, have played an extremely important role in the development of the cause of persons with disabilities in China.

3.1.2 Primary social organizations of persons with disabilities

Currently, social organizations of persons with disabilities in China consist of two parts mainly: disabled persons' federations widely spread all over China and other associations for persons with disabilities.

Inosculating representative function, service function and management function as a whole, China Disabled Persons' Federation is national institutional group of persons with disabilities approved by the Chinese government, a comprehensive social group of "semi-government-semi-private" nature. Meanwhile, in order to better represent, reflect the actual problems of different categories of persons with disabilities, China Disabled Persons' Federation has set special associations inside, such as China Association of the Blind, China Association of the Deaf, China Association of Persons with Physical Disability and China Association of Persons with Psychiatric Disability and their Relatives etc., routine work of these associations are handled by standing body of China Disabled Persons' Federation. China Disabled Persons' Federation also sets branches and sub-branches in all provinces, cities and counties, to publicize policies for persons with disabilities, protect their rights and interests and serve the groups. Grassroots mass organization of persons with disabilities will be established at sub-districts, township, and enterprises and institutions dense with persons with disabilities. (Zhou Pei, 2012)

Also, there are nongovernmental organizations of persons with disabilities. Some of them are established voluntarily by persons with disabilities, such as friendly society of persons with disabilities; some are established by charity persons, such as Puki in Shanghai; others are affiliated to government with relatively independent operation.

3.1.3 Problems faced by development of social organizations of persons with disabilities

1) The government actually assumes the role of social organizations of persons with disabilities

Disabled Persons' Federation should be the most important provider of services persons with disabilities in China, which holds the political and economic resources. But under the situation of various conflicts getting prominent at the transition period of society in recent years, policies and actions of the government have taken on new changes; measures for "maintenance of stability" which pay much attention to social stability are getting more. On the one hand, the government provides services for persons with disabilities through the Disabled Persons' Federation; on the other hand, it conducts management of persons with disabilities through it. Actually the Disabled Persons' Federation assumes management function of this special group of people, persons with disabilities. And the function is enhanced at the present time of prominent social conflicts. Economically and politically, Disabled Persons' Federation are affiliated to the government, the resources for service provision also come from the government. So the services provided to persons with disabilities by Disabled Persons' Federation is actually provided by the government. In this process, the government actually assumes the role of social organization.

2) Impact of social atomization

The urban society management system in transition period in China is facing unprecedented challenges. On the surface, it is shown in frequent occurrence of various social conflicts; while take a deeper look, we will find that the disorder of basic order of urban society management caused by social atomization has reinforced the crisis to a large extent.

With the deepening of reform and opening up of late 1970s, the single form of social organizations

in China "unit system" disintegrated; at the same time, people gradually got individualized, and get out of connection with the society and the groups they used to be in. In this context, along with the disintegration of the unit system, persons with disabilities lost a stable support organization, and lost connection with society. Selfishness and indifference of people caused by social atomization makes impossible of persons with disabilities getting help from surrounding crowds, which results in poverty of the group of persons with disabilities, and their lack of emotional support.

3) Social capital shortage of persons with disabilities and social organizations of them

Persons with disabilities are both the object and the subject of social management of persons with disabilities; both the beneficiaries and promoters of development of the cause of persons with disabilities. While actually, for the limitation of disabilities and impact of mentality, barriers in social environment and lack of social support, numerous persons with disabilities are excluded from mainstream society, lack of the ability of gaining social capital as normal persons; also, since most persons with disabilities are in poor living conditions, there is shortage of social capital for persons with disabilities. Plus the impact of social atomization nowadays, the insufficient social capital is getting more inadequate.

3.2 Development goal of social organizations of persons with disabilities

3.2.1 Needs analysis of the group of persons with disabilities

First, need for poverty relief and support. The need for poverty relief and social support is still the top need among social needs of persons with disabilities. Dim employment situation and limited income etc. result in the strained circumstances of persons with disabilities and their families. According to Maslow's hierarchy of needs, the need for survival is the most fundamental need, and only on this basis, can pursuing for needs of higher hierarchy become possible.

Second, need for employment. Employment is one prerequisite to ensure a stable and permanent income for persons with disabilities. Psychologically, improvement of education level and vocational skills can bring to persons with disabilities more satisfaction and happiness. Low education level limits the possibilities of persons with disabilities improving their life by themselves, and hinders the overall development of the cause of them in macroscopic view. Therefore, it is of vital significance to provide support for employment as well as vocational trainings.

Third, need for rehabilitation and life services. Need of persons with disabilities for medical assistance and rehabilitation training services will be on steady increase, especially with the prominence of China entering the aging society, elderly persons with disabilities are on the increase, the need for medical assistance and rehabilitation training services will also increase together with need for daily care services such as life care.

Fourth, need for cultural and educational services. Most persons with disabilities have cultural competence and cultural needs. Yet for social discrimination, inadequate educational facilities for them etc., persons with disabilities are always constrained in attaining education. In addition, to meet the needs of persons with disabilities for cultural life is related not only to education, but also to other cultural life services in various forms, while cultural facilities specially targeted for the special physiological conditions of persons with disabilities are rare.

3.2.2 The development goal of social organizations of persons with disabilities: to realize public services

Due to changes in social situation, improvement in consciousness of citizenship, and the current difficulties they are in, including social atomization and the government taking steps to exit the field of social services, etc., social organizations of persons with disabilities should take achieving real public services as the goal. To do this, persons with disabilities must get empowerment, to improve their own abilities. From the perspective of social organizations of persons with disabilities, they should be fully aware of the numerous problems they are facing, realize needs of persons with disabilities, and seek for a proper way suitable to the development of organizations based on their needs.

3.3 Integration: construction of social organization of persons with disabilities

3.3.1 Introduction of the concept "grid management"

Community grid management is an innovation based on new technology. Relying on a unified urban management and digital platform, it classifies all communities in a city into unit grids according to certain criteria. By strengthening inspections on components and events in the unit grids, a mode is established with disposal and supervision separated from each other. For the government, the main advantage of this approach is that the government can take the initiative to discover problems, handle them in time, strengthen its capacity on urban management and issues processing speed, and solve the problems before residents make complaints. In this way the previous mode of passive response to issues changes to the new mode of actively discovering and solving problems; second, it adopts digitalized

management tool, which is mainly manifested in the digitization of management objects, processes, and evaluation, by doing this agility, accuracy and efficiency of management can get ensured; third, it is a closed scientific management mechanism, with not only a set of standardized and unified management standards and procedures, but also a closed loop formed by four steps: discovering, filing, dispatching and closing a case, which very effectively enhances the capability and level of management. Because of these features, the traditional, passive, qualitative and decentralized management in the past can turn into the present modern, active, quantitative and systematic management.

3.3.2 Construction of social organizations of persons with disabilities based on grid community management

1) Micro societies in communities based on grid management and its significance

Simply speaking, Community Grid Management is to draw many grids in the community in accordance with the specific circumstances, and then assign community staff to different grids, and the staff will be responsible for residents in the grid he/she belongs to, thus plays the role of management and control. Based on the grid administrator's knowledge on the actual situation and the social relationship he/she has established with persons with disabilities in the grid, the administrator may assist persons with disabilities in establishing social networks, so as to build "micro societies" in the grid. Then these micro societies can be connected on the social network of all grid administrators. For the volunteer nature and moderate autonomy among these micro societies, organizational rigidity and social support network whose services are not up to the needs of persons with disabilities caused by huge organization can be avoided. Such social support network just plays the role of enhancing the social capital of persons with disabilities and social organizations of them, thus achieves the purpose of empowering persons with disabilities.

2) Social workers cultivate micro societies

Social workers are professional workers who follow the value of helping people to help themselves, use professional methods such as case work, group work, community work and administrative work etc. to help organizations and individuals to exert their potential, coordinate social relations, solve and prevent social problems, and promote social justice. In the process of establishment of the micro societies, social workers will play a big part. Due to physical conditions, persons with disabilities may have some problems in terms of social contact, and social workers will play the role of link in it. They use professional work skills, gain resources through various channels, solve problems, and promote the establishment of micro societies of persons with disabilities in the grid. In this process, social workers are "companion" of organization building, "connector" of various resources, "coordinator" of stakeholders, and "facilitator" for exchanges and actions of persons with disabilities.

3) The relationship between social workers and grid administrators

In societies building, the relationship between grid administrators and social workers is an unavoidable issue. Grid administrators have the background of community staff, mainly responsible for the management of population information. Social workers as a third party to intervene between the government and persons with disabilities, are direct providers of services for persons with disabilities. Different from grid administrators, at work, social workers are spokesmen of the interests of persons with disabilities, and facilitators for establishment of micro societies from bottom to top.

However, with the development and popularization of social work career, a lot of people who work in the community become social workers through learning and passing the qualification exam. Therefore, in some communities where conditions are not ready to hire professional social workers, grid administrators are actually playing the role of social workers.

4) The role of persons with disabilities

Persons with disabilities are the service objects as well as principal part of micro societies, which have been established with the assistance of social workers and grid administrators (sometimes they may be the same persons). Persons with disabilities may take initiative in the process of establishment of micro societies, when possible, micro societies can be handed over to them for self-management.

3.4 Model latency and the impact to environment

With the establishment of micro societies and the support networks, power of persons with disabilities is enhanced, social organizations of them have developed and social capital is enriched. Difficulty of persons with disabilities can be solved, their needs can be satisfied. Opportunities for persons with disabilities to voice in the society will increase, persons with disabilities will have more impact on society, and people will pay more attention to persons with disabilities and care for them more. This will have an impact to formal and informal social systems.

In the formal institutional level, with the increase of this impact, it will get fixed through some

clear form in organizations and in the country, and supervised by the organizations of the actor and ensured its implementation through coercive power, thus formal institutions will be affected. Laws, rules, policies, regulations and agreements etc. related to social organizations of persons with disabilities will be established and updated. For example, restrictions of laws and policies on construction of social organizations of persons with disabilities may reduce, social organizations of persons with disabilities and corresponding association organizations may establish their own norms and regulations, so as to make social organizations of persons with disabilities develop in unformal institutional level from formal institutional level, and relevant values of concepts, ethics, morals, customs and ideologies will also be affected. Interpersonal indifference and the sense of alienation from society of individuals caused by social atomization will also get eased.

With the formation of the new environment, which is conductive to latency of the model, social organizations of persons with disabilities will make development in a relatively stable and continuous environment. In the meantime, according to the logic of the previously described AGIL model, when new problems arise, we can repeat this process, so as to achieve new development for social organizations of persons with disabilities. In this "spiraling", the cause of the persons with disabilities will gain sustainable development.

4 Conclusions

Based on Parsons AGIL model, the research explores one method to make interpretations on social organizations of persons with disabilities, which is to dynamically see the four parts of AGIL as a whole in link. When analyzing and solving the development problems of social organizations of persons with disabilities, first make analysis on the current environment of such organization and the problems in it, define the development goal of the organizations, and then put forward resolutions according to the goal, in other words, integrate resources based on the present community grid management mode, with cultivation of professional social workers, establish micro societies of persons with disabilities and corresponding social support networks with persons with disabilities as principal part, so as to solve the problems of social capital shortage and care loss of persons with disabilities which they face after disintegration of unit system and the government withdrawal from specific social services, and thus to empower them and social organizations of them. Then a social custom of supporting for persons with disabilities will form, and it can also promote policy and legislation of the government and NPC, so that a new environment that conforms to the development of the cause of persons with disabilities is created to maintain the mode. When it comes to new challenges, we can also make adjustment according to the model, and finally promote the development of the cause of persons with disabilities.

It is sure that for the time limit and constraint of the author's experiences and knowledge, there are still many problems regarding the research, such as, the specific methods and means for establishment of micro societies; the adaptability of this dynamic AGIL analysis model; whether there are better models to make analysis and give solutions to the problems etc. The author will proceed with answers to these questions with colleagues and scholars who have read this article.

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A Comparative Analysis of Multimodal Construction of Discourse Meanings in Chinese and Foreign Academic Speeches

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Abstract：Academic speeches are typical multimodal discourses, in which all kinds of modes are mutually dependent and cooperative to realize the academic speeches. Meanwhile, they construct and transmit the discourse meanings of the speakers. This paper adopts two academic speeches as samples to explore the differences in Chinese and foreign academic speeches. Based on Norris' multimodal interaction theories, this study adopts ELAN software as the mode annotation device. Three perspectives will be explored and analyzed comparatively, namely, mode relations, the dynamic construction of multimodal contexts, and multimodal construction and transmission of meanings. It is expected to provide a new angle for multimodal discourse analysis.
Key words: Multimodal interaction; Academic speeches; Meaning construction

1 Introduction

With the development of all kinds of media, the ways of information transmission have become more diversified. Discourse analyses are no longer pure linguistic ones, and more non-linguistic factors will be embodied in them. Derived from Halliday's systemic metafunctions in Functional Grammar, Kress & van Leeuwen (1996) made systematic studies on the meanings of images and inquired into how the different modes integrate and construct the overall meanings in social interactions. They noted that the meanings of discourses in social interactions were not merely realized by a single modality, but realized by an integrated use of multiple modes. Then in 2001, they put forward the framework of multimodal discourse analysis. They believed the same meaning can be expressed by different modes in a particular cultural context (Kress & van Leeuwen, 2001). Multimodal theory has been widely applied in analyzing discourses in social interactions currently.

At present, the analyses in China or abroad either focus on technological analyses, or focus on the application study on teaching. In China, the representative studies are conducted by Zhang Delu, Hu Zhuanglin and Zhu Yongsheng. Zhang Delu(2009) explores the synthetic theoretical framework for multimodal discourse analysis of different modes in multimodal discourse and their realization in foreign language teaching; Hu Zhuanglin (2007) studies construction of multimodal English classroom for the cultivating of multimodalization; Zhu Yongsheng (2007) examines discourse meanings, whether the same type of discourse can realize different ideologies, and how the relationship between discourse and ideology should be analyzed. These researches enrich and deepen the understanding of multimode in linguistic field, and promote its application in teaching and linguistic studies.

Academic speech is a kind of prepared and extemporaneous discourse. It is an important type of academic communication. Through academic speeches, the scholars from all fields publicize their research results and exchange ideas and new viewpoints with their peers. In this way, they can not only put forward new theories or ideas, but promote their own fame. Academic speeches are typical multimodal discourses, which include the usage of languages and many diversified modes. This type of discourse has raised academic attention, and relevant studies have been carried out. Hyland (2010) analyzed tone and mood, and discovered that although different speakers presented

Different speech characteristics because of varied personal experience and academic background, but they shared some common points, such as the use of affirmative modal verbs, a great amount of use of tone modifiers, the frequent use of declarative sentences, the use of present tenses and active mood, etc.

Based on the previous studies, this paper will further explore how the kinds of modes are mutually dependent and cooperative to realize the academic speeches, and how they construct and transmit the discourse meanings of the speakers.

2 Research Methodology

2.1 Research questions

In this study, the following questions will be explored and analyzed: (1) In Chinese and foreign academic speeches, whether there are differences in the selection of different modes by the speakers? (2) What are the relations among the selected modes? (3) Whether the modes play the same functions in constructing and conveying meanings? If the answer is "No", then, what are the differences? (4) In what ways do the different modes interact to realize the construction of meanings in academic speeches?

2.2 Corpus selection and research framework

This paper adopts two sample speeches to make comparative analyses: Sample One is a TED academic speech from Eli Pariser and Sample Two, an academic speech from Zhang Weiwei, discussing "Viewing China Model in Global Comparation" in 2014. Eli Pariser, a Pioneering online organizer, gave a speech on "Beware Online Filter Bubbles" in 2011 to present the new idea about how personalized search might be narrowing our worldview. Zhang Weiwei, a distinguished professor of Fudan University, focuses his studies on China Model. The two sample speeches are academic speeches which bear the typical characteristics of Chinese speeches and foreign speeches.

This study adopts ELAN software as the Mode Annotation Device. ELAN software can transcribe video and audio texts, which is very convenient in establishing different transcription levels for different speakers.

This study adopts Sigrid Norris' (2004) Multimodal Interaction Analysis as the framework to explore the differences in Chinese and foreign academic speeches. The framework includes the unit of analysis in multimodal discourse analysis, different communicative modes and features of different modes in human interaction. According to Norris (2004), a communicative mode is a "heuristic unit that can be defined in various ways and has no clear boundaries". She proposed nine modes in her framework: spoken language, proxemics, posture, gesture, head movement, gaze, music, print, and layout.

This paper will adopt Norris' mode clarification, but cancel the mode of music since in academic speeches, music is rarely used. In coding scheme, hand movement is adopted in analyses. The modes of print and layout are mainly presented in PPT designing.

Three perspectives will be explored and analyzed comparatively, namely, mode relations, the dynamic construction of multimodal contexts, and multimodal construction and transfer of meanings. It is expected to provide a new angle for multimodal discourse analysis.

3 Dynamic Analysis of Differences in Constructing Discourse Meanings

With the gradual expansion of network information and the wide application of modern media technologies, non-verbal modes tend to play more and more significant roles in meaning construction. The multimodal discourses are composed of multiple modes, and they mutually interact to construct and transmit the whole meanings of the discourses. Therefore, in the process of analyzing the construction and transmit of discourse meanings, other modes besides languages should be explored together in order to get a comprehensive view of the communications.

3.1 Mode selection and differences

There is a close relationship between mode selection and the language user. Different speakers may use quite different modes in their speeches, which represent their own differentiating selection systems.

According to Halliday's Social Semiotic Theory (Halliday, 1978), the selection system is a meaning system, a meaning potentiality. The multiple modes of communication, including language, head movement, facial expressions, etc, are components of the meaning system（Kress & vanLeeuwen, 2001；Norris, 2004).

In the following, the researcher will present annotation output results of the two samples to illustrate the speaker's preference of certain modes and how the duration of time affects the meaning construction.

Table 1   Sample One Annotation Output Results

	A	B	C	D
1	Eli Pariser	Begin Time	End Time	Duration
2	spoken language	0:02:23	0:05:11	0:02:88
3	posture	0:05:67	0:06:78	0:01:11
4	gesture	0:05:03	0:07:11	0:02:08
5	head movement	0:05:09	0:05:66	0:00:57
6	gaze	0:05:07	0:05:09	0:00:02
7	hand movement	0:05:07	0:09:45	0:04:38

Table 2　Sample Two Annotation Output Results

	A	B	C	D
		Zhang Weiwei	Begin Time	End Time	Duration
1	Zhang Weiwei	Begin Time	End Time	Duration
2	spoken language	0:03:42	0:05:11	0:01:69
3	posture	0:02:12	0:03:09	0:00:97
4	gesture	0:10:03	0:11:50	0:01:47
5	head movement	0:03:09	0:04:91	0:01:82
6	gaze	0:10:07	0:10:15	0:00:08
7	hand movement	0:07:41	0:10:30	0:02:79

In Sample One, the speaker tends to use "hand movement" to help to construct and strengthen the meanings he expects to transmit. The duration is longer compared with Chinese speaker in Sample Two (0:04:38 VS 0:02:79). The speaker in Sample Two adopts "head movement" such as head nodding more frequently (0:01:82 VS 0:00:57) to help to transmit his meaning and tries to show modesty, which is one of virtues in Chinese culture. Head nodding can also be interpreted by Chinese people as a way to affirm others' ideas and to facilitate interpersonal communication. In Sample One, the duration of "spoken language" lasts longer at the beginning of the speech compared with Sample Two(0:02:88 VS 0:01:69) which implies that in foreign speakers' eyes, in the process of constructing meanings, language modes play a more important in academic speeches compared with the non-verbal modes. Whereas, in Chinese speakers' minds, non-verbal modes are more important in establishing harmonious communication atmosphere for the audience, which function as the prelude factors before the speech. Therefore, the Chinese speakers pay more attention to the non-verbal modes such as posture and facial expressions before deliver speeches.

3.2 Modalities interaction and meaning construction

In speech communications, how do the multiple modes interact on each other to construct the whole meanings? Zhang Delu (2009) classifies the relations among the modes into complementary relationship and non-complementary relationship. In order to realize the expected speech effect, the speaker must know how to coordinate the modes to construct the meanings, in which all of the modes should be in complementary relations. That is to say, one mode works to provider new experience or contents for the other modes, or one mode is used to strengthen the meaning of another mode. Both of the two kinds of communication modes are indispensable, and mutually complementary. The successful transmission of the different modes' information relies on the other modes.

Different modes bear different modal supply features, that is, they have their unique ideographic potentiality respectively. For instance, the language expressions are used to explain the profound concepts and theories; colors of the images are better in expressing humans' feelings and attitudes; graphic structures can be used to promote expressing directions.

The following table will present clearly the mutual interaction among non-verbal modes and how the meaning are constructed in the process of speeches.

Table 3　Interaction among Non-verbal Modes and Meaning Construction

Non-verbal Modes		Facial Expression	Posture	Hand Movement	Gaze	proxemics
Characteristics	Eli Pariser	earnest; smile; attentive	Right posture/home position/left-to-right posture	metaphoric Hand movement (MHM)	Gaze at PPT Presentation (GP)	closer distance
	Zhang Weiwei	smile; attentive; relaxed	Home position/ left-to-right posture/ right-to-left posture	deictic hand movement(D	Gaze at the audience (GA)	Distance from the audience
Meaning Level	Eli Pariser	1)interpersonal meaning; 2)discourse meaning;	1)interpersonal meaning; 2)conceptual meaning;	1)interpersonal meaning; 2)discourse meaning;	interpersonal meaning	interpersonal meaning
	Zhang Weiwei	1)interpersonal meaning; 2)discourse meaning;	1)conceptual meaning; 2)interpersonal meaning;	1)conceptual meaning; 2)interpersonal meaning;	interpersonal meaning	interpersonal meaning
Roles in Meaning Construction	Eli Pariser	To strenghten meanings(SM)	To construct the meanings(CM)	SM & CM	CM	SM
	Zhang Weiwei	SM	SM & CM	Iconic hand movement(IHM) showing profession	SM & CM	Social distance implying social status

Through comparatively analyzing Sample One and Sample Two, we find Eli Pariser adopts "hand movement" as one of the major modes in constructing the meanings in the speech. Chinese scholar Zhang Weiwei mainly relies on the modes of "gaze" and "posture" to construct and transmit meanings in his speech. On the mode of "facial expressions", Chinese scholar paid more attention to use them to establish and strengthen his professional status. In order to narrow the audience's psychological distance with the speakers, both of the speakers "smile" frequently to the audience.

In Sample One, in designing the PPT, the speaker fully utilizes the diversified modes to express and transmit the meanings. He applies properly the elements such as sound, image and videos to provide information, interprete and deepen the speech contents. PPT presentations and verbal expressions are complementary to meaning expressions. Video materials integrate video and audio modes presentations together, which include images, sound, words and so on. They coordinate harmoniously to present stereoscopic sensory stimulation, which can promote the audience's perception, understanding and storage of the received information.

In the whole academic speech, obviously, the multiple modes coordinate together to implement the construction of meanings. But in this corpus, the main modes are the combination of the speaker's speech, and the words, images and video modes in the PPT. By virtue of the modes presented in the PPT presentations, the contents of the speech, supplemented by the speaker's gestures, hand movement, postures, facial expressions, and other modes such as tones and audio, are transmitted efficiently in the whole speech discourse. Other modes work as very important assistant ways to yield the expected speech effects, which will directly affect the audience's and understanding of the contents, degree of recognition, and ultimately, their psychological feelings.

3.3 Comparative analyses of constructing dynamic multimodal contexts

Since academic speeches belong to a kind of extemporaneous speech, in analyzing, the functions of contexts in the speeches should be explored. In order to grasp the essence of the interactions, we segment the whole speech into four critical segments, namely, the beginning, ideas elaboration, exemplification, the conclusion. Each segment relies on "mediate actions" as devices to mediate the relationship among the modes. The "mediate actions" include the speaker's gestures, hand movement, postures, facial expressions, tone and pitch, geographic position, spatial layout, video and audio, layout, etc. After analyzing the modes adopted in each segment, we find that in Sample One and Sample Two, both of the speaker utilize fully the diversified channels and measures to create the authentic communicative contexts for the audience. He puts on various facial expressions to be in accordance with his speech contents. He holds proper postures and consciously takes advantage of his own images (such as postures, gestures, tones, eye contact, facial expressions, and so on). The speaker uses rhythmic voice, natural and passionate words to ensure the successful proceeding of the communication and interactions.

It is widely acknowledged humans' verbal and non-verbal expressions or actions usually comply with the recognized cultural traditions, values and social practices. Contexts should form an interface between macroscopic cultural contexts and microscopic speech contexts. They integrate together to affect the speaker's selection of languages forms and multimodal modes in speech communication.

4 Conclusions

The study takes the non-verbal modes as an integral part to construct and transmit meanings in speech communication. Through the comparative analyses of Chinese and foreign academic speeches within the framework of Multimodal Interaction Analysis, it provides a new angle for the multimodal discourse analysis.

Since the academic speeches belong to a part of extemporaneous speeches, its characteristics of extemporaneousness implies that there are many uncertain factors that may affect the speech communication, which makes the usage of the modes and the relations among the modes become more complicated. Therefore, we should conduct more speech corpus analyses so as to reveal and describe the interaction and complementary mechanism in the discourses.

Acknowledgement

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An Analysis of Synergistic Effect of University Campus Culture Construction: Take the Campus Automobile Culture in Wuhan University of Technology for Example

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Abstract: A synergistic effect is produced during interactions among the subsystems of university campus culture construction. This paper provides five paths, namely, sharing of university spirit, sharing of resources, synergy of culture construction mechanism, synergy of subject behavior, integration of implicit and explicit education means to be adopted to maximize the release of synergistic effect, so as to obtain better synergistic effect in the construction of university campus culture. This paper then studies the construction of automobile culture in the campus of Wuhan University of Technology as a case which comprehensively analyzed and evaluated its synergistic effect, in order to provide an approach for scientific analysis and judgment of this effect on university campus culture construction and realize the dynamic monitoring on it.
Key words: Campus culture construction; Synergistic effect; Path; Fuzzy comprehensive evaluation

1 Introduction

In the new era, universities are endowed with functions of culture inheritance and innovation. The development of culture inside the university campus enters into an age of multicultural coexistence that every culture flourishes vigorously and every opinion is embraced freely. In the context that the education reform is being deepened in an all-round way and the education resources are being integrated and optimized, collision and communication of multiple cultures lead to cultural conflicts and differences. According to the practical experiences of several universities, the core spirit of cultural construction and core cultural values have been overwhelmed during the multicultural development in the campus which only lingers at the superficial and narrow-minded multicultural competition level that is only about senses such as matches, games, cultures, sports and entertainment. And some people deems that university campus culture construction is no more than an appendage of running a school, and it costs unnecessary expenses. These narrow-minded and short-sighted concepts have twisted the connotation of university campus culture, made the management and regulations in disorder. In addition, they have made the university campus culture lack of real core spirit and value norms, erased the realistic value and true connotation the culture has for inheritance of university spirit, regulation of teachers and students' behaviors and boost of university development (Wu Juan, Lin Zhijun ,2010; Yang Yang ,2012). This paper analyzes the university campus culture construction system from the view of synergy in order to find the accessible paths for synergistic effect, solve the multicultural conflict issue and promote the innovation of university campus culture construction.

2 Connotation of Synergistic Effect of University Campus Culture Construction System

Research on synergy of campus originates from the systematic scientific research, and soon afterwards is popularized in the application of management and economics. Ansoff (1957) stated that synergy is enterprise's overall performance generated by the sum of every independent component, in an expression of 2+2=5, i.e. the whole value of an organization is greater than the mere sum of the parts. Porter (1985) further studied synergy from the perspective of value chain, explaining that the activity that an organization shares resources between business units (Michael Porter, 1997) finally creates a competitive advantage by gaining more marginal income than marginal cost through synergy. As a branch of social culture, campus culture is an important approach to strengthening and improving college student's ideological and political education. Kroeber (1952) believed that culture, especially the cultural system of values, is the product of human activities. From the view of Marxism, the formation of culture is a sum of formation processes of values system that human subjects use and change objective world. Campus culture originates from the inner heart and behaviors of college teachers and students and reflects their cultural concepts, thinking features and behavior patterns. Effective campus culture construction can become a vital carrier for ideological and political education of college students

to, through the intra-system function, release the sharing outcomes between cultural construction and moral, intellectual construction, make the classroom teaching and extra-curricular activities complementary to each other, and realize a synchronous pace between the campus culture development and college student's healthy growth, so as to exert synergistic effect to indeed enhance the ideological and political education level of college student.

However, few studies on synergistic effect of university campus culture construction are published and no ultimate solution to the cultural conflict issue existed in the campus cultural construction in reality can be proposed. In combination with synergy theory and related studies, the author of this paper believes that the synergistic effect of university campus culture construction indicates that the subjects inside the system carry out cultural sharing through related approaches and build a bridge between the university spirit, values and the healthy growth of college students to facilitate the shaping of student's inner personality and quality by university's school-running essence and concept and social spiritual civilization, by which a common psychological contract between the students and the university will be created, and sharing, synchronous and complementary effects between the university cultural construction and promotion of teachers and students' behaviors and qualities will be achieved.

3 Access Paths for Synergistic Effect of University Campus Culture Construction System

Seeing from the operation and development of universities, the release of synergistic effect of campus culture construction contributes to the success of integration of campus cultural education resources. The university campus culture construction not only requires the interaction among the subjects outside the university to realize synergy between the inside and the outside, but also requires the coordination among the subjects inside the university to gain internal synergy. This paper focuses on the internal synergistic effect of campus culture construction in order to reveal the black box of synergistic effect release of the university campus culture construction system.

1) Sharing of university spirit b_1 brings synergistic effect, and highlights the leading position of socialist core values. University spirit is a high concentration of university's behaviors, concepts, beliefs and customs in a long-term process. The sharing of university spirit helps all the teachers and students stay at the same level regarding core concepts like values and helps share the university campus culture construction resources between each other to deliver healthy, positive and active values, and consequently make the university culture construction keep in line with university talents cultivation and social services. The access paths for university spirit in the university culture construction are as follows: 1) all the teachers and students set up socialist core values and place it in the dominant position; 2) explicitly put patriotism in the leading position and nationalism at the center to help students accept mainstream culture from the cognitive view; 3) let the student associations and organizations with the Communist Youth League taking the lead play their guiding role to aid young students unify their personality, psychology and exterior culture automatically, and to generate good university environment and academic atmosphere; 4) use innovative online working methods and take active advantage of new media platform to strengthen the communication between students and the university so as to let the students accept the leading of mainstream culture from daily life.

2) Sharing of resources b_2 brings synergistic effect. Several scholars deem that sharing of software and hardware resources can reduce the operation cost for diversified organizations. Hence the access paths for sharing of resources of university campus culture construction system are as follows: 1) sharing of intangible resources, represented as sharing of inner knowledge. The knowledge sharing among the subjects of campus culture construction helps the subsystems of campus culture construction system acquire innovative operation methods, which on the one hand is conducive to the accumulation of university campus culture construction resources, and on the other hand drives the circulation of professional knowledge accumulated by the university, thus reflecting the upgrade of overall value of the university campus culture construction from the perspective of value creation; 2) sharing of tangible resources, embodied as sharing of hardware resources, and coordination and harmony of the geographic location of campus, building style, greening, dormitory, offices, experiment center, teaching facilities, etc., which contributes to the sharing effect of campus culture construction; 3) cross sharing of intangible and tangible resources make the explicit university environment and implicit profound inner cultural knowledge in harmony, creating unique university cultural landscape and mark of time, which results in synchronization with talents cultivation.

3) Synergy of cultural mechanism construction b_3 brings synergistic effect. Mechanism

construction is the core of university campus culture construction which restricts and also orients teaching, scientific research, talents cultivation and social service, etc. of university. Sound mechanism is able to stimulate teachers and students to raise their self-management awareness and perfect their behaviors which will be internalized as self-restriction and regulation. The synergy between university campus culture construction mechanism and the procedures, contents and running mechanism of university's basic behavior norms is beneficial for campus culture construction system operating in an orderly way so as to realize the synergy of university campus culture construction.

4) Synergy of subject behavior b_4 brings synergistic effect. According to Porter's value chain theory, the operation flow of sharing of culture construction chain can facilitate the system to gain scale effect and competitive edge. How the subject of campus culture construction can get this synergistic effect depends on which links of value chain are the easiest ones to generate scale effect and competitive edge in the university campus culture construction chain, and depends on how important every link is in the previous mentioned chain. In this chain, the interaction between the behaviors related to culture construction practices and ones related to talents cultivation, scientific research, career services and ideological education is a process of coordination and harmonization. Teachers and students as subjects use the knowledge learned from practicing the cultural activity system, and automatically perfect their abilities and qualities during campus culture construction.

5) Integration of explicit and implicit education means b_5 brings synergistic effect. As an implicit carrier, university campus culture construction complements the explicit education of class teaching. In order to reinforce the synergistic effect of university campus culture construction, every implicit and explicit means that is beneficial to this construction must be integrated, for example, to set up an explicit working mechanism in favor of this construction from multiple aspects such as teaching, management, services. At the same time, attention shall be paid to implicit education means to create good atmosphere for the construction. The factors released by the synergistic effect of campus culture construction should be integrated to every link of campus education and life to activate the extra-curricular activities to the extreme extent, so as to improve the synchronization of this construction with student work, ideological and political education and talents cultivation to eventually create synergistic effect of university campus culture construction.

Based on the above analysis, this paper analyzed the synergistic effect of automobile culture construction system of Wuhan University of Technology (WUT) as a case study that further analyzed the status quo of the synergistic effect of automobile culture construction in the campus of WUT by adopting the fuzzy mathematic evaluation method and combining the previous analysis of access paths for the synergistic effect of university campus culture construction in accordance with the scientific and feasible principle, oriented and subjective principle, systematic and targeted principle, adaptive and dynamic principle, in an attempt to find an approach to improving the release of synergistic effect of automobile culture construction in the university campus.

4 Evaluation on the Synergistic Effect Value of Automobile Culture Construction in the Campus of WUT

By referring to associated data and experiences, this paper stood from the view of expert evaluator and included undergraduates, postgraduates and doctoral students as well as teaching and administrative staff of School of Automobile Engineering of WUT as respondents. Questionnaires were distributed to the respondents in a random way. And stratified sampling was adopted to conduct the sample survey. A total of 432 questionnaires were sent out during this survey and 280 questionnaires were collected. After removing the invalid questionnaires and ones whose format were non-conforming, finally 272 valid questionnaires were obtained with a validity rate of 63%. For the design of question items in the questionnaire, the index system was designed according to the above access paths for synergistic effect of university campus culture construction. The consistency of questionnaire was tested with the corrected item-total correlation (CITC) and Cronbach's α. According to the test results, the questionnaire was revised in order to make the index description of questionnaire understood by more respondents. Then a revised formal questionnaire was formulated, whose CITC was above the test criterion of 0.5 and Cronbach's α reached 0.732 which conformed to the test criteria of questionnaire, meaning that further distribution was permitted. Likert scale was mainly used during the survey. Investigators gave a score ranging from 1-4. In the meantime, according to the semantic differential scale, measurement levels were designated as Very Good, Good, Fair, Poor. See Table 1 below for details.

Table 1 Criteria for Quantitative Evaluation Grading

Value	Comment	Level
	Very Good	E1
	Good	E2
	Fair	E3
	Poor	E4

4.1 Determination of index weight

Evaluation object set P = value of synergistic effect of automobile culture construction in the campus of WUT. Evaluation factor was determined as (university spirit synergy, sharing of resources, synergy of cultural mechanism construction, behavior synergy, synergy of implicit and explicit education means), and then the analytic hierarchy process was used to work out the largest characteristic root of the automobile culture construction system in the campus of WUT, which was $\lambda_{max} = 6.00237$. In order to determine whether the judgment matrix of the automobile culture construction system in the campus of WUT passed the consistency test, the consistency index was calculated:

$$CI = \frac{\lambda_{max} - n}{n - 1} = \frac{6.00237 - 6}{6 - 1} = 0.000474$$

The average random consistency index was $RI = 1.24$. Therefore, the random consistency rate was:

$$CR = \frac{CI}{RI} = \frac{0.000474}{1.24} = 0.00038 < 0.10$$

The above result showed that, the ranking result of analytic hierarchy of the automobile culture construction system in the campus of WUT was satisfactory with appropriate allocation of weight. The result of normalization of its corresponding characteristic vector was:

$$W = (0.298\ 0.229\ 0.179\ 0.175\ 0.127)$$

In a similar way, we still used the analytic hierarchy process to build a judgment matrix for the secondary indexes of the automobile culture construction system in the campus of WUT respectively, and worked out the weight by using software to calculate the largest characteristic root of judgment matrix and conducting a consistency check. After normalization, the weight values of each secondary index were:

$\omega_1 = (0.342\ 0.324\ 0.226\ 0.108), \omega_2 = (0.386\ 0.275\ 0.339\ )$,

$\omega_3 = (\ 0.276\ 0.232\ 0.392\ )$, $\omega_4 = (0.101\ 0.237\ 0.221\ 0.235\ 0.095\ 0.111)$

$\omega_5 = (0.346\ 0.432\ 0.222\ )$

4.2 Multi-level fuzzy comprehensive evaluation

This paper adopted the fuzzy comprehensive method using weight average model to generate operator, calculate vector and synthesize scores. The equation was as follows:

$$b_i = \min\left(\sum_{i=1}^{p}(\omega_i \cdot r_{ij})\right) j = 1,2,3\cdots, m$$

Among which b_i, ω_i, r_{ij} respectively represented the membership grade that belongs to level i, the weight of number i evaluation index and the membership grade of number i evaluation index belonging to level j.

Calculate the vector result of multi-level fuzzy comprehensive evaluation: the statistical data of the automobile culture construction system in the campus of WUT from the sample survey were taken into the established model to calculate the vector of fuzzy comprehensive evaluation at every level. The results were:

$$B = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \\ b_5 \end{pmatrix} = \omega \cdot R = \begin{pmatrix} 0.288 & 0.151 & 0.464 & 0.097 \\ 0.304 & 0.321 & 0.320 & 0.055 \\ 0.344 & 0.261 & 0.335 & 0.059 \\ 0.239 & 0.319 & 0.304 & 0.138 \\ 0.410 & 0.348 & 0.162 & 0.079 \end{pmatrix}$$

Therefore, the comprehensive evaluation vector of synergistic effect of the automobile culture construction system in the campus of WUT was:

$$A = B * W = (0.308\ 0.262\ 0.343\ 0.085)$$

With the evaluation vector of every index, the comprehensive grade value was thereof worked out. Therefore the comprehensive score of university spirit synergy was: $(0.288\ 0.151\ 0.464\ 0.097) * (4\ 3\ 2\ 1)^T = 2.63$, with evaluation result of "good"; the comprehensive score of sharing of resources was: $(0.304\ 0.321\ 0.320\ 0.055) * (4\ 3\ 2\ 1)^T = 2.87$, with evaluation result of "good"; the comprehensive score of the synergy of cultural construction mechanism was: $(0.344\ 0.261\ 0.335\ 0.059) * (4\ 3\ 2\ 1)^T = 2.89$, with evaluation result of "good"; the comprehensive score of synergy of subject behavior was: $(0.239\ 0.319\ 0.304\ 0.138) * (4\ 3\ 2\ 1)^T = 2.63$, with evaluation result of "good"; the comprehensive score of synergy of implicit and explicit education means was: $(0.410\ 0.348\ 0.162\ 0.079) * (4\ 3\ 2\ 1)^T = 3.09$, with evaluation result of "good". The comprehensive score of value of synergistic effect of automobile culture construction in the campus of WUT was $(0.308\ 0.262\ 0.343\ 0.085) * (4\ 3\ 2\ 1)^T = 2.79$, demonstrating that the overall value of synergistic effect of automobile culture construction in the campus of WUT was "good".

4.3 Analysis of results

The result of fuzzy mathematical comprehensive evaluation of synergistic effect of automobile culture construction in the campus showed that, the overall value of synergistic effect of automobile culture construction in the campus of WUT was "good", demonstrating that the paths of automobile culture construction in the campus of WUT had exerted synergistic effect, achieved preliminary success and expected for further development. The level evaluation result of synergistic effect factors of automobile culture construction in the campus showed that this construction currently runs well in the aspects of sharing of university spirit, sharing of resources, synergy of culture mechanism construction, synergy of behavior, integration of implicit and explicit education means, demonstrating that the School of Automobile Engineering of WUT is able to integrate teaching, scientific research, enterprises and various tangible and intangible resources at home and abroad under the guide of university spirit synergy led by the socialist core values, make a lot of coordination and interaction actions that promotes the enhancement of synergistic effect of automobile culture construction in the campus by focusing on the automobile culture construction mechanism, and able to utilize implicit and explicit education means to boost the healthy development of the automobile culture construction in the campus. According to the scores, we can know that further improvement needs to be made regarding the university spirit synergy and subject behavior synergy of the automobile culture construction in the campus for that of WUT. The university spirit, which should be held as the soul of campus culture construction, shall be refined and accumulated under the guide of socialist core values, to navigate the cultural construction. Close track of teaching, scientific researches, services and managing behaviors shall be paid attention to so as to upgrade the connotation of culture construction from these behaviors and improve the psychological quality and professional proficiency of teachers and students as subjects.

5 Conclusions

Based on the above analysis, this paper tried to summarize the connotation of synergistic effect of university campus culture construction and its generation path and to provide a basic theoretical frame for it so as to assist the university culture construction department to keep track of the running of campus culture construction system which helps the university to hold the overall direction of campus culture construction, integrate current cultural and educational resources as well as implicit and explicit education means, coordinate the frame and implementation of university campus culture mechanism and also coordinate the interaction between the cultural construction and university's education, management and service actions. This frame can also help realize the dynamic monitoring of synergistic effect paths for university campus culture construction for the smooth operation of campus culture construction system. Therefore, it has good application prospect and a value for promotion.

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Construction of a High-Level Martial Arts Team Management Pattern Based on the Three-Dimensional Methodology WSR

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Abstract: By adopting the WSR, interviewing professionals, searching relative documents, inspecting on the spot, designing questionnaire and reasoning logically, this paper intends to analyze the module of a high-level martial art team management. The results indicate that the traditional pattern, relying too much on the couches' experience or simply restricted to the management regulations, therefore cannot give full play to the subjective initiative or in the process of control and prediction achieving the comprehensive effects of the management. WSR, a three-dimensional system consisting of W- facilities maintenance, S-rules and regulations, and R-human resources, emphasizing a comprehensive management combining all the three perspectives and the effects of whole control, which lays an important theoretical foundation of both the organization and management of high-level martial art teams in Chinese universities and forming a cognitive system of the three-dimensional mechanism.

Key words: Martial art team; Management system; WSR methodology

1 Introduction

The traditional pattern, being affiliated, independent, or cooperative, has a remarkable influence at the primary stage. However, with the rapid development of social science and technology, continuous expansion of the education functions, and the change of management conception in the new century, there is a higher demand for the management work. Meanwhile, traditional management disadvantages gradually increasing, it is urgently needed of a management pattern characterized as being more scientific, regulated, comprehensive, logical and humanized. WSR three-dimensional system management for high level sports team in Chinese colleges comes from practices. It also will accept the examination of pretties (Ma wenjing, 2007). "WSR three-dimensional management mode" consists of the three dimensions of w(wuli) S(Shili) and R(Renli). From the macroscopic theory the three-dimensional system management mode emphasizes on management of "three into one" of facility safeguards, regulation and emphasizes on the realization of integrity of management effects. (Wang Yan Deng, 2011). This provides important theory base for the organization and management of high level sports team in colleges forming the cognitive system of "WSR three-dimensional system management mode" (Qiaojian, 1995). Therefore, the author of this essay, based on system methodology, tries to reasonably construct the WSR pattern, guided by oriental philosophy, and combining the features of systematic science.

2 Basic Theory of WSR System Methodology

In the middle of the 1980s, people always ignored the humanity factors in solving practical problems, which seriously discouraged the solution to them. As far as Xi Zezong concerned, consideration should be given to the importance attached and the relative factors between stuffs and humans in a systematic program. Professor Gu Jifa, put forward the oriental system methodology Wuli-Shili-Renli by referring to both Chinese thoughts in philosophy and western system methodology, shorted for WSR. He pointed out that we should know the stuff use the opportunities and learn humans. Although the three branches stand for different meanings in this methodology, there is a closed link between them. The core of the system is the overall consideration for all the three branches when confronted with complex circumstances; W: the rules and objective existence of materials movement; S: the ways to solve problems, that is how to arrange or make use of stuffs; R: all understandings and solutions to matters are completed under the assistance of human beings and so does the judgment of both matters and things (Bo Chen, 2001).

Table 1   Contents of the WSR

Sector	Object and content	focus	principles	Supporting theory
Wuli	Rules and regulations in material world	What Analysis on functions	Honesty Truth	Natural science
Shili	Reasons of Organization and systematic management	How Analysis on logic	Cooperation See for efficiency	Management science System science
Renli	Reasons of dealing with individuals and groups	A good job Analysis on humanity	humanity, harmony, and efficiency	Humanistic Knowledge Behavioral knowledge

3 Establishment of the Three-Dimension Management Pattern of Martial Arts Teams

3.1 Frame of a high-level martial arts teams management pattern

The three dimensional management systems are made up of three parts: W stands for the assurance of materials needed for the high-level martial arts teams in colleges; S stands for various rules and regulations promoted by high-level martial arts teams in colleges; R stands for HR of high-level martial arts in colleges.　The three branches can be stretched out without limits according to different situations in universities and obtain full openness, close to each other and fully interacted. The three branches systems, together with their own derivations, are all open to and communicate with the outside world, including the exchange of materials. There is a connection among all branches systems, which makes it possible for each one to shift and change to another one or the environment. Some branches, even sometimes can be part of the system under some condition while they can also be totally out of the system under some other condition to penetrate into the environment to fulfill its function. The short-term departure and long-term convergence can be completed by the emergence of departments or the personnel mobilization (Zhong Wei, 2011). Therefore, there is a possibility for the adjustment of orders of high-level martial arts teams in colleges in China.

