Application Analysis of Big Data in Innovation Management in Enterprises

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Abstract: Under the background of big data, the rapid integration of domestic and foreign markets has provided new opportunities for enterprises, but also brought some problems. Under such circumstances, enterprises are facing the elimination of the market, and they need to improve their competitiveness, do a good job in the structural adjustment and management innovation of the enterprise, improve the management ability of the enterprise, solve the problems in the development of the enterprise, and realize the sustainable development of the enterprise. Meet future challenges. According to the concept and relationship between big data and innovation management, through the mode and strategy of innovation management, this paper analyzes the development trend of innovation management in the era of big data, and solves the problem of innovation management of enterprises.

1 INTRODUCTION

1.1 The Concept of Big Data

Big data, or huge amount of data, refers to the amount of data involved that is too large to be captured, managed, processed, and organized within a reasonable period of time through mainstream software tools to help companies make more positive business decisions (Deng, 2020). The definition given by the Mc Kinsey Global Institute is: a large-scale data collection that greatly exceeds the capabilities of traditional database software tools in terms of acquisition, storage, management, and analysis (Ding, 2020). Data type and low value density are four characteristics.

1.2 The Concept of Innovation Management

Innovation management refers to the innovation of the enterprise structure and system, and the use of new technologies, equipment, and methods to carry out management functions such as decision-making, planning, organization, incentives, and control, and provide new ideas for enterprises (Huang, 2020). Innovation management is a social organization that adapts to external and internal development for the purpose of scientific and technological progress.

Innovation management is based on management concepts (Huang, 2015). The management concept reflects the management mode and way of thinking of the enterprise, and is the soul of the enterprise (Gu, 2008). Managers must carry out systematic thinking training, master and improve management methods and theories. Only managers with good innovative thinking can innovate better, take innovative management as a kind of fun, and generate new social and economic benefits (Li, 2017).

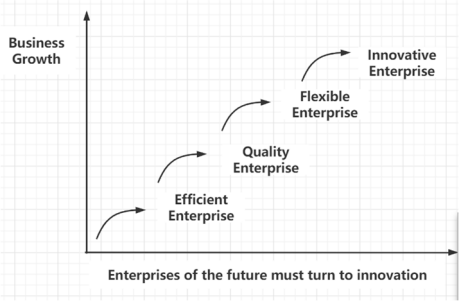

Figure 1: Innovation of Enterprise Management System.

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1.3 The Relationship Between Big Data and Enterprise Innovation Management

The characteristics of big data are large amount, diversity, high speed and value. For enterprises, in order to strengthen market competitiveness, they should find an effective way to mine customer data and extract effective information (Li, 2020). Only by continuously introducing data flow to make it continuously adjust and optimize its own management model can enterprises take a long-term position in the market and always retain the market position of the enterprise (Liu, 2015). In the context of the era of big data, enterprises can usher in many development opportunities, but they also need to constantly overcome various new challenges.

2 DEVELOPMENT TREND OF INNOVATION MANAGEMENT

2.1 Enterprise Value is Becoming More and More Diversified

Corporate interests and corporate values are closely related [9, 2018, Liu]. At present, some enterprises have realized that only by pursuing diversified enterprise value can they obtain more benefits (Liu, 2010). For an enterprise, its value diversification includes many aspects, such as economic value, social responsibility, etc., some are directly related to the interests of the enterprise, and some are indirectly related.

2.2 Organizational Structure Change

There are many theories related to business management, but many enterprises in the development have realized that if they cannot apply theoretical knowledge to specific practical production, just blindly "talking on paper" will hinder the development of enterprises (Lei, 2009). In some enterprises, their organizational structure is unreasonable, which is not conducive to the practice of business management theory (Lin, 2020). Therefore, it is necessary to analyze the organizational structure based on the actual situation of the enterprise, and make timely changes to the unreasonable parts (Liang, 2020). For example, clarify the management level of the enterprise, simplify the production and auditing process, and establish a flat matrix-type organizational structure.

