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TRACKING FUNDS' USAGE USING BLOCKCHAIN TECHNOLOGY

Kunal Trisal, Amit Jena, Ritesh Kr. Pandey, Mohit Kumar
Computer Department
NBN Sinhgad School of Engineering

Abstract – **Corruption in Government agencies is quite common and not traceable. Funds used for different Government projects are not utilized optimally, rather these funds are used in illegal or personal expenses of corrupt entities present in the organization. This results in the loss of common people as they don't actually get what they were promised. Blockchain is a distributed, decentralized ledger which stores records in the form chain of blocks which are cryptograhically secure. The use of Blockchain in Government fund allocation system can eliminate corruption as there will be transparency, and we will be able to track the usage of funds easily.**

Key Words: **Blockchain, Fund allocation, Fund Tracking**

I. INTRODUCTION

Blockchain is a decentralized, distributed ledger which stores data in a cryptographically secure manner. In layman terms, blockchain is a collection of blocks. It's one of the emerging technologies which has a promising future. Blockchain has the capability to change or revolutionize several industries.

Time Stamping digital documents can almost eliminate the risk of someone tampering with the documents. This makes the documents more secure. Using blockchain, we can time-stamp the documents or data that we are storing in the blocks. During early days of development, blockchains were only known because of cryptocurrency. Blockchain was only used in cryptocurrencies initially. With time, blockchain found its way into different industries. Now-a-days, many companies have adopted blockchain, and are using it. Blockchain is used in international transactions, digital currencies or cryptocurrencies etc.

The use of Blockchain in Government sector can prove to be a boon. This is because using Blockchain in Government sector can eliminate corruption completely as there will be transparency between people and the Government. All the transactions will be tracked easily.

When funds are allocated for a project, it's often seen that the actual amount used in the project is less than the amount allocated for the entire project. As a result of corruption, major amount of money is used by the officials for their own personal expenses. This is one of the major reasons why Government projects fail a number of times, or the work done seems to be average.

II. TRACKING FUNDS

Tracking funds allocated by the government for a project was a difficult process in the past, and because of this there happens a lot of corruption in the Government sector. All the transactions done are written in a ledger, and this ledger is kept with the high Government officials. So there is a central authority in this case which is dealing with the funds allocated. As there is a central authority, there's no transparency and hence corruption is high. Blockchain comes into play here.

Blockchain is a distributed, decentralized and immutable ledger. These three qualities of blockchain are what makes it one of the leading technologies in the world currently. A blockchain consists of a peer-to-peer connection of nodes. These nodes play an important role in the blockchain. These nodes can be thought of as a cluster of computers. All these computers in the cluster, or nodes play an important in the addition of a transaction in the blockchain.

A blockchain is a collection of blocks storing data. All these blocks are cryptographically secure. Each block in a blockchain is linked to the previous block. Each block in a blockchain has a unique hash value associated to it. Each block consists of a number of transactions. Each transaction in a particular block has a hash value associated to it. We calculate the hash value of the entire block using the hash values of all the transactions present in the block. We use Merkle Tree to do so. All these characteristics of a blockchain make it even more secure, and generate a feeling of trust.

Blockchain is 'distributed'. This means every node which is a part of the connection, has a local copy of the ledger on the system. This helps in maintaining consistency in the p2p (peer-to-peer) network. Each local copy is updated with the addition of something new in the network.

Blockchain is 'decentralized'. This is one of the most important characteristics of blockchain. The control of blockchain doesn't lie with a central authority, rather it lies with all the nodes which are part of the network. This is what makes blockchain different from others. If any addition is to be done in the blockchain, all the members in the network have to validate and approve the things. Validation from a single member cannot add a transaction to the blockchain.

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So blockchain is decentralized.
Blockchain is 'immutable'. This is because a blockchain is a chain of blocks, and to make change to a single block, we have to find the hash value associated with the previous block. In blockchain, each block is linked with its previous block, which makes it extremely difficult for an intruder to make changes to a particular block.
Tracking usage of allocated funds in a government project has always been a major issue. Using blockchain we can solve this major issue. Blockchain promotes transparency as it doesn't involve the central authority of a single organization, rather it requires involvement of all the nodes which are part of the network. Due to transparency, we can check exactly what amount is spent at which place in the project. This will eliminate corruption as there will be a complete check on all the transactions being done.

