The Risk of Artificial Intelligence Embedded in Government Governance: Mechanism, Process, Prevention and Control

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Abstract. As a cutting-edge technology, artificial intelligence is widely used in government governance to provide advanced technical support and guarantee. Embedding artificial intelligence technology into the government governance process can greatly improve the efficiency and level of governance. Based on the analysis of risk evolution and development, the article focuses on the mechanism, process and form into risk generation of government governance. In response to the different processes and forms of risk occurrence, measures such as continuous improvement on risk awareness, improvement of internal and external governance environment, and improvement of governance models are proposed to strengthen intervention and prevention and control, so as to achieve the goal of technology and system compatibility, efficiency and effect improvement. Let the application of artificial intelligence technology become a great tool for improving government governance capabilities and innovating government governance models.

Keywords: Artificial intelligence · government governance · Formation mechanism · Intervention prevention and control methods

1 Introduction

Artificial intelligence is a multi-disciplinary frontier science that integrates computers, philosophy, and psychology, and accelerates the development and progress of society. At the same time, it also makes the development of human society full of more uncertainties. The application of artificial intelligence in the government field is undoubtedly relatively successful. It effectively controls the optimal size of the government, improves the efficiency of various administrative decision-making, simplifies the administrative process, and provides the modern government with new governance methods. The improvement of governance capabilities has brought new ideas and new opportunities to meet people's yearning and needs for a better life to a certain extent [1]. However, in the process of technological development, the characteristics of its "double-edged sword" are also revealed, and government governance risks brought about by technology should also be given extensive attention. According to the "2019 China Artificial Intelligence Development Risk Early Warning White Paper" survey, more than 60% of Chinese respondents

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believe that artificial intelligence technology has certain risks and threats, and technical vulnerabilities in artificial intelligence will cause different levels of personal security crises. At the same time, this risk not only stems from the basic and technical layers of artificial intelligence technology but also from risks caused by external environmental factors [2]. These risks have become factors that hinder the government from realizing the modern governance [3]. This article analyzes the formation mechanism, process level, and pattern of government governance risks from the perspective of artificial intelligence, and puts forward reasonable suggestions for its intervention, prevention, and control.

2 Mechanism

Government governance is a collection of government actions, and is a practical activity made by government staff in accordance with government decisions. According to survey data onto IRESEARCH Consulting, government governance accounts for nearly half of China's artificial intelligence market share in 2020 (as shown in Fig. 1). There is no doubt that artificial intelligence technology has penetrated the government governance process. But in the process of social change, in addition to the advancement of technology, the environment has also changed. The emergence and changes of various internal and external factors have made government governance no longer closed, and the probability of generating risks has gradually increased. Therefore, the analysis of these risk formation mechanisms can reveal the logic of risk generation and prevent and resolve them in a global and targeted manner (as shown in Fig. 2).

Government governance inherently has two major parts of the internal and external environment, and government governance behavior involving artificial intelligence technology is naturally in these two systems. The internal environment is the main part that leads to risk generation, which includes endogenous risk factors and exogenous risk factors. Endogenous risk factors refer to corresponding risk factors arising from root content such as governance models and institutional rules. External risk factors are risk factors that result from the limited cognitive and technical capabilities of government administrators on artificial intelligence. The external environment is an important part

