Analysis of Challenges and Countermeasures of Digital Rural Construction

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***Abstract*—** *Under the background of digital economy, digital village construction is an inevitable requirement for the modernization and development of agriculture and rural areas, and also a path choice for high-quality rural revitalization. However, digital village construction is still facing challenges such as insufficient infrastructure construction, low motivation of farmers' participation, imbalance between supply and demand of professional talents, and conflict between information sharing and information security. Therefore, it is necessary to strengthen the construction of infrastructure, enhance public participation, strengthen the cultivation and introduction of talents, and avoid digital security risks, further improve the construction of the rural digital economic system, and promote the high-quality development of digital construction.*

***Keywords*—** *Digitalization, Rural Construction, Rural Revitalization, Challenges, Countermeasure Analysis.*

I. INTRODUCTION

The advancement of industrial digitization has brought new development opportunities to rural societies, as well as new challenges to rural construction. The 19th CPC National Congress Report put forward the strategy of rural revitalization, after which the construction of digital villages was further identified as the strategic direction of rural revitalization. Digital village construction has become one of the hot topics in the context of rural revitalization strategy. At present, most of the relevant domestic research still lacks a certain perspective, and there is a large space for in-depth study. Therefore, based on the perspective of rural revitalization, this paper further systematically explores the practical challenges faced by digital rural construction and the corresponding countermeasure mechanism, which is of practical significance for cracking the problems of digital rural construction in China and promoting the digitalization and modernization of the rural governance system.

II. THE VALUE OF DIGITAL VILLAGE CONSTRUCTION

A. The Essence of Digital Village Development

Digital village construction refers to a new development model based on modern information technology, using digital means to promote the development of rural areas and improve the living standards of farmers, including agricultural informatization, the construction of an e-commerce platform for agricultural products, e-government, online education and training, health care monitoring and other aspects.

The construction of digital villages is aimed at creating a new community model that integrates information exchange, resource sharing and social services in order to modernize rural areas, including improving the living standards of rural residents, developing the rural economy, and improving rural infrastructure. The focus of digital village construction lies in the integration, optimization and sharing of rural information resources through digital technology, the Internet and other means, accelerating the process of rural informatization[2] , narrowing the development gap between rural and urban areas, and promoting integrated urban and rural development.

B. Value and Significance of Digital Village Construction for Rural Revitalization

Digitization helps to enhance the efficiency and effectiveness of rural governance. Through digital technology, the rapid collection, transmission and processing of information can be realized, thus improving the scientific and precise nature of decision-making; the openness and sharing of information can be realized, thus promoting the openness and transparency of governmental and social governance, and strengthening the fairness and democracy of rural governance.

Digitization helps to improve the quality of agriculture and increase income. The application of digital technologies such as the Internet and big data to agriculture not only promotes the informatization and convenience of decision-making in agricultural operations, but also helps to promote the intelligence of agricultural production and management, thus realizing an increase in the efficiency and profitability of agricultural operations.

Digitalization provides new opportunities and ways for rural development and innovation. Through digital technologies such as the Internet of Things and smart devices, it promotes industrial upgrading, talent training and cultural innovation in rural areas, breeding new industries, new forms and new models and promoting the comprehensive development of rural areas.

In summary, digital village construction, as an important direction of rural governance and development, helps to improve the rural environment and improve the living standards of farmers while promoting the integration of the digital economy and the rural economy, providing strong scientific and technological support for rural revitalization, and is one of the key links in rural revitalization.

III. CURRENT STATUS OF DIGITAL VILLAGE CONSTRUCTION IN CHINA

At present, China's digitalized countryside construction has made certain progress. Traditional infrastructures such as various energy sources, transportation and logistics, and

communications have become smarter, and the speed and quality of information interaction have been significantly improved, providing more opportunities for promoting economic development and social and cultural progress in the countryside. Specifically, it is mainly manifested in the following aspects:

A. Informatization Construction

Governments at all levels have strengthened informatization through the construction of information platforms, digital archives and public information services to improve the science and precision of decision-making.

B. Intelligent Agriculture

Through digital technology, it realizes precise management and intelligent control of agricultural production and improves the efficiency and quality of agricultural production.

C. Rural Financial Services

Through digital technology, comprehensive coverage and inclusion of financial services has been achieved, providing rural residents with more convenient and diversified financial services.

D. Public Services

To improve the quality and efficiency of public services through digital technology, strengthen infrastructure development and improve living standards and social security in rural areas.

