The Application of Big Data in Modern National Economy and Politics

Tian Weili

Beijing Administration institute, Beijing, People's Republic of China; tianweili1122@126.com

ABSTRACT

Big data is a new stage of informatization development. With the convergence and integration of information technology and human production and life, the rapid spread of the Internet, global data showing explosive growth and massive agglomeration, have had a significant impact on economic development, social governance, national management, and people's lives.

Countries around the world regard the promotion of economic digitization as an important driving force for innovation and development, and have made forward-looking layouts in cutting-edge technology research and development, data open sharing, privacy and security protection, and talent training.

In-depth understanding of the current situation and trends of big data development, and its impact on economic and social development, analyze the achievements and existing problems of my country's big data development, summarize and discuss the government's response strategies, and promote the innovation of government management and social governance models, and realize government decision-making Identification, precise social governance, and efficient public services all have important meanings.

Keywords: big data, national governance, national strategy, government decision-making, digital economy

Применение больших данных в современной национальной экономике и политике

Тянь Вэйли

Пекинский институт управления, Пекин, Китайская Народная Республика; tianweili1122@126.com

РЕФЕРАТ

Большие данные — это новый этап развития информатизации. В результате сближения и интеграции информационных технологий, производства и жизни людей, быстрого распространения интернета, глобальные данные, свидетельствующие о взрывном росте и массовой агломерации, оказали значительное влияние на экономическое развитие, социальное управление, национальную стратегию и жизнь людей.

Страны по всему миру рассматривают поощрение оцифровки экономики как важную движущую силу инноваций и развития и разрабатывают перспективные планы в области передовых технологических исследований, открытого обмена данными, защиты конфиденциальности и безопасности, а также обучения.

Углубленное понимание нынешней ситуации и тенденций развития больших данных и их влияния на социально-экономическое развитие, анализ достижений и существующих проблем развития больших данных позволяют подытожить и обсудить стратегии реагирования правительства, а также содействовать инновациям в области государственного управления и моделей социального управления. Идентификация, грамотное социальное управление и эффективные государственные службы — все это имеет важное значение.

I. Introduction

Big data is a data collection characterized by large capacity, multiple types, fast access speed, and high application value. It is rapidly developing into the collection, storage and correlation analysis of data with a huge amount, scattered sources, and diverse formats. A new generation of information technology and service formats with new knowledge, creation of new value, and enhancement of new capabilities.

The convergence and integration of information technology and economic society has led to the rapid growth of data. Data has become a national basic strategic resource. Big data is increasingly affecting global production, circulation, distribution, consumption activities, economic operation mechanisms, social lifestyles, and national governance capabilities. Significant influence.

At present, my country has a certain foundation in the development and application of big data, has market advantages and development potential, and many related engineering plans are being gradually advanced. However, there are also problems such as insufficient openness and sharing of government data, weak industrial foundation, lack of top-level design and overall planning, lagging in the construction of laws and regulations, and limited areas of innovation and application, which need to be resolved urgently.

II. The background and development history of big data

1. The background of big data

(1) Information Technology Progress

The modern information technology industry has a history of more than 70 years, and its development process has experienced several waves. First was the wave of mainframes in the 1960s and 1970s. At this time, computers were huge and had low computing power. After the 1980s, with the continuous development of microelectronics and integration technologies, various computer chips have been miniaturized, a wave of microcomputers has emerged, and PCs have become the mainstream. At the end of the last century, with the rise of the Internet and rapid development of network technology, a wave of networking was set off, and more and more people were able to access and use the Internet.

In recent years, with the rise of mobile phones and other smart devices, the number of people online on the global network has surged. Our lives have been surrounded by digital information, and this so-called digital information are what we usually call "data", which we can call it for the big data wave. The continuous popularization of intelligent equipment is an important factor in the rapid growth of big data.

