Journal of Humanities and Social Sciences Studies
ISSN: 2663-7197
DOI: 10.32996/jhsss
Journal Homepage: www.al-kindipublisher.com/index.php/jhsss

JHSSS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Digital Technology Enabling Rural Revitalisation: Inner Mechanism, Realistic Obstacles and Path Exploration

Chen Jing Jing
College of Marxism, Qinghai University, Xining, Qinghai 810016
Corresponding Author: Chen Jing Jing, **E-mail**: 18856218172@163.com

| ABSTRACT
Digital technology is an important engine and a powerful driving force for vigorously and efficiently promoting the comprehensive revitalisation of the countryside. As the leading force of the new round of scientific and technological revolution and industrial change, digital technology, with its technological innovation, intelligent leadership, information dissemination, ecological wisdom, data governance and other diversified presentations, has boosted the revitalisation of rural industries, talents, culture, ecology and organisations. Facing the arduous task of rural industrial transformation and upgrading, the short board of rural talent support, the lack of vitality in rural cultural development, the difficulties encountered in rural ecological revitalisation, the role of rural organisations still needs to be strengthened and other realities in the process of promoting the comprehensive revitalisation of the countryside, we need to be empowered by digital technology to promote the transformation and upgrading of the rural industry and stimulate the vitality of the rural industry; to enhance the quality of rural talents and cultivate new rural talents; and to pass down and innovate rural culture and shape a new rural culture. Innovation of rural culture, shaping the new face of rural culture; protection and optimisation of rural ecological environment, promoting rural green development; optimisation of the rural governance system, enhancing the effectiveness of rural governance, so as to achieve the close connection and effective empowerment of digital technology and rural revitalisation.

| KEYWORDS

Digital technology; rural revitalisation; comprehensive rural revitalisation

| ARTICLE INFORMATION

ACCEPTED: 09 June 2025 **PUBLISHED:** 24 July 2025 **DOI:** 10.32996/jhsss.2025.7.7.11

1. Introduction

The research on digital technology and rural revitalisation has shifted from theoretical discussion to practical application, and scholars have not only analysed the importance and role mechanism of digital technology in rural revitalisation, but also put forward specific implementation paths and strategies, which provide rich theoretical support and practical guidance for the construction of digital villages. However, although the current research results cover many aspects of rural revitalisation, they lack systematicity, and rural revitalisation involves the revitalisation of five aspects of rural industry, talent, culture, ecology and organisation. Therefore, it is necessary to start from the mechanism of digital technology enabling rural revitalisation, analyse the dilemma of empowerment, and put forward practical paths with the framework of 'five revitalisations' of the countryside, in order to provide useful references for the comprehensive revitalisation of the countryside and the modernisation of agriculture and rural areas.

1.1 First, the internal mechanism of the comprehensive revitalisation of the countryside empowered by digital technology

Digital technology, as an important symbol of the contemporary advanced productive forces, is the result of the combination of scientific and technological innovation and digital transformation, which represents the new direction of the development of productive forces. Compared with traditional technology, digital technology has significant advantages and characteristics, and

will provide a strong impetus for the modernisation of agriculture and rural areas in the five dimensions of industry, talent, culture, ecology, and organisation, thus helping to promote the comprehensive revitalisation of the countryside.

(I) Technological innovation: digital technology promotes the upgrading of rural industries

