

Application of Block Chain Technology in Agricultural Products E-commerce Sharing Platform

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Abstract: Based on the connotation and characteristics of block chain technology, this paper summarizes and analyses the development status of agricultural e-commerce in China, constructs the development path of further application of block chain technology in agricultural e-commerce in China, and puts forward the establishment of a unified national agricultural e-commerce system based on block chain technology. From the user's perspective of e-commerce platform, this paper expounds the application scheme of block chain technology in the whole process from commodity selection to transaction negotiation, and finally to delivery and receipt, avoiding the occurrence of information leakage and process redundancy. Finally, this paper explores the potential risks of e-commerce platform based on block chain in resources, technology, law and other aspects, and puts forward corresponding strategies. At present, the application of block chain technology in the field of e-commerce is in the ascendant, which still needs a lot of theoretical research and experimental conclusions as support. I hope this paper can provide reference for e-commerce researchers to study block chain.

1. Introduction

In the late 1990s, with the rise of electronic data interchange technology, e-commerce officially launched in China. With the continuous integration of Internet of Things, cloud computing and other technologies, as well as the strong support of national policies, China's e-commerce development has entered a mature stage [1]. However, with the rapid expansion of e-commerce user groups and product categories, problems such as imperfect supporting facilities, unbalanced regional development, and untrustworthy trading system have gradually emerged. Nie Linhai, by analyzing the characteristics of e-commerce development in China, puts forward that the powerful means to expand the scope of network consumption and improve the convenience of network consumption is to support the development of e-commerce in rural areas, communities and small and medium-sized cities [2-3]. Wang Juanjuan and others suggest that new technologies such as big data should be applied to improve the supporting facilities of e-commerce platform in order to ensure consistency and reliability in operation and management [4].

Although the above research suggestions can achieve better feedback effect in the short and medium term, they can not fundamentally eliminate the problem and eliminate the negative impact. Existing solutions are centralized, failing to achieve real fairness, justice and mutual trust, and the legitimate rights and interests of users and information security can not be well protected [5-6]. Therefore, there is an urgent need for a method that can not only avoid centralized center interference in e-commerce transactions, but also ensure user information security, so that e-commerce can break through the existing bottleneck and enter a healthy development. Block chain technology just meets the needs of e-commerce transformation. Firstly, block chain technology and e-commerce market are decentralized.

The technical characteristics of block chains coincide with the difficulties in the development of e-commerce, and few people have been involved in the research on the integration of block chains and e-commerce. Therefore, this paper starts with the construction of payment system, circulation system and credit system of e-commerce, making the management concept and technical characteristics of block chain a bridge connecting information flow and value flow of e-commerce integrated system. Secondly, from the user's perspective of e-commerce platform, the operation

steps of block chain technology in the aspects of sale, purchase, transaction, payment and receipt are elaborated in detail, providing reference examples for future practical application. Finally, the risks faced by e-commerce platform based on block chain are analyzed from the aspects of resources, technology and law, and the corresponding solutions are put forward.

2. Connotation and Characteristics of Block Chain

Block chain is a distributed database derived 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" [7]. As shown in Figure 1, the operation principle of block chain technology can be regarded as a universal 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. Block chains provide cloud backup for all users, so that information can not be forged or tampered with and improved to ensure data authenticity and transparency of the process.

