Optimization of Human Resource Performance Management based on Big Data

Xinlei Guan[*]

Nanchang Vocational University, Jiangxi 330500, China

119574540@qq.com

[*]*corresponding author*

Abstract: With the advent of big data wave, data has become an important information asset. Based on the relevant concepts and theories of mass data technology and performance systems, this paper takes a company as a typical case to conduct case analysis, and makes an in-depth analysis of a company Based on the current situation of the company's performance systems and the existing problems in each link of performance systems, this paper expounds the process and significance of applying the performance systems information system of mass data technology to performance systems, and puts forward the optimization and improvement scheme for the main link of performance systems after applying the performance systems information system. This paper discusses the application of performance systems information system based on mass data technology in enterprise management.

1. Introduction

Nowadays, people are more in the Internet and LAN interaction and cooperation, the development of computer technology and remote communication technology, so that the cost of human communication has been reduced to an unprecedented level. People can ignore the limitation of time and space and transfer, exchange and share all kinds of information resources in real time through the network. In this process, huge amounts of data are generated, and behind these data is human behavior [1].

With the support of "cloud technology" and "Internet", by exploring the potential relationship between data, enterprises can quickly find and realize an effective way of performance systems, and build a relationship model between industrial performance and performance indicators, so that human resource performance managers can get rid of the supervision and check work that consumes

a lot of energy. When enterprises analyze human resource performance data, they can be able to achieve the goal If these information can be fully used, it will be used as a catalyst in the communication and exchange of the team to effectively solve all kinds of disputes, which is conducive to the establishment of a good and open relationship between enterprise leaders and employees, and the formation of a good organizational structure and employee culture. For the cultivation of mass data talents, every link of mass data construction needs to be completed by professionals. Therefore, it is necessary to cultivate and build a professional team of mass data construction who master mass data technology, understand management and have experience in mass data application. For enterprises, mass data technology, as an emerging technology, has high technology content. Mass data talents are scarce resources, and the cultivation of mass data talents is even more difficult [2]. The guarantee of data security and work networking make it easier for competitors and even criminals to obtain all kinds of information about people and enterprises, and make use of relevant information to do things unfavorable to enterprises. Therefore, in order to eliminate this hidden danger, how to ensure data security is an important issue for enterprises in the era of mass data. In the era of mass data, enterprises mainly mine unstructured data, which may involve employees' privacy and cause employees to have corresponding resistance. At the same time, mass data mining lacks corresponding legislation to ensure sharing and prevent abuse. Therefore, how to balance data openness and privacy protection is a difficulty for enterprises . In the era of mass data, enterprises urgently need to study how to make full use of mass data technology to optimize performance systems, in order to improve the efficiency and efficiency of performance systems [3].

On the basis of mass data theory and performance systems theory, this paper takes performance systems of company a as a case to discuss the innovation and application of enterprise performance systems under the background of mass data in detail, so as to provide theoretical reference for the construction and application of performance systems system based on mass data.

2. Related Concepts

2.1. Big Data Related Concepts

The essence of mass data is a batch of data sets, but it can not be concluded in a short time with conventional methods. Its data scale is massive, and its information itself is chaotic at first sight. Only the mass data processed and screened by special methods can better provide analysis and auxiliary decision-making for production and life [4].

Volume means a large amount of data and information, including the amount of collection, storage and processing. The initial calculation unit of mass data is at least Pb level (1000 TB), even EB level (one million TB) or ZB level (one billion TB). Variety means that there are various sources and categories of data. It includes unstructured, semi-structured and structured data information, including document, image, video, sound, location information and so on. Value (low value density) means: the scale of data is huge, but only a small number of valuable information, that is, the value density of information is relatively low, or it is not too much to look for a needle in a haystack. With the advent of the Internet age, tens of thousands of data and information are constantly generated every day. It can be said that we are in an era of data explosion. In our daily work and life, the ratio of the amount of data we need to the total amount of social data is getting smaller and smaller. How to combine the actual needs and use powerful technology to penetrate the massive data to find useful information is an urgent problem in the mass data era Problems to be solved. Velocity means: with the rapid increase of data volume, the efficiency of computing and

filtering data has also improved a lot. It is required to do real-time processing and real-time analysis as far as possible. For example, we search Baidu for a hot event that happened a few minutes ago, and the website has screened out the content we want to see through mass data algorithm.Veracity: conclusions drawn from mass data are usually more accurate and reliable, because the wider the data source, the fewer possible omissions and errors [5].

