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The application of Internet of Things technology in the development of modern agriculture

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Abstract: With the continuous advancement of Internet of Things technology, there has been a more in-depth use of Internet of Things technology in various industries, and the Internet has shown a huge role and some positive influences in it. The Internet of Things is an important driving force for the success of national scientific and technological innovation and industrial structure optimization, because the effective support of Internet of Things technology has enabled more industries to achieve qualitative changes and leapfrog development. This paper will briefly explore the use of Internet of Things technology in modern agriculture, hoping to better explore the advantages of Internet of Things technology through the research of this paper, so that the speed of modern agricultural development continues to accelerate.

1. Introduction

The Internet of Things has always been considered the next industrial revolution because of some positive effects in people's daily lives and different aspects of production and work. Agriculture is a basic industry in the process of China's national economic development, and its role in China's future growth and development cannot be ignored. Therefore, in the development of modern agriculture, the scientific application of Internet of Things technology can provide a broader space for the development and growth of modern agriculture, so that the development speed of modern agriculture continues to accelerate, and at the same time, it can better play a positive role in the continuous improvement of social and economic level and the continuous improvement of people's material living standards.

2. The concept and technical system of agricultural Internet of Things

2.1 Concept

The agricultural Internet of Things is the Internet of different objects that are also connected to each other in the process of agricultural production and development. On the basis of the compatibility characteristics of the Internet of Things, agriculture can make the corresponding technical means in the modern agricultural production system have a broader application space and good development

prospects. At present, the overall development direction of China's agriculture is precision and efficiency, through the reasonable application of agricultural Internet of Things can comprehensively collect agriculture-related data information, do a good job in the intelligent analysis and research of these data information, so as to achieve the commonality and effective sharing of data, but also can accelerate the automation adjustment of agricultural production and the effective optimization and improvement of production and operation structure.

2.2 Technical system

In the current system process of agricultural Internet of Things development, the application of technology also covers different levels. On the whole, the technical system is composed of 5 different parts, which involve the collection, transmission and processing of information, including control systems and information applications, and these 5 parts play a certain role in promoting the good application of technology [1]. In different application scenarios, the weight of these systems can be continuously optimized, and under the premise of ensuring that the system functions meet the application scenarios, the technical capital investment in them can be saved as much as possible, so as to achieve the balance and coordination between the application efficiency and cost of the Internet of Things technology.

3. Application of Internet of Things technology in the development of modern agriculture

3.1 Application in agricultural pest monitoring and early warning

For a long time, because the traditional processing methods and processing technology of agricultural pest information application are relatively single and backward, it is very easy to lead to the loss of these data in the process of processing these data and information, and it is impossible to summarize the specific laws of agricultural pests and diseases through the scientific analysis of these data and information, delaying the effective control time of agricultural pests and diseases, which is not conducive to improving the scientific monitoring of agricultural pests and diseases and effective early warning and control. In the monitoring and early warning of agricultural pests and diseases, the reasonable application of Internet of Things technology can become the key to the control of pests and diseases, which can ensure that agriculture achieves the important goal of increasing production and efficiency and increasing income. Taking the application of the integrated information system of pest monitoring and early warning of agricultural Internet of Things as an example, it can be understood that this system integrates different functions such as data management, monitoring analysis and statistics, and query, and is a multi-functional data processing and effective management platform. This system also covers different parts such as monitoring system and information management platform and meteorological monitoring, which plays an active role in monitoring the situation of agricultural diseases and pests in a timely manner, summarizing the data and information in it, and issuing early warnings.

3.2 Application in facility agriculture

Facility agriculture has played an important role in guaranteeing the smooth development of agricultural production activities, and the scientific play of the actual role of facility agriculture can achieve the corresponding production goals of green pollution-free vegetables and provide more reliable guarantees for the people. Combined with the specific requirements of food safety, it is necessary to vigorously develop facility agriculture, which can smoothly solve a series of quality problems in vegetables. While the benefits of modern agricultural production are also continuously

improved, it can also promote the transformation and upgrading of agriculture. Compared with traditional facility agriculture, we can understand that the problems of low yield and low production efficiency in the past can be effectively solved through the use of Internet of Things technology, further optimize the agricultural industrial structure, strengthen the real-time control of different aspects such as temperature ventilation conditions and humidity in the greenhouse, reduce the capital cost of agricultural production as much as possible, and form a scientific guarantee for the efficiency of agricultural production. Therefore, it is necessary to introduce Internet technology in facility agriculture, through the practical role of technology, to help the current agriculture achieve the goal of sustainable development, but also to effectively improve the financial efficiency of agricultural production activities, to protect the ecological environment. In the process of the development of facility agriculture, the effective play of the practical role of Internet of Things technology will also accelerate the speed of development of facility agriculture, and effectively optimize and improve the specific composition structure of modern agriculture.

