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Blockchain Technology in Banking Sector

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A B S T R A C T

In today's modern world where everything is technology driven from voice assistants to unified payment interfaces, People are into adopting more and more new methodologies and new technologies so as to cope with the need of modernization growing rapidly day by day. Blockchain is an elemental, underlying technology which promises trailblazing applications within the banking industry. Blockchain manages and stores transactional records along with ensuring security, transparency, and decentralization. There is a digital signature on every transaction on a blockchain, which demonstrates the genuineness of the blockchain. Blockchain contains blocks containing data that cannot be changed and uses cryptography to secure it. To tamper a record of a block in the blockchain, one needs to change records of all the connected blocks in blockchain, and one is required to change the distributed ledger too. This feature makes it nearly impossible to change the data entered in a blockchain. This technology acquired fame after the introduction of world's first cryptocurrency, called bitcoin. Banks are among the most authorized, long serving and greatest monetary middle entities in India. Modernization has been characterized by a few but massive changes in the banking sector. Blockchain technology if used effectively can restructure the upcoming future of the Banking System. This paper will illustrate transacting over a secured and reliable blockchain-based network and therefore will abolish the need for intermediary entities. This is a review-based paper that provides the information about opportunities of the secure Blockchain technology in the banking system.

Keywords:Blockchain, Bitcoin, Cryptography, Distributed Ledger, Decentralization.

1. INTRODUCTION

In today's modern world where everything is technology driven from voice assistants to unified payment interfaces, People are into adopting more and more new methodologies and new technologies so as to cope with the need of modernization growing rapidly day by day. Blockchain is an elemental, underlying technology which promises trailblazing applications within the banking industry [8]. Blockchain manages and stores transactional records along with ensuring security, transparency, and decentralization. There is a digital signature on every transaction on a blockchain, which demonstrates the genuineness of the blockchain. Blockchain contains blocks containing data that cannot be changed and uses cryptography to secure it. To tamper a record of a block in the blockchain, one needs to change records of all the connected blocks in blockchain, and one is required to change the distributed ledger too [6]. This feature makes it nearly impossible to change the data entered in a blockchain. This technology acquired fame after the introduction of world's first cryptocurrency, called bitcoin. Banks are among the most authorized, long serving and greatest monetary middle entities in India [2]. Modernization has been characterized by a few but massive changes in the banking sector. Blockchain technology if used effectively can restructure the upcoming future of the Banking System. This paper will illustrate transacting over a secured and reliable blockchain-based network and therefore will abolish the need for intermediary entities. This is a review-based paper that provides the information about opportunities of the secure Blockchain technology in the banking system.