As a new engine for rural revitalisation, digital technology promotes the transformation, upgrading and diversification of rural industries through digital innovation, thus realising the leap from traditional to modern agriculture, promoting the deep integration of agriculture and non-agricultural industries, and laying a solid material and technological foundation for the comprehensive revitalisation of the countryside. Specifically, one of them is the intelligent aspect of agricultural production. The digital economy's impact on entrepreneurial action and outcomes is more pronounced among medium- and large-scale farms than smaller producers[1]. The application of digital technologies such as satellite remote sensing, Beidou navigation, Internet of Things, and big data in the field of agricultural production has significantly improved the level of digital intelligence in agricultural production. For example, through precision agriculture technology, fertiliser and irrigation can be applied precisely according to the specific needs of crops, reducing the waste of resources while improving crop yield and quality. Significant progress has been made in the application of intelligent agricultural technologies, such as agricultural sensors, agricultural big data and artificial intelligence, agricultural intelligent control and agricultural robotics, and other directions of research, and the application of these technologies makes agricultural production more automated and intelligent. Second, in terms of reducing agricultural production costs. Through the deployment of advanced facilities such as remote sensing applications, IoT measurement and control systems, and integrated field monitoring sites, uninterrupted monitoring of crops is implemented. Based on these visualised data, the 'four conditions' of soil moisture, crop growth (seedling condition), pests and diseases (insect condition) and natural disaster risk (disaster condition) are accurately predicted. Accordingly, fertilisers and pesticides are applied in a timely and precise manner, thus significantly reducing the excessive use of fertilisers and pesticides and effectively lowering the production costs of crops. Thirdly, in terms of the ability of traceability management of agricultural products. The deep integration of digital technologies such as the Internet of Things and blockchain with the whole process of agricultural production provides a visualisation platform for the safety of agricultural products and improves the traceability management capability of agricultural products. It not only enhances consumers' trust in agricultural products, but also improves the market competitiveness of agricultural products.

(II) Intelligent Leadership: Digital Technology Boosts Rural Talent Cultivation

Talent revitalisation is the key to rural revitalisation. Talent resources are a key and strategic asset for China's modernisation, and play an important role in promoting the construction of digital villages. The application of digital technology, especially the introduction of modern agricultural technology such as smart agriculture and precision agriculture, has not only greatly improved the efficiency and quality of agricultural production, but also successfully attracted a large number of young talents with skills and dreams to return to the countryside to start their own businesses, adding new vigour and strength to the rural talent pool. At the same time, digital technology has promoted the transformation of rural industrial structure into high-end and intelligent, giving rise to high value-added industries such as the processing of special agricultural products and eco-tourism, and providing more diversified employment and entrepreneurial choices for rural talents. Firstly, digital technology has enriched digital employment opportunities in the countryside, opened up new channels of income generation for farmers through live e-commerce, rural culture and creativity, and put forward new requirements for the development of rural talents' skills. Secondly, digital technology has broken the geographical limitations of educational resources, introduced high-quality educational resources into the countryside through online live broadcasting and cloud platforms, and improved the digital skills and comprehensive literacy of rural talents. Third, digital technology has also helped improve the training system, incentive mechanism and public service provision for rural talents. Through digital means, the training, evaluation and incentives of rural talents can operate efficiently, providing a strong guarantee for the stability and growth of rural talents. At the same time, the application of digital technology in the field of rural public services, such as medical care, education, law and order, has also significantly improved the efficiency and quality of public service provision.

(III) Information Dissemination: Digital Technology Boosts Rural Cultural Prosperity

Rural cultural revitalisation is an important element of rural revitalisation. The core of digital technology to promote rural cultural revitalisation lies in combining the features of modern digital technology with the deep heritage of traditional culture, thus awakening the sense of identity and self-confidence inherent in rural culture. Through the integration of rural industrial, human and cultural resources, innovative inheritance and dissemination methods, cultural identity and economic value are enhanced, community cultural ties are strengthened, and self-confidence and consensus are shaped in the mingling of traditional and modern culture. In the strategy of rural cultural revitalisation, digital technology provides technical support for the protection and inheritance of outstanding traditional culture in the countryside, while injecting new impetus into rural cultural revitalisation and promoting the simultaneous development of culture and economy. On the one hand, the application of digital technology greatly promotes the digital protection and inheritance of excellent traditional culture in the countryside. Through digital means, such as 3D scanning, digital photography, virtual reality and other technologies, it is possible to make high-precision digital

records and preservation of traditional buildings, artworks and handicrafts in the countryside, making it possible to preserve these precious cultural heritages for a long time and disseminate them widely. The integration of cultural tourism and AI is a new engine for rural revitalization [2]. In addition, the establishment of digital platforms has provided new channels for the display and education of rural culture, enabling more people to easily access and understand rural culture, and enhancing the public's knowledge of and interest in rural culture. On the other hand, digital technology has provided new impetus for the revitalisation of rural culture. The use of digital tools such as the Internet and social media can effectively promote rural culture, attract more tourists and investment, and promote the development of rural cultural tourism and related industries.

