

A Research on the Implementation Scheme of Smart Agriculture Based on Internet of Things

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Abstract: In the past year, China's scientific and technological innovation level and social and economic development level have been continuously improved. New technology has been applied to more and more fields. The agricultural economy, as an important support of China's hit economy, has always been valued by all social classes. Under the background of the current rapid development of science and technology, China is constantly introducing high-tech in the process of agricultural production so that China's agricultural development is constantly optimized and moving towards the direction of modern agricultural development. The Internet of Things (IoT) is an important technology that is widely used in various fields at present, and it has become indispensable for the development of many industries. The integration of Internet of Things into the production and planting process of modern agriculture is undoubtedly a brand-new agricultural production mode. By organically combining Internet of Things with modern agriculture, a brand-new agricultural planting mode-smart agriculture was born. The application of Internet of Things in agricultural planting can effectively improve China's agricultural production efficiency. For this reason, this paper will briefly describe the scheme that needs to be implemented for the development of smart agriculture under the combination of Internet of Things and agricultural planting and put forward some problems faced by the current development of smart agriculture, and give corresponding solutions, aiming at providing some experience for further promoting the development of modern agriculture in China.

Keywords: Internet of Things; Smart Agriculture; Implementation Plan; Research Strategy

1. Introduction

China has a large area of planting land for agricultural development, and so far China has been in the leading position in the world in agricultural development. As a big agricultural country, the most important occupational factor for China's agricultural development in the past was the influence of the natural climate. However, the application of various technologies in modern agriculture can effectively reduce the low price of agricultural products related to natural factors. In recent years, China has been advocating the development of smart agriculture and ecological agriculture, and the agricultural production technology in China is constantly innovating, developing, and updating. Especially, the application of Internet of Things has greatly promoted the rapid formation of smart agriculture in China. Using the Internet of Things to develop China's agricultural economy is the only way for China's agricultural development, and the application of science and technology can provide a better technical guarantee for China's agricultural development. With the progress of the agricultural economy and the increase in farmers' income, it is necessary to apply advanced science and technology to agricultural planting and production in China. The traditional planting mode requires a lot of manpower and material resources. At the same time, it takes a long time and the efficiency is low. Due to the influence of certain factors, some problems often appear in the planting process. However, the planting efficiency and the accuracy of various information collection can be effectively improved, and the problems existing in the agricultural planting process can be found promptly and corresponding solutions can be given after using the Internet of Things. Therefore, China's agricultural economy can be effectively promoted and China's agriculture can be fully developed and advanced.

2. The Basic Concept and Hierarchical Framework of Internet of Things

2.1 The basic concept of Internet of Things

Internet of Things is a new technology that has been widely used by enterprises and major market platforms in recent years. Once it was introduced, it was applied and popularized by major markets. Internet of Things is a new concept derived from the current advanced network technology and the rapid development of information technology. The concept of Internet of Things was first put forward in the 1990s by the Massachusetts Institute of Technology. The key point of the Internet of Things is the integration of electronic information technology and Internet technology. With the help of wireless data communication and FRID technology, it is an important supporting foundation for the development of Internet of Things to build a brand-new system that can cover everything in the world by interconnecting everything. The specific definition of the Internet of Things was in 2005. The main technical premise of this technology is perception. It uses infrared sensing technology, electronic screen identification technology, global positioning technology, laser scanning technology, camera technology, and other technologies to combine to realize real-time object positioning and capture the specific state of other production equipment such as commodities and goods, and then realize the mutual transmission of information through the Internet network to realize the identification, positioning, and tracking of goods. The application of Internet of Things in enterprise safety production is an inevitable trend of enterprise development and an important factor to promote the development of major market economies. It can be said that the Internet of Things is based on Internet technology. By summarizing the Internet of Things, the specific application of the Internet of Things can be divided into the following three characteristics: comprehensive perception system, super intelligence, and seamless interconnection between things and people.

2.2 The concept of the layered architecture of Internet of Things

Through in-depth analysis of Internet of Things, we can get that Internet technology can be divided into three different functional layers: network layer, application layer, and perception layer. The network layer is mainly to realize the purpose of information exchange and resource sharing of goods by integrating goods with the Internet through Internet technology. The application layer needs to expand all the data and information read by the perception layer, and the concrete analysis and data processing are super intelligent. The perception layer uses all kinds of professional instruments and systems to identify goods and transmit information. Internet of Things can effectively provide people's life and the production of enterprises with high significance. At that time, it can also make great changes in people's way of purchasing goods, which can deliver goods safely, effectively, and accurately.

3. The Analysis of the present situation and problems of China's current smart agriculture development

At present, the important direction of China's agricultural economic development is to quickly build a smart agricultural system, which mainly prepares all the processes in the planting process through the Internet of Things. Moreover, it greatly reduces the artificial investment and the problems caused by successful planting by experience. The wisdom of agriculture is to collect and sort out the valuable experience in the agricultural production process, and then integrate and analyze these experience data through the Internet of Things to improve the efficiency of agricultural production.

