

# *Research on the Development of Rural Governance Based on Digital Technology*

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**Abstract:** Over the past 40 years of reform and opening up, rural societies have been challenged by the absence of governance subjects, the complexity of governance content, the fragmentation of governance structure, and the low performance of governance. Digital technology has paved the way for resolving the challenges of rural governance with scientific and technological support. However, there are problems such as weak digital architecture, biased perception of digital technology application by grass-roots governments, and poor digital skills and literacy of farmers. In the new era and new march, to promote the construction of digital villages, it is necessary to continuously consolidate the facility basis for the development of digital villages, deepen the grassroots government's awareness of the application of digital technology, improve the digital literacy and skills of farmers, and improve the digital governance system.

## **1. Introduction**

Efficient governance is a due course for the modernization of rural governance. Deep structural changes in society are often accompanied by innovations in science and technology. Digital technology can integrate and process all kinds of information by means of computing, storing, and transmitting, and can reduce the complexity of governance into a clear "map", and eventually realize standardized, refined, and intelligent governance. Digital technology speeds up and enhances the effectiveness of social governance and is a key variable in achieving high-quality and high-efficiency rural governance and in promoting the rationalization of agriculture and rural areas. Accordingly, applying digital technology to rural governance and enabling rural governance is one of the important elements of accelerating the construction of digital China [1-2].

## **2. The role of Digital Technology in Rural Governance**

In enhancing the efficacy of rural governance and promoting rural development, digital technologies can achieve such advantages as information sharing and delivery, data analysis and decision support, precise poverty reduction and eradication, agricultural intelligence and refinement, e-commerce in the distribution of farm products, as well as rural tourism and cultural preservation. Digital technologies can have a positive impact on rural residents' involvement in decision-making and access to information [3-4]. Digital technologies provide more chances to participate in decision-making, enhance the convenience of access to information, increase the information

transparency, and expand the scope of social interaction. These benefits can help to promote the continuity and quality of rural development and facilitate the implementation of the rural revitalization strategy [5-6].

## **2.1 Unique Advantages of Digital Technology**

Digital technology has a unique advantage in enhancing the efficiency of rural governance and promoting rural growth, as shown below.

(1) Data sharing, analysis and decision support. Digital technology can achieve rapid sharing and transfer of information, integrate information from various levels and departments in rural areas, and promote the flow and exchange of information. This helps to improve the science and precision of decision-making and enhance the communication and interaction between the government and farmers. Digital technologies can collect, organize, and model a large amount of data, providing decision support and forecasting capabilities. Through data-driven decision-making, the needs and issues of rural development can be better understood, providing a scientific basis for decision makers to optimize resource allocation and decision-making outcomes [7-8].

(2) Enhancing agricultural intelligence and helping to reduce poverty with precision. Digital technology is being applied to all parts of agricultural production, such as soil monitoring, weather prediction, intelligent irrigation, precise fertilization, and so on. Through real-time data and sensor monitoring and feedback, the agricultural production process can be optimized, yield and quality can be improved, and resource consumption and environmental pollution can be reduced. Digital technology can help realize the precise recognition and positioning of the rural poor and gain a deeper understanding of their needs and problems. Through the creation of files and information management systems for poor families, it is possible to implement precise poverty reduction policies, accurately place helping resources, and promote poverty eradication in poor areas [9-10].

(3) Enabling the distribution of agricultural products and enhancing rural travel and cultural protection. Digital technology has driven the change in the mode of circulation of agriculture products, making it feasible for them to be sold online and delivered logistically through an e-commerce platform, which breaks the time and space limitations of traditional agricultural product sales. This helps to widen farmers' sales channels and improve the market competition and added value of agricultural products. Digital technology provides new chances for rural tourism, and by constructing digital tourism platforms and promotion strategies, more tourists can be attracted to the villages for tourism and experience. At the same time, digital technology also helps to protect the cultural legacy of the countryside and realize the digitized display and inheritance of cultural resources.

