



Analysis and Outlook of Blockchain Technology Application in China Internet Finance

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Abstract. In July 2020 the People's Bank of China officially issued the Notice on Promoting the Standardized Application of Blockchain Technology, which is a redefinition of blockchain + Internet finance. As China is a policy-oriented country, with the policy tilt, the concept of integrating Internet finance with blockchain has become a hot topic in these years. Many challenges and opportunities arise in the process of blockchain gradually penetrating into Internet finance. In order to promote the mixture of blockchain and Internet finance and to elaborate the current situation of the integration of Internet finance and blockchain in China, this paper introduces the theories related to blockchain and Internet finance. A SWOT analysis is made. This paper also proposes some optimization suggestions, such as the strategies of chain-bank parallelism, Financial data fusion deposition, intelligent risk control, and expanding the layout of financial settlement field. Meanwhile, this paper hopes to provide some useful inspirations and references for this new hybrid model.

Keywords: Data cleaning · blockchain + Internet finance · Chain Library Parallelism · Financial data fusion deposition

1 Introduction

The blockchain revolution is continuing to sweep through business and academia. Blockchain is a technical solution to maintain a reliable data base together by decentralization as well as de-trusting [1]. The core technologies of blockchain are distributed ledger, asymmetric encryption, consensus mechanism and smart contracts [2–4]. This paper analyzes the applicability of blockchain technology in the Internet finance industry and the impetus of its own unique attributes in finance. China's research on blockchain is slightly later than foreign countries mainly due to its national political and policy trends. However, from 2016, the government started to gradually recognize it, and by 2020, it started to strongly support it, and the hybrid application of blockchain technology and Internet finance has become the main theme and research hotspot in recent years. The financial market has faced different opportunities and challenges in this change process. The structure of this paper will start from the characteristics of blockchain and Internet finance in detail, and use SWOT analysis to study, and finally give some suggestions for optimization and solutions to the problems combined with all the above.

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2 Literature Review and Theoretical Basis

2.1 Research Status in China

2013 saw the first mention of blockchain technology in the paper “Bitcoin World” by scholars such as Yue Zhang and GuoHua Wang, which officially kicked off the research on bitcoin. Domestic scholars’ research on blockchain technology in the early stage mainly focused on the legal use of bitcoin. In 2017, they basically stopped studying and focusing on bitcoin. This is because the Chinese government officially had the People’s Bank of China publish the “Announcement on Preventing Risks of Token Financing” on September 27, 2017, explicitly banned any trading of digital currencies in China. It doesn’t mean that China will refuse to embrace blockchain technology. Yang and Zhang (2014) argue that blockchain technology is a security guarantee for virtual currencies [5]. Yuan Yong and Wang Feiyue (2016) proposed that blockchain is the core support technology of the digital cryptocurrency system represented by Bitcoin, but they only interpret the technicality of blockchain from the perspective of its application in Bitcoin, and do not deeply explore the role of blockchain in the business sector [6]. Wang Shujun (2016) proposes that blockchain technology enables electronic money to have the equivalent value of money, which is an important guarantee that virtual currencies such as Bitcoin can be legally utilized. She believes that blockchain, as an Internet of value, can embody the five functions of money, such as value scale, storage means and circulation means, using its core technology to ensure the accuracy of information transmission and the security of digital asset circulation [7].

2.2 Current Status of Foreign Research

At the beginning of the 21st century, Satoshi Nakamoto explained the concept of electronic cash system based on P2P network technology, cryptography, timestamp technology, and blockchain technology in his article “Bitcoin: A Peer-to-Peer Electronic Cash System”, which marked the birth of blockchain technology as one of the basic technologies of Bitcoin. The initial research on blockchain in foreign countries mainly focused on the mining of bitcoin and virtual currency applications. For example, Meiklejoho (2013) concluded from his study of Bitcoin that virtual currencies have gained a lot of space with the security of blockchain technology. He is positive that virtual currencies are driving business and social progress, but the paper does not go into the deeper changes of virtual currencies and blockchain technology on our business and society [8]. Pete Rizzo (2017) argues that blockchain is far more important than bitcoin and that more applications of blockchain technology should be implemented, based on the launch of the world’s first virtual currency trading platform based on blockchain technology in the United States. He affirms that with many new application models of blockchain technology, different social actors can better collaborate to conduct new businesses, but he only combines blockchain applications with virtual currencies and still does not broaden its application areas [9].

3 The Hybrid Application of Blockchain and Internet Finance

Blockchain technology has a bright future in financial fields such as digital currency and digital notes, cross-border payment and settlement, credit management and credit proof, as well as securities trading and equity registration. The three stages of blockchain application and several important applications of blockchain in the field of Internet finance are shown in Fig. 1 [10]. At present, the specific application scenarios of “blockchain + finance” are listed in Fig. 2.

