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Application of Big Data Statistical Analysis Methods in the Field of Economic Management

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ABSTRACT

With the rapid development of information technology and the explosive growth of data volume, big data has gradually become an important tool in the field of economic management. By collecting, analyzing and processing large amounts of data, big data statistical analysis methodology can provide enterprises and researchers with effective information contained in the data, so as to more accurately predict the market development trend, assess enterprise risks, and optimize the management and operation processes. The purpose of this paper is to discuss the application of big data statistical analysis methods in the field of economic management, and to demonstrate the practical application effects of big data analysis in different economic management scenarios by analyzing specific examples - Jingdong's intelligent logistics Qinglong system, Google Oxygen Plan's organizational control and Citibank's user attraction. Thus, it highlights the prospect of the wide application of big data technology in the field of economic management and its remarkable effectiveness.

KEYWORDS

Big data; Statistical analysis; Economic management; Intelligent logistics; Organizational management

1. INTRODUCTION

With the development of the Internet, the Internet of Things, all walks of life have accumulated a large amount of data resources, how to extract effective information from these resources, has become a huge challenge faced by various fields [1, 2]; at the same time, along with technological advances, such as advances in computational power and storage technology, making it possible to process and analyze large-scale data, the development of big data platforms and distributed computing has also provided the need for big data analytics technical support [3]. Moreover, under the environment of globalization and digitization, the competition in the market has become more and more intense, and enterprises and governments need to gain competitive advantages through big data analysis, which has also become an important driving force to promote the development of big data technology. Overall, the widespread application of big data statistical analysis methods in the field of economic management is driven by the growth of data volume, technological advances, intensified market competition, improved personalization needs, increased demand for risk management and other factors. Together, these factors contribute to the widespread application of big data statistical analysis methods in economic management.

2. OVERVIEW OF DOMESTIC AND INTERNATIONAL DEVELOPMENT STATUS

2.1. Overview of Domestic Developments

Policy support: The Chinese government attaches great importance to the development of big data, and has continuously introduced big data-related policies to promote the development of the big data industry, and has successively issued policies and regulations such as the Circular of the State Council on the Issuance of the Outline of the Action Plan for the Promotion of the Development of Big Data, and the Law of the People's Republic of China on Data Security, etc., to promote the development and application of the big data industry. Local governments have also actively followed up by launching various kinds of big data application demonstration projects, supporting enterprises and scientific research institutions to innovate and explore in the field of big data, and at the same time focusing on the cultivation of talents, and committing themselves to cultivating a large number of professionals in the direction of big data who know the technology and understand the business.

Technological innovation: Domestic companies such as Alibaba, Tencent, Huawei, etc., have invested a lot of resources in big data technology research and development, and developed big data platforms such as Alibaba Cloud and Huawei Cloud to support the data processing and analysis needs of various industries. Universities and research institutions have also achieved important results in the research of big data algorithms, models and applications, providing technical support in the field of economic management.

2.2. Overview of International Development

Policies and regulations: The United States, the European Union and other countries and regions have also introduced a number of policies and laws and regulations related to big data to promote the development and regulation of the big data industry. For example, the United States has launched the Big Data Research and Development Initiative, while the EU has implemented the General Data Protection Regulation (GDPR) to protect user data privacy.

Technology leadership: Foreign tech giants such as Google, Amazon, and IBM maintain a leading position in big data technology. These companies have developed advanced big data analytics tools such as Google BigQuery, Amazon Redshift, etc. to provide powerful data processing capabilities to users worldwide.Foreign universities and research institutions are also at the forefront of big data theory and technology research, publishing a large number of high-level research papers and innovative results.

3. CASE STUDY

With the continuous progress and wide application of big data technology, all industries are actively exploring how to use big data to improve operational efficiency, optimize management processes and enhance decision-making capabilities. In the field of economic management, big data statistical analysis methods have become an important tool for enterprises and organizations to enhance competitiveness and respond to market changes. Through the collection, analysis and processing of big data, companies can more accurately predict market trends, assess risks, formulate strategies, and improve customer satisfaction and operational efficiency.

The following paper will demonstrate the practical application effects of big data statistical analysis methods in different economic management scenarios by analyzing three specific examples - Jingdong's intelligent logistics Qinglong system, Google Oxygen Plan's organizational control, and Citibank's user attraction.

3.1. Jingdong Intelligent Logistics - "Qinglong System"

3.1.1. History of the Green Dragon System

Green Dragon (2013): full upgrade: Jingdong Logistics began to comprehensively improve logistics services, optimizing warehousing, sorting, distribution and other links.

Green Dragon (2014): external orders take off: The Green Dragon system began processing external orders, enabling efficient order processing.

Green Dragon (2015): Channel Sinking: The Green Dragon system is gradually expanding to socialized logistics to handle more types of orders.

Qinglong (2016): Smart Logistics: Introducing technologies such as big data, artificial intelligence and Internet of Things to realize intelligent and efficient logistics services.