## **2.2 Impact of Digital Technology**

Digital technology has a major impact on rural residents' involvement in decision-making and their access to information, among other things.

(1) Easy access to information and opportunity for decision-making participation. Digital technology has altered the way information is disseminated, making it more convenient for rural residents to access all kinds of information. Through the Internet, cell phone applications, and other channels, inhabitants can learn about government policies, market conditions for farm products, technical knowledge, and educational resources. In addition, digital technology has also promoted the digitalization of rural life services, such as online shopping, online payment, online education, etc., to provide rural residents with a more convenient way of life. Digital technology provides more ways and a platform for rural residents to more easily participate in the decision-making process. Through online surveys, online questionnaires, social media, etc., people can express their

proposals, opinions and needs, and participate in the formulation and execution of public policies. The open and inclusive nature of this type of participation can increase the participation and satisfaction of rural residents and improve the rationality and feasibility of decision-making.

(2) Transparency of information and provision of a social platform. Digital technology can facilitate open government affairs and information transparency, allowing rural residents to have more of government website and WeChat public numbers, so that rural residents can learn more information and enhance their sense of monitoring and participation in government work. Digital technology has provided rural inhabitants with a wider range of social networking platforms, allowing them to communicate and interact with other residents, experts, scholars, entrepreneurs, and so on. Through various social media platforms and online forums, rural residents can share their experiences and problems and get advice and support from different fields. This expanded social interaction helps build a bridge between rural residents and promotes the sharing of experiences and resources. Intuitive understanding of the government's work progress and decision-making results. For example, the government can release government work reports, budget information, project progress, and social welfare undertakings through channels such as the establishment of government websites and WeChat public numbers, so that rural residents can learn more information and enhance their sense of monitoring and participation in government work. Digital technology has provided rural inhabitants with a wider range of social networking platforms, allowing them to communicate and interact with other residents, experts, scholars, entrepreneurs, and so on. Through various social media platforms and online forums, rural residents can share their experiences and problems and get advice and support from different fields. This expanded social interaction helps build a bridge between rural residents and promotes the sharing of experiences and resources.

### **3. The Dilemma of Governance as a Driving Force for Digital Transformation of Rural Governance**

General Secretary Top leaders of China pointed out that "Problems are the starting point of innovation and the power source of innovation." The problems and challenges facing the rural society in its transformation and development are not only the power source of achieving innovation in rural governance, but also provide opportunities for the integration of digital technology into rural governance.

#### **3.1 Changes in Rural Society Require Technological Innovations in Governance**

With the advance of industrialization, rural societies founded on traditional agriculture have inevitably undergone changes and transformation towards a modern society. Over the past 40 years of reform and opening up, there has been a large-scale population movement in the countryside, and the economic and social development has changed the pattern of relationship within the countryside and the livelihood mode of the villagers, so that "Vernacular China" has been transformed into "Urban and Rural China" gradually, and the rural governance is facing a historic challenge. Rural governance is also facing historic challenges.

Firstly, the main body of governance is lacking. Traditional rural society is a community of values, sentiments, and life interests gradually formed by people living together for a long period of time. Under the drive of industrialization and urbanization, the mobility, diversity, and splintering of rural society have been increasing, and the countryside has been gradually moving from a community society to a fragmented society. With an overpopulation of the agricultural population and many young people going out to work, there is a serious problem of "hollowing out" in the countryside; villagers outside the countryside have little motivation to participate in rural

governance; the aging of the villagers left behind is prominent; and villages are lacking in popularity and vitality.

