

Research on the Current Application of Big Data in Public Governance

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Abstract: Computer technology has profoundly impacted contemporary society, and the social governance of the digital era is inseparable from big data technology. The importance of data statistics in the field of public governance is increasingly prominent, as it can aid government decision-making, improve the quality and efficiency of services. By deeply analyzing data, precisely meeting public demand, increasing service speed and execution, and through real-time monitoring of social data, the government can grasp social dynamics, pre-warn risks, formulate targeted policies, and ensure social stability and harmony. At the same time, attention is paid to the problems that may arise from the application of big data technology, fully leveraging the unique advantages of electronic information technology, establishing and improving relevant laws and regulations to ensure its healthy and orderly development.

Keywords: Big Data, Public Governance, Public Administration, Statistical Application

1. Introduction

The profound impact of computer technology on contemporary society is undeniable, and the era of information technology we live in has brought about an unprecedented data explosion. In this context, the social governance of the digital age is inseparable from big data technology, and the importance of data statistics in the field of public governance is becoming increasingly prominent. As a key tool for public governance in the new era, big data technology not only improves governance efficiency but also optimizes resource allocation, injecting new vitality into the socio-economic development of our country. The application of big data technology in public governance helps government departments make wiser decisions, thereby enhancing the quality and efficiency of public services. By deeply mining and analyzing data, the government can precisely identify public needs and then provide personalized services. Big data technology has realized inter-departmental collaboration, improved service response speed and execution power, thereby increasing public satisfaction. Real-time monitoring of social data allows the government to grasp social dynamics, pre-warn risks, formulate targeted policies, and ensure social stability and harmony. Big data technology provides the government with precise management tools, helping to improve the level of social governance. For example, in urban management, real-time big data analysis helps optimize resource allocation and improve the quality of public services.

Analyzing urban infrastructure and environmental monitoring data, the government can accurately grasp the urban situation, timely discover and solve problems, and enhance urban governance efficiency.

In the future, efforts should continue to be made to increase investment in and application of big data technology in the field of public governance, while also paying attention to the problems that may arise during the application process, establishing and improving relevant laws and regulations to ensure the healthy and orderly development of big data technology in the field of public governance.

2. Introduction to the Application of Big Data in Public Governance

2.1. Assisting in the Formulation and Implementation of Public Policies

In the current era, we are facing a phenomenon of information explosion, with a vast amount of data and unprecedented social issues. In our country, traditional policy decision-making often follows an experiential model, which inevitably is influenced by various factors and cannot meet the challenges of the new governance environment. Even procedural policy formulation, when faced with massive data, using methods such as field research and sample surveys, no longer fits social development. The limited number of traditional statistical samples and the lack of comprehensive information restrict the scientific development of public policies [1].

Big data technology, with its unique advantages, provides a new perspective and method for the identification of policy issues. With technological progress, the era of big data has arrived. Big data, with its characteristics of being voluminous, comprehensive, diverse, and predictive, offers unprecedented depth and breadth for policy formulation. In this context, ensuring that policy issues are comprehensive, democratic, and forward-looking is particularly crucial, enabling the government to formulate and implement policies more efficiently.

Firstly, under traditional information processing methods, the limitations in data volume and processing capacity make it difficult to conduct a comprehensive and in-depth analysis of policy issues. However, the automatic data collection methods of the internet and various smart terminal devices can reduce the rate of data errors and human interference from the source, ensuring the authenticity and accuracy of statistical products.

Furthermore, the authenticity and comprehensiveness of big data also help to verify the quality of traditional statistical data, strengthening data quality control, thereby to some extent improving the quality of government statistical data [2]. In the era of big data, information is no longer monopolized by a few but presents a characteristic of universal participation, co-construction, and sharing. This makes the policy-making process more transparent, and the public can participate more conveniently in policy formulation, expressing their demands and opinions. Through big data technology, the government can listen to public opinion more objectively and fairly, thereby enhancing the democracy of policy formulation. Big data thinking and technology not only provide strong support for government scientific decision-making but can also track the effects of decision implementation and evaluate feedback, thereby improving the precision of subsequent decisions [3].

2.2. Refined Daily Monitoring and Management

The application of big data technology transforms passive decision-making into proactive governance. The government's management model shifts from passively solving problems to a framework of active governance, achieving an organic unity between public service demands and local government governance capabilities, truly implementing government governance to the "last mile"[4]. It acts like an intelligent assistant, capable of real-time monitoring of various social issues, and timely identifying and resolving problems. This approach not only enhances the efficiency of government work but also plays a positive role in improving people's livelihood and stabilizing society.

