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Analysis of Dilemmas Faced by Rural Revitalization in the Context of Digital Governance and the Path of Promotion: Taking Xi'an City as an Example

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Abstract: This paper provides an in-depth analysis of the dilemmas and paths currently faced by rural revitalization under the digital governance framework, using Xi'an, China, as an example. Rural revitalization is an important agenda in many developing countries, where integrating digital technologies into the governance process presents opportunities and challenges, focusing on how to use digitalization, a key component of modern governance, to promote socio-economic development in rural areas. This paper aims to reveal the complexities involved through analysis. The study is based on a mixed-methods approach, incorporating qualitative data from unstructured interviews with residents, as well as quantitative data from surveys and regional economic reports. It includes technology gaps, infrastructure constraints, digital literacy of the rural population, and how governance policies are adapted to local needs that affect the implementation and effectiveness of digital governance in rural revitalization. The study also explores the relationship between digital governance and rural revitalization, the relevance of digital governance ruralization, an analysis of rural digital governance, and rural digital governance practices. Ultimately, the thesis suggests potential ways to solve these dilemmas. And, it emphasizes the necessity that digital talent cultivation should be increased, new types of infrastructures should be improved, a rural governance system should be constructed, and policy frameworks for narrowing the urban-rural digital divide should be developed. This study contributes to the understanding of rural revitalization in the era of digital governance and provides insights into sustainable rural development and digital transformation. At the same time, the study results in the Xi'an region case may provide experience in solving similar situations globally.

Keywords: digital governance, rural revitalization, regional analysis, digital villages, rural development

1. Introduction

In the era of rapid digital transformation, the concept of rural revitalization has received widespread attention, especially within the framework of digital governance [1-3]. This thesis explores the symbiotic relationship between digital governance initiatives and the revitalization of rural communities, analyzing the problems currently faced and the means of possible solutions.

Historically, rural areas have faced challenges such as economic decline, population loss, and limited access to services, and the emergence of digital technologies has provided a new paradigm shift in thinking to address these challenges [4-5]. Current research on rural revitalization strategies covers a variety of topics, focusing primarily on socioeconomic development, technology integration, environmental sustainability, and community participation. Scholars have emphasized the critical role of sustainable economic diversification, the adoption of information and communication technologies to bridge the digital divide, and the importance of environmental management in rural areas [6-10]. Policy and governance have also figured prominently, with studies analyzing the impact of various policy interventions on rural communities [11].

However, rural revitalization in a digital governance framework faces many practical problems. Chief among these is the digital divide, with many rural areas lacking the necessary digital infrastructure and high-speed Internet access, coupled with economic constraints that limit investment in technology [9]. In addition, rural populations often face education and skills gaps in technology use, which are further hindered by cultural resistance to adoption [12]. Policy and regulatory frameworks often exhibit an urban bias and fail to address the specific needs of rural areas. Data privacy, security concerns, and the need for sustainable, long-term project funding also add to the complexity of the problem and are key aspects that need to be thoughtfully considered in any rural

digital governance initiative [13].

Recent research has emphasized the role of digital governance in empowering rural communities, arguing that digital tools can enhance public service delivery, community participation, and economic opportunities in these areas [14-15]. However, implementing digital governance in rural settings faces unique challenges, including digital divide issues, infrastructure constraints, and the need for capacity building. Despite these challenges, digital governance has positively impacted rural revitalization in a number of successful models, demonstrating potential avenues for broader application [16].

Current research, while broad in scope, tends to focus on urban-centered digital initiatives and less on the actual rural context, with a particular bias towards research that integrates policy with rural realities. This research gap highlights the need to focus on how digital governance strategies can be tailored to the unique needs and strengths of rural areas [17-18]. By examining various case studies and theoretical frameworks, this dissertation aims to clarify the vein links between rural revitalization and digital governance in reality by analyzing the technological gaps, infrastructural constraints, digital literacy of rural populations, and governance policies in the context of the actual situation of rural communities in Xi'an City, Shaanxi Province, China, to contribute to the discourse of rural revitalization in the digital era, and to propose a feasible strategy of utilizing digital governance to promote rural sustainable development as well as rural revitalization. It will contribute to the discourse on rural revitalization in the digital age, and propose feasible strategies to promote sustainable rural development and rural revitalization through digital governance.

