

**Chinese small and medium-sized enterprises (SMEs) Early warning Human Resources Crisis.**

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**ABSTRACT**

*With world economic integration, Chinese enterprises joined international market for competitiveness and develop active enterprise activities. The domestic and international advanced experience of human resources needs an effective management of Chinese enterprises. In this regard SMEs face human resource crises to expand cooperation and development of international market. Therefore, study of SMEs human resources crisis early warning has practical significances. This paper describes concept of human resource management, problems and reasons about human resource crisis early warning of SMEs in China. It designs early warning index system of human resource crisis of the SMEs. We use analytic hierarchy process method for finding effect of early warning index from three factors like external environment, enterprise and individual. We use extension engineering method for extension early warning model of human resource crisis of the SMEs including extension prediction sub-model and extension evaluation sub-model. The extension early warning model is chosen on SMEs to make case analysis and research, and forwarded countermeasures and Suggestions from major factors HRM and human resource crisis early warning and sub factors like building up HRM concept, perfect HRM institution, establishing human resource crisis management system, forming crisis early warning team, and establishing crisis information database.*

**KEYWORDSs:** SMEs; Human Resources Crisis; Early Warning Model; Extension Evaluation

**INTRODUCTION**

Since reform and opening up, China's small and medium-sized enterprise development rapidly, not only become the important force to promote the development of national economy promoting the reform of economic system, promote the marketization and internationalization of economy. The improvement of the economic structure and the relationship between urban and rural areas, expanding employment, and maintain social stability, play an irreplaceable role. Private enterprises are the main body in the non-public sector of the economy in Chinese economic development. China's rapid economic growth, is mainly by the growth of small and medium-sized enterprises. In the rapid development of social economy, enterprise crisis and enterprise management must be taken seriously. Any enterprise crisis may occur at any time, it is difficult to avoid. In today's challenges of knowledge economy, enterprise competition, the final analysis is the talent competition. Human resource is the key factor to promote the development of enterprises, directly affect the enterprise benefits and long-term development, which is an important means of enterprise profit. Rise and fall, success and failure of the enterprise depends on enterprises with physical capital to some extent. Enterprise management involve to study all kinds of crisis, including human resources crisis. Leading to the crisis, even threatened enterprise's survival. Presently Chinese enterprise crisis prevention awareness is very weak, the crisis warning system within the enterprise has not been set up. Especially the human resource crisis management function, strengthen enterprise human resources department .

**ENTERPRISE HUMAN RESOURCES CRISIS WARNING**

Enterprise human resource crisis warning is an important part of human resource crisis management. Initial research direction is focused on the financial management in business and financial risk early warning. At the same time, the American scholar R. Blake and Mouton studied effectiveness of leadership behavior. They took lead from perspective of organizational factor of effective leadership and ineffective leadership behavior differences, and set up an index system to evaluate the enterprise internal distrust of the behavior. Loizos Heracleous (1997) consider that human resource crisis is an important manifestation of corporate human resources crisis type. Enterprises human resources competition like fierce, social and organization are experiencing intense change, which mean that companies and employees become able to support the success of the enterprise in the future. The leader's ability, confidence and potential are the key factors of enterprise competition, staff knowledge and skills are the guarantee of enterprises to keep sustainable competitive advantage. Nancy R. Lockwood (2005) put forward the enterprise human resource crisis in four steps: (1) establish a team of crisis warning (2) the analysis ability of organization (3) establishment of crisis plan; (4) the execution plan. Zhang Zhihua and Chau Huanzhou (2008) pointed out the human resources crisis early warning indicators classified as basic indicators, behavioral indicators and manage organizational indicators, they established a corporate human resources crisis fuzzy comprehensive evaluation model, and select SMEs empirical analysis. Mingqin Zhang and Xie Liren (2009) established the enterprise human resources management risk early warning index system, which can be divided into recruitment risk, human resource planning and development, the use of employees and management risk. But there is no

analysis of the weight of the index system, and no further empirical.

## METHODOLOGY

(1) The connotation of Chinese SMEs human resources crisis, on the analysis of the forms and causes mainly adopts qualitative research. On the analysis of the questionnaire's results, the design of human resource crisis early warning index system, using the analytic hierarchy process (AHP) to determine index weight at all levels. Meanwhile the use of extension engineering to build Chinese SMEs human resources crisis early warning model mainly adopts the method of quantitative research.