(IV) Eco-wisdom: Digital technology boosts rural ecological protection

Rural ecological revitalisation is an important underpinning of rural revitalisation. Rural ecological revitalisation and green development complement each other and are important features of digital rural construction. The core efficacy of digital technology-enabled rural ecological revitalisation lies in the integration of cutting-edge technology into traditional agriculture, and the promotion of the innovation and popularisation of environmentally friendly production technology. Adhering to the concept of sustainable development, digital technology not only accelerates the upgrading and green transformation of rural industries, but also continues to consolidate and optimise the ecological civilisation system, providing a new impetus for the long-term prosperity of the countryside. Specifically, digital technology has introduced information technology and intelligent equipment to build new models of green agriculture, such as water-saving irrigation and organic farming, which can not only improve the efficiency of water use, reduce the use of chemical fertilisers and pesticides, but also maintain the fertility of the soil and ecological balance. In this way, rural industries have been able to transform themselves into knowledge- and technology-intensive industries, which not only involve the application of new technologies, but also emphasise the integration with traditional agricultural technologies. This integration can enhance the green productivity of agricultural production, making it more sustainable and also providing solid support for the construction of a rural ecological civilisation. Through intelligent management, the agricultural production process becomes more precise and efficient, helping to protect and improve the rural ecological environment and achieving a win-win situation between agricultural development and environmental protection. Secondly, under the guidance of the 'two mountains' concept, the greening of the rural industrial structure is the key to achieving sustainable development. Through the introduction of information technology and intelligent equipment, the countryside can build a new model of green agriculture, such as water-saving irrigation and organic farming, which not only helps protect the environment, but also improves the efficiency of agricultural production and the quality of agricultural products. Such a shift has facilitated the transformation of rural industries into knowledge- and technology-intensive ones, emphasising the fusion of old and new technologies, thus enhancing green productivity. Thirdly, local governments have significantly increased their investment in agricultural science and technology research and development, thereby promoting the widespread and in-depth application of scientific and technological achievements in the construction of rural eco-civilisation, and providing a strong impetus for the countryside to build a high-value-added industrial chain encompassing rural tourism, sightseeing and picking, and green recreation and health care, among others. With the increasing popularity of digital information tools such as computers, mobile phones and self-media, it has become more and more convenient for rural residents to access all kinds of information resources, which creates extremely favourable conditions for the smooth promotion of the construction of ecological civilisation. By strengthening eco-education initiatives and organising eco-friendly activities, village-level self-governance organisations have successfully mobilised villagers' enthusiasm for green production. At the same time, they actively promote low-carbon lifestyles and work together with villagers to contribute to the ecological protection and sustainable development of villages.

(V) Data Governance: Digital Technology Boosts Modernisation of Rural Governance

The revitalisation of rural organisations is the basic guarantee for rural revitalisation. The role of digital technology in the modernisation of rural governance is mainly reflected in the empowerment of the decision-making process of rural organisations and the innovation of the traditional governance model. As an emerging means of governance, digital technology is reshaping the pattern of rural governance. For one thing, digital technology enhances the scientific nature of rural organisations' decision-making, optimises resource allocation, improves governance efficiency, and makes service provision more accurate and efficient through means such as big data, cloud computing and artificial intelligence. At the same time, the application of digital technology has profoundly revolutionised the rural governance model and enhanced the transparency and openness of the decision-making process. With the help of democratic participation channels and a sound talent cultivation system, rural self-governance power can realise flat management and build a new pattern of multi-party collaborative governance. With the flourishing development of Internet online platforms and social media, the speed of information transmission and sharing range have been significantly increased, breaking the boundaries of geography and time, opening up new ways for villagers to efficiently express public opinion and participate in governance, and strongly promoting the in-depth practice of participatory governance model. Secondly, the digital technology platform is gradually developing into a new way to promote social organisations, agricultural enterprises and other diversified subjects to participate in rural governance. They not only provide strong support for various modes of participation, such as returning to the village, project-driven, and capital injection into the

countryside, but also constantly inject fresh vigour and rich resources into rural development. Through these platforms, the main participants in rural governance have been diversified, forming a multi-level, multi-domain and multi-object governance system. In this system, the government, enterprises, social organisations and villagers work together to remodel social relations through digital technology and increase the coordination and integration of different subjects. Such a cooperation model not only optimises the rural governance structure, but also promotes the modernisation of rural governance, enhances the systematic governance of rural society, and comprehensively improves villagers' well-being. Thirdly, digital technology has promoted the improvement of the mechanism for collaborative promotion of rural governance, including the promotion of the participation of multiple subjects in governance, the attraction of external resources, the enhancement of interdepartmental cooperation and interregional collaboration, the integration of the advantageous resources of various regions, the reduction of shortcomings, and the promotion of interregional economic and cultural co-development.