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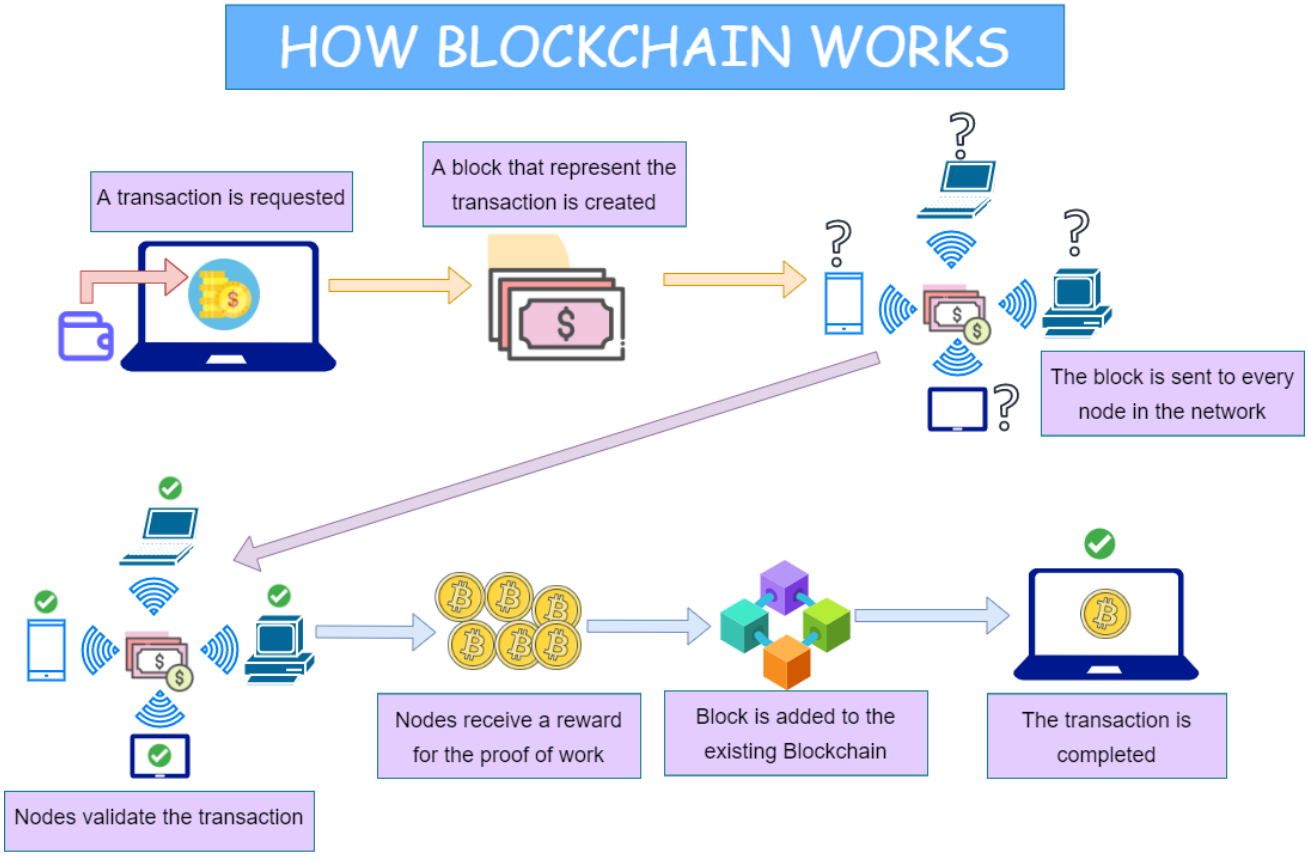
2. BLOCKCHAIN TECHNOLOGY

Blockchain is an elemental, underlying technology which promises trailblazing applications within the banking industry. Blockchain is basically a decentralized, distributed and an immutable ledger that allows one to record the transactions in a network. Blockchain provides a peer-to-peer(P2P) network to validate and confirm each transaction [14]. The elementary unit that records transaction, is unchangeable and contains all the information about the transaction is called a Block. The conventional ways of recording transactions are centralized, expensive, inefficient and redundant and this is where blockchain comes to rescue. Blockchain possesses many characteristics that can prove to be a panacea to tackle complications arising in various fields. The two major attributes of blockchain are decentralization and immutability [11]. Blockchain is a decentralized ledger, which means that the records are shared among all the bodies rather than being in a central ledger. Through blockchain the participation of the third party is eliminated which enables faster and cheaper operation. Another intriguing characteristic of blockchain is immutability which means that the transaction cannot be changed once it has been recorded already. If there is a need of updating a transaction, a new transaction has to be created altogether and is updated to all the networks. All these transactions are checked by other computers in the same network, and when verified cannot be tampered with [9]. This ensures reliability and trust. The most common application of a blockchain technology is a digital currency or cryptocurrency known as Bitcoin that allows online payment from one party to another without a need for third body.

WORKINGMECHANISM

Blockchain, as the name suggests is simply a chain connecting blocks. The transaction recorded in a block contains a hash value which is a type of digital signature, hash of previous block and the stored ledger of all valid transactions. Using the hash one block in the blockchain links with the another one and then strengthens the verification of previous block because of which an immutable blockchain is formed [3]. The five essential concepts to know about the working of the blockchain is: a network of nodes, tokens, a structure, a consensus mechanism, and rules. Each connected participant(computer) in a network sums up to making the network of nodes [2]. The connected nodes examine the validity of each transaction. The verdict formation is a collaborative process where every single node present in the network engages to check the appropriate version of the ledger also known as consensus mechanism. Any niggling fault or a blunder like double payment or manipulating the transaction are prevented by the nodes [5]. There are two types of procedures: proof-of-work and proof-of-stake. Under proof-of-work mechanism, network of nodes must be able to resolve complicated issues to join the newly formed blocks in the blockchain. Hence, it is nearly impossible to manipulate the transactions since the third party must be able to outperform the complete network. It is most commonly seen in bitcoin. [6] In Proof-of-stake the working is performed based on the ownership of token. The highest token network can generate more blocks. Set of protocols for communication between the parties are called rules. It defines the feature of ledger systems. These five concepts clubbed together forms a blockchain.