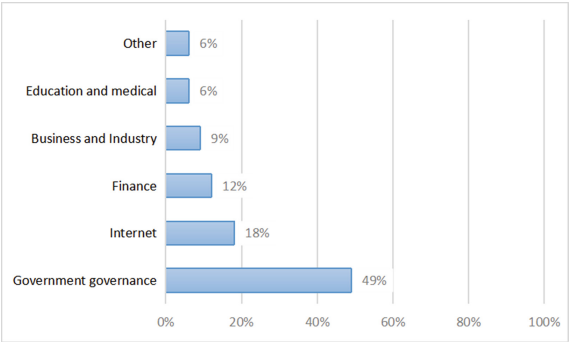

Fig. 1. Distribution map of China's artificial intelligence market share in 2020

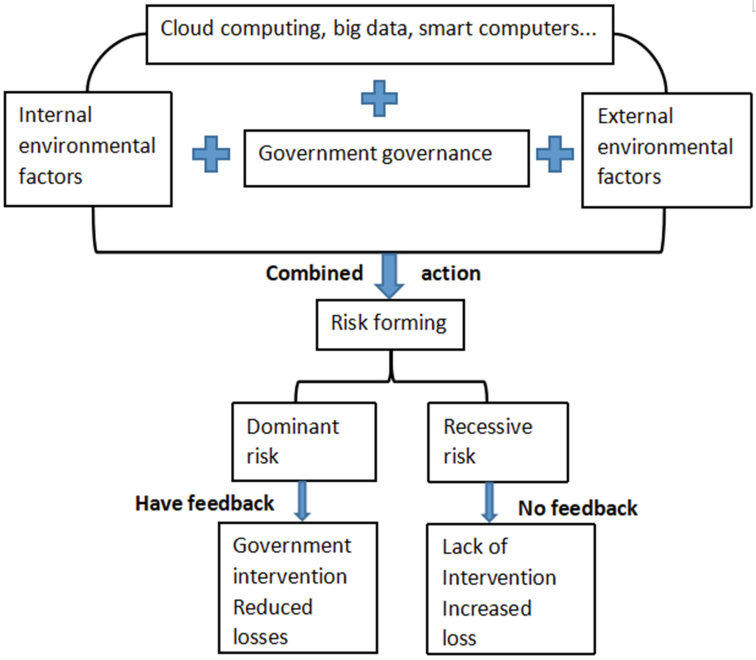

Fig. 2. The risk formation mechanism of government governance using AI technology

of expanding the types of risks and exacerbating the formation of risks. External risk factors are mainly generated from the aspects of artificial intelligence companies, media public opinion, and public perception.

Internal and external interactions have formed a variety of risks. These risks can be classified according to explicit or implicit. Dominant risks can be easily discovered and have the characteristics of superficiality and variability. They can provide timely feedback to government departments to obtain certain interventions and effectively reduce losses caused by risks. Hidden risks have the characteristics of latent and lagging nature. These risks have certain signs in the early stage, but they will not be paid attention to. After a period of development, they will become severe risks. Because there is no effective intervention in the initial stage of the formation of the risk, it will cause greater hidden dangers and losses.

The agglomeration of internal and external environmental risk factors has formed risks, and the spread of risks has caused losses to the public, government, and society. If the generation and spread of risks cannot be prevented by optimizing the internal and external environments, then this process will become a closed loop, the risks will worsen the environment governed by the government, and the use of artificial intelligence will be meaningless. Therefore, by analyzing the level and pattern of risks, and exploring strategies for intervention, prevention and control, can artificial intelligence, the "double-edged sword", be completely turned into a weapon for improving the government's governance model.

3 Process and Level

The risks arising from the integration of artificial intelligence technology into government governance conform to certain laws. In the early stage of use, due to the lack of awareness of artificial intelligence and the technology is in its infancy, all exposed problems are obvious. With the passage of time and technological progress, semi-hidden risks and hidden risks have gradually emerged (as shown in Fig. 3). At the same time, risks are divided into three levels, namely cognitive risk, ethical risk, and institutional risk (as shown in Fig. 4).

Cognitive risk, as an explicit risk, is the first and lowest-level risk. It will occur in the early stage of artificial intelligence integration into government governance. This risk manifests itself in several aspects. First, in the initial stage, the publicity for artificial intelligence is not in place, and users do not understand the usage and safety of the technology, and misunderstand artificial intelligence technology. The second is that the fixed thinking mode of administrative personnel has not changed, and the application of artificial intelligence technology will reduce the government's pressure on employment and reduce job settings. Because of this, many administrators are resistant to advanced technology, which affects the application of artificial intelligence technology. Finally,

