

BLOCKCHAIN AND EDGE-COMPUTING-BASED SECURE FRAMEWORK FOR GOVERNMENT TENDER ALLOCATION

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering degree in Computer Science and Engineering

by

THARATISH CHARAN. R (38110598)



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHOOL OF COMPUTING**

**SATHYABAMA INSTITUTE OF SCIENCE AND
TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade "A" by NAAC

**JEPPIAAR NAGAR, RAJIV GANDHI SALAI,
CHENNAI - 600 119**

MARCH - 2022



SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **R. THARATISH CHARAN (38110598)** who carried out the project entitled **"BLOCKCHAIN AND EDGE-COMPUTING-BASED SECURE FRAMEWORK FOR GOVERNMENT TENDER ALLOCATION**

" under my supervision from November 2021 to March 2022

**Internal Guide
Dr. M. KANIPRIYA PhD**

**Head of the Department
Dr. L. Lakshmanan, M.E., Ph.D.,**

Submitted for Viva voce Examination held on_____

Internal Examiner

External Examiner

DECLARATION

I THARATISH CHARAN. R hereby declare that the Project Report entitled **A BLOCKCHAIN AND EDGE-COMPUTING-BASED SECURE FRAMEWORK FOR GOVERNMENT TENDER ALLOCATION**

done by us under the guidance of Dr./Prof./Mr./Ms. **Dr. M. KANIPRIYA PhD** (Internal) is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

DATE:

R. THARATISH CHARAN

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T.Sasikala M.E., Ph.D, Dean**, School of Computing **Dr. L. Lakshmanan M.E., Ph.D. ,** and **Dr.S.Vigneshwari M.E., Ph.D. Heads** of the Department of Computer Science and Engineering for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide Dr./Mr./Ms for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Computer Science and Engineering** who were helpful in many ways for the completion of the project.

ABSTRACT

Block chain technology is an example of such technology that has been attracting the attention of Governments across the globe in recent years. Enhanced security, improved traceability, and lowest cost infrastructure empower the block chain to penetrate various domains. Generally, governments release tenders to some third-party organizations for different projects. During this process, different competitors try to eavesdrop the tender values of others to win the tender. Block chain technique used under various security service with different model. It is used as backend database model that maintains distributed ledger. No. of users can register and make the tender quotation under various department. Admin will check and give the response from the quotation result. Admin or authority check the experience and process management level skill for general auditing purpose.

TABLE OF CONTENTS

CHAPTER No.	TITLE	PAGE No
	ABSTRACT	i
	LIST OF FIGURES	iv
1	INTRODUCTION	1
	1.1 Outline of the Project	1
	1.2 Existing System	1
	1.3 Proposed System	2
2	LITERATURE SURVEY	3
	SYSTEM ARCHITECHTURE DIAGRAM	6
3	MODULES	7
4	ALGORITHMAM USED	9
5	REQUIREMENTS ENGINEERING	11
	5.1 General	11
	5.2 Hardware Requirements	11
	5.3 Software Requirements	11
6	DATA FLOW DIAGRAM	12
	Module Description	13
7	CONCLUSION	16

APPENDIX	17
A. SCREENSHOTS	17
B. PUBLICATION AND PLAGIARISM REPORT	20
REFERENCE	25

LIST OF FIGURES

FIGURE NO	FIGURE NAME	PAGE NO
1	System Architecture Diagram	6
2	Module diagram	8
3	Data Flow Diagram	12

CHAPTER 1

INTRODUCTION

1.1 OUTLINE OF THE PROJECT

In There have been various attempts to implement the technology to make government processes paperless and instantaneous, such as online ticketing systems, online issuing of tenders, filing tax returns, etc. Although most of these systems seem robust and well implemented, all of them are based on the idea of a central server that has a single point of failure, as hackers can easily hack or disrupt its functioning by attacks, such as DOS, Slow-loris, SYN Flooding, etc. In most governments, complicated bureaucratic systems often result in highly inefficient workflow fraught with corruption, mismanagement, and human errors. Some of the governance processes, such as government tenders include malpractices like information leaks, corruption, bribery, etc. Most of the existing electronic services and IT infrastructure have the above-mentioned limitations, however, new technologies, such as blockchain have the potential to greatly ameliorate the existing problems. A permissioned blockchain network can provide the necessary transparency to effectively implement government policies for the benefit of the citizens of the country and fix responsibilities in case of abuse of the system.

