

# Blockchain Technology Used For Interbank Applications

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**Abstract:** The one important technological new idea/innovation is a blockchain concept in back of bitcoin system. Blockchain concept makes easier the payment transaction event by designing a decentralized, common ledger to make better the regularity scope and pull out unnecessary negotiators. In current days the technology of blockchain is widely adopted and used by the financial institutions/industries for the applications and exploration. In this paper initially we analyze the architecture concept of blockchain technology, later the principles/characteristics of the technology. In this paper we are using Ethereum instead of bitcoin for testing and for transaction purpose. Finally, the research accomplishments and the design of interbank application based on blockchain concept is implemented.

**Index Terms:** Blockchain, Smart contracts, Ethereum, Ganache, Metamask

## I. INTRODUCTION

“Blockchain is a name that tells it is a linked chain relationship between number of blocks”. It is having complete general transparent ledger because, it contains all agreed contract records of transaction [1]. Blockchain header is a unit, which can store’s the information and that record cannot be modifies. So, this system creates an open and transparent ledger system [2].

Blockchain is the digital, fixed/inflexible, distributive document/records, those record transactions are in consecutive manner. Each transactions or digital proceedings in the communal ledger has to be secured and authenticated through some agreements, which are applicable for those participants in the network [3]. It meant that no one individual can modify or change any data or transaction with in the blockchain network without the permission of other users in the network. So, it is transparent and clear that the concept of block chain is closely identical to the database [4].

Smart contract is one of the main features, which is used in blockchain technology. The smart contract is working as a “if-agree-then-okay” logic [5]. The use of smart contract does not require any human intervention. So, the smart contracts show that it can done individually and it is decentralized and operated without any intermediary [6].

There are 3types of blockchain

**I.PUBLIC BLOCKCHAIN:** This public blockchain is entirely decentralized and it has permission to read and write the data on the blockchain, they are equally shared by all the connected members of the blockchain that data is stored on the database. This type of blockchain network is completely based on trust less system.

**II.PRIVATE BLOCKCHAIN:** That particular organization has the capacity to change some rules of private blockchain and has the authority to reduce the transaction established on their rules and regulations.

**III.PERMISSIONED BLOCKCHAIN:** It is a hybrid network, combination of both public and private blockchain methods.

The one of the main difference between using blockchain technology for the payment transaction in banking sector and the traditional system of payment transactions is the structure of traditional system having very long procedures and as well as it took support from the intermediary bank and it is more time consuming process as well as there is no assurance and transparency in process of transaction of the payment. But by using this new technology that is blockchain it is very secured and authenticated like it is a transparent distributed general ledger as I mentioned before it doesn’t require any intermediary banks or persons. It maintains transparency between all the participants in the network, no need to pay the middle party fees. The main goal of implementation of this new blockchain concept is to solve the data accuracy and reliability issues in the payment transaction process. Blockchain is already used by many fields, by those scenarios the concept has a great major importance in the financing sector. The blockchain concept has a major characteristic of transparency, removing a intermediary and maintains distributed general ledger, which reduces consistency cost and increases the competence.

## II. EXISTING SYSTEM

In existing system, the payment transactions in the inter banks should connect with intermediary bank. Both sender bank and receiver banks should connect with middle bank and the two banks are not communicate with each other as well as those two are not getting all transaction details. Meanwhile, the intermediary bank is the holder or owner, having each and every authority to do the transaction [11]. It has the complete ownership of the transaction of both the banks. Also, it collects fee from both the banks. So, in the existing system there is no transparency between the banks and their transactions and also it takes more time to process the request/payment. By using blockchain it clears all these problems/issues by connecting the banks together and eliminates the intermediary banks [12]. The below figure shows the traditional payment transaction between the two banks.

