

Implementation of Blockchain in the Banking Sector

Puneet Vernekar, Anushree P, Aritroo Kumar Chowdhury, Bhoomika S

Department of Artificial Intelligence and Machine Learning, New Horizon College of Engineering, Bangalore, India

ABSTRACT

Blockchain technology is transformative, and is expected to have a massive economic impact similar to the one the Internet has had in the past few decades. With the increasing innovation in technology for modernizing our lives, new ways to make day to day life effortless and quicker have been introduced. Banking industry is one such field that has been majorly impacted by the digital transformations with the aim of providing quicker transactions for enhanced customer services, cost efficiency and security. Banks have been used as the intermediary third party for carrying financial transactions from early history. With the advancements in technology, the banking industry has adopted one such technique to overcome this third-party intervention. Blockchain is a digital technology that offers decentralization, security and transparency of transaction records. Bank transactions are often considered non-transparent, inefficient and expensive, blockchain is a data structure that ensures that all of the above problems are taken care of. Blockchain gained its popularity after the introduction of the first cryptocurrency which is bitcoin. Almost every sector and domain have been trying to work with this technology to solve their complications. And this paper is a brief study of how blockchain works and can be used to revolutionize the banking industry.

Keywords : Digital Transformations, Banking Industry, Blockchain, Decentralization, Transparency, Cryptocurrency, Bitcoin.

Article Info

Volume 9, Issue 6

Page Number : 261-265

Publication Issue :

November-December-2022

Article History

Accepted : 01 Nov 2022

Published: 05 Nov 2022

I. INTRODUCTION

Blockchains refer to digital databases with no authority or power centralizing their functioning. Decentralization means that the authority of decision-making and supervision lies with a single entity. All the blockchain users have the same powers over the information they access on it. It is an open ledger that keeps tabs on transactions made between multiple

parties. Since distributed ledgers work as a platform of truth and trust because it is not easy to hack them. Furthermore, the tamper-proof structure ensures that all counterparties operate with the knowledge that they are all working with the same structure of the actual financial history. A sequence of transactions in a certain order links the data blocks which constitute the blockchain. Blockchain in payments ensures the quick processing of financial transactions. Blockchain

in banking can guarantee the reliability and security of data in ways that are beyond imagination with traditional security practices. It is emerging as one of the major technological branches in today's times. Many top financial and business firms have chosen to adopt blockchain to improve trade efficiency[1].

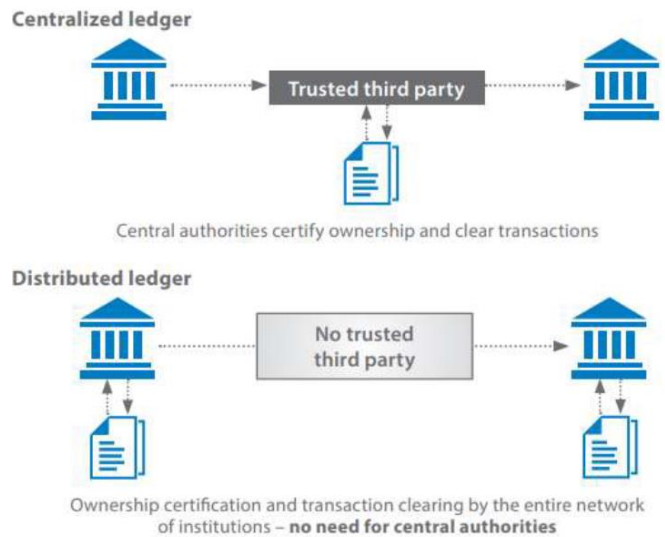
II. Applications in Banking sector

There are various applications of blockchain in banking sector, these are listed below:

1. Payments: Blockchain technology offers a secure and cheap way of sending payments that cuts down on the need for verification from third parties and beats processing times for traditional bank transfers.
2. Clearance and Settlements Systems: Distributed ledger technology could allow transactions to be settled directly and keep track of transactions better than existing protocols like SWIFT. Ripple and R3, among others, are working with traditional banks to bring greater efficiency to the sector.
3. Securities: Blockchain tech removes the middleman in asset rights transfers, lowering asset exchange fees, giving access to wider global markets, and reducing the instability of the traditional securities market. Moving securities on blockchains could save \$17B to \$24B per year in global trade processing costs.
4. Loans and credit: Blockchain-enabled lending offers a more secure way of offering personal loans to a larger pool of consumers and would make the loan process cheaper, more efficient, and more secure. The first live securities lending took place in 2018 with a \$30.5M transaction between Credit Suisse and ING.
5. Trade Finance: The use of blockchain and distributed ledger technology can support cross-border trade transactions that would otherwise be uneconomical because of costs related to trade and documentation processes. It would also shorten delivery times and reduce paper use. With approximately 80%–90% of world trade relying on trade finance, the influence of blockchain on the market would be felt globally throughout all industries that use cross-border trading.