1.2 EXISTING SYSTEM

Concept:

Some of the governance processes, such as government tenders include malpractices like information leaks, corruption, bribery, etc. Most of the existing electronic services and IT infrastructure have some limitations.

Technique:

ECDSA Algorithm.

Disadvantage:

It takes too long time to process the data with less efficiency.

1.3 PROPOSED SYSTEM

Concept:

A permissioned block chain network can provide the necessary transparency to effectively implement government policies for the benefit of the citizens of the country and fix responsibilities in case of abuse of the system.

Technique:

SHA algorithm

Advantage:

It gives convenience to identify and compare the data.

CHAPTER 2

LITERATURE SURVEY

TITLE: Proof-of-PUF Enabled Block chain: Concurrent Data and Device Security for Internet-of-Energy

AUTHOR: Rameez Asif, Kinan Ghanem and James Irvine

YEAR: 2020

PAPER EXPLANATION:

A detailed review on the technological aspects of Blockchain and Physical Unclonable Functions (PUFs) is presented in this article. It stipulates an emerging concept of Blockchain that integrates hardware security primitives via PUFs to solve bandwidth, integration, scalability, latency, and energy requirements for the Internet-of-Energy (IoE) systems. This hybrid approach, hereinafter termed as PUFChain, provides device and data provenance which records data origins, history of data generation and processing, and clone-proof device identification and authentication, thus possible to track the sources and reasons of any cyber-attack. In addition to this, we review the key areas of design, development, and implementation, which will give us the insight on seamless integration with legacy IoE systems, reliability, cyber resilience, and future research challenges.

TITLE: A Blockchain and Edge Computing-based Secure Framework for Government Tender Allocation

AUTHOR: Vikas Hassija, Vinay Chamola, Senior Member, IEEE, Dara Nanda Gopala Krishna, Neeraj Kumar.

YEAR: 2020

PAPER EXPLANATION :

Governments and public sector entities around the world are actively exploring new ways to keep up with technological advancements to achieve smart governance, work efficiency, and cost optimization. Block chain technology is an example of such technology that has been attracting the attention of Governments across the globe in recent years. Enhanced security, improved traceability and lowest cost infrastructure empower the block chain to penetrate various domains. Generally, governments release tenders to some third-party organizations for different projects. During this process, different competitors try to eavesdrop the tender values of others to win the tender. The corrupt government officials also charge high bribe to pass the tender in favor of some particular third party. In this paper, we presented a secure and transparent framework for government tenders using block chain. Block chain is used as a secure and immutable data structure to store the government records that are highly susceptible to tampering. This work

aims to create a transparent and secure edge computing infrastructure for the work-flow in government tenders to implement government schemes and policies by limiting human supervision to the minimal.

TITLE: A Survey on IoT Security: Application Areas, Security Threats, and Solution Architectures

AUTHOR: VIKAS HASSIJA, VINAY CHAMOLA, VIKAS SAXENA, DIVYANSH JAIN, PRANAV GOYAL, AND BIPLAB SIKDAR.

YEAR: 2019

PAPER EXPLANATION :

The Internet of Things (IoT) is the next era of communication. Using the IoT, physical objects can be empowered to create, receive, and exchange data in a seamless manner. Various IoT applications focus on automating different tasks and are trying to empower the inanimate physical objects to act without any human intervention. The existing and upcoming IoT applications are highly promising to increase the level of comfort, efficiency, and automation for the users. To be able to implement such a world in an evergrowing fashion requires high security, privacy, authentication, and recovery from attacks. In this regard, it is imperative to make the required changes in the architecture of the IoT applications for achieving end-to-end secure IoT environments. In this paper, a detailed review of the security-related challenges and sources of threat in the IoT applications is presented. After discussing the security issues, various emerging and existing technologies focused on achieving a high degree of trust in the IoT applications are discussed. Four different technologies, blockchain, fog computing, edge computing, and machine learning, to increase the level of security in IoT are discussed.