Secondly, the content of governance is being complicated. In the process of modernization, the locality, the homogeneity, and the closed nature of the countryside have been broken, and the phenomena of value, plurality, interest, pluralism, and life stratification have appeared in the rural society, and the content of governance has shown a trend of complexity. First of all, it is difficult to unify the diversification. With the spread of different ideas in the countryside, the countryside has become a place for the convergence, mingling, and exchange of different cultures and ideas, and some people's values have shifted from one to many, from the whole to individual, from spiritual to material, and from sacred to secular, with the social evaluation standard moving towards relativism, skepticism and nihilism. Secondly, it is difficult to mobilize for the division of interests. Since the reform and opening up, one of the most fundamental changes in the countryside has been the differentiation of peasants into different identities, occupations, and social relations. The differentiation of peasants means the diversification of the sources of interests of peasant groups, the complexity of interest relations, and the emergence of contradictions in interests. After the division of farmers, their ideology has changed, and it has become more difficult to organize and mobilize them. Finally, it is difficult to resolve conflicts and disputes. The number of conflicts and disputes in rural society has increased, and the causes of conflicts have diversified, making mediation difficult.

Thirdly, the governance is fragmented. In the era of big data, characterized by the rapid development of information technology and the interconnection of all things, data have become an important resource for governance. However, due to sectoral barriers resulting from "compartmentalization", the phenomenon of data compartmentalization in grass-roots governance is very prominent. On the one hand, some government departments hold data within their own area of jurisdiction, which they do not share with other departments and which are separated from each other, so that there is a sectoral monopoly on the data; on the other hand, the data collected by grass-roots sectors on the basis of their own needs are often limited, and it is not scientific or accurate to rely solely on their own sectoral data to make relevant decisions.

### **3.2 Digital Technology Provides Scientific and Technological Support for Rural Governance**

In the 21st century, digital technologies such as the Internet, the Internet of Things, artificial intelligence, cloud computing, and blockchain have been continuously updated and widely used in production and life, and mankind is experiencing a social transformation led by digitization, informatization, and intelligence. With the development of Internet technology and the advent of the big data era, digital technology provides a new impetus for the transformation of social governance and has become an important driving force to promote social governance innovation. The application of digital technology in rural society has presented an opportunity for the transformation and development of traditional rural social governance.

The so-called "technological empowerment" refers to the fact that digital technology, as a tool of governance, has been applied to rural governance, giving full play to its advantages of intelligence, precision, and speed, improving the convenience and efficiency of rural governance, and reducing governance costs. In traditional rural societies, rural governance has been characterized by simple governance based on traditional values. With the emergence of such phenomena as changes in economic patterns, accelerated population mobility, expanded social openness, individualization, and the lagging development of rural social organizations during rural social transformation, many difficulties have arisen of the traditional rural-based social governance model, including the absence of a governing body, the complexity of the content of governance, the fragmented nature of the

governance structure, and the low performance of governance. The simple governance of the past faced the predicament of "unmanageable" and "unmanageable". Science and technology are key elements in the modernization of rural governance, and digital technology has provided technical support for such modernization.

First of all, by building a network governance space, it is possible to connect multiple rural subjects through digital technology. On the one hand, it can solve the problem of inconvenient participation in rural governance by governance subjects due to time and space constraints; on the other hand, through the network, it can allow more rural subjects to participate, solving the problem of grass-roots governance in the past, which relied mainly on the grass-roots government to promote it, while other subjects had little participation in it. Secondly, digital technology can enhance the connection between absentee villagers and the grassroots government, village cadres, and other villagers, and connect and reshape the social relations and social structure of villages that have been severed due to population mobility. Thirdly, the empowerment of digital technology can promote good governance in villages. Digital governance platforms have been utilized to promote villagers' autonomy, make village affairs public in a timely manner, and safeguard villagers' rights to self-governance and supervision. For example, public interest lawyers, mediators, and villagers have been integrated into the platform to provide feedback on problems and mediate conflicts online, and to strengthen the construction of the rule of law in villages; and a network platform has been used to publicize good deeds and good deeds in villages and to set up moral benchmarks, leading the rule of virtue in villages. Finally, digital technology has been fully utilized to break down departmental barriers, achieve information sharing, sharing of responsibilities and joint governance within grass-roots governments and between grass-roots governments and other governance bodies, and promote the transformation of rural governance from fragmentation to wholeness, saving governance costs and reducing the waste of governance resources.

