

An Overview of The Digital Financial Application Model with Blockchain As the Engine and The Challenges It Faces

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Abstract: The digital finance powered by the blockchain, through the creation of non-centralized credit, has developed the exchange of digital value into a trend, which is a subversive reform of the traditional business model, while improving the existing financial infrastructure. This creates a global financial network with a whole new meaning. Digital economy theory, free money theory and information asymmetry theory constitute the theoretical basis of digital finance. This paper briefly clarifies the basic connotation and characteristics of distributed bookkeeping of blockchain technology, analyzes the theoretical background of digital finance, expounds several main application modes of digital finance, and expounds the problems faced in its development, and gives development countermeasures.

Keywords: Digital finance, Blockchain, Application model.

1. Introduction

Through decades of growth, Internet-based digital technologies have laid the foundation for the formation of the digital world. After nearly half a century of development, virtual digital fields such as Ali, Tencent, Amazon, and Facebook have appeared in this digital world, and their development and evolution speed far exceeds that of other fields in the real world. The blockchain technology came into being, and it has been endowed with very strong digital financial characteristics from the very beginning.

As a collective application model of many computer and encryption technology innovations, blockchain technology is considered by many to be the most disruptive change after the Internet. It is expected to complete the transformation from the current information Internet to the value Internet, which will set off a huge round of technological innovation and industrial transformation in different countries.

Finance is the blood and important support for economic and social prosperity, and plays a fundamental and supporting role in China's economic and social development in the new era. Blockchain has brought unprecedented influence, especially the development model of the traditional financial industry, but it has also brought another possibility of innovation and change in the financial industry. Under the booming wave of blockchain, digital finance powered by blockchain is likely to reshape the financial system of the entire world.

2. Overview of Blockchain Technology

2.1. The Basic Connotation of Blockchain

From a technical point of view in a narrow sense, blockchain is a type of distributed ledger that combines data blocks into a data structure in a chain-like manner according to time sequence, and uses encryption algorithms to prevent data tampering and forgery.

From the perspective of economy, technology, society, etc., blockchain is a distributed point-to-point network information architecture. It uses blockchain data architecture to verify and store data, and uses distributed node consensus algorithm to generate and encode , and innovative data, and use encryption to ensure the security of transactions and data transmission and reading, and can also apply smart contract programming and operation application functions composed of general script coding.

The interpretation of the broad category of blockchain has gradually been accepted by all sectors of society. According to a survey by the World Economic Forum in Davos, by 2027, 10% of the world's GDP will be directly or indirectly realized by the blockchain. It can be seen that the digital finance powered by the blockchain will have great potential.

2.2. Main Technical Features

2.2.1. Free from Centralization

It can be said that almost all the current database management mode is centralized record and centralized storage--centralized management. Even remote disaster recovery and cloud storage only change the storage place from one place to multiple places, and from local to cloud. However, blockchain adopts a pure mathematical approach for distributed storage and recording. Every node can record, store, maintain and other operations of data without the participation of centralized systems or third-party institutions.

2.2.2. Trust-free

In the conventional internet mode, it implements information matching, verification and accumulation of trust through a trustworthy central point or third-party channel, while in the open and transparent operation mechanism of the blockchain network, it is impossible for nodes to communicate between system rules and They deceive each other within the time frame, so there is no need to establish a pre-set trust mechanism (such as transaction endorsement, guarantee verification, etc.), and the two parties can still connect and trade.

2.2.3. Immutable

Each node in the blockchain architecture will dynamically store the latest permission-based backup of complete database information. It is ineffective to tamper with the database information of a node alone. Because the system is automatically compared, the accounting record information that occurs multiple times with the same data can be confirmed and uploaded to the chain. In layman's terms, if hackers try to tamper with or destroy the entire block, they must control 51% of the nodes and master 51% of the block data to be recognized by the system, which is almost impossible. Because in reality, it is meaningless to launch a 51% attack, and the cost of controlling 51% of the computing power of the entire network is far greater than the benefits obtained after a successful attack. Therefore, blockchain technology has the advantages of being safe and reliable, and the more nodes involved, the more secure the blockchain is.