(2) Theoretical research combined with case study, Selection of Chinese SMEs as a case study object, analyzes the enterprise human resources present situation, and using extension model identification and evaluation of its human resources crisis situation, determine their level of human resource crisis warning. In constructing Chinese SMEs human resources crisis extension model, through the case study and put forward corresponding early warning, which is a theoretical research.

## CHINESE SMEs HUMAN RESOURCES CRISIS CAUSE ANALYSIS

### (1) Enterprise external environment analysis

#### 1.1 Human resources management changes in the environment

From transactional to strategic human resource management, enterprise human resource management department is gradually mainstream become a strategic partner of enterprise business department. Accordingly, the practice of human resource management is no longer repeat attendance, performance appraisal, salary, welfare, other administrative and general affairs work. The human resources policy formulation consist on implementation, the high-level supervisor's selection, staff education training, career design, organization, development planning.

### (3) Personal factors

#### 3.1 The structure of individual factors

Personal structure factors mainly consider the two aspects, employee's age and length of service. On the age, according to the survey found that higher the age lighter is the turnover. That's because young people are more like a challenges and the change of jobs required lower costs, may also gain more benefits, and middle-aged or workers approaching retirement age, have a family, pension and other reasons, the flow will be more careful. In terms of length of service, according to a study in the United States, in any age group of employees, 75% of the resignation of work in

### 1.2 The change of personnel employment environment

From closed to open deep reform and opening up, the perfection of market economy system, changed the past employment concept, objectively provides a comfortable environment, personnel employment promotes the flow of persons toward business centers.

### 1.3 The emergence of a human resource executive search industry

Human resources consulting Consultancy, headhunters, executive search firm have sprung up in China. It provides people with abroad development space directly, and also indirectly caused the enterprise human resources crisis hidden trouble. (2)

## Enterprise internal environment analysis

### 2.1 The changing structure of the organization

Information age, information access and use of more and more easy, information sharing, team spirit, to participate, and collective decision in the future are the main characteristics of organizational activities. These provide the organization structure of the flat condition. According to statistics, the enterprise organizational structure gradually from cone type to flat type development.

### 2.2 The defects management system

System is to ensure that the economic order of the relationship between cooperation and competition is under the constraints of its tangible or intangible, to standardize the behavior of the individual. Enterprise is only under the guidance of correct concept of human resource, the system of recruitment, staff training and development system. The performance evaluation system, incentive system and salary system will make truly mobilize the enthusiasm of staff development.

### 2.3 The changes of the enterprise culture

Enterprise culture is the key to a successful enterprise; its connotation includes the enterprise values, beliefs, habits, and a complex of practices. It can shape the employees the same patterns of behavior. Culture is a kind of accumulation of heritage organizations; it penetrates into every aspect of human resource management. Staff and organizational culture is not adaptability of human resources management to solve the problem and coordination.

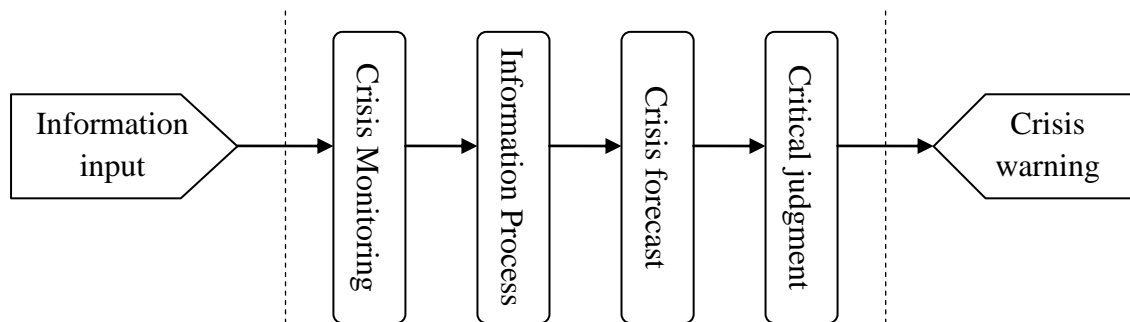
the first three years, more than half of them quit after a year of work, and that the shorter the length of service, showing the higher the employee turnover rate.

### 3.2 Personal status of satisfaction

Employee satisfaction with the current status, such as the current income satisfaction, satisfaction for current position and expectations of the future will be important for human resource crisis happened.