1.2 Second, the reality of the obstacles to the comprehensive revitalisation of the countryside empowered by digital technology

Digital technology has great potential for application in the field of rural revitalisation. However, due to China's digital village construction is still in the initial stage, still facing a series of new situations, new challenges, new problems, such as the existing rural industrial transformation and upgrading of the task is arduous, the existence of rural human resources to support the short board, lack of vitality in the development of rural culture, rural ecological revitalisation and then encountered the problem of the role of rural organizations still need to be strengthened for a variety of reasons, resulting in the empowerment of rural revitalization of digital technology is faced with a number of real obstacles, seriously affecting the empowering effect of digital technology. Seriously affecting the enabling effect of digital technology.

(I) Challenges of Digital Transformation of Rural Industries and the Arduousness of the Task of Industrial Upgrading

Since the 18th National Congress of the Communist Party of China (CPC), China has continued to optimise the environment for innovation and entrepreneurship in rural areas, and to promote the prosperous development of rural industries. In this process, the employment and income levels of farmers have significantly increased, and the countryside has shown remarkable prosperity. Valuable experience and wisdom have also been accumulated in the practice of promoting rural industrial revitalisation in various regions. However, factors such as insufficient funds and investment, insufficient policy support, and weak market scale and industrial foundation have seriously constrained the process of rural digital construction. High technological thresholds, information asymmetry and path-dependence problems make the transformation of rural industries difficult. In addition, the lack of unified planning for rural information service infrastructure, insufficient coverage of network facilities, and the slow process of digital transformation and upgrading have further exacerbated the challenges of rural digital transformation. The imbalance between urban and rural development has increased socio-economic challenges [3]. The digital divide between urban and rural areas has caused rural areas to lag behind cities in terms of equipment configuration and technology application, which in turn affects the quality and efficiency of information access in rural areas. At the same time, there is a general lack of talent needed for digital transformation in rural areas, and the limitation of education level also affects the acceptance and application of digital technology by residents, making the task of digital transformation and industrial upgrading of rural industries particularly arduous.

(II) Insufficient digital adaptability of rural talents and short-board talent support

As a key component of the ‘five revitalisations’, the revitalisation of talents is still a weak link that should not be ignored for many villages. Insufficient digital adaptability of rural talents and short-board talent support are key factors restricting the digital transformation and revitalisation of villages. Specifically, first, the construction of the rural labour force needs to be strengthened. China's villages face the problem of low quality and shortage of labour force, coupled with the continuous migration of the young labour force to cities, making the labour force structure weaker and weaker. At present, the countryside relies mainly on the elderly and women's groups to work in labour-intensive, low value-added industries, which limits the potential for industrial development and creates a vicious circle. The lack of sufficient attraction and incentives makes it difficult for villages to effectively attract and retain various types of talent, which poses a serious challenge to the long-term development of villages. Secondly, the supply of basic public services in the countryside is insufficient. Compared with the cities, the allocation of basic public service resources in the countryside, such as medical care, education and pension, is generally limited in total, unevenly distributed and difficult to obtain. This uneven allocation of resources has led many rural families with the means to move to cities in search of better quality of life and education and medical resources. For those rural children who remain in the countryside or who study in the cities, they often face more limited development opportunities and greater income disparities than their urban counterparts.

