

# Government Funds Allocation and Tracking System Using Block Chain Technology

Mr. Sadgir Vijay Vitthal, Mr. Devkar Roshan Prakash, Mr. Ghodsare Sagar Ramnath, Mr. Nandi Shubnath khokan,  
Mr. Mandalik Dnyaneshwar Goraksh

UNDER THE GUIDANCE OF  
Prof. Dinesh Ghorpade

SIR VISVESVARAYA INSTITUTE OF TECHNOLOGY,  
NASHIK DEPARTMENT OF INFORMATION TECHNOLOGY

**Abstract:** Blockchain is a technology that helps create and maintain a cryptographically secure, shared, and distributed ledger (a database) for transactions. It is a public ledger to which everyone has access but control of the ledger does not lie with a central authority. One can get transparency, accountability and trust by using blockchain to perform digital transactions. It is an enabling technology for individuals as well as companies to collaborate while ensuring that trust and transparency are maintained throughout the process. Considering these characteristics, blockchain can be used for tracking the flow of public funds assigned to a project. The paper explores the uses of blockchain technology in real-life commercial applications and proposes a method that will be used to allocate and track public funds using blockchain technology.

**Keywords:** blockchain; fund tracking; fund allocations.

## INTRODUCTION

Research scientists Stuart Haber and W. Scott Stornetta proposed the idea of blockchain technology where they introduced a computationally practical solution for time-stamping the digital documents so that the documents could not be backdated or tampered with [8]. A cryptographically secured chain of blocks was used to store the time-stamped documents and during the same year, Merkle trees were incorporated into the design making it more efficient by collecting several documents into one block. However, this patent lapsed in 2004 and this technology went unused for four years until before the inception of Bitcoin. In 2004, computer scientist and cryptographic activist [8] Hal Finney (Harold Thomas Finney II) introduced a system called Reusable Proof of Work (RPoW). A non-exchangeable or a non-fungible Hashcash based proof of work token was received by the system and in return a RSA-signed token was created which could then be transferred from person to person. The double-spending problem was solved by RPoW by maintaining the ownership of tokens registered on a trusted server that was designed to allow users throughout the world to verify its propriety and integrity in real-time.

Blockchain is a growing technology. It is one of the promising technologies that can revolutionize the entire industry. Initially, blockchains were used in Cryptocurrencies, Identity Management, Cross Border transactions, etc. Decentralized nature, transparency, immutability, consistency, the security of data - all these build upon the strong characteristics of blockchain

## AIM/OBJECTIVES

### MOTIVATION

Usually when a project is allocated funds, there is no knowledge as to how these funds are being used and a large part of it is never show in records due to corruption. To solve this problem, a system has been proposed using Blockchain to provide the transparency. A major hurdle that the top government faces is the low

-level corruption that is sometimes impossible to track which deprives the state progress.

Blockchain technology is an upcoming technology and said to be one of the most promising technologies which would revolutionize the world.

## LITERATURE SURVEY

Literature survey is the most important step in any kind of research. Before start developing we need to study the previous papers of our domain which we are working and on the basis of study we can predict or generate the drawback and start working with the reference of previous papers. In this section, we briefly review the related work on Government Fund Tracking System using Blockchain Technology.

In this paper, the author proposes an imaginative blockchain-based IOT engineering to help fabricate an increasingly secure and solid IOT framework. By examining the deficiencies of the current IOT design and the benefits of the Block-chain innovation. We decay and redesign the first IOT design to shape another, multi-focus, incompletely decentralized engineering. Accordingly, the proposed engineering speaks to a huge improvement of the first design, which gives another heading to the IOT advancement.

This paper provides, through its technique, an itemized examination of the square chain fit in the inventory network industry. It characterizes the particular components of square chain that influence store network, for example, versatility, execution, agreement instrument, security contemplations, area proof and cost.