### 3.3 Personal family factors

Individual family factors influence on human resources is also a problem that not allows ignoring. When employees are family economic pillar, his working stability requirement is high, the frequent flow will take careful attitude, and the desire of the spouse, family reunion, the responsibility of supporting will produce certain effect to work outside employees.



### 4 Personal career development

If the employee's individual career planning and enterprise development goals, are conducive to play the enthusiasm of the work to improve the employee's dedication. It is also is advantageous to the enterprise human resources planning formulation and implementation which meet the demand of enterprise long-term development.

### SMEs CRISIS WARNING PROCESSING

Crisis warning is based on the change of enterprise external environment and internal conditions, transit crisis phenomenon, which closely monitor cause of crisis warning, and information obtained for processing, and then forecast alarm for future crisis enterprises. The general process is shown in figure 1.

### CHINESE SMEs HUMAN RESOURCHES CRISIS EARLY WARNING INDEX SYSTEM DESIGN

In this paper, the design of Chinese SMEs human resources crisis early warning index system and its concrete contents are given as shown in table 1. Table shows that the index system includes three levels of 17 operation index; these indexes of the specific meaning are as follows.

Figure 1. Flowchart crisis warning processing

**Table 1. the Chinese SMEs human resources crisis early warning index system**

Target layer index	The middle layer index	Operational indicators	Measure
Chinese SMEs human resources crisis	Environmental factors	The natural environment index	Employee fitness to the natural environment
		Regional stability index	Regional aspects in stable condition
		The law and improve the index	Regional legal soundness
		Economic development index	Total area proportion of GDP
		The degree of information index	Information level
		Salary welfare satisfaction index	Education level
	Enterprise factors	Education level index	Salary welfare satisfaction
		The performance evaluation index	Performance evaluation result satisfaction
		Training mechanism perfect index	Enterprise training satisfaction
		Communication effectiveness index	Communication disorders treatment satisfaction
		Recruitment crisis index	Companies recruit vacant positions in a timely manner
		Staff turnover crisis index	The degree of the loss of employees
	Personal factors	Age index	Or more employees accounted for 28 years old
		Length of service index	3 years or more employees accounted for
		Personal status satisfaction index	Personal satisfaction of the present situation
		Personal family index	Family satisfaction for the trip
		Personal career development index	Personal career development planning and position matching degree

**(1) Weight determination method**

The analytic hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Thomas L. in the 1970 and has been extensively studied and refined since then. In this method according to the factors question contains, and relationship between the evaluation target, it is decomposed into different indicator components and it is divided into different levels, thereby forming a multi-layered structure. In order to compare the relative importance of a particular indicator layer on a layer of impact indicators, each indicator invite experts to carry out the same level of pairwise comparison, the comparison result by the scale (Table 2) quantification, and the formation of judgment matrix, the matrix by calculating the maximum eigenvalues and eigenvectors obtained affect the right of a layer on the layer index weight indicators.

**(2) Weight determination results**

To determine the specific weight of each index value, the author designs the weights of AHP questionnaire adopts the method of expert questionnaire, to the relevant aspects of the experts and scholars of business management departments. A total of 40 questionnaires were issued, 36 effective questionnaire have recovery rate 90%, were based on the set of data collected by questionnaire, to establish judgment matrix, through calculation and the consistency check. In this paper, the AHP obtained by calculating Chinese SMEs human resource crisis early warning indicator system is given in table 2.

Table 2. 1-9 Scaling method

Scale	Containing righteousness
1	Compared to the former and the latter is equally important
3	The former slightly more important than the latter
5	The former is more important than the latter
7	It is very important to the former than the latter
9	The former is definitely important than the latter
2, 4, 6, 8	Said the judge of intermediate value
The bottom	If the indicators $i$ and benchmark $j$ the importance of the ratio of the as $a_{ij}$ , the indicators $j$ and benchmark $I$ the importance for $a_{ji}=1/a_{ij}$

Table 3. SMEs human resource crisis early warning index weight

Target layer index	The middle layer index	Operational indicators	
Chinese SMEs human resources crisis	Environmental factors 0.1634	The natural environment index	0.0200
		Regional stability index	0.0820
		The law and improve the index	0.0058
		Economic development index	0.0342
		The degree of information index	0.0131
		Education level index	0.0083
	Enterprise factors 0.5396	Education level index	0.1975
		The performance evaluation index	0.1258
		Training mechanism perfect index	0.0872
		Communication effectiveness index	0.0605
Recruitment crisis index		0.0419	
Personal factors 0.2970	Staff turnover crisis index	0.0267	
	Age index	0.0476	
	Length of service index	0.0178	
	Personal status satisfaction index	0.1270	
	Personal family index	0.0739	
	Personal career development index	0.0307	