(III) Dilemmas in the digital transformation of rural culture and lack of vitality in cultural development

The problems encountered in the development of rural culture have adversely affected the spiritual outlook, internal cohesion, and overall social progress of rural societies. The dilemma of digital transformation of rural culture and the lack of vitality of

cultural development are important issues in the current revitalisation of rural culture. Firstly, in the process of developing rural cultural industries, they often overly cater to market demand, while neglecting the traditional elements and historical lineage contained in rural culture. With the wide application of digital tools, the development of rural cultural industries tends to be quick to make quick profits and excessively pursues short-term economic benefits, which has led to the fragmentation and localisation of cultural development and severed the continuity and systematic connection with the historical lineage. Secondly, in the process of cultural industry development, the main bodies involved, such as government heritage conservation departments, enterprises, village collectives, etc., have failed to pay full attention to the villagers' subjective position due to differences in concepts. When planning for the development of rural culture, the strategies and programmes formulated by these subjects often lack the necessary coherence and consistency, resulting in the over-commercialisation of the cultural industry and the emergence of disorderly development. This situation not only deviates from the original intention of rural cultural revitalisation, but also undermines its essential meaning, constitutes a negative impact on the inheritance and development of rural culture, and makes rural culture lose the ability of self-development and self-renewal.

(IV) Difficulties in the application of digital technology in rural ecological protection and challenges of ecological revitalisation

With the help of digital technology, the revitalisation of rural industries often involves the full use and in-depth development of local natural conditions. However, as the ecological carrying capacity of rural areas is generally not strong, in-depth development and utilisation inevitably leads to contradictions and conflicts between short-term economic gains and long-term development, and between individual and collective interests. While the application of digital technology enhances the efficiency of agricultural production, the impact on the rural ecological environment must also be taken into account to ensure that the pursuit of economic benefits does not harm the ecological balance of the countryside and the capacity for sustainable development. Firstly, the protective development of rural ecological resources is difficult to implement at the level of legal norms. The legal system of rural ecotourism in China is not sound, and there is a lack of 'basic law' and 'special law' specifically for the protection and recycling of ecotourism resources, which leads to contradictions between protection and development, ecological protection and economic development in practice. There are loopholes in law enforcement and management, and in the absence of specific management measures and methods, rural eco-tourism operators may discharge water indiscriminately, fail to meet hygiene standards, and damage the local environment. In addition, local governments have limitations in resources and capacity, supervision and law enforcement need to be strengthened, and at the same time, policy propaganda and education and popularisation have not yet been done, making it difficult for some rural areas to get rid of the traditional mode of development, and if the development method is inappropriate, not only can it not achieve the goal of ecological protection, but also it may exacerbate the ecological problems such as desertification, soil erosion and so on, which poses a threat to sustainable development of the countryside. It poses a threat to the sustainable development of the countryside. Secondly, the integration of digital technology and rural ecological industry has exacerbated the contradiction between ecological protection and development while promoting rural development. In recent years, rural areas have developed projects such as agricultural science and technology parks, idyllic complexes and agricultural high-tech industrial development zones by virtue of their rich ecological resources, and these initiatives have effectively improved the efficiency of the transformation of ecological resources into economic value. However, this process also brings challenges to the stability of land use structure and the ecosystem. As the ecological carrying capacity of rural areas is relatively weak, such structural changes not only affect the rational allocation of land resources, but also may pose a threat to the ecological balance. Thirdly, the issues of resource consumption and environmental pollution in the development of eco-industries are often overlooked. Although digital technology promotes environmental protection and sustainable development, it may also trigger environmental pollution in practice, which deviates from social cognition and is easily ignored.

(V) Digital Governance Challenges for Village Organisations and the Need for Organisational Role Enhancement

The innovative application of digital technology, as the core driving force to promote rural development, has brought new challenges to the digital transformation of the traditional governance system in villages, the updating of the regulatory strategy, the innovation of the governance method, and the evolution of the governance subject. Specifically, firstly, the information literacy of village cadres and village sages and gentry needs to be improved urgently. Due to their age structure, insufficient training opportunities, and conservative attitudes towards new technologies, village leaders and cadres are generally deficient in digital skills in information collection, analysis and processing, which limits the in-depth development of digital governance in villages. Although their acceptance of new technologies is gradually increasing, inadequate skills and lack of policy guidance lead them to feel insecure in applying digital technologies, worrying about issues such as cybersecurity and power changes. Second, the traditional rural governance model is in urgent need of transformation. With the rapid development of digital technology, the rural governance system urgently needs to be upgraded to meet the requirements of the new era. However, the current rural governance is still faced with the dilemmas of homogenisation of the responsible body, solidification of the process, and poor deployment of resources. Although digital governance has made some progress in terms of technical means, there are still deficiencies in promoting communication and collaboration, and the flexibility, efficiency and convenience of self-governance

consultation mechanisms have not yet been fully explored and utilised. Third, rural governance still needs to be strengthened in terms of digital regulation. At present, digital governance in villages mainly relies on administrative supervision tools from higher levels of government, but the actual promotion has encountered regulatory difficulties. These include information asymmetry, mismatch between technology and existing systems, and inadequate digital privacy protection. Specifically, information asymmetry leads to difficulties in effectively integrating data resources, a mismatch between technology and systems results in a disconnect between the form of digital governance and the actual needs of the countryside, and insufficient protection of digital privacy increases the risk of information leakage and infringement.

