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Study on the Mechanism and Path of Digital Technology Enabling Agricultural Social Service Level Improvement

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Abstract

Utilizing digital technology to accelerate the improvement of agricultural social service levels is crucial for building a modern agricultural production system and achieving an organic connection between small farmers and modern agriculture. Currently, China's agricultural social services face a series of issues. Therefore, this paper, based on an analysis of their underlying mechanisms, proposes practical approaches such as establishing data integration and sharing mechanisms, accelerating the digital transformation and innovation of service providers, and strengthening the construction of rural digital infrastructure.

Keywords: Digital Technology; Agricultural Social Service Level; Mechanism; Realization Path

In the current context where "large countries with small farmers" remains a fundamental national and agricultural reality in China, agricultural social services have played a crucial role in facilitating the organic connection between small-scale farmers and modern agriculture. With the application and development of digital technologies in the agricultural sector, digitization has become one of the primary drivers of agricultural growth. Therefore, under the backdrop of the continuous integration of data elements and agricultural social services, studying the mechanisms and pathways through which digital technology empowers agricultural social services is of great importance for enhancing the level of agricultural social services.

1. THE REAL DILEMMA OF DIGITAL TECHNOLOGY ENABLING THE IMPROVEMENT OF AGRICULTURAL SOCIAL SERVICE LEVEL

1.1. Data Integration and Sharing is Difficult

Agricultural social services involve multiple stages and fields, with data sources being extensive and diverse in format, scattered across different departments, institutions, and systems, making integration challenging. The lack of unified data standards makes it difficult for systems to directly connect and share data, increasing processing complexity. At the same time, the severe phenomenon of information silos, where data barriers between departments and institutions hinder resource circulation and sharing, affects service coordination and efficiency. Moreover, agricultural services involve a large amount of personal information and sensitive data from farmers, and data breaches or misuse could result in incalculable losses. These issues collectively constrain the improvement of agricultural social service levels.

1.2. The Digital Transformation of Service Entities Lags Behind

Some service providers lack sufficient emphasis on digital technology and the drive for innovation, leading to slow digital transformation. At the same time, digital transformation requires substantial financial investment, which some service providers cannot afford due to limited funds, making it difficult to ensure the progress of the transformation. Moreover, there is a shortage of digital talent in the agricultural social services sector, causing service providers to face a talent bottleneck when introducing new technologies[1]. This lag not only restricts improvements in service quality and

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competitiveness but also weakens their innovation capabilities and market adaptability, making it hard for them to quickly respond to market demands and meet the diverse service needs of farmers, thus hindering the overall development of agricultural social services.

1.3. Weak Digital Infrastructure

Rural areas lag behind in digital infrastructure construction, with issues such as incomplete network coverage, unstable signals, and low bandwidth being prominent. This affects farmers' timely access to agricultural information and technology. Due to the backward economic conditions and low population density in rural areas, operators face high risks when investing in rural digital infrastructure, leading to a lack of enthusiasm. As a result, the progress of rural digital infrastructure construction is slow, and existing facilities are inadequately maintained. This further exacerbates the weak state of digital infrastructure, severely limiting the application and promotion of digital technologies in agricultural social services.

2. ANALYSIS OF THE MECHANISM OF DIGITAL TECHNOLOGY ENABLING THE DEVELOPMENT OF AGRICULTURAL SOCIAL SERVICES

Digital technology not only provides a new idea for solving the problems in traditional agricultural services, but also injects a strong impetus to promote the comprehensive transformation and upgrading of socialized agricultural services services. The following will explain its internal mechanism from four aspects, and reveal how the digital technology has become the key force to drive the agricultural socialization service towards the modernization and intelligence.

2.1. Break the Data Barrier and Realize Efficient Allocation of Resources

By establishing unified data platforms such as big data centers and cloud computing systems, centralized storage and standardized management of data from various departments can be achieved. Standardized digital technology processes ensure uniform data formats, enabling smooth cross-system integration and breaking down data silos. The introduction of blockchain and smart contract technologies provides a trustworthy environment for data security, while smart contracts clarify data usage rights and benefit distribution[2]. This decentralized data sharing model enhances data utilization efficiency, strengthens trust and cooperation among participants, and offers solid support for the coordinated development of agricultural social services.