**Chinese SMEs human resources crisis warning model of extension**

**(1) Extension forecasting model**

Extension prediction sub model is mainly used to qualitative analysis of crisis information, predict the crisis type, crisis warning and crisis management accordingly. In this paper, extension prediction is the premise of enterprise, the crisis information database is gathered to find matching case of crisis and enable us to predict a particular crisis. The purpose of using extension prediction is to detect the specific crisis occurred at the same time which leads to another type of crisis. Extension prediction sub model mainly using the extension matter-element divergent and correlation contents to analyze the information of human resource crisis.

**1.1 Divergent analysis**

Chinese SME human resources management is the fundamental brain drain of crisis. Its damage is relatively large, leads loss of key talent, emerge employee confidence drop, fall of enterprise competitiveness and damage of enterprise image, represented as ( $R_I$ ). At the same time the key loss of talent responsible for brain drain also may come

from crisis management system represented as  $(R_2)$ . The pressure and loyalty crisis represented by  $(R_3)$

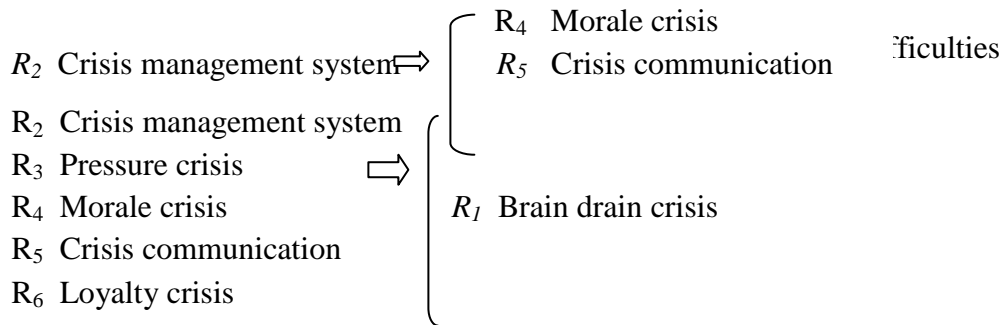
$$\begin{aligned}
 R_1 &= (N, c, v) \left\{ \begin{array}{l} \text{Brain drain crisis: Lost of key talent} \\ \text{Employee morale drop} \\ \text{Enterprise competitiveness} \end{array} \right\} \\
 R_2 &= (N, c, v) \left\{ \begin{array}{l} \text{Management system crisis: Lost of key talent} \\ \text{Employee morale drop} \end{array} \right\} \\
 R_3 &= (N, c, v) \left\{ \begin{array}{l} \text{Pressure crisis: Lost of key talent} \\ \text{Employee morale drop} \end{array} \right\}
 \end{aligned}$$

1.2 Conclusion analysis

$$R_2 = \left\{ \begin{array}{l} \text{Management system crisis: Education level unstsifactory} \\ \text{Performance evaluation is unfair} \\ \text{Staff training is not perfect} \end{array} \right\}$$

1.3 Conten

$R_3 =$  Pressure on crisis, work morale down



Therefore, Chinese SMEs extension forecasting the human resources should consider a problem from the perspective of the overall comprehensiveness. In this method we not only identify information surface represented by the crisis, but also to analyze the cause and consequences of crises, in order to dig deeper crisis factor and, the crisis will be finished in the beginning.

