



Government Fund Allocation and Tracking System using Blockchain

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ABSTRACT: *The state government working involves a large number of transactions activities towards various operations throughout the state. This includes new actions, initiatives, projects, granting contracts, farmer schemes, and so on. One of the most challenging factors that top governments face is low-level corruption which at times is hard to follow and denies the state progress. As a result of the current system, tracking is very problematic and this provides needy people with a service that is sometimes difficult to track, which deprives them. In this case, we use blockchain which enables cryptography and transaction security at every stage while maintaining transparency so that every transaction is backed up with proof of its authenticity. Hence, we present a framework that uses blockchain innovation and a full-proof fund transfer system. Blockchain contains growing list of records called blocks. Cryptographically hashed data, a timestamp, and recent transactions are included in each block.*

KEYWORDS: *Blockchain, Transactions, Security, Tracking, Transparency, Encryption.*

INTRODUCTION

Blockchain is one of the technologies that have created a disruptive change in several industries. Currently, Blockchain is getting used in numerous places and there are more applications of Blockchain yet to be discovered and implemented. Blockchain is characterized by its decentralized nature, the integrity of the information stored within the chain, and its openness. Due to these characteristics, another area in which Blockchain can be used is to release funds for government projects. Governments have to cater to an enormous number of responsibilities of a state. The working of state governments involves numerous transactions towards various operations that require to be applied throughout the state. This includes new projects, repair, and maintenance work, awarding contracts, paying off government employees, farmer schemes, and so on. A serious hurdle that the highest government faces is the low-level corruption that's sometimes impossible to trace, which deprives the state of progress. Tracking it's a really difficult task because of the present system. Blockchain is touted for its capability to reinforce the trust and ease of information-based exchanges among people and associations. The innovation offers a guarantee when deliberately applied within the proper settings. Customarily, associations working their own, singular IT frameworks trying to group must pander to difficulties including compromise of data, recognizing a solitary wellspring of truth, and provoking establishment. Blockchain innovation tends to those difficulties by giving a specialized establishment that underpins the execution of shared business forms, such that no single substance controls the complete framework. Government incorporates a characteristic need to assemble, support, and ensure open trust in data and frameworks. In such kinds of situations, blockchain may help to boost this trust.

LITERATURE REVIEW

A literature survey or a literature review during a project report is that section that suggests the numerous analyses and studies made in the discipline of your interest and consequently the outcomes already published, thinking of the varied parameters of the project and additionally the extent of the project. A literature survey is the maximum substantial step in any reasonable study. Before beginning development, we need to test the preceding papers of our area in which we're operating and the idea of the look at what we're capable of expecting or generate the downside and start operating with the reference of preceding papers. During this phase, we briefly evaluate the associated work on the Government Fund Allocation & Tracking System and the usage of Block-chain Technology.

[1] In this paper, the writer attempted to discover the ability of blockchain technology to decrease embezzlement which can also additionally arise for the duration of the fund's switch of government schemes. Also discovered 8 appropriate traits of any virtual fund switch method which incorporates a sequence of layers. To make certain equity on this form of the virtual method the writer has proposed to apply blockchain-based technology through the usage of mathematical model transaction traits to officially make certain equity at all levels. This system also can be audited through common human beings to trace the cash flow of any schemes, making the system absolutely obvious and fair.

[2] In this paper, the author considered blockchain applications that allow maintaining crystal clear records with the on-demand right to transactional data on a need-to-know basis. The system makes use of encryption to secure transactional data using hashes to take care of a block of transactions during a chain manner which is maintained and verified by every node involved to verify the transaction and save the info in an exceedingly transparent form within the government. In order to form a completely incorruptible government process, the system provides a way to allocate funds securely and track them authentically.

[3] This paper discusses the use of blockchain technology for tracking government funds. When the government issues funds for projects, often a large part of it is unutilized and is barely used for the actual project, one of the main causes being corruption. So, if blockchains are introduced here, everyone can track all the amounts regarding when and where it is being utilized. This technology is utilized in the government sector and can have a major impact on the growth and economy of a country.