2.3 The Internationalization Trend of Enterprises

For modern enterprises, internationalization is a major trend. The global economy has made many companies go abroad to do business with foreigners (Ou, 2001). For Chinese companies, it is not only necessary to compete with their domestic counterparts, but also with their foreign counterparts. Only by establishing a corporate brand internationally can we stand out in the fierce international competition (Rui, 1998).

2.4 Developing Knowledge Management

For enterprises, knowledge management is very important. It not only requires enterprise managers to use the knowledge they have learned to manage enterprises, but also requires enterprises to build corporate culture based on their own actual conditions, and promote enterprise development through corporate culture (Tao, 2010). Corporate culture has three main functions: first, it is conducive to improving the sense of responsibility of enterprise managers and employees; second, it can improve the cohesion among enterprise employees and cultivate team spirit; third, it is conducive to showing a good corporate image to the outside world (Wang, 2020).

3 THE MAIN MODE OF BIG DATA INNOVATION MANAGEMENT

3.1 The Trend of Management Innovation with Supply Chain as the Core

Extend and integrate with supply chain as the core. Improve the system of each department, strive to get rid of the scope of local interests between departments, and improve the company's overall business level (Wu, 2017). The operation and management innovation mode is mainly divided into: the full use of high-tech information technology under the centralized and decentralized management mode. By reducing supply chain supply, the supply chain operation is simpler and more efficient, thereby reducing the number of suppliers and making the operation relatively

flexible (Yang, 2020). Innovate the business management model from the perspective of users, and pay attention to summarizing and analyzing the opinions and suggestions of customers.

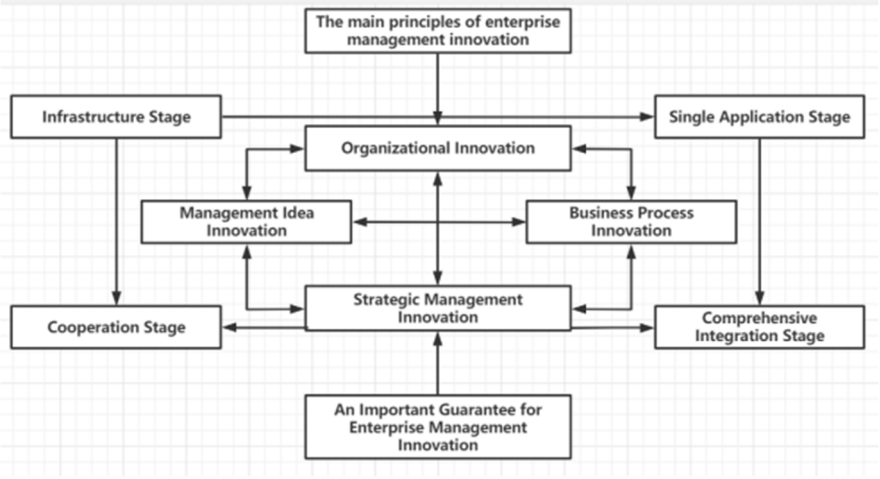

Figure 2: Enterprise Management System

3.2 Management Innovation Trends Centered on Business Process Management

Business process management pays attention to "sequence obedience" and centrally manages enterprise business. Starting from the nature of the daily work content of the enterprise, the business time nodes are clearly arranged, and the business operators and managers have a good grasp of the time nodes and approve them one by one in chronological order, thereby diluting the division of labor in each part (Yang, 2018). The appraisal performance is calculated based on the completion of the process. The business process is approved by multiple links, which not only plays the role of supervision, but also reduces the business pressure of middle-level leaders to a certain extent. In addition, employees in the process need to cooperate with each other and follow the "sequence obedience" rule in the process. The process needs to be approved by the leaders level by level, which requires the business process approvers to be familiar enough with the business content, so that the process approval and connection will be smoother.

3.3 Trends of Strategic Management Innovation Centered on Business Operations

Business operations require enterprises to have a high level of enterprise management. In addition, business operators should focus on the present, look to the future, and take a long-term perspective. Prepare in advance for building a corporate management strategy framework. Organically integrate funds, talents, technology, etc., and creatively carry out business layout and strategic planning (Yu, 2018). Strive to become the creator of new standards in the industry, and enhance its international influence and competitiveness.

