Universe
Scientific Publishing

The application of blockchain technology in financial technology and its innovation to payment systems

Jiahong Zheng

Zhuhai University of Science and Technology, Zhuhai 519041, China.

Abstract: The combination of fintech and blockchain technology is reshaping the future of payment systems and financial services. Blockchain, as a decentralized ledger technology, provides the infrastructure for digital currencies and supports the operation of cryptocurrencies such as Bitcoin. It not only promotes the development of digital currencies, but also promotes the application of smart contracts to automatically execute contract terms and improve the efficiency of financial transactions. Supply chain finance also realizes the transparency of capital flow and logistics information through the blockchain, shortening the settlement time. In payment systems, the application of blockchain technology reduces the cost of cross-border payments, improves payment efficiency, and enhances the security of payment systems through distributed ledgers. This technology has also facilitated innovations in the payments space, such as micropayments and instant payments, bringing unprecedented convenience to consumers and businesses.

Keywords: financial technology; Blockchain technology; Payment efficiency

1. The relationship between financial technology and blockchain technology

Financial technology is the product of the combination of financial services and modern technology, and its purpose is to improve the efficiency of financial services through high-tech means. Among many technologies, blockchain technology has become a revolutionary force in the field of financial technology with its unique decentralization characteristics. Blockchain technology provides a transparent and immutable distributed ledger for transaction information to achieve a secure record of transaction information, which has revolutionary significance for the financial field, especially those parts that need to be trusted and authenticated. With the help of blockchain technology, financial technology can eliminate the intermediary links of traditional financial services, reduce transaction costs, and improve efficiency. At the same time, the application of the technology is also extended to many fields such as asset management, payments and lending. From an asset management perspective, blockchain applications facilitate rapid asset transfer and accurate recording. As far as payments are concerned, more secure and real-time payment solutions can be provided. In the lending market, smart contracts and other blockchain tools can effectively reduce fraud and operational risk.

2. The application of blockchain technology in financial technology

2.1 Digital currency

The rise of digital currency is closely related to the development of blockchain. Blockchain technology is a solid foundation for digital currency storage, trading, and security. In this framework, Bitcoin and other cryptocurrencies can perform value transfer functions without the intervention of traditional financial institutions. Due to the transparency of the blockchain, this decentralized feature enhances the efficiency of transactions and also increases the user's trust in the system, which means that every transaction is traceable and cannot be changed. At the same time, as the technology matures, various forms of digital currencies begin to emerge, including stablecoins and central bank digital currencies, which provide new possibilities for the implementation of monetary policy and cross-border payments with the help of blockchain technology. The popularity of digital currencies has also promoted the construction of new financial infrastructure such as cryptocurrency exchange platforms and wallet services, giving individual and institutional investors the opportunity to enter the crypto market.

2.2 Smart Contract

Another prominent application of blockchain technology is the design of smart contracts. The smart contract is a code for the automatic

execution, management, and enforcement of contract terms. They are stored in the blockchain and automatically fulfill the relevant contractual terms after the pre-set conditions are met, without any third-party intervention. The application of this technology has significantly improved the efficiency of contract execution, especially in the financial field, where smart contracts have begun to be applied to many aspects such as stock issuance, insurance claims payment, and derivatives trading. They can be automated to reduce human intervention, reduce the risk of error and fraud, and reduce transaction and regulatory costs. Smart contracts are therefore considered as a potential technology that can completely change the operation mode of traditional contracts and conventions.

2.3 Supply chain Finance

In the field of supply chain finance, the far-reaching impact of blockchain technology is also obvious to all. Use blockchain technology to make transactions on the supply chain more transparent, thereby increasing trust among the various participants. This allows funds to flow directly into verified transactions, making it easier for small suppliers to get financing without relying on traditional credit assessment methods. In addition, blockchain can also track the flow of funds and goods in real time, bringing unprecedented visibility and efficiency to supply chain management. This improvement reduces the time and cost of financing and enhances the supply chain risk management and control ability. With the deep integration of blockchain solutions and supply chain finance, more innovation is expected, making supply chains more flexible and financial services more popular.

