2018 3rd Asia-Pacific Electronics and Electrical Engineering Conference (EEEC 2018)
ISBN: 978-1-60595-586-5

Discussion on the Development Path of China's Agricultural Products E-commerce Based on Blockchain*

Chao Xie[1,a] and Defu He[2,b,*]

[1]School of Management, Wuhan Donghu University, Wuhan, China

[2]College of Computer, Hubei University of Education, Wuhan, China

[a]Xiechao188@163.com, [b]742646083@qq.com

*Corresponding author

Keywords: Blockchain, Agricultural products, E-commerce, Development path.

Abstract. Blockchain technology, as the core technology to support digital money such as Bitcoin, has attracted wide attention in various fields. Its decentralization and application of trusted and reliable database will bring subversive changes in various fields. Based on the connotation and characteristics of Blockchain technology, this paper summarizes and analyses the development status of agricultural e-commerce in China, constructs the development path of further application of Blockchain technology in agricultural e-commerce in China, and puts forward the establishment of a unified national agricultural e-commerce system based on Blockchain technology.

1. Connotation and characteristics of Blockchain

1.1 Connotation of Blockchain

Blockchain is a distributed database which originates from bitcoin. The core content of database is to enable users to participate in system maintenance in any node through a series of data blocks generated by cryptography. In the data block, the sequential system information and the data exchanged between users are stored synchronously in real time along with the transaction link, and the authenticity of the updated information and the link to the next database block are automatically verified by generating the data "timestamp".The operation principle of Blockchain technology can be regarded as a national accounting method. As a public general ledger chain, the system allows all authenticated users to store and download transaction data in the node as "miners", while the Blockchain backs up all users in the cloud, so that the information cannot be forged or tampered with and improved to ensure the number of transactions. It is based on the openness and transparency of authenticity and process.

1.2 Core characteristics of Blockchain

The first successful application of Blockchain technology in Bitcoin embodies five core features: decentralization, distributed accounting, collective maintenance, anonymity and reliable database. Decentralization: In the Blockchain system, there are no traditional centralized hardware institutions, but numerous peer-to-peer nodes, decentralized storage and accounting, and each node runs independently while real-time association; Distributed accounting: all users participate in data input and accounting independently in the process of operation, system verification After the certificate is passed, the data of all nodes are updated in real time and distributed; collective maintenance: the system is maintained by all nodes together, and any authenticated user can operate in the normal running nodes; anonymity: because the system is distributed accounting and collective maintenance,

*This work was supported by the grants from Hubei Provincial Collaborative Innovation Centre of Agricultural E-Commerce and Youth Foudation WuHan Donghu University.

data upload must be verified and accounted for, so use Users can remain anonymous in a trusted environment; reliable database: because each node is independent of each other, when a single node fails, it will not affect other nodes, so it is a reliable database. At present, it is only in the second stage of "digital notarization". In October 2016, China Post Savings Bank launched an asset custody system based on Blockchain technology, which became the first successful practice of Blockchain technology in the core business of financial industry. This also represents the successful landing of the concept of Blockchain. Innovation and transformation of agricultural e-commerce with Blockchain technology will create unprecedented opportunities for it to break through bottlenecks and achieve transformation and upgrading.

