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Banking Transaction Handling Using Blockchain Technology

[1]Pranav Kasture, [2]Pratik Athare, [3]Aditya Kakad, [4]Mahendra Kale

[1,2,3,4] *Computer Engineering, Pune Vidyarthi Griha's College of Engineering Nashik, Nashik, India*

Abstract---

Blockchain, also known as a distributed ledger technology, stores different trans- actions /operations in a chain of blocks in a distributed manner without needing a trusted third-party. Blockchain is a chain of blocks each is being a storehouse that stores information referring to a transaction and links to the earlier block in the same transaction. These connected blocks form a sequential chain providing a pathway of the basic transaction. There are many threats and frauds detected in banking system. A centralized database is used by banking system which makes the attacker easy to get access to data and this makes the system insecure. Drawback of this centralized system can be reduced by reforming the system by implementing blockchain technol- ogy without using tokens. Blockchain uses decentralized architecture for storing and accessing data over the database. This reduces attacks on database hacked.

Keywords— Blockchain, Decentralization, Banking industry transformation

I. Introduction

Blockchain is a decentralized ledger used to securely exchange digital currency, perform deals and transactions. Each member of the network has access to the latest copy of encrypted ledger so that they can validate a new transaction. Blockchain ledger is a collection of all Bitcoin transactions executed in the past. Basically, it's a distributed database which maintains a continuously growing tamper proof data structure blocks which holds batches of individual transactions. The completed blocks are added in a linear and chronological order. Each block contains a timestamp and information link which points to a previous block. Banking and financial institutions are using Blockchain based technology to reduce risk and prevent cyber fraud . A block will have one parent but can have multiple child each referring to the same parent block hence contains same hash in the previous block hash field. Every block contains hash of parent block in its own header and the sequence of hashes linking individual block with their parent block creates a big chain pointing to the first block called as Genesis block. Bitcoin is peer-to-peer permission-less network which allows every user to connect to the network and send new transaction to verify and create new blocks.

The blockchain technology is a peer-to-peer distributed structure which could be used to overcome the issue in the traditional banking system. It is a collection of blocks that hold the encrypted transactional details sharing the same timestamp. The nodes of the network (miners) are responsible for linking the blocks to one an- other in chronological order, where each block contains the hash of the block created before in the chain. These hash values are the digital signature of each block and are dependent on two variables, first being the transactional details, and second is the hash value of the previous block. There are multiple hashing algorithms like SHA256, RSA to achieve this. Even a minute change in any of the two variables will have a significant influence on the digital signature throughout the blockchain; thus overall, it provides a good security measure in a public ledger

II. LITERATURE SURVEY

Decentralised blockchain technology: Application in Banking sector.

Nikita Rajeshkumar Bagrecha, Ishaq Mustafa Polishwala [1] To giving these functionalities in a distributed banking system using blockchain, which will be at par with the current methodologies. It will also focus on the limitations while implement- ing blockchain and future scope.

"Research of a Possibility of Using Blockchain Technology without Tokens to Protect Banking Transactions"

Natalia A. Popova, Natalia G. Butakova[2] To analyzes the protection mech- anisms of distributed databases, proposes a solution to the problem of maintaining the uniqueness of information in them based on Blockchain technology without to- kens and gives recommendations on the introduction of Blockchain technology into modern banking system The purpose of the work is the analysis and development of recommendations for the protection of information in geographically-distributed structures, typical of modern banks, based on the Blockchain technology

Application of Block chain in an Indian Banking Sector

D.Sharma[3] o figure out the platform, the initial point of this research is an analysis of how the technology operates and functions after that the benefit for busi- ness and economic transaction are analysed and afterwards the research deals with an impact of new technology on banking, above all on financial functions. The hy- pothesis is that blockchain has achieved a great impact on banking sector, also it has the potential to thoroughly modify only the financial and banking sector but also the way we buy and sell our interaction with the authorities as a way of authenti- cating the holding from the authorship. Using the available data and hypothesis of knowledge from the fields of technology, economics, finance, and politics, 4 scenarios were set up for the future of basic technology. The scenario combined with trend analysis in order to prove the starting hypothesis with high reliability, authenticated and accuracy.Banking progressively detect the power of this technology to exploit the benefits of the Fourth Technological Revolution. The research conclusion shows that the technology being checked already has a deep impact on the banking sector, that it is in the starting phase of modifying many industries, with the possibility that they will change them automatically in the next five to ten years.

