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Agricultural Products Tracking Technology for Sustainable Supply Chain

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Key words: Agricultural Product Supply Chain, Tracking Technology, Internet of Things Technology, Operation Mode

Abstract: The quality and safety of agricultural products is a worldwide hot issue. In recent years, with the occurrence of a series of accidents, the safety of agricultural products has attracted great attention at home and abroad. Public health and social harmony and stability. For this reason, many national government departments have established relatively complete food safety traceability systems, which have become an integral part of food safety management. The tracking system has become an important means of agricultural product safety management. Although the traditional tracking technology has ensured the quality of agricultural products to a certain extent and enhanced the competitiveness of agricultural products in international trade, the problem of broken agricultural product tracking chains may occur, which is caused by the defects of the traditional agricultural product supply chain. At present, the Internet of Things technology is developing rapidly. This article proposes a new mode of operation of the agricultural product supply chain based on the Internet of Things technology. Under this model, there is no separation of production and sales, and compared with the traditional supply chain, it solves the problem of traceable chain breaking of agricultural products. In the experimental part, the fuzzy comprehensive evaluation method is used to calculate the priority of the agricultural product supply chain and the traditional supply chain after applying the Internet of Things technology. The results show that the new agricultural product supply chain proposed in this paper has improved the priority of the traditional supply chain by nearly 35. %, The new agricultural product supply chain system proposed in this article has the effect of improving and developing China's agricultural product supply chain system.

1. Introduction

At present, the level of China's agricultural product supply chain is in a state of coexistence of both traditional agricultural product supply chains and modern agricultural product supply chains.

The traditional agricultural product supply chain is mainly composed of individual growers or breeding bases, while the main participants in the modern agricultural product supply chain are directly-owned suppliers, production bases, processing plants and supermarket chains, and consumers. China's agricultural product supply chain management information platform and information technology are not perfect, resulting in asymmetry of related information and intangible increase in logistics costs; agricultural product quality safety standards and systems are not uniform, and different quality standards and requirements make it difficult for node companies in the supply chain Reaching a consensus, quality problems are constantly emerging. In addition, cheap labor has hindered the further development of the supply chain; the limitations of the entire social logistics infrastructure construction are also one of the inhibiting factors for the development of the supply chain. These issues need to be resolved during the development of agricultural product supply chains.

Agricultural product quality safety is a worldwide hot issue. In recent years, with the occurrence of a series of accidents, agricultural product safety has attracted great attention at home and abroad, and it is also a hot spot of concern for consumers. Agricultural product quality safety has directly related to public health. Harmony and stability with society [1-2]. Tracking technology is a powerful means to ensure the quality and safety of food. At present, government agencies and consumers in many countries require the establishment of a tracking mechanism for the entire tracking of agricultural product quality. Some countries have begun to formulate relevant laws and incorporate this mechanism into agricultural products in the form of regulations. In the logistics system. At the same time, tracking technology has become a research hotspot in the scientific field [3-4]. With the development of the Internet of Things technology, the application of the Internet of Things in the agricultural product supply chain has become more and more extensive, bringing unprecedented benefits to the entire supply chain [5-6].

In recent years, many scholars at home and abroad have carried out a lot of research on agricultural product supply chains from the theory and even models. Chen Jinbo et al make full use of the Internet of Things to solve bottlenecks such as agricultural fine production, fertilizers, precise and precise control, traceability[7] , to solve the problems of agricultural product quality and safety and agricultural environmental pollution from the source, established a networked application system and built a modern Agriculture, designed and developed a network intelligent gateway based on open source hardware, and implemented video surveillance functions based on motion detection. Alcardo Alex Barakabitze et al proposed a framework for agricultural productivity in developing countries, introduced the components of ICT-based systems that support different stages of the farming cycle, and explained how the proposed framework can be incorporated into the farming cycle to improve agriculture productivity[8]. The author expects that the proposed framework could improve agricultural productivity by improving the communication channels of the Agricultural Knowledge and Innovation System (AKIS). Lijian W et al designed a traceability system to ensure the quality and safety of agricultural products, improve consumer confidence, and achieve accountability for food safety incidents[9]. Wang Q et al designed an image retrieval method based on the shape characteristics of agricultural product trademarks, focusing on agricultural product trademarks[10]. The boundary features of the trademark image are represented by classic Fourier descriptors, and the regional features of the trademark image are represented by the ratio of the target pixels to the background pixels. The agricultural product trademark search is based on the similarity between boundary features and regional features.