2. The development of e-commerce in China's agricultural products

Agricultural industrialization is an important part of the transformation of the primary industry from traditional to modern. As an important means of agricultural modernization in China, electronic commerce of agricultural products has been strongly supported, such as "Taobao Village" has attracted frequent attention. Under the traditional mode of selling and trading of agricultural products, the mode of passive random selling, no brand and quality labeling is often adopted. This lack of standardized marketing mode not only makes it difficult to obtain reasonable evaluation of high-quality characteristic agricultural products, but also makes consumers lack of trust in the safety and reliability of agricultural products. . In more cases, traditional agricultural products are confined to a small area within the origin, unable to actively develop customers and markets, production, quality supervision, sales and follow-up services are severely separated, unable to form a complete supply chain. This traditional trading mode has caused many difficulties to farmers' income increase, government quality supervision, consumer procurement, brand value construction of agricultural products enterprises and even the adjustment of the national agricultural structure. Based on the current situation of the development of traditional agricultural products commerce in China, e-commerce, as a new form of business, provides unprecedented opportunities for promoting the innovation and development of agricultural products trading mode. In the future, there is still a huge space for the development of agricultural informatization in China. How to create better conditions to promote the healthy development of agricultural e-commerce, the government, e-commerce platform and enterprises have a lot of articles to do. At present, the third-party e-commerce platform is gradually becoming the core driving force for the development of agricultural e-commerce. The third-party platform constantly innovates high-quality and low-cost service products, develops customized services for rural e-commerce needs, helps agricultural e-commerce reduce business costs, and makes rapid progress in agricultural e-commerce in China. Development has a great impetus. However, there is still room for further optimization of the third-party platform in terms of improving the transparency of the transaction process, simplifying transaction procedures, reducing intermediary costs and service costs.

In 2016, the well-known e-commerce enterprises were carrying out the layout of the service system in rural areas. At present, the market has formed a "two super-strong-small crowd" pattern, "two super" refers to the two major agricultural e-commerce giants represented by Alibaba and Jingdong; "multi-strong" refers to the highly competitive agricultural e-commerce websites such as Shunfeng Optimal Selection, I-Buy Network and No. 1 Shop; "small crowd" refers to one. E-commerce platform for agricultural products with long-term growth potential, such as Tiantian Orchard and Yiguo Net. The fresh products e-commerce in agricultural products e-commerce is recognized as a vast "blue sea" in the field of e-commerce by the industry. Among them, the "two supermarkets" led by Alibaba and Jingdong occupy the main market of agricultural e-commerce in China, while some growing agricultural e-commerce is also constantly striving for financing and developing characteristic market segments. Figure 1 is the electronic commerce structure chart of China's agricultural products.

We can know the main development of e-commerce of agricultural products in China from the scale of transaction, the status of return on investment and the proportion of market.

Transaction scale. In 2017, the rural network retail sales reached 1 trillion and 244 billion 880 million yuan, an increase of 39.1% over the same period last year. It is estimated that the rural retail sales will exceed 1 trillion and 600 billion in 2018, or more than 35%. "Taobao village" has also exploded, and the country has reached 2100. Relying on Ali's Taobao and Tianmao e-commerce platforms, the sales of agricultural products have exceeded 100 billion yuan. Many provinces, autonomous regions and municipalities directly under the Central Government have also increased the amount of e-commerce transactions of agricultural products by more than 100% year on year. Strength enterprises such as Shunfeng Optimal Selection, No. 1 Shop and original life have also carried out e-commerce layout in rural areas.

Return on investment. Although the development of e-commerce for agricultural products is in full swing in China, the industry is in the early stage of development, coupled with the characteristics of agricultural products themselves, so it is generally faced with the status quo of return on investment in operating at a loss. Because of the shortage of logistics system and information service facilities in agricultural products e-commerce in China, the investment in the early stage is large and the recovery cycle is long. For example, the initial market development investment of Wuhan E-kitchen boxes exceeded 60 million yuan. At present, although the daily turnover is strong, but because of the high cost of pre-development, it is still in a negative profit state. In recent two years, due to the explosion of e-commerce in agricultural products, many enterprises have withdrawn from the market in the fierce competition, such as Beijing Youcai Network, Shanghai Tianxianpiao, etc.

Market share. In 2017, the total amount of agricultural products transactions in China is about 5 trillion yuan, of which only 25% are traded through e-commerce platform. The small proportion of agricultural products transactions shows that there is still great potential for the development of e-commerce of agricultural products in China, and there is still much room for the development of traditional market resources. However, compared with the total e-commerce retail sales of 29.16 trillion yuan in 2017, the proportion of agricultural products e-commerce in the field of e-commerce has not exceeded 5%, and the efficiency of the combination of agricultural products sales and e-commerce needs to be improved..