TITLE: A Survey on IoT Security: Application Areas, Security Threats, and Solution Architectures

AUTHOR: Vikas Hassija, Vinay Chamola, Vikas Saxena, DivyanshJain, Pranav Goyal, Biplab Sikdar

YEAR: 2019

PAPER EXPLANATION:

The Internet of Things (IoT) is the next era of communication. Using the IoT, physical objects can be empowered to create, receive, and exchange data in a seamless manner. Various IoT applications focus on automating different tasks and are trying to empower the inanimate physical objects to act without any human intervention. The existing and upcoming IoT applications are highly promising to increase the level of comfort, efficiency, and automation for the users.

To be able to implement such a world in an ever-growing fashion requires high security, privacy, authentication, and recovery from attacks. In this regard, it is imperative to make the required changes in the architecture of the IoT applications for achieving end-to-end secure IoT environments. In this paper, a detailed review of the security-related challenges and sources of threat in the IoT applications is presented. After discussing the security issues, various emerging and existing technologies focused on achieving a high degree of trust in the IoT applications are discussed. Four different technologies, blockchain, fog computing, edge computing, and machine learning, to increase the level of security in IoT are discussed.

TITLE: Block chain for government services-Use cases, security benefits and challenges

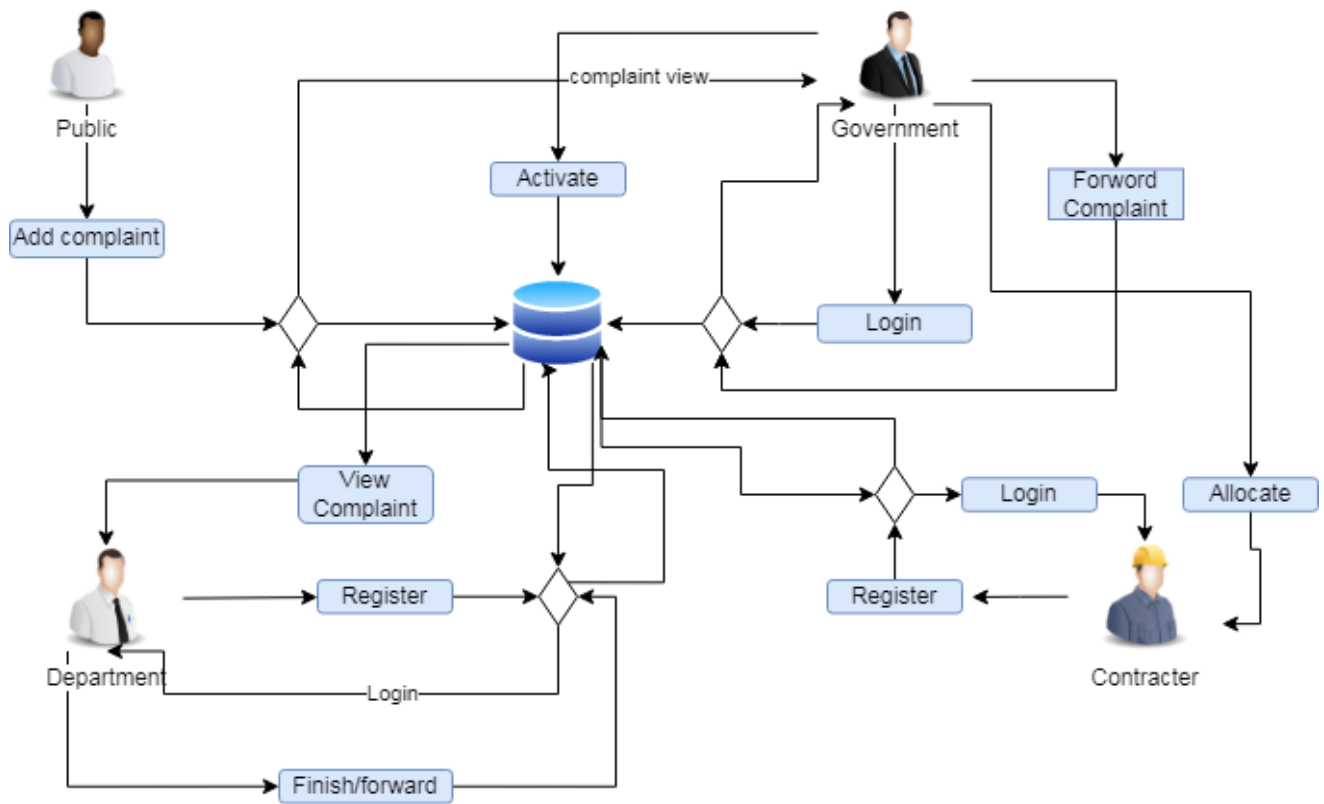
AUTHOR: Ahmed Alketbi; Qassim Nasir; Manar Abu Talib

