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The Application of Big Data in Economic Statistics

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Abstract: The advent of big data has revolutionized the field of economic statistics, providing researchers and policymakers with vast amounts of accurate, timely, and diverse data. At the beginning, this review provides the foundations of big data in economic statistics from two parts-- the definition of big data and the characteristics of big data. Then, this comprehensive literature review aims to explore the applications of big data in economic statistics from five aspects: unit operation management, human resource management, fund operation analysis, risk management, and allocation of internal resources. Additionally, the review analyzes the three advantages and three challenges associated with the use of big data in economic statistics. Besides, the review also provides a number of solutions to improve current problems of economics statistics, including updating statistical concept, cultivating professional statistical talents, and increasing equipment investment. By understanding the potential and limitations of big data, policymakers can make informed decisions to promote economic growth and development.

Keywords: big data, economic statistics, application

1. Introduction

Modern statistical work has had a very wide-ranging impact on improving statistical efficiency due to the advent of the big data era and the development of new technologies and thinking. The enhancement of statistical accuracy and promotion of statistical services to the community is also possible [1]. Big data has become a research topic in economic statistics due to the advancements in information technology [2]. Economic statistics can benefit from big data's more comprehensive, accurate, and timely data support, which provides new avenues and methods for economic policy formulation and decision-making [3]. As of today, with the advent of the era of big data, traditional economic statistics have long been full of loopholes, and more serious problems may occur when economic statistics are used to process data. It is necessary for individuals to revisit economic statistics, recognize their shortcomings, and enhance and optimize them [4].

2. Foundations of Big Data in Economic Statistics

2.1. Definition of Big Data

Big data is a new type of technology derived from the upgrading and development of information technology. Big data has its own technical application mode, but in a certain period of time, it can not effectively use the traditional way to carry out in-depth mining and processing of data information.

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Big data has the advantages of high efficiency, diversity, timeliness and large capacity, and the application of big data in economic statistics can effectively promote the improvement of the efficiency of economic statistics, collect and utilize data in a variety of databases, and upload all kinds of information to the corresponding data platform after effective integration, and improve the efficiency of data utilization under the guidance of clear goals [5]. It can be said that big data has changed the problem of the lack of effectiveness of traditional data due to its own value role, and big data uses multi-dimensional and multi-level data acquisition and computing power to build real-time visual charts for economic statistics management, effectively driving the evaluation value of economic statistics. At the same time, big data can also fully grasp the segmented needs of different customer groups, and provide customers with personalized services according to the actual needs of customers, constantly improve customer satisfaction, but also enrich economic statistics information, and become an important data technology to promote the high-quality development of economic statistics.

2.2. Characteristics of Big Data

The data is broken down into past, present, and future. Big data on the Web primarily relates to the past. It collates, classifies and stores the data to form an extremely large database, and displays it for human or computer reference at the appropriate time, and can even simulate and speculate on future data. The development of network big data in recent years has resulted in the belief that big data has the following five important characteristics. There is a rapid increase in data consistency. Data types can include text, picture, and audio, but they are not restricted to these types. The exponential growth of big data has led to higher and higher demands on computers' processing power. The storage of large amounts of data does not differentiate between good and bad information received. The data stored in big data is valuable, but at the same time, spam, invalid and harmful information outweighs the quality of the information, making it difficult to find it. It's not hard to see that big network data is an endless treasury house. The amount of incorrect information is much greater than the amount of effective information under its sediment. Moreover, it is in a constantly evolving dynamic, which highlights very high requirements for the ability to input user information and the ability to filter [6].

3. The Application of Big Data Statistical Methods in Economic Management

3.1. Application in Unit Operation Management

Using this method, one can find the differences in the operation process of public institutions, allocate resources scientifically, and prevent the problem of repeated operations. Using big data to carry out analysis, screen out worthless data, extract typical data, provide reference for optimization reform and improvement of operation plan, and effectively combine macro and micro economy. Based on the development level of public institutions, the use of this method is conducive to let the unit understand the economic development situation, promote the implementation of national economic policies, and clear the development direction of the unit.