6. Customer KYC and fraud prevention:

Blockchains can store customer information on different blocks, which could help prevent attacks on customer information. This technology for KYC purposes can bring down costs for the banking sector by up to \$160M annually.



III. Methodology

4.1 Blockchain

Blockchain is a decentralized transaction and data management technology developed first for Bitcoin cryptocurrency. The interest in Blockchain technology has been increasing since the idea was coined in 2008. It provides security, anonymity and data integrity without any third-party organization in control of the transactions, and therefore it creates interesting research areas, especially from the perspective of technical challenges and limitations.

It is an ordered, decentralized, immutable ledger that allows a recording of transactions in a network. The transactions are recorded in a block that is unchangeable and contains all the information of the transaction. Any transaction or information of value can be recorded and shared within the network[2]. The traditional ways of recording transactions are centralized, inefficient, expensive, redundant and this is where blockchain comes in use.

One popular example of blockchain is bitcoin- a decentralized peer to peer digital currency. Blockchain

is the technology behind bitcoin. Blockchain provides the foundation and means for recording bitcoin transactions – which can be used to record anything. Blockchain possesses many characteristics that can solve problems in different fields. The two main characteristics of blockchain are decentralization and immutability. Blockchain is decentralized, meaning that the records are distributed to all the parties rather than in a central ledger. It facilitates a peer to peer communication network and eliminates the need for third parties[3]. Since the third party is eliminated, the operation is faster and cheaper. Another interesting feature is immutability, meaning that once the transaction is recorded, it cannot be changed. In case the transaction needs to be updated, a new transaction is created and updated to all the networks. Transactions are verified by other computers in the network, and once verified they cannot be tampered. Thus, it provides high security and trust.

4.2 Types of blockchain

It is important for businesses to understand the different types of blockchain, before implementing it. The differences can be significant, and businesses should adapt the system that is best suitable for their business model. The three main types of blockchain are discussed below:

1. A public blockchain is a fully decentralized blockchain which can be used by anyone with a minimum resource. The main purpose of public blockchain is to remove the intermediaries and

Figure 4.1 Illustrates Centralized ledger and Distributed ledger

facilitate peer to peer transactions. The common example of public blockchains are Bitcoin, Ethereum, and other cryptocurrencies, which are openly available for anyone[4]. Each transaction is verified by the network before it is recorded, so they are highly secured. Public blockchain is expensive and slow compared to private blockchain, but it still outperforms the current systems used for recording.

2. A Private blockchain is a permissioned based type, meaning that participants need permission from central authority (to some level) to perform the task. It is not fully decentralized and is controlled by the intermediary. Each transaction is verified by authority before it is recorded[8]. Private blockchain is faster and cheaper compared to public blockchain. It is mostly suitable for corporate business and governance models. It has huge potential to increase the efficiency and decrease the operation costs. The use case of private blockchain can be online voting system. A sub-category of private blockchain is consortium blockchain which has same characteristics as private blockchain, except that it is owned by a group of entity.

3. A hybrid blockchain is a combination of private and public blockchain. It provides decentralized environment in a private network. It offers great flexibility and control over the data[5]. It is mostly suitable for highly regulated companies. XinFin is an example of hybrid blockchain built by combining Ethereum(public) and Quorum(private). It provides solution for global trade, finance, and supply-chain.

