Research on the Improvement Path of Government Digital Leadership in Public Crisis Governance

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Abstract. This study aims to explore the improvement path of government digital leadership in public crisis governance. Based on the framework of factor structure and function analysis, Analyzed the essential, structural and functional problems of the government in digital leadership, Put forward the ways to improve the governments digital leadership: first, the integration of elements, Including strengthening the cognitive application ability of digital technology, reshaping the decision-making structure of digital governance, accelerating the digital transformation of organization and coordination, and promoting the implementation of digital innovation and reform; Second, the structural optimization, It includes improving the decision-making efficiency of the instruction and decision-making layer, strengthening the interaction efficiency of the coordination and cooperation layer, optimizing the adjustment ability of the execution and response layer, and improving the closed-loop mechanism of the feedback and evaluation layer; Third, function improvement, These include enhancing the precision of risk assessment and prediction, improving the implementation of data-driven decisions, improving cross-departmental collaboration and information sharing, improving data processing and monitoring capabilities in emergency response, and strengthening digital capability training for civil servants and the public.

Keywords: public crisis governance, government digital leadership, digital government

1 Introduction

Public crisis is an inevitable major event in the society, and its frequent and far-reaching impact puts forward higher requirements for the governments governance ability and leadership. In the current digital age, the governments ability to cope with public crises not only relies on traditional management skills, but also needs to adapt to the new needs of digital transformation. The rapid development of digital technology, especially big data, artificial intelligence, cloud computing and blockchain, is disrupting how information is processed and providing new tools for governments to address complex challenges. These technologies are widely used in government administration and public services, greatly affecting the structure, process and perfor-

L. Zhu et al. (eds.), *Proceedings of the 2024 4th International Conference on Public Relations and Social Sciences (ICPRSS 2024)*, Advances in Social Science, Education and Humanities Research 874,
https://doi.org/10.2991/978-2-38476-305-4_34

mance of government. The Internet and ICT are changing the way governments are organized and governed. [1]Therefore, the digital transformation of the government is not only related to the application of technology, but also closely related to the adaptation and optimization of leaders to the digital environment, which requires leaders to have the leadership in the digital age. Many policies, such as the Overall Layout Plan of Digital China Construction issued by The State Council in 2023, show that digital leadership is the core of promoting the digital transformation of the government, and leaders in the digital economy era must have the corresponding thinking ability and decision-making ability in order to effectively respond to the challenges of the new era.[2]

The frequent occurrence of global public crises not only reveal the multiple risks accumulated in the process of globalization, but also expose the limitations of the existing public governance system in the face of complex and uncertain challenges. The traditional risk management mode is no longer able to cope with the current challenges, and the public management must turn to a more comprehensive risk and opportunity management, which puts forward higher requirements for the reform and strategic management ability of the public sector leaders. The complexity of modern crisis governance requires that the government should not only rely on traditional management means, but also combine modern digital technology to improve the efficiency and accuracy of crisis decisions. The application of digital technology not only affects the digital transformation of organizational structure and workflow, but also makes leaders play a core role in it. The digital leadership of government leaders is directly related to the effective use of data resources to promote the modernization of public governance. The promotion of digital governance requires the coordinated development of technology, concept, system, organization, law, ethics and other dimensions, so as to provide more comprehensive support for the response to public crises. This requires the government to strengthen the application of digital technology, and also requires leaders to improve their cognition and adaptation to digital transformation, so as to achieve effective public governance in the digital era.[3]

2 Theoretical Framework

The element-structure-function framework is a system analysis and design methodology. It is commonly used to solve the problem of complex systems, and this framework helps to understand and describe how a system achieves specific functions through its components, the structural relationships between them, and how these elements and structures work together. [4]

Elements refer to the basic units or components that constitute the system. In different systems, these can be physical objects, concepts, processes, or any fundamental components. Structure refers to the interrelationship and connection between the elements. Structure identifies how elements interact and how they are organized and linked together. Function refers to the overall purpose of the system or its output. In this framework, function is achieved by the elements and their structural interactions.