3.2. Application in Human Resource Management

Human resources are the prerequisite for the development of public institutions, and effective implementation of management can enhance the competitiveness of public institutions. The application of big data analysis can implement purposeful screening of human resource management according to the development needs of public institutions at the present stage. In addition, the big data analysis system can scientifically and effectively predict talents according to the specific situation and future development needs of the institution, and use diversified statistical analysis methods to

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ensure the reliability and accuracy of the forecast results, optimize the effect of human resource management, and promote the long-term development of the institution. Based on the application of diversified statistical methods, combined with the relevant situation of different departments, such as intensity, characteristics, content, etc., targeted selection of tubes

Management form, and then improve the quality of human resources management, for the orderly development of various work to provide talent protection. The quality of talents is related to the development of public institutions. The use of regression statistical analysis can understand the demand for talents of the unit, and the use of dynamic analysis method can analyze data according to the flow and development of talents in the unit, improve the pertinence and accuracy of management, and promote the healthy development of public institutions.

3.3. Application in Fund Operation Analysis

The use of big data analysis to implement fund operation management, so that public institutions can timely understand the operating status of funds and formulate targeted financial plans. First of all, based on the analysis of financial data, it can effectively judge the value of funds and product returns in various business and development links, and provide a basis for decision-making. Secondly, through the development of financial information, grasp the benefits of public institutions. Relevant staff can use big data analysis methods to show the operating status of funds in a certain stage in the form of pie charts and line charts to analyze the development of funds in different periods, including characteristics and direction. Based on the analysis of data changes, understand the marketing decisions at that time, and judge whether the work is reasonable. Public institutions should constantly sum up experience, learn lessons in time, further improve the effectiveness of management work, and enhance the scientific nature of decision-making.

3.4. Application in Risk Management

There are many risks in the operation of public institutions, which will generate a lot of data information. The use of big data statistics can facilitate public institutions to find out abnormal places in the operation in time, carry out in-depth implementation analysis, identify existing problems, and facilitate managers to make corresponding decisions. Operation, financial and other management risks, related to the survival and development of public institutions, need to pay attention to. The use of big data statistics in risk management can improve the operation structure, improve security, and provide reliable data for capital operation and long-term management. In addition, it can help public institutions find measures to solve problems, solve problems in a timely and effective manner, and reduce the impact on business operation. For example, a public institution applies big data statistics to implement risk management, focusing on overall planning. First of all, combined with the development of public institutions, the use of computers to build a simulated operation system, simulation management and production and operation of risk loopholes. Around the vulnerability, the use of virtual data to implement security prevention and control, to prevent the impact on the development of public institutions. In addition, secondly, this method is used in the process of operation to avoid risks in operation based on the analysis of data changes. For data with large changes, managers should take timely measures in combination with relevant influencing factors.

3.5. Optimizing the Allocation of Internal Resources

Based on the level of material resources available to public institutions, it is necessary to make statistical analysis of product inventory, purchasing and other data, understand the reasonable amount required for office work, formulate scientific and reasonable purchasing plans, strengthen cost control, and reduce and avoid resource waste. Based on the human resource allocation level, the technology

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can be used to analyze the talent needs of different departments, and then allocate scientifically and effectively. One can also use regression statistics to understand the flow of talents at a certain stage, formulate management systems, optimize the structure, and introduce talents in a timely manner [7].

4. Opportunities and Benefits for the Application of Economic Statistics in the Context of Big Data

4.1. Modern Mathematical Technology in the Context of Big Data to Provide Strong Technical Support for the Enrichment of Economic Theory

In many professional knowledge in economic theory is relatively speaking the most highly abstract theoretical knowledge, in the use of economic statistics knowledge in the practical process, in the statistical work carried out in the practical process of quantification of some variables is difficult to carry out statistics, but this difficulty in the development of big data technology has been resolved in the process of development, in the big data in the economic statistics can be used in the quantification of modern mathematical and theoretical techniques. In the process of economic statisticians, economic statisticians through the tracking of the research object and the use of statistical information system constructed by the government of China in the statistical model to collect data, and with the help of the system to these data for economic theory analysis [8].

4.2. Economic Modeling under the Background of Big Data Is More Accurate and Sustainable

Under the background of big data, economic statistics workers in the work of economic data in a relatively more convenient way, the study of economic statistics more inclined to the micro direction of the transfer of economic statistics workers to carry out their work more easily and conveniently. In the past economic statistics work in the existence of uncontrollable external factors because of the development of big data technology has been effectively resolved, economic statistics work needs to be established in the economic modeling has also become clearer and more accurate under the influence of this, because the economic modeling under the background of the big data can be modeled outside the environmental impact of the factors added to the construction of the economic model for the economic statistics The work of economic statistics can provide a more detailed and comprehensive reference and data support.