[4] This system makes use of encryption to secure transactional data using hashes to take care of a block of transactions in a very chain manner which is maintained and verified by every node involved to verify the transaction and save the information in a very transparent way. Using the system, a transparent, incorruptible government process can be formed by providing a completely secure, authentic, and reliable system of allocation and tracking of funds.

[5] In this paper, the system provides tracking and allocation of funds at every single stage till it reaches the beneficiary's account. The system relies on hashing. The proposed framework expects to tackle all misrepresentations submitted within the public authority area and provides a sequence of secure exchange of information, cash, and other individual data of each transaction. There will be no requirement for the outsider and also the exchanges are regulated all the more sturdily and transparently. This system will assist in limiting human blunders and time delays in fund allocation.

[6] In this paper, System provides a decentralized application that provides the functionalities of a tracking system with proof of delivery using Quark Chain at its core. A transparent behaviour of trade would be established based on smart contracts where the supplier and customer are on the same page and no third-party interference is needed. This would eliminate the scope of counterfeited products getting added to the supply chain as any inconsistencies in the ledger would be noticed, and necessary actions could be taken.

METHODOLOGY

How does blockchain work?

There are three basic components of a blockchain: blocks, miners, and nodes.

Block: Every blockchain is made up of several blocks, and each block includes data, which is a record of transactions. The crucial point is that the chain is not owned by a single individual or organization.

Miners: Miners are assigned with adding new blocks to the chain via a process known as mining. Miners must solve complicated mathematical problems in order to add data to the block. When a block is efficiently mined, the miner is financially rewarded.

Nodes: A node connects each block to another block, forming the chain. A node is basically that keeps the copies of the ledger and keeps the network operational.

How does blockchain provides security?

Most blockchains arrange data into blocks, with each block containing a transaction or set of transactions. Each new block in a cryptographic chain connects to all the blocks before it in such a way that it is very hard to tamper with. Consensus processes ensure that each transaction within the block is truthful and accurate by validating and agreeing on all transactions within the block. Blockchain technology provides decentralization by allowing members of a distributed network to participate. There seems to be no single point of failure, and an individual user cannot manipulate the transaction record.

How is immutability achieved by blockchain?

A hash value is a unique value that identifies a single block. As hash values are determined by the content of each block, each block is uniquely identifiable by its own hash value. As a result, each block can refer to or point to the one before it, such that the fourth block refers to the third, which refers to the second, and so on. As a result, the hash value serves as a reference.

For example, in our system, Admin (Government) sends the funds requested by the user. After that, the Government determines whether the transaction being conducted is legal. As the iterations continue, a chain builds, demonstrating transaction transparency. Lastly, the fund is transferred from Admin to the User, and the transaction gets completed. The immutable feature of blockchain is seen in the previous example, making it immaculate. It is immutable due to the combination of validations given by the blockchain hashing procedure and cryptography.

How will a transaction enter into the blockchain?

It is necessary to approve and validate a transaction before it can be added to the blockchain. Before a transaction can be added to the blockchain, it must go through several important phases. Now, we'll take a look at cryptographic key authentication, and proof of work authorization protocols in subsequent blockchain networks.

Authentication

Although the original blockchain was supposed to function without a central authority, transactions must still be validated. Accessing a person's "account" or "wallet" of value requires the identification of cryptographic keys. A string of data (similar to a password) serves as a cryptographic key. Using a secured digital identity created by these two keys - a private one that is visible only to a user, and a public one that everyone can see - users can authenticate themselves via signatures and 'unlock' transactions.

Authorization

After the users have agreed on the transaction, it must be authorized, before it can be added to a chain of blocks. The decision to bring a transaction to the chain on a public blockchain is decided by consensus. The majority of "nodes" (or computers) must accept the transaction for it to be valid. The people who own machines in the network are rewarded for confirming transactions. This method is referred to as 'proof of work'.

