

Research on the Relationship Between Digital Transformation and Urban and Rural industrial Integration and Development

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Abstract: *This study explores the relationship between digital transformation and the integrated development of urban and rural industries. In the context of economic and social development in the 21st century, the integration of urban and rural development has become an important part of the national strategy, aiming to break the urban-rural dual structure and achieve common prosperity through institutional innovation and technology application. The study found that digital transformation introduces advanced information technology, changes the traditional production management mode, improves efficiency and efficiency, and provides new impetus for the integration of urban and rural industries. This paper analyzes the role mechanism, actual effect, and challenges of digital transformation in urban and rural integration, and predicts the future development trend. The policy proposal emphasizes the deep integration of technology and traditional industries, promoting the development of digital industries, and the two-way flow of urban and rural factors. The forecast shows that the proportion of the primary industry will decline, the innovation capacity of the secondary industry will be enhanced, and the tertiary industry will become the dominant economy. Digital transformation will play a key role in urban-rural integration, promoting the optimization of industrial structure and urban-rural integration.*

Keywords: Urban-rural industrial integration; Digital transformation; Urban-rural integration.

1. INTRODUCTION

In the economic and social development of the 21st century, urban-rural integrated development has become an important part of the national strategy. This strategy is not only related to the optimization and upgrading of the economic structure but also the key to realizing the overall progress of society and the all-round development of people. Integrated urban-rural development aims to break the urban-rural dual structure through institutional innovation and technology application, promote equal exchange of urban and rural factors, deep integration of industries and balanced allocation of public resources, and achieve common prosperity.

In this context, digital transformation, as an important force in promoting urban-rural integration, has an increasingly prominent role and influence in urban and rural industrial integration. By introducing advanced information technology, digital transformation changes the traditional production and management mode, improves efficiency and efficiency, and provides new impetus and possibilities for the integration of urban and rural industries.

The purpose of this study is to explore how digital transformation promotes the integrated development of urban and rural industries and to analyze the role mechanism and practical effect of digital transformation in the process of urban and rural integration, as well as the challenges and future development trends. Through in-depth research on the national strategic significance of urban-rural integrated development, the role and influence of digital transformation, and policy suggestions for promoting the integrated development of urban-rural industries, this paper aims to provide theoretical support and policy reference for promoting urban-rural integrated development.

2. THEORETICAL FRAMEWORK AND A LITERATURE REVIEW

2.1 Theoretical framework

2.2.1 Theory of urban-rural integrated development

The integrated development of urban and rural areas refers to the formation of a benign development trend of integration and inner integration under the factors of institutional reform, technological progress, demand growth,

and cultural innovation under the full development of social productive forces (Yuan Fangcheng & Zhou Weilong, 2024). This theory emphasizes the interaction and integrated development between urban and rural areas and aims to promote the modernization of agriculture and rural areas and achieve high-quality urban and rural development by optimizing the system, mechanism, and policy system of urban and rural development (Zhao Pubing, 2024).

2.2.2 Digital Transformation Theory

Digital transformation involves the use of digital technology to carry out a comprehensive and systematic reform and remodeling of the strategic system, business model, business process, production and operation, and organizational structure of an enterprise or organization (Tang Jinwu & Zhao Zhutao, 2024). Its purpose is to establish a new business model with digital technology as the core, to enhance the competitiveness and innovation ability of enterprises.

2.2 Research progress in urban and rural integration and digital transformation at home and abroad

Domestic and foreign scholars have made some progress in their research on urban-rural integration and digital transformation. Research shows that the digital economy promotes the integrated development of urban and rural areas through production, circulation, distribution, consumption, and other links (Qian Li & Sun Fang, 2023). The application of digital technology in agriculture and rural areas has accelerated the digital transformation of rural areas, and emerging forms such as rural e-commerce, cloud tourism, and intelligent agricultural equipment have emerged, which have promoted the integration of the three industries and market diversification (Qu, N., & You, X., 2022; Wujiang, et al., 2023). In addition, the development of digital technology is also fundamentally changing the form and relationship between urban and rural areas, and promoting the integrated development of urban and rural areas with digital empowerment, which has become an important way to adapt to technological change and transform urban and rural development (Liu Peidong, 2023).