Firstly, big data technology enables proactive governance, allowing for the timely detection of potential risks and problems. For example, by deeply analyzing meteorological data, the government can predict the likelihood of natural disasters and quickly take preventive measures when signs of disaster appear. This proactive decision-making approach significantly reduces the threat of natural disasters to people's lives and property. Additionally, by analyzing medical data in real time, the government can understand the spread of epidemics and timely formulate and implement corresponding prevention and control measures.

Furthermore, big data technology helps the government to distribute and manage resources more scientifically and rationally. For instance, through fine analysis of fiscal data, the government can more accurately grasp budget allocation and expenditure situations, thereby achieving optimal resource allocation. Similarly, in the context of smart cities, digital governance can adjust traffic lights and lighting equipment in specific areas based on big data analysis, smartly allocating more resources during peak demand periods and entering energy-saving mode during low-demand periods, thus reducing power consumption. This leads to energy savings, allowing more city resources to be allocated where they are needed most, reducing government expenditures.

3. Challenges Faced by Big Data in Public Governance

3.1. The Digital Divide Dilemma Across Regions

The digital divide refers to the information gap and the further polarization of wealth, caused by differences in the ownership, application, and innovation capabilities of information and network technology among different countries, regions, industries, businesses, and communities in the global digitalization process [5]. This dilemma of the digital divide also exists within governments at all levels, manifested in information asymmetry, lack of data resource sharing, and non-disclosure of data. One of the highlights of information technology is its efficiency and convenience brought about by breaking the barriers of time and space. Therefore, governments should not artificially create barriered systems and methods of communication, which is not only detrimental to the daily lives of the populace but also increases the cost of maintaining digital systems across various levels and regions, overlooking the greatest advantage of digital governance itself. Governments at all levels should establish a unified and interconnected system, breaking the digital divide and "local protectionism" in the electronic domain.

3.2. Complex Data Utilization Inefficiency

The acceleration of our country's digitalization process has led governments, businesses, and all sectors of society to accumulate vast amounts of data, involving many fields and levels, with extremely high value.

However, the dispersion, heterogeneity, and complexity of data make integration and utilization difficult, leading to fragmentation, duplication, and inefficiency of data, posing challenges to public governance.

First, the dispersion of data causes difficulties in data sharing and communication between departments, leading to resource waste. To address this issue, government departments should build a data sharing mechanism to promote inter-departmental data exchange and cooperation. Additionally, the formats, standards, and structures adopted by different data sources vary, posing challenges to data integration. Therefore, establishing unified data standards and norms is crucial to promote data consistency and standardization. The complexity of data also increases the pressure on data governance. With the increase in data volume, issues such as data quality and security have become more prominent. Government departments and enterprises need to strengthen data management and protection to ensure data authenticity, integrity, and security.

3.3. Privacy and Security Issues

In today's society, personal privacy has become an unavoidable topic. With the advent of the big data era, the collection of personal data by the government in the process of public governance has become a necessary means. However, how to ensure that personal privacy is not violated, and data security is maintained in the process of collecting, processing, and storing these data, has attracted widespread attention.

On the other hand, the privacy data held by the government involves almost all of the important personal information of citizens. Since personal privacy rights are protected by law, this poses challenges to data sharing and openness [6]. Throughout the process of data collection, storage, processing, and use, the government must strictly adhere to relevant laws and regulations to ensure that personal privacy is fully protected. The government should improve the data security protection system to ensure the safety of data storage and transmission. This system includes the use of advanced data encryption technology, establishing a sound data security management system, and regularly conducting data security audits and evaluations. Additionally, the government needs to build emergency plans to timely respond to potential data security issues.

4. Research on the Approaches to Promote the Application of Big Data in Public Governance

4.1. Establishing a Unified Platform System

The information technology revolution has broken traditional time and space constraints, bringing unprecedented efficiency and convenience to humanity. However, this convenience largely depends on whether the standards between various platforms or governments are unified and whether information can flow smoothly. Without consensus on this foundation, the greatest advantages and unique charms of electronic information technology cannot be fully realized.

