

Study on Knowledge Absorptive Capacity of Service Outsourcing Enterprise Based on Knowledge Stock*

Liu Ye, Qin Yuanjian, Zhang Min

School of Management, Wuhan University of Technology, Wuhan, P.R.China, 430070

(E-mail: liuyepd@163.com, qyjhb@163.com, meixue1221@sina.com)

Abstract The rapid development of service outsourcing is a product of international industrial restructuring, promoting the structure optimization of service industrial. Since service outsourcing depends on knowledge highly, this paper explores the relationship between knowledge stock and knowledge absorptive capacity in knowledge management of service outsourcing enterprise, uses SPSS statistical software, factor analysis, correlation analysis and other statistical principles to obtain the key factors that impact knowledge stock and knowledge absorptive capacity, and does analysis of the whole correlation and the dimension correlation between the two parts, which is practical meaningful for enhancing the ability of knowledge management in service outsourcing enterprise.

Key words Knowledge; Service outsourcing enterprise; Knowledge stock; Knowledge absorptive capacity

1 Introduction

The knowledge stems from the thinker's thoughts. In a broad sense, the knowledge is the sum of cognition and experiences in the practice when understanding and changing the world. The knowledge resources are playing a more and more important role in modern enterprises, and have become one of the key factors of enterprises to acquiring core competence. In recent years, many scholars have done an amount of researches on enterprise's knowledge management, among which includes profound analysis on knowledge absorptive capacity.

The knowledge absorptive capacity applied by many scholars explains organizational phenomena and has been introduced in organizational learning (Huber, 1991; Kim, 1998), resource foundation theory (Lane & Lubatkin, 1998) as well as dynamic competence (Mowery, Oxley & Silveman, 1996), which then greatly expands the analytical scope and frame of absorptive capacity. In 2002, Zahra & George conceptually distinguished different factors of knowledge absorptive capacity and defined each factor. According to them, absorptive capacity is a serial of organizational practices and processes. Through knowledge acquisition, knowledge assimilation, knowledge conversion and knowledge application, an enterprise builds up its dynamic organizational ability. In 2001, Wenpin Tsai pointed out that it is really important to strengthen the enterprise's absorptive capacity by increasing R&D investment, but little attention has been paid to how to acquire knowledge - the access to knowledge. According to his opinion, this is related to the enterprise's position in the organizational learning net. In 2003, Jianwen Liao, Welsch and other people studied the relationship between the enterprise's absorptive capacity and organizational response of growth-oriented small and mid-sized enterprises. In 2004, Gong Yi and Li Heng, on the basis of potential and practical absorptive capacity, analyzed the relationship between the enterprise's independent R&D and technique purchase. In 2005, Gao Zhanjun and Li Heng pointed out that in a fast changing and unpredictable environment, resource-based concepts did not account for why certain enterprises could acquire competitive advantages. Thus, they discussed affections of different control methods on an enterprise's absorptive capacity. In 2008, Liu Lu and Yang Huixin integrated the resource base concept and enterprise ability concept and reconstructed Chinese concept of enterprise absorptive capacity. They constructed by interviewing the originating and functioning model of Chinese enterprise absorptive capacity, and expounded by quantitative and empirical methods the affecting factors as well their functions of enterprise absorptive capacity.

To sum up, most scholars paid more attention to the research on the importance of knowledge absorptive capacity, on the relationship between absorptive capacity and enterprise organization as well as how to upgrade enterprise absorptive capacity. While, less attention has been paid to enterprise knowledge stock and knowledge absorptive capacity, and less empirical analysis. This paper is intended to collect data of service outsourcing enterprises, found main effecting factors of enterprise knowledge stock and knowledge absorptive capacity with factor analysis methods. It puts forward suggestions to optimize knowledge management of service outsourcing enterprises, which will be of practical

* Funded by Ministry of Education of P.R.China, No. 09YJA630125

significance for enterprise innovation and maintaining their competitive advantages.

