Research of Agricultural Product Logistics on Internet of Things Technology

Guoxuan Rong
Department of Finance & Economics, Xinyang Agriculture and Forestry University, Xinyang, 464000, P.R. China

ABSTRACT: Internet of things is a seamless connection between the virtual network and the real economy, and a leap of change. It promotes the intelligent, convenient and efficient service for the real economy. Special attributes of agricultural products lead to the circulation of agricultural product logistics that is fully tracked, real-timely monitored and reported. The paper constructs the intelligent logistics information platform, and puts forward the construction of the Internet of things in agricultural product logistics.

1 INTERNET OF THINGS AND AGRICULTURAL LOGISTICS LINKS

1.1 Internet of things

IOT refers to the material objects connected to the Internet. It will be items connected to the Internet through information sensing equipment, for example the radio frequency identification technology, global positioning system (GPS) and others. Then it realizes items related information real-time sharing, intelligent management of the emerging information technology. It is the extension of the Internet, but absolutely is not the Internet. Internet of things has realized the connection and interaction between people and people, people and objects, objects and objects. In this network, the system can identify, locate, track, monitor and trigger the corresponding event automatically and timely.

1.2 Agricultural product logistics

And agricultural product logistics is a series of economic activities that take the agricultural output as the target, to meet the needs of consumers from agricultural producers to the final customers. It includes the movement of goods entities and information processing. Agricultural products from the production, processing, transportation, storage, circulation to the sale of various aspects of the effective convergence that need to be supported fast, efficient and convenient of agricultural product logistics system. Therefore, it is the role of bridge and bond between urban and rural areas.

1.3 Links

IOT technology is applied to the logistics of agricultural products can achieve intelligent movement of every link of the logistics of agricultural products. Then it can integrate all kinds of resources, reduce transportation costs, reduce the flow loss, improve the overall efficiency, avoid market risk, and increase the income of the farmers.

2 THE INTERNET OF THINGS APPLIED IN AGRICULTURAL PRODUCT LOGISTICS

China is a large agricultural country, and agricultural resources are very rich. Huge agricultural market is bound to be separated from agricultural product logistics, then the development of agricultural product logistics rely on network. And the Internet of things is a very complex information network system. It makes the original lifeless objects through the "Networking" to get a strong life, so that objects have learning ability, can sense the user's behavior and make the appropriate adjustments. Internet of things and agricultural product logistics organically fused, the implementation of the various links of intelligent logistics in the agricultural products’ supply chain, has far-reaching application value.

2.1 Solve the problem of information asymmetry in agricultural product logistics

The Internet of things technology used in agricultural logistics, you can use a variety of sensors to collect real-time information of agricultural products, and to ensure the transparency of information and efficient delivery of information. The agricultural product logistics information platform opened, the main parties in the supply chain of agricultural products (such as the agricultural producers, wholesalers, retailers and consumers, etc.) and the relevant departments (such
as the Ministry of agriculture, Ministry of Commerce, bureau of quality supervision, CNCA, Ministry of science and technology and other relevant departments and local) are effectively connected through the network platform. It provides real-time data information of agricultural products. Then tracking of resources released by information exchange and sharing of the main parties, is reasonable allocation and promote the optimization of resources. So it solve all aspects of agricultural products problem of logistics information asymmetry, quickly achieve seamless supply chain of agricultural products on the main parties. For example, including production, processing, transportation, warehousing, distribution, packaging, sales and recycling.

2.2 The standardization of agricultural product logistics lined with International standards

Agricultural product logistics standardization is standard agricultural product logistics order, in order to develop to be complied and used the common criteria (standards) for agricultural product production, processing, transportation, warehousing, distribution, packaging, distribution and waste recycling link formulation. The standardization of agricultural product logistics standardization includes the standardization of packaging, the standardization of coding and the standardization of operation. In the development of agricultural product logistics standards, through the use of networking technology, actively adopt international standards and general national standards, and formulated several standards of all aspects of the various types of agricultural products in the supply chain (such as encoding standard, identification standard, standard terms, logistics units of measurement standards, logistics facilities standard, operation standard, standard circulation transactions and the inspection and quarantine standards, quality and safety traceability standards, etc.), and a unified encoding, embedded EPC tag, the tag is attached to the recognition of agricultural products surface or inside, when the identified agricultural products into the recognition range, RFID reader automatic contactless reader, real-time monitoring and recording of agricultural products the production and circulation process. Efficiently agricultural product logistics standardization system is formed in eventually forming the whole country.

2.3 To improve the overall efficiency of agricultural product logistics

Application of networking technology in agricultural product logistics can realize agricultural products from producers to consumers and the entire circulation logistics information real-time input and output. It can achieve the main agricultural products supply chain of agricultural product logistics information in every link of the logistics, sharing and utilization. In this context, the procedures of the logistics management of agricultural products can basis inside and outside the enterprise environment, management objectives and customer demand factors to modify, delete, and restructuring, reduce unnecessary business processes, improve the controllability of the risk of each logistics link, in order to achieve promotion of agricultural product logistics management cost reduction and overall management efficiency. So it reduce unnecessary logistics links, and improve the overall efficiency of agricultural product logistics.

2.4 Improve the quality of agricultural products traceability system, the safety and quality of agricultural products

Agricultural product quality traceability system is through the bar code scanning, you can check the varieties of agricultural products, origin, transport, packaging, time, process and other information. Thus the quality and safety of agricultural product is effectively supervised. Bar code is equivalent to the "identity card" of agricultural products. So the use of bar code system can realize the information flow and real logistics of the fast and accurate seamless link.