Based on the above background, this article proposes a new mode of operation of the agricultural product supply chain based on the Internet of Things technology. The specific research includes three aspects. Firstly, the basic theory of agricultural product supply chain is studied; secondly, several representative tracking technologies are introduced. The application of these tracking

technologies not only ensures the safety of agricultural product quality, but also enhances the competitiveness of agricultural products in international trade. It is an important area that requires further research and development. Finally, the new mode of operation of the agricultural product supply chain based on the Internet of Things technology proposed in this paper is introduced in detail. Under this model, there is no separation of production and sales, and compared with the traditional supply chain, it solves the problem of traceable chain breaking of agricultural products. And through experimental comparison, the fuzzy comprehensive evaluation method is used to calculate the priority of the agricultural product supply chain and the traditional supply chain after applying the Internet of Things technology. The results show that the new agricultural product supply chain proposed in this paper has a higher priority than the traditional supply chain. 35%, which further illustrates that the new agricultural product supply chain system proposed in this article has a perfection and development effect on China's agricultural product supply chain system.

2. Proposed Method

2.1. Overview of Agricultural Supply Chain Theory

(1) Agricultural product supply chain architecture

The supply chain is a system that surrounds core enterprises and organically connects parts including raw material suppliers, product manufacturers, distributors, and retailers through feedforward logistics and feedback information flow [11-12]. It is a geographically dispersed company. Its raw materials, intermediate products, or final products are purchased, processed, stored, sold, and transported. They are connected through the flow of products to form a unified whole.

As a special commodity, agricultural products have higher requirements on its supply chain management. At the same time, with the continuous development of the economy and the improvement of people's living standards, consumers' consumption concepts are constantly changing. The transformation of the model has brought new challenges to the agricultural product industry. The traditional management model must be changed in order to adapt to market changes and meet consumer demand. The food supply chain is generally considered to be an organization of agricultural products and food production and sales. In order to reduce the logistics costs of food and agricultural products, improve quality, and improve food safety and logistics service levels, a vertically integrated operation mode is implemented. In China, the agricultural product supply chain is a whole process from "farm to table". Food producers include farmers, upstream food suppliers, food processing companies or distribution processors, carriers, distributors, retailers, and supermarkets. The composition of the network-chain architecture, that is, the entire process from "farmland to dining table", the relationship is shown in Figure 1.

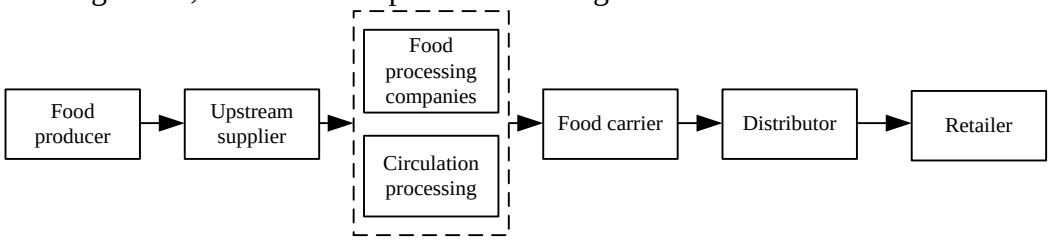

Figure 1. Agricultural product supply chain architecture

(2) Agricultural product supply chain model

1) Traditional agricultural product supply chain model

In the traditional agricultural product supply chain model, the farmer transports the produced

agricultural products to the wholesale market, the purchaser purchases the agricultural products, and then transports them to the wholesale market in the sales place by himself, and finally sells them in the bazaar market or retail supermarket. There are even a few farmers in the suburbs who sell their agricultural products to the bazaars for sale, but this sales are in small quantities. In this model, the production of agricultural products is dominated by family workshops, and the specific agricultural product production technical standards are hardly followed in the production process. The agricultural product transporter and the purchaser are a temporary cooperative relationship, so the vehicle for transporting agricultural products does not have special freshness and thermal insulation properties, which increases the loss of agricultural products in the transportation process to a certain extent. In the traditional agricultural product supply chain model, more sales terminals will choose to trade in the market, because the entrance fee of this market is very low, and it is difficult to guarantee the quality of agricultural products when selling in this market safety. In short, the traditional agricultural product supply chain is an extensive management method, which can only adapt to the lower level of economic development, and it is difficult to adapt to the development requirements of agricultural product industrialization. Figure 2 shows the traditional agricultural product supply chain model.