Understanding Libra

Learn how Facebook used certain parts of blockchain technology to establish Libra, a new cryptocurrency that has the potential to impact the banking and finance industries.

Proof of Work

To add a block to the chain, Proof of Work asks the individuals who own the machines in the network to solve a difficult mathematical problem. Mining is the process of resolving an issue, and 'miners' are generally rewarded in bitcoin. However, mining is a difficult task. The mathematical problem could only be resolved via trial and error, with a 1 in 5.9 trillion chance of succeeding. The process requires significant amounts of computational power, and this consumes considerable amounts of energy. This means that the benefits of mining must surpass the expense of the computers and the electricity used to power them because a single computer would take years to solve a mathematical problem.

PROPOSED SYSTEM

The project's major objective is to develop a platform that tracks government fund allocation using blockchain technology. The platform aims to accomplish the following goals:

- Making the work of government fund allocation with reporting documentation is more convenient. Due to the fact that the data on donations will be aggregated in one place, it will allow us to prepare reports automatically.
- By developing a blockchain-based system, charitable foundations can become more transparent.
- To maintain transparency and security at every stage.
- In order to create a government procedure that is incorruptible.
- To provide an immutable environment for funds tracking.
- Utilization of funds.

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 and sealing every transaction with

proof as the money goes forward. 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. 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.

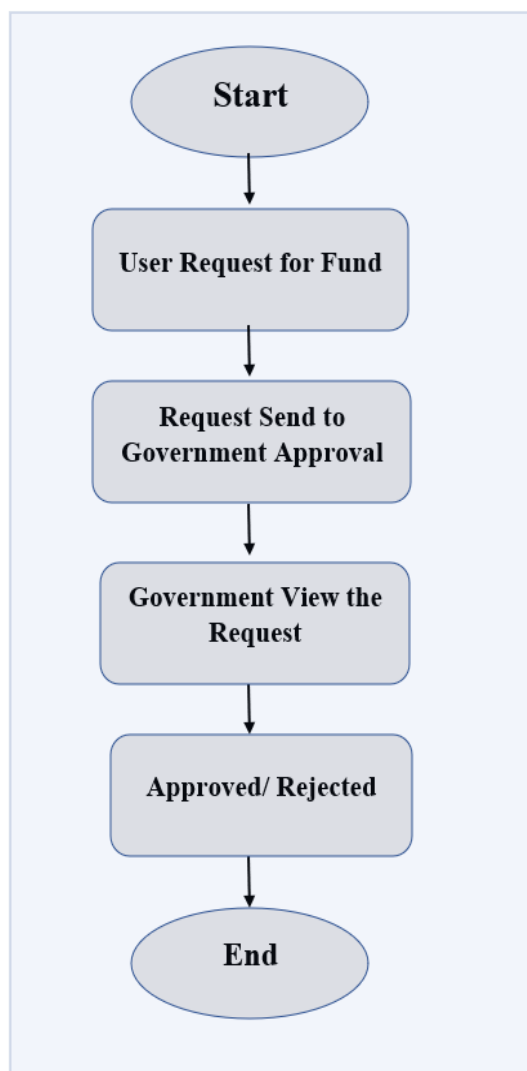


Figure 1: Flowchart of the proposed system

In the Figure 1 we can see that 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.

In Figure 2 and Figure 3 we can see that a block having the stated information is propagated into the network. 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 made publicly available to everyone.