3. THE CONCEPT AND CHARACTERISTICS OF DIGITAL TRANSFORMATION

3.1 Definition of digital transformation

Digital transformation is an active, systematic, and holistic transformation and upgrading of enterprises in the background of global digital transformation to meet the needs of their survival and development and the market change in the digital economy environment. The transformation builds a highly intelligent digital twin with comprehensive perception, and seamless connectivity through the new generation of digital technologies, aiming to optimize and reconstruct the enterprise business model in the physical world. Its core goal is to innovate and reshape the traditional management, business, and business model to achieve the business success, growth, and development of the enterprise.

3.2 Core features of digital transformation

Table 1: Core features of digital transformation

Aspects	Description
Organization structure	From product-centric to customer-centered transformation
Business innovation	From a process-driven shift to a scene-driven shift
Customer interaction	From focusing on function to focusing on experience
Data-driven	Use big data and analysis tools to enable data-driven decisions and operations
Technology application	Deep integration of the new generation of digital technologies, such as AI, cloud computing, the Internet of Things, etc., to promote business innovation and efficiency improvement

3.3 The development trend of digital transformation

The development trend of digital transformation is reflected in the following aspects:

3.3.1 Rapid development of digitalization under the guidance of policies

Government policy plays a crucial role in driving the digital transformation. By formulating supportive policies, providing financial support, and setting up digital transformation funds, the government can encourage enterprises and organizations to speed up the digital process. For example, China's "Internet Plus" action plan has promoted the deep integration of the Internet and traditional industries through policy guidance.

3.3.2 Data-driven becomes the main theme of transformation

Data-driven means that business decisions and operations depend more on data analysis than intuition or experience. By collecting, analyzing, and utilizing big data, companies can more accurately predict market trends, optimize products and services, and improve operational efficiency.

3.3.3 Online business transactions to a platform for business development

With the development of Internet technology, more and more business transactions began to shift to online platforms. Platformization means that companies not only conduct transactions online, but also build platforms to aggregate users, service providers, and content creators to form an ecosystem that creates greater business value.

3.3.4 "Platform + ecology" has become a new economic form

The "platform + ecology" mode emphasizes the construction of an open and shared platform and gathers all kinds of resources and participants around the platform to form an ecosystem. This model can effectively integrate resources, promote innovation, and improve efficiency.

3.3.5 Deep integration of technology and business

Technology is no longer just a tool to support the business, but is deeply integrated with the business and has become the core of driving the business development. Through the application of artificial intelligence, big data, cloud computing, and other technologies, enterprises can develop new products, optimize services, and improve user experience.

3.3.6 Financial digitization has become the forerunner of transformation

Financial digitization uses digital technology to optimize the financial management process and improve the efficiency and accuracy of financial work. It is an important part of the digital transformation of enterprises, which can help enterprises to better control costs, manage risks, and improve the quality of decision-making.

3.3.7 Datacenter and management accounting realize data-driven

Data middle platform refers to the platform for centralized management of enterprise data assets, which supports data integration, processing, and analysis, and provides data services for enterprises. Management accounting uses the data provided by the data center for cost control, budget management, and financial analysis, to achieve data-driven management.

3.3.8 Low-code PaaS platform based on cloud-native becomes the foundation of enterprise digitization

Cloud-native is a way to build and run applications that take full advantage of the advantages of cloud computing. The low-code PaaS (Platform as a Service) platform allows developers to quickly build applications, through a graphical interface and a small amount of coding, allowing companies to transform digital more quickly and flexibly.

4. THE CURRENT SITUATION AND CHALLENGES OF URBAN AND RURAL INDUSTRIAL INTEGRATION DEVELOPMENT

4.1 Connotation and characteristics of urban and rural industrial integration

The integrated development of urban and rural industries refers to the new type of industry-agricultural and urban-rural relations, featuring mutual promotion, urban and rural complementarity, coordinated development, and common prosperity, focusing on the two-way free flow of urban and rural production factors and the rational

allocation of public resources. It involves the factor flow mode between urban and rural areas, market layout and development, and the integration and optimization of primary, secondary, and tertiary industries.

