Enterprise Human Resource Environment Evaluation System and Empirical Research

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Abstract   Human resource environment (HRE)of enterprises has a great influence on the growth of staff and enterprise performance, so it is necessary to do the evaluation of enterprise human resource environment. This paper constructs a human resource environment(HRE) evaluation index system formed by three first-level and fourteen secondary-level indicators, and delegates it weight through the method of hierarchy analysis Finally, the paper takes S Corporation as an empirical study case, and gets the score of the company's human resource environment is 2.99, which is in good condition. The paper is consistent with the actual situation of the company, and proves the rationality of the evaluation system.
Key words   Human resource environment; Organizational environment; Analytic hierarchy process; Comprehensive fuzzy evaluation

1 Introduction

As the concept of human resource has been put forward in 20th century, 50's, human resource has increasingly taken seriously as a kind of resource. Under the background of rapid acknowledge information development, human resource has been one of the most important resources. From the point of view of economics, resources are scarce, and human resource is no exception. The human resource environment (HRE) is a very important factor in how an enterprise can get good human resource and play a greater role of it. It is a topic worth exploring that how HRE is and how its evaluation method is. For employees, a good human resources environment is more conducive for their ability to play and reflect their own values. The merit of HRE will directly affect the attractiveness of enterprises to the talent outside, and also affects the efficiency of internal human resource.

At present, the research of human resource environment and the related areas have made some progress inside and outside the country. Internationally, Newman (1977) divided the working environment of human resource in enterprises into 11 aspects: "supervisor type, task characteristics, performance rewards and punishments, employee relations, work motivation, staff facilities configuration, staff capacity, organizational decision-making policies, living space, producing pressure and work duties "[1]. And Amabile (1996) designed KEYS chart which reflects the working environment condition in view of this point, and verified the related relationship between different working environment and employee innovation[2]. Chiu(2002) designed the cognitive scale of Chinese employees working environment on the basis of view of the five points, which are organizational prospects, operational effectiveness, staff promotion, staff participation and role expectations. And through the research they found out that the recognition of employees of enterprise environment in private enterprises is higher than that in state-owned ones in China[3]. Martin (2006), his study showed that the attitude of staff towards work is affected by their organizational environment[4]. Related issues inside the country have also been researched; Wang (2001) investigated the organizational environmental factors which effects the quit of employees[5]. Zeng (2005) studied how to optimize the internal environment of human exploration from the point view of enterprise culture, enterprise development strategies, incentives and employment mechanism and human resource management model[6]. Xiong (2008) researched causes of organizational confidence crisis, its adverse impacts and suggestions of building trust-based organization environment[7]. Hou (2009) made the evaluation system of hotel personnel environment and analyzed six hotels[8]. However, currently, the research of the construction of the enterprise human resource environment evaluation system which can universally adaptive is still lacking. Therefore, it is of great significance to promote the development of enterprise human resource environment in building a universally adaptive enterprise human resource environmental evaluation system and doing effectively study to enterprise human resource environment.

2 The Establishment of Human Resource Environment Evaluation System

The enterprise human resource environment evaluation of this paper is analyzed based on the objective conditions the enterprise state and the knowledge and experience of employees of enterprises to the environment. Therefore, at the time when the enterprise human resource environment evaluation indicators are established, it takes the way of objective scoring and the questionnaire survey respectively to obtain the evaluation data according to different index characteristics, and then using the fuzzy comprehensive evaluation and the method of weighted arithmetic average to obtain the final evaluation results and then judging the HRE status of an enterprise.

2.1 The establishment of enterprise HRE evaluation index system

2.1.1 The principle of indicator selecting

To make the HRE evaluation index reflects the true situation objectively, on the index setting, we should follow the following principles:

(1) Rational and scientific, on the index setting, we should be scientific and rational, refining the key indicators and reducing the introduction of less correlative index to ensure the representation of index system.

(2) Independent and clarity, the content of indexes is independent with clear boundaries, reducing the relevance of indicators and occurrence of ambiguity.

(3)Generally adaptation, enterprises of different size, industry and nature have their own characteristics, targets set needs universal applicability and replicability propagable.