3.1 The current modernization of China's agricultural infrastructure

Agriculture has always been an important support for China's economic development, and China has always attached great importance to the development of agriculture. In the infrastructure construction of agricultural planting, the state has always attached great importance to it. With the government's increasing investment in agricultural planting, China's agricultural infrastructure construction has become more and more perfect. As far as China's agricultural infrastructure construction is concerned, it has changed from the previous pursuit of a quantity to the current quality development. The standard of agricultural modernization has been

achieved but there are still many shortcomings. There is still a big gap between agricultural development in the east and the west because of the geographical location. Agricultural development in eastern China has always been influenced by the geographical environment and climate, and its development is better than that in western China. The construction of agricultural infrastructure in the east and the development of smart agriculture also makes the development of agricultural planting in the east faster and faster. However, China is also deepening the modernization of agricultural planting and adding Internet of Things to agricultural production. As long as we are firm and with the help of the national government and new technology, China's agriculture will surely develop faster.

3.2 The application of Internet of Things in agricultural planting

At present, the Internet of Things has been fully applied in China's agricultural planting process but there are still some problems in the application process. Among them, some emerging technologies have not been fully popularized because the development of China's informatization level has been restricted in many aspects. And, some scientific and technological infrastructures have not been popularized. Although the Internet of Things has made great breakthroughs in the pilot application of agricultural planting, there are still big problems in the popularization of technology. In addition to the lack of efforts in the main construction of the Internet of Things, there is still the phenomenon of talent scarcity. Most people yearn for the prosperous life of the city, and few technical talents will take root in the countryside. This is a relatively important problem faced by China's current agricultural development. Because the popularization of wireless network technology in rural areas is not perfect, there are still some problems with the application of Internet of Things in agricultural planting. Without strong technical support, it is difficult to make rural agriculture form smart agriculture.

3.3 The popularization of emerging technologies in rural areas is incomplete

At present, it is inseparable from the development, popularization, and application of new agricultural planting technologies to build smart agriculture by using the Internet of Things. The development of smart agriculture in China is still at the initial exploration stage, and there are still big problems and deficiencies in many aspects. There are great differences in agricultural infrastructure, technology popularization, and personnel training due to the imbalance of regional agricultural development. These problems will affect the promotion of new technologies in the process of agricultural development. At the same time, some technology operators will set up certain barriers to technology sharing in order to obtain greater benefits. In this way, the sharing and access of technical resources will be restricted to some extent, and even farmers will buy new technologies, which will greatly increase farmers' planting expenditure and economic burden. This phenomenon seriously hinders the development of smart agriculture and is bad for farmers' enthusiasm for planting.

4. The Relevant Strategies of Using Internet of Things to Realize Smart

Agriculture

4.1 The application guiding ideology of Internet of Things

In the process of agricultural planting, the use of Internet of Things needs to give priority to selecting suitable areas for pilot application. Through the summary of the data and experience of the pilot areas, the application of Internet of Things is carried out according to the actual situation of different areas and the agricultural planting characteristics of the areas. Through the automation and intelligence of Internet of Things, the efficiency and yield of agricultural planting can be improved. On the premise of ensuring the quality of crops, farmers can increase their income. It is necessary to continuously build the Internet of Things system in agricultural planting, collect and count the experiences and technologies in all aspects of agricultural production, and realize the integration of various funds for agricultural planting. And, Using Internet of Things to realize the sustainable development of the agricultural economy is essential.

4.2 The framework of Internet of Things

The application of Internet of Things in agricultural planting can fully reflect its advantages of high automation and intelligence. The application framework of Internet of Things in agriculture is not an individual but it is formed by interlocking multi-level frameworks. In the process of agricultural planting, the framework that the Internet of Things will be applied in building smart agriculture includes water conservancy management framework, logistics management framework, pesticide management framework, meteorological management framework, machinery and equipment management framework, pest management framework, farmland electricity management framework and so on. These frameworks need to be integrated to help IoT technology develop better in smart agriculture. Networking technology provides a safer network environment for China's agricultural development and makes agricultural planting more efficient. At the same time, the high level of automation will greatly reduce the cost of agricultural planting, which is an important support for the sustainable development of China's agricultural economy.

4.3 Cultivating technical talents of Internet of Things.

At present, if we want to make better use of the Internet of Things technology in smart agriculture and then let the Internet of Things technology in agricultural development no longer be restricted, the best way is to vigorously cultivate Internet of Things technology talents. Because the Internet of Things is a new technology developed in recent years, the technical talents in this field are still relatively scarce, especially those who can apply the Internet of Things in agricultural planting. Therefore, at present, it is necessary to train a group of high-quality and high-level IoT technical talents in conjunction with major universities. These talents should not only master Internet technology but also learn the knowledge of agricultural planting. Ordinary agricultural planters should also be trained in IoT technology so that they can master some simple IoT technology operations, provide incentives, and strongly encourage relevant agricultural planters to learn new agricultural planting technologies. It is to make the construction of smart agricultural systems more rapid.

5. Conclusion

To sum up, China's agricultural economic development is inseparable from the help of new technologies. Internet of Things is the most important thing to building smart agriculture development. Internet technology can make agricultural planting efficiency change and combine with it through highly automated and intelligent means. All regions should combine the Internet of Things with the actual situation of local agricultural development to realize the quality improvement of agricultural planting and economic development. At the same time, the Internet of Things is also an important means to help China reduce the imbalance of agricultural development. The Internet of Things will reform the development of China's agriculture, and networking technology will also push China's agricultural development level to a higher modernization.

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