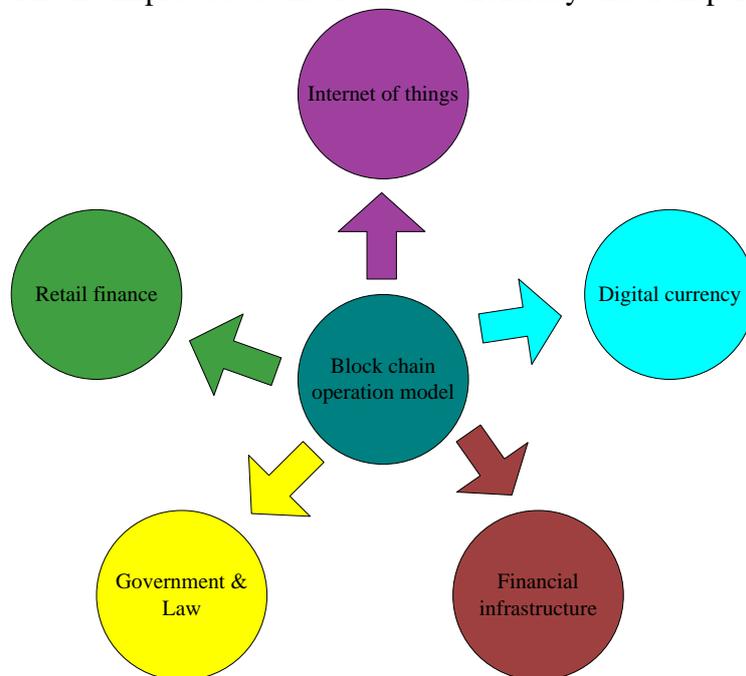


Fig.1. Working principle of block chain technology

The first successful application of block chain technology in Bitcoin embodies five core features: decentralization, distributed accounting, collective maintenance, anonymity and reliable database. Decentralization: In the block chain system, there are no traditional centralized hardware institutions, but numerous peer-to-peer nodes, distributed storage and accounting, and each node runs independently while real-time association. Distributed Accounting: All users independently participate in data input and accounting in the process of operation. After system verification, all nodes' data are updated in real time distributed. Collective maintenance: The system is maintained by all nodes, and any authenticated users can operate in the normal running nodes. Anonymity: Because the system is distributed bookkeeping and collective maintenance, data upload must be verified and accounted for, so users can remain anonymous in a trusted environment. Reliable database [8]: Because each node is independent, it will not affect other nodes when a single node fails, so it is a reliable database. As shown in Figure 2, 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 block chain technology, which became the first successful practice of block chain technology in the core business of financial industry. This also represents the successful landing of

the concept of block chain. Innovation and transformation of agricultural e-commerce with block chain technology will create unprecedented opportunities for it to break through bottlenecks and achieve transformation and upgrading.

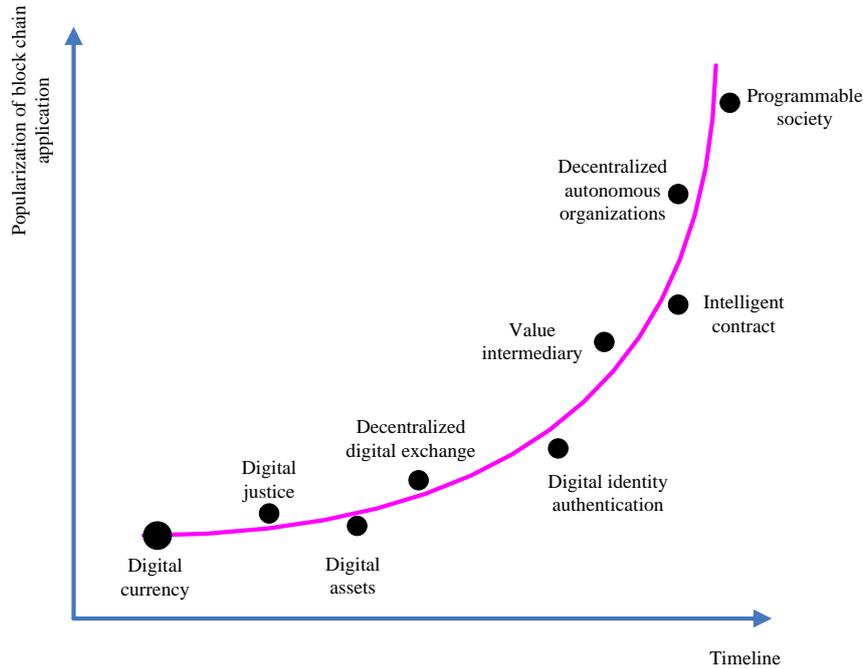


Fig.2. Future block chain development sketch

3. Construction of Electronic Commerce System from the Perspective of Block Chain

E-commerce involves many subjects including enterprises, consumers, suppliers, government and so on in the whole operation process, and these subjects constitute the comprehensive system of E-commerce through the interconnection of information and value [9]. Among them, according to the different modes of transmission among the main bodies, the system can be subdivided into payment system, circulation system and credit system, and the technical characteristics such as consensus mechanism, intelligent contract and decentralization can be combined to construct the e-commerce system from the perspective of block chain, as shown in Figure 3.