4.2 Current development status of urban and rural industrial integration

In recent years, the integrated development of urban and rural areas has shown a good trend, reflected in the steady increase of the urbanization rate, The growth rate of rural residents' income higher than that of urban residents, the integrated level of urban and rural infrastructure, and the continuous improvement of equal access to basic public services.

4.3 Major Challenges and Problems Faced

4.3.1 Low efficiency of the agricultural industry

In the development, China's agricultural enterprises have encountered the challenges of land resource shortage, structural problems of the supply side of agriculture, and insufficient technological innovation and application. The reduction of land resources, the single variety and low quality of agricultural products, and the relative lag of science and technology levels all restrict the competitiveness and sustainable development of agricultural enterprises.

4.3.2 The depth of integrated development of primary, secondary, and tertiary industries in rural areas is not enough

Although agriculture has developed, the development level of secondary and tertiary industries is not high, especially the storage and transportation industry and agricultural processing industry lag. Problems still exist, such as the lack of multifunctional agricultural development, the insufficient development of new industries and new forms of business, and the lack of platforms and mechanisms to promote industrial integrated development.

4.3.3 Farmers' ability to adapt to production development and market competition is insufficient

Farmers have differences in their age structure, gender ratio, education level, and knowledge structure, and lack the concept, production technology, and market competitiveness to adapt to the development of modern agriculture. There is a shortage of scientific and technological personnel in rural areas, and farmers have challenges in adapting to modern lifestyles and seizing development opportunities.

4.3.4 shortcomings of rural construction compared with cities

Rural construction is faced with difficulties in terms of planning guidance, heavy tasks of infrastructure entering villages to households, and insufficient supply of public services. We need to strengthen the guidance of rural revitalization planning, scientifically determine the classification and layout of villages, and improve the accuracy of the allocation of rural public service resources.

5. THE IMPACT OF DIGITAL TRANSFORMATION ON URBAN AND RURAL INDUSTRIAL INTEGRATION

5.1 The application of digital technology in urban and rural industrial integration

The application of digital technology to promote urban and rural industrial integration and the 123 industrial integration, through the elements of aggregation, technology penetration, mechanism innovation, enhance the agricultural competitiveness and innovation, promote the agricultural industry chain integration and value chain promotion, foster the new forms and new momentum of rural development, improve the balance of urban and rural industry layout, coordination and ecological level.

5.2 The impact of digital transformation on urban and rural industrial structure

Digital economy with its high innovation, strong penetration, and wide coverage in production and consumption at the same time, promotes the transformation and upgrading of urban industry, accelerates the development of agriculture and rural modernization, promotes the low cost of urban and rural elements agglomeration and efficient

flow, break the barriers of traditional elements flow, realize the rural digital industrialization, narrow the gap between urban and rural, further promote the urban and rural integration.

5.3 The promoting role of digital transformation on the coordinated development of urban and rural industries

Digital transformation by promoting the rapid flow of all kinds of resources in urban and rural areas, all kinds of market main have accelerated integration and accelerated reconstruction of all kinds of organization model, changed the rural mode of production and way of life, significantly accelerated the modern transformation of agriculture and rural areas development, for urban and rural integration development has brought new variables, injected new impetus, and expand the new development path.

6. POLICY RECOMMENDATIONS AND PROSPECTS

6.1 Digital transformation policy recommendations for China's urban and rural industrial integration

6.1.1 Accelerate the deep integration of technology and traditional industries

Efforts should be made to promote the deep integration of technology and traditional industries and to promote the digital transformation of manufacturing, tourism, elderly care services, and other fields. This move needs to continuously deepen the application of digital technology in traditional industrial research and development innovation, production and processing, warehousing and logistics, marketing services, and other links, to promote the digital transformation of enterprises' manufacturing and management decision-making. At the same time, digital technology should be used to improve the scientific and technological content of the internal structure of the manufacturing industry, promote the intelligent development of the manufacturing industry, and then promote the integrated development of the manufacturing industry and the service industry, reshape the industrial chain, and improve the level of the industrial chain.