3. Innovation of blockchain technology to payment system

3.1 Improve payment efficiency

The use of blockchain has brought an unprecedented increase in the efficiency of the payment system. The technology utilizes a decentralized network to enable transactions to take place in near real time and eliminates many business day waits. Traditional bank transfers or cross-border payments can only be achieved through complex intermediary structures, and blockchain technology greatly simplifies the transaction process with a peer-to-peer transaction mechanism. After the transaction is completed, it is encrypted and immediately broadcast to the network, and after the validity of the transaction is verified by the nodes in the network, the transaction is recorded in the blockchain. This process is much faster than the traditional banking system, allowing individuals and companies to move money more quickly. Thus, the rapid processing of time-sensitive transactions is conducive to the continuous and efficient conduct of business activities.

3.2 Enhance payment security

From a security point of view, blockchain technology adds a solid layer of protection to the payment system with the characteristics of immutable records and complex encryption mechanisms. At the end of each transaction, it is recorded in a block and connected cryptographically to the previous block to form a continuous chain. This means that once the transaction data is written to the blockchain, to change any message must also change the messages on all subsequent blocks, and these messages are almost impossible to do in practical application, so as to ensure that the transaction record has irreversibility and security. In addition, the characteristics of distributed ledgers mean that data is stored on several nodes of the network, which greatly reduces the possibility of data loss or tampering compared to centralized storage. So blockchain provides an extremely secure means of preventing fraud, unauthorized transactions, etc., and provides a high level of security to the payment system.

3.3 Reduce payment costs

Blockchain technology shows great potential to reduce payment costs. Under the traditional payment system, cross-border transactions have to go through a series of banks and financial institutions, and each link will bring costs. Blockchain technology enables financial transactions to bypass the above intermediate links and occur directly between the payer and the receiver, significantly reducing transaction costs. In addition, blockchain has the ability to automate, reduce manual transaction requirements, and further reduce labor and management costs. Because the verification of transactions is automated through a consensus mechanism in the network, it also eliminates the costs associated with review and clearing in the traditional banking system. This improvement in cost-effectiveness is particularly evident for companies,

which often have to deal with the high costs of processing small payments under the traditional banking system. Therefore, the use of blockchain technology not only simplifies the payment process, but also brings significant cost savings to merchants of all sizes.

3.4 Promote payment innovation

By enabling more flexible payment models such as instant payments, micropayments, multi-signature accounts, and so on, blockchain simplifies existing processes while also opening up new payment scenarios. For example, micropayments can now be processed at a very low cost, allowing both content creators and service providers to collect very small amounts of money that traditional payment systems cannot do. In addition, blockchain makes cross-currency and cross-asset transactions more convenient, and users can automatically convert and settle different digital assets through smart contracts. With the advancement of science and technology, blockchain platforms continue to propose new payment solutions, such as the use of blockchain for loyalty point exchange and management, or through distributed ledgers to track and manage transactions between iot devices. In addition, decentralized financial services are also using blockchain technology to disrupt traditional banking, providing users with services such as lending, insurance and asset management without intermediaries. These innovations are not limited to the financial industry, but are driving change in other industries as well. In the power sector, for example, the use of blockchain technology to facilitate energy trading allows consumers to purchase electricity directly from renewable power stations. In the field of art, crypto artworks enabled by blockchain technology, such as non-homogeneous tokens (NFT), provide artists and collectors with an entirely new platform for creation, ownership proof and trading.

Closing remarks

Blockchain technology is leading the wave of fintech innovation, from digital currency to smart contracts, to the deep integration of supply chain finance, it continues to promote the evolution of payment systems. This process is ushering in a new era of more efficient, secure, and lower-cost payments, giving new impetus to global economic growth and development.

References

[1] Fang Y. Application research of virtual currency and blockchain technology [J]. Trade Fair Economics, 2023, (09): 116-118. (in Chinese)

[2] Li Chuyang. Research on the integration and application of blockchain technology in the field of financial technology [J]. Western Finance, 2022, (04): 85-91.

[3] Chen Xiaomei. Research on the application of blockchain technology from the perspective of banks [J]. Journal of Fujian Radio and Television University, 2020, (04): 70-74.