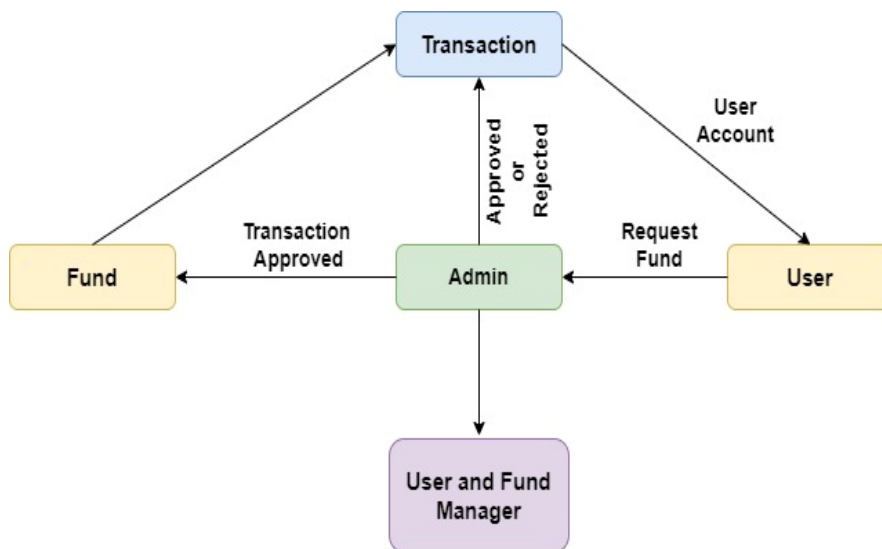


Figure 2: System Architecture

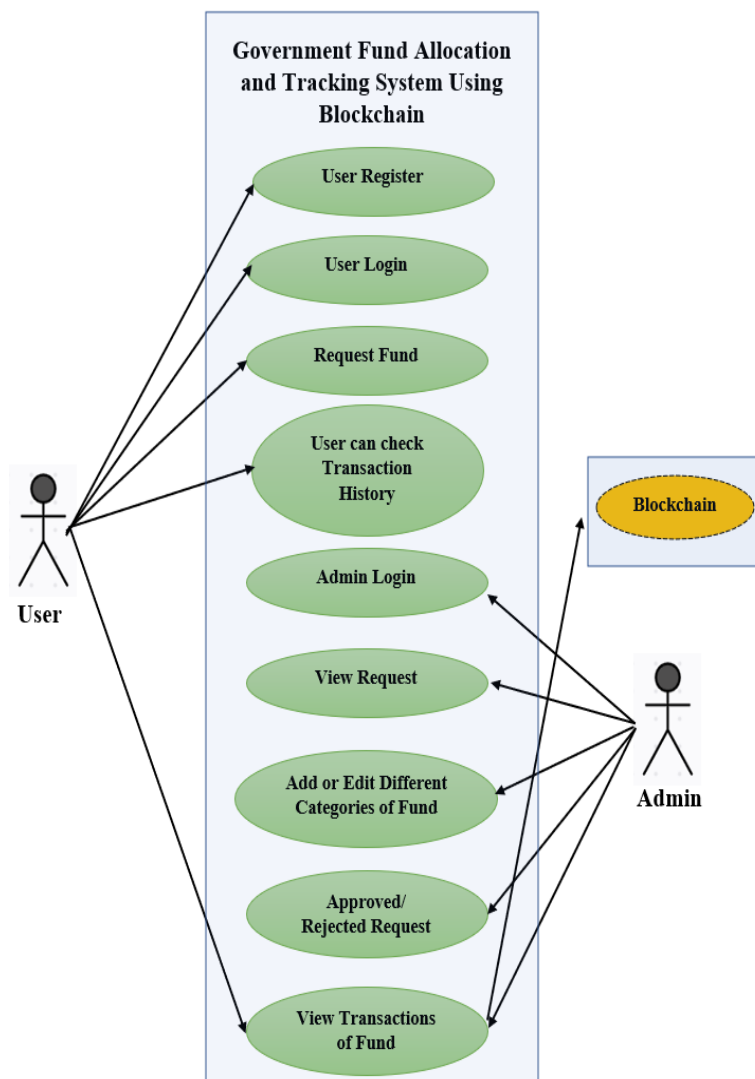


Figure 3: Use Case Diagram

TOOLS AND TECHNOLOGY

Language: Python, HTML, Bootstrap, and Django.