YEAR:2018

PAPER EXPLANATION:

Public sector and governments have been actively exploring new technologies to enable the smart services transformation and to achieve strategic objectives such as citizens satisfaction and happiness, services efficiency and cost optimization. The Blockchain technology is a good example of an emerging technology that is attracting government attention. Many government entities such as United Kingdom, Estonia, Honduras, Denmark, Australia, Singapore and others have taken steps to unleash the potential of Block chain technology. Dubai Government is aiming to become paperless by adopting the Block chain technology for all transactions by 2021. The Block chain is a disruptive technology that is playing a vital role in many sectors. It's a revolutionary technology transforming the way we think about trust as it enables transacting data in a decentralized structure without the need to have trusted central authorities. Block chain technology promises to overcome security challenges in IoT enabled services such as enabling secure data sharing and data integrity. However, it also introduces new security challenges that should be investigated and tackled. In this paper, we review the literature to identify the potential use cases and application of Block chain to enable government services. We also synthesized literature related to the security of Block chain implementations to identify the security benefits, challenges and the proposed solutions. The analysis shows that is huge potential for Block chain technology to be used in to enable smart government services. This paper also highlights future research in the areas of concerns that required further investigation.

SYSTEM ARCHITECTURE DIAGRAM



CHAPTER 3

MODULES

LOGIN

DEPARTMENT UPLOAD

GOVERNMENT VIEW

ALLOCATE CONTRACT

CONTRACT APPLY

GOVERNMENT APPOINT

MODULE EXPLANATION:

LOGIN:

This module gives the way to enter into main page after login with valid input such as username or email id and password.

DEPARTMENT UPLOAD:

This module gives the way to department upload the file with some details about the damaged or unconstructed are with some document to the government.

GOVERNMENT VIEW:

This module to help to government view the construction area and the problem to allocate the tender.

ALLOCATE CONTRACT:

This module is help to the government allocate the tender to contractor to for the construction.

CONTRACT APPLY:

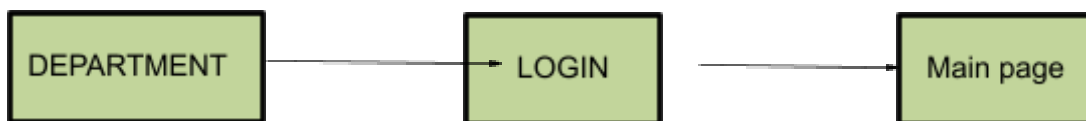
This module is help to contractor view the tender allocation and apply for the contract.

GOVERNMENT APPOINT:

This module is help to the government appoint the contractor for the construction.

