Research on the Application of Computer Big Data in Regional Economic Statistics

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Abstract. With the steady progress of social economy on the time axis, regional economic statistics, as an important basis for countries to understand the local economic development and formulate economic development policies, have also made great strides. At present, because of its powerful analysis and statistical function, network big data has been widely used in regional economic statistics. In this paper, the main component analysis method is used as an example, and the application of large data in regional economic statistics can greatly improve the accuracy of statistics, reduce the error, and through the use of computer technology to analyze the existing problems in the application of regional economic statistics in large-scale data, and put forward a solution.

Keywords: Big Data, Economic Statistics, Application

1. Introduction

With the advent of big data's era, modern statistical work has produced new technologies, but also produced new thinking, in order to improve statistical efficiency, improve statistical accuracy, and promote statistics to serve the society have had a very far-reaching impact[1-2]. In the era of economic globalization, information socialization and cultural diversity, the great data is used to realize the change of the industry in the statistical field, and the method innovation is carried out, thus serving the social and economic construction. The application of large-scale data in modern statistical work has become more and more widely used in the work of modern regional economy statistics, although it is mainly used as a means to assist the main statistics, it also exposes the corresponding equipment and technology in the application process. Some of the problems in the area of personnel knowledge have already been solved, and more rich applications and more complex problems are in a further study[3-4].
2. The concept and characteristics of big data

2.1. Big data concept

The so-called big data refers to the daily use of computers for work, entertainment and other activities, the computer network space will produce a large number of relevant information, through the analysis of the content, nature, characteristics and other related aspects of these historical information, the formation of different targeted data information database for different groups of people, so as to provide more close to people's needs of personalized services. For large data, because of its wide coverage and strong adaptability, it can't be defined from any one-sided view, so there is no definite definition to date. It is quantitative, which represents a large number, fast speed and wide variety; it is also on the knowledge level, with cultural, scientific and academic nature, is evolved from the continuous development of various computing and processing in the process of computer development[5].

2.2. Big data features

The data are divided into the past, the present and the future. The network big data is mainly about the past date. It collates, classifies, stores, and forms an extremely large database, and displays it for human or computer reference at the right time, and can even simulate and speculate the future data. In view of the development momentum of network big data in recent years, it is generally believed that big data has the following five important characteristics. Data consistency is growing rapidly; data types are text, picture, audio, but not limited to these types; the trend of big data's exponential growth has put forward higher and higher requirements for the processing ability of the computer; big data is stored without distinguishing the received information and whether it is good or bad; the data stored in big data has great value, but at the same time, there are more garbage information, invalid information and harmful information than quality information, which makes it difficult to discover useful information. It is not difficult to see that the network big data is an endless treasure house, but under its mud and sand, the number of invalid information far exceeds the effective information, and is in a changing dynamic, which has very high requirements for users' information capture ability and screening ability.

3. The present situation of the application of big data statistics

3.1. The application of big data statistics at home and abroad

As early as 2010, the European Union took the lead in opening up the original database, advocating to increase the development of computer network data, and deepen the practical application of network data. The United States also launched a national data development and application program in 2012 to support multi-party cooperation in the development of large data prospects. Next, Japan launched a new national IT strategy in 2013. In 2015, in China’s "Program of Action for the Development of big data ", the State Council clearly proposed to build a data power and speed up the construction of data big development. Big data has been paid special attention at home and abroad, has been developed rapidly, widely used, and is becoming more and more mature, marking the advent of big data's era[6].

3.2. To improve the ability of government governance

As big data increases year by year and increases faster and faster, relevant agencies expect that by 2020, the amount of data human beings will have is 20 times that of a decade ago, and the increase in the last
two years alone has far exceeded the sum of the data that has been stored in history. Under the influence of the endless emergence of high technology and the rapid increase of economic output, various problems are complex, so that the government will not be able to start without the help of big data. The continuous promotion of big data's construction plan will help the government innovate the social governance mechanism, enhance the national governance ability, and enhance the ability to perceive, predict and resist all kinds of risks. A regional government uses big data to count consumer prices in 2018, as shown in Figure 1.

![Figure 1. The statistical results of the change of the consumer price in 2018 by the use of big data](image)

3.3. Result of statistical social reform and economic development

The result of regional economic statistics is the basic work of the national economic development plan, and it is also an important basis for the state to control the macro economy and adjust the layout of economic development. Today, with the gradual prosperity of big data on the network, the reform of the statistical industry is only to comply with the trend, adapt to the new mode of work, make use of the new relations of production, and actively promote big data's in-depth and extensive application in regional economic statistics, which is the requirement for us to carry out the development of science and rely on science.