3. DO BANKS NEED BLOCKCHAINTECHNOLOGY?

Banking sector constitutes a major portion of global economy. Banks are the greatest and oldest financial intermediaries around the globe. The Digital World has reformed the banking sector and radically changed the banking industry. Over the years, the technology has cleared the way for electronic clearing service (ECS), online banking, Automated Teller Machine (ATM), real-time gross settlement (RTGS), electronic fund transfer (EFT), debit credit cards and mobile banking to the customers [10]. In Today's World, the banking sector is highly dependent on technology and so, blockchain can prove to be a revolution in the industry. Blockchain pledges a significant modification in banking and financial industries as it allows recording of immutable transactions in a block as well as eliminates the third parties [13]. Banking industry was solid and unbreakable because due to the regulation and compliance but recently, banks have been facing a serious conflict from Fintech i.e. Finance + Technology. Fintech provides services like trading and investment, clearing and settlements, payments, digital currencies, and other services and are standing up and innovating a new method of providing high quality financial services to its clients. Blockchain has attracted huge attention from banks, start-ups, private equity firms, and other financial institutions. The big banks such as Merrill Lynch, HSBC, J.P Morgan, The Bank of America, and many others have already applied a transaction with blockchain and are awaiting to execute the technology in their business representation [4]. Blockchain has the capability to transform the backend of banking industry and minimize huge volume of operational cost. The major reasons of blockchain having an upper hand are cost reduction, high efficiency, removal of third-party intervention and transparency. Blockchain not only improves the effectiveness and efficiency of a transaction by eliminating the decision-making time but also automates the quicker completion of record keeping and managing [11]. It also reduces the transaction and operation cost which implies that there is no need for the third party or a hefty brokerage fee for the payment and settlement. Blockchain uses cryptography to ensure trust and security of third party.

4. THE IMPACT OF BLOCKCHAININ BANKING INDUSTRY

The banking sector has been serving people with the services of faithful financial services since its establishment. Every financial transaction starting from trading going up to bank deposit is dependent on trust. Since, the clients remunerate for their trust they will naturally want their transaction to be managed securely and fairly. Banking systems are characterized to maintain the accounting systems and charge their clients for that. The work system in banking industry is monotonous, time taking and expensive [2]. To resolve these issues, several major banks together with the central banks are exploring the application of blockchain in their existing model. Banks are basically focusing on significantly minimizing the backend operational cost. Banks play an important role in the global economy and have faced many complications and hurdles in the past [5]. The Global Financial crisis of 2008 clearly demonstrated that, economy is highly sensitive to the participant's action and it can recur again. Hence, there is a requirement to analyse both merits as well as demerits of blockchain [14]. The query is basically about how can blockchain technology be utilized to construct a better financial representation model without causing any financial meltdown. Financial sectors including banks, and financial markets are completely resting over rapidly advancing technologies. Thus, blockchain technology has unending prospects to revolutionize the complete financial industry. Among the many impacts analysed, the four most important impacts of blockchain on banking sector are discussed below.

Cross-border payments

Blockchain technology can smoothen for banks to make direct economical and efficient payments internationally [10]. First of all, banks are required to have a blockchain networks of their own permitting them to pass on funds directly to another bank's network. All the transactions are recorded in the block and are immutable. Only the parties involved will be able to have access to the ledger and no middle men is allowed. This way blockchain technology has the capability to minimize the time and cost linked which is needed with SWIFT.

