Government Governance in the Background of Big Data: Challenges and Optimization Paths

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Abstract. The emergence of a new generation of information technology, such as cloud computing, big data and artificial intelligence, and the high integration of all walks of life have brought powerful and profound changes to society, and also provided an important opportunity for the modernization of government governance. The local government governance model is an important support for the high-level development of a region, which improves the efficiency and level of government governance. However, in the context of big data, government governance and big data integration are characterized by instability, sensitivity and complexity. A series of constraints, such as the difficulty in changing the traditional decision-making model, the low degree of coordination between government departments, the lack of big data technical talents, and the immature legal system of big data, pose great challenges to the government governance model. This paper takes the innovation of government governance model under the background of big data as the research object, analyzes and discusses the problems faced by government governance and the optimization path of government governance mode innovation.

Keywords: big data · government governance · dilemma

1 Introduction

Human beings are entering the age of data technology from the age of information technology. Data is becoming the core resource, and a new national management model - digital government has been derived. Suggestions of the Central Committee of the Communist Party of China on Formulating the Fourteenth Five Year Plan for National Economic and Social Development and the Plan for 2013, and the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China on Building a Cyber Power and a Digital China to Improve Economic Quality, Efficiency and Core Competitiveness [1]. On the basis of fully understanding the connotation of big data driven, we can define the concept innovation and reform direction of government governance driven by big data [2]. Analyze the challenges faced by the big data driven leapfrog policies, technologies, practices and other multi-level and multi field governance reforms in the government, and explore the current optimization path with the digital government as the core and the goal of improving the level of government governance. Chinese scholars mostly study from the use of government data, while there is less research on

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the improvement of local government governance capacity under the background of big data. In view of this, this paper, against the background of the big data era, analyzes that the government uses big data technology to improve the governance capacity of local governments, and constantly promotes the modernization of the national governance system and governance capacity, so as to provide reference for academia and relevant departments.

2 Government Governance Dilemma

2.1 Challenges to Traditional Decision Models

Traditional society relies on information monopoly and control to govern. There are barriers to the nondisclosure of information. Information means a kind of power. Therefore, controlling information means maintaining authority and controlling power. In the modern information society, due to the technological innovation of the Internet and social software, every society has become the source of media, which has changed the situation of information asymmetry in the past. Information shows a trend of openness, flow and sharing. Change has broken the concentration of power. The "huge, open and shared" characteristics of big data require government departments to change their previous working methods and decision-making models. However, the traditional bureaucratic management mode, one-way communication and vertical leadership system enable the government to maintain its inherent thinking when making decisions. Leading cadres failed to change the traditional decision-making mode in a short time, nor did they form the application of data analysis. Without big data governance thinking concept, it is impossible to actively face and apply big data, leading to the unavailability of many valuable data, which largely weakens the driving role of big data in government governance reform.

2.2 Inadequate Data Opening and Sharing

The openness of Chinese government data lags far behind that of developed countries. The United States, Singapore and other countries issued the directive on opening government data as early as 2010, while China did not propose to promote the sharing, development and utilization of public information resources until 2013. The information sources of big data are diverse and complex. They can come from external organizations such as individual citizens, enterprises or non-profit organizations, or from internal organizations of local government departments. The data collection and integration of local government departments are closely related to the society, but a large amount of data collection of each government department comes from its governance process, lacking top-level scientific design, lagging behind big data thinking, and the government lacks big data. Due to the lack of communication and exchange between departments, data sharing mechanisms and information service platforms are extremely scarce, and data between departments is gradually privatized. Without sharing awareness, it is difficult to establish an effective data sharing management system. All government departments have failed to contact and cooperate well, and there is a lack of useful data sharing

between them. The two-way flow of data and information between the central and local governments is also not ideal. As can be seen from Fig. 1 that resources are not used effectively, which means that although we have a lot of data resources, they may be difficult to use, which makes it difficult for government departments to cooperate with internal and external departments, and leads to social management with half the effort.