3 Analysis of the Problems of Government Digital Leadership in Public Crisis Governance

3.1 Elements of Government Digital Leadership in Public Crisis Governance

First, the limitations of the cognition and application of digital technology. Despite the huge potential of digital technology in crisis management, the lack of awareness of many government officials leads to a superficial understanding of it in response to natural disasters or public health crises, and a lack of in-depth understanding of big data, artificial intelligence and other technologies. At the same time, despite the introduction of digital tools in some government departments, traditional governance thinking is still dominant, failing to give full play to its technological advantages and reducing the role of digital tools in improving the efficiency of crisis response.[5]

Second, the structural flaws in digital governance decisions. Many government departments have complex decision-making process, slow information transmission, and show slow response in crisis response. Moreover, the excessive reliance on personal experience and subjective judgment in the decision-making process leads to a lack of data to support scientific decision-making. This structural defect further aggravates the information barriers between government departments, and the phenomenon of data island is serious, which cannot realize data sharing and comprehensive utilization, and affects the scientificity and efficiency of the overall decision-making.

Third, the digital transformation in organization and coordination. The digital transformation of government requires not only technology, but also the innovation of organizational structure, management mode and work process. However, the traditional bureaucratic management model is too rigid to adapt to the flexibility and flat structure required by the digital transformation. Difficulties in collaboration between various departments make it difficult for the digital projects to proceed smoothly.

Finally, the implementation obstacles of digital innovation and change. Despite the importance of digital innovation, there is a lack of culture and environment to support innovation in practice. At the same time, digital innovation requires a lot of technical and financial support, and many local governments have underinvested in this area. In addition, the current technical talent reserve of government departments is seriously insufficient, which restricts the implementation and maintenance of the project.

3.2 Structural Problems of Digital Government Leadership in Public Crisis Governance

First, the decision efficiency of the instruction and decision-making layer. At present, the government has too many levels of decision-making and too cumbersome processes, leading to slow response in emergency situations. In addition, there is the problem of imperfect information transmission mechanism in the decision-making process. Information is easy to be distorted or delayed when transmitted between levels, which affects the decision makers accurate judgment of the crisis and response to the speed. The asymmetry of information seriously restricts the timeliness and effectiveness of emergency response.

Secondly, the cooperation effect of the coordination and the cooperation layer is not good. Public crisis management needs the cooperation of various departments, but in practice, the unclear responsibilities and responsibilities of various departments often lead to buck-passing. In addition, although cross-departmental linkage mechanism exists widespread, it is often a formality and lacks substantial interaction and information sharing. This phenomenon makes it difficult to integrate information and resources between departments, which greatly affects the overall effectiveness of crisis response.

Third, the dynamic adjustment problem of the execution and response layer. In the face of the changing crisis environment, it is difficult for the government executive layer to adjust in real time according to the actual situation. Traditional rigid coping strategies cannot respond to the complex changes in the crisis. The information feedback mechanism in the implementation is not perfect, which makes the decision-making level unable to grasp the implementation effect in time, which hinders the necessary adjustment and optimization. This untimely feedback not only weakens the effect of crisis response, but also affects the flexibility and pertinence of emergency response.

Fourth, the closed-loop mechanism of the feedback and assessment layer is missing. Effective public crisis management requires the establishment of a sound feedback and evaluation mechanism after the event to realize closed-loop management. At present, many government departments lack a systematic evaluation mechanism. The imperfect feedback mechanism makes it difficult for the opinions of the public and frontline personnel to be effectively transmitted to the decision-making level, which affects the scientific nature and rationality of the decision-making. The lack of accountability mechanism makes it difficult for feedback and evaluation to play a practical role, and the deficiencies in crisis response fail to be solved and improved in time.

3.3 The Functional Problem of Government Digital Leadership in Public Crisis Governance

First, the application of risk assessment and prediction model has limitations. Although the government has introduced many advanced risk assessment and prediction models, the scientificity and accuracy of these models are still insufficient, leading to the deviation of the prediction results in practical application. The low understanding and application of these models by local governments limits the wide application of the models. The shortage of skilled technicians and inadequate training also make the existing tools not fully functioning.

Second, the implementation of data-driven decisions is not effective. Although data-driven is a key way to improve the digital governance of the government, its implementation effect is limited by multiple factors. First of all, the data quality problem is serious, many departments are insufficient in data collection and management, and the phenomenon of data island is common, leading to obtaining comprehensive and accurate data support in the decision-making process. Secondly, the insufficient data analysis ability is also a constraint factor. Despite the introduction of big data analysis tools by government departments, the lack of professional talents and technical means

makes it difficult to translate the data analysis results into practical decisions. Moreover, cross-departmental data sharing and standards are not uniform, limiting data integration and utilization.