MODULE DIAGRAM:

LOGIN:



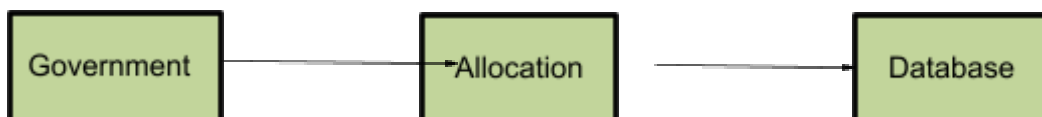
DEPARTMENT UPLOAD:



GOVERNMENT VIEW:



ALLOCATE CONTRACT:



CONTRACT APPLY:



GOVERNMENT APPOINT:



CHAPTER 4

ALGORITHM USED

SHA ALGORITHM:

In the field of cryptography and crypt analytics, the SHA-1 algorithm is a crypt-formatted hash function that is used to take a smaller input and produces a string that is 160 bits, also known as 20-byte hash value long. The hash value therefore generated, is known as a message digest which is typically rendered and produced as a hexadecimal number which is specifically 40 digits long.

Characteristics:

- The cryptographic hash functions are utilized and used to keep and store the secured form of data by providing three different kinds of characteristics such as pre-image resistance, which is also known as the first level of image resistance, the second level of pre-image resistance and collision resistance.
- The cornerstone lies in the fact that the pre-image crypt resistance technique makes it hard and more time consuming for the hacker or the attacker to find the original intended message by providing the respective hash value.
- The security, therefore, is provided by the nature of a one way that has a function that is mostly the key component of the SHA algorithm. The pre-image resistance is important to clear off brute force attacks from a set of huge and powerful machines.
- Similarly, the second resistance technique is applied where the attacker has to go through a hard time decoding the next error message even when the first level of the message has been decrypted. The last and most difficult to crack is the collision

resistance, making it extremely hard for the attacker to find two completely different messages which hash to the same hash value.

- Therefore, the ratio to the number of inputs and the outputs should be similar in fashion to comply with the pigeonhole principle. The collision resistance implies that finding two different sets of inputs that hash to the same hash is extremely difficult and therefore marks its safety.

Uses of SHA Algorithm:

These SHA algorithms are widely used in security protocols and applications, including the ones such as TLS, PGP, SSL, IPsec, and S/MIME. These also find their place in all the majority of cryptanalytic techniques and coding standards which is mainly aimed to see the functioning and working of majorly all governmental as well as private organizations and institutions. Major giants today such as Google, Microsoft, or Mozilla have started to recommend the use of SHA-3 and stop the usage of the SHA-1 algorithm.

CHAPTER 5

REQUIREMENTS ENGINEERING

5.1 General

These are the requirements for doing the project. Without using these tools and software's we can't do the project. So we have two requirements to do the project. They are

1. Hardware Requirements.
2. Software Requirements.

5.2 HARDWARE REQUIREMENTS

The hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. They are used by software engineers as the starting point for the system design. It shows what the system does and not how it should be implemented.

PROCESSOR	: PENTIUM IV 2.6 GHz, Intel Core 2 Duo.
RAM	:4GB DD RAM
MONITOR	:15" COLOR
HARD DISK	:40 GB

5.3 SOFTWARE REQUIREMENTS

The software requirements document is the specification of the system. It should include both a definition and a specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost,

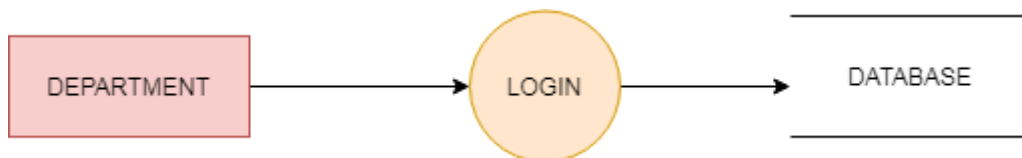
planning team activities, performing tasks and tracking the team's and tracking the team's progress throughout the development activity.