Data mining system for anticipation and discovery of fiscal report extortion right now. These instructive factors are being use for executing affiliation rule digging for anticipation and three prescient mining strategies in particular K-implies, Multi-Level Feed

Forward Network and \ Genetic programming for discovery of budgetary misrepresentation. This exploration can forestall false monetary revealing and distinguish it if the executives of the association is fit for executing budget summary misrepresentation in spite of the nearness of against extortion condition.

Data mining structure for evasion and uncovering of fiscal summary extortion right now . The structure utilized right now the ordinary progression of information mining . These valuable factors are being utilized for actualizing affiliation rule digging for counteraction and three prescient mining procedures in particular K-implies, Multi-Level Feed Forward Network, Genetic programming for identification of money related misrepresentation.

In this paper , the author propose a square chain empower efficient information assortment and secure sharing plan consolidating Ethereum square chain and profound support learning (DRL) to make a solid and safe condition. Right now, is utilized to achieve the most elevated measure of gathered information , &the square chain innovation is utilized to ensure wellbeing and unwavering quality of information sharing.

Blockchain is portrayed by its decentralized nature, respectability of the information put away in the chain and its receptiveness. Because of these qualities , somewhere else where Blockchain can be utilized is to discharge government assets for an undertaking . Normally when an undertaking is allotted assets , there is no information with respect to how these assets are being utilized and a huge piece of it is never appeared in records because of debasement . To take care of this issue, a framework has been proposed utilizing Blockchain to give the straightforwardness.[6]

In this paper , a general versatile fuzzy control plot through yield following mistake input has been proposed for handy yield following of a class of questionable nonlinear frameworks with unmeasurable states and totally obscure elements including parametric or potentially auxiliary vulnerabilities and outer unsettling influences. The proposed conspire gives an integral asset to target following of unmanned vehicles , rockets , versatile robots , and so forth ., at whatever point just following blunder (inconsistency ) can be accessible.

This paper portrays a strategy for consolidating client information with naturally created rules. The presentation improved outcomes yet in general the improvement was not critical , this might be a result of the techniques that were tried. Another perception that is produced using these outcomes is that despite the fact that there was some variety in the exhibition as for restores , the hazard balanced execution was considerably more stable.

In this paper , we propose an item recognizability framework dependent on blockchain innovation , in which all item moving chronicles are interminably recorded in an appropriated record by utilizing shrewd agreements and a chain is shaped that can follow back to the wellspring of the items . Our framework has evident decentralized attributes, which fundamentally lessens the chance of secretly altering information inside endeavors . Our framework is described by information availability , sealing, and protection from man-in-the-middle attacks.

This paper proposed another data sharing plan dependent on blockchain innovation . Clients can deal with their information and comprehend the information being gathered about them and how to utilize it without confiding in any outsider . Nonetheless , the plan didn't consider the chance of the endeavor itself messing with information.

## PROBLEM STATEMENT

Governments need to cater to a huge number of responsibilities of a state. The working of state governments involves huge number of transactions towards various operations that need to be carried out throughout the state. This includes new projects, repair and maintenance works, awarding contracts, paying of government employees, farmer schemes and so on. A major obstacle that the top government face is the low-level corruption that is sometimes not possible to track which deprives the state progress.

Tracking it is a very complicated task due to the current system. But in proposed system we overcome this drawback by using block chain approach. We here make use of blockchain technology to secure the transactions at every stage while maintaining transparency in every transaction sealing every transaction with proofs as the funds move ahead. Blockchain, originally block chain, is a growing list of records, called blocks that are linked using cryptography.

Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. In this project researcher use Blockchain Algorithms for security like AES for Encryption and Decryption By design, a blockchain is resistant to modification of the data. In this paper we propose a system to track funds allocated to the government as they travel through the government process at each stage using Key pair generation algorithm, Metadata file decryption and Data verification algorithms.

## 4.1 SOFTWARE REQUIREMENT SPECIFICATION

### INTRODUCTION

The following sub topics will contain specifications of software and hardware using in the proposed system.