2. The Link Between Digital Governance and Rural Revitalization

2.1. Digital governance for rural revitalization

Digital governance, which essentially refers to the application of digital technologies to the management and delivery of government services and processes, has great potential to contribute to rural revitalization. First, one of the main ways in which digital governance enhances connectivity and access to information and contributes to rural revitalization is by bridging the digital divide. Providing high-speed Internet access in rural areas is critical to connecting these communities to the wider world. Such connectivity enables access to information, e-learning opportunities, telemedicine, and e-commerce platforms, which are essential for the socio-economic development of rural areas.

For example, agricultural practices, which are the backbone of the rural economy, can be revolutionized. Through technologies such as precision agriculture, Internet of Things (IoT) sensors, and satellite imagery, farmers can increase crop yields, monitor soil health, and efficiently utilize resources such as water [19]. Digital platforms can reduce reliance on middlemen by providing farmers with real-time data on weather and market prices and connecting them directly with buyers. Digital tools can help manage natural disasters, which tend to disproportionately affect rural areas. Early warning systems, remote sensing technology, and mobile applications for emergency response can greatly mitigate the impact of disasters. Similarly, digital tools can help in environmental monitoring and protection efforts, which are critical in rural areas where livelihoods are closely linked to natural resources [20].

At the same time, digital governance can streamline government services, such as digital platforms for cultivated land records, online bill payments, digital registries for government-assisted agricultural programs, and virtual platforms for grievance handling in agricultural disputes. When these services are provided online, they can save rural residents the time and expense of traveling to distant government offices. E-government can also provide rural entrepreneurs with tools and resources to start and grow their businesses, including access to online marketplaces (e.g., Taobao, Amazon, Jingdong, etc.), digital payment systems (WeChat, Alipay, UnionPay online banking, etc.), and government portals for business registration and licensing. In addition, digital platforms can provide microfinance and crowdfunding opportunities for rural businesses [21-22].

Meanwhile, digital governance can bridge these gaps through telemedicine services and online educational resources. Telemedicine enables rural patients to consult with specialists in urban centers, connecting remote rural clinics to urban hospitals through the establishment of extensive telemedicine networks. This initiative has facilitated access to specialized medical services, combining modern medicine with traditional Chinese medicine, which also played an important role during the COVID-19 pandemic, ensuring continuity of care while minimizing the risk of infection [23]. These efforts have significantly reduced the healthcare gap between urban and rural areas, made quality healthcare more accessible to China's rural population, and set a benchmark for rural healthcare globally. In turn, e-learning platforms have provided rural students with access to quality education, including vocational training and skills development programs. The adoption of e-learning platforms has contributed significantly to the development of education and effectively narrowed the gap in education quality between rural and urban areas. These platforms have provided rural students with access to a wide range of resources and high-quality instruction that were previously limited due to geographic and infrastructural constraints. Facilitating distance learning during the COVID-19 pandemic promoted digital literacy among students and educators. This digital approach to education improves education in rural areas and promotes equity in China's education sector.

Digital governance is an important form of grassroots governance practice for the countryside, an important initiative to promote the rural revitalization strategy, as well as a catalyst for rural revitalization. It is of great theoretical and practical significance to stimulate the endogenous dynamics of rural revitalization, achieve good governance in the countryside, narrow the gap between urban and rural areas, and ensure the sustainable development of rural areas.2022 The Guiding Opinions of the State Council on Strengthening the Construction of the Digital Government released in June also pointed out that it is necessary to promote the construction of the digital countryside, to support the modern rural governance system with digitization, to accelerate the mending of the short boards of the information infrastructure in the countryside, to construct an agricultural and rural big data

system, and continuously improve the level of comprehensive information services for agriculture and rural areas [24]. The No. 1 document of the central government in 2023, "Opinions on doing a good job of comprehensively promoting the key work of rural revitalization in 2023", further emphasized the need to deeply implement digital rural development action, and promote the research and development and promotion of digital application scenarios. From this, it can be seen that digital governance is an indispensable path to promote rural revitalization.