3.2 Three dimensional pattern of high-level martial arts teams management

3.2.1 Design of Wuli system structure

Wuli refers to mechanism involving motion of matter and usually hold the application of natural science. It mainly responses to the questions like what is matter and what it needs are reality and object existence of the study and the aggregate principles of motion of matter. Traditional pattern of high-level martial arts in colleges, roughly classifying the equipment as facilities, rarely gives a thought to its elements and hardly manifest the integrity of materials as a complete system. With Wuli system, the poor management of traditional pattern can be improved by sorting various information in an organized and systematic way. Major factors affecting the Wuli system are: 1 training facilities and fundamental equipment are basic supports for athletes' training and matches; 2 3 information web fundamental facilities, web guides in! 4 sports equipment means clothes and facilities for athletes.　For Wuli system, the facilities of a sports team play an important role in its development, for on one hand, it acts as the material basis of the training, and on the other hand, helps to save athletes' energy in matches and training. Currently, to reasonably arrange the facilities, it is normally equipped with spots, facilities and workers working on internet information management in colleges in China (Sun Dongchuan, 2001). However, if more measures can be taken except for the above mentioned, for example, setting up a professional assessing group consisting of experts, further expanding financial ways, and improving the management of concerning facilities, material factor would be able to have a more efficient influence on the system. Besides, adopting much more advanced facilities involving information searching and sorting in time will greatly facilitate its development.
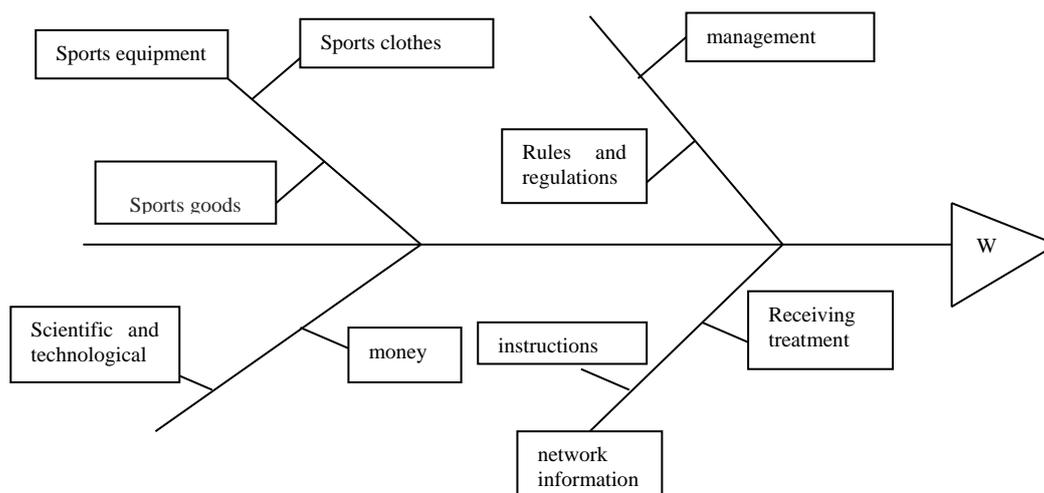
Figure 1　Fish-Bone Chart Analysis on the Wuli Facilities

3.2.2 Design of the structure of Shili system structure

Shili, reasons of solutions to problems, are mainly used to solve how to arrange. It can be generally

interpreted a mechanism used or concerned during the process of creating and changing of the world, indicating a boundary between humans and matters/stuffs. In the essential phrase of the making of rules and regulations of traditional sports team management, there is no good results and no complete mechanism to follow due to a lack of integrity conception, no key points and no levels. Major factors affecting the Shili system are: 1 the rationality of training. It is the key point in a game for the athletes to fulfill their advantages and judge the situation clearly and adopt reasonable strategies; 2 the rationality of training schedules. The schedule should be made not only based on the specific physical strengths but also related to the literacy lessons, at which point schedules should be made after full communications between trainers and trainees. 3 the rationality of literacy classes. High-level athletes are not only equipped with professional sports skills but also need relative literacy classes to upgrade literacy qualities and professional skills, which lays a foundation for the athletes who won't work as athletes any more.4 the rationality of praises and punishment. The mechanism of praises and punishment is designed to restrict both couches and athletes, which at a degree mobilizes the enthusiasm and initiative.
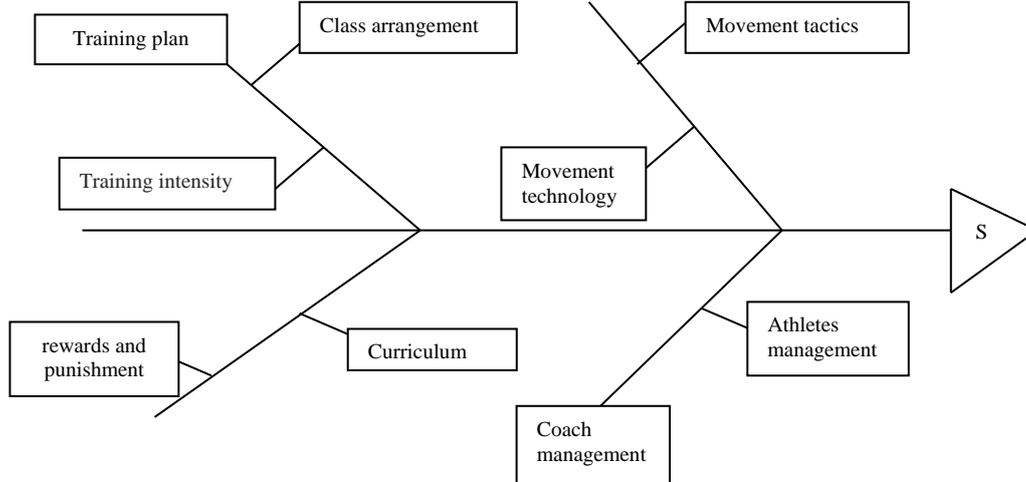
Figure 2   Fish-Bone Picture Analysis on the Shili Regulation System

3.2.3 Design of structure of Renli system structure
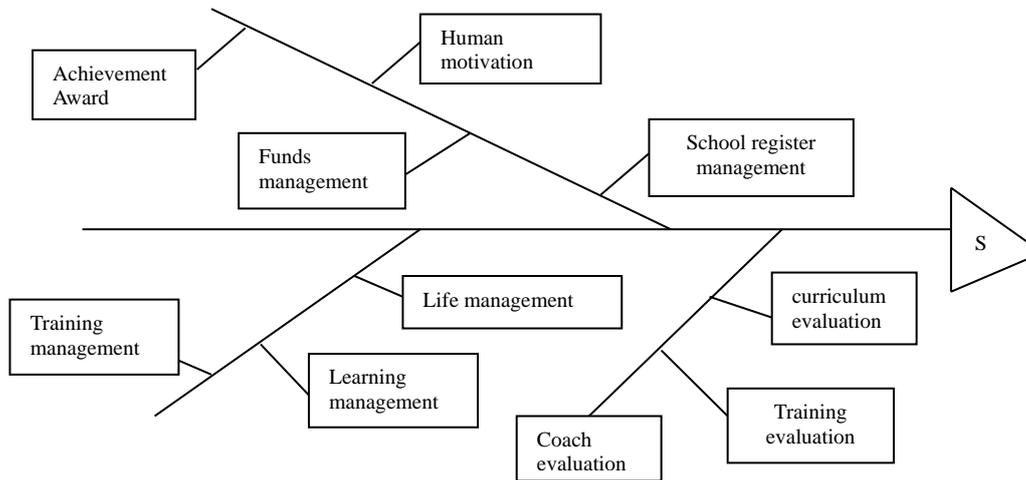
Figure 3   Fish-Bone Picture Analysis on the Renli HR System

Renli, the secrets of living as a human. In life, things and problems can't live without humans, for humans are who are responsible for corresponding assessing standards to deal with questions like 'how should we do' and 'what's the best can we do?' to solve targeted aims under the assistance of the knowledge about humanity and social science.   In traditional module, there is nothing in humanity or flexibility but rules and regulations (Li Haoyi, 2008). Thus, it was able to fully display the significance of harmonious interpersonal relationships. Major factors affecting the Shili system are: firstly, HR

assessment system. Couches are responsible for the organization of competition training, while athletes carry out specific steps under the instruction of their trainers; secondly, systematic management of the enrollment, learning, student status, training, life and employment, the procedure of which should combine both the academic learning and professional sports training and take the duality of identity into consideration. Finally, the key to a high-level sports team is to establish a reasonable mechanism about the organization and motivation of the team. Except for the mechanism, we should also set up a series of regulations on the scientific teaching, curriculum setting, team management and so forth and then be strict about athletes to settle the contradiction between the two aspects.

4 Conclusions

In traditional pattern, there is no flexibility in the system of organization and operation, and the relationship between the orders and obeying is in a mess, so this limits the development of the team of athletes, both internal and external. WSR pattern is scientific and reasonable in theory and successful and feasible in practice, greatly improved the level of the team of athletes in colleges by specifically classifying WSR into three different branches, Wuli materials infrastructure, Shili rules and regulations and Renli HR resources, which also clearly sort out the thoughts and is of great science during the management. Meanwhile, the WSR system still remains to be further improved and implemented, it is strongly advised that we should constantly bring in new ideas and methods about the management and continuously fulfill the pattern on the grounds of practical conditions.

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Research on Countermeasures on the Construction of Curriculum Resources Sharing in Application-Oriented Colleges

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Abstracts: This paper adopts the methods of questionnaire and individual study, taking Wuhan University of Technology as an example, puts forward suggestions and countermeasures on the construction of curriculum resources sharing in the application-oriented universities in Hubei province. Based on the data analysis of 50 copies of questionnaire survey, this paper has empirical research on the current situation of curriculum resources sharing in Wuhan University of Technology from three aspects, which contains curriculum setting, teacher resources allocation and student needs, aiming to explore the mode of curriculum resources sharing in application-oriented universities.

Key words: Application-oriented universities in Hubei province; Curriculum resources; Sharing; Wuhan University of Technology

1 Introduction

In Wuhan University of Technology, there are 87 existing undergraduate majors, which covers literature, science, engineering, arts and other disciplines. Considering the amount of courses, most of the public courses have realized a better situation of resource sharing (Hylen J, 2006), such as "College English", politics, computer, etc. Basically, every major set up and put classified teaching in practice(Xiaolong Li，Jinxiang Yang ,2014), so we should observe and study the current situation of sharing of curriculum resources from every aspect of each school(Frederick Rudolph ,1996). Due to the restrictions of different majors, the possibility of sharing curriculum resources is relatively small for several quite different majors, such as the School of electronic and Information Engineering and School of music. However, there exists relatively large possibility of sharing curriculum resources (Che Yu, 2006) between School of electronic and Information Engineering and School of mathematics. As a result, this paper will have a research between related schools. In this paper, the current situation of curriculum resources sharing in WUT (Wuhan University of Technology) will be elaborated from three aspects, which contains curriculum setting, teacher resources allocation and the student needs. Besides, the setting of curriculum is the most basic and important part (Stanley E, 2011) of teaching planning. From analyzing the existing situation of curriculum setting, the rationality of teaching planning and the maximum possibility of curriculum resources sharing could be revealed (Liu Dongxing, Hua Jinlong, 2014).

2 Research Method and Research Tool

2.1 Analyze on the current situation of curriculum resources sharing in different majors in the same school.

In Wuhan University of Technology, department of computer science and technology is one of the relatively large and strong departments. This department includes three undergraduate majors: network engineering, embedded application software and computer software. In the same school, the curriculum of different majors could be obviously repeated. Hence, it is necessary to share the curriculum resources. According to the teaching planning of department of computer science and technology in 2010, repeated key courses of three undergraduate majors can be showed in the following table:

Table 1   Three Common Courses of Department of Computer Science and Technology in WUT

departments items	Network engineering	Embedded application software	Computer software	Overlapping courses
Amount of key courses	15	14	16	10
Overlapping courses/total courses	66.7%	71.4%	62.5%	—

Statistics in Table 1 shows that in actual teaching, part of common courses are taught in normal class, such as the course "discrete mathematics" and so on, these courses are taught respectively by

different teachers in different classroom. In this way, the curriculum resources don't not realize better resource sharing (Shuangrong Song, 2014). Besides, part of the courses is taught in large class, which follow the way that same teachers spend same time to teach more students, such as the course "data structure". In this way, the curriculum resources sharing between different majors could be more and more reasonable.

2.2 Analyze on the current situation of curriculum resources sharing in different schools.

In the previous chapters, the school of computer science and technology, department of mathematics and the school of electronics and information engineering have something in common in terms of the nature of the subject. Besides, covered courses between these three schools also have close relationship, so curriculum resources sharing could be possible. According to undergraduate teaching program of Wuhan University of science and technology in 2014, curriculum setting of three schools are obtained, and it can be clarified through Table 2.

Table 2　Curriculum Setting of Three Schools

schools items	computer science and technology	mathematics	electronics and information engineering
Overlapping with school of computer science and technology	—	Advanced mathematics; College Physics; Discrete mathematics; C language	Advanced mathematics; Linear algebra
Overlapping with school of mathematics	Advanced mathematics; College Physics; Discrete mathematics; C language	—	Advanced mathematics
Overlapping with electronics and information engineering	Advanced mathematics; Linear algebra	Advanced mathematics	—

Statistics in Table 2 shows that it can be found from the table that there exists certain repeat of curriculum setting in these three schools. Except for these completely same obligatory courses, there are some similar or overlapping courses among these three schools, such as Basis of Computer, Application Design, Electronic Technology Base, Probability theory. All these courses are related to mathematics, computer and electronic information engineering. In conclusion, this type of above-mentioned courses is easy to realize curriculum resources sharing.

3 Results and Analysis

3.1 The research on the curriculum resources sharing from the perspective of allocation of teachers

In Wuhan University of Science and Technology, there is a high level team of teachers. This school has 5393 teaching staff now, including 3069 full-time teachers (793 of them are professors, 1396 of them are associate professors). High-quality and excellent teachers are mostly concentrated in school of economics and management, school of electronic information engineering and the department of mathematics. Now, this following chapter will study the current situation of teachers sharing inside the school and between schools. From my survey and research, it can be found that the phenomenon of teachers sharing is very common among different majors in one school, which means the sharing rate is very high. In the school of economics and management, school of electronic information engineering and the department of mathematics, the sharing of teachers resources is only limited to the same professional courses. In terms of inspected results of technology management department, electrical engineering department and mathematics Department, teachers' allocation of these schools is relatively reasonable. There are different degrees of teacher resources sharing between schools, between departments, between professionals. But this kind of sharing needs to be further elevated in depth and breadth.

3.2 The research on the curriculum resources sharing from the perspective of from the perspective of students

A questionnaire survey was conducted towards students from eight undergraduate schools in Wuhan University of Technology. Rationality and utilization rate of curriculum resources and teacher resources allocation are studied from the perspective of the needs of students. In this way, we can get further understanding of students' internal demand for learning and curriculum resources. Plus,

sufficient practice evidence could be provided for the feasibility and necessity of university curriculum resources sharing.

3.3 Analyze the undergraduate curriculum resources survey in WUT

The questionnaire examines students' evaluation of the present situation of curriculum resources from three aspects: 1) Professional satisfaction degree. 2) The evaluation of school curriculum .3) The needs of curriculum resource sharing. Students from eight schools participated in this questionnaire survey, they are students from school of economics and management, school of liberal arts, school of teacher education, school of foreign language, school of life science, school of computer science and technology, school of electronic and information engineering and school of mathematics (50 copies of effective questionnaire).Statistical analysis results are as follows.

Firstly, professional satisfaction degree

From the results of the survey, 18% of the students is very satisfied with their own professional, and they wish to continue their studies, 6 people are not satisfied with their professional, which accounted for 12% of the total number. But it is worth noting, 22% chose "It's OK, I will choose another job when I graduate." And this percentage is worthy to catch our attention. The specified result could be showed in table 3.

Table 3   Undergraduates' Professional Satisfaction Degree in WUT

items	Very satisfied, want to study further	Satisfied, want to choose other majors	It's Kobuk I will choose another job when I graduate	Not satisfied, always want to change my major	No idea	total
people	9	22	11	6	2	50
percentage	18	44	22	12	4	100

Generally, most students are very satisfied with their professional. According to the table 3, 62% choose "satisfied" and "very satisfied", from this we can see that the inner learning motivation of students is very healthy, and it provide good circumstance for the advance of curriculum sharing.

Secondly, satisfaction degree of curriculum setting and teaching planning

Students' satisfaction degree of their own professional mostly depends on their own interests, cognitive thinking mode and the influence of family environment. However, whether the professional, that students study for four years, could satisfy students' original learning motivation, depends on the rationality of curriculum setting and teaching planning.

According to Figure 1, 89% show that teaching planning partly satisfied or basically satisfied their own leaning needs. However, 13 people express that they are completely not satisfied with their professional, and they can only learn by themselves. And we need focus and reflect on ourselves.
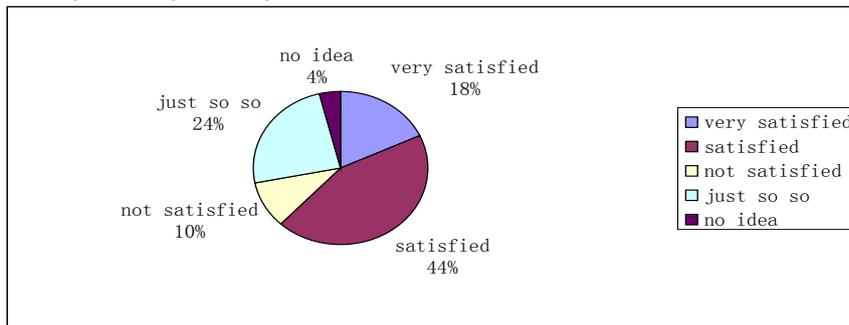
Figure 1   Undergraduates' Satisfaction Degree Towards Curriculum Setting and Teaching Planning

Thirdly, satisfaction degree towards the teaching of teacher

In Figure 2, Comparing with curriculum setting and teaching planning, students' satisfaction degree towards teachers' teaching is very high. 60% express their high satisfaction, 11 people give medium evaluation, only 4% show their complete dissatisfaction and 8 people have unclear idea. The specified results can be showed in the following table.
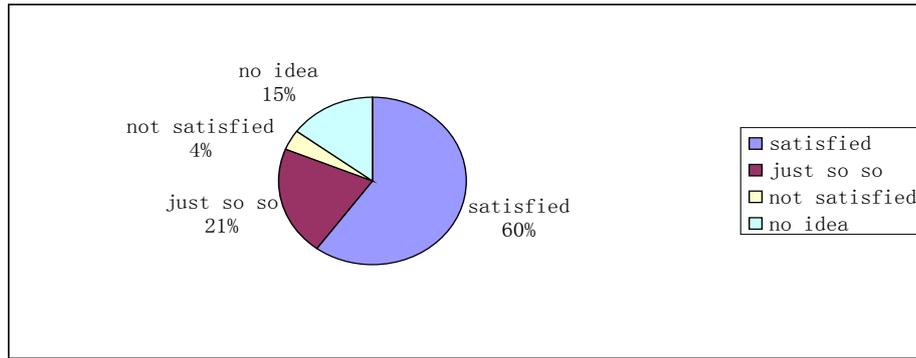
Figure 2　Undergraduates' Satisfaction Degree towards Their Teachers' Teaching in WUT

Fourthly, analysis of students' satisfaction degree towards quantity and quality of courses

According the survey, it can be showed that most students are relatively satisfied with the quantity of existing courses and the arrangement. And they are very satisfied with the setting of their own major courses. However, students from these eight schools have different attitude towards the amount of public courses and professional courses.

Students from different schools have different opinions about the arrangement of existing curriculum. Most of science and engineering students think that the professional courses are too few, such as the course statistics of school of mathematics only has nine, but the public courses are relatively more. Student from school of economic management think that their professional courses are too many, the optional courses and public courses are relatively less, which could impact their expansion of knowledge.

From all the survey results, over 90% students think that the optional courses are too few, 80% think that the offered optional courses has little to do with their own professional courses, and they are not able to choose the optional courses they want. These may be the two reasons why students think the optional courses are relatively few.

3.4 Research on the practical need for resources sharing

After the comprehensive understanding of students' satisfaction degree about their own major, course setting, teaching planning, the necessity of curriculum resources sharing and the specific need are further studied in this research.

From the perspective of teaching arrangement in universities, the need of sharing curriculum resources has been a common view, but is it necessary from the perspective of students?

According to this questionnaire survey and some random interview of individual students, we can see that the results are very obvious; almost all the students show their urgent need of sharing of quality courses. Most students show great interest about courses on Internet, such as open courses of Yale University on the Internet
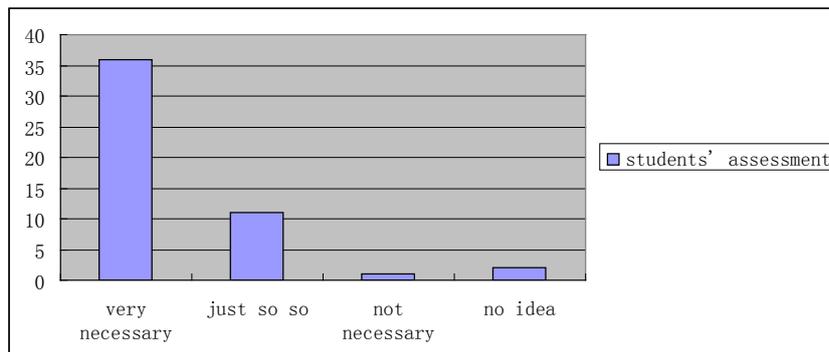
Figure 3　Undergraduates' Need of Sharing Curriculum Resources Sharing in WUT

Just as the Figure 3, students have very clear judge about the necessity of sharing curriculum resources. In this 50 copies of questionnaire, 36 people choose "very necessary",11 people choose" necessary"，and these people accounts for 94% of the total number. Plus, only 1 person thinks it is "unnecessary".

The above-mentioned part has clarified "optional courses". And the further study of optional courses could derive the possibility of optional courses in cross-major class. According to the survey results, it can be showed that 30% of the students chose "not interested another professional", 60% of the students said they were interested. Through random interview of students, part of the physical and engineering students expressed that their professional course is too many, their experiments are too many, their learning work is also very heavy. They have no time and energy to have elective courses, such as students from school of electronics and information engineering and students from school of life sciences. The specified results could be showed in the following table:

Table 5   Undergraduates' Willingness of Cross-major Learning in WUT

genre schools	history and Philosophy	Foreign language	Economics, management ,law	Science and Engineering	computer	arts
Economy and management	16	24	22	4	14	14
Liberal arts	18	33	17	9	13	9
Teachers' teaching	11	33	28	8	29	9
Foreign language	10	31	31	11	19	5
Life science	9	29	36	16	18	6
Computer science and technology	13	35	37	13	19	5
Electronic information and engineering	12	32	39	15	27	10
mathematics	14	31	37	17	31	13

Through table 5, we can see that on the one hand, foreign language and computer courses are generally welcomed; on the other hand, students of science and Engineering, such as students from school of computer science and technology and school of electronic information engineering, show great interest in courses outside of their own majors, such as economics, management, law and foreign language courses.

Through the analysis of questionnaire survey and statistic, we find that students' need of sharing curriculum courses generally exists, they show certain interest in cross-major and cross-subject high quality courses. Although students from different schools show different willingness about sharing curriculum resources, but in general, almost all the students think sharing curriculum resources have more advantages than disadvantages. Some problems are also found in the process of doing questionnaire survey and individual interview, for example, students are not completely satisfied with the setting of curriculum, quantity and quality of courses. Because of the unreasonable arrangement of optional courses, some students don't have energy and time to learn other courses though they want to choose optional courses; but other students think that their professional courses are few, at the same time they don't have suitable optional courses to choose so as to waste too much spare time. To solve these problems, scientific consciousness and methods needs to be raised, we should find students' inner learning need, make reasonable arrangement of curriculum and teacher resources. In this way, we can meet the needs of different levels of students and treat students as the core.

4 Conclusions

The goal of curriculum resources sharing in application-oriented undergraduate colleges and universities of Hubei Province is to optimize the allocation of resources for higher education, improve educational efficiency and competitiveness. Through the integration and utilization of colleges and universities resources, let's make new teaching plan and teaching mode for fostering applied undergraduate talents This kind of talent training mode must have dynamic, systematic and sustainable utilization of the available resources, and constantly update and summarize the mode in the combination of theory and practice, which can be applied into the demands of application-oriented undergraduate education.

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Balanced Scorecard Kills Innovation at Hospitals: A Literature Review

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Abstract: The main question of this paper is whether the Balanced Scorecard, when applied as performance measurement system hinders innovation at hospitals under study. An in depth literature review is done on the on the scope of performance measurement system and the use of Balanced Scorecard from the context of organizations in general, health care industry, and different types of hospitals. Findings show that no mention of the above found in hospitals applying Balanced Scorecard that measure innovation specifically. It can be concluded that, with innovation being inculcated in the vision and mission statements of the hospital, Balanced Scorecard may not hinder the innovation.
Key words: Balanced scorecard; Performance measurement system; Health care; Hospital; Innovation

1 Introduction

The service sector has increased at a fast rate and becoming a competitive sector of the economy (Injazz, 1994; Akter, 2008). This phenomena is also affecting the health care industry which is consisted of several sectors ranging from medical devices manufacturing, nursing, pharmacies to hospitals play an important role in the world economy (Mahmud, 2007). To explain further, there are two main stakeholders in the industry named as healthcare providers and consumers. Additionally, there is a range of internal and external stakeholders. The former involves health care specialists providing professional knowledge and service, such as physicians, psychiatrists, dentists, nurses, babysitters, etc. The latter receive healthcare service and therefore care about the quality of health care services Akter (2008) further discussed on the difference characteristics of the healthcare sectors with an added sector of emerging fields within.

From another perspective, Smeltzer and Ramanathan (Smeltzer, 2002) explained that in health care delivery processes, many key actors playing multiple parts resulted in role ambiguity during the service processes and product variations. From the macro environment perspectives of the health care, the changing variables such as rapid transformation of technology in general, demographic factor and change in lifestyles resulted in unstable environment that affects both private and public healthcare organizations (Koumpouros, 2013). Even with the advancements in scientific and technology fail to address with patients' satisfactions and service inefficiency that have been plaguing the industry (Mohammadkarim, 2011).

These events have turned the global health care organizations to balance between managing increasing health costs and providing high quality services to consumers at lower costs (Deloitte, 2014).

Thus, the role of innovation to help solve or lessen the problems mentioned above in order to increase their competitiveness, effectiveness and sustainability.

2 The Role of Innovation to the Healthcare Organization in the Competitive Market

There are several types of innovations used to solve or minimize global competition and emerging crisis faced by organizations (Bessant, 2006; Brzóska, 2014; Szmal, 2015; Baran, 2015; Dasgupta, 2009). As discussed earlier, it is important for health care organizations have to understand the need of innovation to improve performance apart from regulations imposed (Plsek, 2014) Innovations provide a possibility to create a new customer value (new products and methods of customer service) as well as new value for a business.

Organizations need to innovate to increase and defend competitive advantage, either by managing their environment or by reacting to organizational dynamic and environmental demands (Baregheh , 2009; Bessant , 2005; Damanpour , 1991; Zain , 2002).While hospita3 are embracing an innovation orientation, translating it into improved performance has proven challenging (Plsek, 2014). McCreight (2013) provides an insight to this challenge, "One of the striking differences between hospitals and other

organizations is that so many more groups play important.

As such, the need to measure innovation in the organization has become important to ensure the business survival of the organization.

3 The Need to Measure Performance of Organizations

In general, to manage better in these trying times, most of the successful organizations within the market-based economy use performance measurement systems because they are required by the stakeholders' interest. This is necessary, in order to produce information to indicate performance levels achieved, or to embrace a particular system to generate continuous customer-based market driven improvements

As with other industries, the healthcare industry needs performance measurement system due to the advent of transparency in healthcare quality. This system will become more prominent by using indicators (ishoeck, 2001).

4 The Evolution of Performance Measurement System

Literatures mentioned on the need to measure organizational performance are being inspired by either the Balanced Scorecard (Kaplan, 1993) or by the work of Neely (Neely, 1998).

Initially in measuring organization performance, only one stakeholders' perspective is covered (22, 23,24) or one category within a single stakeholder (Laschinger, 2001; Sluijs, 2003). For example, financial measures such as return on investment, internal rate of return, net present value and payback period which have been demonstrated to be inadequate (Ma, 2013).

Until recently, many scholars have been concerned with the bias that that could be generated using this process. For example, Counte and Meurer (Salge, 2009) recognized the high potential for a single respondents' bias, since they observed that very little information is gathered across types of employees in order to avoid bias.

Given the inherent limitations of financial measures (they reflect historical performance, are highly aggregated, and may lead to a short term bias), many companies have sought to supplement financial measures with nonfinancial measures（Kaplan, 2001).

As a result, the more comprehensive nonfinancial measures are designed to capture the operating effects of managerial decisions that will, eventually, influence financial results (Westbrook, 1998).

The combination of financial and non-financial measures have been agreed by Neely (Neely, 2007) who stated that organizational performance measurement must covers three specific fields of organization results: financial performance (profits, return on assets, return on investment, etc.); market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added, etc.)

This is being supported by the fact that the assessment of performance in an organization is critically important in order to achieve its goals. It is essential for an organization to be consciously aware of its surrounding situation and quality of performance, especially in complex and dynamic contexts (Nikjoo, 1993; Raeisi, 2013).

As discussed above, all the performance measurement models developed after the mid-1980s are more balanced. They embraced different perspectives of analysis and manage them in equally. However, scholars take various ways to balance performance measurement (Daniel, 1989; Neely, 2005; Brignall, 1991).

Turning now to the health care industry, studies stressed on the importance of performance management systems in health care organizations.

5 The Need of a Comprehensive Performance Measurement System to be Applied at Healthcare Organizations

The need for a comprehensive performance measurement system is more prevalent, since the health care industry faces medical errors, patient safety issues, and increasing medical costs (Olden, 2007; Stock, 2007). The increasing medical costs are due to the use of technology and modern medical tests when compared many other industries (Boon, 2004).

As examined by Aguinis (Aguinis, 2011) who asserted that performance measurement system can make several important contributions to organization such as increasing the motivation to perform, achieving organizational goals, improving employees' competency and clarifying the definitions of the job.

6 The Current Knowledge on the Current Performance Measurement System in Healthcare Organizations

Stewart and Locamy (Stewart, 2001) admitted that health care performance measurement systems must do more than measuring administrative functions and its focus on financial perspectives for the purposes of coordination and control. Niven (Niven, 2008) further explained that the main limitation in performance measurement systems at health care organization serves a narrow regulatory, clinical, or diagnostic function. There are not constructed to tell the story of an organizations' strategy and guide its implementation.

So, the need to include wider areas apart from the medical or technical measurements is becoming more important.

7 The Involvement of Stakeholders in Performance Measurement System

Porter (2010) started the argument by saying that an enhanced organization performance depends on the existence of a common goal for different stakeholders. The same understanding has been applied with the concept of quality in health care, which have been developed from a purely technical approach to a multi-faceted issue (Donabedian, 1987). The multi-faceted issue in healthcare, which tries to satisfy the needs, interests and demands of three principal interest groups (Øvretveit, 1992) which can be listed as those who provide the service (i.e. the health care professions), those who manage it, and those who use it (i.e. patients). Additionally, Morgan and Everett (Morgan, 1990) suggested a fourth interested party, namely those who commission the service, the purchasers, resource allocators and policy makers. Each group has its own specific and different interests and opinions on the definition, measurement and improvement of hospital service quality.

It can be deduced that the health care organizations are dependent on their stakeholders. And this, can be done by measuring performance of different stakeholders' perspectives. Evidently, one of the more often mentioned performance measurement system in measuring health care organizations performance is the Kaplan and Norton's Balanced Scorecard.

8 Balanced Scorecard as a Performance Measurement System

Kaplan and Norton (Kaplan, 1996; Kaplan,2001) introduced the use of Balanced Scorecard as a tool for performance measurement and strategic management to business organizations for more than a decade. In addition, Modell (Modell, 2012) explained that Balanced Scorecard is a strategic planning and management system being applied extensively in business and industry, government, and nonprofit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications and monitor organization performance against strategic goal.

Supporters of Balanced Scorecard explained that other types of performance measurement systems do not offer timeliness and forward- looking indicators of Balanced Scorecard. The cause and effect linkages of the Balanced Scorecard capture the complexity and relationships of the strategy, facilitating explicit tradeoffs among cost, quality and access. Many of the other measurement systems complement the Balanced Scorecard by guiding operational and process improvement.

It has been reported that approximately 53% of the global companies and 60% of large US companies applied the Balanced Scorecard as formal process of measurement (Rigby, 2009). From the global perspective, the Balanced Scorecard is one of six most generally used management tools with its high ratings in terms of satisfaction (Rigby, 2010). A Cranfield University research report addressed that out of 75% of the companies that applied a formal process of performance measurement, 46% embraced the Balanced Scorecard as their main method (cited in Balanced Scorecard Collaborative Training Material, 2006).

Although the Balanced Scorecard has attracted commendable interest as a performance measurement innovation (Ittner, 1998; Ittner, 2003), the pessimist view is that it is management fad and a product of management consultants (Zimmerman, 2001). Many are concerned about the variable success of the Balanced Scorecard in its implementation (Malina, 2001) questions about its logical validity (Norreklit, 2000), its many uses (Wiersma, 2009) and its rhetorical basis (Norreklit, 2003; Busco, 2015).

On the bigger perspectives, others have doubts on Balanced Scorecard universal appeal (Bourguignon, 2004) while mentioning that the Balanced Scorecard needs to adapt differences in communication, reward structures, strategies, and information displays and characteristics (Otley, 1999;

Banker, 2004).

Interestingly, when Balanced Scorecard are applied at healthcare organizations, they measure diverse spectrum due to plurality of organizational settings in terms of both focus (for example acute care, ambulatory care, long-term care, insurance and managed care, consulting) and mission (e.g., for profit, religious, government owned)(Shewchuk, 2005).

Within the health care organizations, hospitals are important sectors serving important services. They absorb big percentage of resources. The developing and developed countries experienced about 40 and 80% of resources being distributed to hospitals, respectively Since hospitals affect the health care capability, resulting in the importance of measurement of hospitals performance. (Mohammadkarim, 2011)

Focusing on the hospitals sector alone, Koumpouros (2013) and Christesen (2008) suggested that Balanced Scorecard have expanded their overall customer dimension by reducing patients' complaint. This has led to the understanding that patients are satisfied with the health care services and treatments. It resulted in the improved patient retention rates along with their loyalty towards the hospitals. Consequently, apart from the positive results such as an increment in their revenues (Karra, 2005; Urrutia, 2005), reduce costs (Gurd, 2008) increase hospitals profitability (Kairu, 2013) and evidently improve their financial performance (Davis, 2004)

9 Does Balanced Scorecard Kill Innovation at Hospitals?

Literatures highlighted that the Balanced Scorecard may result in negative result to the organization. This is supported by Voelpel, Leibold, and Eckhoff (Voelpel, 2006) who explained that it may become an obstacle for the organization to become innovative and creative due to its notions on strong inherent organizational control. However, Kaplan and Norton have responded strongly to the arguments made earlier (Kaplan, 2006).

Table 1   Using Balanced Scorecard as Performance Measurement System at Different Hospitals and the Benefits Derived from Different Perspectives.

Name of hospitals/(department of hospital) studied	Benefits and improvements gained
Duke Children's Hospital & Health Center, Durham, North Carolina, U.S.A (Melions, et al., 2000) Description of hospital – not mentioned in literatures	• Costs reductions • Revenue enhancements • Better patients care
St. Martin De Porres Hospital, (Emergency department) Chia Yi City, Taiwan, Republic of China (Huang, et al., 2004) Description of hospital – not mentioned in literatures	• Performance of the emergency department significantly improved after implementing the balanced scorecard including hours of continuing education attended by the staff • Staff job satisfaction, the rate of incomplete laboratory tests within 30 minutes • The average monthly inappropriate return rate, and hospital profit.
Peel Memorial Hospital, Ontario Canada (Harber, 1998) Description- acute care hospital	• Patient satisfaction level increased from 89% to 95% • Staff satisfaction survey participation level rose from 33% to 75%. • Better understanding on where to invest time and money in learning where objectives has been achieved • Achieve ability to relate vision and mission statements to business performance measurement
MacKay Memorial Hospital, Taipei, Taiwan, Republic of China (Wencheng Chang, et al., 2008) Description – a private Christian hospital	• From 2003 to 2005, the revenue from services not covered by the National Health Insurance (NHI) increased from NT$1407 million (US$1 = NT$32.9; €1 = NT$39.0) to NT$17,894 million. • Inpatient satisfaction rose from 89.07% to 91.9%. • The number of visits by disadvantaged patients (those with economic, social or physical disabilities) increased from 82,350 to 97,658 visits. • The number of research projects also increased from 46 to 61 projects. • The percentage of patients admitted to an intensive care unit in less than 3 hours from arrival in the emergency department increased from 47.8% in 2004 to 82.5% in 2005

Source: this paper

With reference to the Norwegian banking sector, Antonsen (Antonsen, 2014) found that Balanced

Scorecard may inhibits information sharing, cooperation and organizational learning.But, the question that can be forwarded to those in the hospital sector in particular, is "Does Balanced Scorecard kill innovation at hospitals?"

To answer the question, an analysis on the several hospitals that applied Balanced Scorecard as performance measurement system and have successfully gained benefits were made.

Table 1 listed the benefits obtained by the different types of hospitals located in different countries in applying Balanced Scorecard.

From the table 1 above, it can be derived from the literatures that the hospitals analysed have been using Balanced Scorecard in many guises that conform to each organizations' objective. In achieving different positive results in many perspectives especially in the financial performance and patients' satisfaction. Unfortunately, they are no mention of measurement recorded from the perspective of innovation.

This may be due to the nonexistence of the innovation indicators in the Balanced Scorecard used in each of the four different hospitals under study.

10 Conclusions

It can be concluded that hospitals have to include in its vision and mission the need to innovate. This will show in the perspectives when designing the Balanced Scorecard. This is to support the argument made by that Kaplan and Norton (2006), that Balanced Scorecard will not hinder innovation at the organization that apply it as performance measurement system.

In other word, Balanced Scorecard will not kill innovation at the hospital when it is a part of the indicators of the performance measurement.

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School Management in the Complex Thinking Perspective

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Abstract: The scope of this Paper is to clarify the unfolding of Complex Thinking concerning the role of management, as a result of a research carried out in some Brazilian public schools, where the dialogical movements were understood in the whole context in which the linear and systemic aspects coexisted. The studies of the theory of Complexity are the bases of the reflections on the management activities, enabling articulation toward the self-organization of the group. It is observed by many researchers that the action of the manager usually encompasses the role of a planner of the work, with rational use of the resources and articulation of the means to reach the targets of the institution, in addition to the role of coordination and control of people´s work. That has shown not to be enough to meet the challenges of the world nowadays. The processes of management may get different meanings: under a more technical view where management is often centralized, decisions come from the top without participation of the other levels; under a more democratic conception, the process is more participative, and decision is collective. In this view, the manager is expected to promote collective work, encourage the participation of the different subjects of the team and institution community, establish co-responsibility and assure the construction and implementation of a proposal – a set of intentions – a collective agreement. To be able to do so, the manager should be prepared to perceive the team as a living system, able of self-organization, as well as the linear and systemic aspects in permanent balance.
Key words: Complex thinking; Management; Self-organization; Sustainability

1 Introduction

The strengthening of democratization represents a change in the net of power relations at the institution. The vertical flow of centralized command is replaced by horizontal relations which are more flexible. Power is not crystalized in hierarchical levels, but it is distributed among the teams of work which take responsibility for thinking and doing. Decision and action becomes complementary in the live dynamics of the balance of polarities – not opposites as in the hierarchical pyramid. The dichotomy between planning and executing does not exist as mutually excluded. Instead, participation of those who share the same ideals for change increases, and they agree in taking a common task defined by negotiations of objectives. Success or failure of results are not attributed to a leader of command, but are the result of collective work. Control is much more related to follow up and evaluation of the process aiming at helping the subjects in their construction of responsible action. Plans of work are not imposed top/down neither outside/inside, but rather built, implemented and evaluated by the teams. Models make no sense, as the solutions come from the context, resources and degree of need and effort on the part of the people involved. This view of management actions expands as we reflect with the help of Complex Thinking by Morin preparing managers to take decisions for sustainable development.

2 From Administration to Management

In the last two decades, the expression 'school management' was introduced in the Brazilian educational context, replacing 'school administration', with the aim of encompassing new skills of the school principal, in   the process of democratization of public schools. In this sense, school management is understood today, at least legally, as a collective and participatory process, which governs the way the school works, involving decision-making, planning, implementation, monitoring and evaluation of an educational policy.

In this context, the school principal is in charge of the implementation of the collective decisions of school boards, as well as the coordination of the operations of the school unit. The manager is expected to encourage the participation of the members of the team and the school community, define responsibilities and ensure the construction and implementation of a pedagogical proposal, ie a body of intentions, a collective pact. The democratic management concepts are closely interwoven with the

principles of citizenship, autonomy and emancipation, being a way to develop people for sustainability.

Democratic management in school, in essence, is not a practice that can simply be instituted because it is a self-organizing process, coordinated by the manager, through participatory experience. This process is not mechanical, as social reality is extremely complex, the educational field is not neutral and the human being cannot be regarded as an instrument of production, distant from the natural world. Thus, the discussion on school management will be expanded below from the perspective of the complex thinking by Morin (2005a, 2005b, 2005c), covering the dialogical movement between linear thinking and systemic thinking.

3 Linear Thinking in Management: Hierarchical Control and Bureaucracy

Linear thinking, a hallmark of our times, tends to simplify reality, fragmenting it so it may be understood and controlled. It is appropriate for the treatment of mechanical and functional problems, but ineffective when dealing with issues that require a systemic view.   Reason is overused, through rationalization, which perceives only the immediate answer, simplifying and reducing everything to simple linear causality.

The traditional model of school management, which expresses the linear, Cartesian and mechanists logic, has its recent origins in the Classical Theory of Administration, whose leading exponents according to Chiavenato (2000) are: the American Frederick Winslow Taylor and his studies on Scientific Management; the European Henry Fayol and the Classical Theory; the German Max Weber and the Theory of Bureaucracy.

One of the criticisms of the administrative models of Taylor, Fayol and Weber is the logical and deterministic approach of the organization, in which fragmentation and the mechanistic division of labor prevail. Critical theorists of the twentieth century, guided by the Marxist conceptions, played an important role in denouncing the alienation in production processes and social relations of such administrative models. As a result of this alienation, human being were perversely prevailed from understanding the nature and product of their work, as well as   perceive themselves as human beings, part of a systemic nature where they are encompassed. The human dimension in its entirety was eclipsed by the excessive importance given to a fragment of a human being's capability: just labor force.

The model and practice of school management, based on the classical management theory, served the purpose of the mass formation of a skilled labor for mechanical work. The structural model of the industry was reproduced in school by maintaining organizational efficiency, centralization of power and instrumental use of communication at the service of control of the production machine.

The ideals of discipline and obedience, plausible in the context of productivity optimization, became the linear communication standards, desirable in the school environment in which subjectivities are hidden and unrecognized. The education process was mechanized and schools became factories. To some extent at least education was robotized and robotizing.

Even nowadays, schools are characterized by pyramidal power structure and the fragmentation of school work. In what concerns school organization, the division of labor in technical-administrative and pedagogical tasks is due to the value of specialization at work. The roles and responsibilities are defined through regulations, to maximize efficiency and to assure hierarchical control.

4 Systemic Thinking in Management: A Living Organization

While the linear thinking is effective for the analysis of the parts of a whole, systemic thinking is important for the understanding of the interdependence and interaction of parts as an open system.

Systemic thinking may be represented by the web of life, as this is its very essence. It is a contextual thinking in the concept of Capra (1997, p. 46):   "systemic science shows that living systems can't be understood by analysis. The properties of the parts are not intrinsic properties but may only be understood within the context of the larger whole. "

A system is a set of components that are related to each other. It keeps an organization and a structure. The organization defines the system's identity and expresses its configuration through the essential features of its parts. The structure is defined by how the parts are related. The structure of the system changes during its existence, in permanent exchange of energy with the environment.   It is an autopoietic system in continuous regeneration.

In the systemic thinking, the labor organizations are conceived as dynamic, not linear networks, as the mechanistic paradigm is not enough to explain them. For Capra (2002), human organizations resemble living systems. They can't be controlled like machines, through instructions, because they are

alive and react to the impositions.

Regarding the organization as a living being, there is awareness that the system is able to get self-organized, to learn, to change and evolve naturally, because its intrinsic feature is self-production. It is in constant circular retroactive movement, of own creation, seeking for sustainability in the balance of two paradoxical forces: autonomy and dependence.

The notion of human autonomy is complex and is directly related to the idea of dependence. According to Morin (2001), the subject depends on the environment in which he or she lives, learning a language to communicate, in order to acquire knowledge and generate new knowledge. These are fundamental perceptions to build an attitude towards sustainability

A sustainable management of a democratic school should be based on the experience of the dialogic principle of autonomy / dependence, through the strategic coordination of actions and mediation of interpersonal relations. The living organization, in this case, is a self-eco-organizing system with relative autonomy, which constantly interacts with exterior, and is able to create its own determinations and purposes.