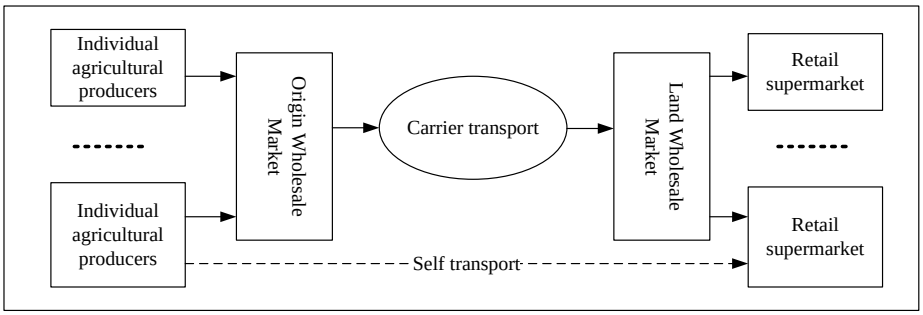

Figure 2. Traditional agricultural product supply chain model

2) Sustainable agricultural product supply chain model

In the sustainable agricultural product supply chain model, large areas of land are concentrated to form large-scale agricultural production bases. Large-scale agricultural production bases are easy to standardized and standardized management of production bases, agricultural production, fertilization, and picking, forming a sustainable A production base of agricultural products, and establish a brand image.

The transportation of agricultural products is handled by a specialized logistics distribution center. Because the logistics distribution center has professional transportation tools and high-quality employees, which can guarantee standardized operations in the transportation process, the logistics distribution center plays a role in connecting production and sales. In the sustainable agricultural product supply chain model, the sales terminal is a supermarket chain. This modern sales terminal has a good shopping environment, standardized market operation and fast settlement services, which guarantees the quality and value of green food. At the same time, this large-scale sales terminal has strong strength to establish a good partnership with agricultural product suppliers, and even establish links with surrounding sustainable agricultural production bases, invest in the construction of sustainable agricultural production bases, and establish the products sold. Brand image and strive for the advantages of the varieties, quality and price of the products it manages.

Figure 3 shows a sustainable agricultural supply chain model.

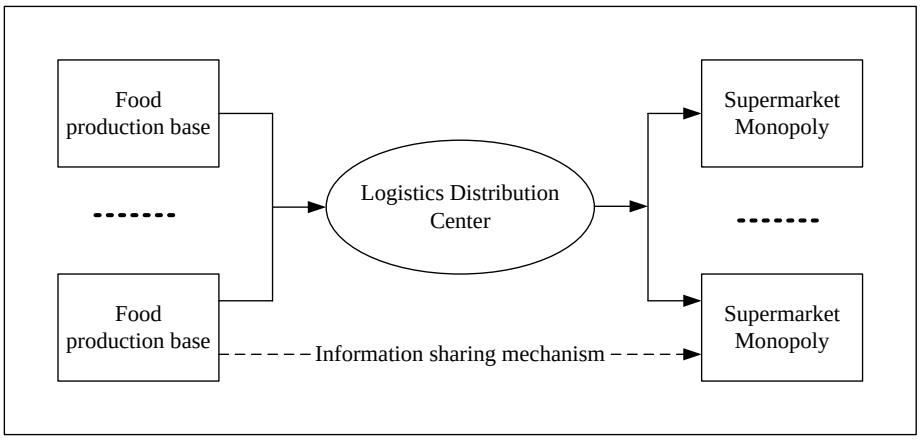

Figure 3. Sustainable agricultural supply chain model

2.2. Introduction of Agricultural Product Tracking Technology

With the continuous increase in the consumption of agricultural products and the diversified development of consumption structures, consumers have put forward higher requirements for the quality and safety of agricultural products, and countries have increasingly paid attention to the entire process of agricultural product quality tracking. The quality and safety of agricultural products in the process of production, processing, packaging or circulation has become one of the important issues in the field of agricultural product safety. In order to control quality and safety, a large number of modern information technologies are used to monitor the safety and quality of agricultural products throughout the entire process, effectively improving the efficiency of agricultural product logistics and service quality, ensuring the good operation of the agricultural product safety monitoring and management system, and establishing a balance between production, supply, and The data sharing and management mechanism of the sales and supervision departments and other links form a complete agricultural product quality safety monitoring and management network system. Here are some of the most representative agricultural product tracking technologies that have already been applied.