#### **4. Challenges of Digitally Enabled Rural Governance**

Digitalization, informatization, and intelligence are important supports for the modernization of agriculture and rural areas in the new era. Digital technology-enabled rural governance can improve the effectiveness of rural governance and reconfigure social ties in the countryside, but there are many problems in the development of rural digital governance, such as weak infrastructure to ensure digital governance, biased understanding of the application of digital technology by grass-roots governments, and the lack of farmers' digital literacy and skills, as well as weak capacity for digital application. It is clear that there are still many risks in rural digital development.

##### **4.1 Weak Rural Digital Infrastructure is a Shortcoming of Rural Digital Governance**

The modernization of rural digital infrastructure is the foundation for the realization of rural digital governance. The empowerment of rural governance by digital technologies requires the support and guarantee of software and hardware facilities such as the Internet, the Internet of Things, artificial intelligence, and data centers, etc. The prerequisite and foundation for the effective functioning of digital technologies is that the Internet can fully cover villages, and that every household in villages can be connected to the governance network through smart terminals. However, many villages are still unable to meet these conditions, and the digital infrastructure of villages remains a fundamental factor constraining the development of rural digital governance. First, the hardware facilities for rural digital governance are insufficient. According to the information released in the 49th Statistical Report on the Development of China's Internet, as of December 2021, there were 284 million rural Internet users in China, accounting for 27.5% of the total number of Internet users, and the Internet penetration rate in rural areas was 57.6%. Both the

number of rural Internet users and the Internet penetration rate in China reflect that although the development of informatization in China's rural areas has made positive progress in recent years, the construction of hardware facilities in digital villages is still lagging behind. Even in places that are connected to the Internet, the speed and quality of information dissemination vary, which is closely related to the lack of hardware support for digital facilities. Secondly, the software and technical support for rural digital governance is not mature. Digital governance requires not only hardware support but also software guarantees. On the one hand, the supply of scientific and technological innovation for digital village construction in China is low, the research results of digital village construction are not rich enough, and there is a lack of technical talents; on the other hand, the application level of digital technology is limited. At present, compared with cities, the level of digital governance in villages is still at an exploratory stage in terms of research and development of digital governance technologies, data collection and analysis, content mining and data application.

#### **4.2 Lack of Clarity on Digital Concepts Creates Obstacles to Digital Governance on the Ground**

The governance philosophy of rural governance subjects has a significant impact on the development of rural digital governance. In terms of the understanding of digital governance, grassroots governments have two major misconceptions, namely, the rejection of digital technology and the excessive worship of digital technology. First, some grassroots governments reject the use of digital technology in governance based on their own interests. Digital governance has increased the transparency of public affairs and the participation of governance subjects, but it has also magnified the responsibility and risk of grassroots governments. On the one hand, grassroots governments have shifted their goals to building digital villages, interpreting digital governance simply as the construction of digital platforms, the development of government programs, online offices, and the release of information on the Internet, and failing to deeply understand the subversive changes that technology-enabled rural governance has brought about, thus making digital governance a "bonsai"-style image project; on the other hand, the uncontrollable nature of online social opinion has made digital governance more of a "bonsai" type of project. On the other hand, the uncontrollability of online public opinion has made grassroots governments concerned about promoting digital governance, which has made the traditional means of control by grassroots governments ineffective, and in the event of emergencies, the push and pull of the Internet will cause the "butterfly effect" of dissemination, so in order to avoid the risks of online public opinion and other risks, some grassroots governments have taken a prudent attitude toward digital governance. Some grassroots governments are cautious about digital governance, and although they have implemented digital governance, it is not in-depth. Second, the omnipotence of digital technology has led some grass-roots governments to excessively worship digital governance. Digital technology has brought great changes to production and life, especially in terms of enhancing government efficiency, optimizing public policy, expanding public participation, and promoting social governance, which has led some grass-roots leaders to have high expectations of the application of digital technology to social governance, believing that digital technology can do everything in governance. However, digital technology is not omnipotent, and digital technology itself is biased and capricious. In many application scenarios, digitization remains dysfunctional, stunted, and dysfunctional. As a result of digitization, a digitally simplified society might be distorted and human initiative ignored. When Governments use the eyes of technology to observe society, they may see only their own shadow, creating the illusion of digital governance.