Faced with the explosive growth of data, the performance of storage devices must also be improved accordingly. American scientist Gordon Moore discovered the "Moore's Law" of the law of transistor growth. Under the guidance of Moore's Law, the computer industry will be updated periodically, which is reflected in the continuous improvement of computing power and performance. At the same time, the previous low-speed bandwidth is far from

meeting the requirements of data transmission. Various high-speed and high frequency bandwidths have been continuously put into use. The growth rate of optical fiber transmission bandwidth even surpasses the improvement rate of storage device performance, which is called Super Moore's Law.

The popularization of smart devices, the widespread application of the Internet of Things, the improvement of storage device performance, and the continuous growth of network bandwidth are all advances in information technology, which provide the material basis for storage and circulation of big data.

(2) The rise of cloud computing technology

Cloud computing technology is an emerging technology in the Internet industry. Its appearance has brought about tremendous changes in the Internet industry. The various network cloud disks we usually use are a manifestation of cloud computing technology. Generally speaking, cloud computing technology is to use cloud-shared software, hardware, and various applications to get the operation results we want, and the operation process is completed by a professional cloud service team. What we usually call the cloud is the "data center". Now major domestic Internet companies, telecom operators, banks, and even government ministries have established their own data centers. Cloud computing technology has been popularized in all walks of life, and is further occupied. Dominance.

Cloud space is a new mode of data storage. Cloud computing technology concentrates originally scattered data in the data center, providing the possibility for the processing and analysis of huge data. It can be said that cloud computing is a huge data storage for big data and scattered users. Access provides the necessary space and channels, and is the technical basis for the birth of big data.

(3) Trend of data resource utilization

According to the source of generation, big data can be divided into consumption big data and industrial big data. Consumption big data is mass data generated in people's daily life. Although it is only a mark left by people on the Internet, major Internet companies have already begun to accumulate and compete for data. Google relies on the world's largest web database to fully tap the potential of data assets. Value, breaking the monopoly of Microsoft; Facebook launched the graph search search engine based on the interpersonal database; the two largest domestic e-commerce platforms, Alibaba and JD.com, have also fought data wars, using data to evaluate opponents' strategic trends and promotion strategies and many more. In terms of industrial big data, many traditional manufacturing companies have used big data to successfully achieve digital transformation. It shows that with the rapid popularization of "smart manufacturing" and the deep integration and innovation of industry and the Internet, industrial big data technology and applications will become the future to enhance manufacturing productivity and competition. The key element of power and innovation ability.

2. Development history of big data

(1) The budding period (1990s to the beginning of the 21st century)

The concept of "big data" originally originated in the United States. As early as 1980, in the book "The Third Wave" written by the famous futurist Alvin Toffler, "big data" was praised as "the splendor of the third wave" Movement". With the rise of complexity science in the 1990s, it not only provided us with complex and holistic ways of thinking and scientific research methods, but also brought us an organic view of nature. In 1997, David Ellsworth and Michael Cox of NASA Arms Research Center used the concept of "big data" for the first time when they were studying the problem of data visualization. At that time, they firmly believed that the rapid development of information technology would definitely bring about the problem of data redundancy, and data processing

technology would definitely develop further. In 1998, an article titled "Visualization of big data Science" was published in the US magazine "Nature", and big data officially appeared as a term in public publications.

This stage can be regarded as the embryonic period of the development of big data. At that time, big data was only studied and discussed by a very small number of scholars as a concept or hypothesis, and its meaning was limited to the huge amount of data and did not go further. Exploring issues related to data collection, processing and storage.

(2) Development period (early 21st century to 2010)

In the first ten years of the 21st century, the Internet industry has ushered in a period of rapid development, and IT technology has also been constantly innovating. Big data was the first to receive attention in the Internet industry. In 2001, META Group (later acquired by Gartner) analyst Doug Lenny put forward the challenges and opportunities of data growth in three directions: volume (Volume, data size), velocity (Velocity, data input and output) Speed), category (Variety, data diversity), collectively referred to as "3V". On this basis, McKinsey has increased the value density (Value), which constitutes the "4V" feature of big data.