Tools: PyCharm IDE

Technology: Blockchain Technology

RESULTS

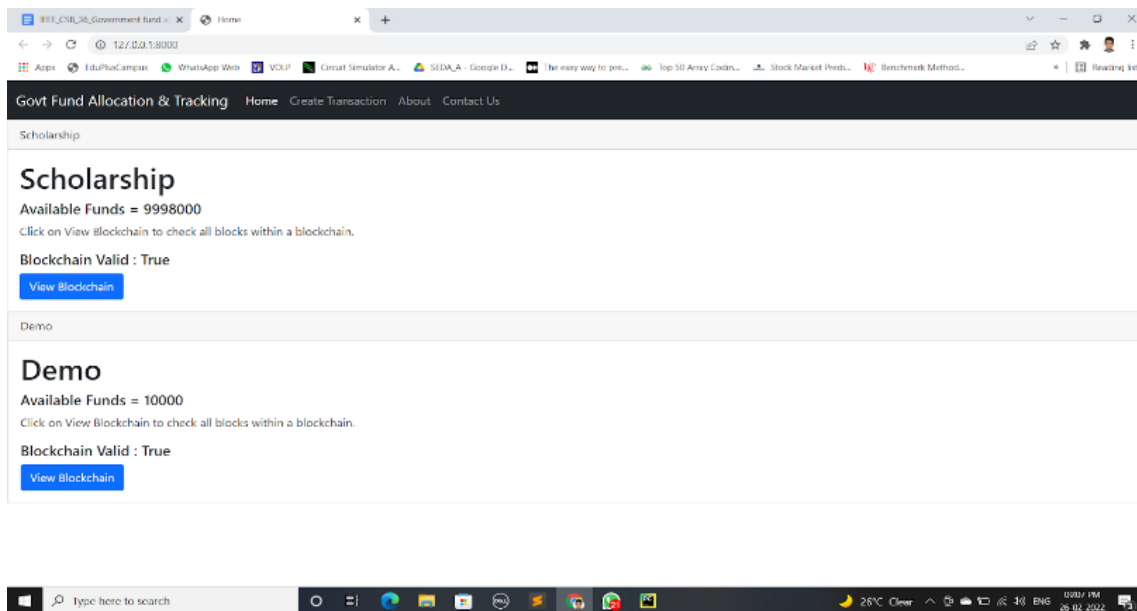


Figure 4: Home Page

The home page will have all the available schemes listed. A normal user can visit the site and check for schemes and available and allocated funds.

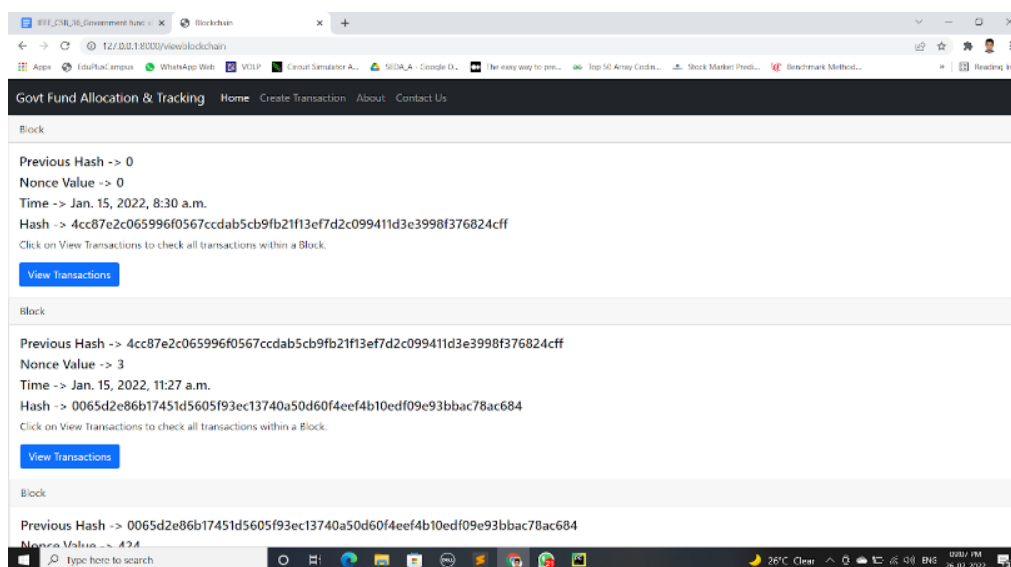


Figure 5: Blockchain

A separate blockchain is available for each fund, where a user can check for all transactions. That transactions are publicly available.

