Evaluation of Enterprise Human Resources Comprehensive Abilities Based on Managerial Psychology

Jianchang Lu*

North China Electric Power University, Baoding, 071003, China

Abstract

Basing on four parts contents of the human resource management, namely choosing talents and using talents and training talents and keeping talents, this paper applies the administration psychology priority content to the human resource management practice. Then, according to above-mentioned work, it builds up evaluation index system of enterprise human resources comprehensive abilities, and uses the method which combines the fuzzy comprehensive evaluation and the analytic hierarchy process together, evaluates the human resource management comprehensive abilities of the enterprise. Therefore, the research of this paper has certain theoretical and practical significance.

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1. Introduction

The organizational structure adjustment, the information and the multinational corporation swift and violent development brings globalization. Human's factor is day by day prominent. How does well the human resources development already become the most important question which in the various countries competition must consider. Although China is the most populous country in the world, human resource which can adapt to global competition requires both in quality and ability is always shortages. Therefore, a systematic study, on human resource development theory foundation and management measures which can improve employee (including managers and workers) quality, is still a major issue in psychological science and managerial science.

In addition, management science itself also urgent requires the psychologist to continuously provide the new knowledge adapting to technological progress and social changes. Therefore, we need to carry out psychology research of human resource management from a new angle, from man's psychological

* Corresponding author. Tel: +15933072215.
E-mail address: lvinch2008@126.com.
level to study how to better to complete the enterprise human resources management, and promote the development of the theory of human resources management. Based on Managerial Psychology, This paper introduces the design of evaluation index system of enterprise human resources comprehensive abilities, and does the actual and effective evaluation to the enterprise human resources management situation by using fuzzy comprehensive evaluation method and analytic hierarchy process, to promote the better development of the human resources management work.

2. Index Systems Establishment on Enterprise Human Resources Comprehensive Abilities

Managerial psychology makes a deep research about how to manager the people in the psychological level, and the theoretical development of managerial psychology in analyze and assess of the ability etc gives a good theory support for choosing talents, using talents, training talents and keeping talents of the enterprise.

The application of managerial psychology in choosing talents is starts from the position design. Choosing the talented person is firstly to design the enterprise's position. The position design is the foundation of human resources management. Next carries on the analysis to the outstanding talented person's general quality. Based on these two aspects, it carries on the match to talented person's quality and the position request. Referencing to iceberg quality model etc, main theory and according, to the science procedure and the enterprise own characteristic and the work position analysis to the work position localization, it comes the scientific talent ability quality psychological evaluation mode to suit the enterprise to select talents and configuration talents, to attain the real “person duty match”.

In the aspect of using talents, it is necessary to choose and cultivate the talent, according to the work’s request to the employees’ physiological and psychological quality. It causes talented person’s body and mind quality adapt ion work need, had a better occupation to adapt can have the creation, could enable the talented person to display the application effect. The enterprise want to use the talent and make the talent showed their ability, they must pay attention to talents ability’s cultivation and development. Only when the ability of the talent get a constantly development, the enterprise can unceasingly progress. Finally emphasizing to use the incentive effect of the job itself, the work incentive effect can cause the talented person better display initiative and the creativity, can make their potential full play, this is the key factor to using talents.

In the aspect of training talents, the work of training is first. If the enterprise can completely maximum limit meet staff’s each kind of need, then the staff also can be completely biggest possibly meets the need which the enterprise develops. Constructing an effective training mechanism, carrying on a successful training, making a good training work, will provide the lasting power for enterprise’s development. Next is to formulate rational behavior standards. Individual ability is plays the role in the certain system environment. Observes the certain behavior standard is an important premise personally to join the organization. A organization, also only has through the certain behavior standards, can keep different individual efforts toward the objectives of the organization. Finally, the enterprise must establish the reasonable talent type and the level structure. The interaction of different talents itself has the educational potential. Excellent employee’s demonstration effects, the subtle effect of the staff who have innovation ability, and so on are all very good educational ways.