(2) Extension evaluation model

Extension evaluation model is the crisis information in the database without precedent, information gathered by using the method of extension for the enterprise to carry on the quantitative evaluation, identify the level of human resources. And then decide whether to release crisis information warning. Using the matter element theory of extenitics and extension identification method, the construction of human resource crisis of extension evaluation sub model steps are as follows:

2.1 Establish classical field matter-element and joint domain matter element:

Setting human resources crisis early warning have  $m$ , is  $c_1, c_2, \dots, c_m$ . On the basis of the index, experts or according to the statistical cluster analysis, the human resources crisis quantitatively is divided into  $n$  levels, described as the following comprehensive evaluation matter element model, classical field matter element, as said in  $R_{0j}$ .

$$R_{0j} = (N_{0j}, C, V_{0jk}) = \begin{bmatrix} N_{0j} & c_1 & V_{0j1} \\ & c_2 & V_{0j2} \\ & \dots & \dots \\ & c_m & V_{0jm} \end{bmatrix} = \begin{bmatrix} N_{0j} & c_1 & (a_{0j1}, b_{0j1}) \\ & c_2 & (a_{0j2}, b_{0j2}) \\ & \dots & \dots \\ & c_m & (a_{0jm}, b_{0jm}) \end{bmatrix} \quad (3-1)$$

As  $R_{0j}$  said first  $j$  level of the human resources crisis matter element model,  $j = 1, 2, \dots, n$ ; as  $N_{0j}$  said SME human resources crisis  $J$  level; as said SMEs human resources  $j$  level of  $k$  early warning indicators value of the range  $c_k$

$$V_{0jk} = (a_{0jk}, b_{0jk}) \quad (k = 1, 2, \dots, m)$$

The SMEs human resources crisis early warning index of allowed values ranging from the matter element model of  $R_p$ , for joint domain matter elements.

$$R_p = (N_p, C_k, V_{pk}) = \begin{bmatrix} N_p & c_1 & V_{p1} \\ & c_2 & V_{p2} \\ & \dots & \dots \\ & c_m & V_{pm} \end{bmatrix} = \begin{bmatrix} N_p & c_1 & (a_{p1}, b_{p1}) \\ & c_2 & (a_{p2}, b_{p2}) \\ & \dots & \dots \\ & c_m & (a_{pm}, b_{pm}) \end{bmatrix} \quad (3-2)$$

In  $R_p$  said SMEs human resources crisis early warning and the matter element model of matter element section domain; as  $N_p$  said all levels of the SMEs human resources crisis; as  $V_{pk} = (a_{pk}, b_{pk})$  said evaluation of SMEs indicators in  $N_p$  of  $c_k$  scope of;  $V_{0jk} \subset V_{pk}$ , ( $j=1,2,\dots,n; k=1,2,\dots,m$ ).

**2.2 Evaluate the matter element:**

For particular SMEs human resource crisis early warning, as  $R_i$  will be collected data by using matter elements.

$$R_i = (N_i, c_k, V_{ik}) = \begin{bmatrix} N_i & c_1 & v_{i1} \\ & c_2 & v_{i2} \\ & \dots & \dots \\ & c_m & v_{im} \end{bmatrix} \quad (3-3)$$

In  $R_i$  for evaluation of matter elements,  $N_i$  for evaluation of enterprise,  $v_{ik}$  for k index evaluation of SMEs parameter values  $N_i$ .

**2.3 Establish correlation function**

On the basis of concept record;

$$\rho(v_{ik}, V_{0jk}) = \left| v_{ik} - \frac{a_{0jk} + b_{0jk}}{2} \right| - \frac{b_{0jk} - a_{0jk}}{2} \quad (j=1,2,\dots,n; k=1,2,\dots,m) \quad (3-4)$$

$$\rho(v_{ik}, V_{pk}) = \left| v_{ik} - \frac{a_{pk} + b_{pk}}{2} \right| - \frac{b_{pk} - a_{pk}}{2} \quad (k=1,2,\dots,m) \quad (3-5)$$

In  $\rho(v_{ik}, V_{0jk})$ ,  $\rho(v_{ik}, V_{pk})$  show respectively  $v_{ik}$  to section  $V_{0jk}$  and section  $V_{pk}$  of extension distance.

$$D(v_{ik}, V_{pk}, V_{0jk}) = \rho(v_{ik}, V_{pk}) - \rho(v_{ik}, V_{0jk}) \quad (3-6)$$

In above equations the points  $v_{ik}$   $V_{0jk}$ ,  $V_{pk}$  having correlation function calculating values as;

$$K_j(v_{ik}) = \begin{cases} \frac{-\rho(v_{ik}, V_{0jk})}{|V_{0jk}|} & \rho(v_{ik}, V_{0jk}) = \rho(v_{ik}, V_{pk}) \\ \frac{\rho(v_{ik}, V_{0jk})}{\rho(v_{ik}, V_{pk}) - \rho(v_{ik}, V_{0jk})} & \rho(v_{ik}, V_{0jk}) \neq \rho(v_{ik}, V_{pk}) \end{cases} \quad (3-7)$$

The evaluate  $k$  is the characteristics of SMEs as  $N_i$  correlation functions of level  $J$ .