It can be seen that the construction of digital villages has brought many good effects to rural development: mobilizing the enthusiasm for rural development, improving the level of rural management, popularizing rural education, medical care, public services and other resources for people's livelihoods, promoting the adjustment of the agricultural production structure and economic structure, expanding the pattern of new economic dynamics, realizing the innovative development of villages and so on, which has brought the gospel to rural development.

IV. CHALLENGES TO DIGITAL VILLAGE DEVELOPMENT

Digitizing the countryside is a task of broad significance and far-reaching implications. While significant progress has been made, there are many challenges.

A. Inadequate Infrastructure Development

Due to the relative lag in infrastructure development in rural areas, the construction of digital infrastructure faces certain difficulties and challenges. First, the low coverage of broadband networks in rural areas and the poor coverage of digital services have to some extent constrained the process of building digital villages. Secondly, there is a lack of financial support; rural development is growing rapidly, and the scale of investment is crucial, but at this stage, a large number of rural investments are still subject to the financial disposability of local governments, and infrastructure construction needs to be completed by relying on local financial allocations, which are not able to undertake large-scale construction of digital platforms.

In addition, data sharing and cross-platform links between rural digital platforms have not yet been fully realized, and duplication of data and information collection and construction of digital platforms is common, resulting in a serious waste of resources. The services provided by digital platforms still focus on simple information dissemination, are similar to traditional government websites, and are far from the digital platform construction plan, with limited benefits from platform construction.

B. Low Motivation of Farmers to participate

Digital village construction is different from smart city construction in that cities provide a hard foundation for the development of digital technology, in contrast, digital village construction is not only limited by objective material conditions, but also has to solve the compatibility problem between modern technology and local traditions.

Along with the promotion and application of digital technology in rural areas, the living conditions of rural society are increasingly dominated and influenced by advanced information technology. However, the development of informatization in rural areas is relatively lagging behind, the popularization of digital technology and informatization applications is limited, and some disadvantaged groups in rural areas are unable to quickly embrace the use of smart devices and information technology due to their low digital literacy. In particular, the wandering of village elderly people and migrant workers has made the digital village construction not yet fully integrated into the actual functioning process of the village society, and unable to give full play to the advantages of digital technology and informatization means. In addition, there is a certain information asymmetry between farmers' demand and service supply, and the top-down digital village construction action does not match with the bottom-up vernacular society, which leads to the difficulty of digital services to meet the actual needs of farmers, and the insufficient endogenous motivation of the farmers, and the lack of willingness to participate in the construction of digital villages , which affects the actual effect of the construction of the digital villages.

C. Imbalance in the Supply of and Demand for specialized Talents

The level of talent and technology in rural areas is relatively low, and digital construction lacks the support of professional and technical personnel. At the same time, the loss of talents and the lack of training mechanisms are also one of the factors restricting the construction of digitized villages.

On the one hand, the gap between urban and rural economies, production and living environments, and cultural concepts has led to the influx of high-quality and outstanding rural young adults to the cities; on the other hand, the digital village construction, as a new organizational work, has high requirements for information technology, but due to insufficient mobilization and training, some of the village cadres are not equipped with the ability to set up digital platforms, organization and management has also led to the endogenous forces that should be actively involved to gradually be marginalized. In the long run, this will inevitably

lead to a further shortage of human resources in the rural digital information engineering market, and the standardization of digital village systems will face an increasing shortage of highly skilled workers.

D. Conflict between Information Sharing and Information Security

The construction of digital villages requires the collection, transmission and storage of a large amount of personal information, and there are information security risks. First, data leakage. The construction of digital villages involves a large amount of sensitive personal and corporate information, such as financial data and identity information. If these data are not protected and reasonably utilized, it will have a serious impact on personal privacy and even generate legal disputes. Second, network security threats, digital village construction needs to rely on Internet technology for data transmission and storage, but there are various risks in the network environment, such as viruses, Trojan horses, malware, etc. These threats may lead to system paralysis, data loss or tampering and other problems. In addition, there is the risk of attacks on the supply chain. Since the construction of digital villages involves the participation of many parties, an attack on one of the links may jeopardize the security of the entire system. For example, if products from untrustworthy vendors are selected for hardware procurement, backdoor programs or other malicious codes may exist.