Table 1　HRE Index System

	First-level index	Secondary -level index	Index Description
Objective indicator	Basic environment (U_1) $w_1=0.2473$	Enterprise Development(U_{11}) $w_{11}=0.4251$	Enterprise development condition and development trends
		Enterprise scale(U_{12}) $w_{12}=0.2493$	The size of enterprise
		Enterprises Position(U_{13}) $w_{13}=0.3256$	Area of enterprise
		CR=0.0043	
Subjective indicators	Organizational Environment (U_2) $w_2=0.3021$	Organizational structural system(U_{21})　$w_{21}=0.1996$	Recognition of staff to the organizational framework
		Organizational management capabilities(U_{22}) $w_{22}=0.3100$	Evaluation of managing ability of management in the organization
		Organizational stability(U_{23}) $w_{23}=0.1570$	Whether the organizational personnel structure is stable
		Organizational information flow degree (U_{24}) $w_{24}=0.1338$	The degree of organizational information dissemination and communication
		Organizational of interpersonal coordination degree (U_{25}) $w_{25}=0.1996$	Whether the organizational interpersonal relationship is coordinated, the political condition of the company
		CR=0.0011	
	Personal development environment (U_3) $w_3=0.4506$	Personnel selection mechanism(U_{31}) $w_{31}=0.1921$	Whether the personnel selection mechanism is reasonable
		Performance appraisal system(U_{32}) w32=0.1573	Whether the performance appraisal is scientific
		Remuneration competitiveness(U_{33}) $w_{33}=0.2346$	He standard of remuneration in the enterprise
		Education and training(U_{34}) $w_{34}=0.1626$	The training opportunity and training quality
		Working conditions(U_{35}) $w_{35}=0.1246$	How is the working and leisure facilities
		The job matching(U_{36}) $w_{36}=0.1246$	Whether individuals and work is match
	CR=0.0043	*CR=0.0007*	

2.1.2 The establishment of indicators

HRE indicators set from three dimensions, which is the basic environment of enterprise, organizational environment and individual development environment. We set three first-level and

fourteen secondary-level indicators based on this consideration. Basic environmental indicators reflect the background and development condition the enterprise state and show the basic elements of HRE. Indicators in this level include three secondary-level indexes, which are enterprise development, firm size and enterprise location; Organizational environment indicator is the working organizational environment that inside the enterprise stay, which reflects the organizational situation. Under this level, it sets five secondary-level indicators which are organizational structure system, organizational management ability, organizational stability, smooth degree of organizing information and organizational interpersonal coordination degree; The personal development environment of the first level indicator reflects the occupational status of employees and the assessment of their own to personal professional status and development prospects. At this level it sets six secondary-level indicators which are personnel selection and performance evaluation mechanism, competitive pay and benefits, education and training, working conditions and job matching (Table 1). Evaluation in these three dimensions, as the quantitative analysis that the basic environmental index incline to objective, the research analysis taking the way of direct scoring according to data, and because of the personal subjective feelings that involved and dematerialized indicators in the organizational environment and personal development environment, we analysis adopting the method of questionnaire and fuzzy comprehensive evaluation.

2.2 Identifying indicators for weight

For this study set of index weight, we adopt AHP (Analytic Hierarchy Process) method. AHP is a kind of systematical and hierarchical analysis method that combines the qualitative and quantitative, and that subjective judgments can serve as an important part of the judge on the factors the AHP is quite satisfactory[9]. In order to guarantee the scientific of the weight, we consult to 7 people include university experts, HR practitioners and corporate staff. We give scores with taking the method of 1-9 calibration, constructing the judging matrix on the basis of suggestion, and doing data analysis through hierarchy analyzing software yaahp(0.51), and doing conformance testing and normalizing and get each index weight, specific results(table 1).