2.2.4. Openness and Transparency

Different from the traditional data query mode, only the administrator can see the complete data and the parties can only see the personal transaction information. Except for some personal private identity information that cannot be shared publicly, other information and data can be open to all traders, and each trader can publicly query and trace the ins and outs of any transaction as a manager and supervisor. Blockchain transactions are automatically recorded by the system, thus ensuring that the data is highly transparent and open.

2.2.5. Anonymization

Because the data exchange of transactions between nodes follows established encryption algorithms, the relevant process rules, such as smart contracts, will actively determine whether the data exchange is valid. This data exchange is based on location rather than real individuals, so it can be implemented appropriate protection for individuals who come and go in reality. Of course, anonymity may also make regulations such as anti-money laundering and anti-terrorist financing more difficult.

3. The theoretical Basis of Digital Finance with Blockchain As the Engine

3.1. The Digital Economy

In "The Digital Economy Era", Puscott clearly clarified that the digital economy is the new economic system of the information age, and the digital economy is the digitalization of all information and knowledge. Digital economy is an economic revolution dominated by digital technology: under the influence of digital technology, production, operation and circulation are first digitized, and then various commercial economic activities and the digitalization process of traditional industries and emerging industries are achieved, so that the social and economic efficiency has been significantly improved. Digital economy is the theoretical cornerstone of digital finance with blockchain as the engine. Digital financial promote the fusion of computer and communication technology, digital information will all assets, and applied in block chain, to goods or services of the production, trading and supply process of digital transformation, makes the traditional routine industry became the new digital transformation, it will cause a new round of economic model of social change, create a new economic system. Digital

finance is a practical application in the digital age under the principles contained in the digital economy.

3.2. Free Money Theory

In his book *The Denationalization of Money*, Hayek argued in favor of an individual currency creation system based on various technologies including a commodity basket index, which made it possible for multiple currencies to coexist in a region or country. Such a personal currency system has the characteristics of being free from centralization and denationalization. The free competition of various currency systems will benefit the public and bring about a more stable currency. The theory of free money has guiding significance for digital financial behavior. In the digital financial system, different digital currencies can be freely exchanged at zero cost, which greatly improves the efficiency and convenience of people's transactions.

3.3. Information Asymmetry Theory

American economists Akerlof, Spence, and Stiglitz believe that in the process of trading goods or services, buyers and sellers receive different information, and traders with information advantages will use this aspect to Get more benefits, even harm the other party's interests, and also create credit problems. This theory provides methodological guidance for digital finance. The blockchain technology in digital finance attracts traders to join the overall accounting system through mining awards, achieves the optimal allocation of resources, and accepts more resources to participate in the system, thus establishing that everyone can participate, The centralization-free credit system that everyone participates in greatly eliminates information asymmetry in the transaction process of goods and services, and traders in the system can complete transactions without going through a central platform or third-party institutions.

4. The Main Application Mode of Digital Finance with Blockchain As the Engine

4.1. Encrypted Digital Currency: From Controversial to Today's Gradual Attention, the Primary Factor in Digital Finance

From the beginning of barter to the popularization of physical currency to the emergence of digital currency, the credit meaning of currency keeps expanding. The Central Bank of China pointed out that the release and circulation of digital currency can firstly reduce the high cost of issuance and circulation of traditional banknotes, and improve the convenience and transparency of commercial trade and other services; it can also consolidate the People's Bank of China's control over currency supply, demand and circulation. Promote the optimization and upgrading of China's financial infrastructure, and promote the continuous development of the economy to improve quality and efficiency. There is no doubt that all countries in the world have a general consensus to promote the development of digital currency, the most critical factor in digital finance powered by blockchain.

Ecuador and Tunisia took the lead in publishing encrypted digital currencies at the national level to solve the troubles of inclusive finance and greatly improve the convenience of

people's daily life.

In February, JPMorgan Chase announced that it would issue the digital currency JPM Coin. JPM Coin is blockchain-based and enables instant payment transfers between institutional accounts. In June, Goldman Sachs CEO David Solomon said in an interview that a digital currency will be issued in the near future. In September 2018, the New York Department of Financial Services (NYDFS) has approved the applications of two companies, Gemini and Paxos, to issue stablecoins. Their stablecoins are based on blockchain technology and are pegged to the US dollar. Both companies intend that stablecoins can become a more efficient payment and settlement method in addition to fiat currencies. Facebook is also coming in to announce that it will launch a digital currency libra.