2 Knowledge Stock and Knowledge Absorptive Capacity

Service outsourcing mainly includes BPO (Business Process Outsourcing), ITO (Information Technology Outsourcing), KPO (Knowledge Process Outsourcing). The business of Service outsourcing enterprises mainly involve registration management services, accounting tax agents, software development services, network consulting services, enterprise culture, professional training services and so on. They are different from standardized products manufacturing of manufacturing, the main resources of Service outsourcing enterprises are knowledge resources, including enterprise staff knowledge and organization knowledge, so for the resources management of such enterprises, knowledge management is particularly important.

The famous scholar Porter holds that: "Knowledge discovery, integration and innovation has been through the whole process of the human transforming nature, society and themselves, the continuous accumulation of knowledge stock directly influence the progress and development of human society, and is the fundamental driving force of social progress." For service outsourcing enterprises, knowledge stock refers to enterprise's possessive the total of knowledge resources in particular time point, including the sum of all knowledge of enterprise staff, equipment and organization structure, it mainly depended on the individuals and organizations as the carrier. Knowledge absorptive capacity mainly includes for types: knowledge acquisition capacity, knowledge acceptance capacity, knowledge internalization capacity, knowledge use capacity. Among them, knowledge acquisition capacity refers to the ability to judge and obtain the knowledge which have a key role in the enterprise that generated in the external; knowledge acceptance capacity is emphasized external knowledge was explained and understood effectively within the enterprise, the knowledge can't be understood is difficult to be developed and used again; knowledge internalization capacity refers to the effective integration of the new external knowledge and the internal existing knowledge; finally, knowledge development-utilization capacity refers to through the common use of internal knowledge and external knowledge to develop new knowledge.

Enterprise knowledge acquisition mainly depended on the basis of the original knowledge, judge and identify the external knowledge based on the existing knowledge cognition and experience, the better knowledge base enterprise has, the more experience it own, the basis of characterization will get more powerful, thus the higher knowledge acquisition capability enterprise will have. Staffs have good knowledge quality, the more active thinking they have, and the more open management style enterprise have, the enterprise is easier to receive the external knowledge, and integrate new knowledge with old knowledge. In the process, the absorption of knowledge will be influenced by enterprise information sharing platform, enterprise organizational structure, enterprise culture, and so on, the pros and cons of these factors be directly determined by the existing knowledge stock of enterprise. Enterprises transformed outside knowledge into their own knowledge, the main purpose is that we can apply the knowledge to products or services, and they can accumulate experience and upgrade skills in the service process, ultimately, adding new knowledge stock for the enterprise.

From the above analysis, we can propose that knowledge stock and knowledge absorptive capacity are relevant, the following, this paper will use empirical data to analyze the relationship between them.

3 Empirical Analysis

This paper is mainly studied the service outsourcing enterprise in Wuhan City, covering software development enterprise, training institutions, consulting firms and other enterprises. This study sent 312 questionnaires in all, 301 were recovered, 298 were valid, the recovery rate and the proportion of valid questionnaire were 96.5% and 95.5% respectively.

Questionnaire is composed of two parts, knowledge stock and knowledge absorption capacity, the measured variables are shown in Table 1.

3.1 Factor analysis for knowledge stock

According to the valid questionnaires, use the method of factor analysis to analyze the impact of knowledge stock. First of all, KMO and Bartlett's testing: KMO test coefficient is 0.878, greater than 0.5; sample distribution of Bartlett's Test of the chi-square test value is 237.143 (freedom of 10); the significant level is 0.000. So it is suitable for factor analysis. Secondly, use the method of principal component analysis to determine the number of factors. Use the method of the principle component analysis to extract two eigenvalues which are greater than 1, and then, by comparing pre-and

post-rotation factor loading matrix, the factor of the extraction are classified and explained, which are shown in Table 2.

Table 1 Measured Variables of Questionnaire

Subjects	Codes	Factors Variables	
Knowledge	a1	the level of staff qualifications	
	a2	the work experience of staffs	
	a3	the command degree of professional knowledge for staffs	
	a4	the management level of managers	
Stock	a5	the relationship between enterprises and clients	
	a6	the number of intellectual property asserts	
	a7	the level of organizational processes	
Knowledge	b1	enterprise can quickly implement the decision-making	
	b2	enterprise attaches great importance to staff learning ability	
	b3	copy the new knowledge effectively	
	b4	determine the value of the knowledge source	
	b5	the degree of understanding of the external environment	
	b6	know whether the source of knowledge matches with the enterprises' strategic	
	Absorptive	b7	to perfect the existing business process by existing experience
		b8	to make up for the shortcomings of enterprise with newly acquired experience and skills
	Capacity	b9	use new knowledge in products and services effectively
		b10	quickly work out appropriate strategies for environmental changes
		b11	enterprise often carry out training and study courses
		b12	provide new knowledge to staffs quickly and efficiently
		b13	learning atmosphere in enterprise is very strong
		b14	staffs have a strong sense of innovation
		b15	break on the usual thinking for the specific issues

