

Research on Information Technology and Agricultural Modernization

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Abstract

Nearly 10 years of application of modern information technology in agriculture made the simple review, on the basis of summing up the application of rough areas, namely the applications in agricultural production, management, management, and then discusses the information technology, the application prospects of agricultural development in the future, at last put forward the main problems of agricultural informatization to be cracked.

Keywords

Information technology, Agriculture, Application, Prospects, Problem.

1. Introduction

The wave of informatization featuring computer technology, communication technology, and automatic control technology is sweeping across the globe. It is the basic feature of the new economic era and plays an important role in the process of agricultural modernization. Informationization is the sign and key to the modernization of modern agriculture. It dictates the direction of agricultural modernization in the future.

2. Application of Modern Information Technology in Agricultural Development

2.1 Informationization of Agricultural Production

In agricultural production, the application of modern information technology has penetrated into various industries and multiple links. In the field of crop production, its outstanding performance is agricultural monitoring, precision fertilization, intelligent irrigation, intelligent monitoring of facility agriculture, monitoring of pests and weeds and prevention and control of informatization; livestock husbandry, relying on modern information technology to achieve livestock breeding and breeding, meat and eggs The automation, intelligence, and digitization of milk production, feed production, farm management, environmental control of livestock and poultry houses, etc., and the establishment of a product traceability system; grass industry, realizing the remote sensing of grassland, disaster warning, grass Informatization of protection and fire emergency command, etc.; in the veterinary field, relying on RFID and other technologies, animal identification and disease traceability have been achieved, and a huge database of animal-sourced bacteria resistance monitoring databases and veterinary microbial species management databases have been established. The veterinary drug product can be effectively reviewed, supervised and traced; in the fishery field, remote sensing technology is used to enable the monitoring of marine biological resources and inhabiting environment geographical information, real-time monitoring of fishing vessels, and monitoring of marine catastrophic events, etc.; GPS is installed in the field of agricultural machinery. Satellite

navigation module for self-driving tractors, spraying pesticides, precision fertilization, harvesting operations and transplanting tillage began to apply.

2.2 Informatization of Agricultural Operations

In terms of agricultural operations, significant achievements have been made in agricultural e-commerce, informatization of wholesale markets, and leisure agricultural information services. Agricultural e-commerce: At present, there are more than 30,000 agricultural websites in China, and a considerable number of them are involved in agricultural e-commerce. Among them, the Ministry of Agriculture's "One-stop-stop" service platform dedicated to providing online marketing services for farmers and enterprises has more than 360,000 registered members, has more than 100,000 annual information releases, and has a daily average of more than 180,000 hits. Some provinces (autonomous regions, municipalities directly under the Central Government) have supported and established a number of specialized websites and trading networks focusing on local key agricultural products. In the informatization of wholesale markets, most of the wholesale markets in the country have established information systems based on "information centers, testing centers, and settlement centers". Many wholesale markets have established advanced agricultural product quality inspection centers and modern electronic monitoring systems. The smart IC card management system basically realizes market management informationization and electronic charging. The modern logistics system that matches the informatization of the wholesale market has developed rapidly. Order agriculture, chain operations, and logistics and distribution have become important ways for the development of new circulation formats. Some regions fully utilized the favorable conditions for the rapid development of large-scale supermarket chains and farmers' specialized cooperatives in production areas, actively promoted fresh agricultural products directly into supermarkets from their producing areas, and implemented super agricultural docking, which effectively solved the problem of disjointed production and sales of agricultural products. In terms of leisure agriculture information services, some localities also actively use modern information technology to expand the versatility of agriculture and promote the development of ecology, tourism, and leisure agriculture, focusing on the characteristics of local resources. On May 19th, 2011, implementing the spirit of "proactively developing leisure agriculture and expanding the space for non-agricultural employment in rural areas" by the Party Central Committee and the State Council, the Ministry of Agriculture launched the "Entering the City into the Home" project of the national leisure agriculture service information. The Bureau of Township Enterprises of the Ministry of Agriculture has signed cooperation agreements and memorandums with China Mobile Communications Corporation and Nokia Lianxin Internet Service Co., Ltd. to jointly promote the construction of information and information services for leisure agriculture.

2.3 Informatization of Agricultural Management

1.Implementation of "Jinong" project construction. The construction of e-government has been intensified, and the agricultural sector has taken the opportunity of implementing the "Golden Farmer" project to vigorously promote the informatization of information resources sharing, decision-making, service, and supervision.