Systemic thinking is necessary for the manager, as it allows him to view school life beyond the bureaucratic routine and formal / functional relations. School dynamics can understand as a living being, a culture in permanent construction.

Democratic management can fit in this conception, for autonomy and dependence, in dialogical movement, are complementary polarities that characterize the emancipatory process.

An articulation action could be unveiled by the manager when understanding that the own power may be used to stimulate shared decision-making, in which he takes the coordinator position. Thus, he / she can create opportunities for him / her and his / her team to experience new relations and for the educator´s isolation scenario to assume new more organic settings.

Systemic thinking is opposed to linear thinking, but both are embraced by complex thinking, so that reality may be better understood.

5 Complex Thinking in Management: Dialogic Relationship between Linear Thinking and Systemic Thinking

Morin (2005a, p.151) explains that all organizational relationship produces antagonism with complementarity, ie, "[...] the complementarities that are organized between the parties secrete antagonism, virtual or otherwise; dual and complementary identities coexisting in each part is itself virtually antagonistic ". As in the TAO, a figure of complexity, the female principle yin contains within it the yang masculine principle, antagonistic and dormant; in opposite relationship, the male yang principle contains latency in the female principle yin. When a polarity reaches its peak, it reveals within it the seed of its opposite.

Linear thinking which is expressed in the bureaucratic matrix and systemic thinking characterized by the vision of the whole oppose dialogically, are complementary opposites, according to the interpretation of complex thinking (Morin, 2005a, 2005b, 2005c). The linear thinking and systemic thinking are always present in the same reality. The prevalence of one over the other may represent a simplistic attitude in the interpretation of reality, if they exceed, for example, in the particularization or generalization. Mariotti (2007, p 82) explains: "The holistic view is as reductionist as the Cartesian. One reduces aggregation, while the other reduces by fragmentation."

The school organization reflects in its domain all the social complexity as it is a part of this. It is a cell of the social hologram, therefore it reflects inside the dynamics of the whole of which it is part. As society, it is also a living organism that is able to get self-organized. Metabolically (Moraes, 2004) it is in permanent reorganization or regeneration, in response to all processes of disintegration. Inside, the relations are ambiguous, appearing as complementary and antagonistic. Beside the movements of change, there are conservative forces; collaboration and resistance are forces which coexist, as well as order and disorder. A force is always in operation in response to the simplifying character of the opposite force. The system is open and caordic.

With the vision of complexity on the school organization, it is possible to deal with the paradoxes that are perceived in everyday reality, which is predictable and at the same time unstable and uncertain. The school culture is ambiguous and has a contradictory character, because it has elements that stimulate innovation, as well as elements which contribute for conservation. Routine and emergent situations alternate; formal and informal relationships flow in parallel; ambiguities are natural in the game of convergence and divergence. It's actually the game of all living systems like we can see in nature.

Understanding reality from the perspective of complexity is to realize that there is a creative tension between the polarities depending on contradictions. The opposites are fed by this contradiction and the dialogic relationship is maintained, while new properties emerge that feed, as a recursive ring, the balance game of polarities.

The school is a place of conflict, of dialogic encounters that generate creativity.   The subjects have different interests and values from each other that can be negotiated through dialogue. The dialectic can be helpful in finding a consensus whenever possible. A dialogics is necessary in situations where tensions remain, and also in what concerns respecting diversity. The words by Mariotti (2007, p. 154) complement the idea: "Being able to distinguish when employing dialectics and dialogics is a highly strategic skill."

Conflicting situations are not only found in schools, but are part of the social fabric. They are the result of confrontation of ideas, in all social issues, especially of political nature. In fact, they are reflected in the school. An example of this is the paradox in which managers are in the task of mobilizing educators for participatory and co-responsible building of a political-pedagogical project.

Thus, the management action faces a conflicting reality, explicated by De Rossi (2006), whose interests and values emanate from two distinct and contradictory forms of reasoning: the regulatory one and the emancipatory one. The linear reasoning of regulations is at the service of public policies that are governed by the market economy and are extremely concerned with quick results, while the emancipatory reasoning regards the socio-political citizenship construction as a process.

A major challenge for the school manager is to encompass the coordination of bureaucratic and educational activities in such a way that they may express a relationship of interdependence. In practice, there is a division of activities due to the technicist culture still prevailing particularly in the public schools. The educational activities tend to be under the supervision and full responsibility of the coordinators, while bureaucratic activities monopolize all the time of the school manager. This split is due to a fragmented and reductionist vision of school teams who base their actions only in the list of regulations drawn up by school assignments. They lack a vision of the whole, a perception of the systemic reality.

Educational and bureaucratic doings are imbricated in the democratic and complex dimension. The bureaucratic tasks, called 'the means', are necessary to give support to the school routine, to the maintenance of the infrastructure, the implementation of the projects, in short, to give life to the intentionality of the formative educational process. Otherwise, if they are valued as 'core activities' they will assume a linear and instrumental character. On the other hand, the educational activities are made viable through the bureaucratic structure and legal boundaries that need to followed and keeping control.

Bureaucracy is also ambivalent. It has an operational and rational characteristic, as it encompasses working methods and applies impersonal rules to ensure the good work of the organization. However, this same bureaucracy can be manipulated by rationalization, running the risk of becoming an administrative blockage, to the extent that the real purpose is distorted.

Besides the bureaucratic and routine activities, there are planned actions. The former are predictable and resemble rigidity, the latter are focused on uncertainty and emerging elements. Planning is a more strategic action, as it works in the field of unpredictability and flexibility, in opposition to the program through which everything is done more automatically (MORIN, 2000, 2001).

In addition, planning, in the complex and democratic dimension, is an activity resulting from collaborative movements inherent to participatory spaces and dynamics. They emerge and are consolidated as leaders and their teams do not arise as mutually exclusive opposites. In this case, management is not exercised by authoritarism, but gains recognition and legitimacy when there is respect and value of individuality and diversity. The balance between the polarities is maintained because the focus of the changes remains on the interests and meanings. Significant disturbances act naturally in organizations, perceived as self-organizing systems, without having to undertake a mechanical effort to put them in motion.

These impulses may trigger structural, unforeseen changes. Under these conditions, intuition, according to Motta (2001) shall be valued in the action of an officer, beside the analytical rationality, as it produces the global vision required to cope with ambiguities and uncertainties which are present in the emerging situations at work. What is desired is a balance between order and chaos, logical and illogical elements, rational and intuitive ones.

In modern organizations, communication of inter-subjective nature emerges at the heart of management practices, concomitant with the reduction of both, relations of subordination and use of communication only to transmit orders and guidelines.

In contemporary management, the concept of authentic communication arises in professional activity. According to Zarifian (2001, p. 165), it is "a process by which reciprocal understanding is stablished which leads to a shared meaning, resulting in further understanding of the actions that those involved   take together or in a convergent manner." This meaning is transformed in the course of this communication according to the viewpoint exchanges and turning more explicit the common needs. From the reflective dimension of meaning, that is, the subjective and practical redesign, the subject directs his / her thoughts and actions, undertakes the own change in face of the events or problems that have made a pre-existing situation lose stability. The expression of that individual dimension is the mark of freedom of the subject, an attribute of civility in modern society.

However, authentic communication is related to expressiveness, that is, in the right to freely express the personal meaning that is contained in the thinking and action, in relation to the partners of communication, as well as the power to express this sense in the initiatives concerning ideas and the doing with autonomous responsibility.   Thus, the individual assumes the causality of the own actions.

In line with this, there is a dialogical relationship in the management action, that is: to assert an idea or action in terms of the management skills to direct and control, and at the same time, use authentic communication as a source of reflection on the challenges of the company and the subjective engagement of the individuals who compose it.

Thus, the interpersonal relationship based on the authoritarian model of obedience, and control gains a new meaning by the collaborative model, which values friendship, cooperation, fellowship and consensus. While the first model exemplifies the patriarchal culture and is based on distrust and desire for domain, the second is related to the matristic culture, recognize trust as the principle of interpersonal relationships.

Mariotti (2000) summarizes the essence of these two matrixes according to their characteristics. The patriarchal culture is described as an expression of linear thinking, which, in turn, is guided by the need to control nature, to encourage competitiveness, to use deterministic discourses of exclusion, based on immediacy and dichotomies such as good / bad, friend / enemy, and others. The matristic culture, representative of complex thinking, is distinguished by understanding the human being in tune with nature, by the participation, solidarity, inclusion, as well as acceptance of reflection on paradoxes and differences.

6 Conclusions

Manager´s role alignments are a complex undertaking, but not complicated, and deals with key ideas like: democratic management, participation, autonomy, emancipation, and others of the kind. The change is systemic, but it requires the manager's attention to the context and at the same time, the value of educators and needs to look at the whole and the parts as an open dynamic system, without losing sight of the intersubjective plot. So in other to take care of the school organizational climate is crucial for the members of the team work in charge to find pleasure and meaning in their role on a self-sustaining creative living movement, helping students to develop more participatory activities and attitudes related to a sustainable world as is now happening in more educationally advance countries like Finland.

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Construction of Early Warning Model of Doctor's and Master's Degrees for Local and Provincial Educational Departments in China Using Radar Chart Approach

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Abstract: In this paper, the radar chart approach was applied to monitor provincial degrees. The paper defined and quantized indicators such as teaching staff, scientific research, talents cultivation, base construction, academic exchange, and social services. National minimum standards, the average and the maximum value of the degrees among the same-level and same-type ones were used to determine the radii of the three concentric circles. The paper constructed the early warning model of doctor's and master's degrees in China. An applied research was presented using this method.
Key words: Radar chart; Doctor's and master's degrees; Early warning

1 Introduction

Following the law of development, the risk early warning theory, as an important research object in the field of management, uses advanced techniques and methods to make accurate judgements of current situations, based on which the evaluation, prediction, warning of the operation quality and consequence of part of or entire social systems related can be achieved (John L. D., Ted R.G, 1998). Considerable research has applied the risk early warning theory to humanities and social sciences research fields namely business administration and public administration, whereas only a few research applied the risk early warning theory to the field of education. Focusing on the construction of emergency early warning institutions on campus, Yi Zhaodi (2016) suggested that social groups such as governments, community, schools, and family should be incorporated in the construction of safety campus, and special attention should be paid to the significant influence of community in safety campus construction. Chen Guang (2011) emphasizes the importance of establishing the work responsibility mechanism with well-defined and law-abiding duties and responsibilities, the people-oriented and student-friendly safety education mechanism, and the prevention-oriented trouble shooting mechanism with comprehensive coverage. By studying the construction of early warning system of specialties in vocational colleges, Li Haizong (2014) maintains that the indicator system should include 10 second-level indicators such as demand for talents, source of students, employment status, teaching staff etc., and 38 third-level indicators. In order to study the standard construction of compulsory education schools, Yang Shuyi (2012) constructed 15 second-level indicators such as school-aged population enrollment ratio, annual consolidation rate, ratio of music teachers, PE teachers, and art teachers, etc. to represent the risk evaluation indicator system of the standard construction of compulsory education schools. Research on early warning model of doctor's and master's degrees in local and provincial education departments remains a blank.

The local or provincial graduate education departments carry out early-warning evaluation on doctor's and master's degrees within their jurisdiction, in order to provide information and lay the foundation of dynamic regulation of doctor's and master's degrees for graduate students training units. For the reason that the number of degrees authorized is large and the process of evaluating those degrees is intensive and time-consuming, the early-warning evaluation posts a challenge to the local and provincial graduate education departments. This paper states that the key to meet the challenge is to establish scientific supervision methods and modernized supervision techniques, therefore the local and provincial graduate education departments can have efficient supervision on doctor's and master's degrees within their jurisdiction, thus eventually improving the provincial and local authorized degrees early-warning mechanism.

2 The General Structure of Early Warning Mechanism of Doctor's and Master's Degrees Based on Radar Chart Approach

First invented and applied in the field of corporate financial management by Japanese businesses, the radar chart method is mainly used as a comprehensive evaluation technique to assess corporate financial conditions. As the shape of financial composite chart resembles radar, the chart is known as the

radar chart. The radar chart is a direct and graphic comprehensive technique to analyze and evaluate corporate financial status and business conditions from the perspective of production, safety, revenue, growth, and mobility (Fu Zan, Fang Deying, 2007). Using the radar chart, a lateral comparison is achieved by comparing a corporation's financial indicators, which represents the financial status of the corporation, with the lowest, the average and the highest financial conditions among similar corporations. Therefore, the corporate's financial conditions can be revealed. Local or provincial government has the similar demands to supervise the degrees offered by the graduate students training units, hence the radar chart approach can be used in the early warning supervision on the doctor's and master's degrees.

In order to use the radar chart to early-warningly monitor the degrees, this paper firstly frames the general structure to solve the following problems:

2.1 Demand analysis of the provincial graduate education departments

The demands of the provincial governments to early-warningly evaluate the authorized degrees is twofold:

One is to provide information for graduate students training units. By developing corresponding information system, graduate students training units are able to get a full picture of whether their doctor's and master's degrees meet the national basic standards, how the degrees have developed over a time span, and the lateral comparison between similar disciplines among the same-type degrees within provinces.

The other one is to provide decision-making references for provincial or local governments to carry out dynamic regulation on authorized degrees. In 2015, the State Council Academic Degree Committee issued < Notice on Carrying Forward Dynamic Adjustment of Doctor's and Master's Academic Degrees and Professional Degrees >, stating that the Academic Degree Committee of provincial and local Council should take the responsibility of the dynamic adjustment of graduate students training units within their jurisdiction, to constantly adjust and improve the structure of disciplines and specialties, to eliminate the degrees which have inefficient demands, inadequate conditions to cultivate graduate students, and poor cultivation quality, and to replace them with those with urgent needs and well conditions.

2.2 Component analysis of authorized degrees

Nowadays, there are different perspectives of how degrees are composed of. This paper holds that the degrees are composed of 7 indicators, namely research orientation, teaching staff, scientific research, base construction, talents training, academic exchange, and social services. Teaching staff includes the number, the structure and the competence of teaching staff; Scientific research includes research projects and scientific achievements; Base construction includes the number of national, ministerial, and provincial bases; Talents training includes the size and quality of students cultivated; Academic exchange examines international conferences and international projects; Social services examine the transformation of scientific achievements. These indicators are used to determine the specific contents and indicators when monitoring authorized degrees using the radar chart method.

2.3 Determining the radii of the concentric circles in radar chart

There are three key elements to determine the radii of the concentric circles and provide comparison.

The first element is to determine the radius of the exterior circle, which shows the highest level within certain limits. More specifically, it reflects the maximum value of all related disciplines at the same level (doctor's degree or master's degree) or the same type (academic degree or professional degree).

The second one is to determine the radius of the middle circle, which shows the intermediate level within certain limits. More specifically, it reflects the average of all related disciplines at the same level or type.

The third element is to determine the radius of the inner circle. Inner circle reflects a government's basic requirements or minimum standards for an authorized degree, the lowest threshold to be more precise.

A radar chart of doctor's and master's degrees consists of the three elements which can be used to evaluate degrees. For instance, if all indicators of a degree fall beyond the inner circle, the degree is qualified. If some indicators fall within the inner circle, the degree is considered disqualified. Moreover, provincial and local graduate training departments should consider the demands of dynamic adjustment, to bring the degrees which rank last among the same level and same type degrees into supervision. The degrees under supervision are potentially to be eliminated during the dynamic adjustment.

3 Matters Need Further Attention

The above chapter introduces the framework of using the radar chart to early-warningly monitor the doctor's and master's degrees of provincial graduate students training units. A few matters need to be clarified for application reasons.

3.1 The selection and definition of the indicators

Using the radar chart approach to monitor degrees of provincial graduate students training units requires a clarification of the specific indicators. This paper holds that the construction of a degree is composed of 7 factors: research orientation, teaching staff, scientific research, base construction, talents training, academic exchange, and social services. Research orientation mainly tells that the degree has stable, characteristic, and advantageous orientations, which is difficult to be quantified. Meanwhile, the factors like teaching staff, scientific research, and the talents training can reflects the features and advantages of orientations. For the reasons above, the research orientation is not included. Therefore, 6 indicators used to monitor the doctor's and master's degrees of provincial graduate students training units are teaching staff, scientific research, base construction, talents training, academic exchange, and social services.

These indicators should be defined. First of all, the indicators used should meet the national essential requirements for authorized degrees that are expecting to come forth. At present, the Academic Degree Commission of the State Council is organizing the Discipline Appraisal Group of the State Council and Professional Degree Advisory Committee to formulate essential standards for doctor's and master's degrees, and bring forward basic requirements for the Audit and Qualified Assessment of authorized degrees, for academic degrees and professional degrees respectively. For the standards are still under consideration, this paper follows the basic standards that came forward at the 11th Degree Authorization and Audit in 2011. The basic standards have two requirements for Teaching Staff: the number of teaching staff who are professors, and the number of teaching staff who have doctor's degrees. There are three requirements for scientific research: the amounts of scientific research funds, the amounts of public and government-sponsored research funds, and scientific research awards. One requirement for talents cultivation is the number of degrees granted.

Secondly, the indicators used should meet the needs of systematic assessment to authorized degrees. The national requirements only propose some key factors which are far from comprehensive, so further improvements are required. For Teaching Staff, academic leaders should take into consideration. Hence, academicians, "the Thousand Talents Plan", Yangtse Rive Scholars, and the National Science Fund for Distinguished Young Scholars are included to reflect the quality of teaching staff. Besides the research funds and provincial and ministerial-level research awards, the number of papers which can be indexed by SCI, EI, and ISTP and the number of patents are also included to systematically assess the innovation capacity of the discipline. As for base construction, the number of national research bases and provincial research bases are included. Besides the size of talents cultivated, indicators reflecting the quality of talents cultivation such as the number of National Excellent Doctoral Dissertation (nomination included), Provincial Excellent Doctoral Dissertation, and Provincial Excellent Master's Dissertation are included. For academic exchange, the number of international academic conferences and the amounts of international research funds are considered. For social services, the transformation of scientific achievements into productivity is included.

3.2 The determination of the radii of three concentric circles

The Radar Chart consists of three concentric circles. The radius of the inner circle reflects the national lowest threshold or basic requirements. Besides the indicator required by the national government, as national requirements are still being discussed, the radius of the inner circle is defined as the minimum value of the degree among the same-type and same-level degrees in a province. The radius of the middle circle is defined as the average value of the degree among the same-type and same-level degrees in a province. The radius of the outer circle is defined as the maximum value of the degree among the same-type and same-level degrees in a province.

3.3 Improvements of the database and the data

In order to monitor the construction of doctor's and master's degrees using the radar chart, an information management system should be developed to collect and handle the massive data using existing network platform. As has been discussed above, the data processing is not complicated, nor is the development of the information management system. The key lies in the acquirement of data. In order to collect mass data needed, importance should be attached to the construction of basic database and the improvement of related data. The more records related to doctor's and master's degrees are

collected, the more comprehensive the data are, and more thorough the analysis of the construction and development of doctor's and master's degrees can be achieved. Currently, several provincial and local Academic Degree Commission have established fundamental information database of graduate students training units within their jurisdiction, which provides basic information of the doctor's and master's degrees. Nevertheless, the information database is incomprehensive, incomplete, and dated. Furthermore, the regular report system is yet to be established. Further improvements are expected to create the conditions for early warning supervision on doctor's and master's degrees.

4 The Application of Radar Chart to Early Warning Supervision on Doctor's and Master's Degrees

For research convenience, the early warning supervision on a Doctor's degrees of Chemical Engineering and Technology in a designated province is taken as an example for applied analysis.

4.1 Data collection and data processing

4.1.1 Data Collection and Handling

This paper takes data on degrees of Chemical Engineering and Technology in 2015 as an example. Details are depicted in Table 1.

4.1.2 Data Processing

The indicators are non-dimensionalized. The equation reads:

$$k_i = \frac{x_i - \min x_i}{\max x_i - \min x_i}, \quad (i=1,\ 2,\ 3,\ \ldots\ldots,\ n) \tag{1}$$

In the equation, k_i represents the standard value of x_i, whose range is 0 to 1. $\min x_i$ represents the minimum value of x_i, while $\max x_i$ represents the maximum value of x_i.

Table 1　Descriptive Statistics of Academic Doctoral Degree of Chemical Engineering and Technology in a Designated Province

Units for graduate training	Teaching Staff			Scientific Research					Base Construction			Talents Cultivation						Academic exchange		Social Services
	The number of professors	The Number Of Teaching Staff have Doctor's degree	academicians, "the Thousand Talents Plan", Yangtse Rive Scholars, the National Science Fund for Distinguished Young Scholars	Annual Research funds (10 thousand)	Annual Gov. Sponsored Research Funds (10 Thousand)	Number Of Provincial Or above Sci. Awards	Number Of Papers Indexed By SCI EI ISTP	Annual Number of patents	Number Of National bases	Number Of Provincial bases	Number Of Doctor Degree granted	Number Of Master Degree granted	Annual number of National Excellent Doctoral Dissertation (including nomination)	Annual number of provincial Excellent Doctoral Dissertation	Annual number of provincial Excellent Master's Dissertation	Number of Inter. Conference	Annual funds of inter. research projects	Annual Profits Of research Transformation
Univ. 1	25	46	1	1460	890	1.8	65	15	0	2	6	111	0	0.6	2.2	0.8	60	360
Univ. 2	35	58	3	2180	1340	3.2	182	31	1	2	35	230	0.4	2	3	3	80	780
Univ. 3	20	28	0	1870	1152	1.4	112	11	0	3	11	78	0.2	1	3	1.2	70	420
Univ. 4	22	44	0	230	170	2	43	8	0	2	18	66	0	0	2	0.2	110	450
Univ. 5	14	29	0	710	480	0.4	45	10	0	2	9	75	0	0.4	2	1	120	600

Table 2　Normalized Data

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18
Univ. 1	0.630	0.750	0.333	0.625	0.628	0.500	0.158	0.304	0	0	0.147	0.274	0	0.300	0.200	0.214	0	0
Univ. 2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0	1.000	1.000	1.000	1.000	1.000	1.000	0.333	1.000
Univ. 3	0.444	0.375	0	0.839	0.845	0.357	0.496	0.130	0	1.000	0.294	0.073	0.500	0.500	1.000	0.357	0.167	0.143
Univ. 4	0.519	0.708	0	-0.016	0.033	0.571	0	0	0	0	0.500	0	0	0	0	0	0.833	0.214
Univ. 5	0.222	0.396	0	0.234	0.289	0	0.014	0.087	0	0	0.235	0.055	0	0.200	0	0.286	1.000	0.571

For research convenience, the 18 indicators representing the contents of authorized degrees are denoted as x1 to x18, varying from the number of professors to annual profit of research transformation. When determining the radii of the three concentric circles, the outer circle reveals the highest level among the same-level and same-type degrees, the radius of which is denoted as 1 according to equation (1). The middle circle represents the average value among the same-level and same-type degrees, the

radius of which is denoted as 0.5 according to equation (1). Similarly, the radius of the inner circle which represents the lowest level is denoted as 0. Therefore, the radii of the three concentric circles are 1, 0.5, and 0 respectively. For observation convenience, the center of the circles is denoted as -0.5. The indicators are non-dimensionalized and presented in Table 2.

4.2 Drawing the radar chart

In 2010, during the Degree Authorization and Audit by the Academic Degree Committee of State Council, several requirements are proposed for Doctoral degree candidates: the number of professors should be no less than 8, the number of teaching staff who have doctoral degrees no less than 10, the annual research funds no less than 260 000 yuan, the annual government-sponsored research funds no less than 130 000 yuan, the annual scientific awards at provincial or above levels no less than 0.4, the annual doctoral degree granted no less than 1. These data form the lowest level of an authorized degree, which can be seen as the radius of the inner circle. After determining the radii of the three concentric circles and normalizing the statistics, the values of all the indicators can be determined. Using softwares such as EXCEL, the radar chart can be drawn.
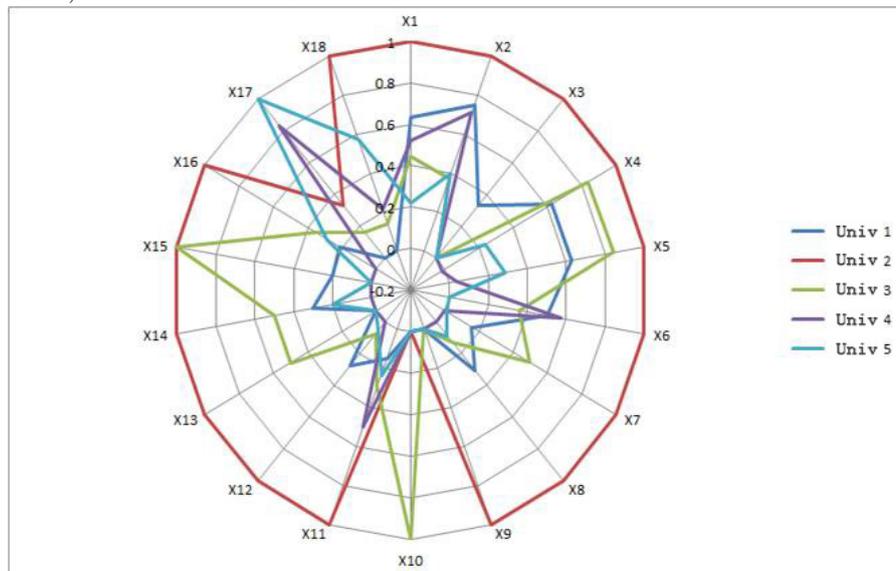
Figure 1   The Radar Chart of Degrees of Chemical Engineering and Technology of Several Universities

4.3 Analyzing the construction of authorized degrees using the radar chart

As can be seen in the radar chart, University No.2's degree of Chemical Engineering and Technology has the most strength and advantages, 16 indicators of which are at the highest levels, especially for indicators X10 and X17. The strength of University No. 3 is also strong, indicators X4, X5, X10, X13, X14, and X15 of which are above the average. University No.1 ranks in the middle, indicators X1, X2, X4, X5, and X6 of which are above the average. While University No.4 ranks relatively low, indicators X1, X2, X6, and X11 of which are above the average, but indicator X14 is below the average. University No. 5 ranks last, only indicators X17 and X18 of which are above the average.

5 Conclusions

As can be seen in the radar chart which depicts the supervision on the degrees of Chemical Engineering and Technology within a designated province, the University 4 fails to reach the national basic threshold. Therefore, the provincial educational departments should warn the University 4 to reinforce scientific research, research funds to be specific. Meanwhile, the radar chart reveals that the overall strength of university 4 and 5 are relatively weak, hence university 4 and 5's degrees of Chemical Engineering and Technology should be included in the provincial dynamic adjustment. The radar chart serves as decision support for local or provincial government to dynamically adjust degrees.

This paper only discusses and analyzes the radar chart method. In order to apply this method to early warning supervision on doctor's and master's degrees, several adjustments are required.

5.1 Longitudinal comparison should be included

Firstly, this paper only made a lateral comparison between doctor's degrees offered by several

graduate students training units in a designated province. Longitudinal comparison should also be included. Because the longitudinal data is quite difficult to collect, this research did not include longitudinal comparison. But if ample longitudinal data are provided, further research can study the development of a degree through a period of 3 or 5 years to analyze the construction and development of degrees and the indicators that constitute the degrees in a given period. Consequently, administrators, especially the ones governing university Graduate Schools, are able to fully understand the overall situation and the construction and development of indicators that constitute the degrees, and to make accurate judgments relying on the information provided.

5.2 The scale of the data should be expanded

Secondly, this research should expand the scale of data. Ideally, the early warning supervision on degrees should be undertaken in a relatively large scale horizontally and longitudinally. As the data collected are rather small, the highest value, the average and the lowest value of the degrees of various levels and types cannot objectively represent the values of degrees. As a consequence, the objective evaluation of the construction and development of a degree is compromised. Thus, future research should establish a nationwide database based on basic data collected across the nation, which will play an important role in determining the radii of the three concentric circles. The larger data will contribute to the increase in the reliability of basic values of the three layers.

5.3 Several indicators need further adjustments

In this paper, the indicator system includes 6 first-class indicators and 18 second-class indicators. All the first-class indicators and second-class indicators are given the same importance when conducting correlation analysis. While from the perspective of system theory, the importance of the elements that constitute doctor's and master's degrees indeed vary. For instance, external elements such as scientific research, talents cultivation, academic exchange, and social services should overweight the internal elements such as teaching staff and base construction. Additionally, provincial and local graduate education administrators as well as university graduate education administrators vary in work hierarchies, work contents, and focuses, therefore the indicator system should adjust accordingly to meet various needs.

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Study on a Model of Creative Thinking

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Abstract: Transformative thinking model is based on the theorem of contradiction & identity. Its integration in studying, working and researching will enforce the interpretation in concept of diverse thinking, even more to enforce the understanding and finding in scientific theory. This model will be the one of the latest models the computer stimulate human intelligence. Applying the formal model into study, work and scientific study, which will play a guiding role, will deepen the understanding of thought and concept of the law of the unity of opposites and mutual transformation, so as to deepen the understanding of and discovery of interdisciplinary theory.

Key words: Contradiction; Identity; Transformation; Thinking model

1 Introduction

Artificial intelligence is a young discipline formed by the three directions of natural science, social science and technology science. In 1956, in the Dartmouth conference, scientists investigated machine to simulate human intelligence, and first proposed the terminology "artificial intelligence". Since then, the AI (Artificial Intelligence) research has been recognized and its name and mission were determined, the earlier achievements and the first group of researchers also appeared.

The aim of the study of artificial intelligence is to create a machine that can simulate human intelligence (Lu Ruling, 1987). The two main schools of artificial intelligence research are: "bionics" and "heuristic". Bionics is to simulate the human nervous system, it adopts the neural network simulation with computer or physical components while the heuristic genre is to imitate human cognitive ability or use a similar approach (E·Popov, 1985).

This paper presents an artificial thinking model, which is a model of human thinking, is established according to the method of dialectical thinking. It is a kind of new model of computer simulation of human intelligence, which is the form of dialectical thinking. There are at least two approaches to this new model that we need to explore, that is, the transformation method and different reasoning, the two are interrelated and complement to each other. It is worth noting that the transformation of thinking mode is only a simulation of the law of the unity of opposites. As for how unity is decomposed into two opposite thinking models, the author has been basically solved. Different reasoning is a thinking method based on the law of the unity of two opposites. Mao Zedong states in *on contradictions* that "when the movement of the things in the second state, as the number of changes the first state reaches a maximum point, causing the decomposition of the unity, the nature of the changes, so a significant change appears". If we want to find out the unknown object $\overline{a}$ according to the object which currently known, it is reasonable for us to regard a and $\overline{a}$ as a unified body with some kind of identity of opposites, they constitute the two aspects of a contradiction, so that the other side of the contradiction, the object $\overline{a}$ can be sought from the object a. Whereas the question about how to find out the other side $\overline{a}$ when regarding a as one side of the contradiction in a unified body is the core of different reasoning. Due to the length limitations, this article does not include a detail discussion on this question.

2 All Opposites Exist Similarities

2.1 On the law of the unity of opposites

Mao Zedong's exposition of the unity of opposites: the law of things, which is the law of the unity of opposites, is the fundamental law of nature and society, and it is also the fundamental law of thinking. Contradiction exists in all objective things and subjective thinking process and conflicts throughout all the process from the beginning to the end, it is called the universality and absoluteness of contradictions. Meanwhile, each aspects of contradictions differs, it is called the specifieness and relativity. Contradictory things share indentity according to certain conditions, therefore they can co-exist in a continuum, and can convert each other to the opposite side, and it is the particularity and relativity of contradiction.

Bbu Vogman's exposition of the unity of opposites: everything is always and ever and ever moving

slowly. Things change, they change into another state, and become the other things, and hence, the opposition emerges from the constant movement and change. Similarly, in the unified opposition formed by movement and changes, the universal connection principle has been clearly visible and can be recognized.

We can easily recognize some opposites, while others are very difficult or impossible to understand. We are familiar with the opposition, in the physical fields; there are hot and cold, long and short, quiet and noisy, solid and liquid, quality and energy, mountains and valleys, land and sea, day and night, movement and stationary, the past and the future. In the world of organic, there are human beings and animals, land animals and aquatic animals, predators and herbivorous animals, plants and animals. There are soft and hard, sweet bitter in sensations. In human emotions, there are happiness and sadness. In social aspects, there are social individuals, young man, labors and weak people, urban and rural areas, industrial and developing countries, market fluctuation, free man and slave, labor and capital, economic and ecological, war and peace. In the field of thinking, there are thinking, material and spiritual, the inner world and the outside world, the inevitable accidental atheism and the theism, the spirit of science and the natural science, good and evil, as well as other countless opposition.

What is the unity of opposites? When we study the opposite, we can find the common character of opposites. It is the indentity of things "indentity, unity, consistency, mutual penetration, mutual penetration, mutual dependence, mutual connection, mutual cooperation. These different nouns are of one meaning, they refer to the following two kinds of circumstances: first, the two aspects in the process of the development of every kind of contradiction exist each with its opposition to the premise of their existence, the two sides are in a unified body. Second, the contradiction of both sides, according to certain conditions, they transform towards its opposite. These are the so-called indentity. The original contradiction cannot exist in isolation and if there is no contradiction with it, it will lose its own conditions. Because of the presence of each other, they are opposite to each other, and coupling with each other, they share mutual penetration, mutual penetration and depend on each other, this is the first meaning of indentity. The mutual transformation of the contradiction between the things is more important. The two aspects of contradictory things, because of a certain condition and the direction of their own, they transform to the opposite direction toward their opposite sides, which is the second meaning of indentity (Mao Zedong,1958).

2.2 The indentity of opposites is the basis of thought form.

When discussing the law of the unity of opposites thinking, we should first refer to a sentence, that is "we shall never believe we can use these dialectical principle as we can use the formal logic, formal logic has become a science, mathematical science, dialectics is a system that can't be axiomatic and have no reason to become a special science." (Bbu Vogman,2001) But the same work pointed out that: "in the scientific community, the most profound one in a large number of examples is Einstein's discovery: quality (material) and motion (energy), people had thought the opposite objects are the same because the movement is free and the matter is condensed. That is to say, there are two kinds of material and form. This indentity can be calculated with the famous formula." It shows that there exists some kind of indentity of the interconversion between two opposite things, when we find the same may establish the conversion relation between them to make it formal. Precisely when competing transformation relations, the writer finds out the common characteristics of all sorts of mutual transformation between the opposites and to give a formal research to the thinking law of the unity of opposites, so as to set up their common-followed reforming process of thinking model.

3 The Transformative Thinking Model
3.1 The meaning of transformation

The unity of opposites thinking form is through the transformation of the method, the transformation method is to turn one thing into the other, and the other is the way of the two things that are opposite to each other. It's a thinking model formed according to the unity, the oneness and the unity of the things and the reflection of the law of the unity of opposites in the theory of knowledge. There are many ways to investigate the indentity of things, and many ways to transform one thing into another such as model, imitation, simulation, bionic, equivalent, transformation, mapping, correspondence, duality, isomorphism and transformation, etc. They find out the laws of things by comparing the similarities between one thing and the other. The essence of this kind of method is to seek the indentity between two things (that is, seeking common); the key lies in the correctness of the conversion process.

3.2 The law of the unity of opposites thinking, the transformative thinking model

1) Convention: a represents a class of thing while $\bar{a}$ is another class of thing that share identity with a.

2) Currently known: In $\bar{a} \xrightarrow{\bar{B}} \bar{A}$, $\bar{B}$ represents certain kinds of thought, method and solution while $\bar{A}$ is the law of $\bar{a}$. The formula shows that the law $\bar{A}$ applied to the object $\bar{a}$ is acquired by using method $\bar{B}$ to study the object $\bar{a}$.

3) Inquiry: In $\bar{a} \xrightarrow{\bar{B}} \bar{A}$, A is the law that apply to the object a, the formula shows that the law A applied to the object a is acquired by using method $\bar{B}$ to study the object $\bar{a}$.

4) Transformation: In $a \xrightarrow{T} a^T = \bar{a}$, a^T is equivalent to a, or that it is a a transformation. T indicates the condition of transformation, which is based on the condition that there is some kind of identity between a and $\bar{a}$. It is the key to make sure that a^T is equivalent to a, in other words, to make sure that a^T and a meet the need in $a^T \cong a$ relationship which indicates the transformative the object a^T and the original object a may be equivalent or approximate equivalent. The formula shows that when the object a is transformed into the object a^T, the object a^T meets the relationship $a^T = \bar{a}$, that is to say, the transformative thing a^T is the object $\bar{a}$.

5) Conclusion: when $a \cong a^T, a \xrightarrow{\bar{B}} A$, in which $a \xrightarrow{\bar{B}} A$ is $a^T \xrightarrow{\bar{B}} A$, A is the law that apply to the transformative object a^T. If a^T is equivalent to a, A is applicable to object a. If A is approximate to a, A is the approximate solution and law to a.

3.3 The key to the use of transformative thinking model

Among many non a things, it is not easy to find a non a object $\bar{a}$, which has some kind of indentity with the object a. It points out that every difference of things in the world already contains the contradiction, the difference is the contradiction. The things that are different from the object a is infinite. In other words, how to find the non a object is a worthy question.

We have to find out the transformative condition T according to the identity of the object a and $\bar{a}$ and once we find T, it is possible to transform the object a to the object a^T. At the same time, when a^T and a meet the $a^T \cong a$ relationship, a^T is approximate or equivalent to $\bar{a}$ and the law of the object a is also approximate or equivalent.

4 Referring to Transformation Examples of Opposing System

The transformative thinking model points out that in order to seek the law of the object a, we should seek a $\bar{a}$ which possesses certain indentity with the object a in a collection which exclude the object a, and then convert a into a^T, equalize a^T with $\bar{a}$, however, the result is that it is either a or the opposing a, therefore, it's difficult to find the object $\bar{a}$ which has certain indentity with the object a in this collection. We illustrate the application of transformation of thinking model on the basis of mechanical system transformation.

If a represents machine set and the real motion of machine set is required, seeking $\bar{a}$ which has certain indentity with machine set in a non-machine set collection. If $\bar{a}$ is the minimalist machinery (single), the machine set can be converted into single machine, thus solving the problem of unit movement with the method of single movement. To meet the need of $a \cong a^T = \bar{a}$, the transformation condition T of the conversion a into a^T as follows: the transforming ability PT acted on the transformation system a^T and the works of transforming ability short MT is equivalent to all forces of the machine set and works of moment, and equalizing the kinetic energy of transforming system a^T with that of original machine set. Thus, we can use the method of single machine movement to solve the problem of machine set movement. So the indentity of single machine and the machine set is that the energy they possess is equal, and mechanical power acted by them is equal. The equivalence of energy and mechanical power is the indispensable condition of the transformation (Lian Shiyou, 2007).

5 Conclusions

Firstly, the transformative thinking model illustrated in the paper is actually a kind of formalization of the law of the unity of opposites in the dialectical thinking method.

Secondly, applying the formal model into study, work and scientific study, which will play a

guiding role, will deepen the understanding of thought and concept of the law of the unity of opposites and mutual transformation, so as to deepen the understanding of and discovery of interdisciplinary theory. Transformation is a process of discovery, seeking another thing which has the same indentity with some things, that it is a process of discovery. Therefore, the transformative thinking model is a kind of creative thinking method.

Thirdly, it is assumed that the transformative thinking model can use some kind of artificial language to describe, and further produced in a program form of reforming process of thinking model.

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A Research on Pragmatic Failure in Intercultural Communication

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Abstract: Intercultural communication has become one of the most important activities of the world today. However, due to the cultural differences among people in different regions and countries, communicative barriers exist among people with different cultural backgrounds, often leading to communicative failure. Pragmatic failure is a major cause of an unsuccessful communication. This paper analyzes the phenomena of the pragmatic failure in intercultural communication and discusses the causes of pragmatic failure from the perspective of the relationship between language and culture. Recommendations are also made on how to cultivate language learners' pragmatic awareness, to develop their pragmatic ability, and to increase intercultural communication competence.
Key words: Intercultural communication; Pragmatic failure; Context; Communication competence

1 Introduction

With the increasing process of globalization, intercultural communication has become more and more prevalent in our daily life. We are no longer constrained by state boundaries but have all become part of an independent international network. One of the key changes this has triggered is the need to communicate effectively with people from different cultures in different languages. However, due to the complexity and intricacy of the differences between different cultures and languages, intercultural communication does not proceed as smoothly as intercultural communication. If we neglect the distinction, pragmatic failures are easily made. To make matters worse, even though the source and the receiver of the communication realize the differences, it is likely that both parties would encode or decode the message based on their own culture and consequently give inappropriate feedbacks accordingly.

Researches on intercultural communication have attracted broad attention in academic circles, especially foreign language field in recent years. The number of papers related to intercultural communication added up to 6,942 from 2003 to 2012, among which 80% discussed the issue in foreign language field. Most of the papers focus on how to cultivate intercultural communication competence (Hu Wenzhong, 2013). Scholars have reached certain consensus of its components, that is, intercultural communication competence is generally studied at three levels: cognitive, emotional and behavioral. For instance, Lustig and Koester believe that intercultural communication competence includes adequate knowledge, proper motivation and well-trained behavior and it cannot be acquired by having any one of the elements alone (Lustig M & Koester J, 2007). Yang Ying and Zhuang Enping state that intercultural communication competence is composed of interwoven systems of global awareness, cultural adaptation, knowledge and communication practice (Yang Ying & Zhuang Enping, 2007).

In western countries, scholars of intercultural communication are mainly from disciplines of communication, psychology and management, etc. Only a few of them come from education field. Ruben points out that the actual needs consist the major impetus for studies of intercultural communication competence in the west (Hu Wenzhong, 2013). Objects of training in intercultural communication competence are mainly multinational company staff, technical personnel, diplomats, business expatriates and overseas students, etc. Specific research objectives include: (1) explaining the causes of the failure of the work in foreign countries; (2) predicting success factors of the work in foreign countries; (3) studying the standards of the staff sent to work abroad; and (4) designing and implementing the training and preparation for expatriate staff.

2 Crucial Factor for Successful Interculture Communication

Hall first put forward the term intercultural communication in his book *The Silent Language*. It can be defined as the interpersonal communication between members of different cultures and backgrounds (E. Hall, 1990). A successful interculture communication may be attributed to many factors. From pragmatic perspective, it is crucial to clarify the notion of context.

2.1 Context

Context, closely associated with communication, plays a vital role in the process of communication. The concept was put forward by the British anthropologist Malinowski. He initially divided context into

three levels in his theory: discourse context, situational context and cultural context (Malinowski, B, 1923). Based on his theory, scholars did further research on context from different perspectives. In intercultural communication, context can be regarded as the sum of verbal and non-verbal factors that influence the actual communication.

Hall proposed his theory of context in 1976, dividing context into high context and low context. In high context cultures, much of the information has been pre-encoded in the receiver, hence only a small part of the information is conveyed through verbal or non-verbal messages. In low context cultures, on the contrary, most of the information must be presented by the messages sent by the source so as to supplement the loss of information that could have been decoded through context in high context culture.

2.2 Cultural adaptation in a particular context

People of particular ethnic groups tend to have preconceived notion of their own culture. Therefore, cultural communication barriers may frequently occur in intercultural communication. In practice, it is difficult for people to adapt due to cultural differences and the complexity of context.

Context varies in intercultural communication. The way of adaptation of the speakers, therefore, varies accordingly. It largely depends on which culture plays the leading role in terms of the explict and implict contextual factors. Fu Yonggang clarified the explict factors as the general background of communication, including time, place, occasion, language, the specific context, etc. Implict factors refer to what is deeply rooted in people formed from their own experience and culture, such as value, religion, national psychology, behavioral standards and norms, culture, personal experience, and so on (Fu Yonggang,2002). Implict factors are relatively stable while explict factors are temporary and thus variable. Generally, in intercultural communication, people adapt to each other's culture on the principle of observing the customs of the host. For instance, at the office or public places in a low context culture country, where low context culture is dominant, the speakers should adapt themselves to the low context culture. Likewise, in the same country, if the communication occurs at home of someone coming from high context culture country, where high context culture is dominant, the speakers should adapt themselves to the high context culture (as shown in Figure 1)
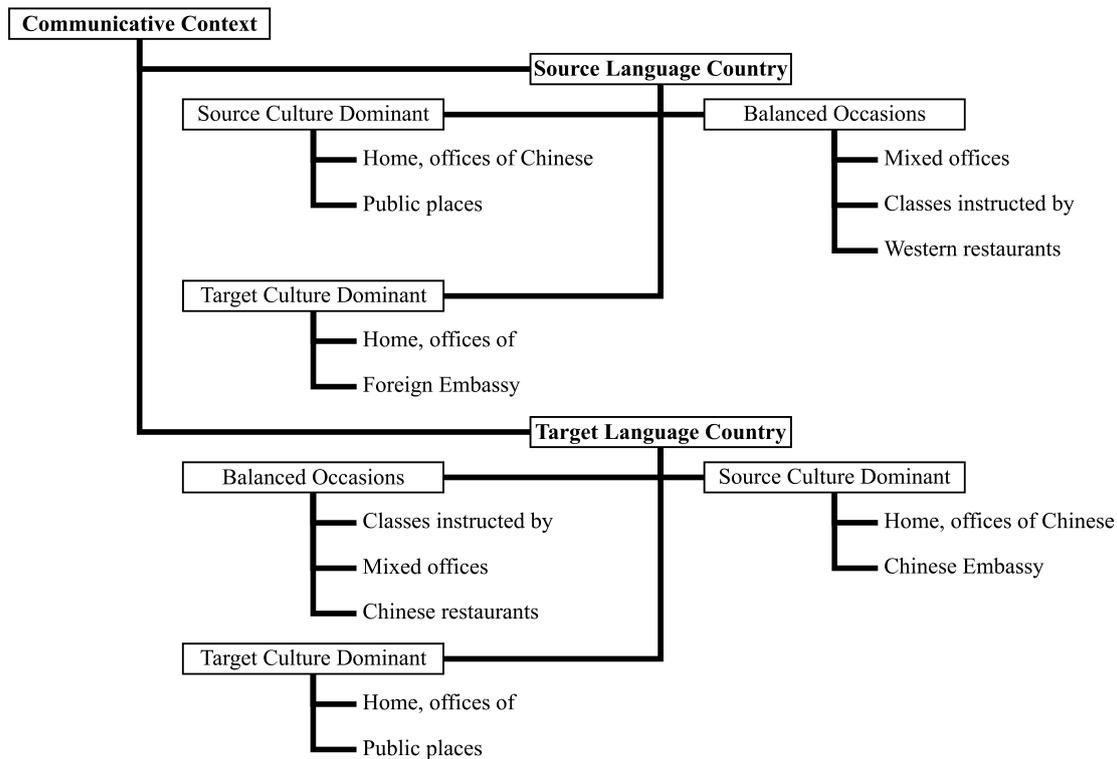

Figure 1   Taking Chinese as the Source Language

2.3 Importance of intercultural communication competence in management

From the previous discussion, it is clear that cultural adaptation is of great importance during intercultural communication. In terms of management, administrators' objective attitude, empathy,

tolerance of ambiguity, etc. help to avoid misunderstanding and thus build up a positive relationship with their counterparts. Shi and Franklin's study showed that intercultural adaptation of business expatriates was significantly related to job performance in a positive way, and their outstanding performance would guarantee the success of multinational business operation (Shi X & Franklin P, 2006). Another study of Shi also showed that the relevance between intercultural knowledge, intercultural competence, intercultural sensitivity and job performance was higher than the relevance between language ability and job performance (Shi Xingsong, 2014).

