

CHAPTER-6: BLOCK CHAIN TECHNOLOGY IN FINANCE

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Introduction

For a long time, technology has taken over the world. Daily needs are expanding in our daily lives and people are starting to adopt new technologies. Simply put, block chain is a distributed and secure ledger that records transactions in a network. Stores all changed data in a buffer. Assets (houses, cars, cash or land) can be intangible assets (intellectual rights, patents, copyrights, brands). Almost anything of value can be tracked and sold via the block chain network, reducing risk and cost for all parties.

Three main features that define block chain. First of all, the block chain repository must be cryptographically secure. Simply put, to access or contribute data you need two encryption keys: the public key (the actual location in the database) and the private key. Private key is the unique key that the network needs for authentication. The second digital log or transaction storage is block chain, meaning it takes place online. Finally, block chain is a database that can be accessed over a public or private network. Bitcoin block chain is one of the most famous public block chain networks. Anyone can create a Bitcoin wallet and join the network as a single person. Private networks may exist on other block chains. These are better suited for banks and fintech, as everyone needs to know who is participating, who has access to the data, and who controls the private key for the information. Federated block chains and hybrid block chains are two types of block chains that combine many aspects of public and private block chains.

A "block" is where all data modifications or modifications are stored while accessing data in the block chain. Stored transactions can be encrypted using a unique, immutable hash value, such as that generated by the SHA256 algorithm. Old data is merged instead of writing from new data to help track changes. Additionally, since all transactions are encrypted, the data is immutable, allowing the network to identify and reject changes to the list. When changes are gradual and unregistered, and blocks of cryptographic information are continually "linked" together, a perfect historical audit is created that allows access to previous iterations of the block chain.

Many nodes, often referred to as approval mechanisms, are required to check and verify the accuracy of new information when it is uploaded to the network as permission or financial support. Once confirmed, a new block is created and added to the chain. The block chain ledger is then updated across all nodes.

The first foundation of the public block chain network to ensure the integrity of transactions is financially beneficial. Doing this is called "mining". Buyers and sellers can exchange cryptocurrencies online through block chain technology, without the help of banks or other intermediaries. Any value can be exchanged in this network; Bitcoin is a popular example of this. With block chain, the process of recording transactions is not necessary. It is an efficient, effective and safe system. Bitcoin relies

on the block chain, which has been proven to be used beyond cryptocurrency, to record its transactions.

Cryptocurrencies and all other digital assets are created with block chain technology. A number of block chain or cryptocurrency applications called “decentralized finance” (DeFi) aim to replace the role of existing financial intermediaries through smart contract services. Decentralized management, just like block chain, means that anyone who has access to the program has the right to make changes or additions to it. As a result, users now have direct control over their money. Traditional financial institutions such as banks and exchanges are adopting block chain technology to manage online payments, accounts and business transactions.

The "New Financial Internet" progressed based on block chain and changed many things, especially the financial sector. As of 2015, many major financial institutions around the world began developing block chain business plans. Goldman Sachs, JPMorgan Chase, UBS etc. Many major banks in the world, including, have established their own block chain research centers. Goldman Sachs has even filed a patent for a block chain- based trading solution. Other national exchanges, including the Nasdaq Stock Exchange and the New York Stock Exchange, are also conducting intense research into block chain technology.

The Main Concepts behind Block Chain are

- 1. Public Ledger** A shared ledger is a distribution of information that is “linked only” and distributed throughout the organization. The transaction is closed only once by joint transaction, which reduces the competition of traditional use of transaction network.
- 2. Authorization:** Because of the authorization, business authorization is safe, reliable and authentic. “By limiting the ability to participate online, organizations can easily comply with data protection laws, such as those set out in the Health Insurance Portability and Accountability Act (HIPAA) and the EU General Data Protection Regulation (GDPR)³.”
- 3. Smart contract:** A smart contract is “an agreement or code that governs a business transaction; it is stored on the block chain and determined as part of a transaction.” Network analysis. Block chain has many consensus methods, including PBFT (Practical Byzantine Fault Tolerance), multi-signature, and proof-of-stake.
- 4. Consensus:** All parties consent to the network-verified transaction by consensus. Block chains contain a number of consensus procedures, including PBFT (practical Byzantine fault tolerance), multi signature, and proof of stake.

History of Block Chain Technology

The history of block chain technology dates back to the 1970s, when computer scientist Ralph Merkle patented a hash tree (sometimes called a Merkle tree). These trees form the basis of computer science for storing data by connecting encrypted blocks together. Stuart Haber and W. Scott Stornetta developed a system using Merkle trees to prevent tampering with timestamps in the 1990s. This is the first event in block chain history.

Before - Bitcoin and other Virtual currencies

An unknown person or group known only as Satoshi Nakamoto defined the current version of block chain technology science in 2008. Satoshi Nakamoto's Bitcoin block chain idea uses a 1MB block of data for Bitcoin transactions. Many aspects of the Bitcoin block chain system are still important to modern block chain technology.

