Scientific
Research
Publishing

Human Resource Management in the Era of Big Data

Siyu Zang, Maolin Ye

School of Management, Jinan University, Guangzhou, China
Email: 13719403342@163.com

Abstract

In the era of Big Data, enterprise management is undergoing tremendous changes. Human resource department, as an important part of the company, has also been affected by big data. The article is in the context of the era of Big Data, discussing the application of Big Data in major modules of human resource management, including recruitment, talent training, talent assessment and so on. Moreover, this article proposes the major challenges that HR will face and corresponding solution.

Keywords

1. Introduction

Humanity has been creating a steady stream of data since the date of birth. Data can be said to exist in every aspect of our work and life. Especially in recent years, all walks of life have focused on the massive data mining and application, which reveal that the era of Big Data has come and is menacing [1]. This trend has integrated into every work of enterprise management, including human resource management. HR needs to face a variety of reports, and a large number of personnel resumes and statistics. Only depending on these traditional information management systems, it is hard for HR to predict future human resource unit movements, employees' growth curve and employee turnover intention effectively. However, if HR could refer to the Big Data philosophy and continue to explore Big Data management, human resource management would be more accurate, efficient and objective.

Therefore, under the background of the era of Big Data, the purpose of this article is to discuss the application of Big Data in major modules of human resource management, the major challenges that HR will face and corresponding solutions. Before these discussions, we will briefly introduce the concept of Big Data and its main

features.

2. The Concept and Features of Big Data

Just like most emerging concepts, researchers haven't achieved unity about how to define Big Data. But by comprehensive many scholars' definition of Big Data, author discovery that there are five adjectives can describe Big Data well. These adjectives are massive, high growth, diversification, new approach, a more convincing result [1] [2].

Although scholars hold different views about the definition of Big Data, but they have unified understanding that Big Data has four basic features: Volume, Variety, Velocity, and Value (low density data value). This is so-called four V characteristics [2].

2.1. Volume

Large-scale is the most basic features of Big Data. In recent years, there are three main reasons for the surge of the amount of data. The first is the popularity of the Internet, which makes data acquisition and sharing become more easily. The second is the substantial increase in capacity of data acquisition of every kind of sensor, which makes people acquire more real and more comprehensive data. In addition, methods and concepts of individual data processing has experienced a shift from relying on sample data to analyze the overall tend to using the overall data to analyze directly, the difference between these two methods is enormous.

2.2. Variety

The complex data type is an important characteristic of Big Data. In the past, although we had the huge amount of data, but most of them are structured. Accordingly, the data processing methods we need are fixed. But with the rapid development of the Internet and the sensor, we acquire more and more unstructured data, which is just the one the Big Data needs to focus on. This kind of data is minority and it makes traditional data processing face enormous challenges.

2.3. Velocity

With the rapid development of information acquisition and dissemination technology, data volume grows rapidly and new data emerge every moment. Fast-growing volume of data requires faster data processing speed. Because only faster data processing speed can make large amounts of data be effectively utilized. Otherwise, the proliferation of data will become a burden to solving problems. In addition, the value of the data over time decreases rapidly. And if the data has not been processing effectively, they will lose value. At the same time, Big Data makes no sense.

2.4. Low Value Density

While the large scale introduction of unstructured data helps us retain all the details of the data, it introduces a lot of useless information, sometimes even wrong information. So compare to structured data, unstructured data has low value density. However, just as the value of the data is relative, the discretion of the density value is relative also. Sometimes an insignificant detail data may cause a huge impact [2].

3. The Application of Big Data in Human Resource Management

3.1. Big Data Application in Recruitment of Talent

In modern world, competition among enterprises is the competition of talent, and recruiting talents for enterprise is the primary task of human resources department. Traditional recruitment usually follows the steps below: First, sector heads report demand for talent. Second, the recruitment message will be posted on the corporate portal. Then, when the applicants found the message and were interested in it, they would submit their resume. After that, HR would select applicants' resume and interview appropriate candidates till they find the person they want. During the selection process, in addition to education, gender, profession and other hard targets, interviewer's experience played an important role. But the reality shows that the results are often biased. Because

most of the time, the interviewers couldn't acquire comprehensive information about candidates. The information they attained always from the candidates' description. This kind of one-sided and false information leads to the deviation of the results. But now, the Big Data can be well compensated for it. First of all, Big Data provides a broader platform for enterprises' recruitment work, which is the Internet. According to statistics, China has more than two-thirds of enterprises use online recruitment [3]. Company integrates recruitment into social networking, and constantly gathers resume information and application information, which laid a solid foundation for the "Big Data" analysis of recruitment. Moreover, even when companies don't need recruitment, they can also gather information about the candidates persistently. In addition, the combination of social networking sites and recruitment can help recruiter find more information about the candidates, including personal video picture, living conditions, social relationships, ability etc., so that the candidate's image become more vivid and achieve accurate "person-post matching" [4]. Of course, during this period of time, the candidates can learn recruitment process information more open and transparent, as well as their degree of compliance with job offers. This can be described as a win-win.