### PROJECT SCOPE

#### USER CLASSES AND CHARACTERISTICS

1. The proposed system is used to track the funds allocated to the state government as they travel through the government process at every stage. We here make use of block-chain technology to secure the transactions at each stage while maintaining transparency in every transaction sealing every transaction with proofs as the funds move ahead. This allows maintaining crystal clear record with on-demand right to transactional data on a need to know basis. The system makes use of encryption to secure transactional

data by means of hashes to maintain a block of transactions in a chain manner which is maintained and verified by every node involved to authenticate the transaction & save the data in transparent form within the government. The system allows for a full proof, secure & authentic fund allocation and fund tracking system to help form an incorruptible government process.

#### **4.2.1 SYSTEM INTERFACE**

Module 1 - Government: - Government will give the fund which is requested by the user.

Module 2 – Authority (TPA):- This will authorize or verify the user that it is a valid user as well as valid request or not.

Module 3 - User (Customer):- User will request for the fund according to their needs.

#### **EXTRENALINTERFACEREQUIREMENTS USER INTERFACE**

The web based application is used to communicate with the system.

#### **HARDWARE INTERFACE**

The computer system is used to control the system.

#### **SOFTWARE INTERFACE**

The web browser is used to interface with the web application.

#### **COMMUNICATION INTERFACE**

The http protocol is used as communication protocol for this system.

#### **USER INTERFACES**

The user experience should be considered as priority in user inter- face. This is the way that the product will be used by users [3]. Users should meet the exact needs they want, without confuse. Designer should clear the primary objective of developing an interactive prod- uct. It is suggested to classify the objectives in terms of usability and user experience goals. There are six goals of usability. They could make the product easy to learn and effective to use.

#### **SIX USABILITY GOALS**

Effective to use(effectiveness)

Efficient to use(efficiency)

Safe to use(safety)

Having good utility(utility)

Easy to learn(learnability)

Easy to remember how to use(memorability)

Effectiveness is a common goal to reach the best result of the expectation. The performance of the software is satisfactory. Efficiency is focus on the cost of computation of the software. Most users make an attention on the speed of software, they think every action should be fluent. If a lag accrued during the operation, people will think there are some problems with it. It will worsen the user experience.

#### **SOFTWARE QUALITY REQUIREMENTS**

Adaptability:

Proposed System can be adapted easily to various operating requirements

Availability:

Can easily execute on currently available minimum configuration of hardware and software.

Correctness:

It will work correctly according to the valid input requirements.

Usability:

This system used in different mobile phones or any device.

#### **SYSTEM REQUIREMENTS**

## **DATABASE REQUIREMENTS**

The database required in this system is stored on the cloud. We store the historical data on cloud for future use.

## **MINIMUM SOFTWARE REQUIREMENTS**

JAVA, PHP, CSS, HTML  
MySQL database  
Google APIs

## **MINIMUM HARDWARE REQUIREMENTS**

Minimum P4 Processor and above  
Minimum 512 MB RAM and above  
Minimum 100 GB HDD and above

## **SYSTEM DESIGN**

The proposed system is used to track the funds allocated to the state government as they travel through the government process at every stage. We here make use of block-chain technology to secure the transactions at each stage while maintaining transparency in every transaction sealing every transaction with proofs as the funds move ahead. This allows maintaining crystal clear record with on-demand right to transactional data on a need to know basis. The system makes use of encryption to secure transactional data by means of hashes to maintain a block of transactions in a chain manner which is maintained and verified by every node involved to authenticate the transaction & save the data in transparent form within the government. The system allows for a full proof, secure & authentic fund allocation and fund tracking system to help form an incorruptible government process.

In this we are using 2 modules i.e. User and Admin.