Second - Smart Contract

Innovators began exploring the use of block chain over Bitcoin a few years after the first generation of money was announced. For example, the creators of Ethereum have chosen to support block chain technology in asset transfers. Smart contract operation is a big plus for them.

We - The Future

Block chain technology continues to evolve and expand as businesses discover and implement new applications. Businesses have overcome scale and computing limitations, and the ever-changing block chain offers many options.

Block Chain Technology Projects

Decentralization

Decentralization in the context of block chain means the decentralization and transfer of power from centralized entities (the same person, organization, or group) to network roles. In a decentralized block chain network, transparency increases trust between participants. In addition, these networks can prevent users from interfering with the network.

Immutability

If something does not change, it cannot change or change. Once a change is added to the shared list, other participants cannot change it. To fix the error in existing transaction data, you need to create a new transaction; There will be two processes on the network.

Authorization

Block chain systems create rules for authorizing participants in recording transactions. New changes are saved only if approved by a majority of network users.

Use of Block chain Technology in Finance

Investment of Funds

Available funds - used and expensive. Current systems involve manual processes that use multiple storage locations. Service providers can use block chain in the financial field to record users' legal, personal and public information on the block chain. These could be:

- Reducing errors and fraud
- Keeping an open mind

- Information is easier to find

The capital market can instantly get information about the user's data: It does not change the Smart Deal. If a person refuses to share information, entry will be denied. Users can also specify user information and reasons. Therefore, block chain in financial services can increase the transparency of the investment process.

Financial Records

Businesses plan to use block chain to store immutable records of financial records such as:

- financial history
- dividends
- Profits received

Smart contracts It gives many investors access to the information they need. For example, business owners should have access to confidential information, while interested parties should only have access to public information. Therefore, block chain in financial services can help organizations increase transparency in financial processes.

Stock Exchange

The market now includes organizations such as regulators, brokers, exchanges, etc., which increase the value of the system. A decentralized approach to business management can increase efficiency. Block chain could eliminate the need for third-party regulators, as smart contracts can be used to create regulations.

IPOs

Excessive fees for investors, private equity firms and banks make the entire IPO process expensive. Therefore, the stock market is ready for decentralization. To reduce costs, block chain ensures that all aspects of contact between investors and companies are secure without intermediary.

Government Spending

Governments around the world are using new ways to reform legal systems and improve public relations. Advances in technology allow public finances to become more open, thus making the system more reliable. The residents will follow how much money is spent on road construction. The fight against public corruption could be avoided if the government started using public block chains to link data on the city's spending. Therefore, using block chain in government financial services will increase reliability.

Lending Platform

Until block chain, people needed intermediaries to establish trust and complete transactions. Borrowers and borrowers can directly negotiate interest rates, number of payments, and transaction length using immutable smart contracts. Smart contracts allow lenders and borrowers to negotiate terms. If the borrower defaults, the smart contract adds late fees to the total amount owed to the borrower.

Political Financing

The chain of records of public funds received and distributed by a political party in blocks will provide transparency to voters. Voters can make better choices between political parties using block chain.

Invoice Management and Billing Solutions

Businesses accept electronic payments but do not have the necessary standards for invoicing to be effective. Companies using block chain in financial transactions can use smart contracts to send invoices to the block chain. Block chain provides information such as transaction expiration date, payment amount, customer information, etc. can store information. After the payer pays, the smart contract changes the invoice to “Paid” and notifies the company that the payment is complete. In financial services, Block chain can help determine whether customers can make transactions safely.

Best Block Chain Enterprise Protocols

Hyperledger Fabric

The Linux Foundation maintains the Hyperledger Fabric platform, an open source block chain architecture. It has a dynamic and interesting development environment. Permission Fabric networks are secure because all members are identified and known.

R3 Corda

It is a customized service ideal for banking transactions and verification. It uses decentralized ledger software and confirmation methods to ensure transparency, traceability and transaction analysis. It has five principles: longevity, stability, stability, scalability and error-freeness.

Kaleido

With Kaleido, it is easy to create a multi-region, multi-cloud block chain network based on Hyperledger Fabric, Cluster, Hyperledger Besu and the Hyperledger Besu protocol. This greatly reduces the likelihood of an accident after the fact. All protocol options support Hyperledger, FireFly, Supernodes and the entire Web3 development stack.

Enterprise Ethereum

Smart contracts and legal authorizations are required for public block chain platforms. It also provides greater privacy while increasing speed and scalability.

Ripple

Ripple Net uses block chain technology to connect banks, organizations, asset exchanges and focus on faster payments. It has fast delivery, high security, faster payment and modern communication.