In 2005, big data achieved a major breakthrough, and Hadoop technology was born and became the main technology of data analysis. In 2007, the emergence of data-intensive science not only provided a new research paradigm for the scientific community, but also provided a scientific basis for the development of big data. In 2008, the American "Nature" magazine launched a series of special issues on big data, discussing a series of issues related to big data in detail, and big data began to attract people's attention. In 2010, the U.S. Information Technology Advisory Committee (PITAC) released a report called "Planning for the Digital Future", which detailed the collection and use of big data in government work. The U.S. government has paid great attention to the development of big data. This stage is regarded as the development period of big data. As an emerging term, big data has begun to attract the attention of theorists. Its concepts and characteristics have been further enriched. Related data processing technologies have appeared one after another, and big data has begun to show its vitality.

(3) Flourishing period (since 2011)

In 2011, IBM developed the Watson supercomputer, which broke the world record by scanning and analyzing 4TB of data per second, and big data computing reached a new height. Immediately afterwards, McKinsey released a research report entitled "Massive Data, Innovation, Competition, and the Next New Field to Increase Generation Rate", which introduced in detail the application of big data in various fields, as well as the technical architecture of big data, reminding In response to the advent of the era of big data, governments of all countries should formulate corresponding strategies as soon as possible. In 2012, the World Economic Forum was held in Davos, Switzerland. At the meeting, a series of issues related to big data were discussed and a report called "Big Data, Big Impact" was released, officially announcing the arrival of the era of big data to the world. The United Nations released the white paper "Big Data for Development: Challenges and Opportunities" in May 2012, discussing how to use Internet data to promote global development.

3. Development status and importance of big data

Globally, the use of big data to promote economic development, improve social governance, and enhance government services and regulatory capabilities is becoming a trend. Relevant developed countries have successively formulated and implemented big data strategic documents to vigorously promote the development and application of big data. At present,

the scale of Internet and mobile Internet users in my country ranks first in the world, with abundant data resources and application market advantages. Breakthroughs have been made in the research and development of some key technologies of big data, and a number of innovative Internet enterprises and innovative applications have emerged. Some local governments have launched large-scale applications. Data related work. Adhering to innovation-driven development, accelerating the deployment of big data, and deepening the application of big data have become an inherent need and inevitable choice for stabilizing growth, promoting reform, adjusting structure, benefiting people's livelihood, and promoting the modernization of government governance capabilities.

(1) Big data has become a new driving force
for economic transformation and development

Leading technology flow, material flow, capital flow, and talent flow with data flow will profoundly affect the organizational model of social division of labor and collaboration, and promote the intensive and innovative production and organization methods. Big data promotes the networked sharing, intensive integration, collaborative development and efficient utilization of social production factors, changing the traditional production methods and economic operation mechanisms, and can significantly improve the level and efficiency of economic operation. Big data continues to stimulate business model innovation, and constantly spawns new business formats. It has become an important driving force for the Internet and other emerging fields to promote business innovation and increase value and enhance the core value of enterprises. The big data industry is becoming a new economic growth point and will have an important impact on the future information industry structure.

(2) Big data has become a new opportunity to reshape
the country's competitive advantage

In the context of the rapid development of global informatization, big data has become an important basic strategic resource of the country and is leading a new round of technological innovation. Making full use of my country's data scale advantages, realizing the simultaneous improvement of data scale, quality and application level, exploring and releasing the potential value of data resources, is conducive to better giving play to the strategic role of data resources, enhancing cyberspace data sovereignty protection capabilities, and maintaining national security, Effectively enhance the national competitiveness.