1.3 Third, the path of digital technology empowering comprehensive rural revitalisation

The current theoretical research and practical exploration have fully confirmed the key role of digital technology in promoting comprehensive rural revitalisation, and demonstrated the strong interactive potential between it and rural development. However, it also faces many difficulties. From the perspective of the existing practical experience of integrating digital technology into the comprehensive revitalisation of the countryside, it is also urgent to build a practical path to promote transformation and upgrading from the industrial level, improve the quality of talent level, inheritance and innovation from the cultural level, protect and optimise the ecological level, and optimise the system at the governance level, so as to continuously enhance the intrinsic qualities of the comprehensive revitalisation of the countryside from the multiple levels of industry, talent, culture, ecology, and organisation.

(I) Promoting the transformation and upgrading of rural industries with digital technology to stimulate the vitality of rural industries

Promoting industrial prosperity is the primary task of implementing the strategy of rural revitalisation. Driven by digital technology, rural industries are ushering in opportunities for transformation and upgrading. Digital technology not only improves the intelligent level of agriculture, but also promotes the deep integration between various industries in the countryside, injecting new vitality into the rural economy.

For one thing, strengthening rural digital infrastructure is a prerequisite for promoting industrial integration. The government needs to increase investment and optimise rural infrastructure such as transport, water conservancy and communications to lay a solid foundation for industrial integration. At the same time, it should formulate a comprehensive rural industrial development plan, clarify development goals, build a cooperation platform and promote synergistic development among industries. In addition, through the integration of innovative resources and the introduction of supportive policies, it should provide financial support and technological safeguards for rural industries, promote the research and development and application of key technologies, and enhance industrial competitiveness.

Secondly, a risk management mechanism for industrial integration adapted to the digital age should be established. In the face of the endless new forms of industrial integration, there is an urgent need to establish a risk assessment framework that relies on digital technology. This system will make use of big data, artificial intelligence and other cutting-edge technologies to achieve accurate identification, assessment and monitoring of emerging risks and ensure that risks in the process of industrial integration are effectively managed and controlled. Timely response to changes in the market and technology to achieve efficient allocation of resources. To meet the challenges of industrial integration, it is necessary to accelerate the construction of a comprehensive regulatory policy system to ensure that policies and regulations can keep pace with the development of the times in core areas such as data security, protection of individuals' privacy rights and interests, and effective supervision of platform enterprises.

(II) Enhance the quality of rural talents with digital technology and cultivate a new power of rural talents

Talent revitalisation is the foundation of rural revitalisation. In order to play the core role of rural talents in the construction of the digital countryside, it is necessary to improve the comprehensive quality of rural talents and stimulate the new power of rural development.

For one thing, rural areas should deepen cooperation with higher education institutions and vocational and technical training institutions, introduce advanced digital education resources, and provide customised training programmes for rural talents. Through online learning platforms, distance education programmes and digital skills training, rural talents can master the latest digital technologies and information processing capabilities, and enhance their vocational competitiveness and innovation. For example, by strengthening the online training and education resource sharing mechanism among agriculture-related universities, crafting a series of practical and high-quality training courses, strengthening farming education in agriculture-related universities and making it a mandatory course, and promoting the 'Excellence in Agriculture and Forestry Talent Education and Training Programme 2.0' to cultivate innovative, complex and skilled agriculture and forestry talents, we will be able to meet the needs of the industry. To meet the needs of the industry. Abbreviation: Strengthen farming education and cultivate urgently needed agricultural and forestry talents.