4.3. Under the Background of Big Data, Government Economic Statistics Can Be Gradually Customized

In the development of economic statistics without the support of big data technology, in the development of economic research work for research data mostly from the database established in the work, in these databases for data deletion and searching is to occupy most of the time of the economic statistics work of a task, extremely time-consuming work and pull down the efficiency of the work. Relatively in the big data technology support the development of economic statistics, economic statistics workers can big data technology to search for third-party data provided by the economic statistics research and analysis, simplify the work link, improve the efficiency of economic statistics work.

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5. Challenges of Big Data in Economic Statistics

5.1. Ignoring the Importance of Management in Economic Statistics

Because many enterprises do not pay attention to economic statistics, most of the economic statistics employees will feel that the public does not understand economic statistics at all, and there is a great misunderstanding of economic statistics. Not only ordinary employees, but also most leaders do not pay much attention to economic statistics. They think economic statistics is completely unnecessary and have no concept of economic statistics. In order to reduce corporate expenses, some enterprises use funds in positions they think are useful, and these enterprises even do not arrange this position. The economic statistics work is handed over to those unprofessional economic statisticians to complete, therefore, the economic statistics department can not get the technical support that the enterprise should have, without the guidance of superiors and the support of other personnel, the economic statistics work is very difficult, and the economic statistics department of many enterprises can not fully implement the economic statistics work. In the process of enterprise development, economic statistics help to adjust the economic dynamics of enterprises and groups. Some people think that the work of economic statistics is to calculate the profit and loss by sorting out financial statements, and think that it is directly left to other financial personnel to replace it, this view is obviously very wrong. Because enterprises ignore the importance of management work in economic statistics, economic statistics can not reach the working standards, economic statistics can not be effectively carried out, and enterprises can not get fundamental development.

5.2. The Relative Lack of Economic Statistics Application Equipment

In the past, when people carried out economic statistics, the equipment used was generally the relevant calculation model established by computers to analyze certain differences in economic data. After the emergence of computer technology information technology and big data technology, people need to use relevant equipment for comprehensive collection, storage, sorting and calculation of the massive economic data information generated. However, as far as the current economic statistics are concerned, the relevant advanced collection, storage, sorting and calculation equipment of economic statistics is really needed, and the actual situation is that the corresponding advanced equipment supporting the collection, storage, sorting and calculation of a large number of economic data is lacking [9]. Because of the lack of these equipment, it is far from being able to adapt to the current requirements for the collection, storage and calculation of various economic data. In other words, due to the lack of support of these advanced equipment, it is difficult to achieve the collection, storage, collation and calculation of massive economic data information, and thus it is impossible to make a good analysis of social and economic phenomena, making it difficult for economic statistics to play its maximum utility in social and economic construction and development. Then it shows that economic statistics influence the advantages of modern economic development. It can be seen that if you want to do a good job in the application of economic statistics in the era of big data, you must pay attention to, increase investment, improve or original economic statistical equipment, and increase modern advanced economic statistical equipment to meet the requirements of the current economic statistics work.

5.3. Lack of Understanding and Mastery of Big Data

The generation and development of big data is based on the Internet and computers, and professional knowledge and skills are needed to realize the application of big data. In the work of regional economic statistics, the relevant work is mainly completed by the statistical departments, and the personnel in these departments are generally older, and their understanding of the computer and the

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Internet is low, so it is difficult to have a clear understanding of big data, regard it as something dispensable, and think that it has nothing to do with the actual statistical work. There is slack in the economic statistics work, does not pay attention to the application of big data in the work, and even mainly with the help of manual completion of relevant statistical work. This makes the promotion and application of big data in regional economic statistics more difficult, and then limits the development of regional economic statistics, which is one of the important issues that the current regional economic statistics departments need to think about.

6. Application Countermeasures of Economic Statistics

6.1. Update Statistical Concept

If we want to improve the level of economic statistics fundamentally, we must renew the idea of economic statistics. It is necessary to replace traditional ideas with modern ideas and take economic statistics as an important method to explain social and economic phenomena. Enterprises should also establish the concept of scientific development and take the scientific concept of development as an important guideline to guide economic statistics. In daily work and life, we increase the frequency of the application of big data technology in the process of economic statistics. Economic problems are characterized by the analysis of economic statistics and the discovery of close data links within the economic problems, which has a certain complexity. In data analysis and processing, the satisfaction and integrity of the data must be guaranteed, the valuable information can be summarized, the actual economic problems can be effectively used, and the steady development of the social economy can be promoted by solving the problems. In the current data information environment, in order to correctly embody the value of data information, it is necessary to economically implement huge data information and related sequential analysis and processing. Therefore, one need to update the concept of economic statistics in time to facilitate the innovative development of economic statistics and provide opportunities for improving the level of economic statistics [10].