2.3 Comments chosen

The comment is the evaluation standard to the environmental condition, and this research adopts point from 4 point to 1 point to carry on the appraisal. Under the basic environment of the first-level index, the enterprise development indicator takes the enterprise profit ability as the evaluation standard, bestowing 4 points to enterprises that year income grows 15% above in three years, 3 points to which grows 15%-8%, 2 points to which grows 8%-0% and 1 point to the negative growth; The enterprise size indicator carries on the judgment according to its annual turnover size, bestowing 4 points to enterprises that the year turnover surpasses 300,000,000RMB, 3 points to which is between 30,000,000--300,000,000RMB, 2 points to which is   between 30,000,000--5,000,000RMB and 1 point to 5,000,000RMB below; The enterprise position mainly carries on the appraisal by the enterprise local situation, bestowing 4 points to enterprises which located in first-level city (Beijing, Shanghai, Guangzhou, Shenzhen), 3 points to the provincial capital city, city specifically designated in the state plan and the coastal developed city, 2 points to the medium-sized city and 1 point to small cities. Regarding two first-level indicators of organizational environment and individual development environment, it adopts four descriptive words of superior, good, general, bad and evaluates with 4/3/2/1 point to carry on the questionnaire design separately, and to obtain the appraisal data through carrying on the investigation to the enterprise staffs.

2.4 Indicators comprehensive evaluation

(1) To the basic environmental indicators, the paper gets the evaluation results taking the way of weight arithmetic average.

(2) It takes the way of fuzzy comprehensive evaluation of organizational environment and personal development environment.

Its fundamental model is:

①Establish factor set U, namely evaluation indicator collection

$$U= \{u_1, u_2, u_3, \dots , u_n\}$$

②Establish evaluation set V.

$$V= \{v_1, v_2, \dots, v_m\}$$

v_i represent the evaluation results

③The degree of membership of factor u_i ($i=1,\dots, n$) to evaluation level v_j ($j=1,\dots, m$) is r_{ij}, and then the appraisal vector of single factor u_i is

$$r_i=(r_{i1}, r_{i2},\dots, r_{im})$$

in which $\sum_{j=1,}^{m} r_{ij} = 1$ $(i=1,2,\ldots,n)$

By n factors for the comprehensive evaluation matrix

$$R=(r_1, r_2,\ldots, r_n)^{\mathrm{T}}=\begin{bmatrix} r_{11} & r_{12} & \ldots & r_{1m} \\ r_{21} & r_{22} & \ldots & r_{2m} \\ \ldots & \ldots & \ldots & \ldots \\ r_{n1} & r_{n2} & \ldots & r_{nm} \end{bmatrix}$$

④Establishing weight set W

$$W= (w_1, w_2, w_3\ldots, w_n)$$

w_i means the weight of the i-th factor in U set, and $\sum_{i=1,}^{n} w_i = 1$

⑤By vague it changed for

$$S=R \bullet W$$

⑥ Into a numeric conversion

$$U= SV$$

This is the basic model of fuzzy comprehensive evaluation, and finally the numerical results can be obtained.

(3) Regarding to the result number of the three first-level indicators which obtained, according to its different weight, carries on the arithmetic weight average again to obtain the comprehensive evaluation results of HRE evaluating indicator system.

3 Empirical Research

This research select S Corporation to do the empirical analyze. S corporation is the subsidiary company of China Railway Group's capitalization, mainly doing business for architectural engineering. This company is also one of important enterprises of Chinese construction industry.

3.1 Data collection

This research carried on the material collection as well as the questionnaire survey based on indicators that preceding text established. Data shows that the business income of the company exceed more than 230 billion RMB in 2008 and 40 billion RMB in 2009; The profit growth in 2007, 2008 and 2009 is 260%, 22.6% and 34%, belongs to the high-growth enterprises. In the survey, we designed questionnaires included by 11 questions options and four personal background description problems, and in which the composed problems   correspondence to the subjective indicators in the index system of HRE. This investigation takes the method of on-site survey anonymously. We granted 120 questionnaires and recycled 107 effective questionnaires, the effective recovery rate is 89.2%. Through the analysis of samples, the number male employees who accept this investigation is 78, the number of female employees is 29, and the rate is 72.9% and 27.1%respectively; Age distribution between 20~55 years old, working life in 1~36 years; Staffs who engaged in the technical position is 66, occupies 61.7% of all the investigated population, 41 people on management and rear service, and this result may basically reflect the company's situation. We compiled statistics the data on the questionnaire and got the following data (table 2).