For agricultural product to implement networking management, is related to agricultural products with unique identification code. From production to sales of each links can be traced in accordance with the principle, then the establishment of agricultural production and operation record registration system, record producer and the base environment, agriculture inputs use, field management, processing, packaging and other information. When the product quality problems of agricultural products, can quickly and effectively search the problem where the link, trace the root causes of the problem and call to account.

3 THE INTERNET OF THINGS IN THE CONSTRUCTION OF AGRICULTURAL LOGISTICS APPLICATIONS

3.1 Increase agricultural product logistics system infrastructure construction

Through the tilt of the financial, tax, financial, insurance and other economic levers, increase the agricultural product logistics system in the application of the infrastructure construction investment. A complete set of infrastructure is an important condition for the rapid development of agricultural product logistics, but agricultural product logistics system in networking applications of infrastructure construction investment cost is very high, and relates to the links of the supply chain, so many companies will be discouraged. To highlight
its economy, suggested the government to actively participate in and strongly support hardware infrastructure construction of agricultural product logistics system in networking applications, advocate the multi subject of network infrastructure construction investment, and ultimately the seamless connection of agricultural product logistics facilities and networking facilities.

3.2 *Strengthen the cultivation of the Internet of things in the agricultural product logistics system*

Internet of things technology is a comprehensive technology after the integration of a variety of high-end technology. The application of Internet of things technology in agricultural product logistics, the personnel need to master not only the agriculture and the logistics, but also the information technology and the economic management. It is suggested that the development plan of national education and scientific, and technological talents should be combined to set up a multi level and multi type personnel training mode. The logistics system of agricultural products is increased in the cultivation of professional talent, then enhance the core competitiveness of agricultural product logistics industry is essential. This provides a strong support for the Internet of things in the logistics of agricultural products.

3.3 *Strengthen the network construction of agricultural product logistics information system*

Construction of agricultural product logistics information platform puts into the supply chain of agricultural products on each node’s information in the Internet of things. It not only solves the logistics and information flow out of sync problem, and smooth communication of all the main agricultural products information channels and agricultural products supply chain, and then injected into the regulatory and safety mechanism, and improve information sharing mechanism, can realize the network environment of agricultural product logistics collaborative development of new models. For example, the production of the main agricultural products (farmers) can be directly put the production information into the information platform, can also carry out planting agricultural products according to the information platform in order. Circulation of agricultural products (agricultural production cooperatives, logistics park, wholesale markets, supermarket chain logistics enterprises, etc.) according to the statistical information in the information platform contact, upstream and downstream, make distribution plan and distribution, and upload related logistics information. Consumption of the main agricultural products can be their own need to publish information to the platform, and check the goods in the information platform. The relevant government departments can participate to forecast, timely analyze and release the information of agricultural products, to provide quality services for the market. At the same time, government regulators can accept the inspection and quarantine and tax policy from the information platform reporting, and the results of the reply on the information platform for feedback, etc. Because IOT is organically combined networking related technologies and agricultural product logistics information system, to realize the agricultural product logistics activities related to information acquisition automation, cargo visualization, digital storage, real-time transmission, sorting intelligent, and rise of the agricultural product logistics information accurate, transparent and efficient(As Figure1).

3.4 *Developed innovative agricultural product logistics mode under the environment of the development of Internet of things*

When tradition meets modern agricultural product logistics encounter things, "things ×" for agricultural product logistics to provide development opportunities. Development of agricultural product logistics under the environment of Internet of things must realize agricultural production, distribution and sale of the whole process of the integration of monitoring and quality traceability system.

We must recommend the establishment in agricultural production, management, technology, quality and other aspects to more fine and precise concept, development to adapt the development of market economy. It is conducive to the coordinated development of innovative agricultural product logistics mode of the application of the Internet of things technology.
3.5 Cultivating the main body of agricultural product logistics

Diversification and benign interaction of agricultural product logistics is the basic premise and important guarantee of innovative agricultural product logistics mode under the Internet of things. Suggestions make great efforts to cultivate, development and growth agricultural production cooperatives, logistics park, wholesale markets and supermarket chains such as agricultural product logistics subject, for agricultural products production and marketing situation and agricultural product logistics development, build the collaborative development of innovative agricultural product logistics mode under the environment of Internet of things.

3.6 Construction of agricultural products quality and safety traceability system

The quality and safety of agricultural products is related to the people's health, life safety and the healthy development of society. It is a problem that can’t be ignored, and the development and application of the Internet of things also related to security and privacy. So, Construction of agricultural products quality and safety traceability system has no time to delay. The coordination of the government need promote the Internet of things and the logistics system of agricultural products from the macro level. Government should through policy guide, project tilt, financial support, training and publicity and other means, co-ordination and integration of traceability management resources and strength. Government should standard agricultural product logistics system in the application of the rule. Government also should develop agricultural product logistics network system of development and planning for special security technology, to play the leading role of the government regulation and service. Agricultural networking products quality safety traceability system should pay attention to scientific, economic and practical with the help of external scientific research strength. It track the tracing management of advanced technology, to develop traceability system basic requirements and acquisition targets, the transmission format, exchange interface, coding rules and other aspects of the standard and operation specification. Then we will establish to approve the database for agricultural product, create records on production of agricultural products, product identification label information quality and safety information input and query system, forming a complete chain, information rich, covering agricultural products production, processing, circulation and consumption of all aspects of the agricultural products networking quality safety traceability system. It will be traced back to the carrier of information and traceability, traceability information to achieve flexible collection, classification management, information sharing, online query. Ensure the delivery and traceability of agricultural products in the whole process of quality control.

4 ACKNOWLEDGEMENTS

The work is supported by the funds of Soft science research project of Henan province (162400410138).

REFERENCES