V. COUNTERMEASURES AND RECOMMENDATIONS FOR THE CONSTRUCTION OF DIGITAL VILLAGES

In order to overcome the above challenges, concerted efforts are needed from the Government, enterprises and all parties in society to improve the quality and effectiveness of digital services and to promote the overall promotion and realization of digital villages. Specific measures could include:

A. Strengthening Digital Infrastructure

Financial security is a necessary condition for strengthening digital infrastructure. On the one hand, the government should increase financial investment to promote broadband network construction and information infrastructure construction in rural areas, and improve the coverage and quality of digital services; on the other hand, digital villages can be moderately supported by social capital, mobilizing relevant enterprises to increase their investment in the construction of rural information infrastructure, and exploring the improvement of the network communication system and the system of building a database, so as to provide a comprehensive rural intelligent management platform Solutions.

B. Enhancing Public Participation in Digital Village Development

First, we should improve the content system of digital village construction by focusing on the needs of farmers. On the one hand, to meet the real needs of rural residents and enhance the sense of access of farmers as the focus of the work, timely detection and resolution of the digital village construction process of information skills requirements and the quality of the villagers themselves do not match, the

information technology landing with the village organization is difficult to connect and other issues; on the other hand, fully explore the rural digital construction platform information access function, and through data analysis, timely capture of rural residents On the other hand, it fully exploits the information acquisition function of the rural digital construction platform and captures rural residents' needs and expectations through data analysis in a timely manner, so as to realize the downward shift of the center of gravity and the sinking of services.

Secondly, it is necessary to strengthen the scientific and technological quality and information literacy of farmers. In order for the digital economy to be better implemented in the countryside, farmers must be guided to actively participate in it. Government departments can strengthen the scientific and technological quality and information literacy of farmers through publicity and promotion, and raise the awareness of rural residents of the value of digital technology; carry out basic skills training in the use of digital platforms, and improve the enthusiasm and ability of rural people to participate in the construction of digital villages. At the same time, we strengthen and improve the digital services for the floating population, encourage and guide the villagers to express their demands reasonably through various interactive platforms and actively participate in the public affairs of the villages. Only by fully respecting and understanding the local characteristics and values of villages, and strengthening communication and interaction with farmers, can the digital technology platform be widely recognized and applied, and can promote the further compatibility of digital rural construction technology with local traditions, so as to realize the benign interaction between digital construction and rural revitalization

C. Strengthening Talent Development and Introduction

Talent is the key to promoting high-quality digital villages. The Government should establish a talent pool for digitized villages through the introduction of talents and the cultivation of local talents, and promote the cultivation of talents and technical exchanges in rural areas. On the one hand, it can take advantage of the national policies to recruit excellent technical talents from the society to participate in the construction of digital villages. The government should also solve the problem of the establishment of talents. At the same time, should also solve the problem of talent preparation, appropriate to improve their salaries, encourage and guide capable, know how to lead, technical villagers back to make the digital village construction of the talent pool to be supplemented.

On the other hand, should design a special talent training program for digital villages, provide more practical opportunities related to digital village construction, such as community service, scientific and technological innovation and other activities, and enhance the understanding and mastery of digital applications by the relevant personnel; cooperate with higher education institutions, Internet technology companies and vocational training institutions, and adopt a combination of thematic lectures, group learning, vocational training and distance education to cultivate digital talents with digital thinking, professional skills and

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comprehensive qualities.

D. Avoiding Data Information Security Risks

The application of digital technology is a double-edged sword, and in order to avoid the derivative-type risks behind it, a sound system of laws, regulations and institutions adapted to the construction of digital villages should be established to strengthen the guidance and regulation of the application of digital technology. Limit access rights so that only those who have been authenticated and have obtained the necessary permission can access sensitive information to protect privacy and security; establish a sound information security management mechanism, install firewalls and intrusion detection systems on village digital platforms, and take appropriate encryption measures to ensure the security and reliability of digital village construction; establish a comprehensive risk assessment and crisis contingency plan for technology management comprehensive framework, and develop the habit of backing up data on a regular basis to ensure that it can be restored to the state of the most recent backup even if there is an unforeseen situation.

VI. CONCLUSION

In the context of the development of the digital economy, the construction of digital villages is a choice of paths for high-quality rural revitalization, and while it has broad development prospects and significance, it also faces multiple challenges and difficulties. Therefore, it is necessary to increase policy support for digital rural construction, strengthen the connection and cooperation among the government, enterprises and all social parties, use digital links to fill the short boards of agricultural and rural development, and jointly promote the process of digital rural construction and improve the construction of the rural digital economic system by multiple subjects.

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