Front End	:	J2EE (JSP, SERVLETS) JAVASCRIPT
Back End	:	MY SQL 5.5
Operating System	:	Windows 07
IDE	:	Eclipse

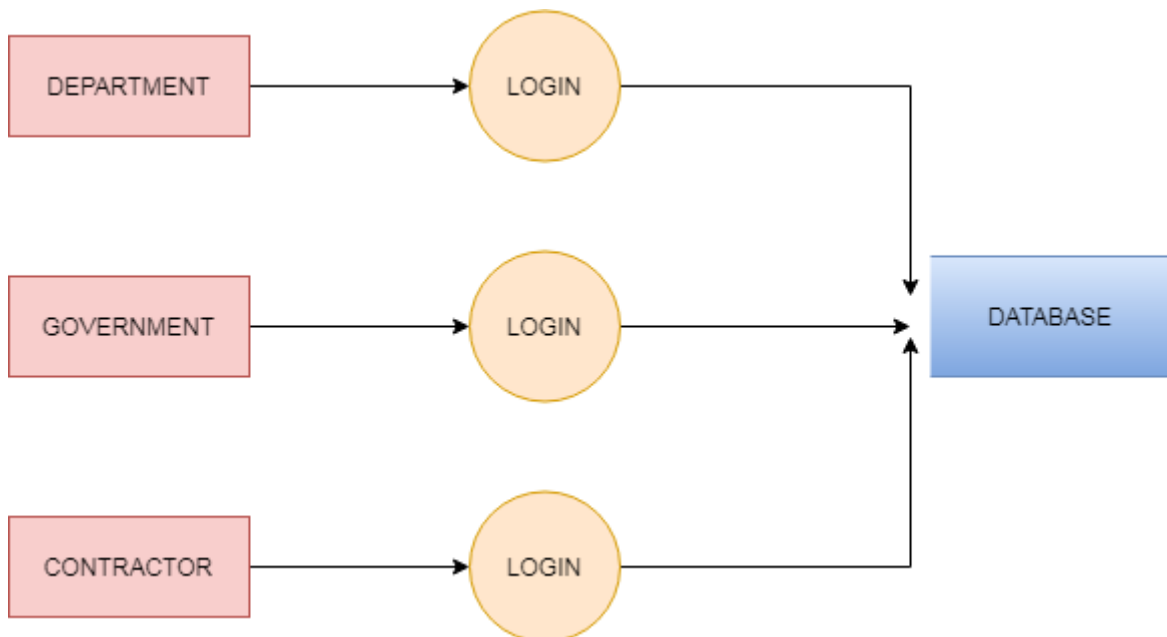
CHAPTER – 6

DATA FLOW DIAGRAM

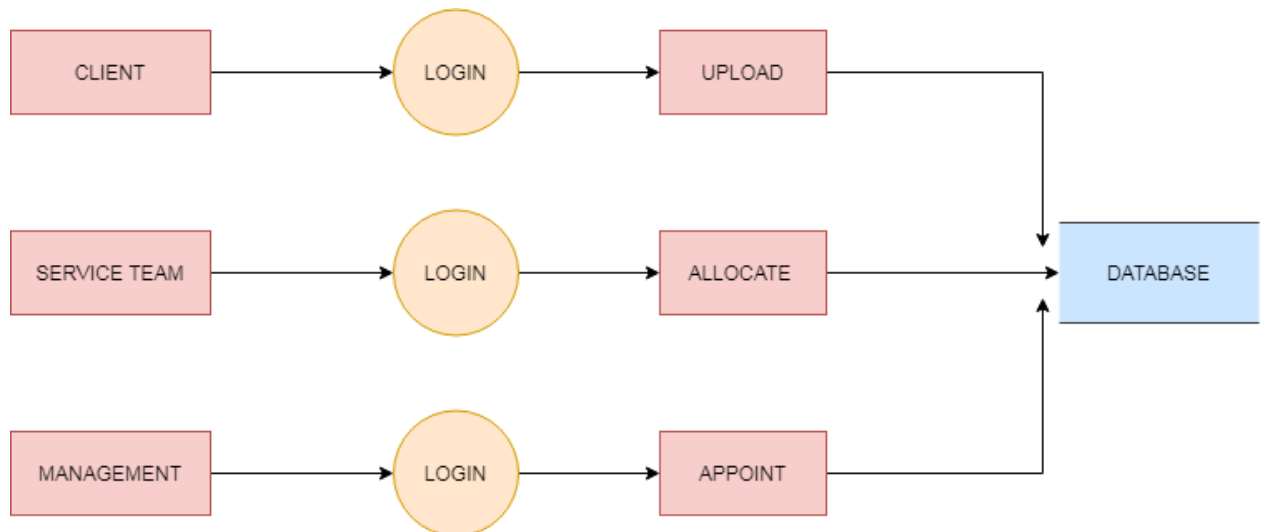
LEVEL 1:



