

The Research on the Positive Influence of Big Data on the Development of Chinese Government Statistics

XueFang Han^{1,a}, HuiChao Feng^{2,b}

¹School of Economics and Management, Beijing Jiaotong University, Beijing, China

²School of Economics and Management, Beijing Jiaotong University, Beijing, China

^a2546813745@qq.com, ^bfhchaowonder@yeah.net

Keywords: Big data, Government statistics, Positive influences.

Abstract. With the rapid development of the information industry in the 21st century, “big data” has penetrated into all walks of life and has also had a greater impact on government statistics. This paper combines the characteristics of current big data and the development status of government statistics, finds that the rise of big data has highlighted the concept of government statistics sharing, improved the quality of government statistics, enriched the sources and types of government statistics, and reduced the cost of government statistical data.

1. Introduction

With the rapid spread of the Internet and intelligent hardware, data has exploded. According to *China Big Data Industry Profile Analysis and Industry Market Analysis in 2017* released by *China Industry Information Network*, global data growth rate will maintain at around 50% since 2008. The global total is expected to reach 40ZB by 2020.

The more data the world produces, the more information it can be analyzed and the more areas it can be applied. Especially in the aspect of government statistics, the role of big data has become increasingly prominent. On October 10, 2017, the director of *National Bureau of Statistics* pointed out that the *National Bureau of Statistics* should not only improve the quality of statistical data and the authenticity of the data, but also raise the scientific of the data. At present, the *National Bureau of Statistics* has established cooperation with *Inspur*, *Alibaba* and other enterprise research mechanism, will further increase the openness and sharing of data, and improve the authenticity, accuracy, completeness and timeliness of statistical data.

In our country, the government statistical has information, consultation and supervision function, as the population scale expansion and diversification of economic and social development, the party and the state put forward new and higher requirements, the general public also has a lot of expectation to statistical work. At this point, it is particularly important for the government statistics department needs to consider how to study top-level design and overall planning, speed up research and use of related technologies, and do a good job in data mining and other statistical work from the perspective of big data, .

2. Literature review

2.1 Research status in foreign countries

In 2008, *Nature* published a special issue to discuss future technical issues and challenges related to big data processing [1]. In 2011, *Science* launched a data processing special publication research report, pointing out the status of big data research and the value it will bring to the community. *IBM* and *McKinsey & Company* released big data research reports respectively. In 2012, *Davos World Economic Forum* released the report *Big Data, Big Impact: New International Development Probability* [2]. The United Nations released the report *To Develop Big Data: Challenges and Opportunities*, expounding the opportunities, major challenges and big data applications brought about by Big Data [3]. The theoretical research of big data has been pushed to a climax through this series of important research results.

The Obama administration creatively introduced the concept of “big data” to the public administration. In 2009, the U.S. federal government issued *The Open Government Directive*, as a prelude to big data and launched the “Data.gov” public data open site. In May 2010, the federal government issued the *Digital Government Strategy* to provide better “digitization” services to the public. A series of measures centered on data has been fully promoted by the U.S. government, and the impact of big data on the U.S. government has gradually emerged [4].

2.2 Research status in China

In the context of big data, the status and functions of government statistics are experiencing various impacts brought by technological progress [5]. Cao pointed out the statistical work function of the government is gradually weakening in the era of big data and the government is no longer the sole owner of massive data [6]. For the government, it is not an easy task to use big data with ease. In particular, there are different types of big data, different reference values, and large quantities, and there is no obvious strong link. It requires the government statistics must be reformed in terms of work philosophy, purpose of work, and work methods [7]. Feng emphasized in order to achieve fundamental reforms in government statistics, all statistical work must take the path of specialization [8], system designers should study the sources of data acquisition, credibility, and cost, and set indicators according to the needs of users [9].

After the application of big data technology, the statistics department’s analysis should be the primary number of collected data. With the popularization of computers and the Internet, the data collection capacity and automation of government statistics data can be rapidly developed [10]. From the point of view of the data generating entity, the sources of big data that can be applied by government statistics are administrative record data, business record data, and the Internet (including search engines) [11]. The government statistics department should strengthen cooperation with various government functional departments, integrate the existing “administrative records” scattered among various functional departments, improve the data collection system of various information sources, and establish a modern government statistics system to maximize the development of the value of these data resources improves the productivity of government statistics departments [12]. In 2015, Professor Jeremy S. Wu of George Washington University proposed the concept of statistics 2.0, affirming that statistical data from the census are important for the development of government, society, economy and science, and can effectively solve practical problems.

3. The Positive Impact of Big Data on Chinese Government Statistics

3.1 Big data can highlight the concept of government statistics sharing

In the past, due to the limited functions of the statistical department, only the direct reporting data could be logically reviewed, but the business review could not be conducted. This made it difficult for the management of various departments. A large number of repeated investigations seriously increased the burden on respondents and reduced the overall work efficiency. In the era of big data, data sharing between government departments is a highly probable event that complies with the trend of development. By building a unified data exchange, sharing and application platform among government departments, the data can be effectively integrated to achieve cross-departmental, cross-regional and cross-industry business information sharing, changing the “private” monopoly to be “public” sharing, satisfying multiple needs, improving the ability of collaborative services between various government departments, improving the quality and efficiency of service for the people, and thereby drastically reducing the government’s management costs [13].