2.2. Rural Revitalization Feeds Digital Governance Rural Outreach

Rural revitalization policies can play a key role in facilitating the spread of digital governance in rural areas. By incorporating digital governance strategies into rural revitalization efforts, Governments can effectively bridge the digital divide, enhance service delivery, and empower rural residents. Rural digital governance is the use of information-based digital technology in the process of rural governance, making rural social management more modern and democratic. In addition, rural digital governance can also promote the refinement of comprehensive rural services and the intelligence of rural communities, to maximize the public interests of rural society. The implementation of the rural revitalization strategy can not only force the upgrading and transformation of China's rural grass-roots governance but also promote the digital wave of the countryside to keep pace with the times, which will help the popularization of digital governance for all.

Rural revitalization can effectively stimulate rural infrastructure construction and expand broadband Internet infrastructure to rural areas. At the same time, fixed broadband deployment can be challenging in remote rural areas, so rural revitalization policies could also focus on improving mobile network coverage. After all, cell phones are currently the primary means of accessing digital information for many rural residents. The private sector is encouraged to invest in rural digital infrastructure, including telecommunications and technology solutions. Policies could strengthen non-governmental organization (NGO) collaboration, with NGOs experienced in digital literacy training and community engagement. Through NGOs, they can help bridge the access and education gap.

Rural revitalization policies can also allocate resources for digital literacy training programs [25]. These programs should target individuals of all ages and emphasize basic digital skills, cybersecurity, and the use of digital tools for various purposes, including governance. Digital resource centers or community centers equipped with computers and Internet access can also be established on a village-by-village basis to serve as focal points for digital literacy programs and information dissemination. Awareness-raising campaigns can also be conducted in the community to sensitize the rural population to the benefits of digital governance. Use local media, community meetings, and outreach programs to disseminate information. The policy could also encourage the deployment of IoT and sensor networks in rural areas. These technologies can collect valuable data related to agriculture, weather conditions, and resource management, informing decisions to process and analyze data collected from rural areas. These insights can guide policymakers in implementing targeted interventions.

In conclusion, the implementation of the rural revitalization strategy can force the upgrading and transformation of grass-roots governance in China's villages and promote the digitalization wave of villages to keep up with the needs of the times, and the two can complement each other to narrow the gap between urban and rural areas.

3. Relevance of Ruralization of Digital Governance

3.1. Individual Level

In the context of the new era of digital governance, digital awareness is invariably developed, both among digital citizens in the countryside and the digitally poor. Economic efficiency can be improved by giving rural residents access to digital markets, educational channels, and financial services, thereby expanding their participation in the digital economy and human capital development. The rapid development of digitalization is also forcing rural residents to learn about apps and recognize the various types of "Internet+" projects. This is at least not a bad thing for rural residents, rural residents can make full use of the benefits of the information age, online village affairs, supervision, and evaluation, which not only saves more time costs but also can effectively prevent the digital economy wave of new "rent-seeking" behavior. The whole process is truly transparent, open, and democratic, which not only enhances the people's sense of ownership in digital governance but also protects the legitimate rights of citizens. In addition, rural residents can also use digital platforms such as Jitterbug and Xiaohongshu to promote and sell agricultural products, increasing their income while also better connecting with the times.

3.2. Social Level

At the societal level, the ruralization of digital governance enhances the dissemination of information, optimizes the delivery of services, reduces transaction costs for government and rural stakeholders, and improves the efficiency of resource allocation. It effectively increases agricultural productivity, market access, and income distribution, contributing to overall economic growth and poverty reduction. In addition, digital governance enhances social capital by strengthening community participation and promoting collective action and social inclusion, which in turn leads to more sustainable rural development outcomes. Effective monitoring and evaluation mechanisms aligned with performance indicators and data analytics enable data-driven decision-making,

resource optimization, and accountability, ensuring the durability and effectiveness of digital governance initiatives in rural extension.

Digital rural governance is of great significance to the modernization of rural governance capacity and the realization of rural revitalization. In recent years, a large-scale "digital revolution" around the countryside has been developing rapidly in various parts of China, such as Deqing County, which has explored the construction of a "135" framework system for rural digital governance, and the government reforms of "running at most once", "running only once" and "running once without running" for villages have also been gradually extended to the village level. More and more villages are joining the new era of digital governance, which not only enhances the level of digital governance in the whole region of China, but also helps to promote the integrated development of urban and rural areas, narrow the gap between urban and rural areas, and thus accelerate the realization of the goal of comprehensive revitalization of villages in the digital era.