(3) Big data has become a new way to improve government governance capabilities

Big data applications can reveal connections that are difficult to show by traditional technical methods, promote open sharing of government data, and promote social enterprise data integration and resource integration, which will greatly enhance the government's overall data analysis capabilities and provide new means for effectively dealing with complex social issues. Establishing a management mechanism of "using data to speak, using data to make decisions, using data to manage, and using data to innovate" to achieve scientific decision-making based on data will promote the progress of government management concepts and social governance models, and gradually realize the modernization of government governance capabilities.

III. Comparison of Big Data Strategies in Countries in the World

1. Big data strategies of major countries and organizations in the world

The current successful cases of big data applications are mainly concentrated in developed countries in Europe and the United States. In addition to technological breakthroughs and

application innovations, big data is gradually causing changes in public ideology and even deep adjustments in social structure. It has received extensive attention from major countries and regions in the world, and they have put forward specific big data development strategies from the national level. Due to the rapid development of big data itself, with the continuous development of storage devices, recording tools and analysis technologies, the depth and influence of its application are also changing with each passing day. The big data strategies of various countries are also based on the overall development trend of the country.

(1) United States

In 2009, the U.S. Federal Government issued "The Open Government Directive", which launched the Data.gov public data open website as a prelude to big data.

In March 2012, the U.S. federal government released the "Big Data Research and Development Initiative", which officially launched the "Big Data Development Plan" and announced that it would invest more than US$200 million to start big data research.

"Big Data Research and Development Initiative", which expresses the national big data strategy as follows: "By collecting and processing huge and complex data information, gaining knowledge and insights from it, enhancing capabilities, accelerating the pace of innovation in science and engineering, and strengthening the U.S. territory Security, change the mode of education and learning".

In May of the same year, the federal government issued the "Digital Government Strategy", which elevated big data to a national strategy related to the country's core competitiveness, and believed that the big data development plan was another major issue in the field of information science after the "information highway plan". The initiative is committed to providing better "digital" services to the public. A series of measures centered on data have been comprehensively promoted by the US government, and the impact of big data on the US government has gradually emerged.

(2) United Kingdom

The British government launched the government data website Data.gov.uk in 2010, which has similar functions to the Data.gov platform in the United States, but mainly focuses on the improvement of big data information mining and acquisition capabilities. Based on this, a new government data website was released in 2012. The government's digital strategy, specifically led by the Department for BIS, established the Data Strategy Board (DSB), to provide relevant services for the government, private sector, third-party organizations and individuals through the opening of big data, and to absorb More technical strength and financial support will help broaden data sources to promote employment and the development of emerging industries, and achieve social and economic growth driven by big data.

In 2013, the British government increased its financial support for research in the field of big data, and proposed a total funding plan of 189 million pounds, including a direct investment of 10 million pounds to establish an "Open Data Institute".

(3) European Union

As a political community, the starting point of the EU's big data strategy is different from that of general entity countries. It emphasizes technology-oriented data sharing and eliminates the information barrier between member countries. In November 2010, the European Communications Commission submitted a research report entitled "Open Data: The Engine of Innovation, Growth and Transparent Governance" to the European Parliament. It developed a big data-related strategy around open data and was adopted by the European Union Digital Agenda in November 2011. , As the "EU Open Data Strategy" deployment and implementation. Its core is to promote the openness and transparency of public data owned by the governments of member states. Through the construction of

data processing, sharing platform and scientific research data infrastructure, all information of the EU public administration department is opened to the whole society, and the membership of the "pan-European portal" is realized. National barrier-free information sharing.

(4) Australia

Australian Government Information Management office, AGIMO released the "Australian Public Service Big Data Strategy" in August 2013, which put forward 6 principles of big data strategy:

- Data is a National asset;
- Privacy by design;
- Data integrity and the transparency of processes;
- Skills, resources and capabilities will be shared;
- Collaboration with industry and academia;
- Enhancing open data.

It can be seen that Australia's big data strategy pays more attention to the protection of public privacy and encourages the government to cooperate with social entities in other fields to provide better public services and policy guidance, thereby gaining public trust in the government's possession and management of big data.