2.2. Characteristics of Human Resource Performance Management based on Big Data

(1) Opening and Sharing of Performance Management

Mass data is which also provides support for the opening of performance management indicators. Open means that, on the one hand, it is open to data uploaders,providing help for all the people within the enterprise, reducing the cost of each Department to obtain information, and accelerating the speed of decision-making. In addition, due to the convenient and quick access to information, the problem of information asymmetry caused by technology and status among departments in the past will be eliminated to a great extent. After the opening of performance management, the real-time sharing of Mass data information is also conducive to the timely discovery and solution of problems for individual employees [6].

(2) Diversified Sources of Performance Management

Different from the traditional performance management mode, performance systems based on Mass data has a variety of data sources. It no longer depends on the implementation of indicators manually entered by employees, but automatically extracts the performance management indicators of each time node through the system [7]. In addition to the conventional text information, it also includes a lot of data that would not have been manually entered into performance management before, for example Such as pictures, videos, progress analysis reports, etc., these data enrich the dimensions of data sources, adding a large proportion of unstructured data. Therefore, Mass data technology must be used in the processing of these data to become a data analysis report that managers can understand [8].

(3) Visualization of Performance Management Analysis

After mass data is processed by cloud computing, because of its powerful computing power, it can analyze the hidden logical relationship between data, find the linkage between performance indicators that is not easy to find by traditional methods, and even get the fundamental way to improve a key indicator. Therefore, performance management analysis visualization can quickly improve enterprise KPI. In a deeper level, visualization can also show different images to different users [9].Users can select analysis reports related to their role positioning according to their different roles, so as to help them understand performance information more accurately [10].

2.3. Related Formulas

Weight calculation:

$$CI = \sum_{i=1}^{5} W_i CI_i \qquad (1)$$

$$RI = \sum_{i=1}^{5} W_i RI_i \qquad (2)$$

$$CR_A = \frac{CI_A}{RI_A} \qquad (3)$$

3. Analysis of Human Resource Performance Management of Company a based on Big Data

3.1. Management Status

Company a is a large multinational company. It transformed into a consulting company 10 years ago. At present, it ranks the first in the field of business consulting and is among the world's top 500 enterprises all the year round. With the deepening of China's reform and opening up, a company's business is expanding. In the middle and late 1980s, he entered the Chinese market and set up a company in Beijing. In the early 1990s, he set up branches in Guangzhou and Shanghai.

The current management mode of a company is matrix management mode, that is, employees are subject to the dual leadership of region and product business. This mode enables different product service departments to share human equipment and other resources in human resource strategy, and maximizes the utilization of enterprise resources. However, this management mode has high requirements for performance systems. However, the current performance systems method of a company can not meet the requirements of matrix management mode.

3.2. Management Issues

The original attitude indicators of a company, such as sense of discipline, teamwork and so on, are mainly evaluated by the staff's superiors, which is lack of objectivity. Most of the time, the mood and mentality of employees have problems, and even the employees themselves don't know, not to mention their superiors. In addition, even if the leaders and superiors perceive the problems of employees' mentality and emotion, they also carry out internal communication and will not reflect in the performance appraisal part. This makes the attitude indicator useless, which is obviously not in line with the original intention of the indicator. Moreover, even if there is internal communication within the Department, the leadership can not help the employees solve and deal with the psychological and emotional problems from a professional perspective.

The design of a company's current performance index weight is based on the rule of thumb. From the weight construction of these performance evaluation indexes, it is not difficult to see that the weight ratio of the sum of the qualitative indicators "service quality" and "internal process" related to performance accounts for 50% of the total performance 70%, while the weight ratio of qualitative indicators such as "learning innovation" and "work attitude" related to attitude only accounts for 30% of the total performance. It is not difficult to see from the emphasis of a company's performance appraisal index weight ratio that a company still belongs to the traditional company that pays more attention to performance indicators. This reflects that a company's human resource strategy does not meet the requirements of today's market. Today's market is changing rapidly. The level of the former mainly depends on the evaluation and supervision of performance indicators, while the level of the latter obviously depends on the attitude indicators and ability indicators for examination, supervision, feedback and improvement.