**2.4 Calculated correlation degree and evaluation level:**

On the basis of correlation functions further calculation warning indicators for evaluation of enterprise and various grades of correlation matrix,  $K = [K_j(v_{ik})]$ , using various characteristics of power factor  $\lambda_k$  were obtained by analytic hierarchy process and calculation of SMEs  $N_i$  correlation of  $J$  level.

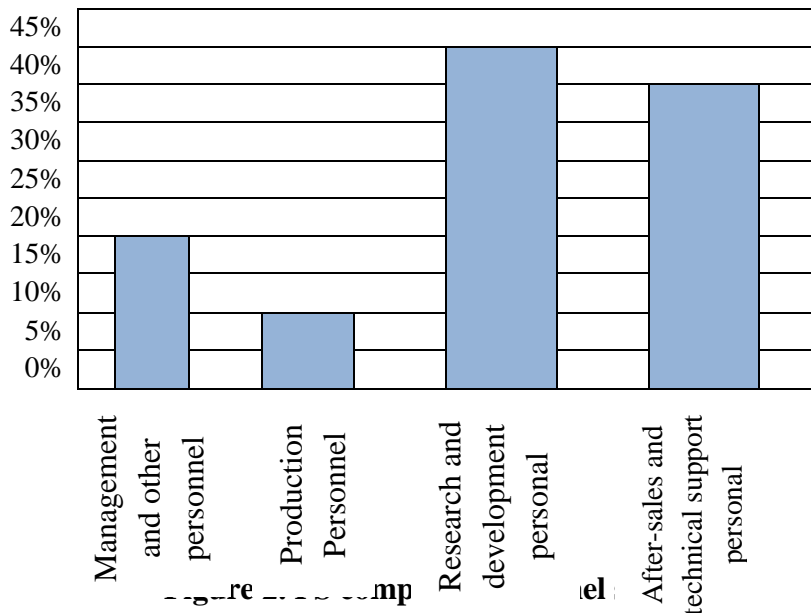
$$K_j(N_i) = \sum_{k=1}^m \lambda_k K_j(v_{ik}) \quad (3-8)$$

where  $K_{j_0} = \max_{j \in \{1,2,\dots,m\}} K_j(N_i)$ , rule medium enterprises  $N_i$  of human resource crisis will be  $j_0$  level.

**GENERAL INFORMATION OF THE CASE STUDY**

**(1) PS company human resources Status**

PS Company was established in 1985, located in Shenzhen special zone, small and medium-sized enterprises (SMEs) is a communication equipment manufacturing industry. In the year 2013, the company's business income was 350 million RMB. After 28 years of unremitting efforts, PS company has several people at the beginning of development of small workshops up to now the well-known small and medium enterprises with more than 6000 employees. Among them, 40% of the total number of employees were engaged in product technology research and development, 35% in sales services and technical support, 10% of production personnel, 15% for management and other personnel, the specific form is shown in figure 2. Company has set up of a dedicated human resources center which is responsible for staff recruitment, training and compensation. The human resource system staff at about 200 people.



**(2) PS company human resources structure**

In terms of staff education constitute, Company employees more than 90% have undergraduate and bachelor degree or above., Research and development staff of more than 80% has master degree or above. In terms of employee age distribution, company staff is given priority to young and middle-aged people, the average age is 28 years old. Age below 25 years old (including 25) the staff of nearly 900 people, 25 to 30 years old (including 30) employees nearly 2900 people, 30 to 40 years old (including 40) employees nearly 1600 people, staff of nearly 600 people over the age of 40. In terms of distribution of length of service, employees working below 1 year (including 1 year) staff of nearly 500 people, 1-3 years (including 3 years) employees nearly 1400 people, 3 to 5 years (including 5 years) the staff of nearly 2500 people, 5 years or above employees nearly 1600 people. In terms of employee gender composition, company currently having male employees nearly 4500 people, female employees nearly 1500 the proportion of male and female is 3:1.