(5) Japan

In May 2010, Japan's Advanced Information and Communication Network Society Promotion Strategy Headquarters issued the "New Information and Communication Technology Strategy" with the goal of realizing a national-based e-government and strengthening mutual assistance relations between regions. On this basis, the Ministry of Internal Affairs and Communications In July 2012, a new comprehensive strategy of "Active ICT Japan" was released, focusing on the development of a big data strategy through technological innovation, thereby realizing a citizen-based e-government and strengthening mutual assistance relationships between regions.

In practical applications, Japan's big data strategy has played an important role. The combination of ICT technology and big data information capabilities has contributed significantly to assisting in solving public problems such as disaster relief and the Fukushima nuclear power accident, and realizing social public value promotion.

(6) Korea

Under the guidance of the "Creative Economy" national development policy advocated by the Park Geun-hye government, various departments in South Korea have proposed specific big data development plans, including the "Big Data" based on the "Building Intel Comprehensive Database" by the Korea Institute of Science and Technology Policy in 2011. Central Strategy" and the strategic plan for the future development of big data formulated by the National Science and Technology Commission of Korea in 2012. Among them, in 2012, the national-level large data and cloud computing system-related enterprises were trained by the Ministry of Future Creation and Science. The data development plan is implemented to the production level through a number of specific development strategies such as the "Fifth National Informatization Basic Plan (2013-2017)".

2. Main features of big data strategies in various countries

It can be seen that the priorities of big data strategic planning in different countries are not the same, but combined with the characteristics of the massive data itself in the era of big data, the public value from expression, conflict, mediation to identification, and promotion are all developed in a new paradigm. These big data plans can be summarized in the following three aspects from the perspective of public value:

(1) R & D support

Enriching big data mining and analysis tools to form a more comprehensive and in-depth understanding of society will help the government identify public value needs and judge their importance in an increasingly complex and dynamic social environment.

(2) Data sharing

The important foundation of public value mediation lies in the communication and interaction after comprehensively mastering information. Most of the value conflicts of the multiple social subjects originate from the prisoner's dilemma and double-blind selection interpretation under the reality of information asymmetry, which causes technical defects in the value mediation link. With the support of big data, a comprehensive and detailed grasp of conflict-related information and real-time judgments will help to better solve the problem of information asymmetry, thereby improving the effect of value conflict mediation.

(3) Strategic security

Using standards to guide and control, the application-level trend can realize the guidance of public value requirements, the guarantee of data sovereignty and national security, and it is a necessary content for the government to promote the generation of public value.

IV. The guiding ideology and overall goals of the Chinese government's big data application

1. Big data and government governance

Develop and use big data to create a new model of social governance featuring precise governance and multi-party collaboration.

Take big data as an important means to improve the government's governance capabilities. Through efficient collection, effective integration, and in-depth application of government data and social data, the level of government decision-making and risk prevention will be improved, the accuracy and effectiveness of social governance will be improved, and the capacity of rural social governance will be enhanced ; Facilitate the streamlining of administration and decentralization, support the transition from pre-approval to mid- and post-event supervision, and promote the reform of the commercial system; promote the organic integration of government supervision and social supervision, and effectively mobilize social forces to participate in social governance. At the end of 2017, a cross-departmental data resource sharing and sharing pattern has been formed.

2. Big data and economic governance

Develop and use big data to establish a new economic operation mechanism that is stable, safe and efficient.

Make full use of big data to continuously improve the ability to acquire and utilize data resources in the fields of credit, finance, finance, taxation, agriculture, statistics, import and export, resources and environment, product quality, corporate registration and supervision, enrich the sources of economic statistics, and achieve economic benefits Operate more accurate monitoring, analysis, forecasting, and early warning, improve the pertinence, scientificity and timeliness of decision-making, improve the management efficiency of macro-control and industrial development, credit system, market supervision, etc., ensure the balance of supply and demand, and promote the stable operation of the economy .