3 Analysis of the Reason for Pragmatic Failure

The concept of pragmatic failure is first advocated by British linguist Jenny Thomas (1983) in her Applied Linguistics. She holds that in intercultural communications, when the hearer fails to understand the semantic meaning of what the speaker says or gives an inappropriate response to what the speaker means, communication failure or pragmatic failure occurs.

In addition, Thomas distinguished two kinds of pragmatic failure: pragmalinguistic failure and sociopragmatic failure. Pragmatic failure is not just syntax errors, rather, it is because the wrong way of speaking does not conform to cultural conventions, and thus the communication cannot reach the expected result. Major causes of these two kinds of pragmatic failure include negative transfer of culture, negative transfer of thinking patterns, negative transfer of values, negative transfer of politeness and improper learning or teaching techniques.

3.1 Negative transfer of culture

Due to the profound influence of the customs and tradition, there distinctly exists negative transfer of native culture. The greater the cultures differ from each other, the stronger the cultural negative transfer will be, in which case pragmatic failures are more likely to occur. Negative transfer of culture is closely related to the cultural differences, so in an intercultural communication, it is essential to reveal the hidden culture factors that may lead to misunderstanding or even conflict in order to achieve a successful communication.

3.2 Negative transfer of thinking pattern

Although the way of thinking is different from person to person, generally speaking, people from the same culture share common laws of thinking. However, people from different cultural backgrounds will have much bigger differences since they form their typical way of thinking and knowing under the influence of their own culture. Language is the carrier of thinking and thinking is mainly manifested through language. Therefore, the interference of negative transfer of thinking pattern is one of the major causes that lead to pragmatic failure.

3.3 Negative transfer of values

Obviously, in different cultures, people value different things. The value system is the core of culture. One cannot fully understand a nation's language and its behavioral patterns without fully comprehending the nation's value system. In intercultural communication, we cannot take it for granted that what we value most is also the core of value system of another culture. For instance, it is generally acknowledged that the Oriental cultures speak highly of group interest whereas western cultures place emphasis on individual interest, China and the United States being the typical representatives of the two cultures respectively.

3.4 Negative transfer of politeness

The living habits and social etiquette also vary greatly from culture to culture. Polite language in one culture may be regarded as rude or even offensive in another culture. For instance,
An American teacher: Thank you for your help.
A Chinese student: It is not worth mentioning. Moreover, it is my duty.
In this example, the American teacher thanks the Chinese student for his help. In Chinese culture, it is proper and polite for him to respond in this way. However, the word 'duty' in English implies that 'I have to', so the American teacher may misunderstand the help as insincere. Thus communicative failure occurs.

3.5 Improper learning or teaching techniques

For most of the learners, second language acquisition mainly takes place in class. The lack of opportunity to practice using the target language in authentic communication context makes it easier for the learners to use the language in an inappropriate way. Learners are also liable to overgeneralize grammatical rules (Liu Changjiang, Kong Ruizhu, 2010). In terms of teaching methods, many teachers fail to impart adequate cultural background knowledge to the students, resulting in the students' lack of a

sense of cultural difference.

4 Intercultural Communication Strategies

The aim of this pragmatic failure research is to overcome the conflicts under the condition of intercultural communication in order to achieve successful communication. In addition to acquire the correct forms and sounds of the target language, language learners should also know well the knowledge of how the language is pragmatically used in the target culture. Therefore, in order to reduce pragmatic failures, efforts should be made to develop intercultural communication competence from the following aspects: cultivating intercultural communication awareness, avoiding negative stereotypes, developing intercultural communication competence in terms of grammatical competence, pragmatic competence, communication ability and the awareness of context.

4.1 Cultivate intercultural communication awareness

Intercultural communication awareness refers to the ability to understand cultural differences. It also refers to the recognition of people's basic ability to create their unique culture, and the acceptance of the different values and behavioral patterns of different cultures.

In order to improve sensitivity to cultural differences, learners have to be quite familiar with the target culture, including history, philosophy, literature, music, religion, customs, rituals and ceremonies, food and clothing, lifestyle, values, time orientation, the way to solve problems, social systems, etc. Not until they have a thorough understanding of the target culture can the learners hold a tolerant attitude towards cultural differences and evaluate the differences properly. With a critical eye to the foreign culture, they would not feel baffled or disappointed when people from another culture behave beyond their expectation.

4.2 Avoid negative stereotype

The term stereotype is first proposed by American critic Walter Lippmann (1922). He holds that the world is too complicated for humans to perceive so people need to treat the outgroups in the form of generalization and classification. Early theories of stereotype content proposed by social psychologists assumed that stereotypes of outgroups reflected uniform antipathy. For instance, Katz and Braly argued in their classic 1933 study that ethnic stereotypes were uniformly negative (Operario, Don; Fiske, Susan T, 2003).

Stereotype refers to the attributes that people think characterize a group. Stereotypes can help make sense of the world since they are a form of categorization that helps to simplify and systematize information. Within stereotypes, people are as similar to each other as possible. Thus, information is more easily identified, recalled, predicted, and reacted to. However, negative stereotype ignores individual differences. The interference of negative stereotype may lead to false judgment or even prejudices.

Therefore, in intercultural communication, it is necessary to avoid the influence of negative stereotypes. Subjective evaluation will affect the processing of information. An open and tolerant attitude towards foreign cultures, admitting that there are exceptions in stereotypes, helps to prevent forming negative stereotypes of other cultures.

4.3 Cultivate an acute sense of context

To cultivate an acute sense of context, language users should not lay too much stress on language forms. Instead, they should strengthen the pragmatic function of language and make proper inference of language under the specific situational context. Moreover, it is helpful to have an insight into Chinese culture so as to know better the differences between Chinese and foreign cultures. To a large extent, Chinese people tend to transmit Chinese culture in a way acceptable to foreigners. However, the lack of real context while learning English weakens their ability to select an appropriate way to send messages in particular context. Therefore, it is of great significance to develop a sense of context for a successful intercultural communication.

4.4 Develop intercultural communication competence

The concept of 'communication competence' is raised by the American sociolinguist Hymes in contrast with Chomsky's 'linguistic competence'. Hymes (1971) thinks communication competence includes pragmatic knowledge and ability, that is, in the process of using language, not only do the two parties communicate grammatically, they also need to beware of the feasibility, appropriateness, and reality of communication discourse in particular context. Grammaticality, feasibility, appropriateness and reality are the four major parameters of communication competence. Such competence requires adequate cultural knowledge of the target language.

In terms of grammatical ability, language users have to avoid the negative transfer of the native language. At the same time, they have to know well the living habit of people from the target culture, especially their way of conversing. Otherwise, even though the message is sent in grammatically correct way, it may cause confusion or even misunderstanding to foreigners. So it is advisable that a better English learning environment be provided for English learners to practice their pragmatic competence.

5 Conclusions

The trend of globalization is unstoppable. Intercultural communication happens everywhere in this global village. However, communication obstacles or even conflicts do exist in the process of intercultural communication as a result of cultural differences. Therefore, it is necessary for us to raise cultural awareness and form a right attitude towards cultural conflicts caused by cultural differences. Besides, it is also an urgent need in the process of globalization to develop intercultural communication competence and adopt proper tactics to eliminate and minimize the obstacles.

Intercultural communication is by no means just an activity of using a language and language skills. It is a process during which the source and the receiver encode or decode the context as well as the message. In other words, the understanding of language and context co-exist in intercultural communication. Language is inseparable with culture and it is used only in a particular context. These pragmatic failure analyses may help us to know better the pragmatic rules of a certain culture and hence avoid pragmatic failures. To gain success in real communication, we need to cultivate intercultural communication awareness, avoid negative cultural stereotypes, develop intercultural communication competence and have a keen awareness of context.

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A Research on Practical Rationality and Limitation of Utilitarianism

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Abstract: Utilitarianism thought has existed since ancient times, but mostly in the embryonic stage. Since modern times, many people, such as Bentham (Jeremy, 1748-1832), has made the thorough development to the utilitarianism thought, which made it have a higher level of rationality, but at the same time there are also limitations. Based on this, this paper firstly analyzes its realistic rationality from four angles of moral origin, evaluation standard, social equity and guiding significance, and then discusses its limitations from two aspects of theory and practice.
Key words: Utilitarianism; Rationality; Limitation

1 An Overview of Utilitarianism

1.1 The origin of utilitarianism

Utilitarianism as an ideological trend has a long history. On the history of Western thought, it can be traced back to the hedonism theory of Epicurus, an ancient Greek philosopher. In Epicuru's opinion, pleasure is equated with happiness, but opposite with enjoyment. Tang xia(2014) put forward that the concept of happiness was the most important element in the history of Western ethical thoughts，Muller regards happiness as a core category of his ideology．Muller's happiness thought includes the definition of happiness，happiness and joy，happiness and virtue and personal well － being and overall happiness and so on. Based on view of utilitarian，we should explore and analyses Muller's happiness thought dialectically，in order to present the socialist moral construction revelatory value and useful reference. On this basis, he finds that the purpose of life is to seek happiness and to get rid of pain, which is just one of the greatest interests of the people living in the world. His hedonism theory profoundly affected the western world. French Enlightenment thinkers Helvetius use this as opposed asceticism and the shackles of feudal weapon, which deepens its theoretical connotation and practical significance. Thereafter, British philosopher Mandeville, David Hume, Adam Smith and William Godwin, also has done corresponding research on utilitarianism theory, which places a very important leading role in the rise and development of the modern utilitarianism represented by Bentham and Mill. Utilitarianism of Bentham et al, essentially is a kind of ethical theory, taking actual efficacy or practical benefit as the moral standard. In Bentham's opinion, moral takes the pursuit of happiness as its goal, and the essence of happiness is pleasure which can be measured by substances. Mill inherited the main theories of Bentham, but he denied that pleasure can be measured, because in Mill's opinion, pleasure can be classified to a senior, junior level while the senior pleasure (spirit) is higher than that of lower pleasures (material) (as showed in Figure 1).
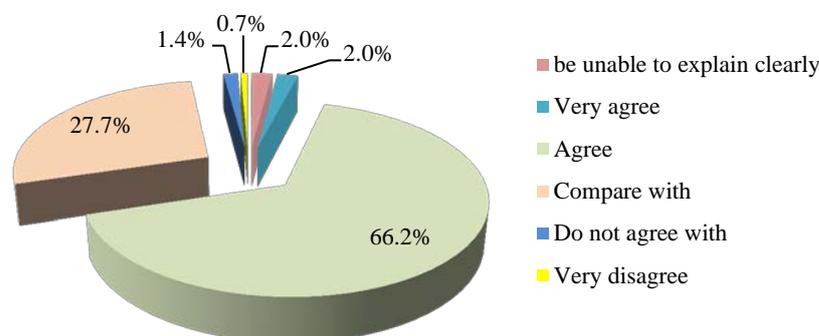

Figure 1   I am a Happy Person

1.2 The principle of utilitarianism

The principle of utilitarianism can be summarized as the principle of happiness maximization, or

the principle of utility maximization. In Bentham's opinion that it seems that the pursuit of happiness and pleasure is the ultimate goal of all human behaviors, so, happy or not, or whether it is to enhance happiness is to determine is the main symbol to decide whether a behavior is correct. In other words, pleasure and pain become a measure of human ethics, and all the behaviors which can increase happiness are rational and kind, and should get approval; but which cannot increase the happiness and even reduce it, are unreasonable and bad behaviors, and should be subject to the negative. The most reasonable behavior is such that can bring the greatest kindness, which is able to give the greatest majority of the community the greatest happiness. In general terms, it is the principle of happiness maximization. In modern times, it seems that the principle of happiness maximization is the fundamental principle to measure everything whether is right or wrong. Of course, the realization of the maximization of happiness is not in conflict with the interests of everyone, that is, the realization of personal happiness is not based on damaging the happiness of others. However, in real life, the conflict of individual interests can be seen everywhere. Therefore, Bentham advocated that the interests of the minority should be subject to the interests of the majority, so as to maximize the benefits. This principle seems to be very reasonable, however, there is a certain contradiction between the largest majority and the greatest happiness itself, which leads to a lot of difficulties in the application then.

1.3 The influence of utilitarianism

Utilitarianism has produced a broad and far-reaching influence on the society, which has formed two camps, advocates and opponents. In advocates' opinion, Utilitarianism mainly thinks about the moral origin on the view of combining utilitarianism from utility, social and moral point, which deepened the cognition of the essence of moral, more persuasive than the inane moral sermon. Utilitarianism also views utility as measure of the behavior of the core standards, which is simple. But those who were against thought that although utilitarianism emphasizes the greatest happiness for the most people, it often tends to egoism in practice. However, the historical impact of utilitarianism is not negligible, whether advocate or opponent (Wang Ruibing, 2008). Utilitarianism was born in the era of the modern enlightenment in Europe. As the product of the enlightenment, it is not only the ideological weapon of the political reform used by the emerging European bourgeois, but also theoretical weapon to defense for the capitalist relations of production and capitalist economy, which strongly promoted the European Society from the era of the feudal aristocracy to capitalist era. Although at the beginning of the 20th century, Principia Ethic published by Moore gave a heavy blow to the classical utilitarianism thought of Bentham et al, but in the latter half of the 20th century, utilitarianism radiated the new vitality in the west, and even in the whole world, which is, of course, related with the intrinsic theory of ethics development, and also has an important association with the actual needs of the western society.

2 Realistic Rationality of Utilitarianism

From the development course of utilitarianism, we know that as a naturalistic ethics concept, utilitarianism has its strong vitality, which can be attributed to its rich ideological content. And on the other hand it is also closely related with undeniable and practical rationality. Specifically, they are listed in the following four points:

2.1 Clarify the moral origin, highlight the value of human

The origin and essence of morals is a timeless question, and the answer to it may even lead to a series of political, religious and social revolution. Appears in the European Medieval Thinkers, morality is the will of God, and the fundamental purpose of practicing moral of man is God. Therefore, people need to depress their desires in order to follow the moral, which is the nature of Christian asceticism ethics, and the reversed causality concept of moral cognition fundamentally is helpless to realize human happiness and pleasure. By getting rid of the bondage of god, utilitarianism tended to explore to the moral origin, value and purpose from the point of view, and sharply pointed out that moral is to people but not to God, and the ultimate goal of moral is to make happiness. This kind of moral concept is a subversive cognitive to the church traditional ethics, which not only produced huge impact to Christian asceticism, but produced profound ideological liberation movement to the European society, and effectively promoted the multiple fields of the European Society of political, economic and other development. As far as the modern development of Europe is concerned, whether the Renaissance or the enlightenment, its fundamental goal is to liberate people from the shadow of God, to re-explore the value of human. Utilitarianism moved the moral judge right from the body of God to people's hands, and teach people how to cognitive self and treat others from the aspects of the combination of morality, happiness and social perspective these. Without any exception, all these reflect the people-oriented

moral pursuit, not only embody human dignity as a man, but also develop the brilliance of humanity, with a great influence on Europe's realm of thought and the social reality.

2.2 Clear ethical standards, enhance the guiding significance

Before the birth of the utilitarian moral view, theology and religion is the Supreme Master of the moral sphere, however, there are two problems in the moral sphere under the guidance of Theology and Religion: a, Moral lacked an objective criterion, prone to only talk about ethics phenomenon, even became a moral supremacy theory and even dogmatism; b, Morality linked with divine, but far away from people's daily life, becoming a bound of human nature, which can be easily seen both at home and abroad China. Neo Confucianism advocated "save heaven, get rid of the human desire", and advocated by the Catholic Church of the Middle Ages in the west, "people's life should take God as the center, and seek to the death in heaven through the abstinence of real life". All these can be the evidence. Utilitarians, did not explore the nature of morality and objective criteria through the vain God and religion. On the contrary, utilitarian think that morality has close association with happiness and even social relations and the economic base, so it can take the real happiness as the moral ultimate off arms, also see promoting the well-being of the people as the judgment of human behavior, to judge whether the behavior is right or wrong and whether it reflects the standard of kindness. This not only theoretically clarifies the cognitive errors followed by people for thousands of years, but also effectively exposes the false essence of the religion and theology in the field of moral hypocrisy, and greatly enhances the vitality of the utilitarianism. Happiness is the core of the utilitarianism, and utility principle, or utility maximization principle is the primary principle of utilitarianism, which set an objective standard to the moral rationality, namely whether it can meet people's needs or promote human happiness. Compared to other unreal moral thought, this greatly increases the guiding significance of utilitarianism thought to moral practice

2.3 The minority subordinate to the majority, promote social equity

Since the birth of utilitarianism, it has repeatedly been criticized, which has an important link with many people their own faulty understanding. Most people think Bentham and Mill's utilitarianism is self-centered and mercenary thought. But actually otherwise, utilitarianism emphasizes not only personal happiness and benefit, but it also stresses collective happiness and interests, and even it put more emphasis on the latter one. This are essentially different with Yang Zhu's "pulling hair Elisha had not also the world", China's traditional pre Qin thinker. The core principle of utilitarianism is the greatest happiness of the majority. There are two aspects hidden in it: social welfare theory and altruism. And this is a great inspiration to the social justice and fairness. First, in the eyes of Bentham, traditional moral values are undoubtedly not in compliance with human nature, which restricts man's pursuit of joy and happiness. So the utilitarianism tries to deny the asceticism, and agrees with one's pursuit of their own interests very much; Secondly, in the affirmation of individual pursuit of profit, utilitarianism does not deny their interests at the same time, because, the perfect social interests should be everyone's interests without damaging the interests of others as the premise, in order to achieve the maximization of the social collective interests; Finally, it is undoubtedly an ideal state that everyone gets his own interests without damaging others' interests as the premise. But the possibility of that state is very low, more the case is contrary to a person or class of people's interests and collective interests (on the contemporary value of utilitarianism, 2008), this time to maximize the benefits of the point of starting, these people should follow the minority is subordinate to the majority principle, for the collective interests of the concessions.

2.4 Theory to guide the reality, to promote social development

Utilitarianism has innovation in many places. For example, it explores the origin of morality based on interests rather than false deity. And also, after it has an in-depth analysis of the reasonableness of the personal interests, and then has a further analysis of the several relations that may exist between the individual interests and collective interests. All in all, as an important part of the Western Modern Enlightenment thought, utilitarianism has a profound guiding role for social development. As China, after decades of development of reform and opening up, China has leapt to the second largest economy in the world, but in the order of the market economy construction and the principle of the market, there are still many shortcomings. Utilitarianism can exactly play the guiding role. Specifically, the following three points: First, respect for individual interests. Personal interest is not only the main factor of the mobilization of individual labor enthusiasm, but also personal happiness, so, only when personal interests get respected, social morality can be seen. It requires our country to maintain the legitimate rights and interests of the laborer in the present stage of economic construction (Wang Kangri, Chen Xuxin, 2014), gradually through legal construction and moral opinion. Second, pay attention to the

principle of effectiveness. Market economy is the economic benefit in the final analysis, while benefit is fundamental basis to measure the success of economic construction. As a result, the country in the economic construction should start from the utilitarian principle of utility, break in the presence of formalism and bureaucratism, so as to guide the people to pursue the practical effect; third, emphasizing the consistency of individual interests and collective interests. The minority is subordinate to the majority, the individual is subordinate to the collective, which is not only the core idea of the utilitarianism ethics, but also the essential requirement of the collectivism values.

3 Limitations of Utilitarianism

Although utilitarianism has a lot of practical rationality, its limitations in theory and practice cannot be ignored. In fact, the realistic rationality of utilitarianism is the main support of the utilitarianism, and its limitation is the core of the opponents.

3.1 Lack in theory

Utilitarianism has two obvious deficiencies in theory. Firstly, utilitarianism has abandoned the traditional way to view the moral from the point view of God, and pulls it back to the real life. But according to the logic of the theory of utilitarianism, the world does not exist any ultimate value, because, once people found some value more valuable than the existing human value, in other words, more utilitarian, then the current value of the situation becomes precarious, because in the utilitarian view, in order to achieve better use to the maximum benefit, the existing value system inevitably needs to make sacrifices, which exposes the extreme purpose on the noodles dew , while highlights the core of the theory of utilitarianism naturally(Qin Jian,2014). On the so-called extreme purpose, the current all ethics and code of conduct in the final analysis are only means only, which itself does not have the subjectivity, is just a mean to achieve a more utilitarian ethics. The resulting consequence is that in the evaluation system of utilitarianism, rational calculation is the core standards, but sensibility and emotion lack essential living space. Here, all moral obligations, and human dignity and basic rights can be calculation as well as the contents of the bargaining process chip. In the pursuit of utility maximization, it eventually will do harm to human, which makes people become more cold, and also make the entire society lack love and affection.

The theoretical limitations of utilitarianism also reflected in the relationship between the motivation and the results of the neglect. On the general experience of the real life, the behavior people is usually divided into intentional and unintentional, two forms. Although there is homogeneity in the final result between the two forms of behavior, they have a distinctive in law and moral definition. In terms of legal definition, the same cause of death, but with intentional homicide and negligent homicide, has the essential difference in the sentencing process. That is to say, the society in the measure of a person's behavior caused by the consequences, usually also investigates the motivation. But in the theoretical system of utilitarianism, the status of the motive is useless, or there is a lack of space for the existence of the motivation, because utilitarianism only measures the effect as the sole measure. The sanctity of this approach will enable fuzzy for norms of behavior and conform to the boundaries between the norms of behavior, so as to eliminate the sanctity of moral, so that moral becomes instinct for living or becomes a kind of technology, which has a fundamental difference with the essential target of moral to teach people to perform good deeds. Pure utilitarianism will make moral have kind behaviors without kind thoughts in practice. This contradictory situation of development will lead to a dwindling of good deeds, which is just the same as the Chinese," heart of goodness, goodness without admiring; not evil, evil without penalty ".

3.2 Negative in Practice

Utilitarianism not only has a larger lack in theory, but in practice, it also has some negative effects. These negative effects are related to both the theory itself and the strategy misconduct of practitioners in the practice. In terms of the negative of utilitarianism in practice, the first point is how to define the relation and difference between the personal interest and the collective benefit. Although utilitarian made it clear that, when there is no conflict between the personal interests, the sum of each individual interest is the interests of society as a whole. But when there is a conflict between the interests of the individual, the interests of the majority are the interests of the whole society. But there exist two operating difficulties: first, how to define what interests are the interests of many people, and what interests are the interests of a small number of people, once lacking a fair and objective way of definition of and a good social environment, there will be bullying, which is contrary to the original purpose of utilitarianism; second, public interest is difficult to sector, compared with the interests of the

individual, and a lot of people tend to view from the individualism and take self-interests as the core, so that the utilitarianism evolves as egoism.

Secondly, the core principle of utilitarianism is the principle of utility maximization. Behind the principle of utility maximization, there is a kind of extremely rational value, that is to say, the greater the function, the greater the value. The popularity of utility principle makes utilitarianism inevitably becomes the first principle of measuring all things, and it is also the only standard to judge the value of life. This pragmatic attitude, though helpful to the development of science and technology, is not necessarily a good trend for people themselves (Zeng Yongheng, 2016). Because in addition to the rational, there are many non-rational elements in the life of people, such as belief, emotion and so on. Once people's irrational factors all need measuring by the effectiveness and usefulness, it inevitably will result in the decline of the humanistic value, which in contemporary China has increasingly come out. Because, in western society, utilitarianism has a complete social foundation and complete restriction conditions, while in China utilitarianism as the exotic, the utility principle greatly affected the Chinese people's real life state.

Finally, utilitarianism has a problem of integration with traditional culture in practice. At present, utilitarianism in China has a large market, and profoundly affected the development of Chinese society. But even the utilitarianism in favor of it, it is also very difficult show his recognization to utilitarianism publicly, because utilitarianism has a natural conflict with the traditional Chinese Confucian values. Confucianism is very valued justice identified, especially Mencius. "Justice" is symbol of the in Chinese traditional culture. The symbol obstructs the understanding to utilitarianism of contemporary Chinese people. Some even directly regard utilitarianism as putting benefit the first, and the one-sided understanding, is not only a kind of slander for the utilitarianism itself is, but also a barrier factor for China to better use utilitarianism to service on social development.

4 Conclusions

Utilitarianism, as an important part of the Western Enlightenment thought, placed a very important role in the growth of the western capitalist class and the establishment and development of the capitalist economic system. Compared to the traditional ethics moral concept, moral idea of utilitarianism has a closer connection with real life, and it fits people's actual demand more, with a strong practical rationality. It not only clarifies the relationship between moral and social, but also provides a set of objective criteria for moral judgment, enhances the practicability of moral. But it is just because the close link with real life, the sanctity of moral self has been weakened to some degrees. Moreover, simple evaluation of the utility makes moral increasingly becomes a survival technique, which is extremely unfavorable to the social development and construction of the harmonious society.

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The Optimization Setting of Innovation and Entrepreneurship Education Course for Master of Physical Education Student

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Abstract: This paper adopts references and evidence-based researching methods, uses physical education for postgraduates in Wuhan University of Technology as a case study, and builds up a creative curriculum provision system aiming at promoting abilities of innovation and entrepreneurship for postgraduates of physical education. The educational conception of innovation and entrepreneurship remains week in physical education colleges and the future career is not optimistic for postgraduates. To strengthen the innovation spirit and practical ability of "sports master students", in order to adapt to the complex and changeable environment, Reform and develop China's higher education is becoming a more and more important task. The results show that it is conducive to the education of theoretical knowledge in a systematic manner by means of taking social demand-oriented principles and set up a variety of courses to add optional elective courses. The sound combination of professional courses and the practice of innovation and entrepreneurship could help to improve capacities and competencies, thus ultimately delivering a physical talent of high quality on innovation and entrepreneurship. The sound frameworks for degree programs, compulsory courses and educational practice will be reasonably designed to form the all-round curriculum network system of innovation and entrepreneurship.
Key words: Sports training of physical education; Postgraduate; Innovation and entrepreneurship; Curriculum provision

1 Introduction

With the rapid development of national economy and social demands of talents in various sorts, the gap between the university graduates and social demand becomes more and more obvious resulting in the difficulties on employment of graduates. The traditional and simple employment education offered by universities can't mention its track on the modern development, which makes an inevitable trend for the higher education in China to build up a new educational model of combination of employment and entrepreneurship. Currently, the Full-time academic graduate students of comprehensive universities majoring in sports training of physical education (hereinafter referred to as graduate of physical education) are facing bleak future in employment. According to the survey of 2015 graduate employment statistics, the employment rate of physical education was only 68.18%. On one hand, reasons for such situation, the nation implemented enrollment expansion policy for graduates on physical education, while the social demands for such professional talents coming to pall; on the other hand, some graduate of physical education devote much time into training, less focus on culture and academic studies, leading to low competencies in innovation and research and less choices in employment.

To "Postgraduates of Physical Education, Innovation and Entrepreneurship, Curriculum Provision" as the key words, access to the relevant research papers a total of nineteen from 2000 to 2016. In foreign countries, the United States is one of the earliest countries to implement innovative education. Peter Drucker (2003) Combining with a large number of enterprises, the paper discusses the connotation, relationship and mutual infiltration and integration of innovation and entrepreneurship. Britain in 1987 the government launched the "Enterprise in Higher Education Initiative, aims to cultivate students' ability of mobility entrepreneurship, to encourage students' autonomous learning, since the government has published a series of policies, and to give support and guidance of entrepreneurial talent training. The German government has put forward the slogan of "to make the university become a pioneer of entrepreneurs", actively research and promotion of innovative entrepreneurial education new model. Chinese scholars on innovation entrepreneurship education research results, Che Zhirong (2004) think that entrepreneurship education is to strengthen the basic knowledge and basic theory of education at the same time, to cultivate students' entrepreneurship and entrepreneurship as the basic content of education. Wang Xueru(2015)mentioned in the cultivation of Sports Master graduate student should keep pace with the times and to the strengthening students practice and innovation ability, encourage graduate students actively participate in research and innovation. Chen Xingsheng (2009) believes that schools in physical

education curriculum setting in addition to a required course should increase the proportion of elective courses for students, which makes the research student to cultivate innovation ability in the course of study. It is pointed out, in the notice of preparation of national employment for 2016 higher education graduates issued by Ministry of Education, that all universities and colleges should stipulate Curriculum, including both compulsory courses and elective courses for credits, on innovation and entrepreneurship and establish Scholarships for innovation and entrepreneurship since 2016.

In summary ,although there is no lack of research related to innovation and entrepreneurship education on sport disciplines ,the current domestic research on the sports master's innovation and entrepreneurship courses are rarely reported .Therefore, the establishment and improvement of educational system on innovation and entrepreneurship, setting great store by cultivation of talents on innovation and entrepreneurship, based on the feature of each discipline, are the urgent research projects for universities.

2 Present Situation Analysis about Physical Education Colleges and Universities of Innovation Entrepreneurship Education

The findings based on references researches and on-site investigations are as follows: first, the innovation and entrepreneurship courses are significantly insufficient in most physical education colleges, and the integration of innovation and entrepreneurship courses into the overall educational system is far from realization; second, the main teaching sources for innovation and entrepreneurship courses are from professors, student instructors and management staff on campus, who can only provide common instructional education due to the lack of physical entrepreneurship experience; third, the establishment of campus practice base on innovation and entrepreneurship is under demand, which provides less ground for the student to adapt to the society and conduct effective practice, for the entrepreneurship courses are just these courses aiming to cultivate entrepreneurship and competencies for students while highlighting practice education. Whether it is during undergraduate study or postgraduate, in the views of some teachers and management staff, the purpose of innovation and entrepreneurship course is only for the provision of employment consultation as well as directions and ideas to start business for the graduates or majors with difficulties in employment .However, sports professional students thinking more agile, possess a strong sense of entrepreneurship, for the especial characteristics of physical education well matches the necessary traits of determination, persevere in efforts, adventure and ambition in entrepreneurs, better than students from other majors in terms of entrepreneurship a comparative survey of entrepreneurship statistics found out the average percentage of graduates, from 43 physical education colleges, engaging in entrepreneurship in the recent three year was 6.5%, far higher than the average percentage of 1.1% from other majors nationwide(Chen Qihu, Xia Qing, Yang Ling,2011). Students from Wuhan Institute of Physical Education scored one gold metal, five silver metals and six bronze metals in the 2016 "Creation of Youth" Entrepreneurship contest for students in Hubei Province, held by Department of Education in Hubei and Provincial League Committee in Hubei. Facing such severe situation of employment, the innovation and entrepreneurship education could cultivate entrepreneurship awareness and competencies for students, foster independence, drive employment by promoting Entrepreneurship, and overcome the difficulties and obstacles fundamentally in the employment issue of graduates from physical education colleges.

3 The Present Situation of Innovation and Entrepreneurship Education in Wuhan University

Wuhan University of Technology put lots of attention into innovation and entrepreneurship education for students, by means of establishment of innovation and entrepreneurship education college, exploration of disciplinary advantages, to push forward development of innovation and entrepreneurship for the university. A tentative entrepreneurship pilot class in institute of economics is on its way consisting of two parts: lessons of entrepreneurship theories (introduction of entrepreneurship, start up project evaluation, business plan) and entrepreneurial practice (innovation design, mock exercise of executive force, practice of entrepreneurial operation). It is exemplary model that the innovation and entrepreneurship education set for graduate of physical education in our university can well borrow from.

An example of 2016 revised curriculum set for graduates of physical education in Wuhan University of Technology shows that there is 9 Degree Courses, 16 elective courses, and the innovation practice and case study is the only one among trans-disciplinary elective courses with six credit hours.

From this point of view, we can see that the innovation and entrepreneurship education still remains weak, which is not conducive to the improvement and cultivation of competencies of entrepreneurship for graduates from physical education colleges.

Therefore we should set great store by the cultivation of innovation spirits and practical competencies aiming to advance the overall development and comprehensive qualities for college students, thus constantly improving education quality for graduates of physical education colleges.

4 The Restructure of Innovation Entrepreneurship Education Course of Graduate of Physical Education

Study of graduates in physical education should follow the development trend of society and economy closely so as to make it best for the future career. Therefore, principles of unity, election and particularity should apply when it comes to Curriculum Provision, which can be well guided by social demand and College Student Development. It has a very significant meaning that we need to properly arrange innovation and entrepreneurship curriculum and well manage postgraduate study and physical education practice. (See figure 1)

Table 1   Innovation and Entrepreneurship Education of Design Course for Graduates of Physical Education

Category		Curriculum	Credit	Hours
Degree Courses		Sports Rehabilitation	1	36
		Introduction of Sports Training	1	36
		Marxism and Social Science Methodology	1	18
		Primacy Foreign Language	1	72
		Theory and Practice on the Chinese Socialism.	1	36
		The Sports Industry Economics	2	36
		Science of Sports Training	2	36
		Human Resources of Sports Development and Management	2	36
		Research Theory and Methodology for Sports Science	1	36
Elective Course	Multi-disciplinary Studies(Optional)	Introduction of Entrepreneurship	2	18
		Operational Practice on Innovation and Entrepreneurship	2	18
		Stipulation of Startup Business Plan	1.5	18
		Necessary Legal Knowledge For Innovation and Entrepreneurship	2	18
		New Product Development and Startup Management	1.5	18
		Practice on Executive Force of Entrepreneurial Team	1.5	18
Education Practice on Innovation and Entrepreneurship		Exercise Physiology & Practice on Public Fitness	1	24
		Sport Psychology and Practice on Entrepreneurial Psychology	1	24
		Practice on Sports Clubs	2	24

The newly released innovation and entrepreneurship courses for graduate of physical education in Wuhan University of Technology are not only for the considerations of addition of few Multi-disciplinary studies, rather they are for the purposes of 1) optimizing curriculum and adding more practical elective courses (optional) conducive to the improvement of entrepreneurial competency and increasing the confidence and capacities for startup business; 2) encouraging a studying model of Multi-disciplinary allowing students to benefit from solid theoretical foundation, expanded knowledge and widened sights; 3) improving quality and competency, and combine degree courses with practice on innovation and entrepreneurship, and advance execution ability, coordination ability and leadership through practice so as to form a high quality talent for innovative sports; 4) changing the way of education, and establishing a accumulative step-by-step education model of lecture-independent study-case study on practice while keeping an close eye on politics of current events, exploring market opportunities, taking advantage of specialized abilities, coordinating natural and social resources,

building up valuable interpersonal network and making unswerving efforts toward career development; 5) categorizing the curriculum into different levels of degree courses, compulsory courses, elective courses and education practice, forming a overall network system on innovation and entrepreneurship, based on the different accounting percentage in cultivating sports entrepreneurial talents of various kinds.

Innovation and entrepreneurship of optimization system is divided into two main parts: theory and practice with the importance of practice knowledge in particular. It is a time when the choice of enhancement of practice competency for graduate of physical education is inevitable, and as such the most effective way to establish a practice base is to associate with enterprises so as to ensure the cultivation of practice competencies.

The implementation of innovation and entrepreneurship courses is the key to cultivate actions of innovation and practice for graduate of physical education. The effective combination of employment instruction and entrepreneurship education, like start a public fitness club by working together with associated enterprises, start rafting and rock climbing business together with tourism companies, or establish a rehabilitation club together with a field survival club and a hospital. Meanwhile, graduates of physical education should actively participate into the teaching activities in class, club plannings for specialized sports, daily operation and management and commercial sports tournaments outside the campus as well as take part in the volunteer service, management and operation in large-scale sports events so as to make best of the physical professionalism and enhance practical competency on entrepreneurship.

5 Conclusions

1) Innovation entrepreneurship education curriculum as a kind of education idea and model, has been paid attention all over the world. But there are few reports on the study of graduate of physical education about innovation and entrepreneurship curriculum in China. Therefore, it is necessary to build a perfect innovation and entrepreneurship education curriculum system based on the characteristics of physical education, and pay attention to the training of sports innovation and entrepreneurial talents.

2) To meet requirements of development and changes of the time, it added innovation and entrepreneurship courses in 2016, and optimized curriculum provision and laid solid foundation for cultivating talents of innovation and entrepreneurship.

3) Curriculum set for graduates of physical education stayed committed to the principles of unity, option and particularity focusing on the development of innovation and entrepreneurship, building up a multi-level, all-round system for curriculum of degree courses, compulsory courses, elective courses and education practice. The creation of combination of university and enterprise, a new model of education and method, and implementation of new education management and guarantee system, with the goal to cultivate a comprehensive physical talent of a new entrepreneurial model to meet requirements of development and changes of times.

4) Innovation and entrepreneurship education of design course for graduates of physical education, should have its own characteristics, combined with the spirit of sports, sports professional characteristics and sports college students style, etc. And it is applied to the practice of sports entrepreneurial talent training, at the same time, using the new teaching management mode and the employment guidance system, could offer more reliable opportunities of practice on entrepreneurship, which could be considered as excellent resources of man power, promoting the sustainable development of innovation entrepreneurship education in physical education colleges.

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Investigation of Young College Teachers' Ideological and Political Status: A Case Study on Wuhan University of Technology

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Abstract: With the deepening of education reform, major changes have been seen in the age structure of the teaching staffs of colleges and universities. Young teachers have characteristics such as active thinking, be able to accept new things and new ideas quickly, stronger subject consciousness and so on. These characteristics strongly impact on the teachers' intrinsic values, and bring to the ideological and political work of hierarchy, arduousness, complexity and other new challenges. In order to understand and grasp the ideological, political, and operational capacity and life status quo of young teachers under the new situation, to solve problems encountered in the process of the growth and development of young teachers, to further enhance the ideological and political quality and comprehensive ability of young teachers, this paper conducts questionnaires on young teachers of WUT from three aspects such as the young teachers' ideological and political situation, the problems existed, and the cause of the problem and the factors that affect the teachers' motivations respectively, and make analysis of the findings and offer some recommendations.

Key words: Young college teachers; Ideological and political status; Chinese dream; Administerization phenomenon

1 Introduction

General secretary Xi Jinping, at the Forum of Party Work in Universities in 2012 pointed out that, college party organizations shall effectively strengthen the ideological and political building of Young Teachers and treat is as a major and urgent issue of College Party Construction tasks, concern young teachers, grasp the ideological trends of young teachers timely, give them in-depth and meticulous ideological guidance, and help young teachers to progress in the ideological and political quality as well as professional quality.

Young College teachers are the most dynamic and most creative groups; the level of political and ideological quality will influence the future development of colleges and universities. In order to understand and grasp the ideological, political, and operational capacity and life status quo of young teachers under the new situation, to solve problems encountered in the process of the growth and development of young teachers, to further enhance the ideological and political quality and comprehensive ability of young teachers and to guide the healthy development of young teachers, a questionnaire survey on young teachers under the age of 45 has been carried out. Here are the analysis of the findings and some recommendations.

2 The Survey Method and Sample Structure

The objects of the survey on ideological and political situation of the young teachers are mainly for young teachers engaged in teaching works in our University; and. the method of quota sampling is adopted. 307 questionnaires were distributed in the 23 Schools of Wuhan University of Technology (WUT), and they are filled anonymously, 307 questionnaires are collected, with 100% recovery rate. Questionnaire data is processed through SPSS12.0 software, reasonable distribution of the samples' sex, age, education, job title, political affiliation, etc., is reasonable, and involves a broader survey, questionnaires have high recovery rate, the results of the survey has a certain universality and representativeness.

Specific sample structure is shown in Table 1 to Table 6:

1) Sex ratio of the sample

According to the collected 307 questionnaires, the sex ratio of the questionnaire is showed in the following table:

Table 1 Gender Distribution of the Sample (N = 307)

Gender	Male	Female
%	48.53	51.47

2) The age distribution of the sample

According to collected 307 questionnaires, the age distribution of the questionnaire is showed in the following table:

Table 2   Age Distribution of the Sample (N = 307)

Age	21-29	30-40	≥40
%	26.71	71.99	1.3

3) Job distribution of the samples

According to collected 307 questionnaires, the working time distribution of the questionnaire is showed in the following table:

Table 3   Job Distribution of the Sample (N = 307)

Working time	Teaching and Research	Party and administrative management	Teaching assistants	Logistics Services	Other
%	57.98	15.31	20.2	0.98	5.54

4) Education distribution of samples

According to collected 307 questionnaires, the education background distribution of the samples is showed in the following table:

Table 4   Education Background Distribution of the Sample (N = 307)

Educational background	Doctor	Master's degree	Undergraduate	PhD	Other
%	40.72	41.04	8.47	9.12	0.65

5) The title distribution of the sample

According to collected 307 questionnaires, the title distribution of the samples is showed in the following table:

Table 5   Professional and Technical Positions Distribution of the Samples (N = 307)

Title	Primary	Intermediate	Deputy High	Senior	None
%	14.33	52.77	20.85	2.28	9.77

6) Political affiliation distribution of the samples

According to collected 307 questionnaires, the political affiliation distribution of the samples is showed in the following table:

Table 6   Political Affiliation Distribution of the Samples (N=307)

Title	CPC member	League member level	Democratic Party	The general public
%	14.33	52.77	20.85	2.28

As can be seen from the above sample distribution, the distribution of teachers' gender, age, education, job title, political affiliation, etc., of the survey are reasonable, and are in line with the reality of the actual situation of WUT. The survey covers a wide and high recovery questionnaire, and the survey results have a certain universality and representation.

3 Investigation Results and the Analysis on Young College Teachers' Ideological and Political Status

This research mainly constructs and designs research questionnaires from ideological trend, living and working conditions and other aspects of young teachers of WUT. The following will analyze the survey results from the perspective of the young teachers' ideological and political situation, the problems, the cause of the problems and the factors that affect those three aspects of teacher motivations.

3.1 From the survey results, the ideological and political status of young teachers of WUT are performed well in general, and are mainly represented in the following areas:

3.1.1 Most young teachers focus on political news, identify with the Party's line, principles and policies, are full of confidence in the economic and political situation and development prospects of the country and society, the overall state of their mind appears to be active, healthy, upward momentum.

The survey shows that the majority of young teachers love the Parties' patriotic education, with a firm political stand, with clear political ideas and actively, and when paying close attention to their own interests, participate in educational reform and social development. Among them, 77.2 % respondents believe in communism, indicating that most of the respondent teachers agree with the mainstream ideology, their political attitudes and ideals and beliefs are generally upright and firm. The findings fully reflect that young teachers of WUT love their country, concern about the politics of current events, and their enthusiasm concerning national affairs is high.

3.1.2 Most young teachers have a strong professional identity, and are very satisfied in their current jobs. And they can educate people as center, passionate in their jobs, and conscientiously fulfill their basic duties as university teachers.

The data shows that 59.28% of respondents are satisfied with their own occupations, there are 70.03% of respondents believe that university teacher occupation is sacred, and decide to strive for it. The survey shows that 55.05% of respondents think that the quality to dedicate oneself to work, to love students shall be pursued by university teachers; 51.14% of the respondents think that the quality of rigorous scholarship should be pursued most by university teachers; 63.52% of respondents believe that educating people is more important than imparting knowledge; 51.79% of the respondents hope to cultivate more outstanding students and treat it as their deeply cherished life goal. These data indicate that the majority of respondents have the correct understanding of their professional responsibilities, have a clear sense of responsibility, and have strong ability and professionalism in fulfilling the basic responsibilities of university teachers.

3.1.3 Most young teachers have positive attitude on ideological and political learning, and are enthusiastic about them.

Data shows that 43.97% of respondents believe that in the current new situation, strengthening young teaching and administrative staffs' ideological work is "necessary"; 30.94% of respondents hold that it is "very necessary." 36.48% of respondents usually consciously learn political theory; 47.23% of respondents occasionally show an active interest. This indicates that the majorities of young teachers are fully aware of the importance and necessity of learning ideological and political theory, and are able to have correct and positive attitude towards the ideological and political theory, most of the young teachers have relatively high motivation on ideological and political theory learning.

3.2 Problems and deficiencies exist in the current young teachers' ideological and political state of WUT.

Overall, the majority of young college teachers' ideological and political status is generally well, but during the course of the investigation, we found that there is still some room for improvement on some problems, which need to be given enough attention.

3.2.1 Most young teachers think that the ideological and political learning is monotonous in form, and boring in content.