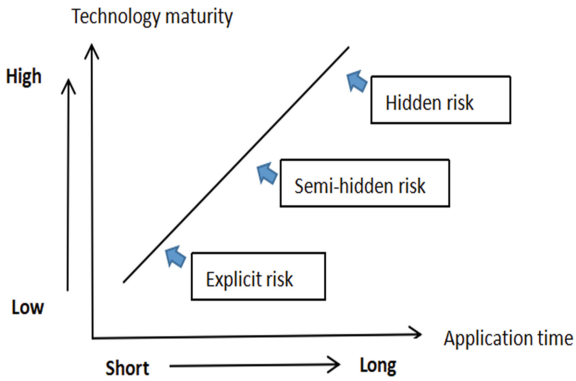

Fig. 3. The process of risk generation

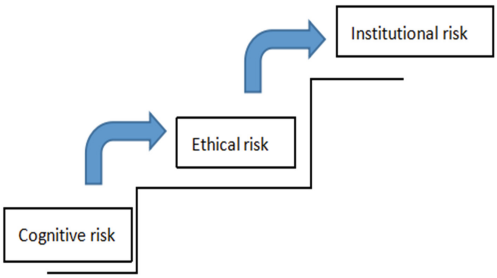

Fig. 4. Three levels of government governance risks using AI technology

government personnel lacks professional knowledge. In the early stage of new technology intervention, government officials do not have the corresponding knowledge and skills, and there are still blind spots on the use of technology, which leads to technology abuse.

Ethical risks often arise after the emergence of cognitive risks, and they are a type of semi-hidden risk. Such risks appear after the technology has reached a certain level of maturity and has become more widely used. The most obvious manifestation is the risk of privacy leakage due to improper data collection and management. As technology holders master the core technology, the government will invisibly transfer a lot of power, which causes too much power for enterprises and R&D personnel. Finally, the data powers enjoyed by different classes are also different. Although artificial intelligence technology changes the life patterns of most people, the difference in hardware conditions or data acquisition capabilities leads to different levels of public participation in government governance, which poses a fairness risk.

Institutional risk is the most invisible and rooted risk. It is also a risk that will be perceived only after the government has used artificial intelligence technology for a long period of time and the technological development has reached a certain level. This type of risk breeds in the internal environment of government governance and is related to governance models and administrative personnel. In the middle and early stages of the process of technology penetration of government governance, administrators received good training and improved their ability to use technology, which may lead to technological dependence, and this dependence derives technical thinking, that is, the knowledge that technology does not make mistakes. This makes the administrators trust the conclusions given by technology and ignore the actual situation in the decision-making process. At the same time, the bureaucratic government structure has obviously produced problems such as waste of personnel and overlapping of posts after the use of technology. Over time, administrators will not only lose their autonomous administrative personality, but they will also lose their enthusiasm for work. Combining these two factors, the government's governance capacity and effectiveness will inevitably be affected.

There are numerous risk events caused by artificial intelligence technology in government governance. In the early stage of the outbreak of the new crown epidemic, although big data technology made it more convenient for the government to count the spread of the epidemic, excessive information collection caused social discussion and dissatisfaction. In 2021, China's Internet penetration rate reached 71.6%, but nearly 400 million people still cannot use the Internet, and even the remaining one billion people cannot guarantee that they have sufficient knowledge or proficient use of artificial intelligence technologies such as big data. The phenomenon of publicizing government affairs platform information without desensitization also occurs from time to time. According to the "2020 China Internet Cybersecurity Report" issued by the National Internet Emergency Response Center, 107 incidents of desensitized display of citizen information on platforms such as government affairs disclosure and recruitment examination publicity were found throughout the year, involving 100,000 pieces of sensitive information. It is not uncommon for government websites in some overseas countries to be attacked. In August 2021, the online service system of Melbourne's Stonnington City Council was

remotely attacked, causing 650 employees to be unable to work, and the private information about nearly 100,000 residents was leaked. Although the application of artificial intelligence technology can effectively improve efficiency, the risks arising from the interaction of internal and external forces need to be resolved, prevented and controlled urgently.

4 Countermeasure

4.1 Raise the Level of Cognition

Pay attention to the impact on artificial intelligence on government governance. The development of artificial intelligence has changed the traditional governance methods of "smart government" and turned it into an "intelligent government" [4]. How to rationally analyze the relationship between technology and humans in such a complex environment to build a new type of government is very important. Many traditional civil servants believe that the massive use of artificial intelligence technology will completely replace humans, and thus feel resistant. However, this relationship should be treated rationally and avoid abandoning the use of tools due to anxiety and panic.