(1) HACCP system

HACCP (Hazard Analysis and Critical Control Point) is a critical control point for hazard analysis. It is a management system for identifying, analyzing, and controlling biological, chemical, and physical hazards that may occur during the production process. It can effectively implement information management of agricultural product quality monitoring. [13-15]. The HACCP system is an effective agricultural product quality and safety management system. Like the traceable system, it requires an effective recording system. It is a scientific, reasonable and systematic way to ensure the safety of agricultural products and carry out hazard identification, evaluation and control. method. By monitoring and controlling each step of the process, the probability of hazards is reduced. But the system also has flaws. From the perspective of a simple traceability system, it mainly focuses on how to effectively identify, exchange and transmit objective information. It lacks the combination of the traceability of the entire production chain with HACCP's hazard identification and key control points. Food Security traceability systems are not isolated. It must work in conjunction with other quality management systems. Only by combining the agricultural product safety traceability system with the HACCP system can all relevant information in the entire agricultural product supply chain be linked and repetitive work can be avoided. In short, the HACCP system is not only a system that can play a preventive role, but also can more safely guarantee the safety of agricultural products

(2) RFID technology

There are many links in the agricultural product supply chain and management is difficult. It is impractical to rely on manual control of each process of agricultural product production. Data technology must be used for data collection, analysis, and processing. The traceability system mainly combines physical logistics and information flow through automatic identification technology, so that all production information records of the product run through the entire supply chain, and network technology is used to complete the transmission and release of information between the various links in the supply chain, and finally reach a comprehensive And trace the purpose of the physical object.

At present, RFID technology (radio frequency identification technology) is attracting more and more attention in traceability systems [16-18]. Radio frequency identification (RFID) technology is a non-contact automatic identification technology. It uses radio frequency signals to automatically identify target objects and obtain related data. The identification work does not require manual intervention and can work in a variety of harsh environments. RFID technology can identify high-speed moving objects and identify multiple tags at the same time, which is fast and convenient to operate. As an easy-to-handle, simple, practical and flexible application technology, RFID technology has been widely used in agricultural product safety management. The superiority of RFID is beyond the reach of other identification technologies such as bar codes, magnetic cards, and IC cards. This technology uses electronic tags as the information carrier of agricultural products, which can effectively implement tracking and tracing, and improve the level of agricultural product safety and monitoring.

China is a large agricultural country, and agricultural products play an important role in the domestic and foreign market circulation field. Automatic identification technology will become the "identity card" for Chinese agricultural products to enter the international market. RFID technology and related information technologies will be combined to apply to agricultural product quality safety It will be the development trend of traceability of agricultural product quality in the future, which will greatly improve China's agricultural product logistics management capabilities, agricultural product quality supervision capabilities, agricultural product traceability capabilities, and competitiveness in international trade.

(3) Stable isotope technology

At present, a series of traceability detection techniques have been used at home and abroad to identify the authenticity of agricultural products, while tracing the varieties, breeding systems and geographical origin of agricultural products. These methods include plant labeling, DNA labeling, near-infrared reflectance spectroscopy, and stable isotope methods. In particular, stable isotope technology is an effective tool currently used internationally to trace agricultural products of different origins and implement protection of origin. It has great potential for development in the traceability system of agricultural products, and is receiving increasing attention [19-20]. Stable isotope technology is to use the composition of the isotope in the organism to be affected by climate, environment, biological metabolism types and other factors, so that the natural abundance of isotopes in different types of food materials from different regions is different, so as to distinguish different types of products Where it may originate. Its characteristics are the identification of adulteration of agricultural product ingredients, the origin of agricultural product pollutants, the tracing of the origin of products, and the determination of the source of animal feed without knowing the background. Stable isotope technology can be used to identify different types of food materials from different sources. It is a direct and effective tool for tracing the origin of agricultural products in the world. It is a relatively new research area and has broad application prospects. At this stage, the stable isotope analysis method is still limited to the laboratory stage. Therefore, this method needs further exploration to be applied to actual production as soon as possible.