Therefore, it is necessary to build a unified and interconnected system. Such a system can help the government more efficiently and conveniently gather, collect, and detect various conditions, thereby substantially enhancing the effectiveness of public governance. On this basis, implementing comprehensive big data analysis can make resource allocation in the digital society more efficient and personalized. Besides, it also facilitates the platform and digital government to monitor illegal or abnormal activities throughout. This monitoring method can more timely and comprehensively detect and address potential criminal behaviors, thus preventing crimes and ensuring social harmony and peace.

4.2. Improving Relevant Laws, Regulations, and Institutional Guarantees

The rapid development of information technology, accompanied by the continuous increase in data volume and complexity, poses significant challenges to government governance. The lack of fundamental institutional and legal guarantees has become one of the real problems in advancing the construction of a digital government.

Firstly, in the data collection phase of building a digital government, our country should strengthen legislation, specifying the scope, conditions, and procedures for data collection. On this issue, it is necessary to ensure the data rights of citizens, enterprises, and the government are protected to avoid data misuse or leakage.

Moreover, it is essential to establish corresponding technical standards and norms for data collection to guide the healthy development of the industry. Data processing and analysis, as the core link of digital public governance construction, directly affect government decision-making and the quality of public services. In this link, our country should enhance the research, development, and

promotion of data processing and analysis technologies, improving the government's data mining and analysis capabilities. Simultaneously, it is crucial to improve relevant laws and regulations, regulate data processing and analysis behaviors, ensure data quality, and prevent risks associated with improper data use.

In summary, the smooth progress of digital public governance construction relies on the support of laws, regulations, and standard systems. It is essential to recognize the urgency and importance of the issues, intensify legislation and standard-setting efforts, continuously perfect the legal guarantee system for digital government construction, and provide robust support for the modernization of government governance. The government needs to establish relevant policies and regulations, clarifying the legality and compliance requirements of big data applications, ensuring that the construction of digital government progresses on a legal track.

4.3. Strengthening the Training of Relevant Technical Personnel

With the continuous development of big data technology, data acquisition, analysis, and application have gradually become key elements in the decision-making process, bringing unprecedented opportunities to the field of public governance. This prompts government decisions to move towards a higher degree of scientification, refinement, and intelligence. Governments, enterprises, and social organizations urgently need professionals with big data analysis skills to gain strong support. By nurturing talents in big data and public opinion governance education, we can more accurately grasp the trends of social public opinion, provide precise data support for policy formulation and implementation, and thus enhance the scientific nature, specificity, and effectiveness of public governance. However, to fully leverage big data in public governance, a professional technical talent team is indispensable.

Currently, professional data analysis talents are increasingly scarce, and composite talents with big data technology and public opinion analysis capabilities are in high demand. Our country needs to vigorously promote the training of big data governance talent teams to meet the development needs of the big data era. On the other hand, as big data technology continues to evolve, cultivating a professional talent team is particularly critical. With the increasing integration of big data technology and internet technology, the application of big data in various industries is becoming more widespread. Therefore, accelerating the training of big data governance talents will help improve the level of public governance in our country.

5. Conclusion

The era of data has arrived, closely linked to the various challenges faced by governments. In this context, governments need to rely on advanced technologies such as big data and artificial intelligence to enhance governance capabilities and achieve precise management. Data-driven decision-making not only improves the specificity and effectiveness of policies but also saves resources and enhances work efficiency. The application of big data in public governance facilitates the formulation and implementation of public policies and achieves refined daily monitoring and management. Government data collection and analysis, comprehensive monitoring of public affairs, social needs, and public satisfaction, ensure the scientific nature and accuracy of policy formulation. Building a unified data platform to share data across departments enhances the synergistic effect of policies. On the other hand, the government should use big data, artificial intelligence, and other technologies for real-time monitoring and evaluation of policy implementation. This helps to identify problems and shortcomings in the policy implementation process, adjust policy directions in a timely manner, and ensure the achievement of policy goals. Through the mining and analysis of massive data, the government can better understand public needs and provide precise, personalized services.

However, the government currently faces many challenges, such as the digital divide, complex data and inefficient utilization, privacy and security issues. The government needs to establish a unified platform system, fully leverage the unique advantages of electronic information technology, and improve relevant laws, regulations, and institutional safeguards. The government also needs to strengthen the construction of a data talent team, increase the training and introduction of data talents, encourage existing staff to participate in related training, and improve overall data literacy.

In summary, government governance in the data era faces unprecedented challenges but also harbors great opportunities for reform. By keeping up with the trends of the times and continuously innovating governance methods, we can better meet the people's expectations for a better life.

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