China's central bank revealed on September 5 that the central bank's digital currency has entered the closed-loop testing stage.

4.2. Digital bills: The Embedding of Blockchain Makes Digital Bills Highly Efficient and Low-risk

Bills are the original blood that supports the operation of different financial businesses, and are also the basic information carriers in the financial industry. In recent years, with the continuous development of the bill market, a series of problems and chaos have followed. For example, speculative and other fund idling activities are carried out from the real to the virtual; some institutions use trust, fund management and other means to expand the bubble of bills; some companies also make fake accounts and open bills to defraud loans. The root of the above problems lies in the fact that there are loopholes in the traditional operation process of bills, which leads to opportunities for people to take advantage of them. The generation of digital bills provides a new idea for dealing with traditional bills. The digital bills based on blockchain technology combine the technical characteristics and bill attributes of the blockchain, and are more convenient, safe, intelligent and efficient. Advanced form of bills.

4.3. Consumer Finance: Blockchain Helps People Consume and Improves Financial Inclusion

With a series of companies including major e-commerce companies (Alibaba, JD.com, etc.), insurance, banks, consumer finance companies, consumer enterprises, small loans, funds, and P2P online loans entering the field of consumer finance, various consumer finance systems continue to emerge, such as: Cash loan, consumer loan, installment payment consumption (typical representative is Alipay Huabei), consumer crowdfunding, consumer asset securitization, consumer refund, etc. Consumer finance can be seen everywhere.

Blockchain technology explores the market potential of emerging countries or regions. Through information sharing in underdeveloped regions, free market competition prevents one party from forming a monopoly and expands the coverage area of inclusive finance.

4.4. Payment and Clearing: Blockchain Technology Makes the Payment and Clearing Ecosystem More Efficient and Secure

Between financial institutions, pay in the process of the organization to carry out the payment and settlement with the bank, is through the center node to process the data, the background of dealing with specific time, specific procedure is needed to succeed, some tedious trade have to manually register and verify, after the cross-border trade, capital can't arrive with the goods at the same time, the cause of delay clearing funds, This impairs the efficiency of clearing payments. In order to improve the payment efficiency and stability of the payment and settlement system, it is necessary to optimize the system structure of the payment and settlement system, and blockchain technology provides a feasible way for it. A network payment clearing platform is established, which is based on the distributed architecture of blockchain, thus improving the clearing efficiency and greatly reducing the operating expenses of payment institutions. This can be realized by providing the same uniform and public transaction payment clearing method for payment clearing between companies and institutions through this platform. If cross-border payments are combined with blockchain technology, the clearing of transactions can be completed synchronously on the chain, shared by participants and updated in a timely manner, and the clearing efficiency of the payment clearing ecosystem will be greatly improved.

4.5. Securities Investment Trading: Simplify the Securities Trading Process, Improve the Payment and Clearing Efficiency of Institutions

Securities investment transaction is a typical transaction operation centering on the centralized structure. Whether in the previous stage of paper physical securities investment transaction or in the electronic trading stage of the information age, a central node (central organization) is needed to make a guarantee transaction for an investment transaction. This kind of traditional central organization operating through the central point has three hidden dangers: first, the traditional securities trading system is vulnerable to attack; Second, it is more difficult and inefficient to supervise systematic technical risk. Third, the cost of capital and transaction compliance assessment is higher. With the support of blockchain technology, the issuance, circulation, storage, payment and settlement of financial products in the securities industry will become more efficient, safe and stable, and the cost can also be significantly reduced, but also reduce the frequency of market violations such as dark operation and insider trading. Goldman Sachs report once pointed out that, The embedding of blockchain technology in securities investment trading in the US could reduce costs for the US securities industry by around \$2 billion, and globally the savings could exceed \$6 billion per year.

In particular, such as Chinese stock in the secondary market trading, often mutual coordination of various agencies is needed to make a deal is completed, and through the free block chain technology centralized and intelligent the features such as contract, can the independent and efficient finish all the work, secondary market trading securities in the secondary market trading efficiency on a large stage, And due

to the uninterrupted operation characteristics of blockchain technology, each participant can trade 24 hours a day, which provides convenience for the conclusion of bidding transactions in the securities settlement or clearing stage.

