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Corruption Reduction Using Blockchain

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ABSTRACT: The recent spread of distributed ledger technology, better known in the financial sector for its digital finance, has led to the emergence of many applications for the blockchain environment. The purpose of this study is to investigate how the blockchain can help reduce the risk of corruption in India. Two stages of book reviews have been done. The first pointed to the dangers of corruption in the Indian context and the second pointed to the effective use of blockchain symbols. Thereafter, a downgrade analysis was conducted, aimed at determining which Blockchain programs were introduced that could be used in the fight against corruption. The study identifies ways to reduce fraud and other causes of corruption to help restore public trust in state institutions in India which have been plagued by corruption scandals in recent years. In addition, the research agenda leading to anti-corruption studies has been discussed.

KEYWORDS: Blockchain, Hyperledger, contract.

I. INTRODUCTION

Blockchain technology is a disruptive emerging technology that can revolutionize many aspects of our lives and many industries. It provides data security, autonomy, transparency, auditability, speed, reduced cost, and efficiency to systems. The technology emerged from Bitcoin as its first use case. Bitcoin is a peer-to-peer payment system invented using the blockchain by Satoshi Nakamoto in 2008 in his trial to solve Europe's economic crises. Bitcoin is now the most successful cryptocurrency. Besides cryptocurrencies, there are several other applications of blockchain in healthcare, banking, insurance, identity management, and so on. There are also increasing blockchain adoptions by many companies such as IBM, Oracle, and Microsoft as well as many countries such as Estonia, Georgia, Russia, UK, and Singapore. United Kingdom government office for science released a report describing the blockchain as highly disruptive and urges the UK government to invest in the technology for its immense benefits. The report testified that blockchain secures data and provides transparency and traceability which are so beneficial for public services. Blockchain removes central authorities and middle parties thus, it is very suitable for removing corruption in systems with much human interference.

II. PROBLEM STATEMENT

Blockchain to provide the transparency and making more secure throughout the process.

Avoiding problems related to a public agents abuse of power and targeting government allocated funds blockchain technology is helpful.

III. SYSTEM OVERVIEW

Blockchain was discovered by Satoshi Nakamoto in his paper “Bitcoin: A Peer-to-Peer Electronic Cash System” which was the foundation for the blockchain-based bitcoin cryptocurrency. Wikipedia defines blockchain as “A blockchain is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data”. This system is based on the concept of a decentralized ledger which is shared between all the nodes in a network. A transaction is represented as a block that has a hash value and a hash value of the previous block. Every transaction is verified by the peer network. When a transaction is carried out, the block is linked to the previous block using its hash value. This mechanism ensures that the integrity of the data is maintained. Some of the major applications of blockchain are cryptocurrencies and smart contracts. A cryptocurrency is a digital asset as a medium of exchange using cryptography to secure financial transactions, control the creation of additional units, and verify the transfer of assets. Blockchain-based smart contracts are proposed contracts that could be partially or fully executed or enforced without human interaction.

IV. PROPOSED SYSTEM

In the context of government fund releasing, trust in an intermediary and on the transactions that are made is necessary. Therefore, we can implement the fund release system using a blockchain. Below is a basic block diagram of how the blockchain will work here. The transaction here is paying the supplier to buy raw materials for the project. The process starts with a transaction. This transaction is represented by a block. This block contains details of the transaction like the amount, the payer, the payee, and the purpose of the transaction along with a transaction ID.

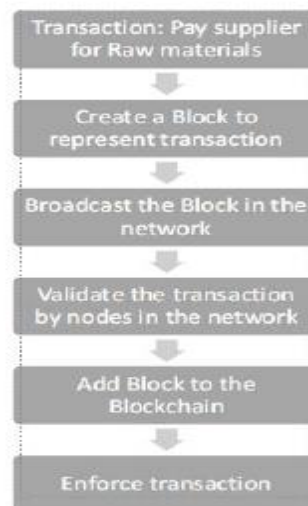


Figure proposed system

V. IMPLEMENTATION

Now a block containing the information mentioned is broadcasted into the network. The nodes (people in reality) involved in the network, validate the transaction. After this validation, the block along with a timestamp is added to the blockchain. The transaction can then be enforced. All of the transactions thus submitted will be recorded in the decentralized ledger and will be visible to everyone publicly. A prototype was implemented for this system using the Hyperledger Composer from the Linux Foundation. Hyperledger Composer set of collaboration tools for building blockchain business networks to create blockchain

applications for business problems. It is a rapid prototyping tool, running on top of Hyperledger Fabric. Hyperledger Composer uses a modelling language called CTO. It has a user interface called playground which is used for creating and testing our prototype. We can define our assets, participants, transactions and access control. The logic behind transactions is written in JavaScript as a transaction processor function. The resources that must be defined are Asset, Participant and Transaction.