The methods and contents of theory of learning directly determine the efficiency and effectiveness of learning. In this survey and study, 60.26% of respondents think that the young teachers' methods of ideological and political learning in WUT are relatively simple and old-fashioned, theoretical studies have replaced all ideological and political work; 60.26% of respondents believe that in terms of the ideological and political work of young teaching and administrative staffs, manner of working should be reformed extensively. Statistics also show that the majority of young teachers have a high degree of recognition on the manner and contents of university ideological and political work.

3.2.2 Serious administerization phenomenon can be found in Colleges, and the pressures of research tasks for teachers are high, which greatly influence the young school teachers' motivation for ideological and political learning.

68.4% of respondents think that our school young teaching and administrative staffs' ideological and political work lies in the efforts to "fade administration, and truly concern about the livelihood of the people", which expresses that the majority of college young teachers have a strong demand for the de- administration of higher education.

Under investigation, we found that for 52.77% of the respondents, the most urgent requirements at their stage is the project and research funding, 55.05% of respondents think that is scientific research published, and up to 61.24% of the respondents hold that should be the position and title promotion. The statistics illustrated that the research tasks and promotion are still imperative for college young teachers.

It from one side reflects that it is evident that the pressure of the research tasks and job promotion is really large.

3.2.3 Young Teachers have limited income, high work pressure, and their benefits need to be improved.

The survey data shows that 35.18% of respondents think that the current major life trouble is the economic income, 27.69% of respondents think that the work pressure is the major life problems. According to the data with reference to Maslow's hierarchy of needs, we can see that young teachers focus on security which belongs to basic survival level. The problem that the basic needs are not well met is an important obstruction that prevents the young teachers' ideological and political level from being effectively improved.

4 Cause Analysis on Our Young Teachers' Ideological and Political Status

Various reasons can account for young teachers' ideological and political status including the social environment, the mechanism, the system, and also the young teachers themselves.

4.1 The influence of social environment

At present our country is in the period of social transition, also a period with all kinds of contradictions and complicated social reality. The change of social environment exerts much profounder influence on the young teachers' thought. Today information technology is developing a rapid way, and Internet is playing an important role in learning, working and living of young teachers. All kinds of speech and thoughts have greater influence on the ideas of young teachers against a more open network environment which is inundated with farraginous information. Under the influence of those factors combined, some young teachers' political beliefs are less than firm, being weak in idea and faith.

4.2 Colleges and universities pay much less attention on young teachers' ideological and political status

Firstly, colleges and universities tend to employ talents who are sharp at personal relationship without considering their ideology. They are also short of practical constraints and norms for young teachers to shape their moral standards and to improve personal accomplishment. Secondly, colleges and universities lay much stress on the performance of institution. Scientific achievements and the success of project funds are seen as apple of the eye, the payment of which is the failure of humanistic care for teachers. It is bound to influence the readiness and effectiveness of young teachers' ideological and political learning.

4.3 Characteristics of young teachers themselves decide that ideological and political work is even harder

Firstly, when recruiting high-level personnel, schools give top priority to outstanding talents who have been studying abroad for years. Therefore, they are prone to be influenced by western culture values and way of life when receiving foreign education. In addition, some young teachers often find it difficult to deal with the contradictory relationship among several kinds of roles. For example, society has a high demand for the duty of teachers but in reality their economic status and professional reputation cannot match with such high demand. There is also a contradiction between the absolute dignity of teachers and the friendship with students. What's more, high expectations for teachers' quality and morality from students and schools are hardly compatible with the reality that teachers possess pluralistic values, to name just a few. Therefore, it is inevitable that the professional growth is full of all kinds of confusion.

5 Recommendations on Strengthening and Improving our Young Teachers' Ideological and Political Status

Higher education shoulders the mission of training builders and successors for the socialist modernization as well as the mission of cultivating a powerful force for implementing the strategy of rejuvenating the country through science and education. To accomplish this arduous task, we need to build a high-quality team of young university teachers. Colleges and universities should start from the strategic height of the Party and country, strengthen the ideological and political work to promote the growth of their overall health when taking their reality into consideration.

5.1 We can use "Chinese dream" to lead young teachers in the thought development, giving special attention to the top-level design, and intensify our efforts to create a good educational atmosphere so as to promote the further development of ideological and political work.

"Chinese dream" is the latest theoretical achievements of sinicization of Marxism, which vividly depicts the common ideal of our people. It is the demonstration of the dream for generations. It embodies

the overall interests of Chinese nation and of the Chinese people, becoming unity flags and high rhythm for motivating people to be united and step forward. Therefore, school should combine the education of "Chinese dream" with education of young teachers in theory, and turn it into the whole process of ideological and political work. In this way, we can firm ideal faith of young teachers, and enhance their confidence in socialism road, theory and system with Chinese characteristics. We need to enrich ways of theory education to establish and improve theory education system which mainly includes inductive education, daily education, and subject education of young teachers. We can help young teachers open field of vision through hot topics as well as situations at home and abroad. We can also use such new medium as Internet community, weibo and mobile phone news to build a network platform for theory learning and situation as well as policy education. Thus we can provide convenience and timely support for young teachers to study theory, situation and policy and ensure the education coverage.

5.2 We should pay attention to integrate theory with practice when carrying out the ideological and political work of young teachers.

Theory learning should pay attention to the combination between theory and practice. We should make it clear what is their fuzzy understanding and answer what they care about most in according to their ideological reality. We should combine theoretical study with the transformation world outlook to guide them to integrate needs of individual development with needs of the state, the school, and society. We must make it deeply understood that young teachers must have high-level morality in teaching, and only in this way can they become the learning model for student. At the same time, in the face of young teachers who are active and have a strong ability in understanding and analyzing substances, we should inherit the traditional ideological and political work mode on the one hand, and absorb the outcome of the development of modern science and technology on the other hand. We should pay special attention to the role of the mass media and computer network, and integrate the ideological and political work with healthy and rich theme activities so as to constantly deepen the connotation of activities, improve teachers' comprehensive quality and make ideological and political work carried out in a profound way.

5.3 We should adhere to the people-oriented principle and solve practical problems.

Ideological and political work of young teachers must always give top priority to people. We should fully understand that the young teachers' working time is short, and they are in a situation in which business only starts up and they are the backbone of their family. Only when the practical problems in life are solved, can they be able work and dedicate heat and soul. When making policies in colleges and universities, we must give full consideration to the characteristics of young teachers and respond to the reasonable demands of young teachers. Besides, we should also improve title appraisal, performance evaluation mechanism, and create conditions to help solve problems of young teachers in life. We need to improve the overall quality of young teachers from such aspects as professional development, problem-solving, and care on physical and mental health. At the same time, we should give them more support, more help and more care to help them build good cultural environment for their all-round development and improve young teachers' happiness index. The real combination between ideological problems with actual problem, the actual measures to promote the comprehensive development of young teachers are definite to enhance the persuasiveness and cohesion of ideological and political education and guide young teachers to work together and to make contributions to the cause of higher education reform and development.

6 Conclusions

All in all, ideological and political education of young teachers in colleges and universities occupy an important position in the ideological and political education system, we should try to follow the law of the ideological and political education, actively explore new methods of ideological and political education according to the actual ideological condition and characteristics of young teachers so as to get better results and promote the reform, stability and development in colleges and universities.

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Measuring of Long-Term Mechanism for Graduate Education Quality Assurance

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Abstract: As for current subjects, government, society and university are participants in strengthening China's construction of long-term mechanism for graduate education quality assurance. When it comes to policy, internal and external systems supporting graduate education quality assurance should be constructed synchronously, by focusing on the construction of internal system. As to internal assurance system, we should embark on six aspects, i.e. the construction of quality assurance systems for realizing source of excellent students, high level teaching, high level courses, first-class research supervisors, first-rank graduate academic dissertation and effective graduate ideological and political education.

Key words: Graduate; Education quality; System; Assurance

1 Introduction

Now，some academic achievements involved in graduate education quality assurance at home and abroad. At home，Wang Jianhua points, People evaluation the quality of graduate education in line with the quality of the "national legal standard", But it "encounters meeting customer needs and meeting the impact of the market applicability". Xia Wenjin and Guo Daijun point, in the graduate education quality evaluation "has not been able to really establish the self assessment and social assessment", but "this is an important part of graduate education quality evaluation system". Zhang Yunhong, Ma Zaoming think that, quality standards begin to diversification at Stage of mass higher education, it decides by the cultivation of different purposes and different requirements". Domestic scholars have made it clear that graduate education quality evaluation standards should be diversified, less discuss how to ensure quality of graduate education adapt to the new standard. in a foreign country，Since the 1990s，Some scholars claim total quality management theory and ISO9000 standard should be applied in the field of higher education quality，and produced some positive impact in theory and practice Of postgraduate education quality management. In the U.S，set up a named the "national education quality innovation organization" non-profit organization by professional associations, business association, a coalition of private enterprise and university has Changed the present situation of the graduate education quality evaluation by the single the university , But involves academic achievements how to establish graduate quality of long-term effective mechanism seldom.

I try from the perspective of "long-term mechanism" and "system"; I think that three majors affect the quality of graduate education: government, society, colleges and universities, I Put forward the six aspects of establishing graduate education quality of the long-term mechanism.

2 Analysis on the Participants for Construction of Long-term Mechanism for Graduate Education Quality Assurance
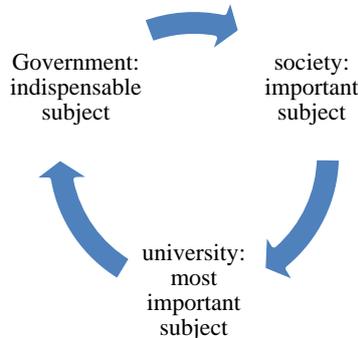

Figure 1   Three Subjects Having Impact on Graduate Education Quality

It's impossible to meet the requirements of various fields and industries for graduate education

quality merely by the government, because graduate education and development model tends to be diversified (Zhang Yunhong, Ma Zaoming 2011). Currently, construction of subjects (See Fig. 1, Three Subjects Having Impact on Graduate Education Quality) for graduate education quality assurance should be strengthened, and initiatives should be taken to construct a graduate education quality assurance system by multiple participation of government, society and university.

2.1 Government: indispensable subject

In retrospection, the development course of graduate education in China is inevitable succession of gradual transformation from planned economy to market economy. Under the conditions of planned economy, the government is "omnibus government", which features in graduate education quality assurance in China that, on the one hand, government launches and organizes the movement of graduate education quality assurance, on the other hand, however, government fulfill in assuring graduate education quality; government participates in graduate education quality assurance in various aspects and types. In the process of graduate education quality assurance, government starts with giving assurance instructions, establishing contents and standards for assurance, and finally organizing experts for inspection of performance in graduate education quality assurance. Under the conditions of market economy, the government becomes "half-omnibus government", when the government gradually starts to focus on the work ought to be done, while undo or do a little work to which the government is not anticipated to fulfill. G. Neave pointed out that, the government should carry out strategic control by policy leverage, and implement related standards by establishment of institutional objective (Xia Wenjin, Guo Daijun, 2014)", i.e. The government should gradually construct long-term mechanism for graduate education quality assurance through macro means such as education guidelines and policy, financial provisions and so on. However, due to long administrative inertia, the government takes a big part as a micro participant. It's obvious that government is an indispensable subject in the construction of long-term mechanism for graduate education quality assurance.

2.2 Society: important subject

At present, in the new situation of diversified interests of related micro subjects in graduate education, the standing of social insurance for graduate education quality rises on a daily basis in China's long-term mechanism for graduate education quality assurance. Remarkable achievements have been made by social insurance in driving closer connection between university (Or research institute etc.) and the society, causing university (Or research institute etc.) to match social demand, relieving the pressure of governmental guarantee, and providing the public with related references. Over the past ten years, establishment of sound social insurance for graduate education quality has been highly valued by theory circle and practice circle in graduate education. For instance, civil graduate education evaluation and ranking has been develop, involving in national-level organization, such as academic degrees and graduate education evaluation institute, which functions to test national graduate education quality; provincial -level organization, such as Guangdong Scientific Management College, which assesses and ranks by universities and majors. However, social intermediary agents lack of real inter-mediation in terms of administrative intervention and strong official implication. Although the force of social insurance for graduate education quality is weak at present time, with limited influence of social insurance, and inability of exerting its influence for graduate education quality assurance, people from all circles are paying more attention to assessment of graduate education quality by social intermediary, for it is in line with the new trend of world development in graduate education(Yang Lun ,2009), which is a proof of increasing importance of social player representing by social intermediary in the construction of long-term mechanism for graduate education quality assurance.

2.3 University: most important subject

In view of the determinant factors of the development of a thing, internal cause takes a key part. Therefore, university (Or research institute etc) is the most important subject in the construction of long-term mechanism for graduate education quality assurance. Internal graduate education quality assurance system is fundamental, graduate education quality may only be assured unless effective graduate education quality assurance system is constructed by university (Or research institute etc.). Only with the root of internal assurance system, external graduate education quality assurance system is effective in consolidating and strengthening graduate education quality assurance. Internal graduate education quality assurance system is the driving power, internal assurance system of each university (Or research institute etc.) should be countermeasure aligned with its actual situation, so as to push on respective graduate education quality toward a promising future. Connotation-based development is compulsory for graduate education in China, university (Or research institute etc.) should continuously strengthen awareness of quality, engrave "quality first" concept into the heart of faculties and students,

and make efforts to make the best out of graduate education quality assurance and university operational management, so as to realize graduate education quality assurance. Support of university (Or research institute etc.) should play a big role in assurance and improvement of graduate education quality, and regulations and systems must be established in university (Or research institute etc.) (Lu Naigui, Xu Lan 2008).

3 Contents of Graduate Education Quality Assurance System and Long-term Mechanism

Construction of long-term mechanism for graduate education quality assurance should combined internal and external systems by focusing on internal system, that is, synchronous construction of internal and external graduate education quality assurance systems, internal graduate education quality assurance system should be prioritized. External graduate education quality assurance system is mainly constructed from governmental and social aspects. In the part of the government, it should gradually delegate powers to lower levels while strengthening services. As for the society, information databases related to graduate education should be established, and theoretical study on assurance should be intensified to explore theory and method in line with China's national conditions. Due to limited space, internal assurance system of long-term mechanism for graduate education quality assurance is discussed in more detail. Referencing to the concept of process management, internal graduate education quality assurance system should be established from following xis aspects (See Fig.2, Graduate Education Quality Assurance System).
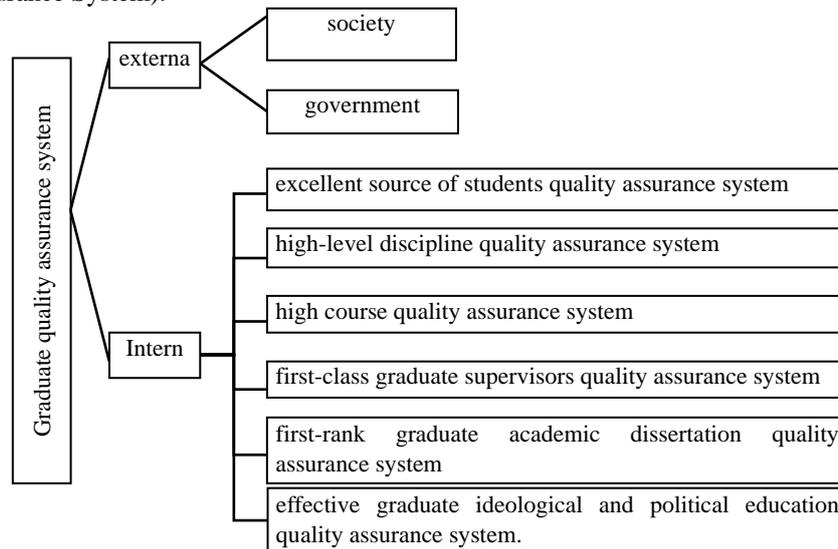
Figure 2   Graduate Education Quality Assurance System

3.1 Excellent source of students quality assurance system
Excellent source of students is the prerequisite and foundation of graduate education quality assurance. Excellent source of students quality assurance system is the first pass of internal graduate education quality assurance system. At first, in the principle of action according to its capacity, university should establish fellowship and scholarship systems that are attractive the graduate students; secondly, myriad forms of incentive, such as bachelor's-master's program , bachelor's-doctor's program and permission of early graduation, should be adopted to retain excellent graduates to study master's courses; still, increase the weighing of graduate makeup exam, focus on assessment of basic quality and development potential of students, including the type of university as well as degree, consistent between bachelor and master in the university of bachelor's degree.

3.2 High-level discipline quality assurance system
Disciplines are all important platforms for the development of university, first-class graduated may only be developed with first-class disciplines. High-level discipline quality assurance system is the second pass of internal graduate education quality assurance system. Therefore, university should establish discipline construction incentive and restraint mechanism focusing on performance evaluation and dynamic adjustment, construct and improve quality assurance system for discipline assessment and construction of academic degree awarding unit, so as to improve discipline level, and drive the

development of graduates in higher quality through construction of more high-level disciplines.

3.3 High-level course quality assurance system

High-level course quality assurance system is the third pass of internal graduate academic dissertation quality assurance system. Courses construction consists of many aspects, such as construction of training program, construction of teaching materials, teaching form, performance assessment and evaluation, and so on. Course quality assurance system with high-level course construction as the core should be constructed by focusing on teaching quality monitoring and course assessment and phaseout.

According to the requirements of development of various levels and types of graduates, course system with clear levels and logic structure should be constructed. For academic degree graduates, design of course system should be perfectly combined with exercise of innovation ability; for major graduates, course system and industrial demand and occupational qualification should be linked.

Construction of basic degree courses of first-level discipline should be strengthened, with public degree courses be focused in the construction of classic graduate courses, enhance interdisciplinary courses and discipline frontier courses as main international courses, drive construction of high-level courses, such as brand courses fully taught in English; and construct high-level public experiments teaching course.

Discipline frontier theories and late research findings are encouraged to include in construction contents of the courses, and construction of several data-banks of course resources; strengthen case-based teaching relying on graduate joint development base, and construct several case-based teaching data-banks; publish several high-level teaching materials and treatises.

3.4 First-class graduate supervisors quality assurance system

First-class graduate supervisors quality assurance system is the fourth pass of internal graduate education quality assurance system (Wang Jianhua, 2009). Focus on the evaluation of supervisors' academic competence and graduate development quality, improve graduate supervisor quality assurance system covering selection of supervisor, review of enrollment qualification and notice of graduate development quality; construction of first-class graduate supervisors quality assurance system can be carried out through following five aspects: 1)deepen the construction of group of graduate supervisors, explore method for the construction of "special zone of talents"; 2)improve supervisor evaluation system guided by teachers' ethic strength, academic competence and graduate development quality; 3)construct incentive system for improving international ability and level of supervisor; 4)establish system for the construction of group of full-time and part-time supervisors for professional degree graduate; and 5) establish system for dynamic adjustment and exit of supervisor enrollment qualification. The mechanism in combination of reward and restraint should be adopted to increase the percentage of doctoral supervisors publishing high-level international academic papers, the percentage of graduate supervisors undertaking national-level research subject, the percentage of graduate supervisors having international academic background, so as to improve overall quality of graduate supervisors, and ultimately assure graduate education quality.

3.5 First-rank graduate academic dissertation quality assurance system

First-rank graduate academic dissertation quality assurance system is the fifth pass of internal graduate education quality assurance system. The quality of graduate academic dissertation is the main embodiment of graduate education level and quality, an important index for measuring whether graduate is top innovation talent, as well as important reflection of overall strength of university (Or research institute etc.) (Liu Cunxiang, 2012). Therefore, construction of first-rank graduate academic dissertation quality assurance system is indispensable for the construction of long-term mechanism for graduate education quality assurance. The construction of first-rank graduate academic dissertation quality assurance system should be carried out by focusing on improving academic dissertation quality, and embarked from six aspects, namely, thesis proposal, in-process inspection, testing of copy ratio, dissertation evaluation, dissertation defense and random checking of eligibility.

3.6 Effective graduate ideological and political education quality assurance system

Effective graduate ideological and political education quality assurance system is the sixth pass of internal graduate education quality assurance system. It is pointed out in Opinions for Deepening the Reform of Graduate Education jointly published by Ministry of Education of the People's Republic of China (MoE), National Development and Reform Commission (NDRC) and Ministry of Finance of the People's Republic of China (MoF) (Education Research Circular No. [2013]1) that, "morality and knowledge build-up should be taken as the essential task of graduate education." Graduate should be trained as "socialist-minded and vocationally proficient" talent. Thus, sublimation of graduate

ideological quality is necessary to assure graduate education quality.

Aiming to improve graduate comprehensive quality, with ideological and political theoretical course as well as trend and policy course as the channel, relying on "three groups" of graduate supervisors, executives and student cadres, with "four platforms" of graduate CPC construction, mental health education, fellowship & scholarship system and academic & cultural activities as the carrier, construction of effective graduate ideological and political education quality assurance system integrating education, management and service as one, is necessary for the construction of long-term mechanism for graduate education quality assurance.

4 Conclusions

In order to further improve graduate education quality, on the one hand, university (Or research institute etc.) should construct internal graduate education quality assurance system from six aspects, namely, construction of excellent source of students quality assurance system, high-level discipline quality assurance system, high-level course quality assurance system, first-class graduate supervisors quality assurance system, first-rank graduate academic dissertation quality assurance system and effective graduate ideological and political education quality assurance system; on the other hand, university (Or research institute etc.) should establish real internal graduate education quality assurance organization, carry out regular or irregular self-inspection, only in this way, long-term mechanism for graduate education quality assurance can be constructed in university (Or research institute etc.), and play an important role for this purpose.

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A Framework for Interdisciplinary Curriculum Innovation

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Abstract: This paper summarizes interdisciplinary curriculum innovation inspirations from Chinese artistic conceptions, in accordance with nature, with case studies from visual arts and English literary works. Eighty-Seven Immortals by Wu Daozi in the Tang dynasty and Auguries of Innocence by English painter, poet and print maker William Blake are both timeless state of the art. Qiantang River Tidal Bore Watching by Li Song in the Song dynasty and Early Autumn by American novelist Langston Hughes create a larger room of imagination with a few touches. Composition of Autumn Willow and Double Crows by Liang Kai in the Song dynasty ingeniously designs as the epiphany in Araby by Irish novelist and poet James Joyce. The paper reveals creative and practicable ways of combining two academic disciplines with wider connotations from a broader perspective.
Key words: Interdisciplinary; Curriculum innovation; Visual arts; Literary works

1 Introduction

Western authors have explored in inter disciplinary since the 20th century. From 1960s to the present, the study of ekphrasis in the western world came into being, such as *A Spectator: Ekphrastic Poetry*, a collection of 50 ekphrastic poems by Canadian poet, author Per K. Brask to expresses the poet's attention to interact studies. (Per K Brask, 2012) "Ekphrasis" refers to a graphic and verbal description of a visual work of art. *Whispers in the Galleries: Ekphrastic and Other Poems* also presented poems and relevant paintings together to illustrate modern society. (Lee Marc Stein, 2014). Scott Gutterman's *Sunlight on the River: Poems about Paintings, Paintings about Poems* is a blender of works of poets and painters, a new perspective on how we see and think. (Scott Gutterman, 2015)

Pictures of Romance: Form Against Context in Painting and Literature was written by Wendy Steiner in 1991. It was discovered that literary romance had unrealistic suspense outside of time because Renaissance and post-Renaissance paintings depicted suspended moment of perception with extraordinary clarity and condensed meaning, both of which departed from reality. The difference is that painting is the art of space while literature the art of time. The conclusion was arrived through analyses of works of Keats, Hawthorne, Joyce, and Picasso, while a return to conventions appeared later in the20[th] century both in painting and literary works. (Steiner, 1991) Interconnection between literature and the visual arts was discovered in this book by Wendy Steiner.

According to *Visual Art and the Teaching of English* as a Second Language by Ingrid Carre from University of Puerto Rico in 1996, cognitive theories of Amheim and Gardner enlightened combination of visual creation and language learning. In the thesis'point of view, figurative language, and characterization can be taught with facilitation of visual arts. (Carre, 1996)

Word Painting: A Guide to Writing More Descriptively was written by Rebecca Mcclanahan in 1999. Illuminated by the book, visual thinkers who think in pictures can be also developed into verbal thinkers by word painting, transferring visual images into words. Those who are very sensitive to different shades of colors and shapes can also have the ability to uncover evocative words to portray with mind's eyes. (Mcclanahan, 1999) Thoughtful instructions and engaging exercises are provided by the book to weave words together in terms of images.

Painting with Words, Writing with Pictures: Word and Image Relations in the Work of Italo Calvino was written by Franco Ricci in 2001. Italo Calvino (1923–1985) was an Italian journalist and writer. The book is also interdisciplinary to research into the works of Italo Calvino who made the invisible visible from the origin of perception. (Ricci, 2001) Interface between words and images are a fascinating field beneficial to both authors, artists and information technology workers.

When Writing Met Art: From Symbol to Story was written by Denise Schmandt-Besserat in 2007. Denise Schmandt-Besserat (born 1933), a French-American archaeologist and retired professor of art and archaeology of the ancient Near East, discovered that cuneiform script which was one of the world's oldest known system of writing came from archaic counting devices. (Schmandt-Besserat, 2007) American Scientists chose her book How Writing Came About as one of the "100 or so Books that Shaped a Century of Science". Writing, which evolved from painting, has its new role to illustrate images and speech to record information across time and space. Schmandt-Besserat's pioneering

research is a key turning point in human history. When visual medium meets with verbal medium, they mutually multiply the capacities to communicate.

Hieroglyphic in Maya, Egypt and China, cuneiform script in Babylon are the oldest known writing system in the world. Cang Jie is the inventor of Chinese characters by observing all things. Cang Jie recorded things by knotted rope first; later the images of all things turned into characters in his mind. In this way, the origin of writing has been closely connected with visual arts. That is why inspirations of writing can be derived from painting. Eastern paintings focus on great art concepts which have no visible form while Western paintings pay more attention to detailed forms. Thus the composition of Chinese painting has complementary effects on English writing. And Vice Versa, elaborate depiction of Western painting will enlighten Chinese writing.

In China, interdisciplinary research has also been conducted. In 2006, Comparing Chinese and English from "Perspective View" was written by He Nanlin, an associate professor in Foreign Language School in Jiangsu University. The article elaborated on perspective, i.e., nearer objects appear smaller and parallel lines meet each other at a point in the distance, in Eastern and Western paintings to inspire English writing. Chinese students are likely to think in the way of Chinese painting with a few words but deeper meaning just like the white space. They write paragraphs without visible unity just like multi-spot perspective in Chinese scroll paintings. Examples of translation from English into Chinese are also discussed by perspective in painting. (He Nanlin, 2006) Other articles are rarely spotted in this interdisciplinary field.

This paper introduces the possibility of interdisciplinary curriculum innovations to help write better English with visual enlightenment from visual arts. Courses like English Writing with Pictures and English Literature with Pictures will be incorporated into the curriculum; minimum words for maximum effect. Further and more interdisciplinary studies of painting and writing should be conducted in the future.
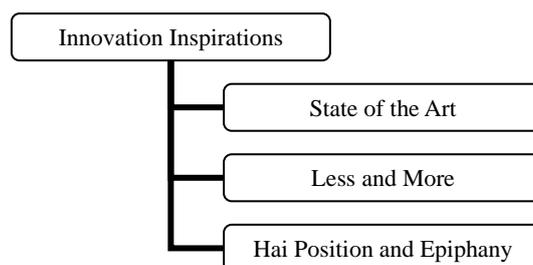
Figure 1   Structure of This Paper

2 State of the Art

Chinese painting began as early as the end of Paleolithic period with rock paintings and the later period of Neolithic with ornamental patterns or designs on potteries. Silk paintings appeared in the Warring States period, then stone relief and portrait bricks in Han dynasty. With cultural exchanges in the Wei, Jin, the Northern and Southern dynasties, Tang and Song dynasties saw great achievements of Chinese painting. In Tang dynasty, there were more than 200 recorded painters due to the reign of Emperor Taizong of Tang China ruling from 626 to 649 who encouraged painting to enlighten the mind and improve human relations. Paintings are painted on paper and silk, then mounted on scrolls to be hung or rolled up. They are also done in albums and on walls, lacquerwork, and other media. From the very beginning, just like Chinese and British literature, the painting subjects were about gods and celestial immortals which could uplift one's state and cleanse one's soul. The Buddha images in Dunhuang Frescoes always inspire the mortals and practitioners. Those works are rare, but still some are passed on with divine protection as is called by Dong Qichang (1555-1636) as "auspicious cloud".

Artists from the Tang dynasty (618-906) mainly painted the human figure and were also good at Buddhist painting. Wu Daozi's works were exemplary perfection. Wu Daozi (686-760) was from Yangdi (Yuzhou in Henan province in China today). He mastered high level of painting skills before he was twenty and lived a poor life as a folk painter. He was good at Buddhist and Taoist painting and created murals in Buddhist and Daoist temples. Legends go that he entered a cave at the foot of a mountain in the mural on the wall of the palace, and left this world. Then the painting vanished from the wall. Wu's inspiration came from all sources like natural scenery and swordplay, but most importantly from the images in his mind as a messenger of heaven. The first English poem Cædmon's Hymn in old English is similarly the praise for god. The inspired lines sound rather as if copied from the invisible tablet in the

eternal mind. Being messengers of god or Muses, only moral people are chosen to accomplish the noble mission to leave timeless and perfect works to the world.

The silk scroll of Eighty-Seven Immortals by Wu Daozi depicted 87 Taoist immortals paying homage to the supreme deity, measuring 30 centimeters vertically and 292 centimeters horizontally. In the main hall of Daoist temples, the Emperor of Heaven, the Supreme God and Supreme Sovereign of Dao are worshipped. On the east and west wall paint Imperial Sovereign Donghua, Nanji, Xiling, Beizhen, so the silk scroll should be the draft for the mural on the east wall. Without restriction of western composition, parallel lines meeting each other at a point in the distance, 87 immortals walks from the right to the left with fluent fine lines of their dresses and ornaments painted in a clear and determined way which endowed the procession with life-like vividness. Imperial Sovereign Donghua and Nanji with auras were leading supreme god, deities, divine generals, celestial maidens to be presented at court of the Emperor of Heaven. The lines are denser to portray Qiuci (an ancient state in China) band which are more mobile and musical.

The silk scroll is China's best achievements in line drawing techniques of classical portraits. One can only be filled with awe when beholding the indescribable beauty in heaven. Wu Daozi's paintings are endowed with the soul of the portrayed image. The river in his mural can be felt flowing and the dragon dances in the clouds when it rains.

The same messengers of god also appear in English authors like William Blake. Like Eighty-Seven Immortals, Auguries of Innocence has no restriction of artificial composition. It is a poem from William Blake's notebooks The Pickering Manuscript. The poem was published in 1863, containing a series of paradoxes which were coincident with virtue and vice in the mundane world. The poem consists of 132 lines and has been published with and without breaks into stanzas. An augury is a prophesy which will not be explicitly illustrated.

William Blake (1757-1827) was an English painter, poet and printmaker who lived in solitude and poverty all his life. Blake was apprenticed to an engraver and later began his career as an engraver, drawing book illustrations and making engravings. He had not only precocious talent of painting but also unworldly vision. He saw God at the window at the age of four and a tree filled with angels at the age of nine. He could converse with Old Testament prophets and could see the soul of an insect. Before his death, he bursted into songs about the things he saw in heaven. William Blake developed his own complex cosmogony and envisioned himself as the living embodiment of the spirit of Milton.

He saw the world with his mind's eyes, fourfold vision. That is why Auguries of Innocence is not just a poem about our time and space. It is about the universe. All human miseries are expressed with images of animals allegorically. The disasters will pass with the glorious arrival of god. Different from the previous rhetoric analysis, the quatrain at the beginning of the poem revealed the boundless time and space from Buddhism, Daoism and Blake's perspective for better comprehension of width and profundity of this poem. In the first four lines, images like sand and flower are not just metaphors. In a sand there are countless worlds in which the river consists of countless sand, according to Sakyamuni. Human beings have no idea about how big or how small the world is. It is beyond the thinking mode of beings in this world. A myriad of time and space coexist and paradises are out of control of our time. Legends exist both in the east and west: after a few days in heaven, thousands of years pass in the mundane world.

A whole new world can be built with one thought of omniscient god. Auguries of Innocence, like Eighty-Seven Immortals by Wu Daozi, are a glimpse of heaven.

3 Less and More

Gong Sun-chou: "What, Sir, is your excellence?"

Mencius: "I understand language and have mastered the fostering of boundless and surging qi." (Owen, 2003)

Qi is a very important concept in Chinese painting. In all kinds of arts, if Qi is in tune with the universe, the work will be touching and convincing. What can be perceived are artistic media, which is the less, but what can be fathomed is Qi, which is the more.

According to Plato, the writer of tragedies is "someone whose nature it is to be two removes from the king and the truth." (Plato, 2003) The king here refers to god who created what a couch is—the true, the real thing. "Images and pictures are only imitations of imitations." (Townsend, 2002) An artist's mission is not to distort but to distill truth from trivial and evanescent happenings.

Li Song (1190-1230) was born in Qian Tang (present day Hangzhou in China), an imperial court

painter in the Song dynasty. Qiantang River tidal bore is a natural wonder described by poets of all times, but seldomly painted by painters. Qiantang River Tidal Bore Watching by Li Song excels in artistic conception, measuring 22 centimeters vertically and 22.3 centimeters horizontally, which is enough for vast space of tides.

The best time to watch Qiantang River tidal bore is the Mid-Autumn Festival, which is indicated by the full moon on the upper left corner of the painting. Pavilions are set on the lower right corner to contrast with the dynamic tides, which are the place to settle down and watch. On the moonlit night, standing on the pavilion by Qiantang River, one is facing the south and the tides come from the east. The distant mountains on the upper right hand enrich the layers of eyesight. It is not necessary to paint every wave and more details, yet a wider space is already depicted. The only line of tides in the painting is the most famous one when Qiantang River enters East Sea, which looks like a girdle crossing the river. After a long waiting at midnight, one can hear the vague rolling first, then the thundering movement of the tides comes in no time and after a breathing-taking moment vanishes in front of your eyes. And that is the eternal moment depicted in this painting (Ding Xiyuan, 2007).

The size of this paint has nothing to do with the vast time and space and Qi in this painting. Likewise, a story does not need every detail to touch the readers.

James Langston Hughes (1902-1967), American poet, playwright, novelist and columnist, is one of the major members of the Harlem Renaissance in the 1920s and one of the earliest innovators of jazz poetry.

Hughes's novel Early Autumn has only 444 words. More than eight years later, past lovers coincidently met each other in New York. Mary saw Bill first and he felt rather unexpected. She expected a kiss but only got a handshake. She could not wait to tell him they are in the same city and asked about him. He neglected her thinking about him all these years and answered routinely with a successful story. Then there is nothing left for her to say but "oh" with misshapen chaos of well-seeming forms. The readers will never know why the couple departed from each other and married someone else and need not to know. In psychological time, many years are but a moment. The frame of the story also fits into others' love lives. Love is the most unstable and whimsical fever, heavy lightness and still-waking sleep. Marriage is destined without human intervention. Mary is the heart breaker and heart-broken one. Lost love can never be found, gone with the fallen leaves on the street. Bill asked about her husband but Mary talked about children and work. He invited her just out of politeness. With the lights on, the night was falling. At the end of the story, the lights blurred and behind them are a pair of tearful eyes and the loss of love of her life.

Qiantang River Tidal Bore Watching by Li Song in Song dynasty and Early Autumn by American novelist Langston Hughes create a larger room of imagination with a few touches, at the same time, reveal the truth of universe and human lives.

4 Hai Position and Epiphany

Xie He (5th century) was a Chinese writer, art historian and critic of the Liu Song and Southern Qi dynasties, from The Record of the Classification of Old Painters, Xie summarized "six principles of Chinese painting". According to the six principles, besides the insight of life, the composition of writing and painting should also be ingeniously arranged. Hai is the last of The Earthly Branches which was built from observations of the orbit of Jupiter. The celestial circle is divided into 12 sections to follow the orbit of Jupiter. If the celestial circle is on a piece of paper, Hai position is on the lower right hand which is very important for the vitality of spirit resonance of Chinese painting.

Liang Kai (1140-1210) was known as Madman Liang, painter of the Southern Song dynasty. He was born in Shandong and worked in Lin'an (later Hangzhou of China), where he was well-known for mastery in sketch style of painting to evoke the atmosphere with minimal use of details, effortlessly recording the picture with perfect concentration. Later he practiced Zen Buddhism which inspired him with sudden enlightenment and spontaneity.

Autumn Willow and Double Crows is a round picture with the round moon on the lower right hand. According to the position of the moon and the flying crows, it is the time of rising on the east. The two crows are flying toward the west, with the wings and abdomen relatively exposed, representing Ying and Yang. Our eyes follow the willow upwardly and the Qi is also upward with the block of small branches on the lower left corner. With a turning on the highest point, the eyesight will meet the moon and signature of the artist on the Hai position. In late autumn, with crisp air and clear chirping, the welling silence of the mind is fulfilled in nature (Ding Xiyuan, 2007).
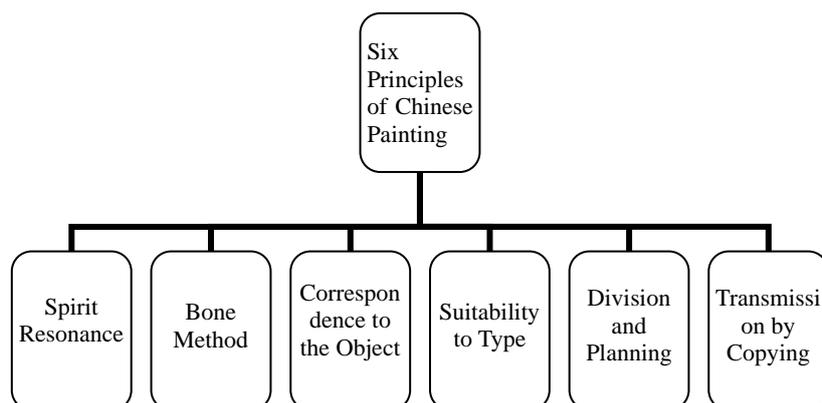
Figure 2   Six Principles of Chinese Painting

Also at the end of Araby by Irish novelist and poet James Joyce, the eyes of the boy's mind reveals the truth of his first love driven and derided by vanity.

January 6th, The Epiphany, which is the day when the Three Wiseman arrived and gave their gifts to baby Jesus; while as a literary term, a spiritual and intellectual illumination of the nature. It is like the sudden wisdom given by divinity at an unexpected moment. The short story is carefully arranged like a painting with every detail to reveal the truth.

There is no light, no belief; the windows closed on both sides of the blind street, no communication; children playing in the shadow, no hope. The girl, Mangan's sister appears with aura in the boy's eyes is actually an ordinary girl. Even colorful objects cannot be found in the story but the color brown is used for two times. The three books the boy found in a dilapidated yard of a priest represent romantic love, religious love and materialist love; the sexual, spiritual and financial sides. This love has distracted the boy from religious ceremony, controlled him to masturbate, and allured him to spend all the money foolishly. The first love is an unfulfilled wish, and the quest of self-discovery. There is almost no communication in this love, in the only conversation the boy just behaves weirdly without focusing on hearing what has been said and giving the proper answer. The pronoun "I" appears in the middle of the plot to signify the awakening of the soul. The immediate and overwhelming pain is revealed by first person point of view of the boy.

After all the obstacles, the books to read, the teacher's scold, the drunken uncle, the ending is a well-chosen position for the epiphany, just like Hai position in Chinese painting. By the flirtation of two men and a woman overheard by the boy, the dark side of love is revealed, meaningless and irrational. Life is just like the empty bazaar, when all the cravings fade, the reality weighs. It turns out that the story is just about an ordinary boy falling in love blindly with an ordinary girl. Araby takes the form of a quest which is ultimately in vain.

5 Conclusions

From the three parts of analysis, the most elevated state and maximum effect by a few touches and ingenious composition, the most representative examples of both visual arts and language arts shed light on the state of the artist.

In the realm of language arts, there are three sources of the ideas. The inspired lines sound rather as if copied from the invisible tablet in the eternal mind. Being messengers of god or Muses, only moral people are chosen to accomplish the noble mission to leave timeless and perfect works to the world. The rational lines are written with clear conscience and laborious work. The devious lines are driven by acquired concepts and lusts, contagiously degrading and misleading the readers.

Like the ethics of other forms of arts, language arts ethics is the prerequisite based on universal human moral codes. The moral standard is not decided by mankind but rather the rules of the universe. Kindness, honesty, agreement of writing with thoughts and behaviors are very important in the Eastern and Western world.

Besides language techniques, it is more important to enlighten students with language arts ethics. Counter examples are plagiarism, rumors, libel, hearsay, foul language, flattering, double talk, animal instinct, alienation, which is just the outlet of personal moods and craving for wealth and fame. The

works written in this way will only contaminate human minds and society in spite of superb technique and ornate language.

Considering the connected origins of visual arts and language arts, more practices to train visual abilities should be given and appreciation of Chinese painting can be introduced in English writing and literature class. Courses like English Writing with Pictures and English Literature with Pictures will be incorporated into the curriculum.

Being in accordance with the universe rules, with tranquil and true self and beneficial effects on the appreciators, visual arts will provide a new source of enlightenment for language arts with the ultimate goal of interdisciplinary curriculum innovation.

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Research on the Job Satisfaction of Coaches and Management Strategies in Commercial Fitness Clubs

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Abstract: The coach is the main body of operation in commercial fitness clubs, while the job satisfaction of coaches decides the quality of service provided by the club in a great extent. This study investigated 2751 coaches' job satisfaction in 45 commercial fitness clubs in Shanghai, Wuhan Hubei and Xi'an Shanxi. The results showed that the participants with higher satisfaction in terms of work environment, management system and communication compared with other variables. Different gender, education background, age and coaching certificate of the coaches have effected on different degrees of satisfaction to the career development, participation in decision-making, salary, work recognition, management system and communication. Suggestion should be given that the clubs should optimize the management strategies, in particular, focus on helping coaches to make a good career planning and enhancing their sense of belonging.

Key words: Fitness clubs; Coach; Satisfaction; Management strategies

1 Introduction

With the improvement of people's living standard, health has become one of the most important issues in our daily life. Participating in the commercial fitness club has gradually become one kind of life style. The successful operation of commercial fitness club involves many aspects, such as enrollment, courses, arenas and equipment, finance, coaches and so on. As the main body of operation of the commercial fitness club, coaches' work efficiency, work value, work methods determine the service quality of fitness clubs to a great extent, and these can be reflected mainly by the coaches' job satisfaction. Therefore, in recent years, the relevant research regarding the commercial fitness club has gradually developed. At present, in China, the research on the commercial fitness club mainly concentrates on course design, management idea, business operation mode, recruitment and so on (Lan, 2010). However, these kinds of studies are mainly from the perspective of the club building but rarely from the perspective of coaches. This means little attention is paid to the coach satisfaction when they were working in the fitness club. Even if there were a few studies about the coaches, but they are also focused on investigating the current situation of coaches in various regions (Wu, 2009; Chen, 2008), the coaches' job satisfaction hasn't raised much attention. In contrast, researchers and practitioners in foreign countries focus more on job satisfaction of fitness club, such as the income satisfaction of different types of coaches(Maguire, 2001), job satisfaction of coaches of different races(Se-Hyuk, 1996), the relationship between coaches' self satisfaction and job performance(Curry, 1986), the impact factor of service quality of coaches(Papadimitriou, 2000), the role of coaches in the employee-customer chain in the fitness industry(Makover, 2003), the relationships among service quality, value, coaches' job satisfaction, and future intentions of customers(Duncan, 2002; Basheer, 2012), etc. These studies have greatly promoted the development of fitness clubs abroad, and improved job satisfaction. We urgently need to strengthen this research in China. This research will take Shanghai, Wuhan and Xi'an cities as an example, aiming to explore the factors that affect the job satisfaction, and then raise an ideal management strategy so as to provide scientific evidence and basis for fitness club development.

2 Data and Methodology

2.1 Questionnaire survey

Based on the literature review and practical experience summary, questionnaire with title The Influence Factors on Coaches' job Satisfaction of Commercial Fitness Clubs was designed, instrument validity and reliability were also established. Job satisfaction was defined in variables of the salary, work environment, management system, work recognition, career development, communication, participation in decision-making. Instrument with a five-point Likert scale indicated the level of member satisfaction (5=high satisfaction, 4=satisfaction, 3=middle satisfaction, 2=low satisfaction, 1=none satisfaction). This study randomly selected 3000 participants from 45 different commercial fitness clubs in Shanghai, Wuhan and Xi'an, 2768 questionnaires were collected, and 2751 were valid, in which 1624

were from men and 1127 were from women aging from 15 to 60 years old.

2.2 Interview

This study randomly selected 15 participants from different commercial fitness clubs with various backgrounds. A semi-opened interview was conducted, targeting to explore the different effect factors of job satisfaction, and collect their comments and suggestions that may be inspiring to the managers in club management.

3 Results

3.1 Overall job satisfaction

In all of the 7 variables, the mean value of the three variables of work environment, management system, communication was higher than others, which were 3.671, 3.611, 3.652 respectively. This indicates that they got high degree of job satisfaction in the aspects of working environment, club management system, and communication compare with others. This may because the fitness club in large cities has relatively good condition, management idea of club was more advanced, fitness coaches' personality was generally more outgoing. However, participants got lower score in work recognition (M=2.953) and career development (M=2.612) dimension, the reason may be related to that a great number of fitness coaches are part-times, their work were not stable enough (see Table 1).