3.2 Big data can improve the quality of government statistics

Due to the limitation of funds and personnel input, the accuracy and coverage of data collected by traditional statistical methods are limited and may not truly reflect the actual situation. The automated process of obtaining information in the era of big data has greatly reduced the probability

of data errors and ensured the authenticity and accuracy of data. At the same time, big data statistics utilizes all data as statistical samples for analysis, surpassing traditional data analysis methods, greatly improving the quality of government statistical products, and enhancing the scientific, accuracy, and predictability of statistical products for government administrators.

3.3 Big data can enrich the sources and types of government statistics

With the development of Internet and Internet of Things technologies, the access to information is more and more convenient, and the types of information acquired are also more diverse. In the information age of the Internet and a variety of sensor coverage, up to ZB-level data basically covers all aspects of social production and life. As a statistical department that collects and arranges social macroeconomic information for government administrations to formulate policies, the use of big data can not only obtain simple social production and living macro-information, but also capture the dynamics of micro-individuals, overcome all drawbacks of traditional statistical sampling surveys, we can come to a more accurate analysis and better serve decision-makers.

3.4 Using big data can directly reduce government data acquisition costs

To carry out a statistical survey, from the formulation of the plan to the implementation of the plan, a lot of manpower and material resources need to be invested in each link, and the final data obtained may also have some deviations. However, in the era of big data, government statistics can directly obtain the company's administrative records and business transaction information, and use these data as the object of statistical investigations. It can not only reduce the input of manpower and material resources, but also ensure the accuracy of data acquisition. For example, the statistics on income and expenditure of urban and rural residents are based on the books of a local resident record. There are few people who are accustomed to using books and it obviously affects the quality of data and costs more. The same effect of a variety of electronic books (such as notes) application interface is beautiful and simple to operate. In the future, it can be fully implemented in the better conditional survey households.

4. Summary

With the informatization process accelerating, the rise of big data has highlighted the concept of government statistics sharing, improved the quality of government statistics, enriched the sources and types of government statistics, reduced the cost of government statistical data, and promoted innovation in government statistics, the government statistical system in order to continue to occupy a dominant position in the wave of the information age, it is necessary to constantly transform the functions and thinking modes of government statistical departments, build a statistical institution system that meets the requirements of big data, master and establish data security and management technology centers, and build a statistical institution system that meets the requirements of big data.

References

- [1] Nature, Data wrangling, <http://www.nature.com/news/specials/bigdata/index.html/>, 2008-09-03.
- [2] World Economic Forum, Big Data, Big Impact: New Possibilities for International Development, <http://www3.weforum.org/docs/WEF-TC-MFS-BigDataBigImpact-Briefing-2012.pdf>, 2014-05-10.
- [3] UN Global Pulse, Big Data for Development: Challenges&Opportunities, [http://www.unglobalpulse.org/projects/Big data of or development](http://www.unglobalpulse.org/projects/Big_data_of_or_development), 2014-05-10.
- [4] Big Data Research and Development Initiative, http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital_government-strategy.pdf, (2012-05-23)2014-05-10.
- [5] Li, D, Research on the Innovation of Governmental Statistics Work Patterns and their Supportive Measures in the Era of Big Data, *Statistics and Consultation*, vol. 5, pp. 15-16, 2014.

- [6] Cao, M, Discussion on the Challenges and Opportunities for Government Statistics in the Era of Big Data, *National Business Intelligence Theory Study*, vol. 4, pp. 78-79, 2016.
- [7] Lu, Q, Research on Statistics Data Form and Government Statistics Work Method in the Background of Big Data Era, *Statistics and Management*, vol. 8, pp. 131-132, 2017.
- [8] Feng, X, Reform of government statistics work in the era of big data, *Modern Economic Information*, vol. 10, pp. 287-287, 2016.
- [9] Xu, C, Reflections on the Reform of Marine Statistics in the Era of Big Data, *Marine Economics*, vol. 6, pp. 54-60, 2016.
- [10] Zhou, Y, Opportunities and Challenges Faced by Government Statistics Work in the Era of Big Data, *Management and Technology of Small and Medium-sized Enterprises (Pre-Sketch)* , vol. 2, pp. 84-85, 2018.
- [11] Jiang, S, Government Statistics in the Era of Big Data, *Research World*, vol. 4, pp. 62-64, 2014.
- [12] Zhao, Y and Zhou, F, On the New Mode of Statistics Reform and Development of Chinese Government in the Era of Big Data, *Teaching and Research*, vol. 48, pp. 20-26, 2014.
- [13] Zhang, M and Zhang, C, Analysis of the impact of the coming of big data era on government statistics, *Statistical Science and Practice*, vol. 3, pp. 60-62, 2014.