5. The Main Problems and Challenges of Digital Finance with Blockchain As the Engine at The Present Stage

5.1. The Legal Framework of Digital Financial System Is Not Yet Complete

At present, the global legal framework of blockchain digital finance is not mature enough. The development and application of blockchain technology will progress day by day, and its combination with financial regions will continue to deepen. The current legal and regulatory mechanisms are far from meeting the needs of the rapid growth of digital finance, which will cause a great destabilizing impact on the development of domestic and even the world's financial industry.

5.2. Blockchain Technology, The Technical Foundation of Digital Finance, Needs to Be Further Improved

On the whole, the application of digital finance is still in the stage of small-scale exploration and practice, far from the large-scale implementation of production. Given the distributed nature of blockchain, it is almost impossible to copy the security defenses of a centralized information database system with exactly the same central structure, so it is necessary to develop new risk management techniques and emergency countermeasures.

5.3. The Talent Reserve of Blockchain Digital Finance Is Insufficient

At present, the number of financial talent reserves pain points is that man with a financial professional, they don't understand computer science, software and hardware, the development and application of network coding, encryption algorithm technology, mathematical principles and other disciplines and professional skills, not to mention the deep understanding of block chain value system, and more than familiar with and proficient in computer and chain blocks in knowledge and technology, I don't know much about finance. In general, blockchain digital finance professionals are far from enough, and the application and industrialization process of blockchain digital finance need interdisciplinary talents with both technology and financial operation.

6. Suggestions on the Development of Blockchain Digital Finance

At present, the digital financial development is block chain from exploring and using the standardization of the golden age, our country has obvious advantages in the application level, such as the number of Internet and business application scenario, we should strengthen the fundamental block chain technology r&d technology application for the exploration and innovation, win at the national level to form for the rest of the commanding heights of innovation and voice. Specific countermeasures and suggestions are as follows:

6.1. Promote the Construction of The Corresponding Legal and Regulatory Framework for Block- Chain Digital Finance, And Create A Good Institutional Environment for The Application and Standardized Development of Digital Finance

It is necessary to legislate the blockchain digital finance framework in the legal system, give the corresponding legal status to blockchain technology, drive the development and application of blockchain technology, and promote the operation of blockchain digital finance within the framework permitted by law. Through the use of chain blocks, on a base of automatic control and data sharing, change the status quo of today's financial regulation and various control, establish cross-department risk defense and law enforcement coordination mechanism, through the new technology to create a cross-industry financial information digital infrastructure, a regulatory and market data comprehensive coordination, and sharing of the Internet.

6.2. Comprehensively Promoting the Research, Development and Application of Digital Financial Blockchain Technology

When blockchain appeared with Bitcoin, there were still many uncertainties in this new thing. Now, after several years of development, it has gradually attracted the attention of all parties, and various innovative products and projects related to it have emerged in an endless stream. The research and development basis of blockchain technology in China is still relatively weak, and the application of blockchain digital finance is still in the preliminary stage. We should work together to tide over the difficulties, and try our best to launch perfect research and development projects of blockchain technology in a relatively short period of time. Under the leadership of the People's Bank of China and other institutions, the research and development of digital financial applications such as digital currency, digital bills, securities investment and trading, consumer finance, intelligent insurance industry and intelligent credit investigation should be strengthened, so as to promote the establishment of universal business service platforms at all levels and provide technical support for social companies and enterprises. In addition, it is necessary to create a reliable security defense system by analyzing the different characteristics of the combination of finance and blockchain, so as to escort the promotion and application of digital finance.

6.3. Firmly Promote the Development and Expansion of Digital Financial Talent Reserve

Talent is the bottleneck restricting the further development of blockchain digital finance. In order to realize the vigorous development of the digital finance industry, it is necessary to continuously expand the talent reserve of digital finance, and it is far from enough to recruit talents from the fresh graduates every year. First, we should select outstanding talents from universities or enterprises to study and study in world-renowned universities, scientific research institutes or top enterprises, so that potential financial business talents can be armed with blockchain technology; Second, we should establish a special talent cultivation mechanism and invite

outstanding experts and professional teams at home and abroad to cultivate interdisciplinary talents in digital finance; Third, by holding a series of national and even global forms such as "blockchain digital financial innovation Competition", we can explore the digital financial complex talents and cooperation teams with cultivable potential.

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