In the aspect of keeping talents, main psychological basis is need theory. No matter from various theories of management psychology, or from empirical studies of our management practice, it can be found, to really mobilize employees work enthusiasm, retain outstanding talents, and make them long-term contribution for the development of the company, it must start from the work itself. Only to provide people with the condition of more advantageous to exert their enthusiasm and creativity, make people’s value be reflected, people will get a greater sense of fulfillment and satisfaction, coruscate higher working
enthusiasm, just can have continuous creativity, and they will have more loyalty to enterprises. Finally, to meet the high-level satisfy of the talent using incentive factors, high-level needs met is the fundamental of retain talent.

Through the above described for the application of managerial psychology in human resource management of enterprise, this paper concludes the following 15 index to reflect enterprise human resources comprehensive ability, detailed index systems are shown in Table 1.

Table 1. Index systems of enterprise human resources comprehensive ability

<table>
<thead>
<tr>
<th>Objective(P)</th>
<th>Level 1 index(F)</th>
<th>Level 2 index(I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choosing talents (F₁)</td>
<td>the rationality of the position design (I₁₁)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the situation of the selected talent satisfy enterprise requirements (I₁₂)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the perfection of personnel assessment system(I₁₃)</td>
<td></td>
</tr>
<tr>
<td>Using talents (F₂)</td>
<td>the situation of adapting to the position(I₂₁)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the situation of developing talents(I₂₂)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the situation of enterprise culture construction(I₂₃)</td>
<td></td>
</tr>
<tr>
<td>Training talents (F₃)</td>
<td>the work of talents training (I₃₁)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the situation of formulating behavior standards(I₃₂)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the situation of talents structure education(I₃₃)</td>
<td></td>
</tr>
<tr>
<td>Keeping talents (F₄)</td>
<td>the situation of meet the talent different needs(I₄₁)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the perfection of incentive mechanism(I₄₂)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the application effect of incentive mechanism(I₄₃)</td>
<td></td>
</tr>
</tbody>
</table>

3. The Evaluation Model of Enterprise Human Resources Comprehensive Abilities

In the aforementioned index systems of enterprise human resources comprehensive abilities, all indexes are qualitative indexes having great vagueness. So it is necessary to quantify these indexes, and then give the weight of each index. This paper will make a research of enterprise human resources comprehensive abilities, by using the method which combines the fuzzy comprehensive evaluation and the analytic hierarchy process (AHP) together.

3.1. Determining the Weight of Indexes using AHP Method

Weights are used to describe relative importance of each index to their upper evaluation index. Weight sets is the collection of multistage corresponding to the evaluation factors. For example, in Fi(𝑖=1,2,3,4), the weight of every evaluation index is:

\[ W_I = (w_{i1}, w_{i2}, \ldots, w_{il}) \ i = (1, 2, 3) \]

The basic idea of AHP is making a pair-wise comparison to the importance of each factor in the inferior level to a factor of the senior level by some experts. Based on this, all the experts scoring form a group of fuzzy judgment matrix. In order to clear definition the relative importance between any two indexes, the 1 to 9 scaling method was introduced in, whose meaning was shown in.
### Intensity of relative importance

<table>
<thead>
<tr>
<th>Definition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 equal importance</td>
<td>two activities contribute equally to the objective</td>
</tr>
<tr>
<td>3 moderate importance of one over another</td>
<td>experience and judgment slightly favor one activity over another</td>
</tr>
<tr>
<td>5 essential or strong</td>
<td>experience and judgment strongly favor one activity over another</td>
</tr>
<tr>
<td>7 demonstrated importance</td>
<td>an activity is strongly favored and its dominance is demonstrated in practice</td>
</tr>
<tr>
<td>9 absolute importance</td>
<td>the evidence favoring one activity over another is the highest possible order of affirmation.</td>
</tr>
<tr>
<td>2,4,6,8 intermediate values between the two adjacent judgements</td>
<td>when compromise is needed</td>
</tr>
</tbody>
</table>

Thus, $n$ is the number of indexes, paired comparison results of the index can use the following judgment matrix expressed as: $P = \begin{bmatrix} 1 & p_{12} & \cdots & p_{1n} \\ p_{21} & 1 & \cdots & p_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ p_{n1} & p_{n2} & \cdots & 1 \end{bmatrix}$