Table 1   Descriptive Statistics for Each Variable

Variable	N	Minimum	Maximum	Mean	SD
Salary	2751	1.2	5	3.013	1.052
Work environment	2751	1.6	5	3.671	0.981
Management system	2751	1.6	5	3.611	1.085
Work recognition	2751	1.2	5	2.953	1.078
Career development	2751	1.4	5	2.612	1.009
Communication	2751	1.2	5	3.652	1.114
Participation in decision-making	2751	1.4	5	2.991	0.937

3.2 Gender difference

Table 2   Results of Gender Differences on Job Satisfaction

Variable	Gender	N	Mean	SD	t	p
Salary	Male	1624	3.26	0.721	-1.154	.240
	Female	1127	3.34	0.768		
Work environment	Male	1624	4.04	0.807	-3.235	.241
	Female	1127	3.92	0.656		
Management system	Male	1624	3.31	0.816	.541	.590
	Female	1127	3.24	0.911		
Work recognition	Male	1624	3.16	0.826	1.212	.227
	Female	1127	3.17	0.767		
Career development	Male	1624	3.00	0.794	1.209	.024*
	Female	1127	3.31	0.823		
Communication	Male	1624	3.22	0.789	.868	.408
	Female	1127	3.16	0.730		
Participation in decision-making	Male	1624	4.01	0.694	-.049	.000**
	Female	1127	3.21	0.710		

*p< .05; **p< .01.

　　Male and female coaches have different roles in the commercial fitness club. From table 2, independent sample *T* test showed that there were statistically significant difference among career development ($t=1.209$，$p=0.024＜0.05$) and participation in decision-making ($t=-.049$，$p=0.000＜0.01$) between different gender. Specifically, male coaches' job satisfaction is lower than female on career development, the reason may be that males are the pillar of the family, their own expectation is much higher. At the same time, male coaches got higher score on participation in decision-making, this was because in the field of sports, it was really a male dominated society, so male coaches gain more opportunities in the club's decision-making.

3.3 Education background difference

　　The fitness coaches' degree is divided into three levels, college diploma, undergraduate, graduate. From table 3, there were statistically significant difference among salary ($f=2.369$，$p=0.043＜0.05$), work recognition ($f=1.747$，$p=0.000＜0.01$) and career development ($f=3.691$，$p=0.004＜0.01$) in different education background. On the salary variable, those who have higher education level are lower in the satisfaction, which was in line with the current situation of our society, that is the higher the education, the higher the income expectation. On the work recognition, undergraduate coaches were the lowest. Regarding the career development, the higher the degree, the lower the satisfaction. Because people with higher degree are willing to get higher position. In fact, the development space of fitness coaches was relatively limited, only few coaches can be promoted to the management position.

Table 3　Results of Education Background Differences on Job Satisfaction

Variable	Diploma		Undergraduate		Graduate		*f*	*p*
	Mean	SD	Mean	SD	Mean	SD		
Salary	4.300	1.332	3.328	1.295	2.925	0.385	2.369	0.043*
Work environment	3.141	1.052	3.317	0.842	3.233	0.273	4.409	0.125
Management system	3.257	0.908	3.408	0.887	2.500	0.555	2.153	0.063
Work recognition	3.242	0.901	2.775	0.908	3.450	1.029	1.747	0.000**
Career development	3.875	0.770	3.583	1.025	3.201	0.583	3.691	0.004**
Communication	3.414	0.984	3.275	1.106	2.950	0.886	0.538	0.747
Decision-making	3.214	1.161	3.141	1.203	3.650	0.592	1.798	0.117

*p< .05; **p< .01.

3.4 Age difference

Table 4　Results of Age differences on Job Satisfaction

Variable	Diploma		Undergraduate		Graduate		*f*	*p*
	Mean	SD	Mean	SD	Mean	SD		
Salary	3.181	1.172	3.216	1.042	4.401	0.000	2.516	0.042*
Work environment	2.632	0.908	3.025	1.173	3.801	0.781	1.874	0.137
Management system	3.041	0.989	3.409	1.185	4.200	0.001	1.865	0.038*
Work recognition	3.215	1.061	3.352	1.014	2.782	0.920	1.732	0.163
Career development	4.735	1.062	3.504	1.241	3.516	0.112	1.737	0.162
Communication	2.512	0.926	3.371	0.954	3.817	1.271	0.356	0.005**
Decision-making	4.501	1.082	3.321	1.026	3.501	0.345	0.925	0.431

*p< .05; **p< .01.

According to the career characteristics of fitness coaches, the age was divided into three levels, younger than 20, 21 to 30, older than 30. In fact, there were very few coaches who are older than 40 years old. From table 4, there were statistically significant difference among salary (f=2.516，p=0.042＜0.05), management system (f=1.865，p=0.038＜0.05) and communication (f=0.356，p=0.005＜0.01) between different ages. In terms of salary, older people have higher degree of satisfaction, this was because the fitness coaches' work experience was very important. The older coaches with much experience have higher income. Also older coaches got higher degree of satisfaction on the management system. Due to shorter working hours, the younger coaches need a period of adaptation. About the communication, the older the coach, the higher the satisfaction. It was reasonable since older coaches obtain more work experience, and are better at communication with customers.

3.5 Coaching certificate difference

The fitness coaching certificates will also have an impact on the job satisfaction. From table 5, independent sample T test showed that there were statistically significant difference among work recognition (t=1.798，p=0.027＜0.01) and career development (t=1.431，p=0.024＜0.05) between the coaches with or without certificates. On the work recognition, coaches hold coaching certificate have higher satisfaction than those without certificate. Because although the club hired a group of coaches without qualification certificate, manager of the club may not value them, and then resulting in their lower job satisfaction. In terms of career development, coaches hold certificate got lower job satisfaction. Actually, licensed coaches want to be able to make greater progress in career. For those without a license, their dream was to get a job.

Table 5   Results of Coaching Certificate Differences on Job Satisfaction

Variable	Certificate	N	Mean	SD	t	p
Salary	Hold	1947	3.123	0.367	.708	.240
	Without	804	3.341	0.723		
Work environment	Hold	1947	4.04	0.741	.712	.241
	Without	804	3.92	0.554		
Management system	Hold	1947	3.31	0.612	2.030	.590
	Without	804	3.25	0.814		
Work recognition	Hold	1947	3.76	0.839	1.798	.027*
	Without	804	3.17	0.592		
Career development	Hold	1947	3.00	0.780	1.431	.024*
	Without	804	3.41	0.863		
Communication	Hold	1947	3.19	0.921	.538	.408
	Without	804	3.14	0.837		
Participation in decision-making	Hold	1947	3.11	0.698	-1.545	.071
	Without	804	3.09	0.818		

*p< .05; **p< .01.

4 Conclusions

Commercial fitness club coaches have different satisfaction levels in terms of salary, work environment, management system, work recognition, career development, communication, decision-making. Overall, coaches had higher job satisfaction on the work environment, management system and communication. Meanwhile, their work recognition and career development satisfaction were much lower. Male's satisfaction on career development is lower than female, but higher than female on decision-making. The higher education degree of coaches, the lower satisfaction on the job salary and career development. The undergraduate coaches have the lowest satisfaction on work recognition. Older coaches may get higher job satisfaction in terms of salary, management system and

communication. Coaches with qualification certificates have higher work recognition, but lower career development.

　　Based on the conclusion, suggestion was given that the commercial fitness club should adjust the management mode and actively optimize the management strategies. Some detailed suggestions are as following: 1) To guide the coaches to make career planning, avoid seeing the work as a survival tool. They should have a long-term development plan. 2) Establish incentive salary system. The coaches work longer has higher salary, but this situation should be broken. Clubs should employ the performance evaluation. Those who work better should get more income. 3) Provide more training chance to coaches, like teach young coaches communication skills. 4) Optimize the management system, try to create a comfortable working environment for all coaches and enhance their sense of belonging to the fitness club.

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Literature Review on the Voice Taking and Future Prospects

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Abstract: In the face of increasingly complex and volatile external environment as well as the challenges of globalization and diversification, the role of voice in the era of knowledge economy is becoming more and more significant. Research indicates that the implementation of effective voice can lead to rapid response to the environment and improve the competitive ability of the enterprise. Based on a literature review, this paper discusses meaning, measure and related theories of "voice taking". Then it sorts out related empirical research of voice taking, and analyzes the variables as antecedents, mechanism and outcomes of voice taking. At the end of this paper, some suggestions are put forward for future research.

Key words: Voice taking; Judge; Advisor

1 Introduction

Facing the complex market environment in the new century, it is different for companies to identify risks and opportunities, which make companies increasingly rely on employees' ideas and concerns in order to improve organizational process and effectiveness (Dyne, et, 1995; Morrison, 2011; Grant, 2013). Effective adoption of voice makes companies respond rapidly to the environment and enhance market competitiveness (Whyte, 1998; Gladwell, 2008; Grant, 2013). Managers should welcome voice of employees, however, because voice may challenge the current situation and even the interests of voice's targets (Morrison et, 2000; Dyne et, 2003; Burris, 2012), it is common that employee's voice do not be taken in companies.

Facing this phenomenon, scholars make efforts to clarify the reasons why voice cannot be taken from the perspective of voice, and ignore the reasons and mechanism why the targets wouldn't like to take voice (Zellars, 2002; Morrison, 2011). In fact, scholars do not pay attention to voice taking based on voice's targets until recent years, and the research is still in its infancy, related theoretical and empirical analysis is still relatively scarce. In China, research in this area is more rare. Through literature retrieval, filtering and sorting, the author searched the collection of journals called EBSCO, Psyc Articles, science online, Wiley online library database from year 1980 to year 2015, which topic or keywords are voice taking, decision-making and so on. After careful reading and content analysis of relevant literature, the author got what we needed and some international journals are listed in the following table (see Table 1). Based on this, this paper talks about "voice taking" form several aspects: meaning, measurement and empirical researches, and suggests some future research directions in the field, in order to arouse the attention of domestic scholar and provides reference for the domestic scholars whose research are carried in Chinese situation.

Table 1　Some International Journals of Voice Taking (1980-2015)

Number	Name of Journal	Article number
1	Academy of Management Journal	4
2	Journal of Applied Psychology	5
3	Journal of Personality and Social Psychology	6
4	Journal of Behavioral Decision Making	3
5	Organizational Behavior and Human Decision Processes	5
6	Journal of Behavioral Decision-Making	2

2 Meaning of Voice Taking

In earlier research about team decision behavior, scholars assume that members have equal decision-making authority and are responsible for the results (Sniezek ET, 1995). However, some scholars found that leadership behavior has a direct impact on personal performance (Campbell et, 2003) as the further research, and roles of team members is gradually differentiated (Katz et, 1966). Based on team roles difference, Sniezek (1995) proposed the "judge–advisor system" mod, JAS for short. This system is often used by subsequent scholar to study voice-taking (Sniezek, et, 1995; Sniezek et, 2001).

Unlike individual decision and group decision-making, JAS contains a judge and several advisors. Among them, Judge has the power of decision-making and he will receive one or several suggestions in the decision-making process, then final decision is made through connection of the comprehensive advice and own opinions (Sniezek, et, 1995).

Although there is no consistent definition of voice taking, through literature review we can find that there exist two roles in voice-taking behavior, judge and advisor. Judge make decision and responsible for it, and advisor provide judge with relevant information and suggestions. Based on this, we consider that voice taking should follow the following two conditions: 1) an individual have decision-making author; 2) judge would consider the suggestion provided by advisor, but not necessarily fully take it.

3 Related Theories and Measurement of Voice Taking
3.1 Related theory of voice taking
Although voice is important for judge, advise discounting is common. Currently scholars have put forward several theories to explain this phenomenon. The first one is differential information. Asymmetric information makes judge prefer their decision, thereby reducing voice-taking behavior (Yaniv, et, 2000; Yaniv, 2004a). The second one is anchoring. Judges regard their own opinion as anchor, and voice can have a slight effect (Tversky, 1974). The last one is egocentric bias. Judge thinks that their opinion is always better than others, thus reduces voice taking (Krueger, 2003).

3.2 Measurement of voice taking
According to current studies in voice taking, scholar use WOA (weight of voice) to measure the degree of change to show voice taking of judge (Harvey et, 1997; Yaniv et, 1997). WOA is calculated as follows: WOA = | final decision - the initial decision | ÷ | advice and content - initial decision |. The final result of WOA changes from 0 to 1. 0 suggests voice has no effect on the final decision of judge and 1suggests the final decision and suggestion have the same content. In addition, it suggests that voice is taken but advice discounting exists when result fluctuates between 0 and 1.

Currently, development and design of voice taking's scale in still in the exploratory stage. In 2014, Fast (2014) and colleges studied the measurement of voice taking, and developed four-items scale of voice taking. Specifically, items with low load coefficient are excluded through exploratory factor analysis, and four items are retained. Then, compare the scale of voice taking and similar behavior scale ("consideration" dimension of leadership behavior and "shared vision" dimension of transformational leadership). Last, test the discriminant validity and convergent validity. Four-items scale contains "asks me personally to tell him/her about things that I think would be helpful for improving this organization", "asks me personally to tell him/her about how things have been done in my previous job(s)", "seeks out task-related knowledge from me" and "asks me personally what skills I have that s/he may not know about that might contribute to our performance here", which is an important step in the empirical researches.

4 Related Empirical Researches of Voice Taking
Through view of the existing research literature, antecedents of voice taking include individual and environmental factors. Specifically, individual factors can be classified into three aspects: judge's features, advisor's features and voice's feature; Environmental factors contain task difficulty and reword; Mediators contain judge's trust in advisor, judge's self-confidence in accuracy of final decision and so con; Moderators contain age, level of education and experience; Outcome variables contain accuracy of judge's final decision, judge's confidence in final decision and advisors' voice (see Figure 2).

4.1 Antecedents
From the perspective of judge's features, the individual factors include dealing style, the degree of self-confidence, ability and mood. 1) Five styles identified by Scott and Bruce (1995) are rational, intuitive, dependent, spontaneous and avoidant, and judges' differing styles can affect the way they accept and respond to advisor advice. 2) The degree of self-confidence. The more confident the judge is, the less voice would he takes (Harvey et, 1997; Francesca et, 2007). 3) Ability. The competent judges think there is no need to refer others' opinion and focus more on their own opinions, which leads less voice taking. 4) Emotions. People who feel incidental gratitude are more receptive to advice than are people in a neutral emotional state, and people in a neutral state are more receptive to advice than are people who feel incidental anger (Francesca, 2008).

From the perspective of advisor's features, the individual factors include the degree of self-confidence, professionalism, and intimacy with judge. 1) Price (2004) and colleges found that

compares with the general confident advisor, judge is in favor of the overconfident advisor's suggestions. 2) Professionalism. Judge prefer to consider the advisor's suggestion who have more expertise ((Goldsmith et, 1997; Harvey et, 1997; Sniezek et, 2004). 3) Comparing various factors, Feng (2006) found that intimacy with judge effects judge's voice taking mostly.

From the perspective of voice's features, the individual factors include quality, style and cost. 1) Quality. Judge prefers voice with high quality compare with poor quality advice (Gardner et, 1995; Lim et, 1995; Yaniv et, 2000). 2) Type. Dalal and Bonaccio (2010) divided it into three types: recommendation for, recommendation against and information, and the type of advice given by an advisor can influence the way it is received by the judge. 3) Cost. Patti (2006) found that voice taking is positive connected with pay for advice.

In addition, these are some environmental factors effecting voice taking, including task difficulty and reword. 1) Task difficulty. Francesca (2007) and his colleagues found that judge rely more on voice when facing difficult task, comparing to simple task. 2) Reword. Sniezek (2004) suggests that appearance of money increase frequency of voice taking.
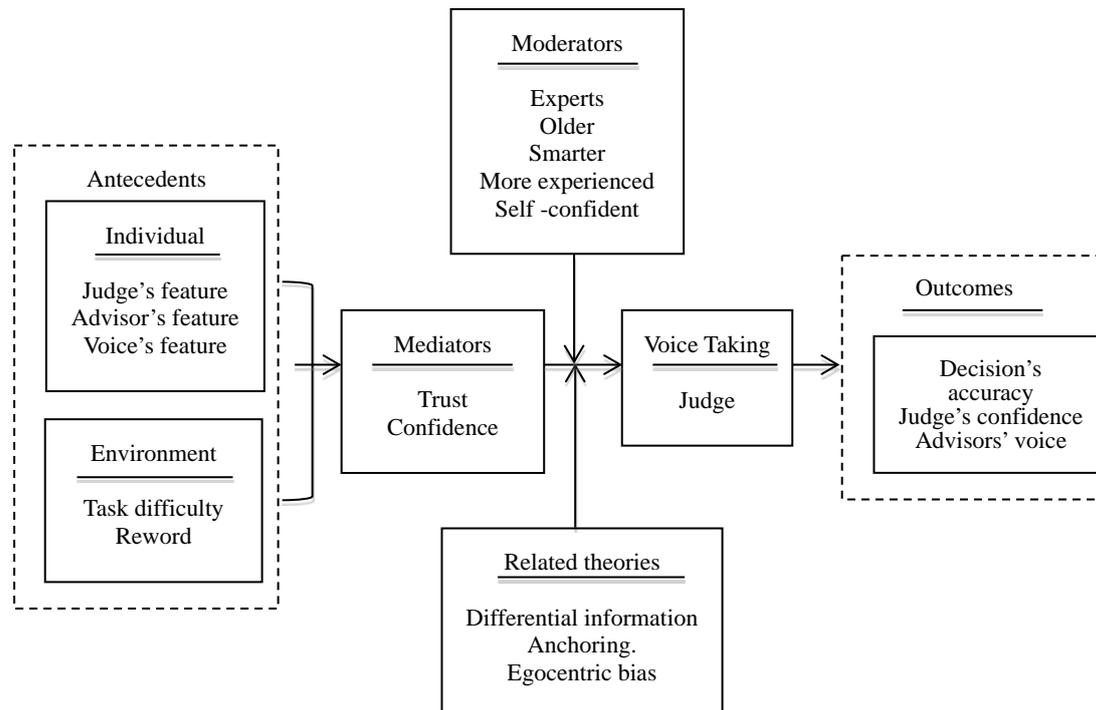
Figure 1   Integration Framework of Voice Taking

4.2 Mediators and moderators

1) Mediators contain judge's trust in advisor and judge's self-confidence in accuracy of final decision. Sniezek (2001) found that judge is willing to accept the voice of advisor who he trusts when the other conditions are same. On this Basis, Galinsky (2008) definite trust as "individual's willingness to accept his/her weakness based on positive expectation for others' acts" in research, and found that judge's trust in advisor mediates the relationship between judge's mood and voice taking.

In addition, See (2011) found that judge's self-confidence in accuracy of final decision mediates the relationship between judge's ability and voice taking. When judge is confident in the accuracy of final decision, he thinks his own opinion is better than others', and there is no need to pay more attention to voice of employee.

2) Studies have shown that many antecedents of voice can be used as moderators as well. For example, voice of experts would be less undervalued (Goldsmith, 1997; Harvey, 1997; Sniezek, 2004); judge would welcome the voice of employees who are older, more educated, smarter or more experienced, because this kind of employees made judge trust them for reasons (Feng et, 2006); judge prefer the voice of employee who is self -confident (Lawrence et, 2003; van et, 2005). In addition, task difficulty can be used as moderator. Comparing to simple task, judge rely more on voice when facing difficult task (Francesca, 2007).

4.3 Outcome variables

1) Accuracy of judge's final decision. Voice allows judges access to knowledge above and beyond what they could have as an individual. In addition, integrating multivariate and unconnected voice can reduce random error (Stewart, 2001). Thus, voice taking can greatly improve the accuracy of decision-making (Gardner et, 1995; Yaniv, 2004a; Sniezek et, 2004).

2) Judge's confidence in final decision. Judge should make effort to understand and react to the advice proffered by the advisors. As effort to process and comprehend advice increases, so does a judge's overall confidence in their final decision (Bonaccioet, 2006).

3) Advisors' voice. Fast (2014) found that managers with low managerial self-efficacy are the least likely to receive employee voice because they send signals that voice is unwelcomed, owing in large part to their feeling of being personally threatened by those who speak up. And in turn, the environment makes employees fell unsafe and lead less voice.

5 Conclusions

Based on a literature review, this paper discusses meaning, measure and related theories of "voice taking". Then it sorts out related empirical research of voice taking. We can see that the empirical research and theoretical research on voice taking are relatively scarce. For this reason, we believe that all aspects of voice taking remain to be strengthened and expanded. Our studies suggest several opportunities for future research.

1) Verifying and revising scale of voice taking. There is no influential relevant scale. Thus, future studies need to adopt more samples (different culture, different industries and different level) to verify the reliability and validity of the existing Scale.

2) Pay more attention to the mechanism of voice taking. Scholar focus more on antecedents of voice taking but there is little research on Mediation mechanism and regulation mechanism.

3) Strengthening the indigenous research of voice taking. Future studies can collect datas from countries and areas in different cultural backgrounds, investigating whether there are significant differences of voice taking in different cultural backgrounds. In addition, future studies can develop scale of voice taking applicable to our scenario.

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Genre Theory and Discourse Module for Introduction in Academic English Writing and Teaching Settings

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Abstract: This paper traced how genre-based pedagogy were conceived by researchers in the different scholarly traditions, and offered a particular view of genre-driven pedagogy and its practical applications in academic English writing of introduction. This view of a genre-based teaching approach largely consisted in a prior discussion with genre definition in which a particular genre-based pedagogy occurs. Research findings revealed that discourse module for induction writing is successful for novel writers and students to be instructed to the ways in which writing steps and prompt context knowledge of introduction have been moulded in their specific disciplinary cultures.

Key words: Genre theory; Discourse module; IMRD; EAP

1 Introduction

Writing effectively is a long-term pursuit both for the students and teachers of second language learning and teaching. Over the last decades, there has been an increasing need for the competence of English to write and communicate in academic and research settings, which has led to the burgeoning of English for Academic Purposes (hence EAP), sometimes referred to as English for Specific Purposes (hence ESP)(Fernandez Toledo).Thus the teaching theories of EAP has been in the full ascendant. Novel English pedagogies for EAP or ESP have sprung out batch after another. Among which genre-based analysis is one of the well-attested theories for the teaching and learning of academic writing. It has generally been tackled as the approach of linguistic performance research in academic or professional settings.

Genre analysis is broadly considered as the study of linguistic behaviour in academic and professional research settings(Bhatia, 1997), whether in terms of changing views of discourse to be rhetorical/social actions, as in Miller (1984) and Berkenkotter and Huckin(1995) or of learning to write to be communicative purposes, as in Swales(John Swales; John. Swales) and Bhatia (Bhatia, 1993). For the last decades or more, genre has been conventionally connoted with literature and literary criticism, and more recently used primarily in linguistics, referring to a distinctive type of text. The Routledge Encyclopaedia of Language Teaching and Learning(Byram) has defined the genre approach as: "A framework for language instruction", clearly indicating that the genre framework supports students' writing with generalized, systematic guiding principles about how to produce meaningful passages.

Under the context of writing, genre specifically refers to socially, generally recognised ways of using language, providing students with explicit knowledge about language. Genre theory is based on the assumption that language is goal-oriented evolving within a culture and members of that culture (a community) usually have little difficulty in achieving their social purposes in the texts they use frequently and are able to draw on their repeated experiences with such texts to read, understand, and perhaps write them relatively easily (Hyland, "Genre Pedagogy: Language, Literacy and L2 Writing Instruction").   Moreover, writing is in part to be thought as a practice based on the reader and writer's expectations: it will increase the chance for the reader to interpret the text purposes if the writer could trouble himself to anticipate the reader's expectation arising from what texts he or she has read previously of the same kind.   In more precise assumption, the relationship between readers and writers could be compared to be dancers following each other's steps, each configuring sense from a text by speculating what the other is probably to do on the base of prior texts influence (Hoey). Therefore, the theoretical assumption of genre-based pedagogy lies in that readers and writers have possessed a preliminary schema of prior knowledge which can be shared with others. When it comes to need, the schema knowledge can be sublimely transferred into new situations to help students read and write the similar texts efficiently and effectively.

The objective of this paper is to report on theoretical and pedagogical issues in the wide scope of genres and to evaluate the merits and disadvantages of the genre approach to teaching writing in EAP. The paper endeavours to try out the following concerns:

1)   What is a genre?

2)　　Mainstreams of the genre approaches

3)　　Working within ESP genre pedagogy

This paper enters into the genre-based pedagogy, providing an accessible review on current theory and research in the wide scope of genres, and applying the understandings of different genre-based approaches to language teaching, especially with the focus on the practical concerns of Introduction writing module, dealing with genre as an organizing principle, teaching and learning practices.

2 Concept of Genre and Genre-based Pedagogical Schools

There is a great deal of theoretical disagreement about the definition of genres. The most influential figure in this field, Swales (1990, p.58), has disseminated a genre as: "a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse community, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of the discourse and influences and constrains choice of content and style". This definition prompts the core idea that genre is a set of communicative events and certain conventions or rules are generally associated with a writer's purpose. Martin (2009, p.309) shared crucial standpoint with Swales that most of genres contain a set of communicative purposes within certain social situations and that each genre has its own structural quality according to those communicative purposes. Miller(1984, p.151) also emphases the action function of a genre, arguing that a genre should be defined not in terms of "the substance or the form of discourse but on the action it is used to accomplish", which   has been extremely influential not only in ESP genre analysis but more generally. Therefore, it is probably to identify the communicative purposes and the structural features (including both standards of organization structure and linguistic features) when genres are employed in writing teaching process. Byram(2000, p.235), one of the leading representatives of SFL, defined a genre as: "A staged, goal-oriented, purposeful activity in which speakers engage as members of their culture. When this framework is used for the language instruction, the student writers will be encouraged to mimic the staged, goal-oriented purposeful activities they engaging as members of their culture.

2.1 Mainstreams of the genre-based pedagogical approaches

In terms of different concentrations and learning strategies, it is customary to identify three distinctive schools of genre-based approach to writing: Australian Systemic Functional Linguistics (SFL), North American New Rhetoric studies, and English for specific purposes (ESP). The three trends differ in the educational contexts to which they have been applied, their intellectual roots, and the weight they give to either context or text(Hyland, 2004, p.24).

1)　　Systemic Functional Linguistics: genre as social purpose

Genre analysis in Systemic Functional Linguistics (typically called the 'Sydney school') is a framework of research analysing the discourse structures of texts. Jim Martin and Joan Rothery are two important figures in the early development of genre analysis in Sydney school whose work underpinned the Disadvantaged Schools Project in Sydney (Paltridge 304). Sydney school described genre as "a staged, goal oriented social process" (Martin, 1992, p.505), focusing on the interactive, purposeful, and sequential trait of different genres, such as description, procedures, recounts or expositions,   and on the principles that language has been systemically determined by the contexts. In the latter study, Martin (2000, p. 120)fatherly explores the connotation of genre in SFL and sharpens his idea as follows: "In functional linguistics, genre theory is a theory how we use language to live; it tries to describe the ways in which we mobilize language; genre theory is a theory of the borders of our social world, and thus our familiarity with what to expect."

Genre-based pedagogy in SFL aims at teaching primary and secondary schools, helping students involve effectively in the planning curriculum and the broader community. The core method of this approach has been placed on the teaching of formal, staged qualities of genres in order to help students recognize the specific linguistic features. Social functions and contexts of texts are central to this framework as interactions can only be understood by considering them against their social setting.

2)　　North American New Rhetoric studies

Rhetorical genre studies are pervasively influential in the US where genres are regarded as part of the social communicative processes by which knowledge about the real world are included(Artemeva). Genres, in this view, both acknowledge and endeavour to the constitution of social contexts, as well as socialisation of individuals. New rhetoric researchers are more prone to explore how genres evolve in different socio-cultural settings to achieve particular purposes, how genres cluster together in sets, and

how genres form systems and networks (Derewianka, 2003, p.134), whereas Sydney school largely accented linguistic methods for analysing genres (Hyon, 1996, p. 696).Miller(1984, p.165)also argues that genres "serve as keys to understanding how to participate in the actions of a community" and that the failure to understand genre as social action turns activities such as writing instruction from "what should be a practical art of achieving social ends into an act of making texts that fit formal requirements", a view that the genre approach should focus not only on the form of communication but also on the social action it is used to accomplish. Eventually, Miller summarizes that "a rhetorically sound definition of genre must be centred not on the substance or the form of discourse but on the action it is used to accomplish" (p. 151).

In line with extraordinary attention on the social contexts of genres, researchers in New Rhetoric fields have made use of ethnographic rather than linguistic methods for analysing texts, developing extraordinary descriptions of academic and professional contexts surrounding genres and the actions texts perform within these situations (Miller, 1994; Hyland, 2004; Smart, 1992). Likewise, the New Rhetoric approach emphasizes a consideration of what kinds of social contexts produce a particular genre in order to increase the efficacy of the genre approach. As an approach to the teaching of writing, rhetorical genre-based pedagogy has come into prominence in part as a response to process writing, which, it was felt, did not realistically prepare students for the demands of writing in academic contexts(Horowitz).

  3)   English for specific purposes: genre as professional competence
ESP genre analysis is a development of text linguistics and the description of academic genres, moving from a focus on lexico-grammatical features to rhetorical moves and, later, to a focus on rhetorical context(Paltridge, 2014, p.304). ESP researchers are interested in taking genre as a device for understanding and teaching the kinds of written language required of non-native speakers in academic and professional settings, because they generally agree on considering genre as a set of structured communicative events. To understand the communicative behaviours behind the texts and analyse the structures of the texts is the pursuit of this school. Swales, whose research has been seminal in shaping genre theory in ESP, describes the underpinnings of genre analysis from three key interrelated notions: discourse community, genre, and task. He uses communicative purpose as an important thread to bind the three terms cohesively: "It is communicative purpose that drives the language activities of the discourse community; it is communicative purpose that is the prototypical criterion for genre identity, and it is communicative purpose that operates as the primary determinant of task (p. 10)."

Researchers in this trend, such as Swales(1990, 2004) and Bhatia (2002, 1993), propose that EAP genre applications can help Second Language Learner of English have a good command of the functions and linguistic conventions of texts that they have read in their major field. They advocate teaching learners the formal features of texts so that the students can learn how to control the rhetorical organization and stylistic features of the academic genres of English-speaking discourse communities(Martin, 2013). This emphasis is also very often found in ESP, where researchers analyse and describe such genre as the literature review, business letters, science reports, formal meetings, sales promotion letters, job applications, and so on (Derewianka; John Swales).

ESP genre approaches have been acknowledged to be an influential writing pedagogy by stating clear what is to be learnt, offering a coherent set of structure/schema for studying both language and contexts, making sure that course targets are derived from students' needs, and providing the resources for students to understand and analyse texts. Students could benefit from genre pedagogical instruction in not only the shared kindness of that writing but also the uniqueness of what they could actually perform themselves. Since the publication of John Swales's ground-breaking book at Genre Analysis: English in Academic and Research Settings in 1990, it is well-recognized to say that there has been dramatically increasing interest in the genre pedagogical potential among language involvers.

3 Working within ESP/EAP Genre Pedagogy
Genre-based pedagogies rest on the idea that ways of writing are community resources for creating social relationships, rather than solely the property of individual writers struggling with personal expression. The ESP genre-based pedagogy focuses on the implications of genre theory and analysis for English for Academic Purposes, primarily with a view to helping students achieve control over the communicative purpose, structure and language features of particular genres that they will encounter in professional and academic contexts. For this aim, ESP scholars have rendered various descriptions of genres as pragmatic discourse models for EAP and professional writing learning and teaching. The work

by Swales(1990, 2004), based principally on the notion of "move" analysis, has been of great influence in the pedagogical instruction in EAP and ESP teaching.

As might be acknowledged, there exist four broad conceptual macrostructures of the research article (RA) called IMRD (Introduction, Methods, Results and Discussion) pattern(Bruce, 1983; Martin, 2013; Swales, 2009). Among IMRD, there are empirical evidences to show that introduction and discussion sections are the most challenging parts to write for English academic learners (Martin, 2013, p.335). In his masterpiece of genre analysis, Swales proposed an appropriate model used for the analysis of the Introduction unit. Later in 2004, he extended and revised the model, making it be adopted universally by many researchers as the rhetorical strategy in RA Introduction analysis. The key moves of this model could be explained clearly to learners.

Move 1 Establishing the research context (citations required)
       via
Step 1*Claiming importance of the research topic and/or
Step 2 Reviewing the research topic
Move 2 Creating a research space (citations possible)
via
Step 1A**Criticising previous studies and/or
Step 1B Reporting contradictory findings and/or
Step 1C Indicating a gap in existing literature and/or
Step 1D Adding to what is known
Move 3 Presenting the Present Work (citations possible)
via
Step 1 (obligatory) Announcing present research descriptively and/or purposively
Step 2* (optional) Presenting RQs or hypotheses
Step 3 (optional) Definitional clarifications
Step 4 (optional) Summarizing methods
Sep 5 (PISF**) Announcing principal outcomes
Step 6 (PISF**) Stating the value of the present research
Step 7 (PISF**) Outlining the structure of the paper

Figure 1   Revised Move 3 Structure (J. Swales, 2004, P.232) for the Analysis of RA Introductions

This model is a typical RA Introduction in academic English settings consisting of three-move structure, each of them undertaking a different rhetorical function as follow:

Move 1 (Establishing the research context) is for the writers to settle work in their research field by accentuating the interest of their study (Step 1) and/or describing what is known about their research topic by reviewing items of previous research (Step 2), with the main purpose of reinforcing the importance of their research and demonstrating their credentials as qualified writers.

In Move 2 (Creating a research space), writers must then justify the existing literatures and projects, giving their personal evaluation to the publications in order to create a research space which permits them to present their novel claims to the other members of their disciplinary community. For this purpose, it is stereotyped to conduct a reasonable criticism of any weak point or a new improvement of the research method in the previously published work by other researchers (Step 1A) and/or to report the contradictory findings from the reported article (Step 1B), and/or find possible knowledge gaps through regarding previous work (Step 1C), and/or contribute new findings as a continuation of previous research topic (step 1D). Subtle hedging devices could be used to avoid subjective boast or blunt criticism in the writing.

As regards Move 3 (Presenting the present work), it is generally recognized to commence with a specification of the main purpose of the research or a description of the unique features of it (Step 1). For realizing this step, the writer could employ different linguistic discourses to indicate the purpose of the study, typically linguistic exponents used being an explicit noun phrases, such as "The target/aim/purpose of this study attempts to show or was/is to explore/ examine/ reveal/ test/determine...", or the use of deictic sentences to state the present text usually followed by a verb predominantly in present tense (e.g. "This paper presents/reports/describes..."). Other available options associated with this move are also available, for example, the presentation of the structure of the paper, related work, current understanding, defining the scope of study and etc. In step 5, the writer can highlight the contribution of their research in an effort to convince the related research peers in their field, mainly by anticipating the principal findings and enhancing the value of one's research as indicated in Step 6. After that, the writer is going to illustrate the organization of the paper as in Step 7.

4 Conclusions

The concept of genre suggested in this paper ultimately attempts to be a staged, goal-oriented, purposeful activity in which speakers engage as members of their culture. Genre has become a key concept in language learning and teaching, and the research methods of genre -based pedagogy also exert a concern with context as well as form and emphasize the dominant role of description and analysis rather than preliminary classification. Summarily, there are three distinctive schools of genre-based approach to writing, namely, Australian Systemic Functional Linguistics (SFL), North American New Rhetoric studies, and English for specific purposes (ESP). The three trends contribute to different language teaching methods with the emphasis of genre given to three aspects: (a) genres as types of goal-directed communicative events; (b) genres as having schematic structures; and strikingly (c) genres as disassociated from registers or styles.

Research findings have figured out the three moves of the Introduction under the support of genres as having schematic structures, making it be adopted universally by many researchers as the rhetorical strategy in RA Introduction analysis .The three moves of the Introduction can be seen as working "from outside in": first talking about the field as a whole, then progressively narrowing the scope so that only the current investigation is being addressed (Berkenkotter, Carol 419) .

The type of writing suggested in this paper attempts to integrate genre theory and genre-based teaching approach to the learning of academic English writing, and adopts a discourse model for Introduction writing in which it is assumed that students or fresh writers learning to write academic papers are easier to be instructed to the ways in which writing steps and prompt context knowledge of Introduction have been moulded in their specific disciplinary cultures. Flexibility of the genre-based approach has influenced ESP language pedagogies by moving away from a highly restricted view of process to an informed theory of language and a moulded pedagogy grounded in research of texts and contexts in which novel writers may feel more confident about the rhetorical options they can choose depending on the context and type of writing.

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Psychological Capital: A Positive Resource for Employee Innovative Behaviour Towards Public Sector Performance

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Abstract: This paper extended the boundaries of positive organizational behavior to public sector organizations. Specifically, the relevance of psychological capital (PsyCap), composed of the positive psychological resources of hope, efficacy, resilience and optimism, was conceptualized in support with public sector reforms. On the basis of extant literature review and arguments grounded in the resource-based theory, and broaden-and-build theory, this study identified psychological capital as a positive resource for employee innovative behavior especially towards public sector performance through effective reforms. Addressing the research gap of limited studies at multiple levels of analysis, a theoretical model was derived, in which PsyCap can lead to innovative behavior of employees towards organizational performance through authentic leadership in a public environment that was perceived by disappointed reforms, resistance to change, power abuse, laziness and despair. Our study extended these theories to South Asian context (i.e., Sri Lanka), thereby providing external validity to the findings of research in Western contexts.

Key words: Psychological capital; Employee innovative behavior; Authentic leadership; Public sector performance

1 Introduction

Today's workplace of business as well as public is changing at a much faster and more dramatic pace than ever. Therefore, in order to sustain and gain a competitive advantage in such an environment, firms must be innovative (McAdam & Keogh, 2004). Particularly, employee innovative behaviors (e.g., developing, adopting, and implementing new ideas for products and work methods) are important resources that make an organization successful in dynamic environments (Yuan & Woodman, 2010). New ideas to the public sector are introduced through reforms. During the last few decades, the public sector around the world has been explored to major reform proposals and significant modification in government norms, structures, and behaviors (Pollitt & Bouckaert, 2011). Therefore, public administrative scholars and practitioners found to be busy analyzing, evaluating, and even proposing reforms (Aberbach & Christensen, 2014). Thus, the results have not been ended up with increased performance as expected. Moreover, they were highly criticized for their incapability of defining public issues, proposing appropriate solutions, and failures in implementations. In contrast, many reform studies suggest that leaders (political and administrative) in public sector more often control hierarchically reform processes due to their exclusive formal participation rights (Christensen & Lægreid, 2001; Pollitt & Bouckaert, 2011). In such a context, it becomes essential even for public sector organizations to maintain strategic human resources to be successful in the reform process as well as authentic leadership to have an impact on the follower's performance.

Sources of sustainable advantage for organizational positive change were well-explained by the resource-based theory of the firm (Acedo, Barroso, & Galan, 2006; Newbert, 2007). This theory proved the positive relationship between strategic resources (i.e. those that are valuable, rare and difficult to imitate or substitute) and organizational performance (Crook, Ketchen, Combs, & Todd, 2008). Thus, it is essential to manage and recognize the human, social and psychological capital to do best for such an innovative change within the organization (Luthans & Youssef, 2004). Nevertheless, Luthans et al. (2008) and Avey et al. (2009) discussed the importance of psychological and attitudinal strengths of individuals than other strategic resources. As a result, a new movement of positive psychology emerged which became concerned with what is right with people and building on that instead of trying to just fix what is wrong with people (Luthans and Youssef, 2004). Consequently, the positive organizational scholarship (POS) and positive organizational behaviour (POB) movements which can be applied to the workplace positivity were emerged. Similarly, a positive, genuine, transparent, ethical form of leadership, broadly termed authentic leadership (AL), is now recognized as a positive approach to organizational leadership that can help meet today's challenges (Avolio & Gardner, 2005; Avolio, Gardner, Walumbwa, Luthans, & May, 2004; George, 2003; Luthans & Avolio, 2003; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). More

importantly, authentic leaders develop and influence their followers by energizing them with positive psychological states, which are conducive to their performance (Gardner & Schermerhorn, 2004) which could provide better solutions to inherent issues of resistance to change, lower productivity, power abuse and despair in public sector organizations.

On the basis of extant literature review and arguments grounded in the resource-based theory, and broaden-and-build theory, this study identifies psychological capital as a positive resource for employee innovative behavior especially towards public sector performance through effective reforms. Our study extends these theories to South Asian context (i.e., Sri Lanka), thereby providing external validity to the findings of research in Western contexts.

2 Psychological Capital: Core Construct and Study Hypotheses

Positive psychological capital is a higher-order core construct which is composed of four components: efficacy, hope, resilience, and optimism. PsyCap is more directly concerned with 'who you are' and more importantly 'who you are becoming' (Luthans, Avey, et al., 2006). PsyCap can be defined as "an individual's positive psychological state of development that is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success (Luthans, Youssef, et al., 2007). PsyCap is state-like and open to change and development as compared with largely fixed traits such as personality (Luthans, Avey, & Patera, 2008; Luthans, Youssef, et al., 2007). Many studies have found that the relationship between PsyCap and employee attitudes, behavior and performance at individual levels of analysis (Avey, Luthans, & Youssef, 2010). Addressing this research gap of limited studies at multiple levels of analysis, our study examines those cross-level interactions where the strength of the relationships among individual-level predictor (employee PsyCap), team-level predictor (authentic leadership) and outcome criterion differ as a function of individual-level (employee innovative behavior) and organizational/industry level (organizational performance).

3 Psychological Capital, Innovative Behavior and Organizational Performance

Limited studies investigated the relationship between hope and creativity (Rego, Machado, Leal, & Cunha, 2009). Rego, Sousa, Marques, and Cunha (2012) examined the relationship between optimism and creativity. Similarly, Tierney and Farmer (2002) also found the relationship between efficacy and creative performance. Research suggests that the positive psychological resources of efficacy, hope, resilience, and optimism have the potential to improve innovative behaviors of employees in the workplace (Abbas & Raja, 2015). Hope is "a positive motivational state that is based on an interactively derived sense of successful (1) agency (goal-directed energy) and (2) pathways (planning to meet goals)" (Snyder et al., 1996). Individuals with greater hope are able to conceive of many strategies to reach their goals and proactively develop alternative plans in case the original one does not work (Snyder, 1994). This ability leads for them to actively work on creative ideas for solving problems, and they regard problems and opportunities from different angles (Zhou & George, 2003). In addition, high hope individuals tend to be independent thinkers (Luthans, Youssef, et al., 2007). Hopeful employees "tend to be creative and resourceful, even with tight budgets" (Luthans, Youssef, et al., 2007). Optimism is a generalized positive expectancy (Carver et al., 2009) and a positive explanatory style of attributing positive events to personal (internal), permanent (stable) and pervasive (global) causes and negative events to external, temporary and situational ones (Seligman, 1998). Optimistic leaders pursue new and creative approaches towards problem solving (Peterson, Walumbwa, Byron & Myrowitz, 2008). Optimists are essential to introduce changes to a system as they always prefer to have positive expectations about results without being resistant to them (Avey et al., 2008). Self-Efficacy, or confidence, is "one's belief about his or her ability to mobilize the motivation, cognitive resources, and courses of action necessary to execute a specific action within a given context" (Stajkovic and Luthans, 1998b). Grounded in social cognitive theory, efficacy motivates the selection of challenging goals, and mobilizes the cognitive mechanisms of symbolizing, forethought, observation, self-regulation and self-reflection toward goal pursuit (Bandura, 1997, 2012). Efficacious individuals are inventive, resourceful (Bandura & Cervone, 1986), and creative (Tierney & Farmer, 2002) and those individuals to be more likely to generate and apply innovative ideas in their workplace (Abbas & Raja, 2015). Resilience is "the developable capacity to rebound or bounce back from adversity, conflict, and failure, or even positive events, progress, and increased responsibility" (Luthans, 2002a). Resilience is

a very important psychological resource, because repeated failure can prevent us from moving forward (Hsu et al., 2014). Resilience can help organizations and their members survive, overcome, learn from and grow through challenges (Youssef and Luthans, 2005). Moreover, resilient leaders are likely to encourage themselves and even their subordinates to take risks and exhibit innovative behaviors (Peterson et al., 2008). Although not addressed by Avey, Reichard, et al.'s (2011) meta-analysis, PsyCap has also been found to influence employees' creative performance, problem solving and innovation at the individual-level. For example, Sweetman, Luthans, Avey and Luthans (2010) and Rego et al. (2012c) found that PsyCap was positively related to creative performance, and Luthans, Youssef, and Rawski (2011) found that PsyCap was positively related to problem-solving performance and reported innovation.

Also excluded from Avey, Reichard, et al.'s (2011) meta-analysis is the relationship between PsyCap and performance at the team and organizational-levels of analysis. For example, by using an experimental design with engineers, Walumbwa, Peterson, Avolio and Hartnell (2010) found that leader PsyCap was positively related to follower PsyCap, which in turn was positively related to follower performance. According to broaden-and-build theory, positive emotions share the capacity to broaden people's momentary thought-action repositories and widen the array of thoughts and actions that come to their minds (Bakker & Demerouti, 2008; Fredrickson, 2001), thereby increasing the potential for the demonstration of innovative behaviors such as sharing creative ideas and providing suggestions for improvements at work (Avey, Luthans, & Youssef, 2010; Avey, Reichard, et al., 2011). Research on PsyCap suggests that PsyCap contributes to positive emotions. The broadened inventory of positive psychological resources such as hope, efficacy, optimism, and resilience may be helpful in problem solving and enhancing creativity since employees with a positive mindset are more creative (Luthans et al., 2011; Rego, Sousa, and Marques, 2012). Moreover, innovative behaviour of these employees may lead to positive change in organizations (increased performance). Similarly, innovative behavior of employees mediates the relationship between employee PsyCap and organizational performance. Therefore, we propose the following hypotheses:

H1: Employee psychological capital is positively related to employee innovative behavior.