**(3) Warning evaluation data collection**

Paper designed a special questionnaire on various indicators of Chinese human resource crisis early warning indicator system for SMEs conducted a comprehensive investigation. According to the model requirements, selected PS SMEs in China at all levels, employees of various departments of human resources crisis early warning indicators of enterprises comprehensive evaluation questionnaire PS participated in a total of 50 employees, including management personnel accounted for 60% of R & D personnel accounted for 40%. According to the survey questionnaires, the use of tools for statistical analysis of the results obtained by the crisis in human resources for SMEs PS to be evaluated matter

**(4) Extension warning model data evaluation**

First based on early warning indicators to determine the setting  $m = 17$ . According to the previous design of the index system, the PS corporate human resources crisis is divided into four levels, namely, that is  $n = 4$ ,  $N_{01}$  said heavy police,  $N_{02}$  said the police,  $N_{03}$  said light police,  $N_{04}$  represents safety.

Second, determine the human resource crisis PS Classic domain matter element  $R_0$ ,  $RP$  festival field and matter-element to be evaluated matter element  $R$ .  $R$  matter element to be evaluated by questionnaire statistics obtained, and the classic element  $R_0$  domain objects and matter-element  $RP$  section is the actual field conditions and expert advice with reference to the strength of PS Company at the forefront of the industry in large SMEs, according to

various indicators in the industry are to determine the actual warning line, expressed as:

$$R_0 = \begin{bmatrix} N & N_{01} & N_{02} & N_{03} & N_{04} \\ c_1 & (0,0.20) & (0.20,0.50) & (0.50,0.60) & (0.60,1.0) \\ c_2 & (0,0.50) & (0.50,0.80) & (0.80,0.90) & (0.90,1.0) \\ c_3 & (0,0.30) & (0.30,0.60) & (0.60,0.80) & (0.80,1.0) \\ c_4 & (0,0.002) & (0.002,0.005) & (0.005,0.015) & (0.015,0.250) \\ c_5 & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_6 & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_7 & (0,0.30) & (0.30,0.60) & (0.60,0.80) & (0.80,1.0) \\ c_8 & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_9 & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_{10} & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_{11} & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_{12} & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_{13} & (0,0.10) & (0.10,0.30) & (0.30,0.50) & (0.50,1.0) \\ c_{14} & (0,0.10) & (0.10,0.30) & (0.30,0.50) & (0.50,1.0) \\ c_{15} & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_{16} & (0,0.25) & (0.25,0.50) & (0.50,0.75) & (0.75,1.0) \\ c_{17} & (0,0.20) & (0.20,0.50) & (0.50,0.70) & (0.70,1.0) \end{bmatrix}$$

$$R_p = \begin{bmatrix} N_p, & c_1, & (0,1.0) \\ & c_2, & (0,1.0) \\ & c_3, & (0,1.0) \\ & c_4, & (0,0.250) \\ & c_5, & (0,1.0) \\ & c_6, & (0,1.0) \\ & c_7, & (0,1.0) \\ & c_8, & (0,1.0) \\ & c_9, & (0,1.0) \\ & c_{10}, & (0,1.0) \\ & c_{11}, & (0,1.0) \\ & c_{12}, & (0,1.0) \\ & c_{13}, & (0,1.0) \\ & c_{14}, & (0,1.0) \\ & c_{15}, & (0,1.0) \\ & c_{16}, & (0,1.0) \\ & c_{17}, & (0,1.0) \end{bmatrix}$$

$$R = \begin{bmatrix} N, & c_1, & 0.68 \\ & c_2, & 0.83 \\ & c_3, & 0.67 \\ & c_4, & 0.020 \\ & c_5, & 0.72 \\ & c_6, & 0.54 \\ & c_7, & 0.86 \\ & c_8, & 0.71 \\ & c_9, & 0.69 \\ & c_{10}, & 0.76 \\ & c_{11}, & 0.79 \\ & c_{12}, & 0.85 \\ & c_{13}, & 0.62 \\ & c_{14}, & 0.68 \\ & c_{15}, & 0.84 \\ & c_{16}, & 0.78 \\ & c_{17}, & 0.83 \end{bmatrix}$$