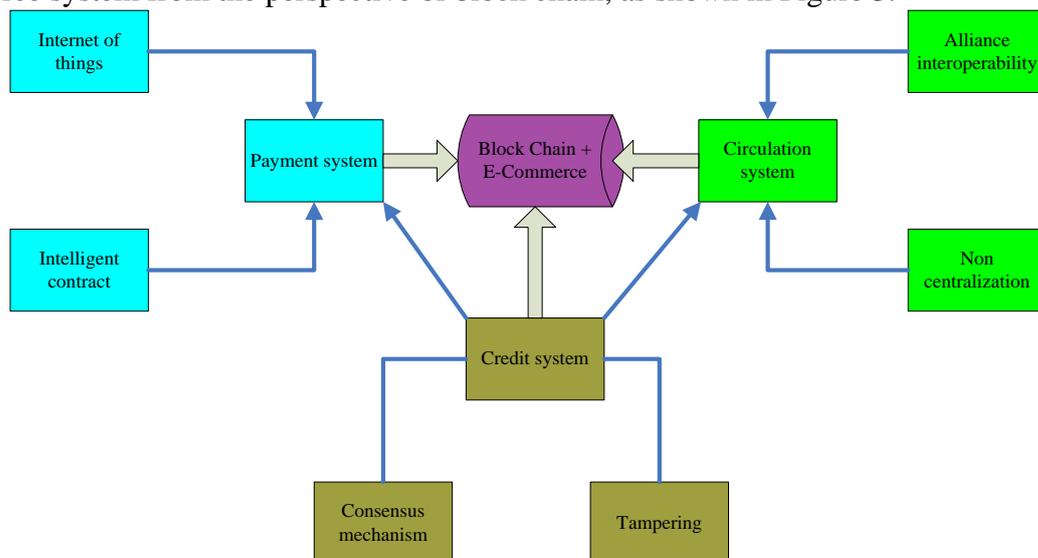


Fig.3. Electronic commerce architecture from the perspective of block chain

Generally speaking, e-commerce is the commercial activity of commodity circulation through information network technology, so the circulation system is the center of the comprehensive

system of e-commerce. Since the whole process of e-commerce activities is generally completed through virtual Internet, the authenticity and traceability of commodities are the basis for smooth transaction and trust-building of users. Traditional e-commerce platforms usually guarantee users by means of third-party professional organization detection and real-time logistics information tracking, but even so, there are still cases of goods lost or quality certificates forged in the course of transportation [10].

Through block chain technology, the information of every link of commodity circulation is allocated to the corresponding blocks, and any generated information is permanently recorded and can not be tampered with. This system replaces the traditional detection and tracking system, avoids the redundancy and inaccuracy of the records of all circulation links, and realizes the automatic and digital detection and tracking of goods from suppliers to online stores and ultimately to users. Among them, transaction and logistics are the key linking up the whole e-commerce circulation. The integration of e-commerce platform and product/partner Internet of Things realizes the effective transmission and block storage of important information. The block chain information storage of the circulation system is shown in Figure 4.