3. Big data and public services

Develop and use big data to build a new people-oriented service system for people's livelihood.

Focusing on the construction of a service-oriented government, in public utilities, municipal management, urban and rural environment, rural life, health care, disaster reduction and relief, social assistance, elderly services, labor and employment, social security, cultural education, transportation and tourism, quality and safety, consumer rights protection, and communities Comprehensive promotion of big data applications in services and other fields, using big data to insight into people's livelihood needs, optimizing resource allocation, enriching service content, expanding service channels, expanding service scope, improving service quality, enhancing urban radiation capabilities, promoting the extension of public services to the grassroots, and reducing urban and rural areas , Regional gaps, promote the formation of a fair, inclusive, convenient and efficient livelihood service system, and continue to meet the increasing individual and diversified needs of the people.

4. Big data and business innovation

Develop and use big data to open up a new innovation-driven pattern of mass entrepreneurship and innovation.

Form a legal system and policy system for the reasonable and appropriate open sharing of public data resources. At present, a unified and open platform for national government data has been established, taking the lead in credit, transportation, medical care, health, employment, social security, geography, culture, education, science and technology, resources, and agriculture. , Environment, safety supervision, finance, quality, statistics, meteorology, ocean, business registration and supervision and other important fields, realize the reasonable and appropriate opening of public data resources to the society, and drive the public to carry out the value-added, public welfare development and innovative applications of big data, and fully release The data dividend stimulates the entrepreneurial and innovative vitality of the masses.

Develop and use big data to foster a new ecosystem of high-end intelligence, emerging and prosperous industrial development.

Promote the integrated development of new-generation information technologies such as big data and cloud computing, Internet of Things, and mobile Internet, explore new business forms and models for the coordinated development of big data and traditional industries, promote the transformation and upgrading of traditional industries and the development of emerging industries, and cultivate new economic growth point. Form a batch of products, systems and solutions that meet the needs of major applications of big data, and establish a secure and reliable big data technology system. Big data products and services have reached the international advanced level, and the domestic market share has increased significantly.

V. Specific tasks to promote the development of big data at the national level

Accelerate the open sharing of government data, promote resource integration, and improve governance capabilities. Promote data sharing among government departments; promote the openness of public data resources; coordinate the construction of big data infrastructure; support the identification of macro-control; promote the precision of government governance; promote the convenience of commercial services; promote the efficiency of safety and security; accelerate the inclusiveness of people's livelihood services.

Promote industrial innovation and development, cultivate emerging business formats, and facilitate economic transformation. Development of industrial big data; develop big data in emerging industries; develop big data in agriculture and rural areas; develop big data for innovation and innovation; promote basic research and core technology research; form a big data product system; improve the big data industry chain.

Strengthen safety guarantee, improve management level, and promote healthy development Improve the big data security guarantee system; strengthen safety support.

Improve the policy mechanism and speed up the formulation and introduction of supporting policies speed up the construction of laws and regulations; improve the market development mechanism; establish a standard specification system; increase financial support; strengthen the training of professional talents; promote international exchanges and cooperation.

VI. Using big data to promote the modernization of national governance

Big data is not only a technological and industrial revolution; it will also bring about profound changes in national governance. As a national basic strategic resource, big data can effectively integrate data information in the national economy, politics, culture, society, ecology and other fields, provide important data foundation and decision support for the modernization of the national governance system and governance capabilities, and promote government services new ways to reform and improve the government's governance capabilities. All government workers should establish the "Internet + big data" thinking, take advantage of the Internet, make full use of big data, promote scientific government decision-making, achieve precise social governance, and improve the efficiency of public services.

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About the author:
Tian Weili, Beijing Administration Institute (Beijing, People's Republic of China), master of Software Engineering, Engineer; tianweili1122@126.com

Об авторе:
Тянь Вэйли, Пекинский административный институт (Пекин, Китайская Народная Республика), магистр по программному обеспечению, инженер; tianweili1122@126.com