Secondly, in order to improve the construction of rural digital infrastructure and provide a convenient digital learning environment, the construction and upgrading of rural Internet and mobile communication infrastructure should be strengthened to ensure that rural talents can access digital education resources and enjoy high-quality online learning and training services anytime and anywhere. Specifically, in order to promote rural development, it is necessary to comprehensively upgrade the construction level of rural network facilities and strengthen the mechanism of infrastructure co-construction and sharing. This includes accelerating the pace of development of rural broadband communication networks, mobile Internet, digital TV networks and next-generation Internet. At the same time, rural human capital plays a certain intermediary role between the digital economy and the prosperity of farmers [4]. At the same time, it is necessary to continue to carry out the pilot work of telecoms universal service compensation, provide strong support for the development of broadband networks in rural areas, and actively promote the construction and upgrading of radio and television infrastructure in rural areas. In this process, it is also necessary to attach great importance to the issue of network security in the construction of rural infrastructure, and to crack down in accordance with the law on the destruction of telecommunication infrastructure, the production, sale and use of 'pseudo-base station' equipment, and telecommunication network fraud and other illegal and criminal activities, so as to ensure the stability and security of the rural network environment.

(III) Inheritance and innovation of rural culture by digital technology, shaping the new face of rural culture

The inheritance and development of rural culture is an important part of the rural revitalisation strategy, and the integration of digital technology provides new opportunities for the protection, inheritance and innovation of rural culture.

For one thing, digital technology enhances the recognition and participation of rural culture. Through digital platforms, the value and role of rural culture are effectively publicised and villagers' awareness of the importance of local culture is raised. This not only enhances the ability and enthusiasm of villagers to participate in cultural governance, but also helps to correct the problem of one-sided cognition and misplaced subjects. Specifically, the application of digital technology has made it easier to record and preserve rural culture, and traditional folklore, handicrafts, folk songs and stories have been able to be displayed in all aspects on digital platforms. Such digital communication methods, such as short videos, social media and online cultural platforms, have enabled rural culture to transcend geographical limitations, triggering resonance and discussion on a wider scale and inspiring local residents' self-confidence and pride in their own culture. In addition, the application of digital technology provides new possibilities for the preservation and development of rural culture, including digital preservation, digital storytelling and the use of online platforms for cultural exchange.

Second, digital technology contributes to the continuity of rural cultural heritage. The use of digital means to record and preserve intangible cultural heritage in villages, such as traditional handicrafts and folk art, can effectively prevent cultural faults and enable traditional culture to continue to be passed on in the digital age. At the same time, digital technology can also promote the integration and use of rural cultural resources, promote the exchange and integration of rural cultures from different regions, and achieve cross-regional dissemination Through online platforms, it is possible to revive and promote traditional rural festivals and customs, so that they can be integrated into modern life in a new form.

(IV) Protecting and optimising the rural ecological environment with digital technology to promote green rural development

In the process of promoting the comprehensive revitalisation of the countryside, it is necessary to pursue economic benefits as well as to protect the ecological environment, so as to achieve the harmonious coexistence of 'mountains of gold' and 'mountains of green water'. The introduction of digital technology provides new ideas and means for the protection and optimisation of the rural ecological environment.

Firstly, digital technology can enhance the green production mode in the countryside. Through the introduction of digital technology, it can effectively promote the development of green technology innovation in the countryside, improve the maturity and stability of these technologies, and further reduce their application costs. Digital technology empowers the agricultural factor allocation system and promotes the greening process of resource utilisation, and can effectively reduce the frequency of the use of traditional agricultural production materials such as pesticides and fertilisers, as well as reduce the emission of agricultural pollutants with the help of new-generation communication network technologies such as 5G, the Internet of Things, the industrial Internet and the satellite Internet, Internet usage has a more pronounced effect on the employment transition of the "middle-aged generation."[5]. At the same time, setting and enforcing strict environmental standards can incentivise rural enterprises to actively adopt cleaner production technologies and reduce environmental pollution, such as through digital advisory services and financial services, agricultural e-commerce and procurement, and smart agricultural technologies that provide solutions to the lack of producer knowledge, lack of market opportunities, financial exclusion, climate change, and

increasing ageing in traditional agriculture. On this basis, efforts should also be stepped up to train a professional and skilled labour force to provide solid human resources support for the development and application of green technologies in the countryside. In particular, it guides the older labour groups to shift to green production behaviours and improves the modern management level of the labour force.