How Block Chain Technology will Change the Financial Industry

More discussion and analysis mainly about the future of financial industry block chain technology. Clearly, this concept has the power to change business logic and create new business opportunities. Block chain can be defined as a digital network of nodes operating in parallel, allowing information

sharing and authentication. Technically, it is a method of combining cryptographically signed blocks of data to create a permanent and immutable file.

Frequently used in cryptocurrencies such as the well-known Bitcoin or Ethereum, it is a block chain system that enables the use of threads without the need for an intermediary through "smart contracts" that ensure a good agreement between two parties. . Because of work. The system is based on simultaneous and complete data processing and is highly secure. Block chain technology is frequently used in this digital currency. Currency unit. Block chain technology was first used in the financial sector as it was developed for trading virtual currencies such as Bitcoin. However, over time, new technologies have developed and are now used in most industries. According to a 2018 Taactrica analysis, block chain usage will be greatest in the following 5 sectors: business, manufacturing, government, healthcare and insurance. These predictions came true in 2019.

The top ten industries using the block chain industry should be:

1. Payment
2. Shared credits
3. Crowdfunding
4. International currency exchange
5. Financial transactions
6. Shared credits
7. After work: checkout and settlement
8. Supply Chain Management
9. Patient record management
10. M2M IoT Asset Management

Freedom of money and finance, which will end the management of our money and business, is the freedom we will face.

This has an impact on the financial market and the creation of new jobs. The main problem facing business is keeping track of time while maintaining the high level of stability that is a hallmark of business.

The following statistics show what block chain has achieved and what it will achieve in the next few years:

- In 2018, commercial companies invested \$552 million in block chain; \$379 million was invested in distribution and commercial services.
- Increase safety and security To ensure transparency in services, 90% of banks in North America and Europe have invested in block chain technology. Accenture estimates the technology could help banks save \$8 billion to \$12 billion a year.

- According to some estimates from Wintergreen, the global block chain market was estimated to be worth \$708 million in 2017 and is expected to reach \$60 billion by 2024.

Block chain technology should not be viewed as a rival by financial institutions, but can and should be viewed as a good friend. Antonio Garca-Lozano, director of Grant Thornton Consulting, said: "This technology will not destroy banks, but will allow them to explore new niches and areas of doing business."

Challenges of Block Chain Technology in Financial Services

1. Inception, Implementation and Cost Tracking

Using block chain technology requires more investment. It requires a lot of involvement in terms of software and technology required to launch. Small investments and financial institutions may not be able to pay these fees due to their financial situation. Therefore, it is difficult for such organizations to use this method to immediately generate and record business. Cleaning is equally expensive. Financial institutions that view the system as a liability fail to account for high medical costs, thus reducing the company's overall revenue.

2. Data Modification

It can also cause data correction issues. Information collected by financial and financial markets, especially information regarding the economy, is frequently changed. As this competition drives change, block chain systems are becoming more of a burden than an asset for companies. For this reason, most financial institutions have decided not to use it to record transactions. Data entry takes a long time. Since many transactions will be made during the day in the banking sector, if the process is long, the data of each transaction will be delayed and will cause inefficiency in the system.

3. Knowledge Tips

Using the block chain system requires technical skills, especially computer skills. As a result, illiterate employees cannot enter correct information into the system. Therefore, it forces employers to hire literate workers. Hiring such people costs the company more. As a result, many companies decide to transfer their sales to their existing employees rather than using the system and then transferring it to some of their employees. The option is to provide training to existing employees. It is also a very attractive experience; therefore some businesses may choose not to use it.

4. Block Chain Timeframe

The length of time between transactions entered into the system is not verified. Because the system is opaque, it is impossible to predict how long the transaction will remain in the system. Financial markets often want to understand the future effects of past transactions. If the duration of this information is unknown, technology is useless in the financial market. The calculations of this system are complex and difficult for the average user. One of the main problems of today's block chain involves programming languages.

5. Block Chain Regulations

There are many block chain regulations. Such policies can challenge any company. To reduce installation time, most organizations prefer to run and use systems with minimum requirements. For

this reason, many businesses are affected by the long process and limitations in using block chain systems. 6. It depends on electricity and computer.

Block chain installation requires a computer. Therefore, computer problems such as system speed and viruses can affect the system. Computers need power too. Due to their dependence on electricity, these systems can become unstable when there is a power outage or shortage. Most companies need systems that can solve these problems. If a company chooses to use the block chain approach, a manual backup solution is required.

Conclusion

The use of block chain technology in the financial services sector will eliminate major barriers to access to restricted areas because the technology offers on-demand use on machines and even mobile phones. In this section, we will discuss the basic ideas behind block chain, the history of block chain technology, various aspects of block chain technology, the application of block chain technology in finance, how block chain technology will change the financial industry, and the Pros and Cons of Block chain Technology. . Block chain in finance. Banking and other financial sectors are largely adopting block chain technology. The use and impact of block chain should be further researched in the coming years.

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