6.2. Cultivate Professional Statistical Talents

In the context of big data to improve the efficiency and quality of economic statistics

The efficiency and quality of work also need to pay attention to the training of statistical professionals who are good at applying big data technology. Emphasis on the cultivation of economic statistics professionals, on the one hand, the need for higher education and vocational education in the economic statistics courses to further improve the curriculum, this improvement is mainly reflected in the economic statistics courses in the content of the teaching of the addition of knowledge related to big data technology, in the process of economic statistics professionals in the development of teaching activities need to supervise the students to receive the theory and technology related to big data knowledge and skills, in order to achieve the purpose of economic statistics in the context of big data. In the process of teaching activities of economic statistics professionals, we need to supervise students to receive the knowledge and skills related to big data theory and technology to realize the purpose of completing the work of economic statistics in the context of big data [11].

On the other hand, to ensure the smooth development of economic statistics in the context of big data, it is also necessary to strengthen the introduction of big data professionals in economic statistics units, so as to help the smooth introduction of big data technology in the promotion of economic statistics, in order to improve the quality and efficiency of economic statistics. In addition, for the staff who are already working in the front line of economic statistics, it is necessary to strengthen the training and management of economic statistics knowledge under the background of big data, so as to improve the understanding of economic statistics staff on big data technology, on the basis of which to guarantee the smooth development of economic statistics.

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On this basis, the smooth development of economic statistics can be guaranteed. To this end, we also emphasize the development of economic statistics under the background of big data to publicize this work, so as to ensure that the economic statistics staff in the development of economic statistics actively accept big data technology, and actively use big data technology to carry out economic statistics work. In the daily assessment of economic statistics units, it is also necessary to emphasize the determination of the training results of economic statistics staff, as a way to urge economic statistics staff to take the initiative to accept the learning of new economic statistics technology. In addition, it is also necessary to strengthen the information literacy training of economic statistics staff, so as to ensure that economic statistics staff can skillfully carry out the operation of a variety of advanced equipment related to big data, and thus improve the efficiency of economic statistics work.

6.3. Increase Equipment Investment

In the era of big data, the application of economic statistics needs to improve the equipment to ensure that the equipment can become a carrier for the smooth application of various advanced technologies. In order to achieve this goal, it is necessary to strengthen equipment investment, introduce advanced equipment in combination with the requirements of economic statistics, and realize the comprehensive application of big data technology. Therefore, it is necessary to strengthen capital support, update and upgrade equipment hardware and software, and improve the efficiency of economic statistics. At the same time, it is necessary to strengthen cooperation with big data enterprises to ensure that economic statistics can be carried out with sufficient technical support, so that economic data can be reasonably analyzed and processed. In practice, it is necessary to build a system that is compatible with economic operation statistics, and integrate various hardware and software tools such as cloud platforms and sensors. In terms of data collection, various devices such as intelligent terminal devices and client monitoring devices need to be installed. According to the system data storage requirements, the data warehouse can be built. Using ETL tool, we can realize the extraction, loading and transformation of system multivariate data. With the help of GIS map in the system, the visual analysis and display of statistical results can be realized. In addition, considering that the application of big data technology requires the support of cloud computing technology, it is necessary to strengthen the construction of corresponding hardware and software facilities, create a good network environment, provide technical support for the mining, transmission, analysis and processing of massive data information, and then ensure the application effect of economic statistics.

7. Conclusion

Big data holds vast potential and extensive application prospects in economic statistics. Under the background of big data era, the reform of economic statistics technology, the enrichment of economic theory and the wide application of data statistical model have brought opportunities for economic statistics. Government, talent and capital are important links to promote the continuous innovation and development of economic statistics theory and technology, and the era of big data has also put forward new challenges to economic statistics. Therefore, the management of various government departments and enterprise departments should pay more attention to economic statistics, pay attention to the recruitment and training of economic statistics talents, and increase capital investment, so that economic statisticians can seize opportunities in time and not be afraid of challenges when facing various opportunities and challenges. All departments should strive to ensure the accuracy of economic data statistics and the effectiveness of economic statistical models to provide a solid data foundation for social and economic development. By harnessing the characteristics and advantages of big data, economic statistics can be improved in terms of accuracy and timeliness, providing more

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accurate reference for economic policy formulation and decision-making. However, the application of big data in economic statistics still faces challenges, such as data privacy protection and data quality management. Further research and exploration are necessary to fully leverage big data's potential and promote the development of economic statistics.

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