(4) EAN.UCC system

Regarding the study of traceability code encoding, EAN.UC system is mostly used in foreign countries to track and trace the production process of agricultural products [21-22]. At present, the entire agricultural product processing chain mainly adopts the EAN.UCC system to track and trace the entire process, and establish a tracking and tracing information system for the food supply chain from "farm to table". The EAN.UCC system provides a complete coding system for identifying goods or services in the supply chain. Using automatic data collection technology, the management objects of the supply chain in the growth, processing, storage and retail of edible agricultural and sideline products are identified and linked to each other. This system connects the information of all links in the food supply chain, can track the entire process of food production, processing, transportation to sales, make the production process transparent, ensure the reliability of food safety tracking, and make the company's products in the fierce market In a competitive position. However, this system also has shortcomings. Using the EAN.UCC system requires that at each processing point in the food supply chain, not only the product processed by itself be identified, but also the existing identification of the processed food ingredients. Information and add all its information to the product for use by the next processor or consumer.

2.3. New Model of Agricultural Product Supply Chain Operation Based on IoT Technology

(1) Problems and Perfection Ways of Agricultural Product Supply Chain under the Background of Internet of Things

1) Problems facing agricultural product supply chains in the context of the Internet of Things

The problems faced by the agricultural product supply chain in the context of the Internet of Things include the following four aspects:

A lack of scale and low level of supply chain organization;

B. IoT technology standards in the field of agricultural product supply chain are chaotic;

C. The Internet of Things technology is not effectively applied and the informationization level of the agricultural product supply chain is low;

D The lag in the hardware facilities of the logistics system of the agricultural product supply chain has led to the slow development of agricultural e-commerce.

2) Ways to improve the supply chain of agricultural products in the context of the Internet of Things

Solutions to the problems faced by agricultural product supply chains in the context of the Internet of Things:

A Rectify farmer's trade and agricultural product wholesale markets, and establish an Internet of Things supply chain network circulation system;

B. Using the agricultural product e-commerce development platform to cultivate core enterprises in the supply chain;

C. Apply IoT technology to establish and improve the agricultural product quality and safety system at each link of the supply chain;

D Innovate the logistics management of agricultural product supply chain and give play to the advantages of third-party logistics of the Internet of Things.

(2) Evaluation system of agricultural product supply chain based on Internet of Things technology

1) Supply chain performance evaluation indicators

The establishment of the agricultural product supply chain evaluation system is mainly determined by referring to the traditional supply chain performance evaluation indicators [23-25], based on the application of the Internet of Things in each link of the supply chain, and taking into

account the degree of informatization on this basis, so as to determine An evaluation system with four categories of indicators and 16 indicator sub-factors was developed. Table 1 shows the performance evaluation indicators of the agricultural product supply chain based on the Internet of Things technology.

Table 1. Agricultural supply chain performance evaluation index

Target layer	Level I indicator B	Secondary indicator C
Comprehensive Supply Chain Performance A	Production and Processing Level B_1	Product quality C_1 Total operating cost C_2 Product flexibility C_3 Node business closeness C_4 Learning innovation development ability C_5
	Transportation and distribution capacity B_2	Timely delivery rate C_6 Order accuracy C_7 Transportation and distribution cost C_8 Attrition rate C_9
	Sales Operation Level B_3	Customer satisfaction C_{10} Service Capability C_{11} Market share C_{12} Net profit margin C_{13}
	Degree of informatization B_4	Timeliness of information C_{14} Information accuracy C_{15} Information sharing C_{16}

2) Determination of supply chain evaluation index weights

Take the comprehensive performance A of the supply chain of the target layer as an example: establish a judgment matrix of layer A, and multiply A by row elements. As shown in formula (1), normalize the results to obtain feature vectors.

$$\overline{w_i} = \sqrt[n]{\prod_{j=1}^{n} a_{ij}} \quad (1)$$

The consistency check can be performed on the judgment matrix by using formula (2) and formula (3).

$$\lambda_{max} = \frac{1}{n}\sum_{i=1}^{n}\frac{(AW)_i}{W_i} \quad (2)$$

$$CR = \frac{CI}{RI} \quad (3)$$

The relative weights of the judgment matrices of other levels can be performed in the above manner.