There are not many examples of hybrid applications in China, and we can currently see China Merchants Bank as the first company to complete this practice. China Merchants Bank’s blockchain product “China Merchants Bank One Chain” has successfully passed the blockchain testing by China Financial Certification Authority (CFCA), which is the first blockchain product in the banking industry to complete the testing by CFCA.

Scene classification	Specific application
Blockchain 1.0	Cross-border payment, e-commerce, P2P lending, microfinance, etc
Blockchain 2.0	Stocks, annuities, bonds, options, note trading, some funds, pensions, etc.
Blockchain 3.0	Smart contracts, financial systems, property rights registration, intellectual property protection, education certification, Internet of Things, food safety traceability, used car traceability, notary certification, etc.

Fig. 1. The three stages of blockchain applications [Owner-draw]

Specific application scenarios	Key Technical Points	Application Cases
Cryptocurrency	Distributed ledger, encryption algorithm, consensus mechanism	Bitcoin, Ether, Ripple, Litecoin, Libra and other virtual currencies, digital RMB (E-CNY), Bakong Cambodia and other central bank digital currencies
Cross-border payments	Distributed ledgers, P2P networks	China Merchants Bank, RippleNet cross-border payment system, Visa B2B connect platform, R3 Blockchain Alliance's Corda framework-based cross-border payment platform, Singapore EDT cross-border payment platform
Credit system	Distributed ledger, consensus mechanism	Chain Suning Financial Blockchain Blacklist Sharing System, China Credibility Network, LinkEye, Credit Union Chain, Central Bank of China "Credit Chain", EU Kredit chian, etc.
Securities area	Smart contracts, consensus mechanisms, distributed ledgers	Overstock T0 platform, NASDAQ FInq blockchain private securities trading platform, Bank of Communications "Jucal Chain" blockchain asset securitization platform, Shanghai Securities platform, etc.

Fig. 2. Application scenarios of “blockchain + finance” [Owner-draw]

“The platform includes open license chain, blockchain cloud service platform (BaaS), blockchain encryption service, judicial depository service, middleware and other service components and tools, and has such features as security and stability, independent control and excellent performance. It also features open, collaborative, and shared governance blockchain technology, which reduces inter-agency trust costs, improves financial service efficiency, promotes the implementation of several internal and external applications, and helps CMB customers develop both technology and business.

4 SWOT Analysis for Hybrid Application Approach

4.1 Advantages of Blockchain in Internet Finance Applications

4.1.1 Accelerates the Flow of Internet Financial Funds

With the feature of direct clearing and settlement between nodes and nodes of blockchain, the decentralized and third-party platform features of blockchain technology can enable direct transactions between the two sides of financial funds, reduce transaction links, improve settlement efficiency and eliminate intermediary costs, thus speeding up the flow of financial resources in the world.

4.1.2 Enhances the Risk Control Capability of Internet Finance

Based on the asymmetric encryption and open architecture of blockchain, the data information on the chain has the characteristics of high accuracy, transparency and sharing, which can be viewed by the participants in the financial market in a timely manner, and the supervisory department, and discover and prevent the possible problems. In the blockchain, each node can participate in checking the data and verifying the authenticity of the data, which greatly improves the authenticity of the data. The decentralized form of blockchain technology makes anyone's operation on the data of one node will be recorded by other nodes and can be traced, which effectively improves the supervision of Internet financial transaction data. Even if other information is tampered with or deleted, as long as the private key is not leaked, the wrong information cannot be matched with the identity of the node. Thus, Internet finance can improve its ability to control risks and thus better maintain the orderly operation of the financial market.

4.1.3 Reshaped the Credit System of Internet Finance

Blockchain stores data in a node-synchronous way, and the data of each node is independent and complete, so that scattered personal data can be fully collected, which ensures the openness and transparency of data and promotes the open sharing of data and the interconnection of society. In blockchain, each person is an independent database, which can be programmed to record, store, verify, transfer and share, generate credit records and confirm ownership, and save a lot of human and material resources to check and analyze credit qualifications during transactions. A credit system with transparent information and irreversible transactions plays an extremely important and positive role in enterprise financing, and blockchain technology applied to the financial credit system will bring a new highly transparent, safe and efficient way of transaction.

4.1.4 Reduces the Cost of Internet Financing and Simplifies the Financing Process

In traditional trade finance, MSMEs commonly apply for loans directly with banks, but are limited by their own low creditworthiness and often obtain financing for only a small portion of their needs, which means that MSMEs have to use social financing, which is more costly and burdensome, to obtain funds. However, in Internet finance business supported by blockchain technology, blockchain technology can support the credit of core enterprises to pass deeper and wider in the supply chain, which greatly reduces the financing cost, and the suppliers at the end of the supply chain can also get credit and obtain financing at a lower cost.