Trade finance

Banking sector plays a crucial role in financing the flow of goods around the World. According to the study done by the World Trade Organization (WTO) it was estimated that around 80 - 90% of worldwide trade was supported by trade finance. Trade finance is basically a payment guarantee provided by financial organizations to satisfy the trade transaction. Letter of Credit (LOC) is the most common form of trade finance [6]. Letter of Credit is nothing but a written and recorded document created by a bank in the name of the buyer promising the payment of the purchase amount to the seller on the due date and if not then the banks will be responsible to pay the sum. Blockchain can uncomplicate the complicated process of drafting the LOC [12]. Since the parties involving in trade will be having their own blockchain network so the information could be shared on a private distributed ledger and the agreement could be done with the smart paper work.

Know your customer

KYC an acronym for Know your customer is another vital application of blockchain technology in banking industry. Banks usually require quite an amount of time to finalize the KYC process for a customer. It is the bank's wholesome duty and obligatory task to record the information related to a customer and make sure that the details are checked prior to establishing any kind of financial transactions. At present, KYC is governed by a lawful framework to keep away from threats including money-laundering and terrorism financing. Also, customers are asked to submit their details to the bank in order to open an account with that respective bank [2]. The information is recorded in the centralized system of that bank and can only be accessed by them. Through blockchain, a client information can be recorded in a block and the block can be distributed among the different banks. It maximizes the effectiveness of operation and removes the redundancy.

Capital markets

Blockchain has a considerable potential to reshape the capital market trading. Capital market includes a huge working procedure and many a times takes an immense amount of time to settle the accounts. There are many conciliators in capital markets like credit agencies, brokers, investors, banks (mostly investment) and others

who diligently engage in the market. In today's world, these members maintain their ledger themselves. It is very time consuming and costly [6]. It involves a high counter party threat as there is an involvement of quite a number of parties. Blockchain technology can be used to maximize the effectiveness of custody securities services and that of the trade. It is quite obvious that the efficiency and transparency of any transaction can be booted up to a certain level if the engaging companies have a common blockchain system.

5. FUTURE SCOPE

In spite of the bright future of blockchain in banks there are still many challenges linked with it. Without addressing these challenges blockchain cannot be applied in real life scenarios of banking sector. Some of the problems implementing blockchain includes regulation, security and privacy, energy consumption, lack of understanding in trust and technologies and cost & efficiency. Regulation which means since a fully decentralized system is almost impossible to achieve and so, there must be some kind of a control on the financial institutions. Having no control means that there is no one to support during a bad period which can lead to an economical breakdown [9]. That is why regulation is required in Blockchain technology. Security and Privacy i.e. In spite being the most secured technology till date, the public blockchain distribute data among all the parties which can trigger risk of misuse of data. Private blockchain provides better security and privacy [1]. Energy consumption i.e. Another issue with blockchain is that it consumes huge amount of energy and leaves behind an immense carbon footprint [1]. Lack of understanding in trust and technologies i.e. In spite having huge potential there is a lack of awareness among people and organization about what it is and how it works due to which new ideas and investment cannot be introduced [9]. Cost and efficiency last but not the least it has a high cost and efficiency problem which depends on the types of blockchain used and the members forming the network. These limitations need to be addressed before applying blockchain in the banking sector in real life. There are further studies going on as in how to suppress these limitation so as to reap the benefits of blockchain in the banking industry.

6. CONCLUSION AND RECOMMENDATION

The outcome reveals that blockchain is about to create a huge amendment in banking sector. The blockchain technology seems to be quite capable enough to be able to resolve the issues arising in the banking sector. The four promising zones where blockchain technology can impact cross border payment, trade finance, knowing your customer and capital market. Banks will be able to perform cross-border transaction quickly and economically with blockchain as compared to the current services. The elimination of third party makes the transaction effective and efficient for the customers. Likewise, the smart paper work can be used to record, authenticate, and share the details of the customers among the banks in a blockchains network. This will save quite an amount of time and money for banks and will be helpful for regulation authorities to govern the money laundering and other terrorism threats. Trade settlement can be expected to complete in a real time with greater efficiency. The information stored in blocks in a blockchain is immutable and hence trusted by the regulators. Along with these, blockchain also comes with a handful of limitations as mentioned above which needs to be curbed down before entering any real-life scenarios. The main purpose of this research was to demonstrate the impacts of blockchain technology in banking sector and how it can pave way for efficient and transparent banking industry for the customer. To conclude, blockchain technology has a great potential to reshape the banking industry around the globe.

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