3. Experiments

3.1. Experimental Data Set

As one of the three "Agricultural Internet of Things Regional Experimental Projects" test areas (Tianjin, Shanghai, and Anhui) determined by the Ministry of Agriculture, Tianjin has actively

deployed the Internet of Things for a wide range of applications in agriculture, and has achieved exploration and cultivation of agricultural Internet of Things applications. Standards, industrial R & D, and management entities. The agricultural Internet of Things is gradually being extended to all aspects of agricultural breeding in Tianjin. Among them, the planting industry is represented by a number of bases such as the Tianjin Agricultural Academy of Modern Agricultural Science and Technology Innovation Base and Binhai Huaming Agricultural Science and Technology Park. The information is collected through the Internet of Things technology to achieve intelligent monitoring and management throughout the process, providing effective agricultural production and management Information to provide consumers with assured fruits and vegetables. Through the Tianjin Agricultural Internet of Things platform, six major solutions for the modern urban agricultural Internet of Things technology and six demonstration models of the Tianjin Agricultural Internet of Things industry have been initially established, which can monitor the entire process of agricultural production, processing, transportation, and sales. The traceability system further enhances the safety of the product and achieves a sustainable development cycle of "high efficiency and high ecology".

This article selects a supply chain of agricultural products in the Tianjin Agricultural Internet of Things. Based on the evaluation system of the supply chain indicators, this paper uses fuzzy comprehensive evaluation method to conduct research. The impact of the application of the Internet of Things on its agricultural product supply chain is studied from the overall performance level to Comprehensive evaluation.

3.2. Experimental Parameters

Based on the comprehensive performance A of the supply chain in the target layer, the judgment matrix of the hierarchy A is established, and the consistency check of the judgment matrix is obtained:$\lambda_{max} = 4.117,\ CR = 0.043 < 0.1$. It can be seen from the test results that the judgment matrix has satisfactory consistency.

Table 2 shows the relative weights of the judgment matrices at each level.

Table 2. Relative weights of the judgment matrices at each level

Class	Relative weights
Level I indicator B	W=(0.263 0.118 0.055 0.564)
Secondary indicator C_1~C_5	W_1=(0.433 0.161 0.296 0.063 0.047)
Secondary indicator C_6~C_9	W_2=(0.539 0.083 0.255 0.124)
Secondary indicator C_{10}~C_{13}	W_3=(0.509 0.078 0.224 0.188)
Secondary indicator C_{14}~C_{16}	W_4=(0.117 0.614 0.268)

4. Discussion

4.1. Priority Analysis of Supply Chain Based on Fuzzy Comprehensive Evaluation

Aiming at the differences between the agricultural product supply chain before and after the application of the Internet of Things technology, a questionnaire survey was conducted on the performance evaluation indicators of 50 people in the supply chain. 50 copies of the questionnaire were collected, and the recovery rate was 100%, and the analysis results were calculated. According to the membership degree of each factor and its weight vector, a comprehensive evaluation vector of each factor of the first-level indicator layer can be obtained, and then the priority of the first-level indicator layer can be obtained. Comprehensively evaluate the target layer and each level in the

traditional agricultural product supply chain and the Internet of Things-based agricultural product supply chain, and obtain the evaluation index priorities as shown in Tables 3 and 4.

Table 3. Priority of evaluation indicators at all levels of traditional supply chains

Class	Priority
A	4.34
B	5.36
C	1.54

Table 4. Priority of agricultural product supply chain based on Internet of Things

Class	Priority
A	7.83
B	5.98
C	2.23

Figure 4 shows the comparison of the priorities of evaluation indexes at all levels of the traditional agricultural product supply chain and the Internet of Things-based agricultural product supply chain.

Figure 4. Contrast relationship of priority evaluation index at all levels

It can be seen from Figure 4 that the fuzzy comprehensive evaluation method is used to calculate the priority of the agricultural product supply chain and the traditional supply chain after applying the Internet of Things technology. The calculation results show that the agricultural product supply chain based on the Internet of Things is at the target level and the first level. The priority of the indicator layer and the secondary indicator layer are higher than the corresponding value of the traditional agricultural product supply chain. Among them, at the target level, the new agricultural product supply chain proposed in this paper has a higher priority than traditional supply chains by nearly 35%, which shows that the new agricultural product supply chain system proposed in this article has the effect of improving and developing China's agricultural product supply chain system.