4 INNOVATION MANAGEMENT STRATEGY UNDER BIG DATA

4.1 Transform Decision-Making Bodies and Strengthen Corporate Cohesion

In the traditional management model of enterprises, managers and senior personnel are the main decision-making bodies, and front-line employees do not participate in decision-making. In the era of big data, the main role of front-line employees in decision-making has become increasingly prominent (Yuan, 2019). In today's Internet age, the speed of information dissemination has also accelerated, and enterprises should pay more attention to the opinions of the public when making decisions. Of course, the grassroots employees are more familiar with the situation on the front line, and the decision-making is more directional. This decision-making model is very beneficial to the improvement of employees' enthusiasm, and can also better strengthen the

cohesion of the enterprise, so that all employees can work together for the development of the enterprise.

4.2 Change the Way of Decision-Making and Improve the Accuracy of Decision-Making

In the era of big data, the decision-making bodies of enterprises have become different, and all data have become the decision-making bodies, replacing sample data, and integrating and analyzing all data is conducive to better looking for related objects. Future control is very beneficial, and it can also make decision-making better (Zhai, 2010). Enterprise managers have clarified the importance of big data, changed the traditional subjectivity, and used data as the main basis for decision-making. This method can make decision-making more accurate and more beneficial to the future development of the enterprise.

4.3 Do a Good Job in Data Forecasting and Grasp Major Development Opportunities

Under normal circumstances, to understand the actual situation of the market, companies will adopt the method of market research, but this method has significant lag problems. Big data itself is mainly based on prediction. It can fully understand market trends, conduct integrated analysis on consumer behavior, deeply understand consumer preferences, and provide them with corresponding products based on specific preferences (Zhang, 2015). Combining the needs of consumers to innovate and optimize products, the competitiveness of products can be effectively improved, and enterprises can also strengthen their core competitiveness. In addition, you should pay more attention to the marketing activities and prices of competitors, understand the trend of the entire market, and then formulate more accurate marketing strategies to seize more market shares.

4.4 Reducing Operating Costs with the Help of Big Data

Many companies use big data to reduce costs and improve operational efficiency. Enterprises should explore and analyze the obtained data to better understand the problems of enterprise management, so that managers have a clear understanding of the status of each department, which is conducive to the scientific allocation of resources and the improvement of utilization. In addition, the scientific nature of enterprise decision-making management has been improved, and operating costs have been effectively reduced, which is very beneficial to the development of the enterprise.

4.5 Innovation of Information Access Ways

In the era of big data, enterprises can also have more contact with data enterprise platforms, and can make full use of these data platforms to collect public opinions and better understand the public's tendencies, thereby extracting the implied commercial value. Enterprises can also actively cooperate with third-party data collection agencies, make full use of their data collection channels, and better obtain the data information they actually need. Both parties can achieve a win-win situation with mutual cooperation.

4.6 Investment in Innovation Management Talents

It is very important to improve the comprehensive ability and collection ability of data analysts, so as to ensure more benefits for the enterprise. Enterprises provide a good working environment and attract professionals through incentive systems. Enterprises should also increase the scale of data systems according to their own data volume, and update and analyze data information at any time to ensure the accuracy and timeliness of information acquisition. Due to the fierce market competition and prone to malicious competition, enterprise data information requires strict security measures, and professional management is required to ensure the security of enterprise data.

5 LINKS BETWEEN OTHER STUDIES AND THIS STUDY

Density measures the closeness of each node in the network, which is the gap between the actual distribution graph and the complete graph. Generally speaking, high-density networks have high information communication efficiency and better work performance; while low-density networks often have problems such as poor information and low work efficiency. Since the co-authorship network is a non-directional network, its density

formula is as follows:

$$d = \frac{2L}{n(n-1)}$$

Important papers on innovation management in my country are mainly published in five journals: Science and Science and Technology Management, Scientific Research, Chinese Soft Science, and Research and Development Management. Using "innovation" and "big data" as titles or keywords, searching for papers published between 2001 and 2021 shows the following distribution.