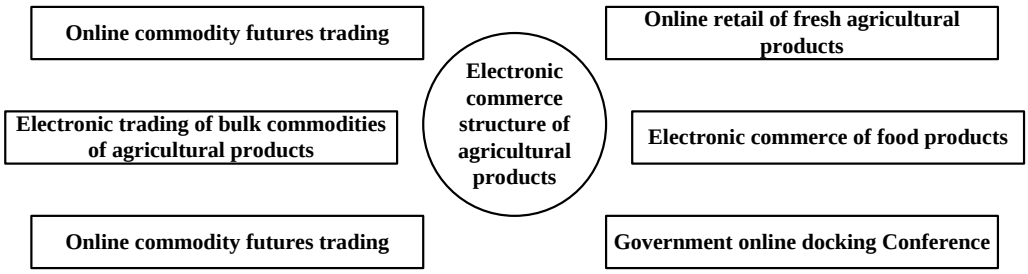

Figure 1. Electronic commerce structure of agricultural products in China.

3. E-commerce development of China's agricultural products based on Blockchain technology spreading path

3.1 Improving the authenticity of agricultural products trading

The application of Blockchain technology is conducive to promoting the rapid development of e-commerce information service construction of agricultural products, especially the trading and circulation facilities of high-quality agricultural products such as "three products and one standard". Through Blockchain technology, the output and transaction of all high-quality agricultural products are recorded openly and transparently on the e-commerce platform, and the quality of high-quality agricultural products can be guaranteed under the condition of data authenticity. At the same time, the

business information of agricultural products can be synchronized among large supermarket chains, wholesale markets and e-commerce enterprises. When released, it can better promote the circulation of agricultural products and eliminate the problem of consumer trust, and quickly establish brand image and consumer loyalty. In addition, Blockchain technology is conducive to speeding up the professional and comprehensive construction of agricultural products e-commerce websites in China. Through e-commerce websites, the data collection, quality supervision and verification of agricultural products and distribution of sales information are combined to provide high-quality agricultural products service information while building a sound online sales of agricultural products. Supervision system to stabilize the channels of information exchange, thereby promoting the development of e-commerce transactions of agricultural products.

3.2 Simplify the trading process of agricultural products

The characteristics of decentralization and collective maintenance of Blockchains are helpful to accelerate the standardization and standardization of agricultural e-commerce. Through the establishment of standardized trading standards and processes, and the establishment of quality standard system and circulation standard system according to different classifications of agricultural products, electronic commerce of agricultural products can be operated automatically under the Blockchain technology, which not only helps to standardize and simplify the trading process, but also protects the rights and interests of consumers in the process of agricultural products trading. In addition to its skepticism and prejudice towards the quality of agricultural products, the promotion of agricultural products in a wider range of circulation. The simplification of the transaction process is more conducive to reducing transaction costs and improving the enthusiasm of farmers to conduct e-commerce of agricultural products. It has solved the problems of the lack of network talents and technology in the development of e-commerce of agricultural products, the ineffective combination of network technology and agricultural economic laws, and promoted the new business transaction mode rapid development. As shown in the picture 2.

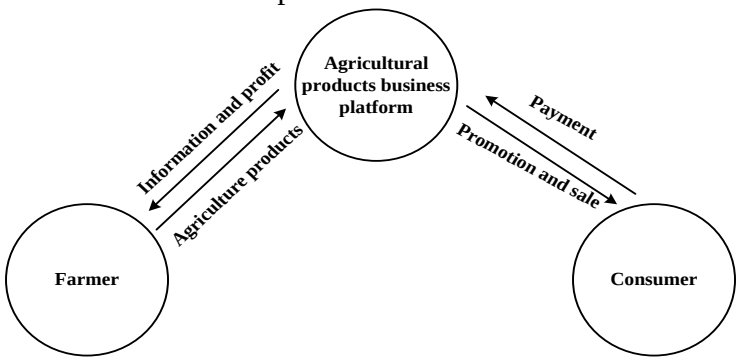

Figure 2. E-commerce mode of agricultural products in China.