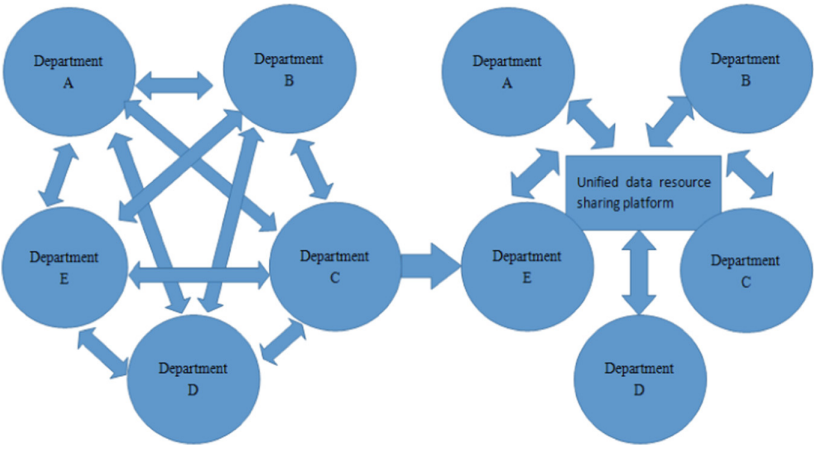

Fig. 1. Unified data resource sharing platform

2.3 The Big Data Security Management Legal System is not Mature Enough

Big data has created an unprecedented era of development. "Big data" is not only a physical concept, but also a social concept. Big data is widely used in social activities as a new culture. The development and utilization of big data and the security and confidentiality of personal information should not be either or. However, many lessons remind us that development and regulation are easily ignored, and information security has always been one of the key issues in the development of the information technology era. The government has collected a large number of private data of citizens in the information construction. These data can help the government to conduct more optimized management, but at the same time, the government is also facing the negative impact of big data. At the same time, in the process of government governance, if the data has no legal norms and exceeds the limit of reasonable use, it will challenge the legal authority and affect social stability [3]. In order to maintain its stability, the law is relatively backward and cannot cover all new issues in various fields of social development. Although the Basic Law of Network Security Law has been issued, the Personal Information Protection Law and the Data Security Law have also been actively implemented in the national legislative plan. However, on the whole, China's laws and regulations related to big data are still imperfect, and there are still problems such as the general expression of laws and regulations, weak pertinence and operability, low legislative level, untimely legislation, insufficient convergence of laws and regulations, and weak systematicness and coordination [4]. There are still legal gaps in some areas related to big data.

2.4 Lack of Big Data Technical Talents

Compared with developed countries, Chinese government departments are relatively short of big data and big data talents. Although the government has set up the information sector, it has ignored the role of the information sector and still uses traditional methods and experience to solve problems [5]. Complex talents who can apply big data to government governance are very scarce. First of all, there is a shortage of talents with the ability of data processing and induction. For example, big data audit offices often need to summarize and analyze data through data generalization, statistical analysis, clustering analysis and other technologies to discover the potential data value in huge data, which requires the use of professional models. However, due to the lack of professional competence of staff, such data analysis techniques have not been widely used. With the collection of large amounts of data in law enforcement departments, they urgently need comprehensive talents with big data thinking and innovation ability to give them guidance and help [6]. The use of professional big data talents plays a very important supporting role in data mining and application, which directly relates to whether China can achieve breakthroughs in using big data to achieve government governance innovation. From the current talent training mechanism, school enterprise cooperation and government enterprise cooperation are slow. There is no clear communication and division of labor among all units, which greatly hinders the training process of big data professionals.