4.2. Impact of IoT-based Agricultural Product Supply Chain on Personnel Performance

In order to show that the performance of personnel in the new agricultural product supply chain system proposed in this paper is affected by the industrial technology environment (H1) and supplier integration (H2), Figures 5 and 6 show the trends of the impact of these two factors on personnel performance. When the computing environment is at a low level, the impact of the IoT-based supply chain on personnel performance is positive; when the industry computing environment is at a high level, the impact of the IoT-based supply chain on personnel performance is more As obvious. The impact of supplier integration on personnel performance is different. When supplier integration is at a high level, it will promote personnel performance, while low-level supplier integration will reduce personnel performance.

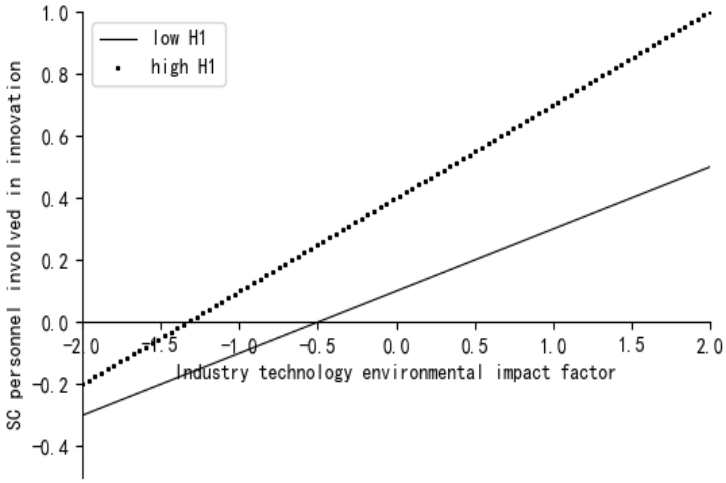

Figure 5. Relationship between personnel performance and H1

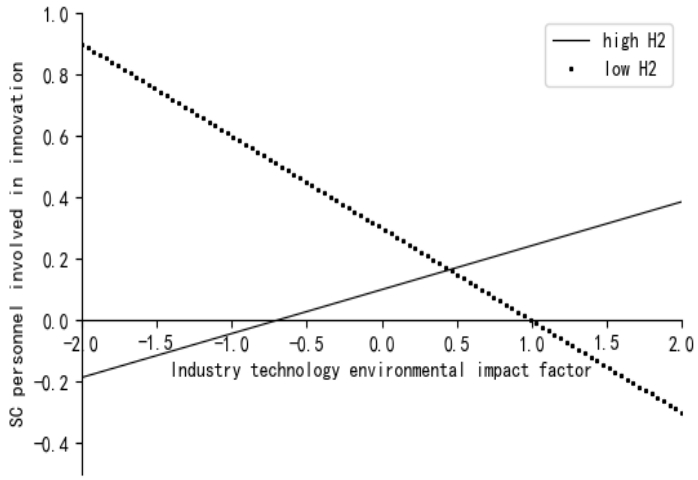

Figure 6. Relationship between personnel performance and H2

4.3. Comparative Analysis of Traditional Supply Chain and IoT-based Agricultural Product Supply Chain

According to the above research results, it can be known that the application of the Internet of Things technology in the agricultural product supply chain has greatly improved the performance level of the overall supply chain, which shows the superiority of its application. It can be explained from three aspects that the IoT-based agricultural product supply chain is superior to the traditional supply chain. Figure 7 shows the three advantages of the IoT-based agricultural product supply chain.