Table 2 The Result of Factor Analysis for Knowledge Stock

Factors Variables	Common Factors	
	A1	A2
a1	.576	.188
a2	.481	.175
a3	.519	.267
a4	.705	.144
a5	.236	.755
a6	.140	.659
a7	.222	.631
eigenvalues	1.33	1.33
the cumulative (%)	42.07	36.25
of % (%)	42.07	78.32

From the factor analysis results of knowledge stock can be see that there are two common factors which eigenvalues are greater than 1: A1 can explain the “a1 the level of staff qualifications”, “a2 the work experience of staffs”, “a3 the command degree of professional knowledge for staffs” and “a4 the management level of managers”, the factors explained rely on personnel carrier, so it can be named as staff knowledge; A2 can explain the “a5 the relationship between enterprises and clients”, “a6 the number of intellectual property asserts” and “a7 the level of organizational processes”, the factors explained rely on enterprise carrier, so it can be named as organization knowledge. In attention, the sores of these two factors in this study are saved for the following analysis.

3.2 Factor analysis for knowledge absorptive capacity

According to the valid questionnaires, use the method of factor analysis to analyze the impact of knowledge absorptive capacity. First of all, KMO and Bartlett's testing: KMO test coefficient is 0.829, greater than 0.5; sample distribution of Bartlett's Test of the chi-square test value is 287.933(freedom of 76); the significant level is 0.000. So it is suitable for factor analysis. Secondly, use the method of principal component analysis to determine the number of factors. Use the method of the principle component analysis to extract four eigenvalues which are greater than 1, and then, by comparing

pre-and post-rotation factor loading matrix, the factor of the extraction are classified and explained, which are shown in Table 3:

Table 3 The Result of Factor Analysis for Knowledge Absorptive Capacity

Factors Variables	Common Factors			
	B1	B2	B3	B4
b1	.384	.553	.218	.351
b2	.397	.627	-.256	.105
b3	.637	.147	.135	.372
b4	.785	.145	.115	.110
b5	.545	.141	.229	.249
b6	.645	.484	.118	.173
b7	.202	.267	.320	.696
b8	.225	.112	.136	.700
b9	-.117	.433	.201	.612
b10	.211	.526	.424	-.246
b11	.353	.626	.239	.131
b12	-.014	.668	.206	.333
b13	.163	.199	.641	-.089
b14	.288	.033	.697	.158
b15	.186	.218	.732	.273
eigenvalues	2.91	2.59	2.28	2.20
the cumulative (%)	21.62	18.12	17.48	9.16
of % (%)	21.62	39.74	57.22	66.38

From the factor analysis results of knowledge absorptive capacity can be see that there are four common factors of which eigenvalues are greater than 1: B1 can explain the “b4 determine the value of the knowledge source”, “b3 copy the new knowledge effectively”, “b5 the degree of understanding of the external environment” and “b6 know whether the source of knowledge matches with the enterprises’ strategic”, so it can be named as knowledge acquisition capacity; B2 can explain the “b12 provide new knowledge to staffs quickly and efficiently”, “b2 enterprise attaches great importance to staff learning ability”, “b11 enterprise often carry out training and study courses”, “b1 enterprise can quickly implement the decision-making” and “b10 quickly work out appropriate strategies for environmental changes”, so it can be named as knowledge acceptance capacity; B3 can explain the “b15 break on the usual thinking for the specific issues”, “b14 staffs have a strong sense of innovation” and “b13 learning atmosphere in enterprise is very strong”, so it can be named as knowledge internalization capacity; B4 can explain the “b8 to make up for the shortcomings of enterprise with newly acquired experience and skills”, “b7 to perfect the existing business process by existing experience” and “b9 use new knowledge in products and services effectively”, so it can be named as knowledge use capacity. In attention, the scores of these four factors in this study are saved for the following analysis.