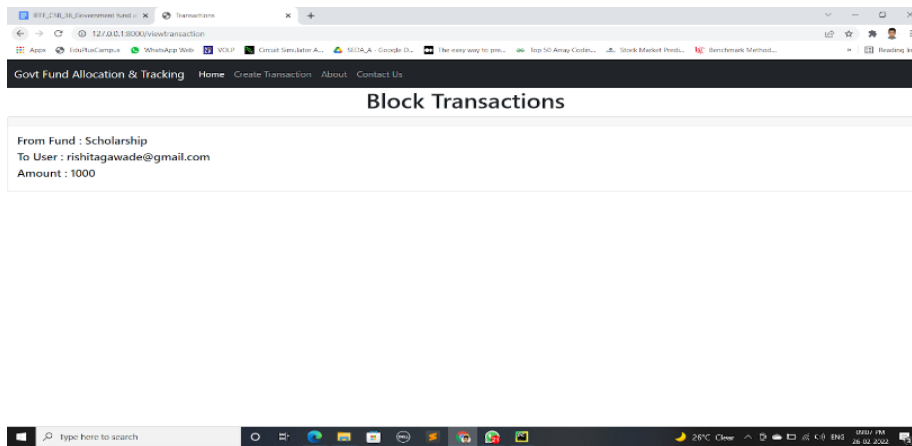


Figure 6: Transactions

Users can check all the transactions within a particular block, all the information about that transaction is available here like username, amount, date, and time of transaction.

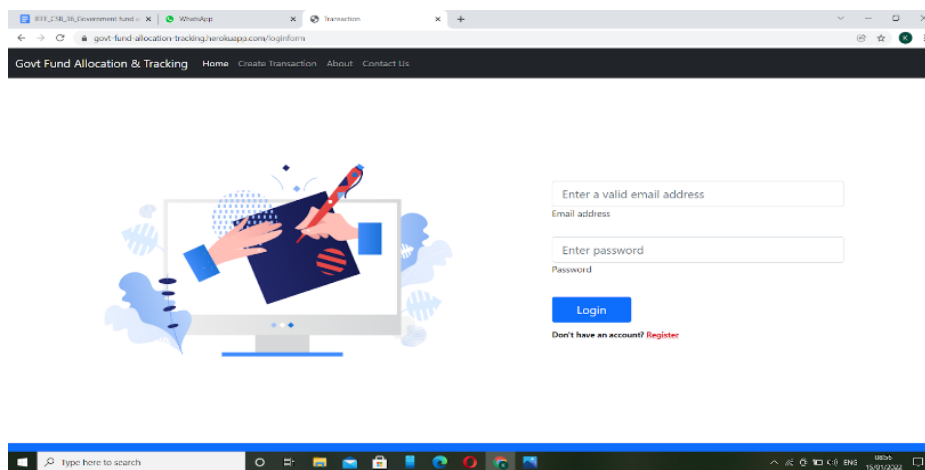


Figure 7: Register and Login

A new user can register to the site by following some simple steps and then the user can request funds. Admin login is also available.