2.2. Drive the Intelligent Upgrading of Service Entities and Enhance Their Competitiveness

Digital technology brings new impetus for the intelligent upgrade of agricultural social service entities. IoT technology collects real-time data from farmland, enabling smart control and improving efficiency, quality, and resource utilization. AI technology mines agricultural data to provide precise decision-making, optimizing supply chains and marketing [3]. Digital technology is widely applied in multiple fields such as agricultural finance, information, and technology, providing producers with convenient financing, market dynamics, technical support, simplifying procurement, enhancing mechanization, achieving smart supervision, and expanding sales. These measures enhance the competitiveness of service entities, improve market adaptability, and inject new momentum into the high-quality development of agricultural social services.

2.3 Improve Digital Infrastructure and Consolidate the Foundation for Technology Application

Digital infrastructure is the foundation for empowering agriculture with digital technology. Robust facilities enable high-speed network connections, ensuring rapid data transmission and real-time interaction. 5G technology offers high bandwidth and low latency, supporting intelligent management applications such as [4]. The construction of the Internet of Things provides a platform for agricultural data collection, with sensors collecting key data like soil conditions in real time. Big data centers deeply mine and analyze this data, providing scientific decision support for agricultural production. Strengthening the development of digital infrastructure can break through bottlenecks in rural digital technology applications, promote the digital transformation of agricultural social services,

achieve precise management of agricultural production, and enhance agricultural efficiency and benefits.

3. PRACTICAL PATHS FOR IMPROVING THE LEVEL OF AGRICULTURAL SOCIALIZATION SERVICES BY DIGITAL TECHNOLOGY

3.1. Establish a Data Integration and Sharing Mechanism

The government should lead in establishing unified data standards and norms, building an agricultural big data platform as the core carrier to integrate various agricultural data resources. This will enable centralized storage, management, and analysis of data, providing comprehensive data support for socialized agricultural services. The aim is to enhance the precision and efficiency of agricultural production, facilitating the transformation and upgrading of the agricultural industry. At the same time, the government should encourage enterprises and research institutions to actively participate in data sharing, stimulating their enthusiasm through policy guidance and financial support. To ensure data security, it is necessary to strengthen management and supervision, clarify responsible entities, and develop management measures and emergency response procedures to prevent data from being leaked, tampered with, or misused during the sharing process[5]. The establishment of this mechanism will strongly promote the development of socialized agricultural services, providing solid data support for agricultural modernization.

3.2. Promoting the Digital Transformation and Innovation of Service Entities

Service entities should enhance their digital awareness and proactively seek digital transformation and innovation. The government should introduce preferential policies to ensure the technical upgrades of service entities and reduce transformation costs. Service entities should collaborate with universities and research institutions to develop digital technologies, conduct application demonstrations, and explore digital service models. At the same time, they should prioritize the cultivation and recruitment of digital talent to provide intellectual support for transformation. Encourage service entities to innovate, exploring new models such as precise big data services and intelligent management, to improve service efficiency and quality, and enhance market competitiveness. Through these measures, promote the continuous innovative development of agricultural social services to meet the new requirements of the digital age.

3.3. Strengthening the Construction and Upgrading of Digital Infrastructure in Rural Areas

It is necessary to accelerate the construction of digital infrastructure such as 5G base stations and big data centers in rural areas, addressing issues like incomplete network coverage and unstable signals, to improve information transmission efficiency. The government should collaborate with social capital, sharing risks and benefits, and formulate policies to encourage investment from social capital. By adopting public-private partnerships, the pressure on construction funds can be alleviated. At the same time, it is essential to establish a robust maintenance management system for rural digital infrastructure, enhancing facility inspections and maintenance, promptly identifying and resolving faults to ensure stable operation of facilities[6]. This will guarantee a good internet experience for farmers, provide a solid foundation for rural digital development, and promote the modernization of agriculture.

4. CONCLUSIONS

This article explores the mechanisms and pathways through which digital technology enhances agricultural social service levels, highlighting that digital technology is a key driving force. However, the widespread application of digital technology in agriculture faces challenges. To fully leverage its potential, it requires joint efforts from the government, social organizations, and service providers. Measures such as establishing data sharing mechanisms, promoting the digital transformation of service providers, and strengthening rural digital infrastructure construction are needed to better improve agricultural social service levels and inject new vitality into agricultural modernization.

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