4. Performance Management Optimization Based on Big Data

4.1. Performance Appraisal Questionnaire Survey

Through the survey results statistics, the number of people who do not know is 242, accounting for more than 40% of the total number, so it is urgent to popularize the performance appraisal.
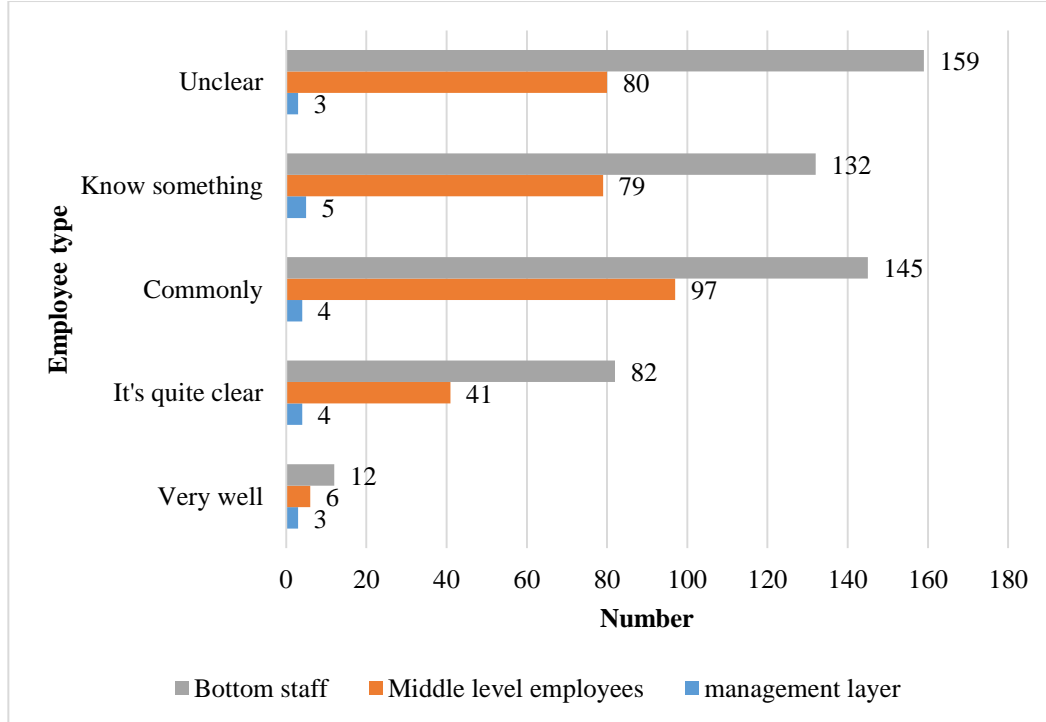

Figure 1. Questionnaire survey results

4.2. Optimization of Performance Weight System

Analytic hierarchy process (AHP) refers to the use of statistics to determine the distribution of weight by solving the matrix eigenvalue. By decomposing the target into different levels, and then quantifying the importance of each index by fuzzy comparison, the comparison results are expressed in the form of matrix, and the matrix eigenvalue is the weight.

The process of using AHP to solve performance weight is as follows

Firstly, the hierarchy of weight is determined, and the hierarchy of weight in this system is the structure of performance index system.

Construct a binary factor comparison judgment matrix. Take the above figure as an example, there are m primary performance indicators (indicator 1, indicator 2, ··; indicator m) in the performance index system. Compare m indicators in pairs. The comparison needs to be based on the measurement table, and the results after comparison are presented in the form of matrix.

It is worth noting that the analytic hierarchy process is not completely objective, because it still needs subjective judgment to determine the comparison results between the two performance indicators according to the comparison measurement table, that is, it needs to be judged by professionals based on experience, but generally speaking, it is more objective to determine the weight with the analytic hierarchy process than to directly use the rule of experience.

Table 1. Primary indicator judgement matrix

Level I indicators	Indicator 1	Indicator 2	……	Indicator N
Indicator 1	1	9	7	5
Indicator 2	1/9	1	1/3	1/5
……	1/7	3	1	1/3
Indicator N	1/5	5	3	1
Sum	1.454	18	11.333	6.533

The final weight coefficient of performance indicators is obtained by normalizing the weight (still dividing each value by the sum of the last line).

Table 2. Normalized primary indicator judgement matrix

Level I indicators	Indicator 1	Indicator 2	……	Indicator N	Weight
Indicator 1	0.69	0.50	0.62	0.77	2.57
Indicator 2	0.08	0.06	0.03	0.03	0.19
……	0.10	0.17	0.09	0.05	0.40
Indicator N	0.14	0.28	0.26	0.15	0.83
Sum	1.00	1.00	1.00	1.00	4.00

Similarly, the same method is used to calculate the weight coefficient of the secondary indicators. It is worth noting that the weight coefficient of the secondary indicators calculated here is for the primary indicators of the same category, and the weight coefficient of the primary indicators is not considered. The weight coefficient of each secondary indicator for the whole performance system should be the product of the secondary weight coefficient and the primary weight coefficient.

4.3. Performance Appraisal Optimization

In the new performance systems information system, the consideration of performance appraisal cycle depends on three factors, namely, the nature of occupation, the nature of index and incentive time.