$$K = [K_j(v_{ik})] = \begin{bmatrix} -0.0120 & -0.0072 & -0.0040 & 0.0067 \\ -0.0541 & -0.0123 & 0.0176 & -0.0239 \\ -0.0031 & -0.0010 & 0.0016 & -0.0016 \\ -0.0162 & -0.0147 & -0.0068 & 0.0114 \\ -0.0082 & -0.0058 & 0.0016 & -0.0013 \\ -0.0032 & -0.0007 & 0.0008 & -0.0026 \\ -0.1580 & -0.1284 & -0.0593 & 0.1481 \\ -0.0772 & -0.0528 & 0.0201 & -0.0152 \\ -0.0512 & -0.0331 & 0.0209 & -0.0141 \\ -0.0411 & -0.0315 & -0.0024 & 0.0026 \\ -0.0192 & -0.0155 & -0.0043 & 0.0063 \\ -0.0335 & -0.0293 & -0.0168 & 0.0838 \\ -0.0275 & -0.0218 & -0.0114 & 0.0220 \\ -0.0115 & -0.0097 & -0.0064 & 0.0229 \\ -0.0999 & -0.0864 & -0.0457 & 0.1633 \\ -0.0522 & -0.0414 & -0.0089 & 0.0117 \\ -0.0242 & -0.0203 & -0.0133 & 0.0998 \end{bmatrix}$$

Third, according to the companies evaluated to determine the correlation function for each level of correlation to the associated matrix, as shown in K. According correlation matrix (K) can be seen, correlation PS human resources crisis and the various levels of the early warning indicators,  $K_j(v_{ik}) > 0$  said  $v_{ik}$  expressed belong to  $V_{0,jk}$ , and the greater the value  $v_{ik}$  have  $V_{0,jk}$  more attributes. On the contrary,  $K_j(v_{ik}) \leq 0$  said  $v_{ik}$  that does not belong  $V_{0,jk}$ , and small the number value,  $v_{ik}$  explanation e $V_{0,jk}$  away from the range.

Fourth, the comprehensive evaluation of PS corporate human resources crisis. According to the weight of each foregoing warning indicators AHP to determine weight, the weight vector is set:

$$W = (0.0200, 0.0820, 0.0058, 0.0342, 0.0131, 0.0083, 0.1975, 0.1258, 0.0872, 0.0605, 0.0267, 0.0419, 0.0476, 0.0178, 0.1270, 0.0739, 0.0307)$$

PS further calculations relative to the human resource crisis correlation for each grade:  $K_1(N) = -0.6923$ ,  $K_2(N) = -0.5117$ ,  $K_3(N) = -0.1167$ ,  $K_4(N) = 0.5197$ . Based on the evaluation principle, as  $K_4(N) = \max K_j(N)$ ,  $j = 1, 2, 3, 4$ . Therefore, PS corporate human resource crisis in a safe state.

From the individual indicators, correlation matrix PS SMEs may reflect the human resource crisis early warning indicators the position, such as natural environment index, the index of economic development, pay and benefits satisfaction index, recruitment crisis index, the personal status of satisfaction index in a safe condition; regional stability, sound laws, the index level of information, education area, performance appraisal, training mechanisms in light police state; while various warning indicators have not reached the level of police and heavy police. For PS businesses, focusing on the need to strengthen the level of information awareness, strengthen staff training and communication aspects of corporate culture.

## SUMMARY AND CONCLUSIONS

In recent years, SMEs have gradually become an important and active force in the national economy, whether in the developed countries or in developing countries, SMEs in their respective economic activity plays an extremely important role. So this paper has carried on the thorough research on the issue, conclusion is as follows:

(1) Chinese SMEs human resource crisis is the Chinese SMEs in the process of operation, due to the culture, the influence of various factors, such as politics, economy, law, lead to the lack of efficiency in the management of human resources, the human resources can effectively meet the strategic needs of the enterprise scale development, hindered the realization of the goal of enterprise.

(2) Chinese SMEs human resources crisis causes include external environment factors and enterprise factors, individual factors in three aspects, Environmental factors; Enterprise factors; Personal factors.

(3) The design of Chinese SMEs human resources crisis early warning index system, and using extension method on Chinese SMEs human resources crisis warning targeted practice evaluation on the actual situation, and enrich the theory of extension method in practical application value. At the same time the building extension of Chinese SMEs human resources crisis early warning model is effective in the process of development of SMEs in the future use tools.

(4) Extension based on the Chinese SMEs human resources crisis early warning and case study, according to the evaluation results of the problems and in combination with the actual situation of enterprises, it is concluded that the development of small and medium-sized enterprises in the future should be from the human resources management and human resources crisis warning two aspects, the effective prevention and control of Chinese transnational enterprises human resource crisis.

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