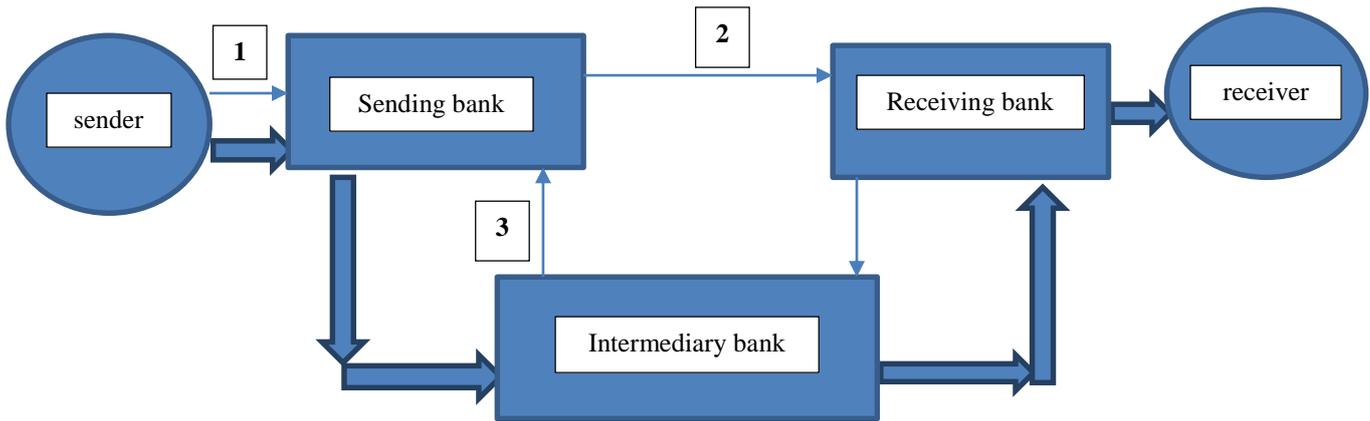


Fig 1: Traditional payment transaction in Interbank



### III. PROPOSED SYSTEM

In the proposed system, we are implementing the blockchain concept for the interbank applications to make the payment transaction. It makes easier, clearer and beneficial the payment transaction by eliminating middle party or intermediary bank. By using blockchain, the transaction is clear and transparent. Each user can get all transaction details done in the network if also that is not relevant to them. The transaction can be stored in the common database in the form of number of blocks added to the network. There we have a secret key to maintain the security that should not share with others for the profitable purpose. These conditions are coming under the smart contract concept. Smart contract is a concept or a program that satisfies all terms and conditions before register into the network. Specially we are using some tools as well as we consider the Ethereum as a money/capital to take sample tests. The requirements/tools are, Solidity is used to host the smart contracts, truffle used for the framework, ganache used for hosting environment, React JS is a coding language. By using these new tools and techniques we are implementing blockchain for the interbank applications.

The below figure shows the transaction process between the banks using new technology blockchain.

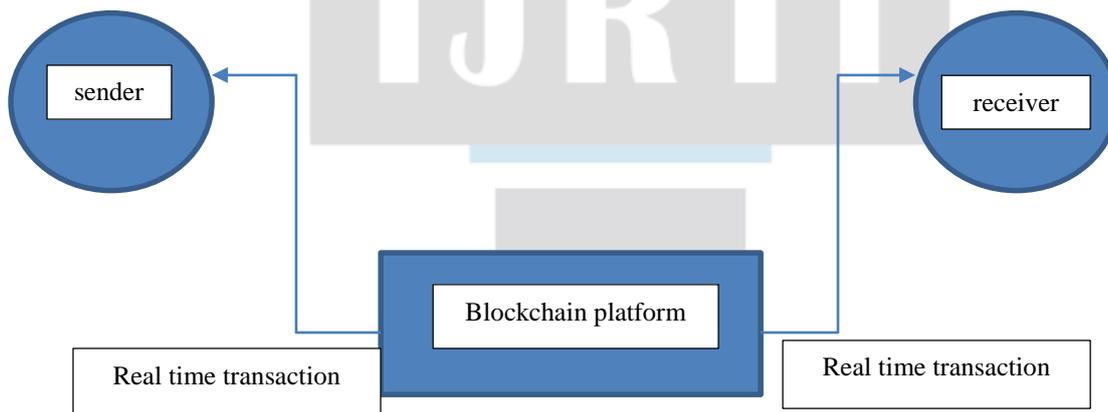


Fig 2: Payment transaction in interbank using blockchain platform

### IV. IMPLEMENTATION

In implementation of blockchain to the interbank applications we are used some tools as I mentioned in proposed part. Some tools are required to install, they are ganache, truffle, mist, Ethereum wallet. So, initially install and setup the tools which are required for implementing blockchain platform for the interbank applications.