H2: Employee innovative behavior mediates the relationship between employee psychological capital and organizational performance.

H3: Employee innovative behavior is positively related to organizational performance.

4 Moderating Role by Authentic Leadership

Organizations need leaders today to challenge the status quo, create visions of the future, and inspire organizational members to want to achieve the visions (Robbins & Judge, 2013). In contrast, previous research on leadership demonstrated that corruptive and unethical leaders negatively influence on employee attitudes, behavior and performance. In the public administration practitioner literature, many researchers observed that public sector employees greatly suffer from despair, apathy, anxiety, poor job satisfaction, less productivity, less innovativeness and less efficiency due to its ineffective leadership. In such a context, authentic leadership plays an important role as it's a promising way to think about ethics and trust in leadership because it focuses on the moral aspects of being a leader (Robbins & Judge, 2013). The primary quality produced by authentic leadership, therefore, is trust (Robbins & Judge, 2013). Previous research found that authentic leaders can influence follower performance (Lord & Brown, 2004). According to Avolio et al. (2004), the behaviors of authentic leaders are viewed by followers as being guided by high moral standards and characterized by fairness, honesty, and integrity in dealing with followers. As a result, followers get motivated to exhibit positive behaviors and have a sense of self-worth and obligation to reciprocate (Illies et al., 2005; Yukl, 2002). Similarly, George (2003) observed that authentic leaders motivate followers by means of modeling and transferring a deep sense of responsibility to deliver positive outcomes over an extended period. Although a great deal of research has focused on examining the relationship between PsyCap and workplace outcomes, there has been comparatively limited research on the factors that may moderate such a relationship (Newman et al., 2014) especially by authentic leadership.

Wang et al (2014) also found that the relationship between authentic leadership and followers' job performance through leader–member exchange was stronger for those low in PsyCap. Research found that more participative or authentic styles of leadership might facilitate the deployment of PsyCap by individuals. For example, even though employees or teams report high levels of PsyCap, leadership may be needed to channel this in the right way to guide the behaviors that yield superior outcomes (Newman et al., 2014). As such, although we expect participative or authentic styles of leadership to accentuate the

positive relationship between PsyCap and desired outcomes, other more authoritarian style of leadership may constrain the deployment of individual-level PsyCap. Drawing from this theoretical, empirical, and practical literature, we derive the following hypothesis:

H4. Authentic leadership will moderate the relationship between employee psychological capital and their innovative behavior such that the psychological capital will be more positively related to employee innovative behavior when authentic leadership exists.

Considering all the four hypotheses, the theoretical model shown in *Figure 1* can be constructed for the study.
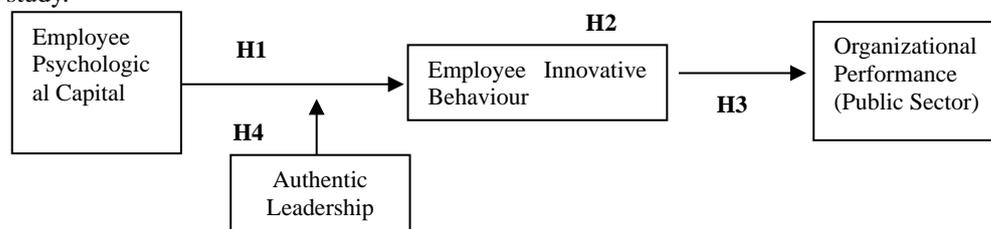
Figure 1　Conceptual Model of the Study

5 Conclusions

Policy makers should seriously consider the use of effective reforms today than ever. More importantly, the reforms will have little impact if the conditions under which they are implemented do not support the introduction of these reforms (such as leadership, the strong institutional culture, high degree of professionalism of employees, and support from the Ministries). Empirical research also suggests that superficial knowledge and insufficient understanding of human beings cause the failure of an organization to mobilize its human recourses. Thus, fierce and dynamic today's global economy calls for different positive psychological resources within each employee (i.e. PsyCap) and an authentic leadership to create a trustful environment. Empirically it was proven that PsyCap and authentic leadership can influence employee work performance, increasing positive workplace behaviors while decreasing negative behaviors and improving trust. Accordingly, this conceptual paper will be set out to review and explore the impact of positive PsyCap and authentic leadership on employee innovative behavior and public sector organizational performance in Sri Lanka. The concepts and constructs discussed in this study will have practical implications for the development of human resources and authentic leadership style especially in public sector organizations. In conclusion, by combining PsyCap and leadership, this study is to be found the relationship between organizational performance and employees' innovative behavior contingent on employees' PsyCap.

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Advantages and Disadvantages of Networked Arts Education in Non-Arts Colleges and Their Improvement

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Abstract: As a form of aesthetic education, arts education plays an important role in quality education in Chinese colleges. The network age has brought both opportunities and challenges to arts education in colleges, and how to meet its challenges is what arts teachers should consider in the new age. In this paper, we use fuzzy synthetic evaluation (**FSE**) method analyze the current situation of arts education in the network age, consider that both opportunities and challenges have been brought by the network age, recommend that arts teachers should ponder values orientation in networked orientation and keep pace with the overall development of education cause.
Key words: Arts education; Average college; Network; New characteristic; Fuzzy synthetic evaluation

1 Introduction

With the development of digital information technology, nowadays information disseminated is being spread by network quickly, impacting greatly on the traditional educational assumptions and teaching modes (Luxuan Fan, 2015). The arts education in non-arts colleges aims to increase their quality of aesthetics, which is quite different than that in the arts schools (Hu Jin and Rong Zheng, 2014). The network age has changed the landscape of the arts education for college students, and makes it acquire new characteristics. It not only has brought opportunities to the students and researchers, but also has posed enormous challenges (Li Lei, 2014).

2 Method

In 1965, Zadeh introduced fuzzy set theory to analyze imprecisely informative data (Zadeh, 1965). Now we develop this fuzzy synthetic evaluation (**FSE**) method to analyze the current situation of arts education.

2.1 The classification of factors

The factors set $U = \{u_1, \ u_2, \cdots, \ u_m\}$ are classified into s type by some kind of attribute,

$$U = \{u_{i1}, \ u_{i2}, \cdots, \ u_{im_i}\}, \quad i = 1,2,\cdots,s \tag{1}$$

They match the conditions:

$$m_1 + m_2 + \cdots m_s = m \tag{2}$$

$$U_1 \bigcup U_2 \bigcup \cdots \bigcup U_s = U \tag{3}$$

$$(\forall i, \ j)(i \neq j \Rightarrow U_i \bigcap U_j = \varnothing) \tag{4}$$

2.2 The determination of evaluation set and weight set

1) The determination of evaluation set

$$V = \{v_1, v_2, \cdots v_n\} \tag{5}$$

2) The determination of weight set

A. Factor class weight set

The weight of class i factors U_i are defined as $a_i (i = 1,2,\cdots,s)$, so the factor class weight set

$$A = (a_1, a_2 \cdots, a_s) \tag{6}$$

B. Factor weight set

The weight of No. j factor in class i is defined as a_{ij}, so the factor weight set

$$A_i = (a_{i1}, a_{i2}, \cdots, a_{im_i}), \quad i = 1,2,\cdots,s \tag{7}$$

2.3 The first level FSE

To synthetically evaluate the factors of first level, the single factor evaluation Matrix of first level **FSE** is defined as

$$R_i = \begin{bmatrix} r_{11}^{(i)} & r_{12}^{(i)} & \cdots & r_{1n}^{(i)} \\ r_{21}^{(i)} & r_{22}^{(i)} & \cdots & r_{2n}^{(i)} \\ \vdots & \vdots & & \vdots \\ r_{n_i 1}^{(i)} & r_{n_i 2}^{(i)} & \cdots & r_{n_i n}^{(i)} \end{bmatrix} \tag{8}$$

The **FSE** of class i factor is defined as

$$B_i = A_i \circ R_i = \left(a_{i1}, a_{i2}, \cdots, a_{im_i}\right) \circ \begin{bmatrix} r_{11}^{(i)} & r_{12}^{(i)} & \cdots & r_{1n}^{(i)} \\ r_{21}^{(i)} & r_{22}^{(i)} & \cdots & r_{2n}^{(i)} \\ \vdots & \vdots & & \vdots \\ r_{m_i 1}^{(i)} & r_{m_i 2}^{(i)} & \cdots & r_{m_i n}^{(i)} \end{bmatrix} = \left(b_{i1}, b_{i2}, \cdots, b_{in}\right) \tag{9}$$

2.4 The second level synthetic evaluation

The single factor evaluation Matrix of second level **FSE** is the Matrix of first level **FSE**

$$R = \begin{bmatrix} B_1 \\ B_2 \\ \vdots \\ B_S \end{bmatrix} = \begin{bmatrix} A_1 & \circ & R_1 \\ A_2 & \circ & R_2 \\ & \vdots & \\ A_S & \circ & R_S \end{bmatrix} \tag{10}$$

So the second level **FSE** is defined as

$$B = A \circ R = A \circ \begin{bmatrix} A_1 & \circ & R_1 \\ A_2 & \circ & R_2 \\ & \vdots & \\ A_S & \circ & R_S \end{bmatrix} = \left(b_1, b_2, \cdots, b_n\right) \tag{11}$$

If some sub-class sets U_i still have many factors, we can divide them again. Then we have third level model or multiple level model.

3 Numerical Analysis and Results

3.1 The opportunities brought by network-age arts education

Digital information technology has injected vitality into the arts education in non-arts colleges, promoting its development of arts education tremendously, and provides writers and artists with a new platform.

3.1.1 New characteristics of educational contents

The network age has seen a substantial improvement in educational contents, of which cultivation of creative ability has become a critical part. The computer network has vastly expanded the scope of educational contents--every college has its own online arts library which collects various forms and thoughts of arts, and shares network resources with one another. This not only has sped up the spread of various forms of arts, but also has stimulated students' creativity. For example, students in many colleges have set up such arts societies as drama clubs so as to enrich the arts life on colleges campuses.

3.1.2 New characteristics of educational objects

In the network age, such methods as network videos and visiting scholars' lectures have been used in non-arts colleges to largely solve the difficult problems confronting traditional arts education. In the network learning environment, with their learning interest stimulated, college students can enjoy high-quality arts education, more actively enhance self-culture and acquire knowledge. On the one hand, this decreases the high cost of arts education to some extent; on the other hand, this promotes initiative of educational objects in learning knowledge.

3.1.3 New characteristics of the educational means

Educational content and educational objects' learning depend on educational means. The Internet, as a new educational means, has provided new learning experiences by encouraging students to use their senses, arousing their enthusiasm for learning, and improving the interactivity of teachers and students.

3.2 The challenges facing arts education in non-arts colleges in the network age and solutions

The network has changes the route of transmission of traditional arts. "Like a double-edged sword, the network is not only a seedbed and a multiplier of excellent music culture, but also a hotbed and an

incubator of vulgar or indecent network music." (Zhong Yi, 2009)

3.2.1 Network proficiency

The advent of network has greatly changed arts education (Meng Jian, 2000). First, it poses a challenge to arts educators' network proficiency. The blackboard-based teaching has been replaced by in multimedia-based instruction, including use of PowerPoint slides, computer and projector. Also，teachers are supposed to know how to use relevant software. This is a big challenge to the educators who cannot embrace new technology (Yang Dechu and Hong Yan, 2002).

Therefore, arts courses should be based on network and connected to the dynamic world, which can widen both students' and teachers' horizons. Furthermore, arts teachers should adopt proper teaching theory which can guide them add popular elements from the Internet, so as to enrich course contents and arouse students' passion for knowledge (Li Huaizhe, 2010).

3.2.2 The relationship between teachers and students

The original relationship of teacher-student has been broken, and has been replaced by the relationship of teacher-computer-student, with the lively, friendly person-to-person communication changing into the relatively cold human-machine communication. Facing the alienate relation, teachers, students and colleges should take measures to eliminate the side effects of network education.

Teachers should communicate with their students outside the classroom, learning about not only students' study, learning progress and knowledge acquisition, but also their life and hobbies, so that they can carry out teaching according to students' characteristics. Students should communicate with their teachers more actively, instead of getting engrossed in the network world and ignoring people and things in the real world. The network just provides better learning conditions and platforms for them, and students should not be engrossed in it. Colleges should prefect their administrative system, for a good system is the guarantee for promoting arts education (Qing Lie, 2004).

3.3 Numerical analysis

3.3.1 Parameter characterization

To analyze the current situation of arts education, we set the parameters as follows,

Table 1   Parameters of FSE

Intrinsic Factors	Educational Contents (F_1)
	Educational Means (F_2)
Extrinsic Factors	Network Proficiency (F_3)
	The Relationship between Teachers and Students (F_4)

The survey information is taken from students so the educational objects are not included in the factors. The weight of each factor is defined by single factor evaluation Matrix

$$
\begin{array}{cc}
 & \begin{array}{cc} F_1 & F_2 \end{array} \\
\begin{array}{c} F_1 \\ F_2 \end{array} & \begin{array}{cc} 1 & 1/3 \\ 3 & 1 \end{array}
\end{array}
\tag{12}
$$

The weight vectors of factors

$$b_1 = \sqrt{1 \times \frac{1}{3}} = 0.5773503 \tag{13}$$

$$b_2 = \sqrt{3 \times 1} = 1.7320508 \tag{14}$$

Then

$$w_1 = \frac{b_1}{b_1 + b_2} = \frac{0.5773503}{0.5773503 + 1.7320508} = 0.2483341 \tag{15}$$

$$w_2 = \frac{b_2}{b_1 + b_2} = \frac{1.7320508}{0.5773503 + 1.7320508} = 0.7499999 \tag{16}$$

3.3.2 Survey information

The survey information is taken from a music class in a non-arts college, there are 120 students in this class.

Table 2   Survey Information

Factors	Evaluation Level				Weight
	A	B	C	D	
Educational Contents	15	15	60	30	0.24833341
Educational Means	0	30	45	45	0.7499999

So the fuzzy relationship Matrix is

$$R_1 = \begin{bmatrix} \frac{15}{120} & \frac{15}{120} & \frac{60}{120} & \frac{30}{120} \\ 0 & \frac{30}{120} & \frac{45}{120} & \frac{45}{120} \end{bmatrix} \tag{17}$$

Then we get the single factor evaluation result of intrinsic Factors

$$B_1 = w \circ R_1$$

$$= (0.2483341 \quad 0.7499999) \begin{bmatrix} \frac{15}{120} & \frac{15}{120} & \frac{60}{120} & \frac{30}{120} \\ 0 & \frac{30}{120} & \frac{45}{120} & \frac{45}{120} \end{bmatrix} \tag{18}$$

$$= (0.0310418 \quad 0.2185418 \quad 0.4054171 \quad 0.3433335)$$

According to the same calculation process, we get the single factor evaluation result of extrinsic factors

$$B_2 = (0.1874999 \quad 0.3743753 \quad 0.15520881 \quad 0.2812500) \tag{19}$$

3.3.3 The calculation of synthetic evaluation

The synthetic evaluation includes all intrinsic and extrinsic factors. The weights of these factors are

$$w = (0.8333333 \quad 0.1666666) \tag{20}$$

The fuzzy relationship matrix R_2 is given by the first level FSE

$$R_2 = \begin{bmatrix} B_1 \\ B_2 \end{bmatrix} = \begin{bmatrix} 0.0310418 & 0.2185418 & 0.4054171 & 0.3433335 \\ 0.1874999 & 0.3743753 & 0.1552088 & 0.2812500 \end{bmatrix} \tag{21}$$

So the result of synthetic evaluation is

$$C = w \circ R_2$$

$$= (0.8333333 \quad 0.1666666) \begin{bmatrix} 0.0310418 & 0.2185418 & 0.4054171 & 0.3433335 \\ 0.1874999 & 0.3743753 & 0.1552088 & 0.2812500 \end{bmatrix} \tag{22}$$

$$= (0.0571181 \quad 0.2445140 \quad 0.3637157 \quad 0.3329862)$$

The value of evaluation level is defined as

$$A = 95, \quad B = 85, \quad C = 75, \quad D = 50 \tag{23}$$

We get the final score of synthetic evaluation is

$$0.0571181 * 95 + 0.2445140 * 85 + 0.3637157 * 75 + 0.3329862 * 50 = 70.14 \tag{24}$$

4 Conclusions

Based on our Numerical analysis result, we may face the fact that networked education has indeed impacted on the arts education in non-arts college, but it has also been providing more opportunities.

Thanks to network technology, the impossible in the arts education in non-arts colleges has become possible. Higher education in China has been universalized; educational contents have been enriched; teachers have an extensive educational platform; initiative of educational objects has been stimulated. On the whole, arts education in non-arts colleges has been greatly improved.

To preserve traditional arts, influenced by the network, people tend to abandon their own beliefs and thoughts, even the artistic spirit passed down within their nation. Thus many local customs and practices have been destroyed by modern technology in the environment of network (Jiao Jianying, 2002). Non-arts colleges should pay more attention to this situation, and guide students to take a healthy and positive outlook towards arts while monitoring and controlling the influence of network on students.

What arts teachers should do is to ponder values orientation in networked orientation, to figure out the essence of education in the new age, to adapt to the rapidly changing age, to seize the opportunities, to face up to the challenges, and to keep pace with the overall development of education cause.

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Analysis of the College Counselors Management Responsibility Mechanism

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Abstract: College counselors, who play a very important role in the daily management and political education of the college students, are attracting more and more attention from the public. Through extensive literature review, the current research status on college counselors was firstly summarized. Then, a questionnaire survey method was adopted, the problems existed in the management of college counselors were thoroughly analyzed from five aspects, which are, the salary system satisfaction, the professional level, the management responsibility, the evaluation and incentive system, and the training level. Finally, based on these problems, the corresponding solutions and strategies were furthermore proposed. This study is not only essential in solving the problems facing the college counselors, but also of benefit to improve the student work management level of the university.

Key words: College counselor; Questionnaire survey; Salary satisfaction; Management responsibility; Evaluation and incentive; Training

1 Introduction

In the recent three decades, the higher education of China has got great development. The college counselors, as an important group, have contributed a lot in this period. With the Minister of Education of China issuing the *Opinions on Strengthening and Improving the Construction of College Counselors and Teachers in Charge and the Provisions on the Construction of College Counselors Team*, the structure and quality of the college counselor teams has largely improved. However, problems associated with the management of college counselors have gradually appeared. Through extensive literature reviews, it can be found that a large amount of research has been carried out regarding the problems of college counselors (Zhou Jialun, 2011; Michael Schaub, 2012); the fundamental reasons are believed that a lack of management responsibility system, and the corresponding scientific evaluation mechanism has not yet been established (Schwitzer A M, 1996; Du Yanhua, Ma Xiaojing, 2016). Mechanism innovation is widely recognized as the fundamental direction to solve the problem of college counselors (Ying Y U, et al, 2014; Qiu Jin, 2012). At present, the majority of researches are about the experience analysis of college counselors' work (Young T L, et al, 2015; Yan Jianyi, 2014); few researches have been carried out from the perspective of management evaluation method and responsibility system. Thus the study of the management responsibility system is essential in solving the problems occurred in the college counselor team.

2 Problems Existed in the Management of College Counselors

Since the beginning of the 21st century, China's universities have experienced a large expansion in the scale and enrollment. Accordingly, the college counselor team is enlarged. However, the original selection, training, and evaluation mechanism aiming at the college counselors do not change. These old mechanisms are unable to meet the requirement of the university development. In this section, the problems existed in the management of college counselors are deeply analyzed.

2.1 Unsatisfactory with the salary system

A questionnaire survey has been carried out regarding the salary satisfaction degree; the results are shown in the Figure 1. Generally speaking, the salary level of the college counselors in China's university is not high. Seen from the Figure 1, 86% of the college counselors are not satisfied with their salary or very dissatisfied, especially compared with the teachers. Although the official regulations take the college counselors as an important composite of the teacher team, however, there is still a big gap between the college counselors and college teachers with respect to the salary level. In China, the college counselors tend to implement a post appointment system. Their salary packages only include the basic salary and a small amount of allowance, while the full-time teachers have more incomings like post allowance and class allowance. This binary difference situation always disappoints the college counselors.
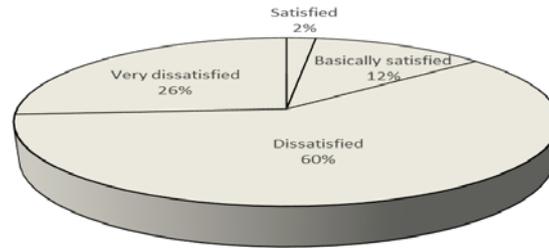
Figure 1   Results of the Questionnaire Survey Regarding the Salary Satisfaction of the College Counselors

2.2 Inadequate in the professional level

Seen from the present situation, college counselors are selected among the fresh graduate, and many of them are the outstanding representatives of the student cadres. Although they work with passion and vitality, they are short of the general knowledge of the ideological and political education, as well as the psychology study and necessary working experience. Thus, these college counselors show poor coordination ability in the management of the college students. It can be seen that the specialization level of the counselors remains to be improved.

2.3 Unclear in the job responsibility

The Provisions on the Construction of College Counselors' team have 8 principles for the job responsibilities of college counselors, but in practice, college counselors take a number of responsibilities, including the student education, management, consulting and serving, more specifically, the ideological and political education, dormitory management, reward and punishment management, poor students helping, psychological counseling and other content. Besides, various tasks from administrative organs at all levels of the school are delivered by the college counselors, and too much work needs to be accomplished by them. Meanwhile, it is a very serious problem that the current post-90s generation has poor self-care ability, psychological ability, self-discipline awareness, and some other issues. All kinds of unexpected and unforeseen problems emerge in an endless stream, which leads to the long-term overdraft with the college counselors. Under this kind of unclear work responsibility, it often leads to the ideological and political education work to the student becomes a mere formality.

2.4 Unsound in the evaluation and incentive system

Since the college counselors are mostly served by the fresh graduates, at present, there are no corresponding professional promotion channels in the work mechanism. In the questionnaire survey, 73% of the college counselors hold a general attitude toward the current evaluation and incentive mechanism, 16% of them are dissatisfied, 6% of them are satisfied, as shown in Figure 2. In addition, most counselors do not think this work shows a good future and do not have the intention to engage in this work for a lifetime. As for the working period, some teachers take this work as a working experience after graduation; if possible, they would like to transfer to a full-time teacher or continue a further study. 48% of them choose to work within 2 years, 46% of them choose to work 2-5 years, only 6% of them choose to work more than 5 years, as shown in Figure 3. Working in a short time period inevitably affects the continuity and systematicness of the student work. Regarding the counselors' evaluation system, some universities purely take the employment rate and the study results of students to assess the pros and cons of them; other universities haven't yet set up a scientific evaluation system, accordingly, there is no effective incentive mechanism.
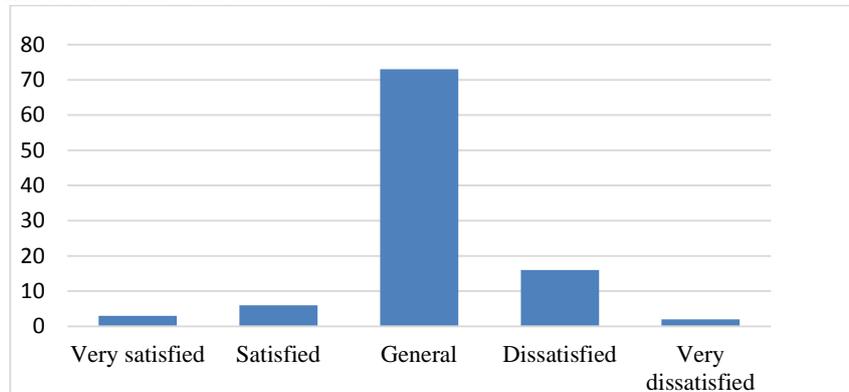

Figure 2   College Counselors' Attitude toward the Evaluation and Incentive System
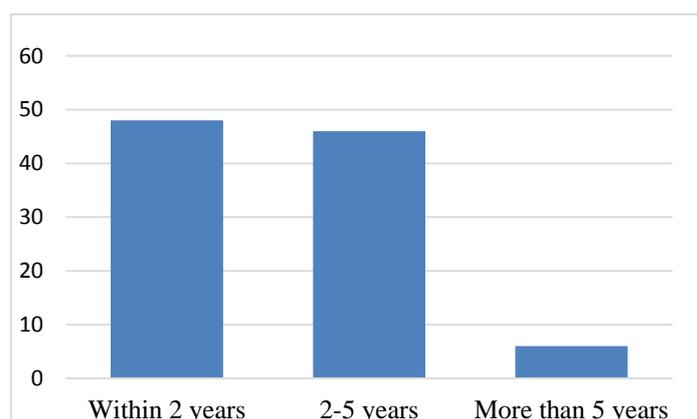
Figure 3   College Counselors' Planning on the Working Period

2.5 Insufficient in the training
The ideological and political education combines the features of scientific, theoretical and political in one, which needs special research and training. Since the college counselors tend to work for a long time under huge working pressure, they usually have little time and energy to take the appropriate training and guidance after work.

3 Establish the Management Responsibility Mechanism of the College Counselors
3.1 Improve the salary level
Gradually establish a new salary structure that combines a basic salary, performance pay, and the welfare. The basic salary is based on the work accomplished by the counselors or their ability to complete the work. Performance pay is the salary which bases on the work performance of the counselor, this part can make the excellent counselors get due reward and make the bad-performance ones to be punished. Besides, the universities should provide a wide range of benefits for the teaching and administrative staff, as well as the counselors.
3.2 Establish a multi-conclusion evaluation mechanism
Gradually establish a multi-conclusion evaluation mechanism linked with the evaluation results. The real conclusion evaluations can be divided into 3 grades, that is, traditional evaluation grade, record evaluation grade, and performance record evaluation grade. The implementation procedures of the multi-conclusion evaluation are divided into self-evaluation, school evaluation, publicity evaluation, and the evaluation of the construction leading group.
3.3 Establish an incentive system for the ideological and political education
Based on the traditional promotion channel, the promotion system of professional technical position (like teaching assistant, lecturer, associate professor, and professor) can also be set among the college counselor group. Dual career development channel, on the one hand, is to solve the contradiction between the scarcity of the administrative post and the demand of staff promotion, on the other hand, is to timely recognize the staff growth and strengthen the incentive for employees. The establishment of the dual career development channel can help the counselors to exert their own potential, and also can stabilize the counselor group.
3.4 Establish a formal training system
Currently, the training system of the college counselor is quite informal. Establishing a formal training system is of significance to improve the professional level of the college counselors. On the one hand, it helps the counselors make sustainable career planning, and provides a variety of training system, like vocational training and personalized training in line with the needs of their own development; on the other hand, it provides a learning platform to encourage more counselors to participate in academic study.

4 Conclusions
This study has thoroughly analyzed the problems existed in the management of college counselors, and then the corresponding solutions and strategies are proposed as follows, the college counselors' salary level should be gradually improved, a multi-conclusion evaluation mechanism, a new incentive system, and formal training system should be gradually established. These four institutional mechanisms

are of benefit to provide promotion channels for college counselors; meantime, they are of benefit for the counselors to realize the stabilization and professionalization.

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A Study on Optimal Allocation of Information Resource of University Library under Web Environment

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Abstract: With the development of the new media, the form of information carrier presents the trend of diversification and cause the change the information needs and reading behaviors of the readers. As the center of information and culture in university, the university library needs to optimize information resources by corresponding measures to meet readers' diversified information needs. This paper analyzes the feature of information needs and the change of reading behaviors in university under new media environment, and the influence on the university library of the new media. At the same time, this paper proposes the ways on optimal resource allocation in the university library.

Key words: New media; University library; Information resource; Optimal allocation

1 Introduction

The new media is system of media forms which depends on the new technical, such as digital magazines, digital newspapers, digital radio, digital television, digital cinema, SMS, mobile TV, network, desktop Windows, touch media. With respect to newspapers, magazines, radio, television of the four traditional media, the new media is aptly called the "fifth media. Under the new media environment, all kinds of information are appeared, the growth of knowledge and update are rapidly, information carrier emerges diversified trend, which gave birth to the changing information needs of readers and reading behavior, which no longer subjects to time, space and the environment limitation. Zhang dandan (2015) put forward that based on all-around understanding of information resources of university libraries，its integration system was studied mainly in its components and level structures. Ye peizhen (2015) explored that As a new social information platform，the modes of library information service are effective expanded by the application of WeChat and analyzes its development situations，points out the problems，and puts forward some proposals to solve the problems. As the information and cultural center in colleges and universities, the University Library to readers and an important platform for the dissemination of knowledge carriers, which should follow the development trend of the E times, taking appropriate measures to adjust its information resources building strategy, optimize the allocation of information resources to meet the diverse readers of reading needs. (As showed in Figure 1).

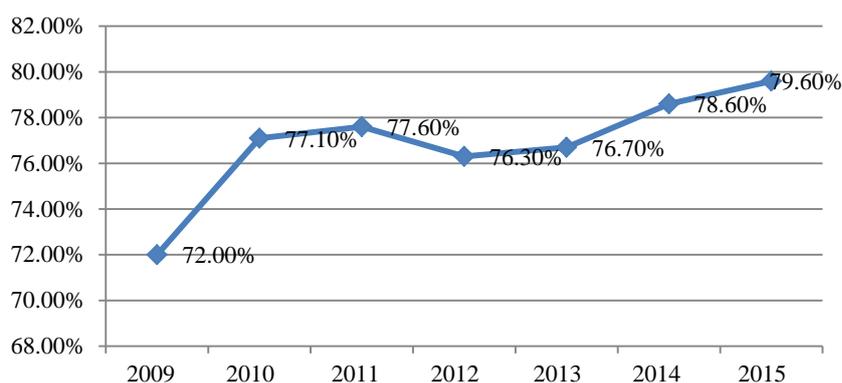**Figure 1　Comprehensive Reading Rate Changes in 7 Years**

2 The Information Demand's Characteristics and Reading Behavior Changes of University Readers under the New Media Environment

2.1 The information demand's characteristics of university reader

2.1.1The diversity of information demand

As follow is the diversity of information demand among university readers under the new media environment:

1) The information sort is diversity. Compared to the times of traditional reading, the demand of information to the readers increases greatly and the demand for the sort of information increases as well, from the news, politics, literature, poetry and music to academic papers and works of science and technology, etc.

2) The information type is diversity. The diversity of readers' information demand is also reflected in various types of information demand. Not only limited to single paper books, newspapers, but also including various types of digital resources, such as electronic books, electronic journals, dissertations, conference papers, reports of science and technology, standard, picture, multimedia resources, etc.

3) The information content is diversity. University library services for different readers, such as scientific research personnel, teachers, graduate students, undergraduates, administrative and management personnel, etc. Different types and different levels of readers have different demands of information content and research fields.

2.1.2 The timeliness of information demand

Timeliness is the urgency of the readers for access to information. In the era of information explosion of new media, as the pace of life is increasing, readers put forward higher requirements in having access to information timeliness and timely. They need to have a very efficient way to obtain information and in the way to get a large number of information resources and expanded knowledge. Timeliness of information demand is a respond to a timely access to information for the readers, is a development of The Times resulting from the changes.

2.1.3 The value of Information demand.

Under the new media environment, readers not only need to get large amount of information timely but also need to get useful information for them.

In the traditional reading area, due to the limitation of access to information, inconvenience of looking for information, readers feel so difficult to obtain and clear up their information efficiently, so that much information resources are unknown. Therefore, there are many relative resources wasted. However, in contemporary society, because of the convenience of access to information, readers have a higher request in the value of information. They hope to get information via a variety of convenient and quick ways and then extracting, filtering, integration of useful information from it. That is the value of information demand.

2.2 The reading behavior changes of university readers

1) The changes of the ways of reading. Under the new media environment, as the appearance of the network resources and the rich diversity of reading form, the reading forms of university readers begin to borrow from paper literature reading to digital literature. Readers become increasingly use computers, mobile phones, ipad, and other electronic reader devices to read. As a consequence, the behavior of readers is no longer restricted by time, space and environment.

2) The approach changes of reading. Under the new media environment, library is no longer the only way for readers to get access to information resources. In addition to borrowing from the library, readers can also search what they want from Google, Baidu and so on.

3) The changes of reading forms. Under the new media environment, university readers are no longer limited to one-way reading form. They also need to have the interaction and communication of two-way reading. They also want to participate in the library construction through the reader driver and a variety of ways to participate in the library information resource construction.

3 The Influence of New Media on University Library

Because of the emergence of new media, the change of readers' information demand and reading behavior, university library inevitably affected by a strong impact and are faced with new challenges. The traditional printing document, a single form of electronic journals, electronic books and others cannot adapt to the development of Times and cannot fully satisfy the readers' demand of the diversity of the information data, timeliness, value. These changes have a great influence on the university library, including in the following two aspects:

3.1 The influence on the library collection structure

New media require library to change to give priority to the traditional printing document resources construction idea, change the traditional library collection structure and finally develop into the physical resources and virtual resources and the combination of multiple types and contents enrichment. This is the inevitable developing trend of university library information resource construction

3.2 The influence on the service form

As the diversity of channels of access to information, readers gradually reduce the dependence on entity library. The number of readers who borrow paper document from library is reduced year by year. In fact, they look for information more depend on the network, electronic reader and mobile phone. Especially for the Web2.0 application in the library, the space of library (both in physical space and virtual space) become more interactive and cooperative. Readers are no longer satisfied with merely resources information. They expect to participate in the construction of the library and use the library in new ways, such as Micro letter, or code scanning, virtual consultation, new concepts and new technologies such as mobile library. Therefore, with the help of the advanced service concept and technology change in the direction of diversification and interactive, Library service model should be developed at the same time.

4 The Optimal Allocation of Information Resources in University Library

The new media brings a big impact to university libraries by altering readers' demands for information and reading behaviors. University library should take active measures to cope with, optimizing the collection structure, improve service levels, meet the challenges brought about a series of new media. The first is the optimal allocation of information resources. Library should actively change the traditional reading of the era of information resources construction of the guiding ideology and the service concept, adopt corresponding measures to optimize the library information resources configuration, optimizing the collection structure, provides the high-quality service for the library to carry out the diversity of information literature safeguard.

4.1 To adjust to construction concept of information resources and establish the new media thinking

With the tide of new media, university library should change its concept of information resource construction, ideas, establish new media thinking, use of limited resources construction funds, reasonable distribution of funds proportion of each type of resource, to establish a steady development of printed resources, vigorously develops the digital resources of the guiding ideology, based on the current, future, formulate scientific and reasonable library information resources construction and development policy and information resources procurement principles. To properly handle the macro and micro, our purchasing and procurement, cooperation collection value and reader demand, functions and service functions of collection, real collection and virtual collection, purchase documents and purchasing service, printed literature and electronic literature and so on various aspects, the relationship between the literature resources system under the guideline of clear in the direction of the optimization, the reasonable development. To realize library collection structure optimization, to adapt to the changing needs of readers, so as to improve the library meet rate to attract readers and information resources.

4.2 To enhance professional abilities of librarian interviewers

Library acquisition librarian is the core of the library collection construction force; its professional quality directly affects the quality of the library information resource construction. Under the condition of the limited budget, new requirements for librarian interviewers include the numerous publication products, complicated procurement methods, various ways of purchasing, and the diverse and growing number of readers and so on. The library must improve the comprehensive quality of librarians, in order to adapt to the change of various factors and still guarantee the quality of library collection resources to meet readers' needs.

1) Librarian interviewers should pay close attention to the frontiers in the field of library development at any time, to strengthen and domestic first-class university library and university library abroad exchanges and learning, learning at home and abroad advanced first-class university library development concept, the concept of management, especially in the advanced experience of the construction of literature resources, looking for the library with the domestic first-class university library, campus library of gap, with the scientific and advanced development concept to guide the library literature resources construction.

2) Librarian interviewers of university library should fully understand the school subject distribution, professional settings, the distribution of the readers, and strengthen the contact with school teachers and students of the colleges, gain insight into the different levels and different professional readers in the reading trends of the new media environment and literature demand situation. Thus when making purchasing, they can conduct a 'know fairly well and on-demand' way of ordering. This will make the literature acquisition work more targeted, systemic and scientific.

4.3 To rational allocate and steadily develop the printed resources and digital resources

In the university library should form proportion coordination between all kinds of resources, complement each other, complement each other in the organic system, form a comprehensive, coordinated and sustainable development of resource system, type, subject to a comprehensive literature carrier type of mutual coordination, the rational use of the literature purchases funds.

1) Type printing resources and digital resources coordinated development is the new media era of the inevitable choice of realizing optimal allocation of information resource in university library. Readers of university library faces have undergraduate and graduate students; teachers and management personnel, with undergraduate, person that use is the main library printed resources library must make sure the main group of basic reading requirements. In addition, in order to achieve the undergraduate course teaching evaluation, such as various types of professional certification of printed literature especially the requirement of Chinese books, the library can't blindly due to the impact of the new media development of digital information, ignore the printed resources construction. Therefore, under the new media environment, university library should handle the printing resources and digital resources coordination, in maintaining the steady development of printed resources at the same time, focus on digital resources construction, and gradually increase the proportion of digital resources in the library information resources construction, to ensure that part of the traditional reading literature needs, and to meet the demand of most digital reading of the literature.

2) While focusing on digital resources construction, library should make rational allocation for the proportion of different types of resources. For example, in order to achieve the undergraduate course teaching evaluation, all kinds of professional certification, and junior student some readers demand for Chinese books, library should ensure Chinese books a year purchases as required; For declining prices are very high and utilization of foreign periodicals and the foreign language books, can be cut gradually and to develop in the direction of digital resources, because this part of the resources of the readers are mainly senior students and teachers, most of them refer to own the resources, through the network to buy foreign paper periodicals and books more funds into the construction of electronic journals, electronic books, can improve the utilization of this portion of the resources, to avoid resource waste of relative purchase costs.

4.4 To make library collection structure diversified by making collection resources type richer

In order to meet the different levels in colleges and universities, the diversity of different status of readers' information needs, library information resource configuration is not only confined to books, periodicals, newspapers and dissertations, conference papers and other common type of literature, and should be continuously introduce more types of information resources. Especially for digital resources, with a variety of rich variety of digital resources, readers need to use a variety of media equipment more convenient to refer to all types of literature information, such as audio, video, pictures, information, science and technology, all kinds of statistical analysis data report, etc. Library should broaden the resources interview, conform to the development requirements of The Times, on the premise of guarantee the quality of interview, order a variety of types of information resources, and the reasonable allocation of various resources to buy proportion, meet all kinds of readers' information needs.

4.5 To make full use of the free resources as collection resources effectively

In using the literature purchase funds to purchase all kinds of literature resources at the same time, the library should also attach importance to free resources development and utilization, the formation and pay attention to the purchase of literature resources mutually, coexistence of complementary mechanisms. For limited budget of the library, this is a good resource complementary way. Free resources can be divided into network free resources and resources through various channels to donate.

1) Network free resources. With use value of the network free resources, university libraries can be filtered by professional disciplines, organizations, reveal and integration, introduce to the readers in the most convenient and effective way, not only to enrich the library collection resources, and also helps to improve the library service level, so as to promote the development of school teaching and scientific research.

2) Donations free resources. For years, donor resources have become an important supplement of library collection resources, donation work no matter whether the library funds shortage, donation work should not be ignored. Any library collection resources are hard to avoid there is some limited and incomplete, through donation work, the library can get a lot of valuable literature resources. Library should at the same time of strengthening the construction of normal resources, resource endowment propaganda work, through all kinds of ways to attract the school teachers and students, alumni, social people from all walks of life and group donated all kinds of useful documents for the library.

4.6 To increase the reader engagement of library information resources construction through

extensive readers interaction,

Information resources construction of university library should be to meet with the demand of the readers for the purpose, in the interview at the same time, librarians to procurement resources library should give full play to the role of the masses of teachers and students, through a variety of reader interaction, listen to their opinions and Suggestions about the construction of library information resources, make the broad masses of teachers and students actively participate in the library in the construction of literature resources. Various departments of teachers such as representative for the library resources acquisition consultant, please them to participate in the library books now mining activity and recommend all subjects are useful to the library literature resources, to carry out the questionnaire, open resources recommendation system, a reader forums, interviewed librarians to each department, fully understand the various departments subject literature demand situation of professional Settings, teachers and students and so on.

4.7 To promote the co-construction and sharing by strengthening the interlibrary cooperation,

With the rapid expansion of various literature resources, the rapid development of user requirements, any information service, including the library can't rely on their ability to meet all kinds of user information demand. Therefore, the university library should strengthen the institutions and library and information service institutions of cooperation, make full use of all kinds of co-construction and sharing mode maximum meet the demand of readers of all kinds of literature. Such as through joint procurement of digital resources, funds allocation, collaboration and other forms to save money, the purpose of the expansion of resources; Cooperation between library interlibrary loan and document delivery way to satisfy the readers for the demand of information resources in our school can't get.

4.8 To strengthen the construction of characteristic resources by highlighting the characteristic collection resources

With the rapid development of university library, the popular library service is more and more cannot satisfy the need of research and learning, college teachers and students characteristic collection resources is becoming the focus of the construction of university library. The construction of characteristic collection would have become a worldwide trend; almost all of the world famous universities have its own unique collections. The characteristic library collection is the basis of the service in library, to play a positive role in promoting subject construction of the school. University library should be based on the key discipline of the school, the backbone of the professional and high quality courses, etc., through purchase, exchange, donation, collection the characteristic resource digitalization, and collect the school related colleges and scientific research groups in the form of scientific research, excellent courseware and key collection, key construction, highlight the characteristics of library collection, and ensure the characteristic discipline the system artiness and integrity of information, promote school's subject construction, meet the needs of university readers of literature.

4.9 Torational allocation of information resources according to the reader's utilization

Libraries spend a lot of money for information resources construction, its produce benefits mainly reflects in the utilization of resources. The reader using situation of library should be based on all kinds of resources to develop information resources configuration principle. Starting from the analysis of readers' utilization, in a planned way, targeted for information resources construction, avoid the blindness of information resource configuration and informality. For the high utilization of resources can be appropriately increased purchasing proportion, the low utilization rate of resources can consider to buy or not buy less, and by way of interlibrary loan and document delivery meet the low utilization rate of this part of the resource demand of the readers. Make the limited funds to maximize efficiency.

5 Conclusions

The rapid development of new technology, new business and its implementation in university libraries is leading the reading trend of University and College readers. University libraries should always follow the era development trend, sets up the dynamic development of the construction concept. It should be based on the current, and to take into account in the future, adjust the construction goal and the key of library according to the readers' timely changing demand. Libraries should also take corresponding measures, reasonable allocation proportion of all kinds of information resources construction, optimize the collection structure, and construction of scientific and reasonable system of library, for the school education teaching and personnel training, scientific research, discipline construction, social services, and provide strong literature information guarantee cultural inheritance.

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The Operating Features and Management Innovation of University Official WeChat

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Abstract: University official WeChat has become an important tool for disseminating information and creating positive image. The research methods of this study is computer aided content analysis. This study takes five Chinese universities official WeChat as the objects of study and investigate in their functions settings, article issued and content categories to find the operating features of universities official WeChat. Based on the operating features, the management innovations include functional positioning, satisfying the motivations of users groups, finding out users' preferences and paying attention to contents creation.

Key words: Chinese universities official WeChat; Operating features; Management innovations

1 Introduction

With the development of the Internet, new media has become an important tool for Universities propaganda. According to data released by the Ministry of Education (2016), until January 2016, among the thirty-two provincial education departments, twenty-three provincial education departments opened official Webo and twenty-two provincial education departments opened official WeChat. Among seventy-five universities which directly under the ministry of education of the People's Republic of China, seventy-three opened official Weibo and all of them opened official WeChat. The date shows that WeChat of universities and colleges gradually arouse great attentions of administrators and become more influential.

Huang Chaofeng and Shi Zhouyan (2016) expound the development history of WeChat in China and the research status of Universities WeChat. On January 21th, 2011, Tencent Company has launched a mobile social APP called WeChat. Until now, the latest version is WeChat 6.3. Currently, a university or a college has different types of WeChat, including functional department，academy，student organization or even a class. This article takes WeChat of universities as research objects. Based on the authority of official WeChat of universities and colleges, official weibo of universities are operated by official agencies of universities, representing voices of universities.

Nowadays, there are two research teams focusing on measuring and evaluating WeChat of universities and colleges (Zhang Qiu and Yang Ling, 2014). The first one is data lab of 《Southern Weekly》, which ranks WeChat of universities and colleges and makes ranking list about them, on the basis of three indictors: communication power、growth power and activity. communication power can be connected with page views and likes of pictures and articles in WeChat accounts; growth power means link relative growth amount compared to the last statistic cycle of the same WeChat account' communications power; activity represents the frequency of items of WeChat official accounts notifications-pushing per week. Another team is *China Youth Daily*. In order to evaluate the influence of WeChat of universities and colleges, *China Youth Daily* makes the ranking list of WeChat of universities and colleges every Monday since January 2014, based on project 211a provincial universities and vocational colleges respectively.

In other countries, when it comes to the relationship between social networking and college students, researchers pay more attention on Facebook instead of WeChat, because the influence off Facebook is greater than WeChat. Severin and Taknard (2007) affirm that the uses and gratifications theory is a psychological communication perspective that focuses on how different people use the same media messages for different purposes in order to satisfy their psychological and social needs and to achieve their goals. Some researchers use gratifications theory to discuss Facebook addition among college students. For example, Koc and Gulyagic (2013) discuss the usage characteristics and provide some opinions about the functions of social networking services. Field (2009) states how to use SPSS to process data and Bharathi (2014) studies the reasons why college students use Facebook.

2 Statement of the Problem

This study determined the operating features of universities official WeChat. Specifically, this study

observes the following questions:

1) External manifestations. It includes the manes, the portraits and the functions introduction of universities official WeChat.