III. SYSTEM ARCHITECTURE

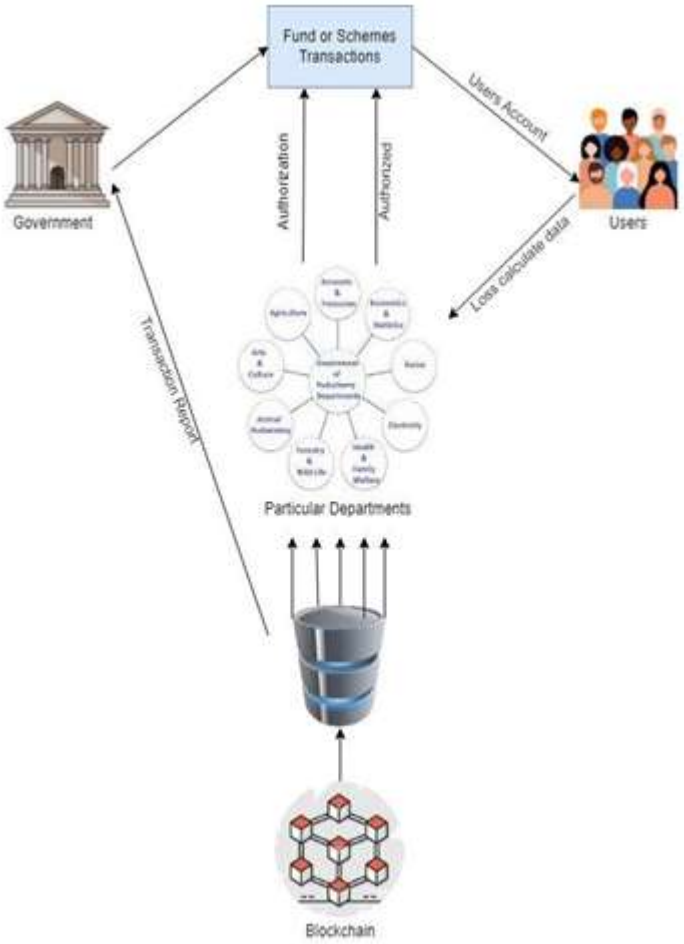

Fig: 1 System Architecture

Fig1 depicts that data related to all the departments is stored using Blockchain. Government has a lot of schemes for various groups in the societies. Suppose due to some conditions like poor weather or extreme monsoon, farmers are facing crisis and are in need of money. Now, the central Government has a lot of schemes beneficial for the famers.
Suppose one such scheme includes paying every farmer two thousand rupees. Now when the request is made by the user or the farmer, funds are released by the Government. These funds are sent to the state government, which further sends the funds to the district representative. District representative is the one who deals with the vendors. Here our government is the administrator to this funding system, so government can trace the entire usage of the funds.
Fig1 depicts that the information of particular government departments is stored using blockchain. This helps in eliminating corruption from all the departments of the government sector as entire usage of the funds allocated, can be traced.

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IV. PROPOSED SYSTEM

The proposed system is used to track the funds granted to the state government as they go through the government process. It uses blockchain technology to safeguard transactions at each level while retaining transparency in every transaction. The system secures data using hashes to keep a block of transactions in a chain. It enables a complete proof, secure, and authentic financial distribution and tracking mechanism, which contributes to the formation of an incorruptible government.

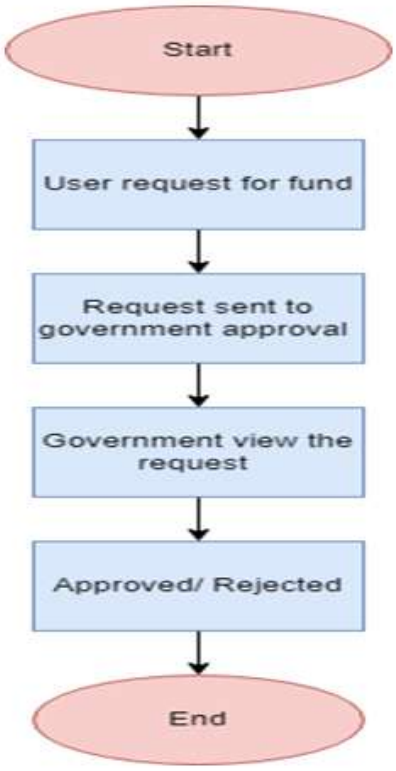

Fig: 2 Block Diagram

In our system, there are 2 modules i.e., Admin (Government)and User.

Admin (Government) Module: Government provides the requested funds to the user.

User Module: In this system, the user will request the funds according to their needs and also, they can check their transaction history and wallet balance as well.

The user requests the funds from the admin (Government) then the request gets sent to the Government for approval. After that, the government views the request and then can approve or reject the request. The transaction is validated by the network's nodes (people in real life). Following this confirmation, the block is put on the blockchain along with a timestamp. After that, the transaction could be enforced. All transactions submitted in this manner will be noted and madepublicly available to everyone.

V. CONCLUSION

Now-a-days corruption in government sector has increased due to inability of traceability of usage of funds allocated for different government projects. Major portion of the funds allocated to a project are used for personal expenses of many entities (bribe) involved in the project. We propose a 2- module system in our paper where the first module is the Government (admin), and the second module is the user. Government refers to the central government which allocates the funds to different sectors, and user refers to the different sub-sectors like State Government, District official, and so on. The user simply has to request for the funds, and this request will be accepted at different stages like District, State and by the Central Government. Once the request is published by the Central Government, the funds will be granted to the users. For example, farmers can demand funds which are allocated to them using various government schemes. The allocation of these funds can be tracked and traced to ensure that no corruption takes place, and each farmer gets the money he or she had the right to have. All this works on the blockchain technology, which is a decentralized, distributed and immutable ledger. These three features of blockchain promote transparency and security of the entire the system we proposed.

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