

#### **Original Research Article**

## Solution to the "Trust" Gap of Cross-Border E-Commerce under Blockchain Technology

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*Abstract:* With the promotion of 5G technology, my China's cross-border e-commerce has developed rapidly, and while achieving outstanding results, some shortcomings have also emerged one by one. As cross-border e-commerce involves more regions, links, and legal scopes, there are problems of security and "trust" gaps in actual operations. In response to this problem, connected with current reality and provide new ideas for the practical dilemma of blockchain technology application, this paper studies the ice-breaking mechanism of the current dilemma faced by cross-border e-commerce by using blockchain technology.

*Keywords:* Blockchain Technology; Cross-Border E-Commerce; Trust Problem; Persuasive Technology; Solution Mechanism

## 1. The application status of blockchain technology

#### 1.1 The definition of blockchain technology

Blockchain technology is a distributed data storage technology. It uses a series of encryption algorithms inside the system to encrypt the data and store it in the database to prevent transaction data from being tampered with at will<sup>[1]</sup>, from which, it can be seen that the essence of blockchain technology is an Internet of value. It established a new production relationship through its own procedures. Based on this, different subjects can better cooperate and develop here. Its essence is still a decentralized database and its features such as decentralization, immutability of information, openness, autonomy and anonymity can better solve the problem of network information asymmetry. In addition, it can also exchange the value, transfer digital currency and digital assets, and perform value measurement, accounting, and storage.

#### 1.2 The merger of blockchain technology and cross-border e-commerce

In the transaction settlement process of cross-border e-commerce, the smart contract of blockchain technology can ensure that the participants fulfill their obligations in the trade process, and can also monitor the behavior of the participants<sup>[2]</sup>, so that the trade can be reliably guaranteed. The consensus mechanism of the blockchain achieves a consensus by verifying and confirming all the bookkeeping nodes in a transaction, and realizes the establishment of a bridge of trust between two parties who do not know each other at the network level. Taking "Tmall Global Shopping" as an example, both parties to a transaction can query public goods or logistics information through the blockchain platform, trace the source of the goods, and confirm and monitor the flow of funds in real time after a trade transaction. Both parties to the settlement can jointly manage the accounts, reduce the possibility of non-reconciliation and reduce the cost

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of reconciliation, thereby optimizing the settlement process and reducing the settlement cycle. This has greatly improved the satisfaction of both trading parties<sup>[3]</sup>.

In the warehousing and logistics process of cross-border e-commerce, blockchain technology is used to establish an online warehousing platform system, and transportation routes<sup>[4]</sup>, resource scheduling, etc. are rationally optimized and configured based on data, thereby reducing transportation time. In addition, distributed records can also be used to monitor and record the entire process of warehousing, transportation, and distribution at home and abroad<sup>[5]</sup>. The data can be disclosed to relevant personnel such as e-commerce platforms, logistics companies, and purchasers to ensure the traceability of information.

In the process of tracing the origin of goods in cross-border e-commerce, the time stamp of the blockchain can trace the origin of the goods to ensure the security and authenticity of the information<sup>[6]</sup>. At the beginning of the transaction, the product source information is entered, combined with the QR code and the product production record to query the database, so that customers can enjoy the source information query at any time and identify the authenticity of the product. Blockchain technology can ensure that the information at each stage of the production, transportation, packaging, inspection, and distribution of goods can be recorded, preventing illegal and false logistics records, and reducing the inflow of informal goods. Each piece of information in the blockchain has its own time stamp and digital signature. Combined with the coding mechanism of the Internet of things, each product is given an identity, which is accurate to one item and one code<sup>[7]</sup>, which operators and customers can inquire at any time. To ensure the transparency of transactions and transportation can greatly reduce the loss and drop of packages. Any problem at any node can be traced back to the source of the problem and the person responsible in time.

#### 2. The current trust gap

Because of the geographical span, the supply chain data of the entire network is completely unequal, and there are serious information islands. The interaction cost between the two parties increases with the expansion of transportation. Each enterprise has its own supplier, which is difficult to unify, which leads to the fragmentation of information and also allows criminals to take advantage of it. It is difficult to have a common coding platform to store, process, share and analyze digital information resources from manufacturers, purchasers, transportation, sales and consumers, which makes it difficult to realize the resource value of massive data and information and it is inaccessible<sup>[8]</sup>. The data status is even more unable to achieve information verification, so it increases the "trust cost" and virtually leads to an increase in transaction costs. In addition, the payment link will also cause a crisis of trust due to the imbalance of information. Under the development of cross-border e-commerce, credit card payment and third-party payment have become important payment methods under the B2C transaction model. There are multiple participants in the cross-border e-commerce payment process, and there is also the problem of one party's distrust of the banking institution selected by the other party.