Third, the lack of cross-departmental cooperation and information sharing mechanism seriously affects the efficiency of public crisis governance. Although local governments have established an emergency linkage mechanism, their operation is often a mere formality and lacks substantive cooperation and information sharing. The communication and coordination mechanism among various departments is not perfect, and different departments often encounter resistance in the process of cooperation due to the differences in their functions, powers and interests, which affects the overall effect of resource allocation and crisis response.

Fourth, the data processing and monitoring capability in the emergency response is insufficient. In the face of a sudden crisis, the government needs to quickly deal with large amounts of real-time data, but many local governments lack sufficient technical means and equipment support, leading to a lag in data processing and analysis. In addition, the coverage and accuracy of the monitoring system are limited, and insufficient technology and funding cause the monitoring system to achieve full coverage, which increases the uncertainty and risk of crisis response.

Fifth, the digital capacity of the civil servants and the public is relatively low. Although many government departments have carried out digital training, there is still a big gap in the operation and application of digital technology. At the same time, the digital ability and participation of the public urgently need to be improved. The network political inquiry has realized the institutionalization of government affairs openness, but the public participation has not been systematically strengthened.[6][7]Peoples demands expressed through online participation can actually affect the governments policy priorities and be conducive to improving the quality of public governance.[8]

4 The Improvement Path of Government Digital Leadership in Public Crisis Governance

4.1 Factor Integration: Consolidating the Core Foundation of Government Digital Leadership

First, strengthen the cognitive application ability of digital technology. The government should promote universal education in digital technology and improve the ability of civil servants to understand and apply technologies such as big data, artificial intelligence and blockchain. At the same time, a special digital technology consulting and support team should be established, composed of experts with rich technical background, to provide technical guidance for all departments. Encourage departments to explore new technologies, accumulate experience through pilot projects, and gradually improve the level of technology application.

Second, the structural reshaping of digital governance decisions. Scientific and reasonable decision-making structure is the basis of digital governance. The govern-

ment should simplify the decision-making process, reduce the hierarchy, and shorten the decision-making time. Establish a flat organizational structure and an efficient decision-making mechanism to improve the timeliness and response speed of decision-making, such as setting up a fast decision-making channel to form a temporary decision-making team to respond to emergency situations. Enhance data support in decision-making, establish a unified data platform, and ensure that departments obtain high-quality data to support decision-making. At the same time, the construction of professional data analysis team and tools to improve the depth and breadth of analysis, to ensure scientific and accurate decision-making.

Third, accelerate the digital transformation of organization and coordination. The government should promote the collaborative work and information sharing among departments, establish a unified information sharing platform and cooperation mechanism, break the information island, and realize information exchange and resource integration. Cross-departmental digital working groups can be set up to hold regular collaborative meetings to promote inter-departmental communication. Promote the innovation of management mode, improve the flexibility and adaptability of the organization, and apply the flexible working mode and management tools, such as telecommuting and mobile office platform. Strengthen the application training of digital management tools to ensure that civil servants can use them skillfully, and improve work efficiency and collaboration effect.

Fourth, promote digital innovation and reform implementation. The government should create an environment to support innovation, and stimulate the enthusiasm of all departments by formulating policies and incentive mechanisms to encourage innovation. Set up an innovation fund to support the research and implementation of digital projects, and encourage new solutions and methods in practice. Increase investment in digital technology and projects, and improve technological infrastructure. At the same time, it pays attention to talent training and introduction, attract high-quality digital talents, and provide guarantee for innovation and reform. Establish a scientific evaluation system, regularly evaluate the implementation effect of digital projects, summarize experience, adjust and optimize the implementation plan, and ensure that innovation and reform achieve practical results.

4.2 Structural Optimization: Build an Efficient Government Digital Leadership Structure

First, improve the decision-making efficiency of the instructions and decision-making levels. Simplify the decision-making process, reduce the hierarchy, and ensure fast information transmission and efficient execution of instructions. The government should establish a flat organizational structure, such as a special committee on crisis response, authorize it to make rapid decisions in an emergency situation and avoid a lengthy approval process. Moreover, the decision-making process should be more dependent on data and scientific methods. Introduce advanced data analysis and prediction tools to establish data-driven decision support systems to ensure that decisions are based on reliable data and scientific analysis. For example, in response to natural

disasters, big data and artificial intelligence technology are used for risk assessment and resource scheduling to improve the accuracy and effectiveness of decision-making.