3 Materials and Methods

3.1 The Biggest Impact of Big Data on Government Governance is the Change of Decision-Making Methods

Big data requires us to change the traditional way of thinking, apply big data to the decision-making system, and integrate the hierarchical and phased characteristics of government decision-making data. Big data will greatly promote the scientific decision-making and precise policy implementation of government governance from concept to method. First of all, big data has a new impact on decision-making thinking and decision-making thinking. It has established a big data awareness to adapt to the information society, paid close attention to big data related knowledge and theories, and strengthened the publicity and training of social governance subjects using big data. The active use of big data technology has improved public management and services and avoided empiricism. Big data will change the previous decision mode that lacks tracking evaluation and closed-loop feedback. In the big data environment, it is easier for leaders to establish closed-loop management. It is easy to form, and the feedback will be more accurate, so as to achieve continuous innovation and optimization of the decision-making system. The analysis of big data and dynamic data information improves the scientific understanding of government decision-making environment and problems. It innovates and optimizes the decision-making process by deeply mining decision feedback data and social participation behavior data. Data analysis can monitor the decision-making process in real time. Understand the factors and conditions that affect decision execution. Once problems occur, data analysis can provide timely feedback, and decision

makers can correct and adjust them in time. Strengthen the ability to grasp the law of big data development, and form a scientific governance thinking that matches government governance innovation.

3.2 Build Big Data Collaboration Mechanism

Big data technology requires highly open and shared data resources, which is actually forcing the government to carry out reform, implement in-depth institutional reform, establish big data thinking that attaches importance to data publishing and in-depth processing, enhance the top-level design of big data applications, and break data. The monopoly mode promotes the social value of data development for economic development and government governance. It uses big data as governance resources and measures to integrate different governance levels, departments, internal and external digital information systems. We can learn from the experience of Pudong New Area, build a "big data collaborative sharing mechanism", encourage qualified units to use big data, cloud computing, artificial intelligence, blockchain and other modern scientific and technological means to achieve core data docking, and explore the establishment of a cross departmental big data sharing platform. On the basis of realizing data "sharing", it is a further idea to build a data "cooperation" platform. "After realizing 'sharing', the next step is to realize the deep mining of data value."

3.3 Establish and Improve Big Data Security Management Legal System

In the context of big data, in the process of government governance, a large amount of data will be used to help government decision-making and government services to a certain extent. According to the possible impact of big data technology on various fields of society, the overall planning and top-level design of the law are used to achieve the full life cycle protection of data [7]. Strengthen the construction of data security system through big data legislation, clarify the legal boundary between data privacy and personal freedom, reasonably balance the contradiction between data disclosure and personal privacy within the legal framework, and fully incorporate data security into the government governance process. Establish scientific and reasonable performance appraisal management methods. In specific practice, we need to improve big data related laws and regulations as soon as possible, promote personal privacy protection legislation, and provide legal protection for the smooth implementation of data governance. The government should strengthen data security governance, establish relevant organizations for data security maintenance, establish a complete data security protection system from prevention to post-processing, and constantly improve data access control technology, abnormal behavior analysis technology, storage encryption technology, firewall technology and a series of related security technology support to ensure the real realization of data security.

3.4 Establish Big Data Talent System

There are many factors affecting the development of big data technology at this stage, and the lack of big data related technical talents is an urgent problem to be solved [8].

Talents from all walks of life are scarce resources of the society. Due to the huge and complex amount of data and information to be processed by local governments, the requirements for relevant technicians and data analysts are extremely strict. In terms of data analysis and data mining, high-level data analysis talents are precious and scarce. Therefore, the government needs to build a comprehensive, scientific and systematic talent training system and attach importance to the construction of big data talent pool to attract professional big data talents and prepare for the long-term development of big data. As an emerging hot field, big data not only involves a certain discipline, but also involves the intersection of statistics, computer science, management, economics, mathematics and other disciplines. Deeply integrate and build a cross disciplinary community, meet the requirements of professionalism and depth, cultivate innovative and compound big data talents, and play the role of think tank for government governance. In addition, the government also needs to carefully plan the layout of talent construction in various professions. It can attract professionals by optimizing salaries and various benefits, so as to establish a professional big data service platform for the government. Secondly, provide sufficient funds for big data training to provide a strong financial guarantee for college talent training.