Strengthen the propaganda of artificial intelligence. Not only government personnel, but also the public should have relevant artificial intelligence knowledge. Understanding artificial intelligence technology is not only a tool to improve government office efficiency, but more importantly, it improves government decision-making capabilities,and strengthen public participation.

4.2 Improve Internal and External Environment

Open communication channels and increase citizen participation. In the process of government governance, artificial intelligence is used to improvement on governance capabilities, but the improvement of governance capabilities cannot lack public participation, and the public must not lack the right to know the purpose of using artificial intelligence. This requires government departments to open communication channels and platforms [5]. Raise public awareness of participation and allow the public to better understand the complementary relationship between technology and governance. The government can also use these communication channels to explore the contradictions between the government and the public so that the government can better understand the people's conditions and make citizens trust the government more.

Repair technical loopholes to strengthen privacy protection. The leakage of information and data has always been an inevitable problem of advanced technology. For the more effective and safe use of artificial intelligence in government governance, it is necessary to break the barriers between the data transmission and eliminate the format differences between data [6]. First, the data format can be unified to reduce collection costs; second, the centralized management of the data center can be unified to realize the sharing and transmission of government information; finally, stricter rules and regulations are implemented for data storage to prevent the leakage of private information.

Straighten out the relationship between government and enterprise and clarify responsibilities and rights. The core technologies and algorithms of artificial intelligence are often mastered by technical researchers and artificial intelligence companies, and the government is only a user of artificial intelligence technology. Therefore, the rights of technology holders will be expanded invisibly. To prevent this from happening, it is necessary not only to strengthen the sense of responsibility of the holders of artificial intelligence technology, but also to allow the government to regulate the corresponding responsibilities and powers, prevent the leakage of power, and better achieve government-enterprise cooperation.

4.3 Innovative Governance Model

Improve systems and regulations. The avoidance of risks cannot only rely on ethical means but should use systems and regulations. To use artificial intelligence in government governance, a relevant and sound institutional system must be established. At present, China's relevant systems are lagging behind. No matter in terms of privacy protection, technical supervision, or division of responsibilities, there is no review and supervision mechanism that is compatible with it. On the basis of improving the specifications and standards of the artificial intelligence technology layer, it is necessary to standardize the administrative examination and approval standards of this process, clarify the red line and the bottom line, strengthen education management, and actively promote the innovative development of artificial intelligence.

Identify the responsible party. In addition to clarifying the responsibilities for the government and enterprises in the external environment, the responsibilities for administrative personnel of the government should also be more clarified. In the process of government affairs, it is necessary to clarify the responsibilities for technology and personnel and standardize the responsibilities between personnel. Only by clarifying the subject of responsibility can we avoid prevarication in administrative procedures and avoid using artificial intelligence as an excuse and reason within evading corresponding responsibilities.

Improve the governance structure. The traditional government organization model and government governance structure are incompatible with the era of artificial intelligence and will still face problems such as poor data sharing, unclear power and responsibility relationships, and mismatched governance structures [7]. This is the fundamental difference between bureaucratic governance and flat artificial intelligence structure. Therefore, it is not only necessary to change the structure of organizations and personnel at all levels, divide the boundaries of functions and responsibilities and use new organizational models to achieve data and information intercommunication and sharing, but also to strengthen communication and cooperation with artificial intelligence companies to jointly resist external risks.

5 Conclusion

The application of artificial intelligence is spurring a revolution, which has a profound impact and earth-shaking innovation on the development of people's livelihood, social

change, and national governance [8]. There has been constant controversy over the addition of artificial intelligence as a new tool for government governance. Scholars from all areas are also actively researching the artificial intelligence technology layer, analyzing the government governance system layer, surveying the internal and external environment, and exploring the integration of the two. In the future, artificial intelligence technology will surely make government governance more advanced and intelligent, and risks will become more variable and complicated. However, no matter what level or stage it is at, the fundamental solution to these problems cannot be accomplished overnight. It requires long-term attention and discussion.

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