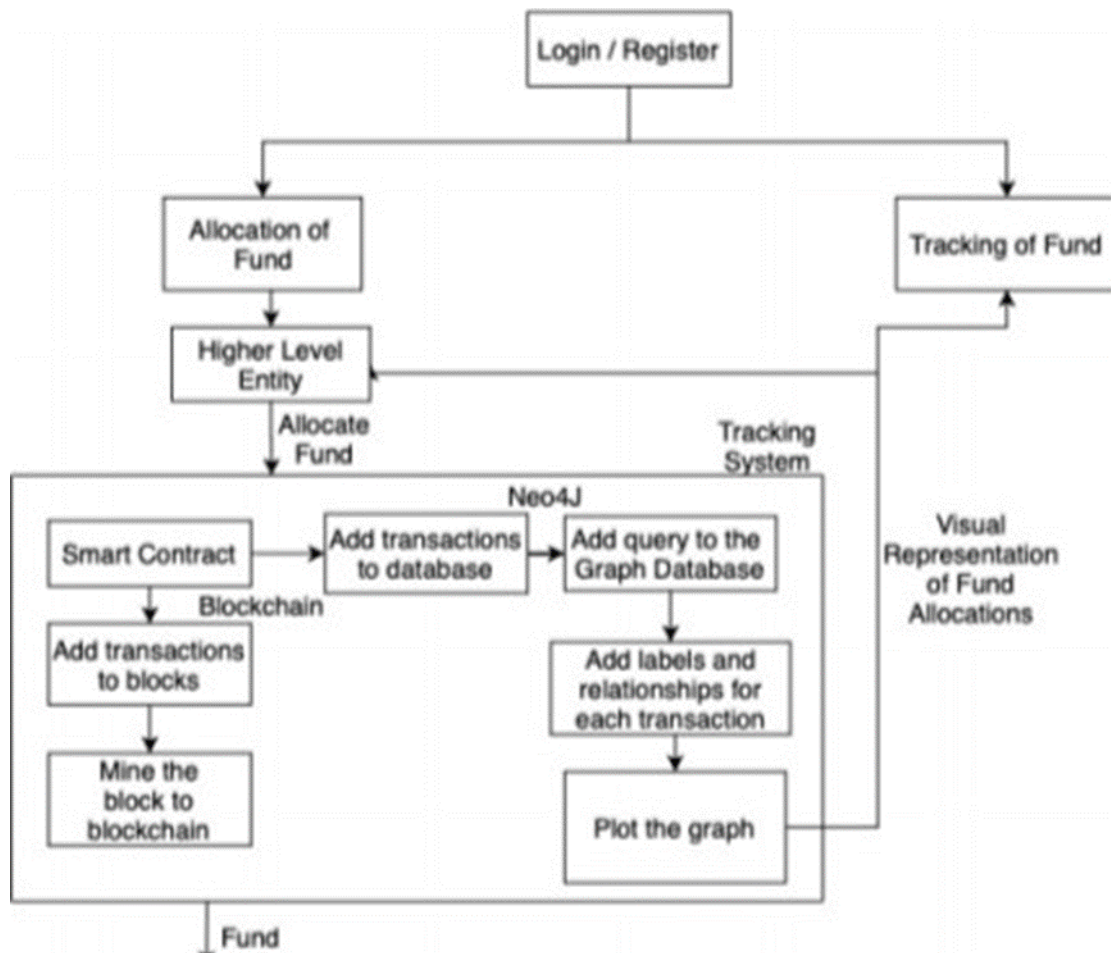
Module 1 - Government: - Government will give the fund which is requested by the user.

Module 2 – Authority (TPA):- This will authorize or verify the user that it is a valid user as well as valid request or not.

Module 3 - User (Customer):- User will request for the fund according to their needs.

## **PROJECT DESIGN**

The problem statement can be defined as creating a blockchain to maintain all of the data regarding fund allocations by the government in a secure way and to establish transparency by maintaining the flow of public funds. The current scenario is such that the public funds are released and allocated for projects but the citizens do not get.