3.2 Comprehensive evaluations

(1) According to the data above, we judging that the annual business income of the S company surpasses 300,000,000 RMB, belongs to the major industry, this indicator $U_{11}=4$; annual profit increase rate in three years is 260%, 22.6% and 34% respectively, surpasses the set standard 15% so $U_{12}=4$; The company belongs to the provincial capital city $U_{13}=3$. Three items carry on the weighted average:

$$U_1=0.2451*4+0.2493*4+0.3256*3=3.68$$

Table 2　Comment set of the Questionnaire

First-level index	Secondary- level index	Comments set			
		Superior	Good	General	Bad
Organizational Environment(U_2)	Organizational structural　system(U_{21})	25	55	18	9
	Organizational management capabilities(U_{22})	23	61	17	6
	Organizational stability(U_{23})	19	47	28	13
	Smoothly degree of organizational information (U_{24})	21	40	34	12
	Organizational social harmony(U_{25})	30	51	19	7
Personal development environment(U_3)	Personnel selection mechanism(U_{31})	11	38	44	14
	Performance appraisal system(U_{32})	32	49	18	8
	Pay welfare competitiveness(U_{33})	38	50	12	7
	Education and training(U_{34})	7	47	45	8
	Working conditions(U_{35})	12	33	41	21
	The job matching(U_{36})	16	50	31	10

(2) Establishing subjective indicators of evaluation matrix according to the questionnaire survey reviews:

$$R_2=\begin{bmatrix} 0.2336 & 0.5140 & 0.1682 & 0.0841 \\ 0.2149 & 0.5700 & 0.1588 & 0.0560 \\ 0.1775 & 0.4392 & 0.2616 & 0.1214 \\ 0.1962 & 0.3738 & 0.3177 & 0.1121 \\ 0.2803 & 0.4766 & 0.1775 & 0.6654 \end{bmatrix} \quad R_3=\begin{bmatrix} 0.1028 & 0.3551 & 0.4112 & 0.1308 \\ 0.2990 & 0.4579 & 0.1682 & 0.0747 \\ 0.3551 & 0.4672 & 0.1121 & 0.0654 \\ 0.0654 & 0.4392 & 0.4205 & 0.0747 \\ 0.1121 & 0.3084 & 0.3831 & 0.1962 \\ 0.1495 & 0.4672 & 0.2897 & 0.0934 \end{bmatrix}$$

Establishing weight set according to the weight that has calculated:

$$W_2=(0.1996, 0.3100, 0.1570, 0.1338, 0.1996)$$
$$W_3=(0.1921, 0.1573, 0.2346, 0.1626, 0.1246, 0.1246)$$

Change to a vague：

$$S_2=R_2 \cdot W_2=(0.2233, 0.4934, 0.2018, 0.0814)$$
$$S_3=R_3 \cdot W_3=(0.1933, 0.4179, 0.2840, 0.1005)$$

Into a numeric：

$$U_2= S_2V=2.86$$
$$U_3= S_3V=2.70$$

(3) The objective indicators U_1 and subjective indicators of U_2, U_3 for weighted average is:

$$U=\sum U_iW_i=3.68*0.2473+2.86*0.3021+2.70*0.4506=2.99$$

3.3 Result analysis

Through comprehensive analysis of the S company, the HRE score is 2.99 which is fine. And the basic environment score is 3.68, which explained that the basic condition of this company is good. And the organizational environment and personal development environment was 2.86 and 2.70 respectively, which shows that in the respect of these two primary index, the company is done not well enough and also have the space to develop and need to do more work to improve. In secondary-level indexes, the score of smooth degree of organizational information, personnel selection mechanism and education and training is low. So S company, in order to increase the HRE, it should be improved on these aspects.

4 Conclusion

Human resource environment of enterprise reflects the development condition and the importance of the enterprise to the staff, which is the important component of HR strategy of enterprises. The paper constructed the evaluation index system of human resource environment of enterprises, and evaluating the merits of the human resource environment in the way of quantitative. Through the empirical study to S company, we can identify that the HRE of the company is good which tally with the actual situation, which also shows the rationality of the evaluation index system. In addition, indicators that this paper set is generally applicable, which can be used to evaluate the human resource environment of enterprises of different properties, different professions and different scale, and the evaluating results is of certain guiding significance. This paper has conducted only one empirical study，so, in the future we can increase the number of samples to do further validation and refinement of the system, and enable it become the standards of judging the human resources environment superior or inferior for enterprise as

well as the staff.

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