# 3. The dilemma and enlightenment of the current application of blockchain technology

#### 3.1 The current dilemma of blockchain technology application

As an emerging technology, blockchain technology still has certain risks in practical applications. First of all, the structure of the blockchain itself and system processing need to be equipped with high-capacity hardware<sup>[9]</sup>. If it is applied to the high-frequency trading industry, it will not be able to load. And if it is a large-scale application, the cost is not a small number, and it is difficult for ordinary enterprises to afford it. Secondly, in terms of technology, hackers can use multi-signature loopholes and algorithm attacks. Digital currency will be threatened, and the blockchain has security loopholes<sup>[10]</sup>. Currently, security vulnerabilities are concentrated in the generation and protection of private keys, centralized consensus process, and prevention of smart contract code vulnerabilities. At the same time, in the public chain, all data in the blockchain is open and transparent, and it is impossible to guarantee both information transparency

and customer privacy from being leaked. Finally, in different fields of application, what kind of attitudes and positions the government departments adopt are also facing severe challenges. Blockchain is a technology that has emerged in recent years. The government's legal system and regulatory measures are lagging behind the development of technology. In the regulatory gray zone, blockchain technology may become a hotbed for black industries.

#### **3.2 Implications for current blockchain applications**

## **3.2.1** To make full use of persuasive technology based on the application of blockchain technology

Persuasive design's application in product design plays a key role in shaping user attitudes and product image. The most important model of persuasive design is the behavior change model, which is called the FBM model. The model proposes that the implementation of a behavior must have three elements: sufficient motivation, ability to implement the behavior, and triggering factors. As an emerging technology, blockchain technology is still not well known by the public. If buyers and sellers use the trading platform provided by blockchain technology, then blockchain technology can be called a third-party product. How to attract more traders to use, and how to let novices get started quickly. Therefore, persuasive technology and blockchain technology can be used as the cornerstone to attract more people to use it. At the same time, it can also assist in solving the trust problem.

## 4. To improve the current regional chain technology to make it better for cross-border e-commerce

#### 4.1 To technically optimize transaction performance and reduce enterprise blockchain application costs

In order to make up for the high hardware requirements in the application of blockchain, the cost is too large and the performance is improved, the basic research of blockchain technology should be strengthened. Although blockchain technology is a hot topic recently, it is still not long after its appearance. In the early stage of development, there are still many details that are missing, and risks and challenges coexist. The government, enterprises and third parties should establish strategic cooperation alliances to jointly develop basic research on blockchain technology, set up pilot projects in key areas, and carry out specific research as soon as possible to create a good combination of blockchain technology and cross-border e-commerce environment.

#### 4.2 To ensure the security of blockchain from the overall perspective of technology and management

It can be seen from the disadvantages of current blockchain technology that as a data storage technology, security is the biggest highlight and the most important thing. More attention should be paid to the security risks of the blockchain and a systematic security assessment should be formed. The government should strengthen legislative work, establish a national risk assessment system, conduct assessments on key areas, take defensive measures, and monitor cross-border data flow, information management, network security, and personal privacy. In addition, some hackers will be severely punished for personal gains and illegal theft of data.

#### 4.3 To establish standards to increase blockchain trust

Blockchain technology should be gradually guided to penetrate into other related industries. Blockchain technology can be used as an information storage platform, which can be used in many industries with its powerful data storage and security management. However, if it is applied blindly, it will lead to the "overkill" of blockchain technology. The government needs to take measures to promote the application of blockchain technology, increase publicity and guidance, so that investors can view blockchain technology in a rational, comprehensive and objective manner. At the same time, it is also recommended that relevant experts or professionals can carry out projects to provide guidance on the combination of blockchain technology and other related fields.

#### 4.4 To actively explore effective supervision of blockchain technology

In response to the emergence of various shortcomings of the current blockchain technology, some people have begun to use loopholes in government supervision to seek their own personal gain and illegally steal trading information. In addition, because the birth of new things and the formulation of relevant laws often lag behind, there will be frictions in communication and use between the two parties of the platform and the regulatory authorities during the transaction process. In response to various behaviors, the government should establish unified standards for the co-ordination of blockchain service providers, e-commerce logistics companies and other users and regulatory agencies, improve laws and regulations, strengthen market supervision, and better promote the development of the industry.

### 5. Conclusion

To sum up, the unique openness and transparency of information of blockchain technology, as well as a series of advantages such as smart contracts and digital currencies, are helpful in addressing the current trust problem that is increasing due to the epidemic. It can redefine the business rules of cross-border e-commerce and effectively integrate the supply chain process of cross-border e-commerce. But at the same time, its drawbacks are gradually revealed in current applications. How to better apply blockchain technology to the cross-border e-commerce logistics field requires further exploration and experimentation by e-commerce platforms and logistics companies. In addition, the government should also recognize the current dilemma of blockchain technology, and promote the development of the industry by formulating sound laws and regulations and strengthening market supervision.

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