3.3. National level

Digital governance can significantly improve the efficiency of rural governance in a country, contributing to greater transparency, accountability, and efficiency in public service delivery. By utilizing advanced information and communications technologies (ICTs), such as e-government platforms and digital infrastructure, rural communities can have smoother access to basic services and information. This can increase social inclusiveness, reduce information asymmetries, and contribute to increased economic productivity and efficient resource allocation. In addition, digital governance enables data-driven decision-making, contributing to the development of evidence-based policies and the optimization of resource allocation. Ultimately, the convergence of technology and governance can create a more robust and equitable socio-economic environment for rural areas, promoting economic growth and overall development.

4. Rural Digital Governance Issues in Xi'an as an Example

4.1. Lack of Digital Talents and Redundancy of the Digital Poor

In today's booming digital economy, the first challenge to rural digital governance is the lack of awareness of digital technology and the digital economy. The pressing issue of digital talent scarcity in rural areas has exacerbated the widening gap between urban and rural areas, creating a clear digital divide. This phenomenon highlights the concept of the "siphon effect", whereby the lure of urban centers, especially more developed urban areas, lead to a massive exodus of rural talent. The migration of younger generations in search of better economic prospects and digital opportunities in urban areas has left rural areas facing a shortage of skilled digital workers. As a result, this digital talent gap hinders the effective implementation of digital governance measures and the economic development of rural areas in Xi'an.

In the city of Xi'an, for example, it was found during unstructured interviews that more rural residents have low digital awareness and cannot keep up with the pace of the times and that the phenomenon of more digital poor still exists, with a predominance of elderly people, who generally lack a basic understanding of digital knowledge. The lack of digital talents is an important problem for the development of rural areas in Xi'an. After in-depth understanding, we found that the "siphoning effect" of the city has led the younger generation from the countryside to move to the more developed "Six Districts" (Xincheng District, Beilin District, Lianhu District, Yanta District, Weiyang District, and Baqiao District), which has led to a gap between the countryside and the countryside, and between the city and the countryside. As a result, the gap between villages and villages, and between cities and villages, has become wider and wider [26-27].

4.2. Inadequate Digital Infrastructure in Rural Areas

The problem of inadequate digital infrastructure in rural areas stems largely from economic and regulatory principles, one of the main reasons being the concept of 'return on investment' (ROI). For telcos and ISPs, the ROI required to expand digital infrastructure into rural and remote areas tends to be lower due to lower population densities. This economic principle is consistent with the "market demand" principle, whereby companies focus on areas of higher demand to maximize profits and efficiency. In addition, this divide is often exacerbated in rural areas by a lack of infrastructure investment. From a managerial perspective, this situation involves a strategic decision-making dilemma. Companies must balance their profit objectives with the broader need for social digital inclusion, a concept linked to 'corporate social responsibility' (CSR). The challenge of expanding digital infrastructure in rural areas is therefore not only a technical issue but also a complex interplay between economic feasibility, market forces, and social equity considerations.

In a district of Xi'an City, for example, digital governance in the jurisdiction requires digital technology as a support point, and the rapid development of digital technology is inseparable from the Internet. However, a district in Xi'an, especially in more remote areas, has a weak digital infrastructure and digital facilities such as 5G networks and fiber-optic network lines have not yet achieved full coverage. According to the 2022 Statistical Yearbook of the Xi'an Municipal Bureau of Statistics, the statistics of telecommunication business in the main years, the number of telephones per 10,000 households in rural areas is 21.40, while the number of telephones per 10,000 households in Xi'an is 240.32, and the number of telephones in rural areas accounts for only

8.9%, which indicates that the digital penetration rate in a certain district of Xi'an City is low, which is an important reason for the slow development of digital governance in the countryside.