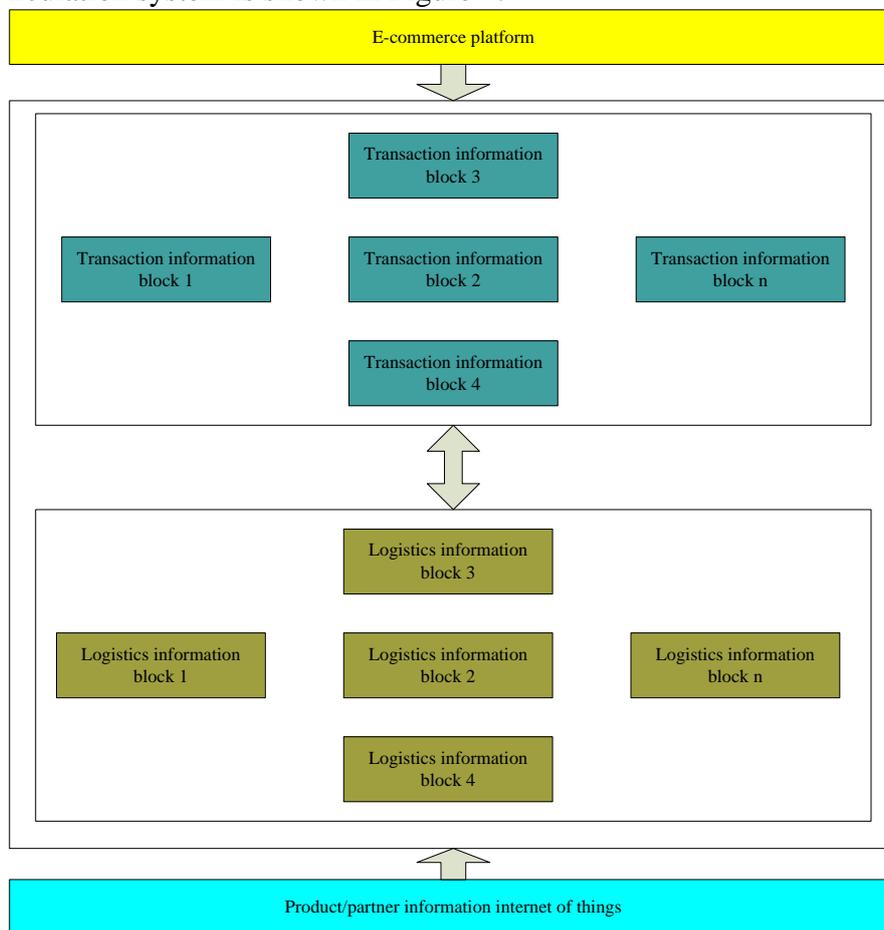


Fig.4. Block chain information internet of things in circulation system

The application of interoperability model of block chain alliance in logistics links of circulation system can ensure the traceability of goods in logistics process, and at the same time, the accuracy of information in each link can be ensured by real-time updating of logistics distribution data. Through the model of weak centralization, we can effectively strengthen the supervision and improve the efficiency of logistics services. Because user information, product information, logistics information and other key information are recorded in each block can not be cancelled and tampered with, thus achieving the traceability and accuracy of information. In the process of logistics transportation, it can track the location of goods and reduce labor costs, and promote the transformation and upgrading of e-commerce logistics model.

4. The Risk and Countermeasure of E-commerce Based on Block Chain

Eliminate security vulnerabilities in block chains from the technical level. When processing data, the data layer of block chain can be combined with the internal data layer to form a two-tier data structure, so that private important information can be isolated from the internal data layer, while public common information can be accessed to the data layer of block chain. At the same time, on the basis of multi-signature technology, advanced algorithms such as zero-knowledge proof and homomorphic encryption are added to further protect users'privacy information. In addition, deep defensive programming is used for intelligent contracts, so as to reduce the impact of data vulnerabilities on the basis of adding security layer.

Seek a new balance between centralization and decentralization. The traditional e-commerce mechanism and block chain technology concept can be organically integrated, rather than completely separated, such as consumer rights protection system, commodity quality detection system, etc. can be used to restrict the occurrence of potential collective irrational risks. At the same time, although the technical characteristics of automatic execution of intelligent contracts reflect the Value Cornerstone of the block chain consensus mechanism, due to regulatory gaps, hackers have a chance to take advantage of. Therefore, when the application of block chains in the field of commerce is still in the preliminary stage of exploration, the corresponding legal supervision system should be designed in advance to make the business model and technical characteristics develop together.

Construct block chain technology system with short update interval, large data throughput and flexible consensus mechanism. By promoting the overall construction and business transition of IPv6, strengthening the research and development innovation of Internet distributed core architecture and key technologies, and introducing virtual scientific research environment and open access system, block chains can fully meet the needs of real-time information response and full utilization of resources in e-commerce market.

5. Conclusion

Block chain 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 block chain technology, this paper summarizes and analyses the development status of agricultural e-commerce in China, constructs the development path of further application of block chain technology in agricultural e-commerce in China, and puts forward the establishment of a unified national agricultural e-commerce system based on block chain technology. The circulation system, payment system and credit system in the core module of e-commerce can be constructed by using the characteristics and mode concepts of block chain technology, so as to realize the interconnection and interoperability of e-commerce information value chain. From the user's perspective of e-commerce platform, optimizing the application process and operation architecture of e-commerce operation can greatly enhance the user's service experience, avoid the risk of information leakage and reduce the occurrence of process redundancy.

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