In first step, after installing the tools open ganache and create the blockchain workspace. Next step opens the ganache and create the account, next we should open the NPM to run the code, finally open react app and create the account. In that account user needs to set the account number which is from the ganache. Finally, user can deposit the amount to his account, he can withdraw or

transfer to another user account. Each and every transaction activity is transparent and recorded in the database. Anybody of that network, can get the transaction details if also which is not relevant to them. This reduces the much time consuming, avoids brokerage fees, removes paper and pen method transaction.

The general concept of blockchain working is given below.

The architecture of blockchain usually includes some fundamental concepts. Where in earlier days data can be stored in a single server called centralized database. There were some issues of data loss when it crashes but by using blockchain it uses decentralization process, where data can be stored in multiple servers, it distributes the data explicitly in transaction process. Also, it is a general public ledge and transparent to all. The implementation of data in blockchain is replicated. Every person/user in this network area has same records of transaction. Aim of blockchain is to maintain general ledger, and not to give authority to any one single institution or authority.

Simple example of blockchain working given as.,

There are "FIVE" peoples in a network namely 'α', 'β', '£', 'Ω', 'π'. So now we need to follow some steps of blockchain to transfer 20 Ethereum from 'α' to '£'.

- i. 'α' wants to send 20 ethereum to '£'.
- ii. This ethereum transaction information is represented as a 'block' in online.
- iii. After that the block is broadcasted or distributed to all persons in network that is for 'β', 'Ω', 'π' these are now considered as a validator node.
- iv. Those nodes can get information and approve that the transactions is valid in network.
- v. After validating, blocks are become chain by adding, which is transparent transaction records.
- vi. Finally, ethereum transfer from 'α' to '£'.

At fourth step the validators 'β', 'Ω', 'π' are validate the data by execute some Cryptographic algorithms and evaluate them. In case of the validators cannot validate data due to some reasons then that data is rejected. So, it is transparent.

## V. ADVANTAGES AND DISADVANTAGES OF BLOCKCHAIN

- Blockchain includes decentralized transaction as well as it maintains general, transparent ledger. It supports near real time by removing friction. Each and every record stored in a common ledger which is shareable by all users in the network. Blockchain reduces server down time, risk of transaction and it avoids middle party fee in financial system.
- But, initial cost of setup is high and data stored in blocks as a chain structure, when you need verification data in traversal of chain operation which is of low efficiency. Blockchain having huge amount of check cost and storage space loss. Because if we enter the contract for each single node is more, then each node has infinite expansion. In content verification process, it allows as each node having all the content and that blocks have hashed. Where design of hash is nothing but rejects address reference or else reference information in address may not be true because there is no hash.

## VI. APPLICATIONS OF BLOCKCHAIN

- **Payment Area:** In interbank fund transfer the two banks sender and receiver will depend on central bank, which takes some days and also both should pay middle party fees but by using blockchain technology, it generates general ledger so need not to depend on intermediary bank, payments carried out directly between the two banks. Hence it reduces time consumption and removes intermediary fee.
- **Interbank bill transaction:** Now a day's interbank bill transactions are not formed independently by trading center as well not having a correct authorized platform of trading. They establish a clearing house, maintains electronic bills. Central banks are dominating and facing data loss problem. But there is no central bank in blockchain concept, it maintains decentralized platform so clearing house itself provides matching services.