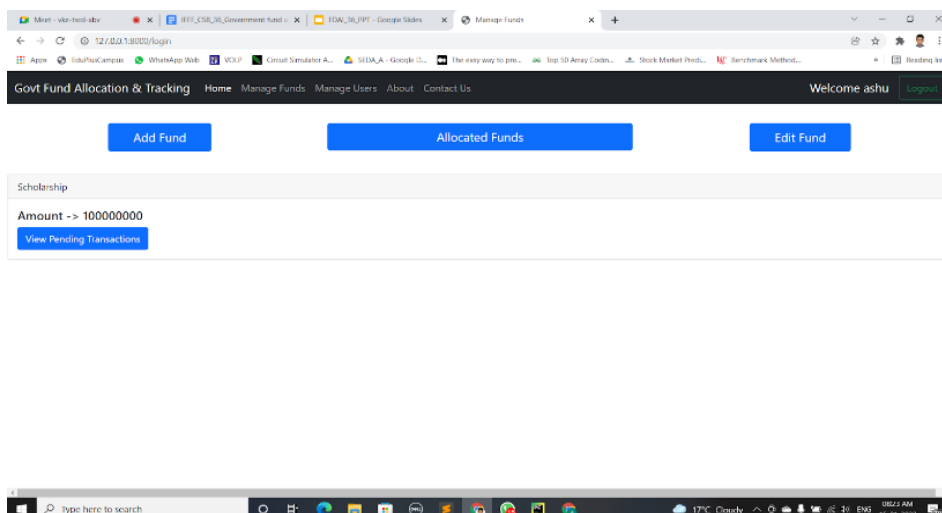


Figure 8: Add/Edit and View Pending Transaction

Once logged as admin there are options to add or edit any fund. Also, the admin can view all the pending transactions in a fund and can accept or reject any of the requests.

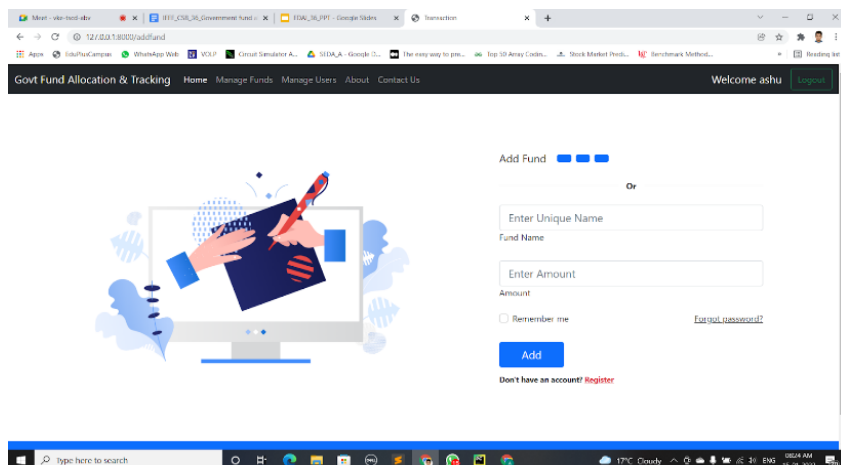


Figure 9: Add Fund

Here, in the above fig we can see that the admin can add a new fund.

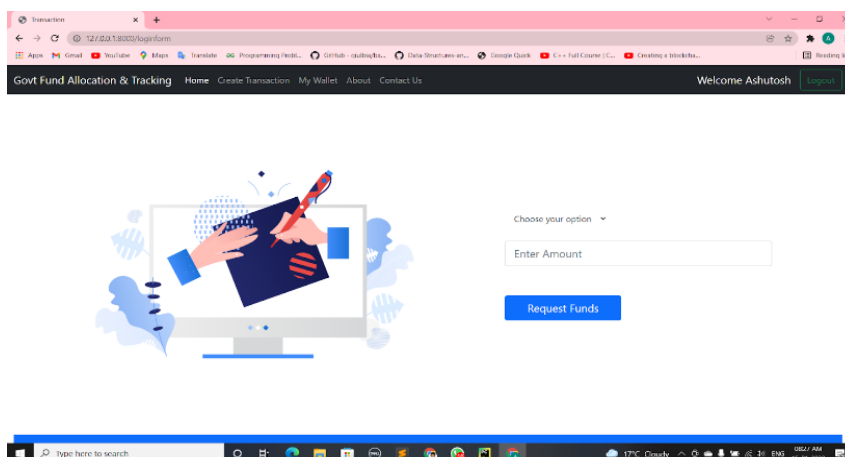


Figure 10: Request Fund

A registered user can request funds and wait for the approval.