3.3 Correlation analysis

Firstly, use the method of correlation analysis to analyze knowledge stock and knowledge absorptive capacity. According to the scores of factors stocked above, calculated the total scores of the two tables: $A=A_1+A_2$, $B=B_1+B_2$, take the whole correlation analysis for the two by SPSS16.0 software, the result is: Pearson Correlation value is .965**, Sig. (2-tailed) is .000, so we can say knowledge stock and knowledge absorptive capacity are positively co-related to each other.

Secondly, use the method of correlation analysis to analyze the dimensions of knowledge stock and knowledge absorptive capacity. According to the scores of factors stocked above, calculated every dimension scores of the two tables, use the method of correlation analysis to analyze the two dimensions of knowledge stock and the four dimensions of knowledge absorptive capacity, the results are shown in Table 4:

From the study results can find that the two dimensions of knowledge stock and the four

dimensions of knowledge absorptive capacity are all positively co-related to each other, but the correlation coefficient of staff knowledge and knowledge use capacity is larger comparatively, the correlation coefficients of organization knowledge and knowledge acquisition/ acceptance/ internalization capacity are larger comparatively.

Table 4 The Dimension Correlation Coefficients

	A1	A2	B1	B2	B3	B4
A1	1.000					
A2	.528**	1.000				
B1	.597**	.665**	1.000			
B2	.649**	.663**	.659**	1.000		
B3	.506**	.542**	.467**	.543**	1.000	
B4	.524**	.495**	.538**	.500**	.427**	1.000

Note: ** p-value<0.01

4 Conclusions

To sum up, knowledge stock and knowledge absorption capacity of knowledge management in service outsourcing enterprises are highly positively co-related to each other. The increase of knowledge stock can enhance knowledge absorption capacity while the upgrading of knowledge absorption can also result in increase of knowledge stock. Therefore, to strengthen knowledge management can keep the enterprise in a constant cycling process that knowledge stock increasing and knowledge absorption capacity upgrading, which can maintain the development of enterprise.

Enterprises investigated in this paper are limited in Wuhan City, and the number of questionnaire is not enough, so the variable of affecting factors is just universality and simple. Whereas enterprises always stay in a constantly changing and complicated environment, some particular affecting factors are still not considered. Meanwhile, the particularities of knowledge management in different service outsourcing enterprises have to be studied in the future.

References

- [1] Zahra S.A., George G. Absorptive Capacity: A Review, Reconceptualization, and Extension [J]. *Academy of Management Review*, 2002, (2): 185-203
- [2] Tsai W. Knowledge Transfer in Intraorganizational Networks: Effects of Network Position and Absorptive Capacity on Business Unit Innovation and Performance [J]. *Academy of Management Journal*, 2001, (5): 996-1004
- [3] Liao J., Welsch H., Stoica M. Organizational Absorptive Capacity and Responsiveness: An Empirical Investigation of Growth-oriented SMEs [J]. *Entrepreneurship Theory and Practice*, 2003, (2): 63-85 (In Chinese)
- [4] Gao Zhanjun, Li Yuan. The Influence of Enterprise Controls on Absorptive Capacity [J]. *Group Technology & Production Modernization*, 2005, (3): 47-51 (In Chinese)
- [5] Gong Yi, Li Yuan, Jiang Lihui. Study on the Relationship Between Internal Self-research Technology Purchased [J]. *Science and Technology Management*, 2004, (8): 26-30 (In Chinese)
- [6] Yang Lu, Yang Huixin. Study on Factors and Role of Absorptive Capacity of Chinese Enterprises [J]. *Review of Industrial Economics*, 2008, (7): 68-91 (In Chinese)
- [7] Kim L. Crisis and Organizational Learning: Capability Building in catching-up at Hyundai Motor [J]. *Organization Science*, 1998, (2):13-21
- [8] Xie Ya. Enterprise Intellectual Property Strategy and Enhancing Core Competitiveness [J]. *Economic and Social Development*, 2006, (3): 34-35 (In Chinese)