Second, digital technology helps to create a rural ecological culture. Rural ecological culture is the embodiment of the harmonious coexistence of man and nature, digital technology can excavate and protect the rural native cultural carriers, including material and intangible carriers, in order to promote the wide dissemination and in-depth development of rural ecological culture, with the help of digital means, such as the establishment of digital museums, to show the unique charm of traditional villages. These digital museums vividly and intuitively present the historical and cultural heritage of villages and colourful folk cultures through panoramic roaming, graphic introduction, audio-visual display and other rich forms, so as to revitalise the excellent culture of villages and tell village stories. In this way, the digital museum breaks the limitation of time and space, so that more people can understand and feel the unique charm of rural culture anytime and anywhere.

Third, digital technology promotes the realisation of the value of rural ecological products. Digital technology can accurately quantify and assess the value of natural resources and ecosystem services in rural areas, and thus determine the economic value of these resources. Based on this assessment, a trading market for rural ecological products can be established, allowing ecological assets to be bought, sold and leased within a legal framework. On this basis, cultural and creative products and services closely related to rural ecology can be further explored, and through the rational development of these products and services, not only can the rural economy be enriched, but also can effectively promote the improvement and development of the comprehensive ecological compensation mechanism. At the same time, it is also necessary to continuously improve the horizontal ecological protection compensation mechanism to ensure the sustainable protection and rational use of the rural ecological environment.

(V) Optimising the rural governance system with digital technology and enhancing rural governance effectiveness

The key to realising rural revitalisation lies in strengthening the governance effectiveness of the countryside, which provides a solid foundation for industrial revitalisation, ecological sustainability, cultural prosperity and the enhancement of residents' well-being. The integration of digital technology provides new opportunities for the optimisation of the rural governance system and helps to enhance the modernisation and effectiveness of rural governance.

For one thing, digital means can promote the intelligent transformation of party building work by establishing a unified party building cloud platform, which integrates a variety of functions such as party member information management, online learning and education, and multi-functional services such as organisational life arrangements, making party building work more efficient and transparent. In addition, the development of special mobile phone applications allows party members to conveniently participate in party building activities anytime, anywhere, which strengthens the close interaction between party members and villagers, while facilitating party members' acceptance of extensive supervision and enhancing their sense of social responsibility.

Secondly, the key to enhancing the digitisation of villagers' committees lies in promoting e-government and increasing the transparency of information disclosure, which is mainly achieved through the digitisation of village affairs management in order to improve the transparency of work. Through intelligent technology, the diversified needs of villagers can be efficiently collected and their channels of participation in village governance can be broadened. At the same time, an effective feedback and progress monitoring mechanism is constructed to ensure that villagers' opinions and suggestions are responded to in a timely manner, and that the progress and effectiveness of projects can be tracked and assessed. It can ensure that the legitimate rights and interests of villagers are fully protected. This involves not only a comprehensive sorting out and optimisation of existing government service processes, but also the integration of various online service platforms, simplification of procedures, reduction of examination and approval links, and enhancement of the effectiveness of grassroots governance services. At the same time, promoting the construction of a grassroots common governance platform.

Funding: This research received no external funding

Conflicts of Interest: The author declare no conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers

References

[1] Gao S, Zhang J, Ma Z. (2025). Digital Economy Development and Urban–Rural Integration in Northeast China: An Empirical Analysis[J].Land,14(5):993-993.

[2] Hailu W, Yang L, Yaning W. (2025). AI-Empowered Cultural Tourism Development: Innovation Paths and Strategies for Rural Revitalization[J].The Frontiers of Society, Science and Technology,2025,7(4):

[3] Huimin Q. (2025). Research on the Impact of Digital Economy on Farmers' Wealth and Prosperity- From the Perspective of Enhancing Rural Human Capital[J].International Business Research,18(3):48-48.

[4] Lu Z, Yang L, Gou D. (2025). Promotion of rural industrial revitalization through the development of the rural digital economy[J].Frontiers in Sustainable Food Systems,91598461-1598461.

[5] Yuan R, Fu Q. (2025). A study of the impact of Internet use on the employment transition of rural labor: evidence from China[J].Frontiers in Sustainable Food Systems,2025,91580280-1580280.