**SYSTEM ARCHITECTURE**

The second module consists of the e-tendering framework. Whenever a project gets assigned to the department, it will put out tenders so as to complete its tasks. These tenders will be put out either by the state or the district depending on the type of project/work that needs to be completed. The framework will also be a blockchain-based framework. A tender will be put out along with the deadline and the district or state will be able to select the most suitable vendor for the task, within the given deadline. If the deadline is not met or there were no proper bids within that deadline then the tender will be reopened for another stipulated amount of time

**E-tendering process:**

The details of vendors that took part in the bid along with the final vendor will be added to the blockchain. This will ensure that the higher authorities are aware of all the bids that were given and which of them was selected by the state or district. The selected vendor details will also be added to the relational database and the same can be then viewed in our graphical representation using the Neo4J framework

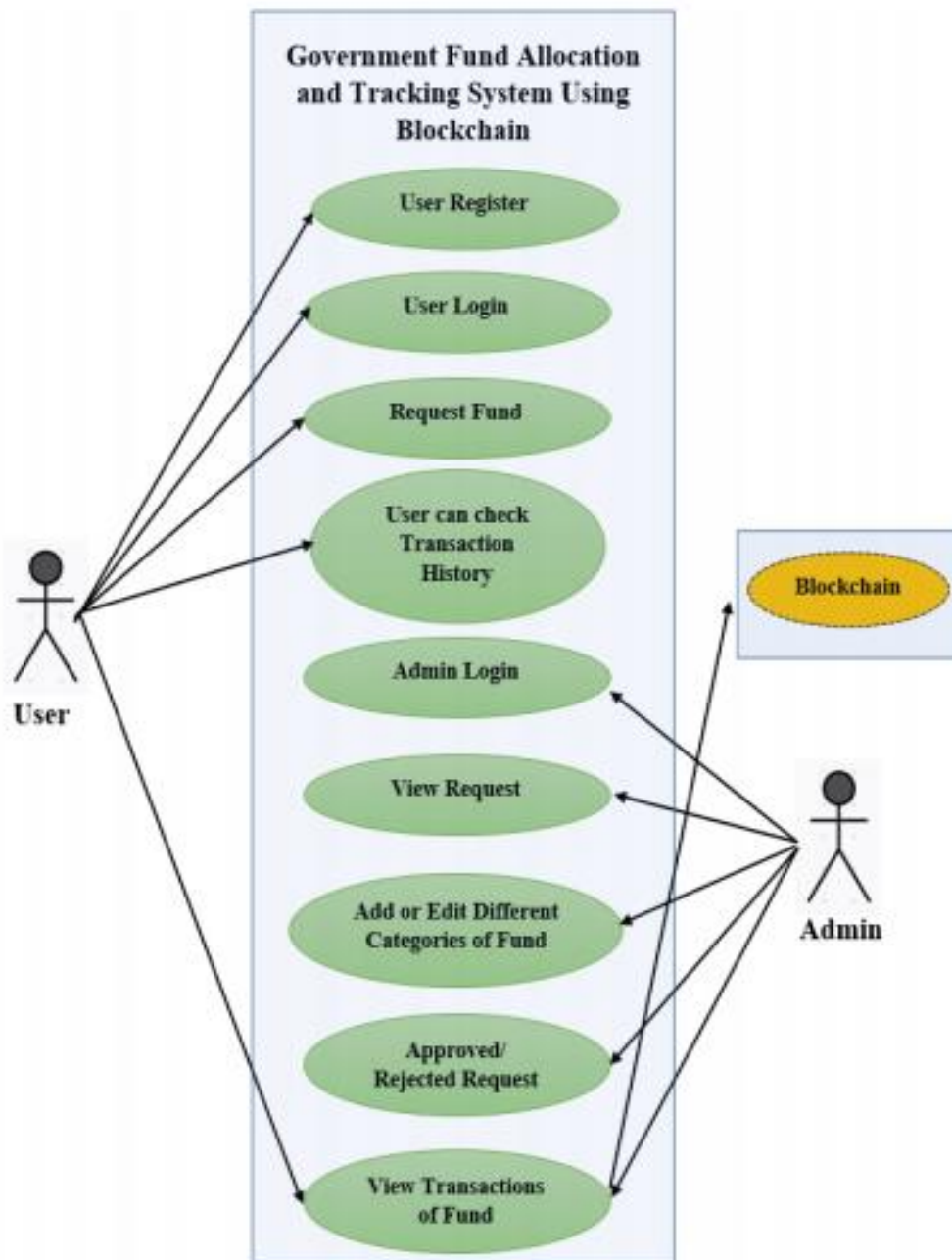
The database used for the system is MongoDB. The database is free to use for development locally and provides a cloud cluster including Database as a Service for production purposes. The database comes with security features built-in out of the box. Storing all of the data on the blockchain might lead to some exceptions. Hence, using a secure database to store the primary/ private keys will reduce the operations of the network. This will allow a reduction in cost for operations.