2) Function Settings.

3) The contents of universities official WeChat. It refers to the quantity, published time and content categories.

2.1 Hypothesis

1) There are some similarities about the function settings of universities official WeChat.

2) Published time of universities official WeChat are regular.

3) The quantity of different content categories is inconsistent.

2.2 Method

This study utilized content analysis. It is a research method to depict the contents objectively, systematically and quantitatively. Content analysis originated in the field of communication in the early 20th century. Hermeneutic content analysis, Empirical content analysis, Computer aided content analysis are all belongs to contents analysis. Considering that this study use SPSS as a tool to assist in analyzing the data, it is Computer aided content analysis.

2.3 Sampling

The WeChat ranking of Chinese universities is published by Southern Weekend Data Lab. It is counted once a week including the quantity of articles, the amount of reading, the quantity of giving a thumb up and the WCI index. Extracting ten ranking lists among the published lists from 2016 January to May and then counting the highest ranking number. The ten ranking lists were randomly-chosen. This study took the top5 as the sampling, they were Wuhan University; Zhejiang University, Xiamen University, Huazhong University of Science and Technology), Shanghai Jiaotong University.

3 Results and Discussion

3.1 The manes, portraits and functions of universities official WeChat

Table 1   Basic Information and Functions of Five Universities Official WeChat

Name	Portrait	Wechat ID	Information Services	Interaction Area	Campus Scenery	Micro Home
Wuhan University	cartoon character	luojia1893	√		√	√
Zhejiang University	school badge	zdnew99	√		√	√
Xiamen University	school badge	xmu-1921	√	√	√	
Huazhong University of Science and Technology	cartoon character	Ihuster	√		√	
Shanghai Jiaotong University	school badge	love-SJTU	√	√	√	√

The names of these five universities official WeChat are the manes of the universities. It makes the users easy to find out the WeChat. Wuhan University official WeChat and Huazhong University of Science and Technology official WeChat use cartoon characters as the portraits and the other three universities use school badges as portraits. After communicating with editorial staff, they said that using cartoon characters could increase affinity and it was also very special and using school badges were solemn.

The fiction areas are usually in bottom of the WeChat interface and the fictions of universities official WeChat can change. University official WeChat generally has three functions, they are inquiry, service and interaction (Huang Chaofeng and Shi Zhouyan 2016). The five universities official WeChat pay attention to inquiry and service. Information services aim at teachers and students. Students and teachers can check out their curriculum, book loaning information, seminar reports. On the other hand, universities official WeChat lay emphasis on campus scenery and the editorial staff said they went to show a good school image by showing great campus scenery to users. Only two universities official WeChat provide interaction area in bottom of the WeChat interface, however, users can send messages directly in the chatting interface. Micro Home refers to the systems of Universities official WeChat. In general, if users want to have further information, they need to click Information Services and the WeChat interface will show more functions, users click the information they want and they can get it.

All these operations are in the same WeChat interface. But things are different for Micro Home. Micro Home usually links to university's homepage and it can give more information than the other systems.

3.2 The content of universities official WeChat

　　1) the information quantity of universities official WeChat

　　From June 12th to June 19th, the quantity of WeChat article from Wuhan University official WeChat, Zhejiang University official WeChat, Xiamen University official WeChat, Huazhong University of Science and Technology official WeChat and Shanghai Jiaotong University official WeChat is seventy-three. Among these, the largest number is twenty-two WeChat articles which belongs to Huazhong University of Science and Technology official WeChat and the least number is seven WeChat articles which belongs to Xiamen University official WeChat.

　　In addition to Xiamen University official WeChat, the other four universities official WeChat publish one or more WeChat articles every day. Under normal circumstances, WeChat articles have photos and text, some universities official WeChat make innovation and publish voice instead of articles such as Huazhong University of Science and Technology official WeChat, it sometimes publishes Goodnight Voice in chatting interface.

　　2) Information published time

　　Using SPSS to analyze the published time of these seventy-three WeChat information. Morning refers to 8:00-12:00; noon refers to12-14:00; afternoon refers to 14-18:00; evening refers to 18-22:00; night refers to 22:00-24:00. WHU is abbreviation for Wuhan University; ZJU is abbreviation for Zhejiang University; XMU is abbreviation for Xiamen University; HUST is abbreviation for Huazhong University of Science and Technology; SJTU is abbreviation for Shanghai Jiaotong University;
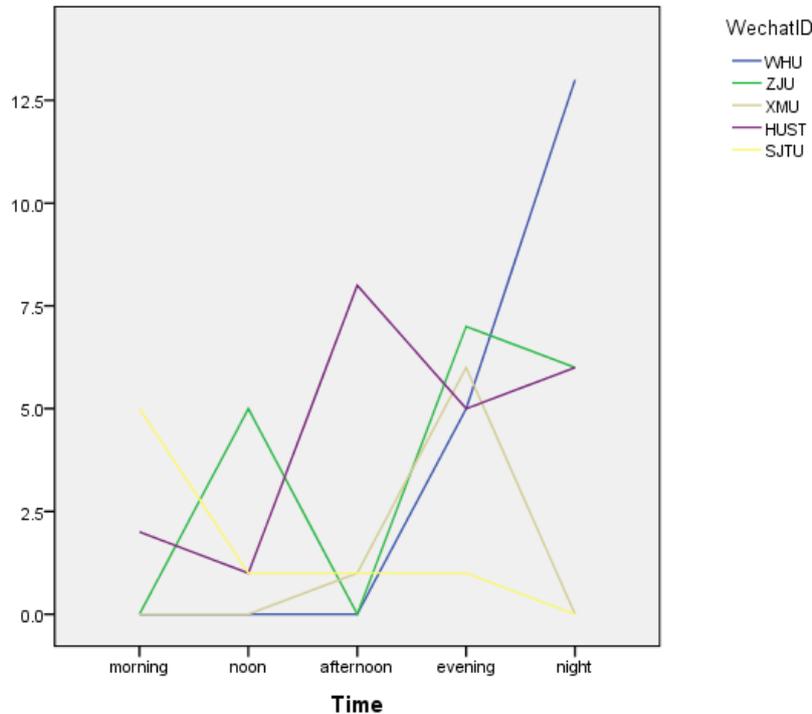
Figure 1　Universities Official WeChat Information Published Time

　　Figure 1 shows that the published time of these five universities official WeChat are irregular. In general, the published time concentrated in evening and night. After communicating with back-office staff, there are large amount people in WeChat operation are students, they are busy at their studies, they only have time in the noon or in the evening to edit and publish WeChat information. The publish time and publish frequency of these five universities official WeChat are different. For example, Huazhong University of Science and Technology official WeChat publishes information at different time of a day and the publish frequency also irregular. However, Wuhan University official WeChat publishes information once a day but they publish two or more articles at every turn.

　　3) The content of universities official WeChat information

　　The content of universities official WeChat information can divide to four categories, they are

announcements, typical deeds, activity promote and belles-letters. Announcements include notification, recruitment, policies, new rules. Typical deeds refer to advanced characters and advanced collectives. Activity promote attends to promote activities, seminars, study sessions and other activities inside school or outside school. Belles-letters describe campus scenery and campus history to express love to their university.

In these seventy-three samples the proportion of four contents categories are similar. However, after analyzing different universities official WeChat, figure 2 indicates that the preferences of the content categories of universities official WeChat information are different.
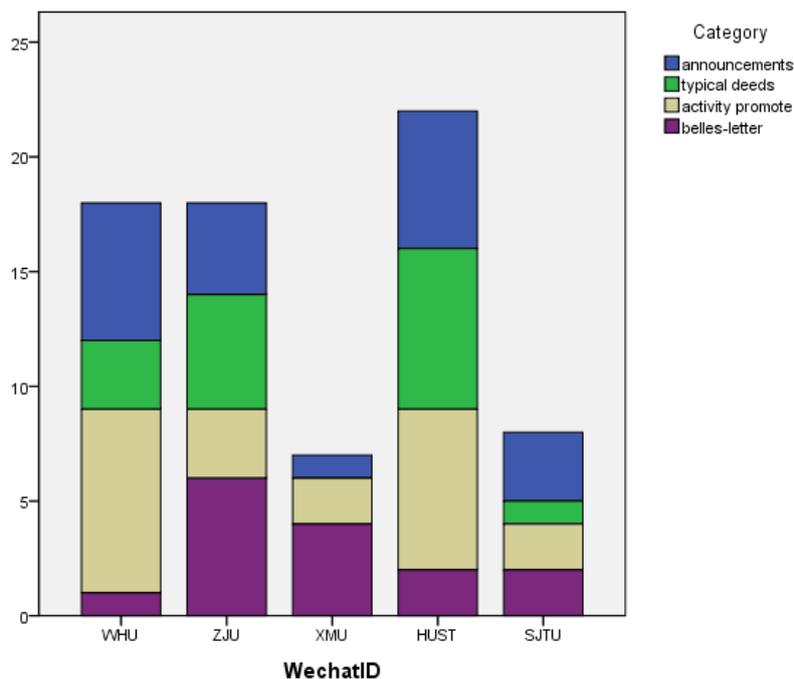
Figure 2　The Proportion of Four Contents Categories of Five Universities Official WeChat

4 Conclusions

The results of this study show that universities official WeChat need to be improved and the operation teams should make management innovation for universities official WeChat.

1) User groups and functional orientation

Universities official WeChat intend to ingratiate Internet Age. With the continuous expansion of WeChat users, students and teachers can deal with their things though universities official WeChat and the university can create a positive image as well as expand influence.

In general, the operation team of universities official WeChat is under the leadership of the University Communist Youth League. The operation team constitutes of students and teachers. Teachers are responsible for operations and students give assistance to teachers. The whole people in the operation team of universities official WeChat are not professional, as a result, it is not easy for them to operate universities official WeChat very well. The operation team should know their users' groups clearly. For universities official WeChat, the users are not only students and teachers but also students' parents, the leaders of education institution even students from other universities. The users use universities official WeChat for a specific purpose and the operation team must know their purposes and satisfied them. For teachers and students, they want to have more service from universities official WeChat such as timetable information, seminar announcement. These services make things convenient for them. For students' parents, their motivation maybe the school policies or the overall strength of the school. The operation team of universities official WeChat need to pay attention to these motivations and do more survey to find out these motivations. Then, they can adjust and improve the features of universities official WeChat to satisfy the demands of potential users.

2) User preferences and content creation

For any WeChat, content is vitality and it has a direct impact on the spread and influence. First, the

operation team should understand users' reading preferences. The most users of universities official WeChat are teachers and students, they like fragmentation reading and they don't like long articles which may wear out their patience. So it is better for the operation team to publish articles which are short and add some pictures to make them interesting. Secondly, interaction and user-centered are also very important. Finally, the staff in operation teams of universities official WeChat need to be aware of the importance of content planning to make the content attractive.

Acknowledgement

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Study on MY Flexitank: Your Bulk Liquids Specialist ?

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Abstract: This paper focuses on sustainability and utilization of Flexitank in the bulk liquids industry. There are variety ways on transporting liquids in bulk quantities. For example, there are ocean tanker, ISO tanker as well as IBC and drums have been used to transport liquids in bulk. How can Flexitank beat all these tanker in forms of usage, cost saving, time consuming and flexibility? The mindset of transporter, shipper and logistic provider mostly will bias towards ocean, ISO, IBC and drums instead of Flexitank though Flexitank falls as second lowest cost in the world as bulk carrier. Can Flexitank industry sustain in the logistic and transport industries? Through studies, following results were obtained as follows. (1) Flexitank, (2) MY Flexitank and (3) bulk liquids transport.
Key words: Flexitank; Bulk liquids; Bulk liquids transport

1 Introduction

What is Flexitank? A Flexitank is a large plastic bag, fitted with a loading and discharge valve. Prior to loading, the flexi-tank bag is laid out into a box container. Unlike the tank container, which is re-used repeatedly, the Flexitank is designed for one trip. The empty contaminated bag must be disposed in an approved waste facility. Certain materials can be incinerated and others might be suitable for shredding in preparation for recycling. Currently, containers are tested and approved by issue of a safety certificate (CSC); however, Flexitank are tested independently of the container. At present, there are no regulations forcing manufactures to test the integrated package of bag and box, although trade associations have developed their own test programs. The flexi tank can accept a variety of nonhazardous liquids such as latex, wine, lubricants, additives, edible oils and many more, depending on the material with which the tanks are made [2].

The market for Flexitanks is driven by their merits of being environmentally friendly, taking the least amount of time and effort in filling and discharging and are compatible with the most number of fluids that are transported. Moreover, Flexitanks overcome many of the problems associated with ISO tank containers, IBCs or drums. Furthermore, since these tanks are used once, they vastly reduce the risk of cross-contamination. On the other hand, the major constraint faced with Flexitanks during transportation is when fully laden. The weight of the 24,000 litre bag causes the side wall of the box container to distort outwards beyond the ISO container. The side wall is designed to withstand a certain pay-load for static cargo. The flexi tank load is liquid and the laden bag effectively forms the shape of the box [2].

Cargo surge during movement and transport of the box results in potentially excessive side and end wall loads and potential instability during trucking and lifting. Also, Flexitanks are not suitable for certain fluids that are hazardous or fall under the Dangerous Goods category of the IMDG (International Maritime Dangerous Goods) Code. Environmental issues also arise during the disposal of these Flexitanks in case of single-use ones. Recently there are many manufacturers who have come up with quality plastics for use as Flexitank material which can be a driving factor for this market [2].

Flexitanks have its own Code of Practice to ensure on safety of using Flexitanks. Manufacturers and operators of Flexitanks for use in shipping containers shall meet the following requirements [1]:

Table 1   Requirements of Flexitanks for Use in Shipping Containers

No	Requirements
1	The criteria used for selecting containers to transport Flexitanks should be as detailed in Part 1 of this Code.
2	The Flexitank system shall be tested against and comply with the Flexitank Test Criteria specified in Part 2 of this Code.
3	Flexitanks shall be designed and selected in such a way as to avoid permanent negative influence on the cargo and the container. Flexitank shall be fully compatible with the cargo intended to be carried.
4	The Flexitank shall be marked with the following information (which must be visible when the righthand door of the container is opened): 5a. Unique Flexitank number. B. Manufacturer's name and / or recognised logo.

5	An A4 size Caution Label shall be applied to the container's left-hand door.
6	Insurance terms for Flexitank shipments shall be checked by the legal departments of shipping lines; but in any case there should be insurance cover for not less than US$5 million per single incident for all parties involved in the chain.
7	Both the Flexitank shipper and operator shall have emergency plans in place. Emergency contact details of the Flexitank operator shall be clearly marked.
8	Flexitank manufacturers and / or operators shall prepare manuals for Flexitank fitting, loading and discharge.
9	Flexitank operators should comply with, as a minimum, the instructions given in the Flexitank manufacturer's manual.
10	The filling volume shall be controlled by at least one of two methods. Either: a. calibrated measuring equipment; or b. the weight of the cargo.
11	The Flexitank manufacturer and operator shall be certified to ISO 9001 (or similar Quality Assurance programme).
12	The following details are required when a Flexitank shipment booking is made: a. Cargo shall be booked as "non-hazardous bulk liquid in Flexitank". b. The Material Safety Data Sheet (MSDS) conforming to the information required in annex B. shall be provided. c. COA impact test reference number.
13	Flexitank companies shall be an Associate Member of the Container Owners Association.

The requirements stipulated in the Code of Practice basically shows that Flexitanks provider needs to perform a very high operating procedure. This is to prevent contaminating, leaking, stability so on and so forth. It is believed that, if any of Flexitanks provider failed to follow the standard it will results to the worse circumstances i.e leak on board and etc. Thus, Flexitanks provider are forced to follow all the rules, otherwise a strict action will be taken towards them.

2 Defining Excellence

Flexitank has been proven as cost saving solutions on transporting bulk liquids [3].

2.1　Save Money on Bulk Liquid Packaging

Flexitanks are an economical bulk packaging option for domestic and international shipments. Flexitanks deliver raw goods to filling destinations where unit packaging and distribution can be handled much more economically. Some companies take advantage of economic free trade zones to repackage liquids upon arrival and reduce customs charges [3].

2.2　Save Money Loading and Unloading

Loading and unloading times are reduced by up to 90%. That's because human operators unload drums. By contrast, pumps transload bulk liquids from tank cars and storage containers to and from Flexitanks. You load and unload liquids in half the time. Multiply that by the number of shipping containers you transport each year, and the cost savings really add up [3].

By using Flexitank container companies can save significantly by reducing their transportation. Compare with tank container companies would pay only one way freight of the 20 FT container. You would not need to return container and pay for this as in tank containers [6].

2.3　Transport More Liquid per Container

With Flexitanks, you can fit up to 31% more liquid inside a standard 20' container then with ISO totes or drums. Drums create dead space. You're paying for freight costs, so why not fit more liquid inside? You also reduce the number of containers on which you pay tariffs or duties [3].

2.4　Save Money on Cleaning

Flexitanks are single-use bulk packaging. There's no need for expensive cleaning and repositioning. Furthermore, the chemicals used to clean metal and plastic drums result in an annual 295 million gallons of wastewater according to the **Environmental Protection Agency [4]**. By transporting via Flexitank, you're also reducing an environmental burden. This can be an especially important consideration for companies who are "going green" [3].
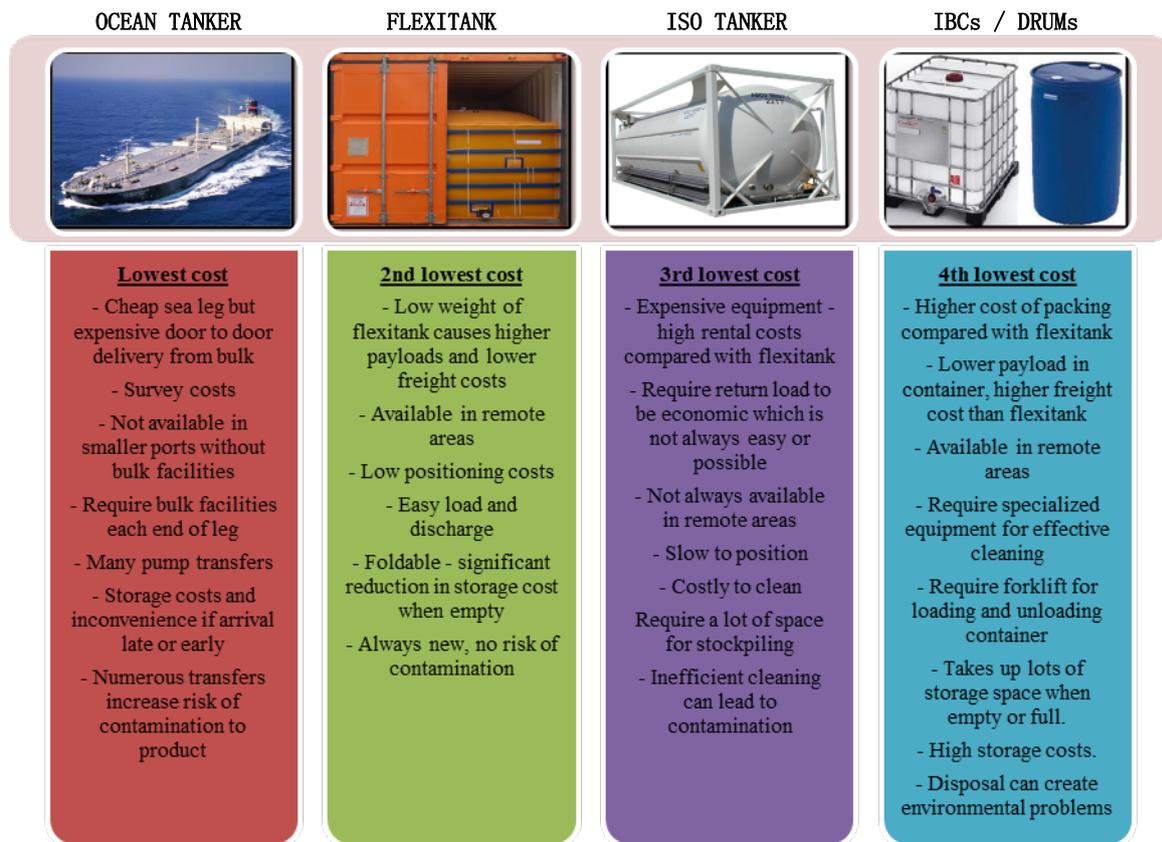
OCEAN TANKER	FLEXITANK	ISO TANKER	IBCs / DRUMs

Lowest cost	**2nd lowest cost**	**3rd lowest cost**	**4th lowest cost**
- Cheap sea leg but expensive door to door delivery from bulk	- Low weight of flexitank causes higher payloads and lower freight costs	- Expensive equipment - high rental costs compared with flexitank	- Higher cost of packing compared with flexitank
- Survey costs	- Available in remote areas	- Require return load to be economic which is not always easy or possible	- Lower payload in container, higher freight cost than flexitank
- Not available in smaller ports without bulk facilities	- Low positioning costs	- Not always available in remote areas	- Available in remote areas
- Require bulk facilities each end of leg	- Easy load and discharge	- Slow to position	- Require specialized equipment for effective cleaning
- Many pump transfers	- Foldable - significant reduction in storage cost when empty	- Costly to clean	- Require forklift for loading and unloading container
- Storage costs and inconvenience if arrival late or early	- Always new, no risk of contamination	Require a lot of space for stockpiling	- Takes up lots of storage space when empty or full.
- Numerous transfers increase risk of contamination to product		- Inefficient cleaning can lead to contamination	- High storage costs.
			- Disposal can create environmental problems

Figure 1   Comparison of all tankers
Source: Adapted from MY Flexitank website

3 Challenges

The market for Flexitanks is driven by their merits of being environmentally friendly, taking the least amount of time and effort in filling and discharging and are compatible with the most number of fluids that are transported. Moreover, Flexitanks overcome many of the problems associated with ISO tank containers, IBCs or drums. Furthermore, since these tanks are used once, they vastly reduce the risk of cross-contamination. On the other hand, the major constraint faced with Flexitanks during transportation is when fully laden. The weight of the 24,000 liter bag causes the side wall of the box container to distort outwards beyond the ISO container. The side wall is designed to withstand a certain pay-load for static cargo. The flexi tank load is liquid and the laden bag effectively forms the shape of the box [5].

Cargo surge during movement and transport of the box results in potentially excessive side and end wall loads and potential instability during trucking and lifting. Also, Flexitanks are not suitable for certain fluids that are hazardous or fall under the Dangerous Goods category of the IMDG (International Maritime Dangerous Goods) Code. Environmental issues also arise during the disposal of these Flexitanks in case of single-use ones. Recently there are many manufacturers who have come up with quality plastics for use as Flexitank material which can be a driving factor for this market [5].

Based on the number of times a Flexitank is used, they can be categorized as multi-trip or single-trip. The first Flexitanks were designed on the basis that they would be for multi-trip use. This meant that cleaning and repositioning costs were incurred. However, these costs have been eliminated with the single-trip Flexitank, the type now most commonly in use. The single-trip type now accounts for more than 95% of the global market [4].

Geographically, the Flexitank market is mainly concentrated in India, China and Malaysia as these are emerging markets followed closely by the rest of the Asia Pacific region. Europe is also seeing a surge in the demand of Flexitanks mostly in the U.K. and Germany. Canada and the U.S. dominate the demand side in the North American region. Large orders for Flexitanks has also been seen recently from

the Rest of the World, especially South Africa, Brazil and Russia [5].

Some of the key players involved in the manufacturing of Flexitanks are: Braid Logistics (UK) Ltd., Trans Ocean Ltd., Print-Packaging.Com (P) Ltd., Infinity Bulk Solutions (IBS), MY Flexitank Industries Pte Ltd, SIA Flexitanks Ltd and many more.

There may also be some challenges using the Flexitanks, such as loading and unloading facilities may not have proper set up for loading and unloading the product. Some carriers and rail companies may not accept Flexitank due to risk factors. And disposable of the bag may be a challenge as every country may have different regulations and requirements about it [6].

As you can see by using Flexitank container companies can save significantly by reducing their transportation. Compare with tank container companies would pay only one way freight of the 20 FT container.　You would not need to return container and pay for this as in tank containers [6].

4 Why Flexitank (or MY Flexitank)?

Table 2　Comparison of all Flexitanks Provider

PROVIDER	YEAR INC	BENEFITS CLAIMED
Braid Logistics – Malaysia	23/12/2015	Global Availability Safety – Operates using strict guidelines from govt body Environmentally Friendly Integrated Supply Chain Traceability Quality Assurance – Raw Mat used R & D
BLT Flexitank – China	Dec 2003	Simple, reliable and economical Fast loading / discharging time High space utilization Environment friendly No risk of cargo contamination Lower transport rates Low storage cost for empty tanks Covered by a factory warranty and insured
GE Flexitank – Singapore	29/04/2015	High quality products and services Modern production equipment and technology High quality product R&D team Skillful staff 24 hours emergency response mechanism Systematic product tracing system
IBL Flexitank – Malaysia	2003	Specifically designed for one-time-use only Environment-friendly construction – recyclable Lower weight compared to a container load Easy to dispose Simple and fast installation
MY Flexitank – Malaysia	01/01/2006	More economical – next lower cost to Ocean Tanker. Food grade. One way system. Higher payloads than drums or IBCs. Readily available. Always new – no risk of contamination. Significant reduction in storage cost when empty. Quick loading / discharging compared to drums and IBCs. No need for forklift to load or unload container. Available in remote areas. Low positioning costs.
One Flexitank – Malaysia	21/02/2014	Resilience Safety Stringent tests Quality assurance Contamination free Competitive pricing Designed for performance

LAF – China	2006	PP Raw Mat Safe and Reliable User-friendly Eco-environmentally Cost-effective
SAFT – China	2009	Low costs---saving freight and cleaning cost High payload---can contain 24,000 liters liquid Time and labor saving---easier to operate Environment friendly---food-grade and degradable
SIA Flexitank - Ireland	2011	Multi size 100% tested Environmentally friendly Contamination free and sterilized Custom build
Hinrich Flexitank – Malaysia	Sept 2015	Reliable Competitive Value For Money Strong and highly durable Saves transporters the substantial costs associated with returning, cleaning, and demurrage
TS-Flexitank	2000	Very low positioning cost No cleaning cost,No disposal cost Cost effective Low labour for handling,filling and loading No need for forklift to load or unload container No need for intermediate bulk storage Available in remote areas Clean and environmentally friendly No risk of contamination No demurrage on Flexitank only on container.No return loads needed

4.1 Competitive Advantage

Flexitanks falls number two as bulk liquids transporter as it was designed to be more efficient solution to offset the drawback of other existing options. From a simple comparison that highlights the benefits of the Flexitank shows out of eleven (11) providers, ten (10) have agreed that using Flexitanks is a cost saving. This confirmed that Flexitank business is relevant in the market where most palm oil and chemical players prefer to choose Flexitank as their first option. The costs of Flexitanks become lower due to many factors, i.e on raw material, usage of container and also during disposal time where other tankers cannot tolerate this.

Compared to the other Flexitank providers, MY Flexitank seems to have more advantages as they produce and manufacture their own products. This situation allows MY Flexitank to have more R&D than Flexitank traders.

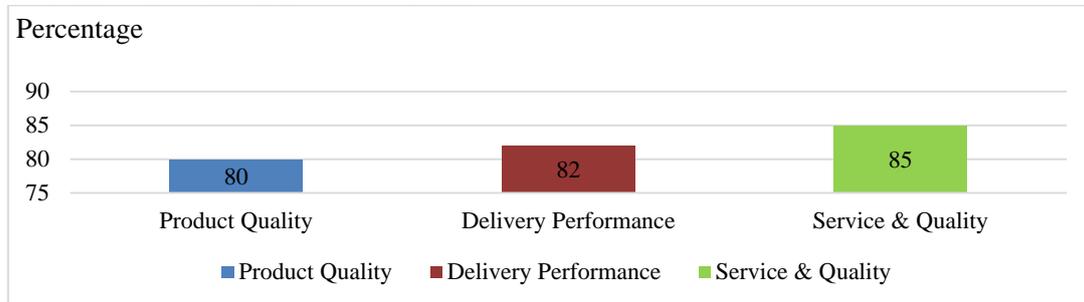## 5 A View from Users of MY Flexitank

Figure 2   Customer Satisfaction Rating for 2015

There was a survey performed in 2015 to measure satisfaction of MY Flexitank's customers. The score is between 80% and 85%, where it shows that, most of client satisfied towards quality, delivery

performance and service and quality of MY Flexitank. The customers that participated on the survey are as below:

Table 3 Customer Survey Report

No.	Customer	Product Quality	Delivery Performance	Service & Support	Total	%
1	ACCORD COMMODITIES	36	45	48	129	90%
2	ACIDCHEM	48	48	48	144	100%
3	AG-SEVEN	48	48	48	144	100%
4	ASACO	48	48	36	132	92%
5	CATT LOGISTICS CO	40	48	42	130	90%
6	CENTROTRADE COMMODITIES	36	36	36	108	75%
7	DE RIJKE	36	48	48	132	92%
8	DRIY PHI	48	48	48	144	100%
9	EDGEPONT	48	48	48	144	100%
10	INTER-SPED	48	48	48	144	100%
11	LOC NINH RUBBER CO	48	48	48	144	100%
12	MAL TECH RUBBER CO	48	45	48	141	98%
13	METALCO	36	36	36	108	75%
14	ORIENTAL RUBBER	36	36	36	108	75%
15	OMEGA	48	48	48	144	100%
16	POLYGREEN CHEMICALS	36	39	36	111	77%
17	SRI TRANG	36	36	48	120	83%
18	SURIACHEM	36	33	36	105	73%
19	TAYNINH RUBBER JS CO	48	48	48	144	100%
20	THE AH YAU	40	39	48	127	88%
21	TRANSMODE OVERSEAS	36	36	48	120	83%
22	UNIGREEN CHEMICALS	40	33	42	115	80%
23	WURFBAIN	36	36	36	108	75%
	OVERALL AVERAGE				**118**	**82%**
		of total 48	of total 48	of total 48	of total 144	

6 Conclusions

Based on the survey conducted, it is empirically proven that there is way for Flexitanks to grow in the logistic industry. Most of customers satisfied with the quality of Flexibags where it's at equivalent with the other tanker, i.e IBC, drums and etc. By using Flexitanks, shipper can save a lot especially on return cargo, low cost disposal method and also time consumed. Even being in the middle of competition and facing crucial price war among the Flexitanks provider, MY Flexitank still standing with their high quality product. It is understood that some clients might not really focus on low price and tolerate with the quality. Most customers chose to receive good services besides the performance and quality products. We shall focus on R&D to make the products better and to maintain good customer relation and service. By taking advice from customers, does not meant we are bowed to all the request but in positive manner, it is good for the improvement of company. Having said that, it is proven that MY Flexitank still standing with a very competitive price without compromise on the quality.

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An Emperical Research on the Factors Affecting Comsumer Intention of Using Online Video Platforms

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Abstract: As the internet booms, the online video platform has attracted a wide rannge of eyeballs. This thesis is intended to focus on online video platforms and enquire into the factors affecting their comsumers'intention. With ICourse online video platform as case, it applies SPSS and LISREL model to emperically study the factors affecting comsumers'intention to use Online video platform in three aspects - consumer perception factor, consumer requirement factor and content factor. Hopefully, the result will be helpful for live onlime platforms to improve consumer satisfaction and attract more attention on their way of future further development.
Key words: Empirical research; Online video platform; Consumer intention; Factors

1 Introduction

As the internet booms, people's life is enriched. Their demand for social contacts and entertainment is also increased, which results in developments of online video platforms. Online video platforms such as ICourse, HuYa and YY have been more and more popular among people and attracted numerous users overnight. As more and more online video platforms spring out, competition becomes more intensive. To attract attention, online video platforms are supposed to learn the factors on comsumers'intention, make correspondant changes to meet the tastes of customers.

At present, both Chinese and foreign researchers have obtained some achievements in studying consumer intention. Based on Technology Acceptance Model, Wei (2015) constructed a theoretical network financial behavior model to study influential factors and mechanism of consumer intention of online banking platform. They concluded that Technology Acceptance Model accounts for consumer intention in some way; risk perception and joyful perception have great effects on consumer intention. Based on TAM and in the light of features of WeChat, Tang (2015) built an influencing factors model of WeChat consumer satisfaction, taking in factors such as media richness, social presence and social influence, finding that effects of consumer perception and social influence on WeChat consumer satisfaction are remarkable. Wen (2014) comprehensively applied UTAUT theory, risk perception theory and media richness theory to construct a structural equation model on the basis of receipt factor, risk factor and content factor.

To sum up, researchers' attention is mainly focused on consumer intention and satisfaction of online financing products or social communication softwares while less has been paid to newly arising Online video platforms which are special and different, and which is why those former consumer intention models need to be improved and the study of this paper is of some theoretical significance. It is intended to enrich and extend *the Technology Acceptance Model* in the internet field to build consumer intention factor model, which will hopefully provide reference for research on online video platforms.

2 Theoretical Foundation
2.1 Technology acceptance model

Davis' Technology Acceptance Model (Davis, 1989) which absorbed nutrients from Theory of Rational Actions and Theory of planned behavior. TAM (Lee, 2009) has been widely applied in the study of information technology adoption behaviors, in which perceived usefulness and perceived easiness of use have effects on people's behaviors. Through influencing perceived usefulness and perceived easiness, External variables influence behavioral intention and then influence adoption behaviors. Online video platform is a newly arising socialized media and is an application of

information technology in the internet field to some extent, so the study will adopt the perceived usefulness and perceived easiness e as consumer perception factors.

2.2 Use and satisfaction theory

As a socialized media, online video platform is characteristic of medium and information dissemination. Meanwhile, it is different from Technology Acceptance Model in that Use and Satisfaction Theory (Severin, 2001) takes audiences as research focus and explains the psychological needs of consumer intention from angle of audiences, which shows that motivation of using some media is to satisfy themselves, that is, the behavior of medium user is goal oriented. Users may fully learn their needs and then choose the appropriate media to meet their needs. Katz (1999) analyzed plentiful articles about social and psychological functions of mass media, chose dozens of demands and then divides them into five categories as follows in Table 1.

Table 1　Category of Demands for Online Video Platform

Category	Description
cognitive needs	To access to knowledge, information, and understand
emotional needs	To experience emotional, aesthetic feelings and pleasant feelings
personal integration needs	To enhance their own confidence, credibility, status and stability
social integration needs	To enhance contacts with friends and family
pressure relieving needs	To escape or transfer attention

2.3 Media richness theory

Media richness theory was firstly put forward by Daft, Lengel and Trevino (1986), in which media richness refers to the ability of a medium to spread information as well as content quality. According to the theory, those media are rich when they can overcome different knowledge backgrounds and make clear those unclear questions so that both communication sides may deal with all kinds of complicated subjective information and reach a consensus. So, the obvious richness is characteristic of abilities of fast feedback, disserminating implications, conveying personal feelings and using natural languages.

3 Research Model and Hypotheses

Based on Use and Satisfaction Theory, Technology Acceptance Model and media richness theory, the study selects consumer perception factor, consumer requirement factor and content factor as key factors of analysis. Before analyzing, here we put forward relevant hypotheses as follows.

3.1 Consumer perception factor

On the basis of variables of Technology Acceptance Model, we are going to measure the consumer perception (CP) in two dimensions-perceived usefulness and perceived easiness of use. Perceived usefulness (PU) refers to the degree to which the user thinks the online video platform may improve their utility. Perceived easiness of use (PEU) refers to the degree to which the user thinks the online video platform can be easily used. Then, here are the following hypotheses.

• Hypothesis 1(H_1): consumer perception factor for ICourse online video platform can be positively reflected by perceived usefulness.

• Hypothesis 2(H_2): consumer perception factor for ICourse online video platform can be positively reflected by perceived easiness of use.

• Hypothesis 2(H_3): consumer perception factor for ICourse online video platform is positively correlated with consumer intention.

3.2 Consumer requirement factor

On the basis of variables of Use and Satisfaction Theory and in the light of real conditions of online video platform, consumer requirement factors (CR) may be divided into 3 dimensions-social contact (SC), interaction (IN) and entertainment (EN). Thouth Online video platform does not have such obvious social attributes as in other social softwares, it is a gathering place for those with same hobbies where users may communicate through comment or direct messages. Interaction is mainly reflected by barrages between anchor and user or between one user and another. The barrage brings in new opportunity to allow users to the express personal views and opinions freely. Entertainment is mainly reflected by the satisfaction of spiritual needs of users. Users may relax themselves, relieve mental pressure and obtain spiritual pleasure. Then, here are the following

hypotheses:

• Hypothesis 4(H4): consumer requirement factor for ICourse online video platform can be positively reflected by social contact factor.

• Hypothesis 5(H5): consumer requirement factor for ICourse online video platform can be positively reflected by interaction factor.

• Hypothesis 6(H6): consumer requirement factor for ICourse online video platform can be positively reflected by entertainment factor.

• Hypothesis 7(H7): consumer requirement factor for ICourse online video platform is positively correlated with consumer intention.

3.3 Content factor

According to media richness theory, content factor (CF) is mainly measured in two dimensions-information content richness (ICR) and information quality richness (IQR). Information content richness refers to the degree to which online video platform can contain varieties of information in all fields. Information quality richness refers to the degree to which information provided by the online video platform is reliable. Meanwhile, content factor may influence consumer perception. Then, here are hypotheses as follows:

• Hypothesis 8(H8): content factor for ICourse online video platform can be positively reflected by information content richness.

• Hypothesis 9(H9): content factor for ICourse online video platform can be positively reflected by information quality richness.

• Hypothesis 10(H10): content factor for ICourse online video platform is positively correlated with consumer intention.

• Hypothesis 11(H11): content for ICourse online video platform is positively correlated with consumer perception.

According to the theoretical basis and hypotheses above, the study provided the model of the factors of comsumers'intention in using online video platform. The model is as follows in Fig. 1.
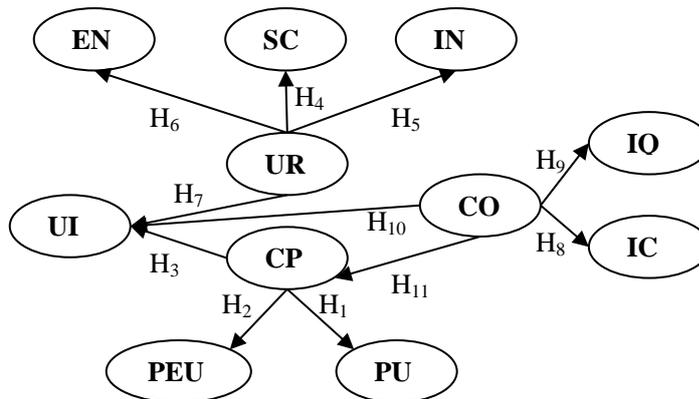

Figure 1   Model of the Influening Factors

4 Questionnaire Design and Data Processing

Herein, we design a questionnaire for collecting data and testing the presented conceptual model. There are 11 latent variables in the model, in which consumer perception factor, consumer requirement factor and content factor are of the second order latent variables which are measured by observational variables related to the first order latent variables belonging to them. The other eight first order latent variables are measured by the relevant observational variables. The questionnaire takes Likert's 5 level questionaire. Number 1 refers to extremely disagreement and Number 5 refers to extremely agreement.

To guarrantee reliability and validity, in the questionnaire we selected mature measurement standards from domestic and foreign studies and made adjustments as necessary according to the features of online video platforms. Besides, we made necessary modifications according to interviews and experts' opinions in the process of designing the questionnaire. Finally, here are determined 24 questions in the questionnaire, among which questions about perceived usefulness

and perceived easiness of use come from articles (Wang, 2013; Vijayasarathy, 2004; Zhou, 2011); questions about social contact, interaction and entertainment come from article [12]; questions about information content richness and information quality richness come from articles (Chen, 2004; Dennis, 1998; Vickery, 2004; Trevino, 1987). All questions are listed in the Table 2. Questionnaires are filled by users from ICourse online video platform. 250 questionnaires are distributed, among which 225 effective questionnaires are recycled.

Table 2 Questions in Questionnaire

Latent variables	Questions
perceived usefulness	I think ICourse online video platform is useful.
	I think ICourse online video platform enrich my entertainment life.
	I think ICourse online video platform expand my social circle.
perceived easiness of use	I think it is easy to learn to use ICourse online video platform.
	I think ICourse online video platform is easy to operate.
	I think it is easy to masterly operate ICourse online video platform.
social contact	I will read the comments from other users.
	I will send message to who owns same hobbies with me.
	I will express my personal views and opinions freely.
interaction	I will write barrage to anchor and communicate with them.
	I will write barrage to communicate with user who watch the same live
	Anchors will reply to me soon.
entertainment	I think watch online live will relax me.
	I like spending time in watching live in ICourse online video platform.
	I feel happy to watch live in ICourse online video platform.
information content richness	ICourse online video platform cover a wide range of field.
	ICourse online video platform contains plentiful information.
	ICourse online video platform meets my need of information.
information quality richness	The quality of information in ICourse online video platform is high.
	Information in ICourse online video platform is realible.
	Information in ICourse online video platform is useful to me.
consumer intention	I want to watch live in ICourse online video platform .
	When it is possible to me, I will watch live in ICourse online video platform.
	I will watch live in ICourse online video platform later.

5 Data Analysis and Model Test

5.1 Test of reliability and validity

In order to test the stability and consistency of measurement results in the above questionaire, the study takes software SPSS22.0 to do statistical analysis and use Cronbach's Alpha reliability coefficient as the measurement index. In general, when Cronbach's Alpha is greater than 0.7, the stability and consistency of questionaire can be guaranteed. The test results can be seen in the table 3. All results are greater than 0.7, showing that the questionaire passes the test of reliability.

Then, SPSS22.0 is used again to test validity, that is, whether the above questionaire can reflect the research purpose through questions in the questionaire. The study takes average extraction of variance (AVE) as measurement index. In general, when average extraction of variance is greater than 0.6, the validity of questionaire can be guaranteed. The test results can be seen in the Table 3. All results are greater than 0.6, showing that the questionaire passes the test of validity.

Table 3 Result of Testing Reliability and Validity

Latent variables	Cronbach's Alpha	AVE
perceived usefulness	0.828	0.744
perceived easiness of use	0.824	0.741
social contact	0.833	0.751
interaction	0.891	0.822
entertainment	0.817	0.737
information content richness	0.831	0.756
information quality richness	0.820	0.758
consumer intention	0.825	0.741

5.2 Test of model

After the test of reliability and validity, we run software LISREL to carry on structural equation analysis validation, structural equation model parameter estimation and path analysis. The output path of model can be seen in the Fig. 2. After analyzing the path relationship, we study validation for the relationship between variables in hypotheses according to path coefficient results. The results of hypotheses are as follows in Table 4. The fit of model parameter values are as follows in Table 5.

Table 4　Results of Hypotheses

Hypotheses	Path Coefficient	Results
H_1	0.82	support
H_2	0.84	support
H_3	0.34	support
H_4	0.72	support
H_5	0.83	support
H_6	0.77	support
H_7	0.25	support
H_8	0.88	support
H_9	0.81	support
H_{10}	0.45	support
H_{11}	0.24	support

Table 5　Fit Results of the Model

Fit index	x2/df	RMSEA	NFI	TLI	CFI	GFI
results	1.55	0.077	0.844	0.90	0.91	0.86

6 Model Results Discussion

According to the analysis above, 11 hypotheses passed the model test.

Consumer perception factor for ICourse online video platform has a positive impact on consumer intention, and users pay great attention to it. The factor is positively reflected by perceived usefulness and perceived easiness of use, which means that if ICourse online video platform can bring conveniences to users' life and is easy to operate or learn, it will attract more comsumers. That is, developers and operators of ICourse online video platform can motivate consumer intention through improving the usefulness and easiness of use. In addition, they can improve the internet technical services by expanding accommodation of users and avoiding the block of live broadcasting.

Consumer requirement factor for ICourse online video platform has a positive impact on consumer intention. The factor is positively reflected by social contact, interaction and entertainment. According to the results, the main motive of online video platform users is making a relationship with those who have the same hobbies. Meanwhile, when they have interaction with one anchor, they meet their psychological need, relax themselves, relieve their mental pressure and obtain spiritual pleasure. Thus, developers and operators of ICourse online video platform must improve the social features of online video platform and add more functions to promote communication. Meanwhile, they can also optimize the function barrage, and make it better for interaction between anchor and users. Then, they can enhance entertainment to attract more users.

Content factor for ICourse online video platform has a positive impact on comsumers'intention. The factor is positively reflected by information content richness and information quality richness. And content factor has a positive impact on consumer perception factor. The result means that users focus more on the classification and field of information that online video platform can provide. A wide range of various forms of network broadcast content can attract users who have different preferences. Meanwhile, the reliability of information is also a key point. Thus, the developers and operators of ICourse online video platform can add more fields of live online broadcasting and strengthen the control of information quality.

7 Conclusions

On the basis of Use and Satisfaction Theory, Technology Acceptance Model and media richness theory, the research integrates consumer perception factor, consumer requirement factor

and content factor to build a model toenquire into the factors of using online video platforms. The results show that consumer perception factor, consumer requirement factor and content factor all have positive impacts on consumer intention. Therefore, The ICourse online video platform can motivate consumer intention through improving the usefulness and easiness of use. Or, they can improve internet technical services by expanding accommodation of users and avoiding the block of live broadcasting. Meanwhile, they can add more contents of live online broadcasting or strengthen the control of information quality.

Nevertheless, some other factors may have impacts on consumer intention, such as risk perception, value perception and social influence. Besides, the study does not have further analysis on whether the impacts are relevant with different groups of users. In later study, the size of the sample will be extended and users will be divided into different groups so that the study can provide specific advices to developers and operators of online video platform of different groups.

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