3.1.2. Specific realization

Green Dragon System utilizes big data technology to better combine people and logistics equipment to achieve automation and intelligence in logistics management and operation. The application of big data in Qinglong system: Data collection: Qinglong system handles billions of data every day, including orders and logistics operations. Real-time monitoring: Real-time data monitoring and optimization of each node of logistics is achieved through big data technology. Pre-sorting: Using big data to analyze data such as address library, keyword library, special configuration library, GIS map library, etc., so that orders can be automatically sorted to ensure 7*24 hours service. User experience: The Green Dragon system ensures an extremely high user experience, such as an electronic signing system that enables users to sign for orders conveniently. Jingdong also realized a few points, so as to better land intelligent logistics:

Create an intelligent supply chain value network: In terms of landing the global logistics headquarters, Jingdong Group has built an intelligent logistics industry center integrating warehousing, distribution, settlement, big data, cloud computing and other modern logistics businesses.

Promote the rapid landing of unmanned technology: gradually carry out the Jingdong " drone, unmanned vehicle, unmanned warehouse " integrated test system construction: at the same time will also be registered in the aerospace base to form a wholly owned subsidiary of the Jingdong Group, the construction of industrial-grade drone R & D and production base.

Build a cutting-edge technology capability output platform: build a new infrastructure platform of "cloud computing + big data", create a unified city cloud portal, build a smart city ecology supported by cloud technology and driven by big data, and create four systems of platform, data, ecology and network, forming a new situation of cloud gathering industry and smart future economic development. The four systems of platform, data, ecology and network will form a new situation of economic development in which the cloud gathers industries and the future is won by wisdom.

3.1.3. Results

Jingdong logistics in the construction of intelligent logistics system started earlier, has been in a relatively leading position in the country, Jingdong is also one of the earliest domestic investment in the construction of intelligent logistics system, in 2014, the first generation of Jingdong warehousing robots into the "Asia One" series of warehouses, followed by years of deep plowing in the field, forming a set of "fully automated warehousing + big data" based intelligent logistics system, in 2021, "Double 11" period, Jingdong invested nearly 400 intelligent express vehicles in 25 cities across the country for delivery. "Fully automated warehousing + big data" as the basis of the intelligent logistics system, in 2021, "double eleven" period, Jingdong invested nearly 400 intelligent courier trucks in the country's 25 cities for distribution, at the same time, in the epidemic prevention and control period, these intelligent courier vehicles and the intelligent courier trucks also took on the important task of distributing people's livelihood materials during the epidemic prevention and control period. The

perfect intelligent logistics system has brought great support to the development of Jingdong Logistics, and the company's revenue has maintained double-digit growth for many years, with revenue reaching 100 billion yuan in 2021.2022 The first quarterly financial report shows that the overall growth rate of Jingdong Logistics has achieved 22% year-on-year growth, which is significantly higher than that of similar enterprises in the industry. For Jingdong Logistics, the construction of intelligent logistics system is an important task that it must do well, which directly affects the development potential and operational efficiency of the enterprise.

3.2. Google's Big Data Analytics-Based Workforce Decision-Making - "Project Oxygen"

3.2.1. Oxygen Plan Meaning

Google since its inception in the company's culture is deeply with the founder's brand, the company also has an unwritten rule, that is, any decision can not be pat on the head, must be data-driven. Everyone must use data to speak, use data to persuade people, and use data to promote decision-making, which can best highlight the non-traditional point, is that HR needs to be completely through the data to guide all the daily work and decision-making. That's why Google is a company that doesn't believe in management intuition. The Google Oxygen Program aims to improve company management efficiency and employee satisfaction through big data analytics methods. The core of the program is to use a data-driven approach to identify key factors affecting employee performance and satisfaction and optimize management strategies.

3.2.2. Big Data in Oxygen Program

The Oxygen Project analyzes employee satisfaction feedback, performance data, work environment data, etc. through big data to derive the main factors affecting employee performance. Based on the results of these analyses, Google established eight standards of good managerial behavior, including being a good coach, focusing on employee success and happiness, and being a good communicator. It has significantly improved employee motivation.

3.2.3. Practical application effects

The implementation of the Oxygen program has significantly improved Google's management and employee satisfaction, as demonstrated by the following:

Through data analysis, Google found that effective management styles had a significant impact on employee performance and improved its management training and evaluation system accordingly. The data showed that Google's manager satisfaction scores increased by 13% and employee turnover decreased by 8%. Based on the results of the data analysis, Google provided employees with more targeted training and career development programs, which improved employee skill levels and career satisfaction. After the implementation of the Oxygen program, participation in the employee skills enhancement program increased by 20% and employee satisfaction increased by 15%. Through the analysis of work environment data, Google optimized the office environment and teamwork mechanism to improve employees' work experience and teamwork efficiency. The data shows that teamwork efficiency increased by 12% and employee work happiness scores increased by 10%. The above data all show the effectiveness of big data analysis, highlighting the important role of big data in human resource management.