Consider the Education department . Suppose the government releases some funds for the infrastructure of government schools. Then the flow that will be followed is, first the government allocates the fund to the state. The state forwards the same to the district and the district then identifies the schools under their provisioned areas and allocates the funds accordingly to the schools . Suppose there is a task related to the infrastructure of the school. In such a case, the e-tendering will come into the picture and a suitable vendor will be selected to complete the task. Now, all of the transactions that take place in this entire process are mined in the blockchain and specific details of each transaction are stored in a relational database. This database will be used by the graph database, i.e Neo4J which will visually show the flow of the fund from start to end.

Few aspects that will be taken into consideration while evaluating measures will be transparency, which will check the proper flow of funds without losing any amount in any illegal or personal use (bribe) thus maintaining unaltered records and the public i.e. citizens are satisfied with the flow next aspect will be security , blockchain provides one of the most essential facilities that are security, every transaction must be secure while maintaining the transparency , to make the credentials of the sender -receiver secure against manipulation while preventing any kind of fraud.

Starting from central to the state to any particular vendor there should be the complete justification of public funds. The given amount should be equal to the utilized amount and everything should be summed up properly and lastly, blocks should be added to the chain keeping the constraint of time and it should not take much time. The same thing applies to the website, the loading, and refreshing of the same should be efficient.

6.1.3 USE CASE DIAGRAM :



**Figure 3: Use Case Diagram**

**CONCLUSION**

The earlier methods that have been used for allocation and tracking of public funds were not up to the mark. There are several limitations in the existing systems. The blockchain only consists of transactions given for the project but does not focus on whether or not these funds are being used properly. The proposed system intends to carry out all transactions of public funds in a secure and transparent way. The use of graph databases will help to clear the visualization of flow along with properties of each node (individual entity in a transaction) in the graph. This paper proposes a solution towards a secure and transparent fund allocation and tracking system using blockchain technology that also includes the e-tendering process. Future work will include the inclusion of the system in a public ledger and to bring all of the departments together in the system.

### References

- [1] A. Mohite and A. Acharya , "Blockchain for government fund tracking using Hyperledger ," 2018 International Conference on Computational Techniques , Electronics and Mechanical Systems (CTEMS ), Belgaum , India, 2018 , pp. 231-234, doi: 10.1109/CTEMS.2018.876920
- [2] H. Saleh , S. Avdoshin and A. Dzhonov , "Platform for Tracking Donations of Charitable Foundations Based on Blockchain Technology ," 2019 Actual Problems of Systems and Software Engineering ( APSSE )
- [3] Benton, M. C.; Radziwill, N. M.; Purritano, A. W.; Gerphart, C. J., "Blockchain for Supply Chain : Improving Transparency and Efficiency Simultaneously ", 130510381 | Blockchain for Supply Chain : Improving Transparency and Efficiency Simultaneously.\
- [4] Mustafa, Mohammed & Waheed, Sajjad. (2019). "A governance framework with permission blockchain for transparency in the e-tendering process ." International Journal of Advanced Technology and Engineering Exploration. 6. 274-280. 10.19101/IJATEE.2019.650072.
- [5] Sheer Hardwick , Freya & Akram, Raja Naeem & Markantonakis , Konstantinos . (2018) . "Fair and Transparent Blockchain -Based Tendering Framework - A Step Towards Open Governance." 1342-1347. 10.1109/TrustCom/BigDataSE.2018.00185.