### **4.3 Low Capacity of Farmers in Digital Applications Affects the Introduction of Digital Governance**

The smooth implementation and sound development of rural digital governance requires not only advanced infrastructure, but also modern farmers with a certain degree of information awareness and application capacity. However, the reality is that farmers' weak digital application ability has become an obstacle to the implementation of rural digital governance. First, the overall level of digital literacy among farmers in China is not high, especially in the central and western regions and less developed areas. The three major shortcomings of rural residents in terms of their ability to use digital applications are their apparent lack of awareness of network security, their limited ability to use mobile media, and their serious lack of ability to increase their income through digitalization. In the countryside, the differences in digital literacy are mainly reflected in gender, age, and education level, with the elderly, women, and people with lower education becoming digitally disadvantaged. According to the 49th Statistical Report on Internet Development in China, by the end of December 2021, the number of non-internet users in China had reached 382 million. In terms of region, the location of non-internet users is still mainly in rural areas, accounting for 54.9% of the total; in terms of age, the elderly over 60 years old are the main group of non-internet users. Second, in terms of digital skills, the level of digital application by farmers is still at a low level. Among the reasons why many non-internet users do not go online, 74.1% are due to lack of skills, ignorance of computers, low literacy level, and inability to. There is also a big gap between urban and rural areas in terms of the depth and breadth of Internet applications. According to a survey conducted by Xie Qiushan and Chen Shixiang on the digital transformation of rural public services in the central and western regions, only 19.73% of the survey respondents regularly accessed the Internet, and 57.21% of the respondents had done business through online channels. There is also a big difference between urban and rural underage Internet users in their use of the Internet, with a higher proportion of urban underage Internet users using applications with strong social attributes, while rural underage Internet users prefer leisure and entertainment applications, which are at the stage of entertainment and superficiality, with insufficient depth of application.

### **4.4 Rural Digital Development Hides Risks Such As Data Security**

In today's society, there is no doubt about the innovation and effectiveness of big data in social governance. While society as a whole is actively promoting the use of digital technologies, it has overlooked the risks and ethical issues that may exist in their applications, as well as the negative effects that they may produce. The uncertainty of the technology itself, the subjectivity of its users, and the changes in organizational structures brought about by the technology have led to many controversies and disagreements at the various stages of data collection, management, and application. While digital technology empowers rural governance, it also poses a number of risks: first, the risk of information security. Digital governance is based on big data, which has become an important governance resource. In daily life, personal privacy is often leaked due to lax data management. The data held by grassroots government departments cover the rural population, transportation and road networks, agricultural production, medical care and social security, etc. If they are not well protected and information is leaked, it will definitely lead to large losses for the participating subjects and the public interests of the grassroots, and even jeopardize the public security of the countryside. Second, the risk of governance failure. Artificial intelligence technology has created a hidden space that is hard to reach for the traditional hierarchical power system, and the massive amount of data generated by digital governance will ultimately be converged and stored in data centers managed by government departments, and the government will become the administrator of these data. The right to manage and dispose of data by government departments

will also create a new concentration of power, and instead of weakening the authority and power of the traditional bureaucracy, the authority and power of the traditional bureaucracy will be strengthened in reverse through digital technology, creating "smart bureaucracy". Third is the risk of ethical conflict. Not only does information technology fail to solve ethical and moral problems, but it even impacts the original administrative ethics. The cyberspace constructed by information technology has made human life more convenient, but the digital divide, data monopoly, and supremacy of algorithms, resulting in the neglect of digitally disadvantaged groups, will lead to a lack of ethical values and a weakening of humanistic care in the process of governance, which will have a negative impact.