4.3. Lack of a Rural Digital Governance System

The system of villagers' autonomy in China has been of great value and relevance to the promotion of democratization in rural areas and the improvement of grass-roots democracy over a long period of time in the past. Undeniably, villagers' self-governance has made good achievements, but it has also revealed some thorny problems. At this stage, China's villagers' autonomy appears "one-person governance" abnormal phenomenon. In some places, the village committee or village cadres hold the decision-making power and execution power of village affairs, forming the bad trend of "one person taking charge of the overall situation", coupled with the arrival of the digital information age, will make a lot of affairs process electronically, the so-called "looking for relations before doing things" may face the risk of failure. The so-called "looking for connections to do things" may face the risk of failure, so the digital reform will conflict with vested interests, resulting in the effectiveness of digital governance in the countryside greatly reduced. In addition to the overuse and "abuse" of power, some grassroots organizations are still weak, defunct, and marginalized, and these problems within the grassroots organizations need to be solved faster to help the construction and implementation of the new system.

One of the main reasons for the current challenges of rural digital governance is the complexity of policy implementation in the vast and diverse rural areas. Rural areas in China vary in terms of economic development, digital literacy, and infrastructure readiness. This heterogeneity poses a significant challenge to a "one-size-fits-all" policy approach, requiring more targeted strategies to accommodate the unique needs of different rural areas. This requires a nuanced understanding of "localization" in policy implementation, a concept that emphasizes the adaptation of broad government strategies to local specificities. Central to this issue is the principle of "intergovernmental relations" in public administration. In China's governance system, policies are usually formulated at the national level but rely heavily on provincial and local governments for implementation. The effectiveness of digital governance measures in rural areas therefore depends on seamless coordination and cooperation between all levels of government. However, this can be hampered by bureaucratic hurdles and differing priorities across administrative levels, which is referred to in public administration theory as the "principal-agent problem," where the goals of the central government (the principal) may not be fully aligned with the goals of the local implementers (the agents).

Furthermore, the Chinese government's approach to digital governance in rural areas is influenced by its broader economic policies, particularly those related to 'infrastructure development' and 'digital economic growth'. Investment in digital infrastructure is a cornerstone of these policies, but the allocation of resources and funding tends to prioritize areas with higher potential for economic returns, leaving rural areas at a disadvantage. This reflects the economics of 'opportunity cost', whereby resources allocated to one region led to lost opportunities in another. At the same time, the "technocratic approach" prevalent in Chinese policymaking affects rural digital governance. This approach prioritizes technology and expert-driven solutions, sometimes leading to a disconnect between high-tech solutions and the realities of rural digital literacy and infrastructure capacity. To bridge this gap, policies should focus not only on technology deployment but also on building human capacity and digital literacy at the grassroots level.

In sum, the improvement of China's rural digital governance system is shaped by a complex interplay of factors at the policy and institutional levels. These factors include policy localization challenges, intergovernmental relations, economic priorities, principles of social stability, technocratic decision-making methods, and national security considerations. Addressing these challenges requires a comprehensive and adaptive policy approach that recognizes the unique needs and circumstances of different rural areas in China.

5. Path to Solving the Problem of Digital Governance in Xi'an's Countryside

5.1. Increase the Training of Digital Talents and Enhance the Digital Literacy of the Entire Population

The Government can formulate relevant policies and plans to dispatch talents to villages in a targeted manner to guide the construction of rural digital infrastructures, cultivate the awareness of the digital economy among rural localized residents, and master knowledge related to digital governance to participate in rural governance, to enable rural residents to become truly information- and digitally-literate digital citizens of the new era. In addition, townships can also offer professional knowledge classes to popularize information technology knowledge and improve the ability to use digital, to improve the digital literacy of the whole population.

Strengthening rural digital talent development is crucial to bridging the digital divide and improving the economic and social well-being of rural communities. This can be achieved through four main means:

Targeted education programs and skills training. The foundation for developing rural digital talent lies in education and training programs designed specifically for rural populations. These programs should focus on imparting relevant digital skills, from basic computer literacy to more advanced technical skills such as coding, digital marketing, and data analytics. Adapting the content to the specific needs and context of rural learners is crucial. Collaboration with local schools, vocational training centers, and online education platforms can facilitate the wide dissemination and popularization of digital education. In addition, integrating digital

skills into existing curricula can ensure that digital competencies in rural areas are developed in a sustainable and long-term manner.

Public-private partnerships (PPPs) for resource sharing and investment, developing digital talent in rural areas requires significant investment in resources and infrastructure, which can be effectively managed through PPPs. Governments can partner with private sector entities, such as technology companies and NGOs, to leverage their expertise, resources, and networks. These partnerships can facilitate the establishment of digital training centers, the provision of necessary hardware and software, and the development of customized training modules. Private sector involvement can also provide insights into current market trends and skill requirements, ensuring that the training provided is relevant and current. Public-private partnerships can be a catalyst for innovation and investment in rural digital talent development.