(1) Normalize each line of vector in judgment matrix $A$, we get $\bar{p}_{ij} = \frac{p_{ij}}{\sum_{k=1}^{n} p_{kj}} \quad (i,j = 1,2,\ldots,n)$

(2) Summing the rows of them, it can be obtained that $\bar{W}_i = \sum_{j=1}^{n} \bar{p}_{ij} \quad (i,j = 1,2,\ldots,n)$

(3) Normalizing $W = [\bar{W}_1,\bar{W}_2,\ldots,\bar{W}_n]^T$, we get $W_i = \frac{\bar{W}_i}{\sum_{j=1}^{n} \bar{W}_j} \quad (i,j = 1,2,\ldots,n)$

the obtained $W = [W_1,W_2,\ldots,W_n]^T$ was the approximate eigenvector.

(4) Calculate the maximum eigenvalue is $\lambda_{\text{max}} = \sum_{i=1}^{n} (PW)_i$.

(5) Consistence Check

To ensure the confidence, the consistency check is necessary. The consistency check index is as follows: $C.R. = \frac{C.I.}{R.I.}$

Among it, $C.I. = \frac{\lambda_{\text{max}} - n}{n - 1}$, $\lambda_{\text{max}}$ is the maximum eigenvalue of judgment matrix, R.I. is average random consistency, they can be gotten from Table 3.
Table 3. Values of the average random consistency index

<table>
<thead>
<tr>
<th>n</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.I.</td>
<td>0.00</td>
<td>0.58</td>
<td>0.90</td>
<td>1.12</td>
<td>1.24</td>
<td>1.32</td>
<td>1.41</td>
<td>1.45</td>
</tr>
</tbody>
</table>

The judge matrix is considered tolerable if C.R.<0.1, and the single sorting is reasonable, in verse, the judge matrix should be modified.

3.2. Fuzzy Comprehensive Evaluation

(1) Establishment of the Comment Sets
Here we divided into four levels of comments, With V to say, V={better, good, neutral, bad}.

(2) Establish the second evaluation (membership) matrix \( R_i = (r_{ik}) \)
General using statistical investigation or Delphi method have a comprehensively consider to secondary evaluation index belonging to each comments level, the considered results with evaluation (membership) matrix expression is as follows:
\[
R_i = (r_{ik}) \quad (i = 1,2,3,4; j = 1,2,3; k = 1,2,3,4)
\]
Here \( r_{ik} \) expresses the degree \( I_{ij} \) belonging to \( k \) comment.

(3) Doing Fuzzy Comprehensive Evaluation
This paper sets up a set of secondary index system, therefore the final evaluation results need to undertake secondary fuzzy comprehensive evaluation. With fuzzy operator \( M(\lor, \land) \), carry matrix synthetic operation on fuzzy judgment matrix \( R \) and its weight vector \( W \). So, the matrix elements are that:
\[
C_{ij} = \bigvee_{k=1}^{m} (a_{ik} \land b_{kj}) \quad (i = 1,2,\ldots,n; \ j = 1,2,\ldots,t)
\]
Detailed evaluation process completed by the following two steps:
First, \( I_i(i=1,2,3) \) index’s comprehensive evaluation matrix \( B_i(i=1,2,3,4) \) is that:
\[
B_i = W_i \ast R_i, \quad (i = 1,2,3,4)
\]
Second, making comprehensive evaluation for the first level index. Among it, \( B = (B_1, B_2, B_3, B_4)^T \) is evaluation (membership) matrix for \( F \), getting the comprehensive evaluation matrix \( A = W \ast B \).

4. Application

With a large enterprise human resources comprehensive abilities model as an example, first by multilateral discussions and expert consultation, according to Table 2, it pairwise compares every index, and determines their weight, then constructs judgment matrix.

Table 4. The judgment matrix and the weight of choosing talents

<table>
<thead>
<tr>
<th>( F_1 )</th>
<th>( I_{11} )</th>
<th>( I_{12} )</th>
<th>( I_{13} )</th>
<th>( W_1 )</th>
<th>Consistency check</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_{11} )</td>
<td>1</td>
<td>1/2</td>
<td>2</td>
<td>0.27</td>
<td>( \lambda_{\text{max}} = 3.0055 )</td>
</tr>
<tr>
<td>( I_{12} )</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>0.60</td>
<td>CI=0.0028</td>
</tr>
<tr>
<td>( I_{13} )</td>
<td>1/2</td>
<td>1/5</td>
<td>1</td>
<td>0.13</td>
<td>CR=0.0053&lt;0.1</td>
</tr>
</tbody>
</table>

Table 5. The judgment matrix and the weight of using talents
Each of above matrix has C.R.<0.1, so they passed the consistency check, the above judgment matrices are effective.