## **5. Path to Improvement of Rural Governance Based on the Development of Digital Technology**

In the information age, the digital development of villages has become an unstoppable trend. In the face of problems and contradictions in the construction of digital villages, we should not avoid or stop. We must persist in making up for the shortcomings, strengthening the weaknesses and improving the capacity, continuously consolidating the foundation of facilities for the development of digital villages, changing the understanding of the application of digital technology, improving digital literacy and skills, and perfecting the systems of digital governance, in order to make good preparations for the development of digital governance in the villages.

### **5.1 Compacting the Foundations: Improving the Availability of Modern Information in the Countryside**

Digital infrastructure development is the material foundation for modernizing rural governance. The key to bridging the digital divide between urban and rural areas and improving the accessibility of modern information in villages lies in consolidating the foundation of digital facilities in villages. A good digital infrastructure is the foundation for the implementation of rural digital governance and the support for building a digital governance platform. The storage, transmission, and sharing of data, as well as the operation of the entire governance process, all depend on the software and hardware of digital facilities. The level of hardware facilities in digital villages has a significant impact on the degree of information acceptance of rural residents and can change farmers' perceptions and actions. First of all, the government should increase the investment in rural digital infrastructure construction and rapidly promote the modernization of rural digital infrastructure. Rural digital infrastructure is a public good, and the attribute of public goods determines that the government is the main body of construction and must take the main responsibility. It is necessary to adhere to the concept of common construction and sharing, and actively build a multidimensional construction mechanism led by the government and participated by the society, to strengthen the construction force. In the construction of digital facilities, high standards and strict requirements should be met in a single step, and the application of the most advanced technologies, such as gigabit networks, 5G technology, and mobile Internet of Things, should be promoted in rural areas, to avoid the waste of resources caused by duplicated construction. Second, it is necessary to strengthen technological innovation and continuously improve the software support for digital governance. On the one hand, it is necessary to pay attention to talent cultivation, establish a talent system, and gradually train a group of excellent agricultural science and technology talents, to build a talent team for the digital development of agriculture and rural areas; on the other hand, it is necessary to strengthen the collaborative innovation of industry, academia, and research, set up a key research and development project financed by the government, and entrust colleges and



universities, research institutes, and Internet enterprises to conduct joint research and development on the basic frontiers of digital countryside governance, and the major common and critical technologies, with a view to realizing a breakthrough in core technologies. On the other hand, it is necessary to strengthen collaborative innovation among industries, universities, and research institutes.

## **5.2 Conceptual Change: Correctly Recognizing the Strengths and Weaknesses of Digital Governance**

Concepts are the precursors of action, and the transformation of grass-roots governments' concepts of governance is the first and foremost task in the implementation of digital governance in villages. Digital technology is the only tool for governance, and tool users should have a correct understanding of the advantages and shortcomings of applying digital technology to social governance. They should not only eliminate their prejudice against digital technology, but also change their excessive worship of digital technology, and set up a correct concept of digital governance. First of all, it is necessary to deeply understand the subversive changes brought about by digital technology empowering rural governance. As a brand-new application mode, digital governance emphasizes wisdom, transparency, interaction, and participation. Information technology has restructured the organizational structure of the government, promoted the technological transformation and upgrading of governmental governance, changed the way of information dissemination and the mode of social organization and management, and prompted the government to take the initiative in accepting social supervision and promoting citizens' participation in governance activities in an orderly manner, thus guiding the transformation of the mode of governmental governance into a networked and holistic one. As the organizer and leader of digital governance in villages, grassroots governments must change their misconceptions about digital governance, put an end to negative behaviors in promoting digital governance for the sake of avoiding risks, and safeguarding departmental interests, establish a comprehensive big data mindset, and actively use digital technology to make scientific decisions, carry out social services, and innovate social governance. Second, it is necessary to eliminate the omnipotence of digital technology and objectively recognize the shortcomings of digital technology. As a promoter of digital governance, grassroots governments must have a clear and rational understanding of the effectiveness and limits of digital technology, and must not confuse the difference between "intelligence" and "omnipotence". It is necessary to establish rationality in governance and deeply understand that technology is the only an enabler rather than a decision-maker, and that technology should ultimately be used by people rather than being "kidnapped" by technology. Digital technology is not a panacea for grass-roots problems. We should not overstate the applicability of digital technology, nor should we over worship digital technology, nor should we be overly obsessed with digital technology; instead, we should have a rational understanding of digital technology, use it reasonably, and make it play its due role in rural governance.