Involving local communities in the digital talent development process through community engagement and local champion development is critical to ensuring the relevance and effectiveness of training programs. This can be done by identifying and developing local champions - individuals who can inspire and lead digital learning within their communities. These champions can be trained to become trainers, which can have a multiplier effect in terms of skill dissemination. Community engagement also includes understanding the specific needs and challenges of rural populations, which can help design and implement more effective training programs. Establishing community learning centers, organizing digital literacy workshops, and holding regular feedback sessions all contribute to a community-centered approach to digital talent development.

Incentives and pathways for continuous learning and application. To encourage continuous learning and practical application of digital skills, it is important to create incentives and clear career pathways. This could include certifications, skill badges, or even tangible rewards for completing training programs. Linking training programs to employment opportunities, whether in local industries or through remote work options, can provide strong incentives for rural individuals to develop and apply digital skills. Government policies can also play a role in incentivizing businesses to hire locally trained digital talent, creating an enabling ecosystem for rural digital employment. Encouraging entrepreneurship and providing support for start-ups can further facilitate the practical application of digital skills and promote economic development in rural areas.

5.2. Improving New Infrastructure and Injecting Vitality into Rural Revitalization

Digital governance in villages must focus on the application of digital technologies such as artificial intelligence, blockchain, and big data. Therefore, the government should strengthen the construction of new infrastructure in the countryside, such as the construction of 5G network base stations, big data centers, and artificial intelligence communities. To promote rural revitalization and information technology innovation as the driving force, the infrastructure system that provides services such as digital transformation, upgrading and iteration, and cross-fertilization thus injects new vitality into rural revitalization.

Good new infrastructure related to digital governance in rural areas can be effectively realized through the implementation of three strategic tools:

The first is to provide advanced digital connectivity infrastructure. The cornerstone of effective digital governance is strong and reliable Internet connectivity. This requires the deployment of high-speed broadband networks, including fiber-optic cables and wireless technologies such as 5G, especially in remote and underserved rural areas. Governments can incentivize the private sector to invest in such infrastructure through subsidies, tax breaks or public-private partnerships. In addition, the establishment of community Internet access points, such as Wi-Fi-enabled public spaces or community centers, can greatly enhance digital accessibility. Such infrastructure lays the necessary foundational framework for a wide range of digital governance services, enabling seamless communication, data transfer, and access to online resources for rural populations.

Second, the development of integrated data management systems is essential for efficient digital governance. These systems should be able to collect, store, process, and analyze large amounts of data from different sources, including government databases, IoT devices, and citizen feedback. The adoption of cloud computing technologies can provide scalable and secure data storage solutions, while the use of big data analytics can provide insights for better policy formulation and service delivery. Ensuring interoperability between different government departments and agencies is critical to creating a cohesive digital governance ecosystem. This approach not only streamlines administrative processes but also increases transparency and accountability in governance.

Lastly, there is the cybersecurity and data protection framework. Since digital governance involves the handling of sensitive data, it is crucial to establish robust cybersecurity measures and data protection frameworks. This includes implementing advanced security protocols, regular audits, and updating IT systems to protect against cyber threats. In addition, having clear data privacy policies in place and ensuring that these policies are adhered to are critical to maintaining public trust in the digital governance system. Training government staff in cybersecurity best practices and raising citizen awareness of data protection rights and safe online behavior are also important components of a comprehensive cybersecurity strategy.

Together, these tools constitute a comprehensive approach to strengthening digital governance infrastructure and ensuring that it is not only technologically advanced, but also secure, user-friendly, and accessible to all, especially in rural areas.

5.3. Building a Rural Governance System and Forming a Stable Institutional Framework

Digital governance allows villages to shift from "rule by man" to "rule by numbers", which can effectively eliminate the abuse of power and corruption. The online process can do "wild goose traces", and clear responsibility for the main body, reducing the "shirking" between the departments. While improving the top-level design, it is necessary to strengthen the improvement of the

local institutional support system to meet the needs of the villagers of the top-down rural governance system, the formation of a stable institutional framework, and the construction of a new pattern of rural governance of common building, common governance, sharing and common supervision. At the same time, the government and regulatory authorities should further strengthen the degree of supervision and enforcement of the application of digital technology, and prevent the improper use of digital technology by strengthening the construction of regulatory agencies, improving laws and regulations, establishing reporting mechanisms, and enhancing the intensity of scrutiny, which in turn promotes the sustainable development of digital rural governance.