## VII. RESULTS



Fig 3: User register page for transaction

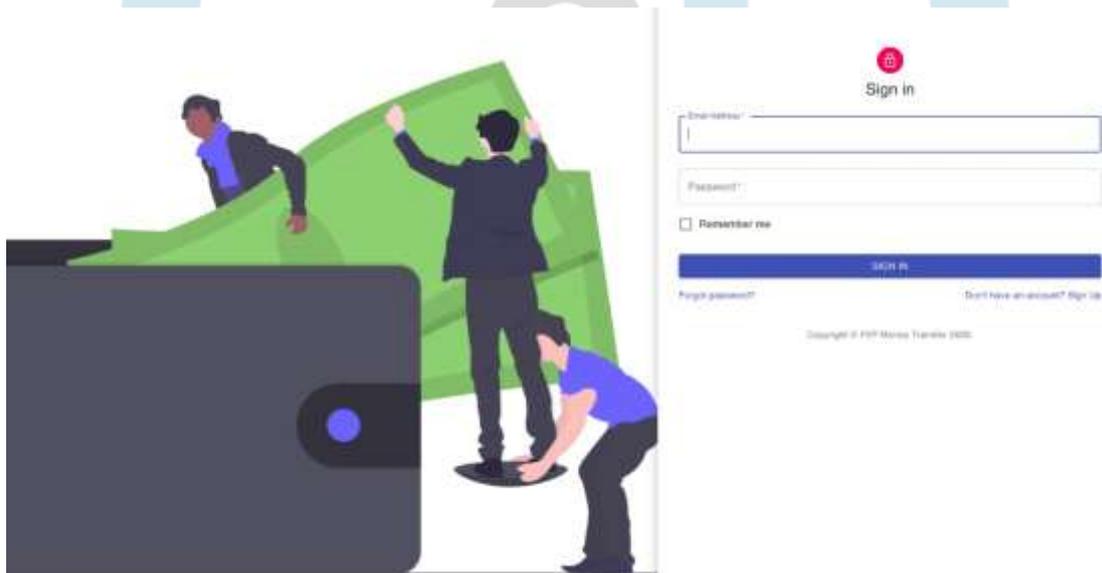


Fig 4: Signup page for transaction of account holders

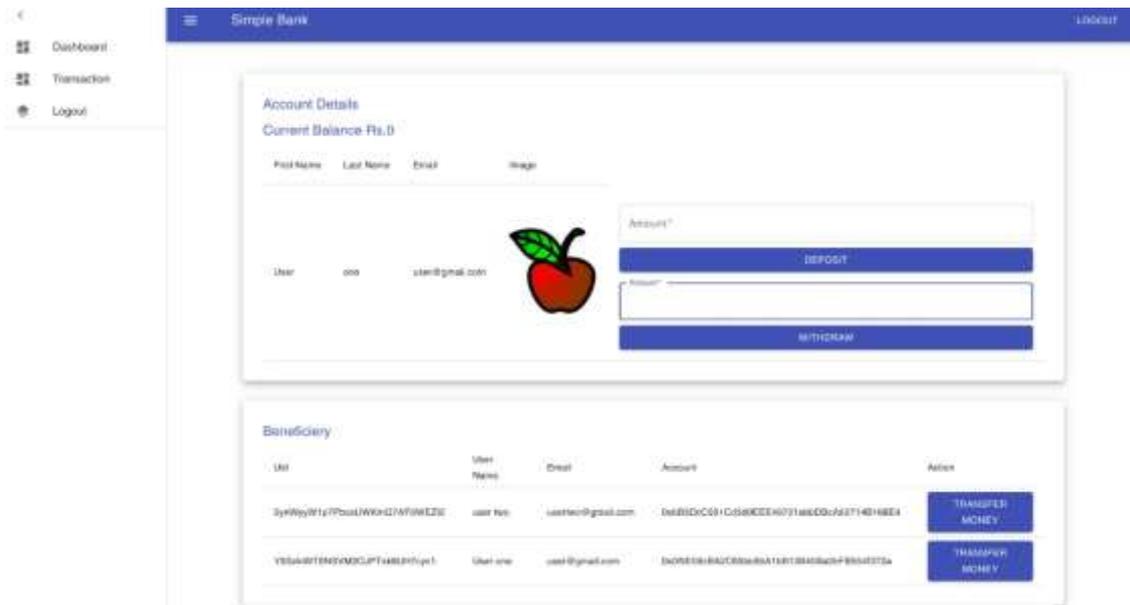


Fig 5: Account details for an individual

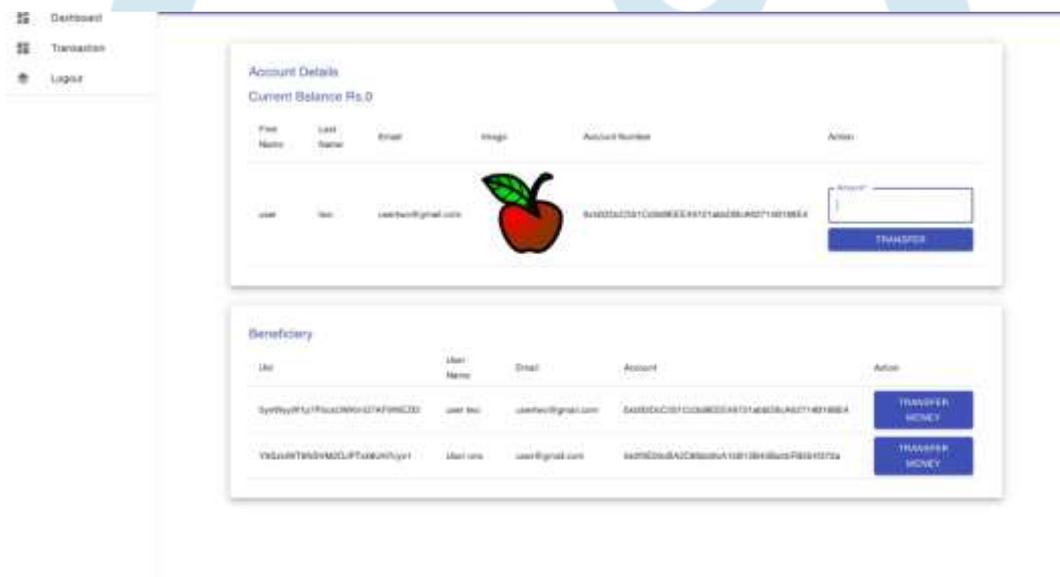


Fig 6: User transfer money to another user in a network

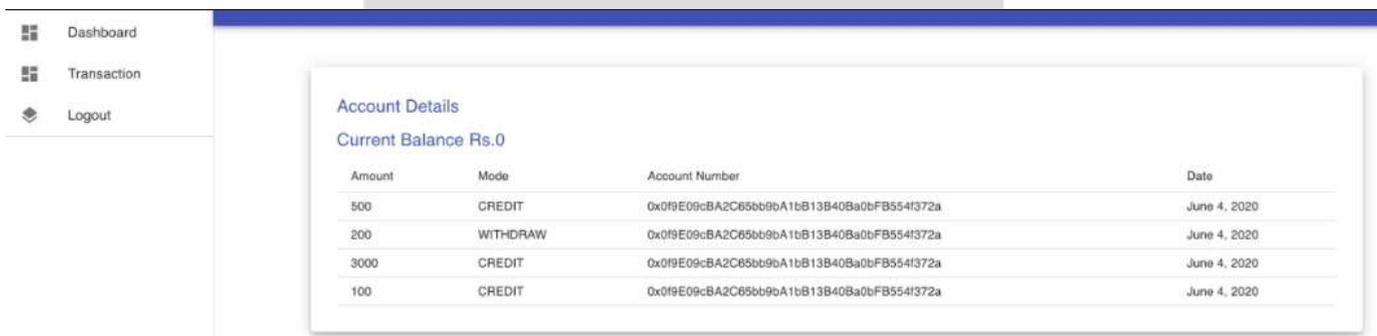


Fig 7: Complete transaction details of an individual

**VIII. FUTURE ENHANCEMENT**

- **INTEGRATION CONCERN:** Blockchain offers solution, they require continuous change or complete exchange of existing process. So, financial institutions should make strategic transition.

- **INITIAL COST:** Blockchain gives more savings in transactions and eliminates middle party fee but initial cost is too high which is major concern for banks.

## IX. CONCLUSION

Blockchain is a new technology, in this paper that new technology is implemented for the interbank applications to solve the issues of more time consuming, to remove the intermediary fees, to make the transactions transparent as well as high secured. As mentioned before by applying blockchain concept the process is taking less time, more secured and transparent. At present, if you invest on an organization, it should face some audits and need to take license. So, it is long process. But if we use blockchain concept based on credit system, we are able to make self-verification, in this way a blockchain is very useful now a days.

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