## **5.3 Enhancing Literacy: Increasing Farmers' Resilience to Digital governance**

Rural residents are the main participants in rural digital governance and the main users of digital technology, and the level of digital literacy of farmers has a bearing on their motivation, initiative, and creativity in practicing and participating in various areas of the digital village. Therefore, the core of digital technology-enabled rural governance lies in the people, and the key is to improve farmers' digital literacy. It is necessary to strengthen rural "wisdom building", enhance farmers' adaptability to digital governance, and train them to become modern, high-quality farmers who are technologically savvy, Internet-enabled, hardworking, participatory and cooperative. To improve

farmers' digital literacy, it is important to consider both the present and the long term. First, in view of the urgency and necessity of implementing digital governance, strengthening digital skills training for farmers is the most effective and fastest way. We need to take the lead from grass-roots government departments and work with operators, Internet companies, and social organizations to promote information technology in the countryside. Through knowledge dissemination, technical guidance, technical training, and other diversified methods, we can, on the one hand, raise farmers' awareness of digital technology and digital governance, and enhance their willingness to use digital technology; on the other hand, we can enhance their ability to utilize digital technology. Second, from the perspective of the long-term development of rural digital construction and digital governance, a rural digital education system must be established. The main reason for farmers' low digital literacy and skills is their low level of education. Therefore, it is necessary to popularize information education in villages, offer information technology courses, and carry out information intelligence education, to continuously narrow the gap between the digital abilities of urban and rural youth through education. In addition, government departments should provide farmers with preferential subsidies for the purchase of digital equipment and services, and take into account the characteristics of rural areas by developing targeted and easy-to-use applications, which would, to a certain extent, increase farmers' motivation to participate in digital governance.

#### **5.4 Institutional Improvements: Enhancing Risk Prevention in Rural Digital Governance**

The risks hidden in the process of digital technology giving play to its governance advantages should not be overlooked. If rural digital governance focuses only on digital empowerment and neglects governance empowerment, it will surely result in the misuse of data. In order to allay the concerns of the public and society about the problems that may arise in the collection, management, and application of data when digital technology empowers rural governance, it is necessary to continuously improve the system and strengthen the prevention of risks in digital governance. First, in terms of information security, it is necessary to improve laws and regulations related to data collection, management, and application, and to establish an effective safeguard mechanism for prevention, supervision, and punishment. Only by paying attention to the system construction and strengthening the implementation of the system can we achieve *ex ante* constraints and *ex post* deterrence, which will serve to safeguard information security. In addition, the ownership of data should be clarified, and the information security responsibilities of those who own the property rights should be made clear. Secondly, in terms of regulating the use of government data, it is necessary to establish a mechanism for the open sharing and monitoring of data. It is important to actively build a coordinated data management mechanism with multiple actors, encourage them to participate in data management, and establish a system of rights and responsibilities for sharing results and responsibilities. Citizens, as the creators, users, and owners of data, should have the right to control and dispose of data, establish a mechanism for authorising the use of data resources by citizens, and break the government's monopoly on data resources. Finally, in terms of ethical norms, it is necessary to establish a "people-centred" concept of digital governance, insisting that science and technology must serve the people and their pursuit of a better life. The application of digital technology must include humanistic care and comply with social ethical norms. In the application of digital technology, the government must abide by the humanistic bottom line and comply with administrative ethics and professional morality.

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