3.2. Big Data Application in Talent Training

As we all know, staff training is an important part to ensure the sustainable development of enterprises. Successful talent training can increase employees' level of knowledge and skill, enhance their work performance [5]. So that enterprises can keep their advantages of human resources in fierce competition and increase their profitability finally.

The traditional employee training is usually organized by the company. According to different training content, company will hire professionals, or in-house training trainer to complete training. But no matter which way to use, it will be spend a lot of manpower, material and financial resources for company to organize such training. And this kind of training usually takes the traditional form of classroom instruction, which cannot meet the different needs of students effectively. Therefore, the effect of traditional training cannot be protected. With the advent of the era of Big Data, this problem has been resolved successfully. In the context of Big Data, information access and sharing are very convenient, any individual can search the information they want to learn through the network at any time or anywhere easily. In addition, more and more organizations began to develop professional network training courses. Companies can according to its own situation choose purchase these courses directly or customize. Such software programs can record the data of study behaviors of every employee, who can not only use the online system to analyze their own training needs, but also can choose your favorite form of teaching. So that employee can make their training more targeted and improve training efficiency. In addition, employee can accept online test and feedback at any time, which can enhance learning interest effectively and ensure the learning effect. And after a certain time, based on the learning data, the software can also predict an individual's possible improve point [6]. In addition, to keep abreast of staff mastery of new skills, managers can monitor employees' learning situation in the background.

3.3. Big Data Applications in Talent Assessment

Talent assessment as the current human resource management expertise has been more and more valued. Currently, the majority of personnel evaluation take the forms of expert assessment, comprehensive evaluation etc., but these methods are very subjective. Given this, researchers have studied a number of issues with Big Data technology, including personnel performance evaluation, personnel selection and classification research [7]. Based on the finding of these studies, the evaluation methods have been improved. These provide new tools and methods for personnel work. To build competency model, for example, the traditional model of building competency required a series of processes, including interviews, coding, questionnaires, statistical analysis, and so on. Now under the guidance of Big Data thinking, companies can build huge employee data system and use of modern information technology to calculate the difference between the performances of outstanding employees and is adventure employees accurately [8]. These distinctions may be because of technical expertise, personality, or even the physiological indices. This will likely revolutionize the construction mode of competency model, making the post competency features become the standards of selection employees. On this basis, rely on Big Data, human resource management system can continue to enrich talent evaluation and competency analysis tools to play out the wisdom of employees and human resource department.

3.4. Big Data Applications in Pay-Performance

The pay level of a company is always the most important indicator that attracts employees, and obtaining salary is absolutely one of the ultimate goals of employees to participate in the work, but for enterprise managers, pay and performance are effective means by which to motivate employees to work harder and harder. However, the reality is that almost every enterprise's pay system is facing problems, and performance system as its basis is experiencing the same fate. The accounting practice is also a complicated work [9]. Traditional performance system often focus on more qualitative and less quantitative terms and pay level is out of touch with performance results. The salary can't reflect differences between high performance employees and low performance employees that resulting in a diffusion of responsibility. Even if company has applied KPI performance mode, it's hard for HR to do the daily performance appraisal. Moreover, to select comprehensive and fair index as KPI is also difficult. Eventually, many companies' KPI become a dummy. While under the influence of Big Data thought, companies can record the daily workload, specific content of the work and the task achievement of each employee, then use cloud computing processing to analysis these data [10]. Finally, according to pay performance standards, wages can be calculated automatically. With computers to achieve these operations can not only improve work efficiency, but also can reduce business investment in human capital.

3.5. Big Data Applications in Employee Career Management

Under the background of the era of Big Data, individual career choices and planning is also closely linked with the data. By quantitative analysis of all the information that we can get of employees, including their interest on job, promotion will, professional experience and performance, career planning books and other data, HR could understand employees' career interests better and provide better assistance for employees' career planning and management. Enterprises can combine the traditional career management with career management of Big Data, take full advantage of these two ways to explore the employee's career path, provide personalized career guidance, finally reduce the employee turnover and achieve the win-win situation between enterprises and employees.

4. The New Challenges Faced by HR

As mentioned above, there is no doubt that Big Data theory and technology have their own advantages, but everything has pros and cons. In fact, Big Data is still in the development stage, and its related concepts, techniques, methods are far from mature [11]. So HR also faces a variety of challenges in the use of Big Data. Combined with its own characteristics, there are three points should be noted.