A nuanced approach is necessary to develop a stable system of digital rural governance, especially in addressing policy gaps, implementation challenges, and achieving policy goals. Four key instruments are critical in this endeavor:

First, policy frameworks and regulatory reforms, a comprehensive and adaptive policy framework is the cornerstone of a stable rural digital governance system. This requires governments to identify and address existing policy gaps that hinder the deployment and adoption of digital technologies in rural areas. Policies must be inclusive, taking into account the diverse needs of rural populations, and should create an environment conducive to digital innovation and accessibility. There is a need to regularly review and update regulations to keep pace with the rapidly evolving digital landscape. This framework should also include data protection laws, cybersecurity regulations, and guidelines for the provision of digital services to ensure a safe and trustworthy digital governance environment

Second is an effective policy implementation mechanism. Successful implementation of digital governance policies is as important as policy formulation. This requires the establishment of clear responsibilities and accountabilities among various governmental and non-governmental stakeholders. Effective policy implementation mechanisms include establishing specialized working groups or committees, ensuring adequate funding and resource allocation, and developing efficient project management frameworks. Training and capacity-building programs for local administrators and officials are essential to equip them with the necessary skills and knowledge to implement digital governance initiatives. Regular monitoring and evaluation processes are also essential to track progress, identify bottlenecks, and make necessary adjustments to implementation strategies.

The third is public participation and feedback integration, which is essential for building a stable rural digital governance system. Policies should be designed and implemented with inputs from rural communities to ensure that they meet the actual needs of the people. The establishment of feedback channels, such as online portals, community meetings, and surveys, allows for the continuous collection of public opinions and suggestions. Such feedback mechanisms can help to identify policy gaps and implementation problems so that governance strategies can be revised in a timely and appropriate manner. In addition, involving rural communities in the policy development process can increase transparency, build trust, and ensure greater policy acceptance and effectiveness.

Finally, policy outcomes are realized and evaluated. The ultimate goal of policy is the effective realization of desired outcomes. This requires a systematic approach to assessing the impact and success of digital governance policies in rural areas. Performance indicators and benchmarks should be developed to measure the extent of digital infrastructure development, digital literacy, service delivery, and socio-economic impact on rural communities. Regular evaluation (either through third-party audits or independent research studies) can provide valuable insights into the effectiveness of policies and help to identify areas for improvement. The evaluation process should also include mechanisms for readjusting policies in response to changing circumstances or unmet goals to ensure continuous improvement and adaptation of rural digital governance systems.

Together, these tools form a holistic approach to building a stable, effective, and responsive rural digital governance system. They emphasize the importance of comprehensive policy design, effective implementation, community participation, and continuous assessment and improvement for realizing the full potential of digital governance in rural areas.

6. Conclusion

As an important driving force of the new round of technological revolution and industrial change, digital technology has profoundly affected the mode of economic and social governance and the pattern of development. With the implementation of digital village construction, digital technology has also had a profound impact on rural society. The value concept, technical advantages, and institutional basis of digital technology have an important enabling effect on the development and change of rural culture, which provides technical impetus for rural cultural change, bridges the regional divide in rural cultural exchanges, and also facilitates the effective integration of rural resources. This paper takes the predicament of rural digital governance in the context of rural revitalization as a breakthrough point, analyzes the relationship between digital governance and rural revitalization, the practical significance of digital governance ruralization, the analysis of the current situation of rural digital governance, and the practical path of rural digital governance in four aspects, and then proposes three countermeasures to accelerate the construction of rural digital governance, namely, to increase the cultivation of digital talents; to improve the new type of infrastructure; to build a rural governance system, to promote the construction process of rural digital governance, and ultimately realize the modernization and development of the countryside. It helps to understand rural revitalization in the era of digital governance and provides insights into sustainable rural development and digital transformation. At the same time, the results of the Xi'an case study can provide a solution experience for similar situations around the world.

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