6.1.2 Promote the development of the digital industry

A big data analysis platform should be established to promote the deep integration of digital technology and the traditional retail industry, promote the rapid development of e-commerce, promote the free flow of all kinds of production factors on the market platform, and improve the efficiency of resource utilization. To cultivate an internationally competitive digital industrial cluster, a sound digital infrastructure, the leading role of leading enterprises, a strong technological innovation ability, and a mature industrial ecology are needed.

6.1.3 Promoting the two-way flow of urban and rural factors

We should accelerate the extension of urban digital and intelligent facilities to rural areas, promote the optimization and upgrading of rural information infrastructure, smooth the two-way flow of technology, capital, and other factors in urban and rural areas, and eliminate the digital divide between urban and rural areas. With the help of smart communities, digital rural construction, and other measures, we will promote the integration of urban and rural digital infrastructure, form a new development pattern, and promote the integrated development of urban and rural factor markets.

Through the above measures, it can effectively promote the deep integration of technology and traditional industries, accelerate the development of the digital industry, and promote the two-way flow of urban and rural factors. The application of digital technology will help to break through the geographical restrictions between urban and rural areas and achieve a more balanced and comprehensive development.

6.2 Forecast of the future trend of the integrated development of urban and rural industries

Primary industry: With the advancement of scientific and technological progress and agricultural modernization, the proportion of the primary industry will continue to decline. However, the decline in the primary industry may slow due to the stability of agricultural demand and rising prices. It is expected that the internal structure of agriculture will be gradually optimized and develop towards the transformation of modern agriculture. The coordination of agriculture, forestry, and fishery in the secondary industry: influenced by scientific and technological innovation and industrial transformation, the secondary industry will undergo major changes,

especially in the manufacturing sector. It is expected that the proportion of the secondary industry will fall to about 34.1% by 2025, and may further drop to about 28% in 2035. This indicates that the secondary industry will greatly improve its capacity for innovation and development, but its proportion in the overall economy will gradually decrease.

Tertiary industry: It is expected that the tertiary industry will continue to maintain the momentum of growth and become the leading force in economic development. With the continuous expansion of the service industry and the improvement of information and digitalization levels, the proportion of the tertiary industry is expected to continue to rise in the next few decades.

In general, the integrated development of urban and rural industries will show a trend of the steady decline of the primary industry, the proportion of the secondary industry but the enhancement of innovation ability, and the continuous rise of the tertiary industry and become the leading trend. In this process, technological innovation will be the key factor to promote the optimization of industrial structure and urban-rural integration.

6.3 The Role and Influence of digital transformation in the Future urban-rural integration

Digital transformation plays a crucial role in the future of urban-rural integration. The dual power of the digital economy in production and consumption, has promoted the transformation and upgrading of urban industries and the modernization of agriculture. At the production end, the digital economy promotes the low-cost collection and efficient flow of urban and rural factors, which not only accelerates the transformation and upgrading of urban industries but also accelerates the modernization of agriculture and rural areas. This transformation has broken down the barriers to the flow of traditional factors, realized the digital industrialization of rural areas, narrowed the gap between urban and rural areas, and further promoted the integration of urban and rural areas.

At the consumption end, the development of the digital economy contributes to the construction of new models of digital life, a new provision of consumption channels, reduces the consumption cost of rural residents and release the consumption vitality of rural residents. This includes expanding high-quality life service resources to rural areas through innovative models such as e-commerce platforms, smart education, and smart medical care, to narrow the gap between urban and rural areas. In addition, with the assistance of digital technology, the development of new industries, such as farmhouse entertainment, agricultural products, e-commerce, etc., provides diversified channels for rural residents to increase their income and provides a guarantee for consumption upgrading.

In general, the digital economy plays a key role in promoting integrated urban and rural development, bringing tangible benefits to both urban and rural residents by improving productivity and creating new consumption patterns. This transformation will not only help improve the efficiency of agricultural production and farmers' income, but also promote social governance and cultural revitalization in rural areas, and promote the high-level integration of urban and rural development.

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