6 CONCLUSION

The era of big data has brought opportunities and challenges to the traditional enterprise management model, and data will become the basis for the development of all walks of life. Faced with such social status quo, enterprises should make full use of the advantages of big data to continuously enhance their management capabilities. Enterprise managers should use modern information technology scientifically, realize the transition of enterprises from "traditional" to "technological", realize innovation in enterprise management, promote scientific development of enterprises in the context of the era of big data, and enable enterprises to obtain better results in the fierce competition. Many advantages to ensure the core competitiveness of enterprises.

REFERENCES

Deng Wenbo. Innovation research on enterprise financial management model in the era of big data [J]. Chinese and Foreign Entrepreneurs, 2020(19): 41.

Ding Huawei. Analysis of the innovation path of enterprise human resource management mode in the era of big data [J]. Fortune Today, 2020(10): 148-149.

Gu Lingxiang. People-Oriented Enterprise Management Innovation (1st Edition) [J]. Beijing, Beijing Institute of Technology Press, 2008.

Huang Xinheng. Research on innovation of enterprise management model in the era of big data [J]. Chinese Journal of Multimedia and Network Teaching (Early Issue), 2020(4): 64-65.

Huang Wei, Wang Jia. Analysis of the impact of the arrival of the era of big data on enterprise management [J]. Shang, 2015 (15).

Li Huiqing. Decision-making thinking in enterprise management based on big data analysis [J]. Journal of Taiyuan City Vocational and Technical College, 2017 (09).

Li Ying. Research on innovation of enterprise management model in the era of big data [J]. Wealth Times, 2020(7): 145-146.

Liu Xuexiao. On the application of big data in enterprise decision management [J]. Modernization of shopping malls, 2015 (21).

Liu Wenlin. Research on enterprise management innovation based on the perspective of big data [J]. Enterprise Reform and Management, 2018 (18).

Liu Zeng. The role of enterprise management innovation in enterprise development [J]. Modern Economic Information, 2010 (2): 61, 63.

Lei Xiaodong. Problems and Countermeasures of Enterprise Management Innovation [J]. China High-tech Enterprises, 2009, (9): 62-63.

Lin Xijian. Enterprise management mode and development under the background of big data era [J]. Chinese and Foreign Entrepreneurs, 2020(21): 48-49.

Liang Jing. Analysis of enterprise management mode and development under the background of big data era [J]. Inner Mongolia Coal Economy, 2020(10): 94, 96.

Ouyang New Year, Zhou Jingqin. Enterprise technology competition and new incentive mechanism [M]. Beijing: International Culture Publishing Company, 2001.

Rui Mingjie. Modern Enterprise Management Innovation [J]. Shanxi, Shanxi Economic Press, 1998.

Tao Fuxin. Discussion on Enterprise Management Innovation [J]. Henan Science and Technology, 2010, (10): 27-28.

Wang Fang. Innovative thinking on enterprise management mode in the era of big data [J]. Modern Marketing (late issue), 2020(8): 114-115.

Wu Lian-collar, Li Chao. Research on Enterprise Management Accounting Theory and Implementation Strategy Based on Value Management [J], Special Economic Zone, 2017(02): 92-93.

Yang Xiaoyun, Ruan Xianghui, Ma Hui. Research on innovation of management mode of water conservancy library under the background of big data era——Comment on "Water Conservancy Digital Library" [J]. Advances in Water Resources and Hydropower Science and Technology, 2020, 40(5): 98.

Yang Zhichun. Discussion on the application of big data in enterprise management [J]. Computer fans, 2018 (01).

Yu Honghong. Exploring strategies to strengthen the construction of internal accounting supervision systems in enterprises [J], Finance and Accounting Learning, 2018(6):110-111

Yuan Tao. Application of big data in enterprise management [J]. Digital Communication World, 2019 (01).

Zhai Dengfeng, Mu Yu. Analysis of the significance of management innovation in enterprise development [J]. Economic Research Guide, 2010 (9): 176-177.

Zhang Zhiqiang, Yan Qiuxu. Thinking about business management teaching in the context of big data [J]. Curriculum Education Research, 2015 (13).