Then, one class index makes single-factor fuzzy evaluation. Suppose a enterprise invites 30 people to evaluate their company’s secondary indexes, and get fuzzy judgment matrix as follows:

$$\begin{bmatrix}
0.23 & 0.56 & 0.21 & 0 \\
0.37 & 0.45 & 0.18 & 0 \\
0.40 & 0.60 & 0 & 0
\end{bmatrix}$$

$$\begin{bmatrix}
0.25 & 0.64 & 0.11 & 0 \\
0.40 & 0.55 & 0.05 & 0 \\
0.54 & 0.40 & 0.06 & 0
\end{bmatrix}$$

$$\begin{bmatrix}
0.33 & 0.46 & 0.21 & 0 \\
0.15 & 0.55 & 0.30 & 0 \\
0.35 & 0.40 & 0.25 & 0
\end{bmatrix}$$

$$\begin{bmatrix}
0.43 & 0.27 & 0.30 & 0 \\
0.20 & 0.42 & 0.38 & 0 \\
0.34 & 0.35 & 0.31 & 0
\end{bmatrix}$$
Then fuzzy comprehensive evaluation matrixes for the secondary indexes are:

\[ B_1 = W_1 \ast R_1 = [0.37, 0.45, 0.21, 0] \]

\[ B_2 = W_2 \ast R_2 = [0.30, 0.54, 0.11, 0] \]

\[ B_3 = W_3 \ast R_3 = [0.33, 0.46, 0.24, 0] \]

\[ B_4 = W_4 \ast R_4 = [0.43, 0.27, 0.30, 0] \]

The fuzzy comprehensive evaluation matrix for one class index is:

\[
B = \begin{pmatrix}
0.37 & 0.45 & 0.21 & 0 \\
0.30 & 0.54 & 0.11 & 0 \\
0.33 & 0.46 & 0.24 & 0 \\
0.43 & 0.27 & 0.30 & 0 \\
\end{pmatrix}
\]

The human resource management comprehensive ability of the enterprise fuzzy evaluation matrix is:

\[ A = W \ast B = [0.3, 0.45, 0.24, 0] \]

According to the maximum subjection principle, this enterprise human resources comprehensive ability evaluation results for the second grade, belonging to the good.

There was some difficulty that in the process of fuzzy evaluation method make about we get what we really need, because of the constraints practical problem in real applications. Such as whether the experience of experts is rich enough, and the comparison of managers' performance evaluation of each index importance is right. And because subjective factors exist in the evaluation, including evaluation personnel emotional bias in different degrees, besides, whether all the rating system is reasonable or not has not got scientific verification. To overcome these shortcomings, it is best to have fuzzy evaluation method used in the practical departments or industries, weighted and marked by corresponding department or industry's experts. So it's results will be more precise and convincing, and we can encourage evaluator to make valuations with a objective and fair manner. Thus, these problems can be well resolved, the result of evaluation will be more objective and effective.

5. Conclusions

The research of managerial psychology in enterprise human resources management practice field has important practical significance for the human resources development of China's state-owned enterprise. At present the state-owned enterprise human resources management situation remained to be improved and enhanced. The combination of managerial psychology and human resource management is a good way for human resource management reform of state-owned enterprise. And this practice will obtain very good effect with theory of further research. This paper in human resources management of managerial psychology application research is mainly from choosing talents and using talents and training talents and keeping talents, four aspects. These four aspects are unified whole, mutual connection, any aspect of mistakes will affect other aspects, so it is necessary to give consideration to the four aspects in real work. The application of managerial psychology in human resources management is very wide, its prospect is also very good, there are many problems worthy of studying, it is believed that the research of this field will be more and more thorough and the fruit will more and more colourful.

References