Banking on Blockchain: An Evaluation of Innovation Decision Mak- ing

Priya D. Dozier ,Troy A. Montgomery[4] It explores the technology evaluation process concurrently as decision makers reacted to the potential uses, as opposed to a retrospective view after a technology innovation had been adopted. Evidence suggests that, organizations applied a specific process to determine the value of blockchain that consisted of understand, organize, and test, which collectively helped create the proof-of-value model. Surprisingly, they find that financial service organizations tend to view blockchain innovation as a lower priority due to the lack of a clear path to value. Additionally, financial service organizations consistently leverage industry con- sortiums to link to external knowledge and help with the decision-making process. Our findings have direct implications to both innovation researchers as well as prac- titioners seeking to evaluate blockchain technology

Blockchain application and outlook in the banking industry

Ye Guo , Chen Liang[5]Present the issues of implementing blockchain in financial sectors. It illustrates how some of the current major banking organizations are ex- ploring regarding the same. As it has been already stated that Blockchain is a truly decentralized system but under many scenarios a security of certain extent is required especially while dealing with money. Thus, they have compared Public Blockchains, Consortium Blockchains and Private Blockchains. They propose numerous financial institutions which can create a consortium blockchain which is the promising model in the banking industry. They have also proposed how industrial standards could be implemented using this technology

Application of block chaining technology in finance and accounting field

Liu Songyue, He Shangyang[6] They focuses on building an irreversible dis- tributed financial system based on large data in the context of large data in order to apply the scenario of "Block Chain Technology + Accounting Services" to the ac- counting industry, and prospects the application of Block Chain Storage Technology and Intelligent Internet of Things technology based on large data, providing inspira- tion for future research

Bitcoin: A Peer-toPeer Electronic Cash System

Satoshi Nakamoto[7] proposes a system for electronic transaction among con- sumers without relying on trust. Here the cryptocurrency is formed by a framework of digital signatures which provides ownership and prevents the problem of double spending. Also, a peer-to-peer network using Proof of Work (POW) is proposed to enable this system. Hence it is a robust and secure distributed system. This paper proposes a basic idea of using Hash values and Timestamp server so as to maintain the integrity of the cryptocurrency and the transactions by broadcasting a new cre- ation of block or a new transaction among all the nodes present in the network.

Exploration and Practice of Inter-bank Application Based on Blockchain

Tong Wu and Xiubo Liang[8] They illustrates that blockchain can be implemented for registration and documentation of various tangible and intangible goods like in- tellectual property rights, pictures, proof of property, vote statistics, smart contracts etc. As they all require a transparent and open information source. The major focus of the paper is about distributed databases where even if one or several nodes fail the transaction stored on the other nodes are not affected and the failed nodes can back up the information from the other nodes present in the network. They also illustrate that smart contracts basically put a set of contract terms into agreement among untrusted parties. It also initiates a solution to use blockchain to overcome traditional interbank payment issues by creating private blockchain networks thus such transactions are less prone to risk and are more time efficient.

Blockchain and its Application-A Detailed Survey

Supriya Thakur Aras, Vrushali Kulkarni [9]explains the concept of non-tokenized schema, blockchain taxonomy and hybrid solutions to become permissioned blockchain from permission less blockchain. Proof of Work (POW) protocol enables all the nodes in the network to solve a cryptographic puzzle by brute force and the winning node is rewarded with some revenue which is then broadcasted in the network. Proof of Stake (POS) protocol is basically block verification by miners using ethereum and altcoins which does not rely on excessive computations.