Second, strengthen the interactive efficiency of the coordination and cooperation layer. The government should establish a unified coordination platform and mechanism to ensure information sharing and resource integration among various departments. Through the digital collaborative working platform, it promotes real-time communication and data sharing among various departments, breaks the information island, and improves the efficiency of collaboration. At the same time, regular communication and cooperation exercises among various departments should be strengthened to enhance the awareness and ability of cooperation, and ensure efficient cooperation in a practical crisis. In addition, a cross-departmental evaluation and feedback mechanism is established to regularly evaluate and improve the effectiveness of the collaboration to ensure the continuous optimization of the collaboration mechanism.

Third, optimize the adjustment ability of the execution and response layer. The government should establish a flexible implementation mechanism that can be adjusted dynamically adjusted according to the actual situation. Through the development of emergency plans and flexible command and dispatch system, to ensure that the response strategies can be quickly adjusted and optimized when a crisis occurs. At the same time, the information feedback and adjustment mechanism of the executive level should be strengthened, and timely information feedback channels should be established, so that the executive level can feedback the on-site information and implementation situation to the command level in time, so as to facilitate the adjustment and optimization of the command level according to the actual situation. In addition, establish an evaluation system for the effect of implementation, regularly evaluate and improve the implementation measures to ensure their scientific and effective.

Fourth, improve the closed-loop mechanism of the feedback and evaluation layer. The government should establish a systematic evaluation mechanism to systematically evaluate and summarize the whole process of each crisis response, find out the existing problems and deficiencies, and improve and optimize them in time. For example, after a natural disaster, conduct a comprehensive post-disaster assessment to optimize emergency plans and resource allocation. The government should also establish a sound information feedback mechanism to ensure that all levels and departments can provide timely feedback on information and opinions. Through smooth feedback channels, civil servants and the public are encouraged to give positive feedback and suggestions to ensure the continuous improvement and optimization of decision-making and measures. Establish a scientific accountability mechanism to hold accountable the mistakes and problems in the process, and ensure the transparent and efficient crisis response process.

4.3 Function Improvement: Enhance the Function Realization of Government Digital Leadership

First, enhance the accuracy of risk assessment and prediction. Governments should introduce advanced risk assessment models and tools, such as machine learning and artificial intelligence technologies, to improve the accuracy of prediction. Establish a

comprehensive risk assessment system by integrating historical, real-time and multi-source data. For example, meteorological data and GIS technology are used to assess the risk of natural disasters and formulate countermeasures in advance. In addition, the government should strengthen its data acquisition and processing capabilities, and build extensive sensor networks and data acquisition systems to ensure the timeliness and accuracy of data support. Establish a data standardization and quality control mechanism to ensure the reliability of data and provide a solid foundation for risk assessment.

Second, to improve the execution effect of data-driven decisions. The government should establish a unified data platform and decision support system to ensure timely access to high-quality data. By integrating departmental data resources, establish a data sharing mechanism, and break the data island. For example, a national unified public health data platform should be established to realize real-time sharing of epidemic data. The government should also strengthen the capacity building of data analysis, equip a professional data analysis team, introduce advanced technologies such as big data and artificial intelligence, and improve the depth and breadth of data analysis. In addition, data literacy training for civil servants is strengthened to ensure the effective implementation of data-driven decisions.

Third, improve cross-departmental collaboration and information sharing. The government should establish a unified platform for collaboration and information sharing to promote information exchange and resource integration among departments. Through the digital collaborative working platform, break the information island and improve the collaboration efficiency. Strengthen the cross-departmental communication mechanism, organize regular communication and cooperation, and improve the cooperation effect. Establish a scientific evaluation and feedback mechanism, regularly evaluate the collaboration results, to ensure the optimization of the mechanism.

Fourth, improve the data processing and monitoring capabilities in the emergency response. The government should build efficient data processing and analysis systems that can quickly process large amounts of real-time data in a crisis. Real-time data flow processing, distributed computing and cloud computing technologies are introduced to improve the efficiency of data processing. Strengthen the construction of monitoring system to ensure coverage and accuracy. Through the establishment of a comprehensive monitoring network, real-time access to the site information, to ensure the scientific emergency command. The government should also maintain and upgrade monitoring systems to improve their stability and reliability and enhance emergency response capabilities.