3.3 The role of quality supervision of agricultural products

In the quality supervision of agricultural products, the scientific use of Internet of Things technology can minimize the probability of food safety accidents, further improve the management of agricultural products, scientific application of Internet of Things technology, can monitor the entire agricultural production supply chain in real time, maximize the protection of the legitimate interests of consumers, and provide comprehensive guarantee conditions for the effective realization of modern agricultural development goals. In the process of promoting the quality supervision of agricultural products, through the rational use of Internet of Things technology, the potential safety hazards and risks existing in the sale of agricultural products can be eliminated in a timely manner, the goal of tracking agricultural products throughout the process can be achieved, and the final effect of dealing with various objective problems can be enhanced. In the future development process, the quality supervision of agricultural products will also produce a stronger dependence on the Internet of Things, so China's food safety will also be fully guaranteed.

3.4 Application in agricultural information platform

The construction of agricultural informatization is also a relatively weak link in China's agricultural production and operation, because the informatization of agricultural industry contains more content and is relatively complex, so financial entities are also diversified. The agricultural production and operation management policies in different regions are quite different, which also seriously restricts the effective construction and development of the information platform operation technology system. On the basis of the application of Internet of Things technology, it can comprehensively integrate all aspects of data information, directly transmit the original data information to the information platform, and update the information content in real time to meet the relevant information needs proposed by different consumer groups. Taking the effective construction and development of the comprehensive animal husbandry information platform in a province as an example, we can understand that the platform is built at the provincial, municipal and county levels of management system, on this basis, combined with the actual situation of management, a multi-level application module is constructed, and the animal husbandry management content in different management subjects is also included in the platform system. The market access mechanism needs to be continuously improved, under the premise of ensuring the security of product information, effectively realize the comprehensive promotion of new variety information and the publicity of legal and regulatory information, as well as online complaints and other different functions, improve the

level of product information interaction, but also for the healthy and stable development of animal husbandry in the region has played a certain positive role in promoting it.

4. Effective suggestions for the application of Internet of Things technology in modern agriculture

4.1 Improve the technical standard system

In the current effective construction of agricultural Internet of Things technical specifications and standards, the government and industry associations also need to participate together. On the basis of the rational use of existing norms and standards, the government level should take the initiative to strengthen its own leadership role in it, supervise the effective implementation of the existing standard system, promote the effective strengthening of the scientific formulation of new standards at the industry level, promote the continuous progress of Internet of Things standards in the direction of internationalization and generalization, and ensure that the content of standards and the development needs of modern agriculture are consistent [2]. In the process of scientific construction of agricultural Internet of Things projects, we should also actively follow the corresponding standard system, and explore a new path for the construction of future industry standards on this basis. It is necessary to implement scientific policy support and further improve the intensity of capital investment in it, so that the level of agricultural Internet of Things construction specifications can be rapidly improved, and lay a solid technical foundation and guarantee for long-term and stable operation and later development in the future.

4.2 Effectively strengthen macro policy guidance

In the process of agricultural Internet of Things projects in different regions, the guiding role played by the government in them is still more important, to fully consider the current agricultural development trend of various requirements, the focus of local characteristic agricultural development has been clear, and on these basis to determine the future overall development planning, so as to guide the reasonable development of specific projects, to avoid duplicate construction or disorderly competition of the bad status quo. In view of some relatively weak links in the development process of the agricultural Internet of Things industry chain, we should also use the form of project cooperation to give full play to some positive advantages of local universities and scientific research institutions at the technical level, build a reasonable technology research and development platform for communication, and improve the support for some advantageous enterprises. Effective innovation at the technical level also needs to be continuously strengthened. At the same time, in the process of developing the agricultural Internet of Things system, we should also do a good job in scientific and technological training for farmers, improve the support policies for benefiting farmers, try to solve the dilemma of early capital investment in the application of Internet of Things technology and some problems of technical investment, and effectively reduce the risks faced by the project in the process of construction and operation.

4.3 Guide the innovation of enterprise business models

The most fundamental purpose of the construction of agricultural Internet of Things is to promote the continuous development and progress of China's agricultural industry in the direction of modernization, and hope to continuously improve the output level of agricultural output economic benefits. Therefore, in the actual promotion process, it is necessary to correctly guide these enterprises, help enterprises strengthen the importance of technological change, and effectively innovate and

optimize the business models applied therein. In the actual operation of the new business system, on the basis of the application of Internet of Things technology, this link of information exchange can be reduced, different agricultural information can be processed reasonably and scientifically, the integrity and comprehensiveness of different information applications can be ensured, and the refined needs put forward by different customer groups can be explored from a deeper level with the help of the effective analysis of big data of the Internet of Things. On the basis of the refined needs of these customers, we take the initiative to develop some new products. It is necessary to scientifically use the advantages of the platform, do a good job in effective publicity of new products, improve the economic benefits obtained through the innovation of business models, drive more social funds into the agricultural industry, and lay the foundation for the modernization of agriculture.

5. Conclusions

In general, the degree of integration between advanced science and technology and agricultural industry is constantly improving, and in the process of modern agricultural development, it is necessary to further strengthen the effective use of Internet of Things technology and build a more complete and scientific operation system of agricultural Internet of Things, so as to drive the rapid development and progress of modern agriculture.

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