4. The application of big data in regional economic statistics

4.1. Constructing the economic statistics function of the region

There are many kinds of evaluation methods for regional economic development, and they are closely related to the development of various industries where they are located. The indicators involved are not only numerous in number, but also complex in relationship. Some indicators have great influence, while others do not matter. This requires proper trade-off, and comprehensive statistics to make the evaluation results scientific and accurate and credible. In this paper, the factors of overlap or interaction are eliminated by principal component analysis, and the comprehensive evaluation function is obtained.
After eliminating the dimensional influence of the variables that affect the economic statistics of each region, the collected data are standardized. Get the following formulas.

\[ G = (g_0) n \times m = (g_1, g_2, \ldots, g_m) \]  
\[ Rg_i = \gamma_i g_i \]

R is a matrix, and \( \gamma_i g_i \) is the corresponding eigenvalue and unit eigenvector. \( \gamma_i \geq \gamma_{i-1} \geq 0 \).

By using the statistical software, the contribution rate of the component obtained by the data processing is analyzed, and the effective fraction of the corresponding component is directly obtained.

4.2. Qualitative index treatment

For some qualitative indicators, such as the impact of policy on regional economy and other factors, we modify according to the evaluation value given by experts.

4.3. Construction of regional economic statistical forecasting model

The regional economy, of course, includes all the social and economic branches of the statistical region, involving all aspects of the local economy. The larger the error caused by the higher the requirement of sampling volume, the greater the error caused by the prediction model. The grey prediction model can effectively avoid this problem. After statistical processing of the collected data, we can get the following grey integral equation

\[ \frac{dx^{(1)}}{dt} + gx^1 = l \]  

Among them, ‘g’ and ‘l’ can be obtained by modelling.

5. Problems faced in application and corresponding countermeasures

5.1. Lack of complete statistical equipment

In fact, there are great differences in regional economic development between different regions. This imbalance of development has profound historical and practical reasons, including the geographical location of various regions, educational status, customs, national policies and many other factors. In the process of regional economic statistics in big data, the data collected under different economic conditions are also different, the requirements for statistical tools and equipment are different, and the requirements for statistical methods are not the same. The application of big data in regional economic statistics belongs to the practical application of high technology, which has high requirements for statistical equipment. However, in some economically underdeveloped places, the infrastructure construction is relatively backward, and there is almost no opportunity for big data to exert his talents. Therefore, it is necessary to use more traditional statistical methods to carry out work. Complete statistical equipment is the first problem to be solved in big data's regional economic statistics in areas with relatively backward economic development.
5.2. The level of staff's knowledge of big data

Big data is a concept derived from computer networks, the use of which naturally requires staff to master relevant expertise in computers and networks. The main body of regional economic statistics is the statistical department, and the staffs receive the traditional statistical professional education, which is not related to the computer. They will underestimate or even ignore the great assisting role that big data can play in the statistical work because they are not good at it. Only by adding computer and network related professionals to the future statisticians, or integrating the courses of statistics with those of computer networks, and increasing the training of personnel in related fields, can big data's regional economic statistics be widely carried out.

5.3. Obstacles from traditional statistical methods

Regional economic statistics is a work with a long history. When the computer network has not been fully developed, its working methods have been quite fixed and almost perfect. Under the rapid development of science and technology, the old working methods have been impacted and are facing innovation. Both to statistical departments and to staff, the old methods are familiar, while the new methods of using big data are still being explored, not only need to study hard, break the thinking that has been used to for a long time, practice the way of working attentively, but also there are great variables. Therefore, in order to make big data popularize regional economic statistics rapidly, it is also necessary to carry out ideological education and mobilization to statistical departments and staff.

6. Conclusion

The wide application of big data in regional economic statistics has greatly improved the efficiency of statistical work, but also made the accuracy of statistical results more guaranteed. With the rapid development of network technology, we should make good use of these high technologies with the times, so that they can be transformed into our tools for social service as soon as possible. Although big data's application depth in regional economic statistics is not enough, and there are obvious defects in software and hardware, deepening the research in this field, doing a good job in the training of relevant talents and paying continuous attention to big data's new developments will greatly benefit our statistical work.

References

[1] Li Haoze. Research on the Application of big data in Regional Economic Statistics [J]. Tomorrow's fashion, 2018 (8): 336.
[2] Xu Haitui, he Lin, he Haichen. The Application of big data in Regional economy oriented to the Optimization of Industrial structure [J]. China Statistics, 442 (10): 12 / 14.
[3] Zhang Zhuolin. Research on the relationship between Shanghai Garment sales and Economic Statistics based on big data's thinking [D]. East China University, 2015.
[4] Wang Yuanzhuo, Jin Xiaolong, Cheng Xueqi. Network big data: present situation and Prospect [J]. Chinese Journal of Computers (6): 3 / 16.
[5] Chu Shengjian, Ruan Shengjian. Practice and thinking on the Application of big data's Statistics [J]. Statistical Theory and Practice, 414 (04): 53 (55 62).

[6] He hai. Application research of big data in regional economic statistics [J]. Modern marketing: academy edition, 2018 (1): 102-102.