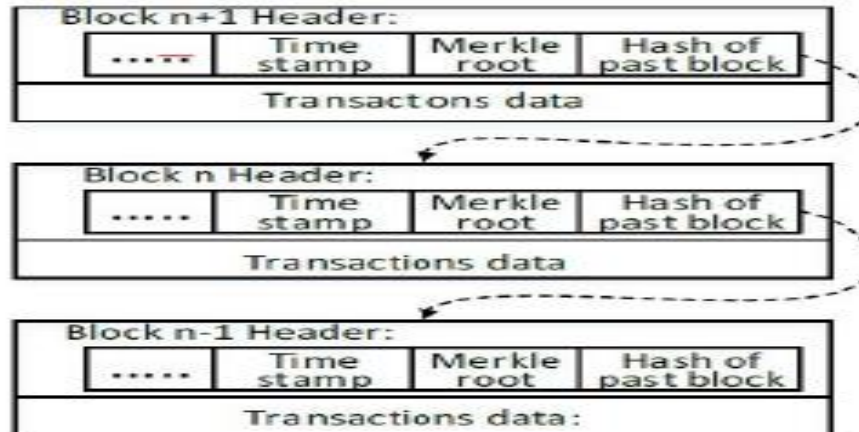


Fig BlockchainStructure

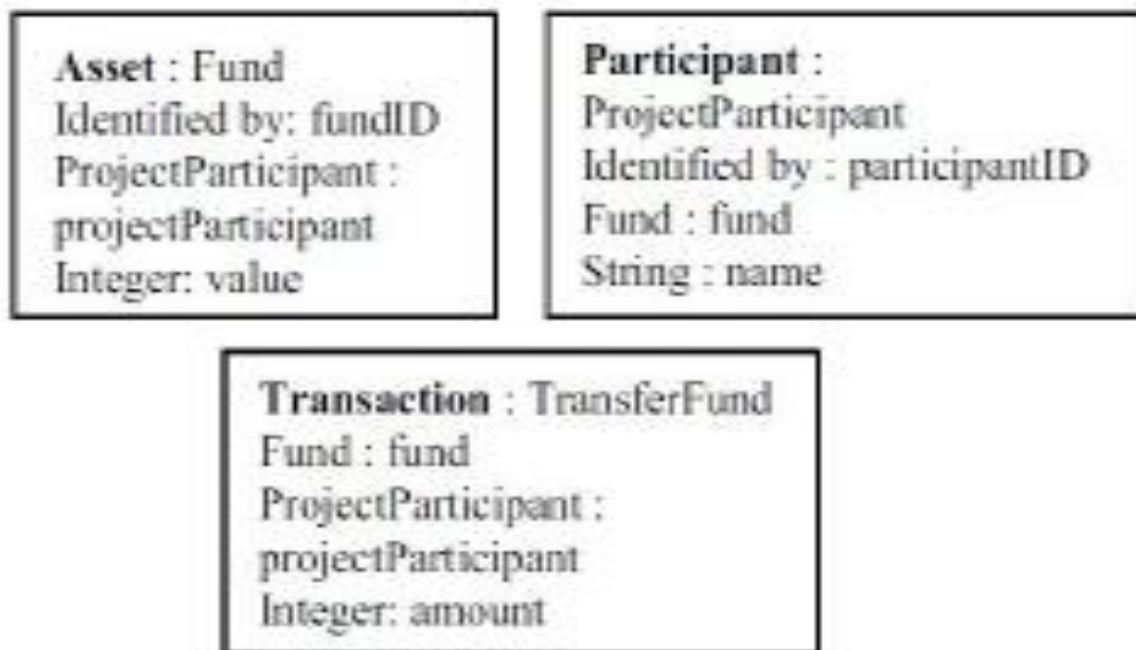


Fig Prototype Model

In this context, the asset is Fund, participants are the people involved in the project, here ProjectParticipant and transaction is paying money for different commodities required for the project, here FundTransaction. We have an initial Total Fund from which other funds are withdrawn by project participants. Each of the participant has a relationship of Fund. An asset (Fund) is created for every participant. The transaction processor function is called every time a FundTransaction is submitted. The function is passed a transaction instance which specifies the involved participant and the amount of fund to be transferred. If the transaction parameters satisfy all the constraints, the transaction is ledgered in the registry. This transaction entry also contains a transaction ID along with a timestamp when the transaction was submitted. The logic here is straightforward. When



ever a transaction is submitted, the specified amount of funds is withdrawn from the total fund. The assets registry and participants registry are updated after the submission, so that the data is consistent.

VI. FUTURE WORK

Since this is a bare minimum prototype of a blockchain application developed using Hyperledger Composer, there is a lot of scope for further improvement in this. In this sense we can control the access to the resources by the participants. Any transaction to be submitted can be made to verify digitally. This model can be exported as a .bna (Business Network Archive) file and run on the Hyperledger Fabric on the cloud where the blockchain would be stored. Further we can generate a REST interface and a GUI for interaction. We can come up with a policy where the wallet address of the people involved in the project is made public, which will make it very easy to trace the route of the fund. This can then be put to use in a real-world situation like the government fund releasing as mentioned earlier

VII. CONCLUSION

The Hyperledger Composer tool allows us to rapidly prototype blockchain applications by defining a business model and deploying it on the Hyperledger fabric. While we considered about building blockchain applications, we even have to consider the access and privacy challenges though. Even then, with further enhancements, this blockchain model can provide a transparency in all the government transactions. There will be no discrepancies of any kind. Because of the decentralized ledger all the transactions can be verified and cannot be altered. The money that is released can be tracked, anyone and everyone can find out how the money is being used. Such a blockchain will surely reduce the ongoing

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