4.2 Disadvantages of Blockchain in Internet Finance Applications

One of the main disadvantages of blockchain application in Internet finance is efficiency. So far, blockchain still takes up too many resources, both computing resources and storage resources, to cope with the current transaction scale.

In the public and alliance chains of blockchain, all transaction information is open and transparent, which means that every participant has access to the complete data backup in the storage nodes. The security of the user's account is protected by the private key, and asymmetric encryption algorithms are not unbreakable in the future. so blockchain technology is facing potential security threats.

The decentralized mentality, openness and anonymity of blockchain dilute the concept of state supervision, and even hinder the investigation and punishment of illegal and criminal acts by the state.

5 Optimization and Suggestion for the Hybrid Mode

5.1 Strategy for Chain Library Parallelism

Blockchain technology can make up for the deficiencies in data security of traditional financial big data application platforms to a certain extent, and at the same time, it can realize the independent execution and recording of data sharing operations using smart contracts. However, recording massive data directly based on blockchain will bring redundancy in storage space, and the system will be less flexible because the data cannot be modified after being chained if there are errors. Therefore, blockchain technology can be incorporated into the system. Blockchain technology can be combined with traditional big data applications, and blockchain can be used to optimize data storage and sharing. The advantages of "chain and library in parallel" complement each other to build a credible fusion and sharing application for financial data.

5.2 Expanding the Layout of the Financial Settlement Field

Blockchain technology has its limitation in cross-border settlement, that is, it cannot realize high-frequency transactions and scale settlement. Therefore, blockchain technology should be combined with other advanced technologies, such as "big wisdom and cloud" and 5G technology. The large-scale application of 5G network will greatly improve the

performance of blockchain, accelerate the synchronization speed of blockchain data, optimize the application scenario of blockchain. Big data and cloud computing technology can well integrate the huge and redundant data stored on the blockchain, so that it can accurately reflect the real situation of users, save users' time in screening data, and provide important reference for users' decision making. Thirdly, the integration of blockchain and artificial intelligence can further ensure the security of data sharing and realize smarter smart contracts, and blockchain will also provide distributed bookkeeping algorithms and consensus mechanisms for artificial intelligence to further cope with complex commands, which will jointly promote intelligent changes in Internet financial enterprises in the future.

5.3 Build Intelligent Risk Control

In recent years, artificial intelligence technology has continued to mature, and its innovative applications that are closely integrated with financial services such as credit and financing, accurate marketing, risk prevention and control It has become a key means to promote the wisdom, personalization and initiative of financial services. At the same time, artificial intelligence has complex algorithms, privacy data is memorized, the calculation results have uncertainty and other problems, for the relevant applications bring certain regulatory difficulties and algorithm black box, information leakage, model It also poses the risk of black box algorithm, information leakage and uncontrolled model algorithm. The integration of blockchain technology in AI financial service scenarios can enhance the reliability and transparency of AI financial application systems, and help build the Blockchain technology can be applied to AI financial service scenarios to enhance the reliability and transparency of AI financial application systems and help build a more secure and controllable intelligent financial service model. Specific application ideas are described as follows.

5.4 Cultivating a Blockchain Talent Pool to Promote Its Deep Application

The late start of blockchain technology research in China has led to the low comprehensive quality of blockchain technicians in China. China should attach importance to the cultivation of blockchain talents, pay attention to the specialized talents, encourage the implementation of joint cultivation of talents by universities, research institutes and enterprises, strengthen the joint tackling of key technologies, and promote the in-depth application of blockchain technology in Internet finance. Relevant government departments should examine the environment of blockchain technology in Internet finance applications in depth, lead the important influence it plays on the future development, regulation and governance of the Internet finance industry, and assess the important role of the blockchain industry in economic transformation and financial system reform. It also assesses the important role of blockchain industry in economic transformation and financial system reform.

6 Conclusion

After the blockchain technology is applied to the Internet finance field, its promotion to the Internet finance industry is indisputable. While widely carrying out pilot financial technology applications based on blockchain technology, China should summarize and investigate various pilot applications and promote the standardized development of blockchain financial technology applications in a timely manner. The system development of blockchain applications in China is mainly based on the reliable and secure blockchain environment in the Chinese financial industry. Therefore, increasing infrastructure, staffing ratios of blockchain-related experts, and research funding will help break through blockchain technology bottlenecks. In addition, China should encourage high-quality blockchain technology applications to go global and enhance the international competitiveness of China's "blockchain + Internet finance" industry.

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