4 Results and Discussion

Based on the characteristics of hierarchical and staged government decision-making data, under the background of current big data, the system architecture of the new government decision-making model can be summarized as "multiple participation, double layers, five stages": first, the decision-making subject structure of "multiple participation" of government departments and non-governmental departments; The second is the data decision-making architecture of "relative separation" between storage and application; [9]. The third is a scientific and effective "ladder operation" decision-making process structure. This model takes the decision-making subject, data chain structure and decision-making operation mechanism structure as the axis, and combines the elements of the decision-making process with the elements of science and technology. First, subdivide the government departments and non-governmental departments through the decision-making subject architecture, and then conduct data collection through "digitalization", and then conduct intelligent data mining, visual content display and quantitative results prediction through the data mining mechanism. Under the framework of decision-making operation mechanism, through the big data analysis of a series of processes, such as problem identification mechanism, agenda setting mechanism, scheme selection mechanism, etc., we constantly achieve effective guidance and standardization of target problem events, and finally develop decision-making schemes. It should be noted that a series of relevant data in the decision-making process can be returned to the decision-making experience database inside and outside the organization to continuously provide information supply and support for different stages of future decision-making. To sum up, the model has three core advantages in promoting scientific and democratic government decision-making: first, rapid response to problems itself helps improve the effectiveness of decision-making and monitoring [10]. Second, it is helpful to continuously optimize the decision-making content in the actual implementation process. Third,

the construction of data link mechanism can promote the repeated and effective use of data, thus greatly improving the value of data, and also provide information reference for subsequent decisions. As shown in Fig. 2:

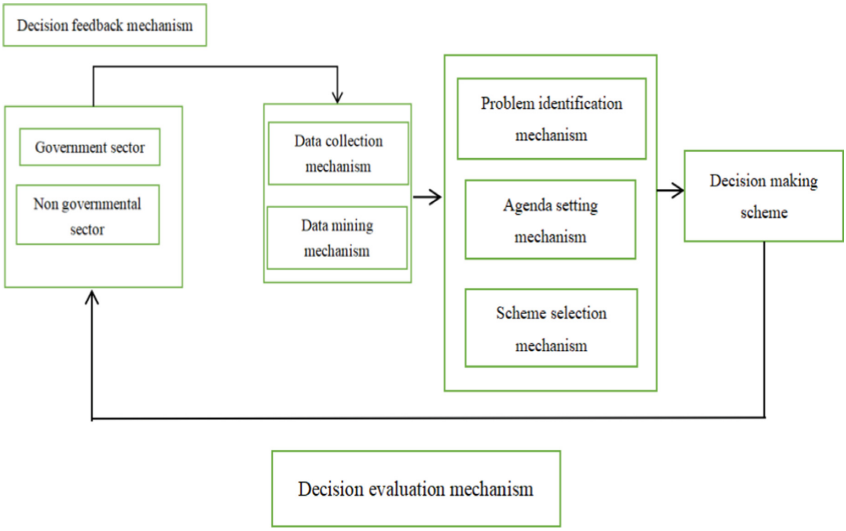

Fig. 2. The architecture of the new government decision-making model in the context of big data

5 Conclusions

Competition exists in society, and the use of data resources will inevitably lead to fierce competition. Everyone in our lives becomes a part of providing data. Whether government departments, social groups or ordinary citizens, talent selection, behavior preference and opinion expression are directly transformed into data, and government governance is gradually transformed into a governance and supervision system model with data as the core. At the same time, as an important national competitive strategic public resource, data resources affect the policies of government departments to a certain extent. At the technical level, by deepening the use of big data technology, the public service ability and supervision ability of government governance have been greatly improved; At the participant level, multiple subjects actively participate in governance activities, forming rich governance subject models, giving full play to the positive role of the market, thus improving the governance level of local governments. The application of big data not only adds new impetus to the development of the times, but also promotes the innovation of government governance. Therefore, in the field of government public management and public services, the application of big data technology has important practical significance for building and realizing a high-level and efficient government.

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