Fifth, strengthen the digital capacity training for civil servants and the public. The government should strengthen the digital training of civil servants and improve their digital literacy. Enhance their ability to understand and apply digital technologies, such as the use of big data analysis tools, through regular training courses and workshops. At the same time, the public should strengthen their digital education to enhance their digital literacy and participation. Digital technology popularization activities will be carried out to enhance public awareness of digital technology. For example, lectures are held in communities and schools to encourage the public to actively participate in digital public services and enhance the overall level of crisis governance.

5 Conclusion

Through systematic analysis, this study proposes the key path to improve government digital leadership in public crisis governance. The research puts forward a systematic path from three aspects of factor integration, structural optimization and function improvement, which provides theoretical support and practical guidance for the government to improve its digital leadership. First of all, in terms of factor integration, the research emphasizes the improvement of civil servants cognition and application ability of digital technology, and suggests that the government provide regular training and professional guidance to ensure effective application. Simplify the decision-making process and enhance the data support, establish a flat organizational structure and data-driven decision-making system, in order to improve the scientific nature and timeliness of decision-making. It is suggested to establish a unified information sharing platform and a flexible management mode to improve the collaborative efficiency and strain capacity. Emphasis is placed on creating an environment for innovation and increasing resource input, and promoting the implementation of digital projects through the establishment of innovation funds and the introduction of high-quality talents. Secondly, in terms of structural optimization, measures to improve the efficiency of decision-making and implementation. It is suggested to simplify the decision-making process and enhance the data analysis to improve the decision-making efficiency and accuracy. Establish a unified collaboration platform and regular communication to promote information sharing and collaboration efficiency. Flexible execution mechanism and information feedback are proposed to improve the strain capacity through real-time monitoring and dynamic adjustment. It is suggested to establish evaluation mechanisms and feedback channels to ensure that the measures are continuously optimized and improved. Finally, in terms of functional improvement, the research suggests taking measures to strengthen risk assessment, data-driven decision-making, cross-departmental collaboration, emergency response, and digital training for civil servants. Future research can further explore the specific cases and implementation effects of each path in practical application, so as to provide more empirical support and experience reference for the improvement of government digital leadership.

References

1. Luna-Reyes, L. F., Gil-Garcia, J. R., Cruz, C. B.: Collaborative Digital Government in Mexico: Some Lessons from Federal Web-Based Interorganizational Information Integration Initiatives. Government Information Quarterly 24(4), 808–826 (2007). https://doi.org/10.1016/j.giq.2007.04.003.
2. Zhai, Y., Cheng, Z., He, Z., et al.: Coordinating the Construction of Digital China to Fully Lead the New Era of Intelligent Digitalization: A Commentary on the 'Overall Layout Plan for the Construction of Digital China'. Electronic Government Affairs 2–22 (2023). https://doi.org/10.16582/j.cnki.dzzw.2023.06.001.
3. Fu, C., Huang, W., Ou, H.: How Does 'Flexible Governance' Bridge the 'Digital Divide' in Public Crisis Situations? An Empirical Study Based on Three Policy Instruments. Public Administration Review 17(2), 140–156+199–200 (2024).

4. Huang, Q., Sheng, F.: New Quality Productivity System: Factor Characteristics, Structural Support, and Functional Orientation. Reform 15–24 (2024).
5. Li, H., Sun, Y.: Technological Empowerment: The Enabling Logic and Effects of Digital Transformation in Public Crisis Governance--A Case Study of the 'Public Crisis Technology Governance Network' in Z City. Urban Issues 65–73 (2022). https://doi.org/10.13239/j.bjsshkxy.cswt.221107.
6. Kevin, C., Desouza, et al.: Leveraging Technologies in Public Agencies: The Case of the U.S. Census Bureau and the 2010 Census. Public Administration Review 72(4), 605–614 (2012). https://doi.org/10.1111/j.1540-6210.2012.02592.x.
7. Balla, S. J., Xie, Z.: Online Consultation and the Institutionalization of Transparency and Participation in Chinese Policymaking. The China Quarterly 246, 1–24 (2020). https://doi.org/10.1017/S030574102000048X.
8. Jiang, J., Meng, T., Zhang, Q.: From Internet to Social Safety Net: The Policy Consequences of Online Participation in China. SSRN Electronic Journal (2017). https://doi.org/10.2139/ssrn.2975456.