4.3 Working mechanism

Blockchain, the name is adapted from the way it works – blocks connected to form a chain. The transaction recorded in a block contains a hash (digital signature), hash of previous block and the ledger of all valid transactions. The hash links the block one after another and strengthens the verification of previous block. Thus, an immutable blockchain is formed. It is important to understand five concepts to know how blockchain works: a network of nodes, tokens, a structure, a consensus mechanism, and rules. Firstly, the network of nodes refers to each participant(computer) in a network. The nodes are connected to each other and checks for the validity of transactions[6]. The higher the nodes connection, the stronger the network. Secondly, tokens also called digital currency or cryptocurrencies represents an ownership of value. It can represent money or any

kind of assets and can be used to exchange value. Next the structure of blockchain is ordered series of transactions. Each block connects to form a blockchain. Then, the consensus mechanism works as a collective decision-making process, where each node in a network participates to determine the correct version of ledger. The nodes prevent double payment and manipulation of transaction[6]. There are two kinds of mechanism: proof-of-work and proof-of-stake. Under proof-of-work mechanism, network of nodes must solve complex problems to add new blocks to the blockchain. This is the reason; it is impossible to change the transactions as the third party must outperform the whole network. It is used in bitcoin. Proof-of-stake works based on the ownership of token. The network with highest token can create more blocks[7]. Finally, rules are set of protocol for communication between the parties. It defines the character of ledger systems. All five concepts pool together to form a blockchain.

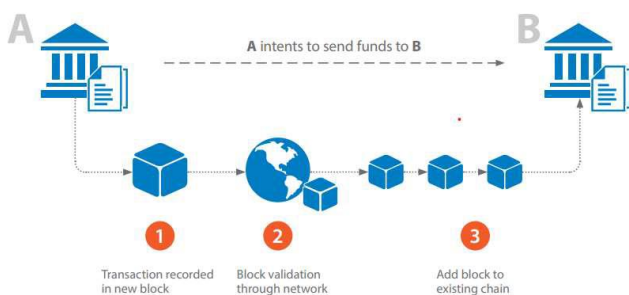


Figure 4.2 Illustrates the process of a blockchain

IV. Conclusion

The blockchain technology is about to cause a big transformation in banking industry. The technology seems promising to solve the inefficiency problems of banks by removing third parties, increasing efficiency, and decreasing cost. The five promising area where blockchain is going to impact are cross border payment, trade finance, knowing your customer, capital market, and regulation & compliance. Banks can perform cross-border trans-action faster and economical with blockchain than the current services such as Swift. The

re-duction of third party makes the transaction efficient and transparent to customers. Trade finance could be done efficiently and economically by drafting agreements with the help of smart contracts. Moreover, it can also help in tracking the trade delivery and reducing the risk.

Similarly, smart contract can be used to record, verify, and distribute the identity of customers within the banks in a blockchain network. This will save a lot of time and money for banks and will help regulation authorities to control the money laundering and other terrorism activities.

V. REFERENCES

- [1]. Chang Jia, Han Feng (2016) Blockchain: From Digital Currencies to Credit Society [M]. CITIC Publishing Group.
- [2]. Gautam Ivatury. Using Technology to Build Inclusive Financial Systems New Partnerships for Innovation in Microfinance[M]. Springer Berlin Heidelberg Publishers, 2009.
- [3]. Wang Wei. Review and Outlook of China's Banking Industry for the First Half of 2016 [J]. Report by Price water house Coopers, 2016-09.
- [4]. Mu Qi-Guo. First Report on Survey of Blockchain Technology: Potential to Disrupt All Industries [J]. Report by Chuancai Securities Co., Ltd, 2016-01-12.
- [5]. Roshan Khadka, "THE IMPACT OF BLOCKCHAIN TECHNOLOGY IN BANKING: How can blockchain revolutionize the banking industry?"
- [6]. C.Mallesha, S.Haripriya, "A STUDY ON BLOCKCHAIN TECHNOLOGY IN BANKING SECTOR", International Journal of Advanced Research in Commerce, Management & Social Science (IJARCMSS)
- [7]. Guo, Y., Liang, C. Blockchain application and outlook in the banking industry. Finance Innov 2, 24 (2016).

- [8]. US Federal Reserve Chair: Blockchains are potential shares, regulatory rules will not be formulated as yet [EB/OL].

Cite this article as :

Puneet Vernekar, Anushree P, Aritroo Kumar Chowdhury, Bhoomika S, "Implementation of Blockchain in the Banking Sector", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 9 Issue 6, pp. 261-265, November-December 2022. Available at doi : <https://doi.org/10.32628/IJSRSET229637>
Journal URL : <https://ijsrset.com/IJSRSET229637>