2.Development and application of agricultural management information system. Developed agricultural management information systems such as on-line administrative examination and approval, grassland supervision, fishery command, animal disease prevention and control, agricultural product monitoring and early warning, agricultural product and production information market supervision, agricultural information collection, emergency command, video conference, agricultural machinery purchase subsidies, financial supervision, etc. Enhance the capacity of the online administrative office, project supervision, and online service for the public in the agricultural sector.

3.The grassroots management platform of the municipalities and villages has been extended and expanded. Some provinces (autonomous regions and municipalities directly under the Central Government) have extended e-government to rural communities, developed, promoted and used municipalities and villages management systems, promoted the construction of population, land, and

enterprise basic data, and used information technology to carry out family planning、social security、employment, recruitment, and election. Business、finance、relief、basic education and other businesses have improved their management.

2.4 Informationization of Agricultural Services

In terms of agricultural services (breeding, agricultural resources, agricultural technology, farmland management, harvest, circulation, consumption, finance, insurance, leisure, etc.), information technology has made great progress.

1. Information service platform construction. The agricultural system has established 19 provincial, 78 prefecture-level and 346 county-level "three rural" comprehensive information service platforms. The Ministry of Agriculture's "Agricultural Machinery Cross-regional Operation Service Through Train System" provides supply and demand information and a matching platform for both sides of agricultural machinery cross-region operation services, and releases cross-district operation information in time, providing supply and demand matching services for 100,000 agricultural operators.

2. Information service model innovation. The service model continued to innovate, with the emergence of Zhejiang Farmers' Mailbox, Jilin "12316 New Rural Hotline", Shanghai "One Stop Station", Guangxi "Digital Agriculture", Inner Mongolia "Nongxin ICT", and Ningxia "Platform Move-up Service Deferred". - Resource integration, Xinjiang Information Center households, etc.

3. Diversified information service entities. Agricultural organizations and scientific research institutes and agricultural enterprises participated in the informationization of agricultural services and made substantial contributions.

3. Informatization and Development Trend of Modern Agriculture

The "Twelfth Five-Year Plan Outline for the National Economic and Social Development of the People's Republic of China" clearly points out that accelerating the construction of a broadband, converged, secure, ubiquitous next-generation national information infrastructure, promoting the deep integration of informatization and industrialization, and promoting economic and social development. Informatization in various fields. Undoubtedly, during the 12th Five-Year Plan period, the development of modern agriculture in China must speed up the construction of the next-generation information infrastructure and comprehensively improve the level of informatization.

3.1 Digitization and Intelligence Will Contribute More to the Development of Modern Agriculture

Modern agriculture will increasingly integrate information technology into agricultural production management processes such as soil testing and fertilizer application, livestock and poultry aquaculture, water-saving irrigation, agricultural machinery scheduling, and so on, and comprehensively increase the comprehensive agricultural production capacity. Such as: precision agriculture, analysis and management of geographic data and maps through Geographic Information System (GIS); positioning and definition of geographic data using Global Positioning System (GPS); development of precise and specific inputs using variable input technology (VRT) Application; using remote sensing (RS) identification and field monitoring techniques to record crop growth.

3.2 Internet of Things Technology will Drive the Modernization and Modernization of Modern Agricultural Operations

At present, the Internet of Things technology is an important part of a new generation of information technology and is favored by governments, enterprises, and research institutions. The core and foundation of the Internet of Things is still the Internet. It is based on the Internet and extends to any object and object for information exchange and communication. The Internet of Things is called the third wave of the development of the world's information industry.

With the improvement of living standards, consumers' demands for quality and safety of agricultural products are not only satisfied with the place of production and brand, but also need to control their quality and safety from the "field to the table", that is, the selection of breeds of pre-harvest crops or the breeding of products. Seedlings, growth during production, post-harvest processing and packaging, circulation, refrigeration, transportation, and other information were recorded.

3.3 The Rapid Advancement of E-Government Will Further Strengthen Modern Agricultural Management

The "Twelfth Five-year Plan Outline for the People's Republic of China on National Economic and Social Development" clearly stated that "focusing on information sharing and interconnection, we will vigorously promote the construction of the national e-government network and integrate and enhance the government's public service and management capabilities." During the "Twelfth Five-Year Plan" period, it will speed up the use of Internet technologies, overcome fragmentation, isolate information islands, speed up the realization of interconnection between the central government and local governments, and promote the extension of rural e-government public services to rural areas. The application and promotion of the agricultural e-government system will further promote the transformation of government functions, enhance decision-making and management capabilities, and increase office efficiency and service levels.