3.3 Improving the e-commerce supply chain service of agricultural products

For the current difficulties of agricultural product quality supervision and consumer trust, we can use the collection and storage of relevant information of agricultural products in the supply chain process to provide inquiries about the origin of agricultural products and quality supervision. Distributed accounting function based on Blockchain technology is adopted. Different traceability information is carried by two-dimensional code according to the growth characteristics of different agricultural products. The product name, species, origin, origin, characteristics of origin, planters, planting stages, fertilizer usage, pesticide usage, maturity date, quality supervision and review are carried out. Personnel data and other real-time data entry, so that consumers can clearly understand products. At the same time, Blockchain technology can improve the supply chain system in the process of traceable information input, and provide modern logistics distribution system support for agricultural e-commerce. For example, by extending the supply chain back-to-value end and

deepening the follow-up service of agricultural products to improve product added value, by providing localized direct supply services and rapid distribution assurance to create product reputation and brand effect, by covering similar product lines, building specialized supply chain team, and enhancing the technical support of the back-end platform to reduce cost.

3.4 Ensure that the settlement process is open and transparent

Decentralization and collective maintenance of Blockchain technology will be conducive to the key link of agricultural e-commerce settlement. Firstly, producers send settlement information to consumers through the system, and the system verifies that the certification is passed and then sends it to consumers. Then consumers settle accounts. After the system confirms that the settlement is true and valid, it automatically generates a "time stamp" to confirm the true completion of the transaction chain. At the same time, the Blockchain records the completed transaction process chain in its own block, and updates the transaction synchronously for all users of the system, further simplifies the settlement procedures, and improves the openness, transparency and authenticity of agricultural e-commerce. Through the application of Blockchain technology in the settlement function, under the mode of shared economy, it establishes trust relationship for producers, sellers and consumers, and realizes mutual supervision and evaluation of settlement and after-sale. Because user information and product information cannot be cancelled and tampered with, all information will be recorded one by one to ensure information. Sharing and traceability.

3.5 Establishing a unified national agricultural e-commerce system based on Blockchain technology

Decentralized technology of Blockchain can establish a relatively perfect and mature electronic trading market of agricultural products, and build a unified and multi-level electronic trading system of agricultural products for the whole country with the electronic trading market of agricultural products as the core. The integrated system based on Blockchain technology unifies many e-commerce platforms into a unified trading system. Through reliable databases, it can settle funds, control risks, provide information services and manage data for electronic transactions on many platforms, and ensure the security, stability and continuity in the process of transactions.

At the same time, by docking with small and medium platforms, the Blockchain system can set them as decentralized nodes of the unified system. Decentralized nodes enable integration of these platforms while preserving their operational independence, which is conducive to giving full play to the efficiency and innovation of full market competition, further tapping the agricultural market, and facilitating the government and regulatory authorities to standardize the online trading standards of agricultural products and reduce the operating costs of enterprises, thereby extending the operation. Agricultural products trading industry chain, fully develop the potential market of China's agricultural products e-commerce, realize the coexistence of scale efficiency and refined production, fully meet the diversified needs of consumers.

References

[1] Li Tingting, Zhong Yan, Application of Blockchain technology in e-commerce logistics industry, *Logistics Egineering and Mnagement*, vol. 15, pp. 73-74, 2018.

[2] Zhang Yanbin, Research on e-commerce information ecosystem model based on Blockchain, *Research on Library Science*, vol. 6, pp. 33-44, 2018.

[3] Zhang Yanbin, Blockchain leads new changes in E-commerce, *Contemporary Economic Management*, vol. 10, pp. 14-22, 2017.

[4] Wang Zhihong, Application analysis of Blockchain technology in e-business network consumption interaction, *E-Business Journal*, vol. 11, pp. 59-60, 2017.