The nature of the occupation includes position level, position type, etc. the performance systems information system will put forward suggestions on the evaluation cycle according to the position level and position type. From the perspective of position level, the higher the position level, the longer the performance evaluation cycle, because the higher the position level, the more responsible for the higher level performance indicators, such as the general manager's evaluation, because the general manager needs to be responsible. Be responsible for the organizational performance of the whole company, and the organizational performance is difficult to be assessed in a short time. Therefore, the performance of the general manager is usually assessed annually, while the performance indicators of the front-line employees are often highly decomposed short-term goals, so it is usually assessed monthly. From the perspective of post types, posts can be divided into R & D posts, sales posts, production posts, functional posts, etc. according to the characteristics of posts, R & D posts should take the R & D project cycle as the assessment cycle, production posts should take the production cycle and natural month as the comparison, in which the higher value is taken as the assessment cycle (that is, the production cycle is less than a natural month, and the natural month as the assessment cycle). For the assessment cycle, if the production cycle is greater than one natural month, the production cycle is used as the assessment cycle). Sales positions usually take

quarter as the assessment cycle, and functional positions usually take month or quarter as the assessment cycle.

4.4. Satisfaction Survey

According to Figure 2, after the performance appraisal of company a is optimized, the satisfaction survey of internal employees is conducted. According to the statistics, the proportion of very satisfied employees is 54.80%, and the proportion of satisfied employees is 28.30%.
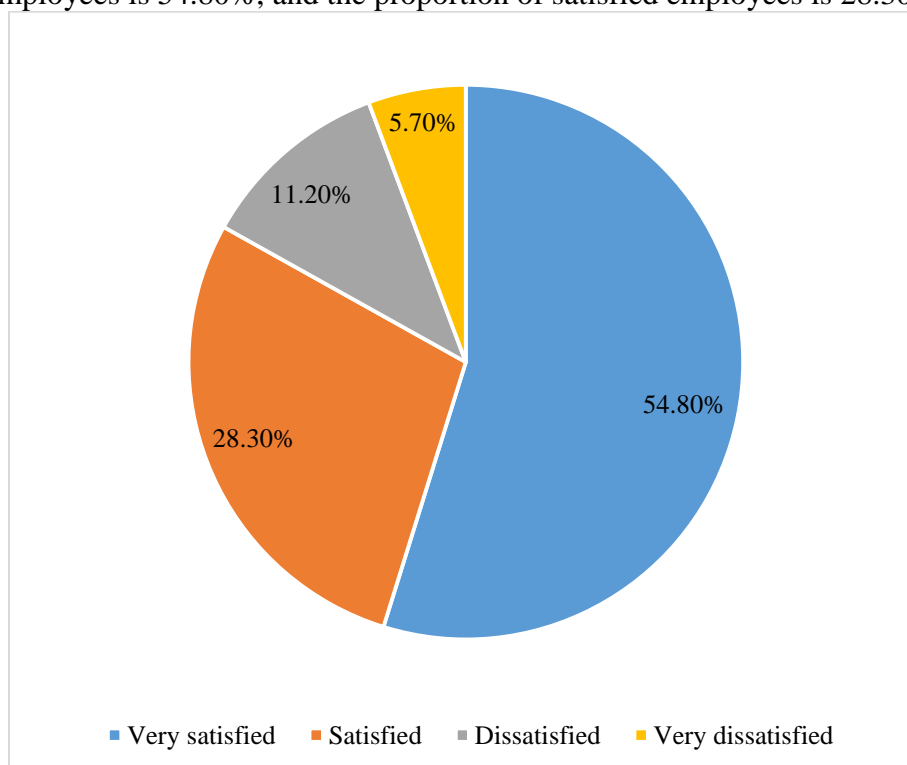

Figure 2. Performance appraisal satisfaction survey after optimization

5. Conclusion

With the development of remote communication technology, office intelligent automation research and development, people work more through the network or based on the network. This makes data information resources replace land and capital, and become the first resource of enterprises in the world. Human society has entered the era of network economy. Therefore, performance systems is no longer a simple performance appraisal plan, but to plan the future development of enterprises, adjust and implement the strategic direction of enterprises. In this context, with reference to a large number of literature, this paper studies and analyzes the performance systems mode of a company. In the aspect of performance planning, through the application of performance systems information system, an effective communication mechanism is established, so that under the matrix management mode, the strategic objectives can also be decomposed into various departments, which improves the long-term chaotic performance appraisal system, enriches the dimensions of appraisal indicators, and more scientifically deals with the weight of performance indicators.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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