3.4 Networking and Multimedia Will Unprecedentedly Satisfy The Demand of Modern Agriculture For Information and Services

During the "12th Five-Year Plan" period, the network and multimedia of agricultural information services will develop rapidly. Networking will help producers, operators, and consumers in different regions to share information technology and information services at low cost, which will help farmers to obtain personalized information services in a timely, comprehensive and detailed manner, and help change the marginalized rural economy. status quo.

The information service is multimedia, and a combination of text, graphics, sound, animation and video information is delivered via computer or other electronic means. Very sophisticated agricultural technologies can be expressed in a simpler, more understandable, and easy-to-learn way, with fast speed, wide coverage, and vivid images. For example, remote diagnosis systems for pests and diseases use networked hospitals, remote training, video consultation, and other applications to provide farmers with specialized techniques to guide disease prevention and control. Looking into the future, the traditional way to ask for appointment services will be replaced by personalized technical guidance and training provided by multimedia technology.

4. Main Issues that need to be Solved Urgently to Promote Agricultural Informationization

4.1 Inadequate Understanding of the Importance of Agricultural Informatization

Although since 2004, seven consecutive Central No. 1 documents have given a high degree of attention to agricultural informationization. In 2009, the State Council issued the "Outline for the Adjustment and Rejuvenation of the Electronic Information Industry" to transform information technology into traditional agriculture and improve information technology services. "As an important measure to cope with the global financial crisis, but from the practical point of view of various places, some places have yet to truly recognize the importance and urgency of accelerating agricultural informatization, and have not yet realized that agricultural informatization will affect agricultural production and management." The importance of scientific management and dispatch, and even rural economic and social stability and development. Therefore, it is still a very important and urgent task for all localities at all levels to really attach importance to, care for and support the construction of agricultural information.

4.2 The Development Plan for Agricultural Information Construction is Seriously Lagging Behind

Informatization not only promotes the development of productivity, but also promotes the transformation of the relations of production. It is a re-innovation of the system and mechanism. Therefore, information-based construction is a systematic project that requires a strong government-led approach and implements overall planning and unified design. At present, the national agricultural informatization construction lacks overall coordination among departments, lacks macro development plans, lacks a unified top-level design, and reduces the utilization of resources.

4.3 Agricultural Information Infrastructure is Still Very Weak

On the whole, China's central and provincial agricultural informatization construction has a certain basis, but the information infrastructure of counties, townships, and villages is still weak. The majority of the country's agricultural departments in towns and villages have not yet deployed computers, especially the infrastructure construction of rural informatization in the central and western regions is very backward. According to statistics, during the "11th Five-Year Plan" period, the total investment for the construction of information infrastructure by the provincial, prefectural, and county-level agricultural departments was about 1 billion yuan, which is equivalent to the scale of investment in the construction of more than 10 kilometers of expressways. Can not meet the needs of China's agricultural and rural economic development.

4.4 The Level of Informatization in Agricultural Production and Management is Relatively Low

In recent years, the national agricultural informatization work has focused on the promotion of e-government and the dissemination of agricultural-related information. The transformation of traditional agriculture with information technology and the service of "agriculture, rural areas and farmers" are still lacking. In the national agricultural system, there are few composite talents who understand both information technology and agricultural science and technology and economics. There is a shortage of practical talents who really grasp information technology and basic skills among grassroots peasants, which seriously hinders the effective use and popularization of information technology. Promotion. At present, the informationization in the field of agricultural production and management is far from the requirements for the development of modern agriculture. Mainly reflected in: information technology has not fully penetrated into agricultural production operations, business decisions, market services and industry management; the application of information technology can not keep up with the pace of development of agricultural industrialization; In the groping.

4.5 The Mechanism for the Development and Sharing of Information Resources Needs to be Established

Because the information concerning agriculture is scattered in many different departments, the agricultural informatization standards have not yet been established, resulting in information being difficult to share and share. The information services provided for farmers often have phenomena such as information overlap, information differences and information lagging. It is very urgent to establish management, service mechanisms and systems that promote the sharing of information resources and efficient development and utilization.

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