4.1. Combined the Use of Big Data with Structured Data

Because of the advantages of Big Data, so many people think that Big Data can solve all problems. But there are many indications suggest that the current Big Data still cannot completely replace traditional structured data, because compared to the validity of structured data, unstructured data is not dominant. Especially for some specific applications, structured data is still dominant. Of course, for some industries, such as the Internet, using Big Data analysis can effectively handle huge amounts of data, analyze user needs roundly and optimize the product. But for the traditional structured data-intensive applications, traditional data processing methods can deal with these structured data well. So it is not necessary for these applications to use Big Data technologies [11].

Specific to the human resources work, if problems can be solved by traditional structured data, HR don't need to use Big Data technology. Because it has never been the best way, only have the most suitable method. HR professionals must understand it.

4.2. Assurance the Security of the Personal Information of Employees

While the development and application of Big Data do good to mankind and the organization, it makes personal privacy and trade secrets exists the danger of being violated. Data security situation is not optimistic. According to IDC statistics: In 2010, there was only less than one third data is of the need to protect, but by 2020, this proportion will exceed to two fifth. In emerging markets in Asia and South America, the lack of data protection is more serious [11] [12].

With the rise of e-commerce and social networking, more and more people leave with a lot of personal infor-

mation on the network. Although the company can analyze employees by obtaining this information, but if they used improperly, it is likely to infringe the privacy of employees and cause huge losses to employees. Once the personal data footprint is gathered and analyzed, it would be easy to obtain personal information. But in fact, it is very hard to keep the information from exposure because of the data release mechanism on the network [12]. The situation put forward higher requirements to the enterprise network security system.

4.3. Careful Use of the Concluded

In the era of Big Data, people think the data is not static and stale, but flowing and updating. Big Data is the source of human knowledge and society value, and through Big Data analysis, we found more valuable potential correlation, from which we can predict the direction of specific things. However, we must be clear that the conclusions that come from data do not necessarily reflect the true. Because with the increase of the amount of data, it may bring some wrong data, making the data value reduce greatly and even draw the wrong conclusion. In addition, the macro conclusions acquired by Big Data analysis, don't make sense for some micro issues. Such as a coin toss, the more times we throw, the closer for us to obtain a positive or negative. But no matter how many times it has thrown, we still cannot analyze that we will get a positive or negative the next time. Therefore, we cannot hope to be able to predict all from the Big Data.

5. Conclusion

In summary, while Big Data provides new methods and ideas for HR, there are inherent drawbacks. HR needs to make full use of the advantages of Big Data and try to avoid its disadvantages, so that Big Data can service companies and human resource can worker better.

References

[1] LaValle, S., Lesser, E., Shockley, R., Hopkins, M.S. and Kruschwitz, N. (2011) Big Data, Analytics and the Path from Insights to Value. *MIT Sloan Management Review*, **52**, 2.

[2] Ma., J.G. and Jiang, W. (2013) The Concept, Characteristics and Application of Big Data. *National Defense Science &Technology*, **34**, 10-16.

[3] Huang, S.L. and Xiang, J. (2013) "Big Data" Light up "Wisdom" of Human Resources Management System. *Science & Technology for Chinese Mass Media*, **12**, 76-78.

[4] Dong, X.H., Ying, A. and Guo, J.G. (2014) Research on the Application of the Big Data Technology in the Network Recruitment. *Human Resource Development of China*, **18**, 37-41.

[5] Tian, H. (2014) The Concept, Thinking of Human Resources Management Based on the Era of Big Data. *Human Resources*, **20**, 162-163.

[6] He, Y. (2013) Management Innovation in "the Era of Big Data". *Human Resources*, **10**, 62-63.

[7] Zhou, G.H. (2013) Thinking on Human Resources Management Based on the Value of Big Data. *Science Mosaic*, **12**, 104-107.

[8] Wang, D.H. (2013) Evidence-Based Human Resource Management in the Era of Big Data. *Chinese and Foreign Entrepreneurs*, **8**, 159.

[9] Wu, Z.Y. (2012) Research on Model of Human Resources Management System Based on Cloud Computing. *China Computer & Communication*, **8**, 142-143.

[10] Wei, B. (2012) The Recruitment Management System Based on Cloud Computing Model. *Science & Technology Information*, **19**, 108-109.

[11] Zhao, J. (2012) How to Make the Enterprise Human Resources Management Adapt to Conditions during the Age of the Big Data. *Human Resource Development of China*, **4**, 13-16.

[12] Meng, X.F. and Ci, X. (2013) Big Data Management: Concepts, Techniques and Challenges. *Journal of Computer Research and Development*, **50**, 146-169.