3.3. Citibank's User Retention Measures

3.3.1. Background

Citigroup is one of the world's largest financial services providers, with operations in more than 160 countries and territories and more than 200 million customer accounts. [4] In recent years, the

company has adopted a purely big data-driven strategy to drive business growth and enhance the services it provides to its clients.

3.3.2. Application of big data in risk management

One area where big data analytics has been successfully implemented in Citi's operations is customer retention and acquisition.

Customer retention: Personalized marketing: Citi uses big data to analyze customer behavior and understand their needs and preferences. This enables Citi to offer personalized products and services to customers, thus enhancing customer loyalty.

360-degree view of the customer: By integrating data from different channels, Citibank creates a comprehensive view of the customer. This helps to better understand customers, provide better service and anticipate customer needs.

Customer Acquisition: Targeting: Citibank uses big data analytics to identify potential customers and find the people most likely to become customers. This helps to pinpoint markets and reduce marketing costs.

Targeted Ads: Based on customer behavior and preferences, Citibank can target ads to increase click-through and conversion rates.

4. CURRENT STATUS OF APPLICATIONS

Market Analysis: Big data statistical analysis methods have become an indispensable tool. A large amount of data in the market is mined and analyzed, including market share, consumer behavior and various other key information. By analyzing this data, companies can better understand the market, predict market trends, as well as develop more scientific and effective marketing strategies [5].

Enterprise Risk Assessment: The application of big data statistical analysis methods in enterprise risk assessment is very extensive, which can be used to analyze and study various data of the enterprise in depth through various data mining and analysis techniques, so as to reveal the potential risks existing in the enterprise and provide corresponding early warning and recommendations.

Supply Chain Management: Big data can be used to conduct in-depth analysis of various data in the supply chain through a variety of data mining and analysis techniques, reveal the bottlenecks and problems in the supply chain, provide corresponding optimization suggestions and solutions, and help enterprises improve the efficiency of the supply chain and reduce costs.

Human Resource Management: Big data statistical analysis methods can be used to mine and analyze various employee data, including employee performance, employee satisfaction, employee training, etc., so as to find out the needs and problems of the employees, provide corresponding optimization solutions, and improve the performance of the employees and the efficiency of the enterprise.

Financial Risk Management: Big data analyzes various data of financial institutions, including loan data, asset data, market data, etc., so as to discover the possible risks of financial institutions and provide corresponding early warnings and suggestions to help financial institutions formulate risk management strategies and reduce risks [6].

Marketing strategy optimization: Big data statistical analysis methods can be used to mine and analyze marketing data, including advertising effects, sales channels, customer feedback, etc., so as to identify problems and deficiencies in marketing strategies, provide corresponding optimization solutions, and improve marketing effects and sales.

5. CHALLENGES AND FUTURE DEVELOPMENT OF BIG DATA APPLICATIONS

Data privacy and security:

With the wide application and development of big data technology, the issue of user data privacy is growing. In the process of collecting and processing large amounts of data, enterprises must strictly comply with relevant laws and regulations to ensure that the security and privacy of user data are not violated.

Data quality and management:

Data quality is key to the effectiveness of big data analytics. High-quality data can provide accurate analysis results, while low-quality data may lead to wrong decisions. Enterprises need to establish a perfect data management system to ensure the accuracy and completeness of data.

Policies and talents:

The development of big data technology requires professional technology and talent support. Enterprises need to continuously improve their own technical level, train and introduce professionals in the field of big data analysis; at the same time, the government should also actively introduce relevant policies to promote the development of big data technology.

6. CONCLUSION

Big data statistical analysis methods have been widely used in the field of economic management. Whether it is Jingdong's intelligent logistics system, Citibank's method of attracting users, or Google's Oxygen Program, big data analysis has brought significant advantages to enterprises. In the future, with the further development of big data technology, I believe that big data statistical analysis methods will play an even more important role in economic management and provide more accurate and efficient decision support for enterprises.

REFERENCES

[1] Lenkas, P., Paridav, W., & Wincent, J. (2017). Digitalization capabilities as enablers of value co-creation in servitizing firms. Psychology and Marketing, 34(1), 92-100.

[2] Reddy, S. K., & Reinartz, W. (2017). Digital transformation and value creation: Sea change ahead. Marketing Intelligence Review, 9(1), 10-17.

[3] Yan, L. (2016). Data analysis and mining in the era of big data. Information Technology and Informatization, (7), 39-41.

[4] Wu, S., & He, Y. (2017). Application of big data analysis in customer management. Economics and Management, (2), 117-120.

[5] Liang, F., Liu, X., & Huang, C. (2017). Application of big data analysis in marketing. Science and Technology Innovation and Application, (8), 78-79.

[6] Wang, W., Li, B., & Liu, Z. (2015). Research on the application of big data analysis in the financial industry. Information Theory and Practice, 38(7), 140-143.