Blockchain Technology: A Literature Survey

Ibrar Ahmed, Shilpi , Mohammad Amjad[10] Provides the evolution of blockchain technology from Merkle tree to provide a secure history of data exchange. It explains the concept of asymmetric cryptography among nodes of a distributed network. This paper portrays a basic blockchain architecture that is the sequence of blocks and the inter-relation between them using the hash of the parent block. It also provides an architecture of the block where the block is divided into a block header and the transactional details.

III. Methodology

1. Authentication

2. Application for banking to handle the transactions.

3. Decentralized application.

4. Hashing Signature verification.

Working

In the proposed system, the typical bank design, which comprises on a centralized database, would be eliminated in the suggested system. The data will be dispersed widely over the block chain, making banking institutions decentralized.

This will not only make data more secure, but it will also decentralize authority. There are two advantages to the transaction method outlined above. To begin with, it will speed up transactions by eliminating the intermediary procedures that are now used in regular transactions, and it will also make it almost difficult for an individual to hack the system since it will demand a massive amount of computing power that no one possesses.

To implement the above-mentioned system, we can have two different types of nodes, verification nodes belonging to the bank and the user node for customers. And there will be multiple user nodes and verification nodes in a distributed system.

Verification nodes will be responsible for the authorized tasks such as verifying a customer's account, verifying a transaction and creating a block for a number of transactions for a given timestamp. And after creating the block it has to broadcast it in the network. User node is used by the customers so they can initiate a new transaction, view their account history and so on.

Each user node is meant to store the public and private key required for the user's transaction. Also, it will store the most updated blockchain. This will not only make the data ore secure but also will remove the power centralization. The transactions over the block chain will be in form of encrypted tokens which will be verified by each nodes on the block chain.

To make any transaction valid, the nodes of the block chain will have to give the proof of the processing it has done in order to verify the transaction. That proof will be taken in terms of the amount of processing done. The above mentioned transaction system has two benefits. this system would be able to implement a distributed system as well as the banking nodes could be semi-automatized so as to reduce work.
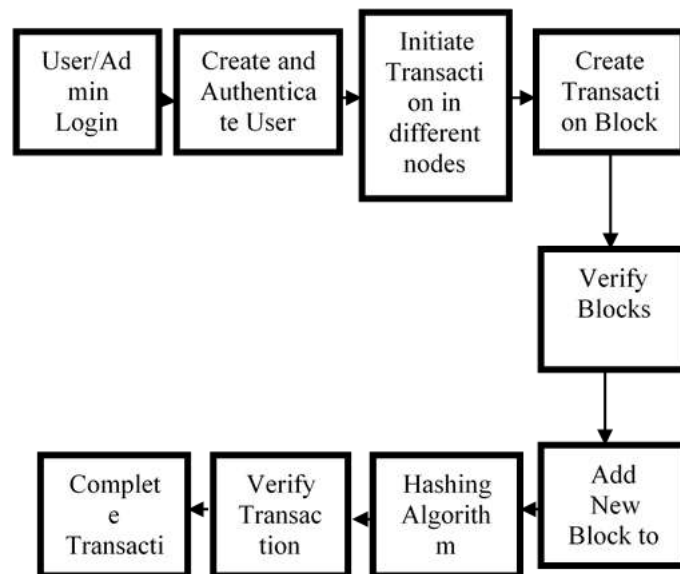

Fig. 1. Block Diagram

IV. Conclusion

To overcome the mentioned disadvantages of the traditional centralized banking system, blockchain technology can be used. Blockchain provides a secure and intrusion free environment for all the transactions occurring between the nodes. This helps in reducing the transaction fee and time, which is significant in traditional banking systems. Also, as this technology is under development, there can be multi- ple advancement in the future.

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