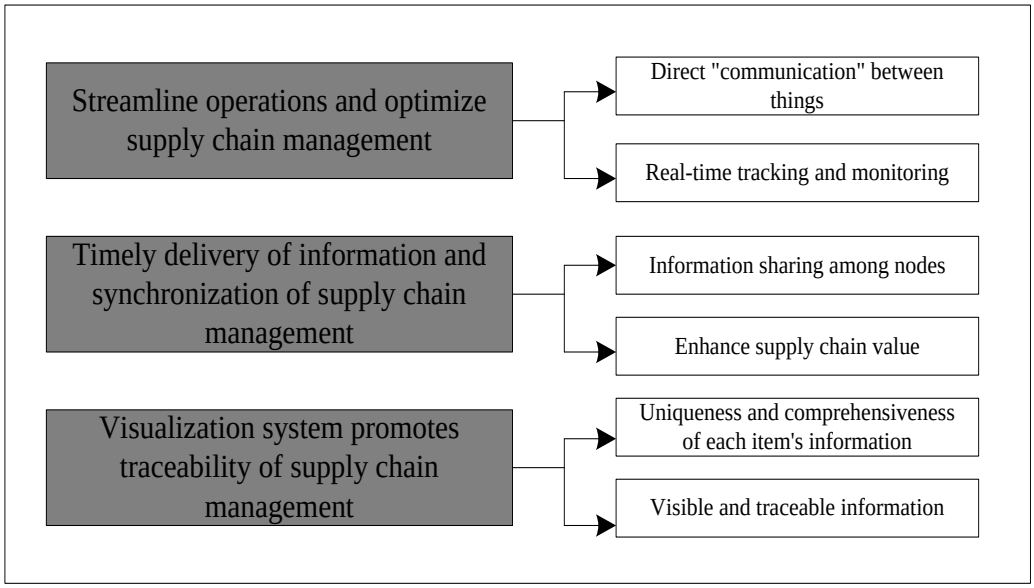

Figure 7. Advantages of agricultural product supply chain based on Internet of Things

(1) Simplify operation process and optimize supply chain management

Among the first-level indicators of B1's second-level indicators at the level of production and operation, the weight of product quality and product flexibility is very large, which shows its importance. The application of the Internet of Things technology has established a direct "communication" mode between things, reducing manual operations and optimizing supply chain management. At the same time, the use of electronic tags, M2M and other technologies also truly implements real-time tracking and monitoring, which helps improve product quality and product flexibility.

(2) Timely delivery of information and synchronization of supply chain management

According to the above research, the level of informatization B4 in the first-level indicators occupies more than half of the weight. Therefore, for the supply chain, information is the top priority. Now the nodes of the supply chain no longer stay in the stage of competing for profit alone. They need information sharing with each other to achieve a win-win situation. Through the comparison of the overall performance of the agricultural product supply chain, it is obvious that prior to the application of the Internet of Things technology, the priority in terms of informatization is much lower than the agricultural product supply chain based on the Internet of Things. The application of the Internet of Things technology in the supply chain of agricultural products meets the demand for information during the production and marketing of agricultural products and is conducive to enhancing the value of the supply chain.

(3) Visualization system promotes traceability of supply chain management

The agricultural product supply chain management based on the Internet of Things technology

realizes the uniqueness and comprehensiveness of each item's information, and meets the requirements of the nodes in the supply chain for the information to be traceable. In the case, any person can trace the relevant information of the product through the information system. This value information chain builds a visualization system of the supply chain. Through the Internet of Things technology, information is exchanged and shared throughout the supply chain to realize the visual management of the supply chain.

5. Conclusion

The application of the Internet of Things in the agricultural product supply chain has its own advantages. The degree of informatization of the supply chain, the quality of production tracking, and the flexibility of the product occupy a larger weight in the supply chain indicator system, which is the main impact of performance levels. Therefore, the integrated, visualized, and synchronized management characteristics of the Internet of Things have improved the overall tracking performance level of the supply chain to a certain extent.

The gradual popularization of the Internet of Things will extend to all areas of social tracking and become the main force for building a "smart earth." The application of the Internet of Things will also lead a new change in the supply chain of modern agricultural tracking products. Tracking Today in the era of big data, the Internet of Things and O2O business models can go hand in hand, further optimize the tracking of agricultural product supply chain processes, and cultivate the agricultural Internet of Things industry to promote the integration of agricultural product supply chain management. The Internet of Things tracking will effectively help the agricultural product supply chain to realize the integration, visualization, intelligence and high informationization, provide satisfactory high-quality agricultural products to consumers, and contribute to the development of modern agricultural product logistics.

With the rapid development of the Internet of Things, this article proposes a new mode of operation of the agricultural product supply chain based on the Internet of Things technology. Under this model, there is no separation of production and sales, and compared with the traditional supply chain, it solves the problem of traceable chain breaking of agricultural products. In the experimental part, the fuzzy comprehensive evaluation method is used to calculate the priority of the agricultural product supply chain and the traditional supply chain after applying the Internet of Things technology. The results show that the new agricultural product supply chain proposed in this paper has improved the priority of the traditional supply chain by nearly 35. %, The new agricultural product supply chain system proposed in this article has the effect of improving and developing China's agricultural product supply chain system.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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