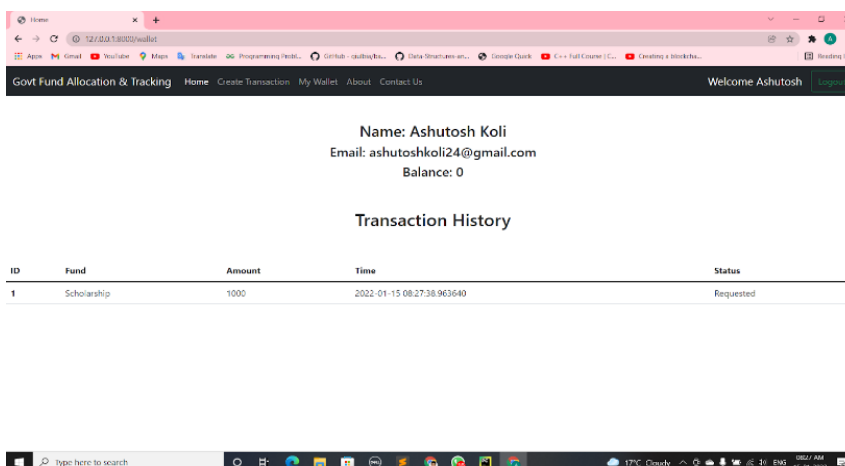


Figure 11: Transaction History/ Status

The user wallet option is also available so the user can keep track of all his transactions and check the status of the amount available in the account and the approval status of requests.

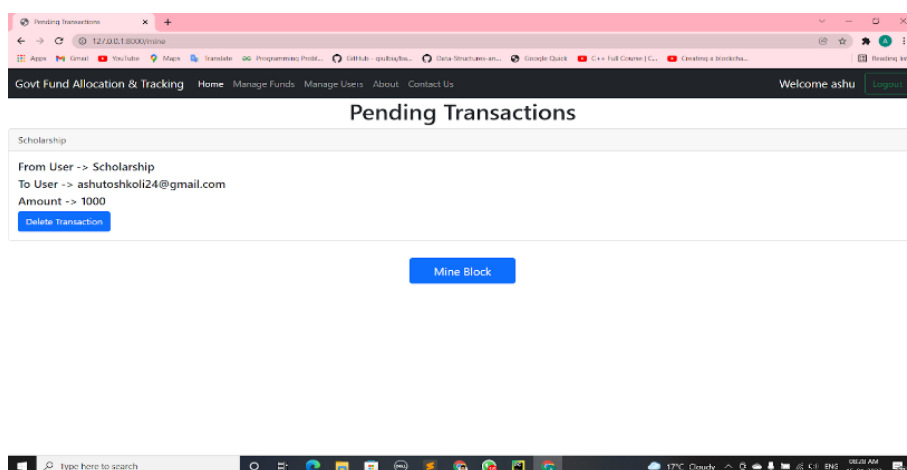


Figure 12: Approve / Reject Transaction

Admin can check for all the pending transactions requests and either can accept or reject them. Once the block is mined it cannot be modified.

CONCLUSION

In this full-proof, secure government fund allocation and tracking system, the allotted funds are tracked at each level until it reaches the beneficiaries. This proposed framework is added to assist the authorities to lessen corruption and offer transparency in all transactions because of the functions of blockchain-like immutability, proof of work, and security. It offers the right governance and transparency. It will maintain track of all transactions made. As blockchain technology is used the transactions as soon as made cannot be changed and if there's any try of tempering, we can get to recognize approximately that easily. There might be no requirement for the outsider and the exchanges might be regulated all the extra sturdily and transparently. In addition to preventing human errors and delays, it will help eliminate human errors. This framework will make the general public authority framework activities appreciably extra stable and productive. We can nevertheless upload customary schemes from everywhere in the world for fundraising to take it to the subsequent stage for big price range required the humans in need.

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