LEVEL 2:



LEVEL 3:



EXPLANATION:

A data flow diagram (DFD) is a graphical representation of the “flow” of data through an information system. It differs from the flowchart as it shows the data flow instead of the control flow of the program. A data flow diagram can also be used for the visualization of data processing. The DFD is designed to show how a system is divided into smaller portions and to highlight the flow of data between those parts.

MODULE DESCRIPTION

PUBLIC COMPLAINT

DEPARTMENT REGISTER

DEPARTMENT LOGIN

SELECT DEPARTMENT

DEPARTMENT UPLOAD

GOVERNMENT LOGIN

GOVERNMENT VIEW

GOVERNMENT TENDER ALLOCATION

GOVERNMENT APPROVE

CONTRACTOR REGISTER

CONTRACTOR LOGIN

CONTRACTOR REQUEST TENDER

CONTRACTOR APPOINTMENT

- **PUBLIC COMPLAINT:**

In this module in our project, here symbolizes a unit of work performed within a database management system. Public add complaint something about some issues about his/her area or zone such as water department issue, Electricity related issue with the picture of that.

- **DEPARTMENT REGISTER:**

The register module provides a conceptual framework for entering data on those department in a way that: eases data entry & accuracy by matching the department entry to the data source (usually paper files created at point of care), ties easily back to individual department records to connect registers to department data, and collects data elements to enable better supervision of tender programs.

- **DEPARTMENT LOGIN:**

In this module in our project, here symbolizes a unit of work performed within a database management system (or similar system) against a database, and treated in a coherent and reliable way independent of other transactions. A transaction generally represents any change in database user will transfer the amount to provider.

- **GOVERNMENT VIEW:**

In this module the government will also view the contractor. And analysis the details will be responsible for your file stored in database.

- **GOVERNMENT TENDER ALLOCATION:**

In this module the government will allocate the tender for the government project. Analysis the details will be responsible for your file stored in database.

- **GOVERNMENT APPROVE:**

In this module is used to help to the contractor to request the tender with the land longitude and the contractor will update the report along with their opinion and they will be stored the database.

- **CONTRACTOR REGISTER:**

The register module provides a conceptual framework for entering data on those contractors in a way that: eases data entry & accuracy by matching the contractor entry to the data source (usually paper files created at point of care), ties easily back to individual charity records to connect registers to contractor data, and collects data elements to enable better supervision of tender programs.

- **CONTRACTOR LOGIN:**

In this module in our project, here symbolizes a unit of work performed within a database management system (or similar system) against a database, and treated in a coherent and reliable way independent of other transactions. A transaction

generally represents any change in database user will transfer the amount to provider.

- **CONTRACTOR TENDER REQUEST:**

In this module the contractor will also view the request. And analysis the details will be responsible for your file stored in database.

- **CONTRACTOR APPOINTMENT:**

In this module is used to help to the contractor to request the tender with the appointment by the government and the contractor will update the report along with their opinion and they will be stored the database.

- **SELECT DEPARTMENT:**

In this module in our project, here the department is need to select the department like construction or some department for the tender allocation.

- **DEPARTMENT UPLOAD:**

The register module provides a conceptual framework for uploading data on those department in a way that: eases data entry & accuracy by matching the department entry to the data source (usually paper files created at point of care), ties easily back to individual department records to connect registers to department data, and collects data elements to enable better supervision of donation programs.

- **GOVERNMENT LOGIN:**

In this module in our project, here symbolizes a unit of work performed within a database management system (or similar system) against a database, and treated in a coherent and reliable way independent of other transactions. A transaction generally represents any change in database user will transfer the amount to provider.

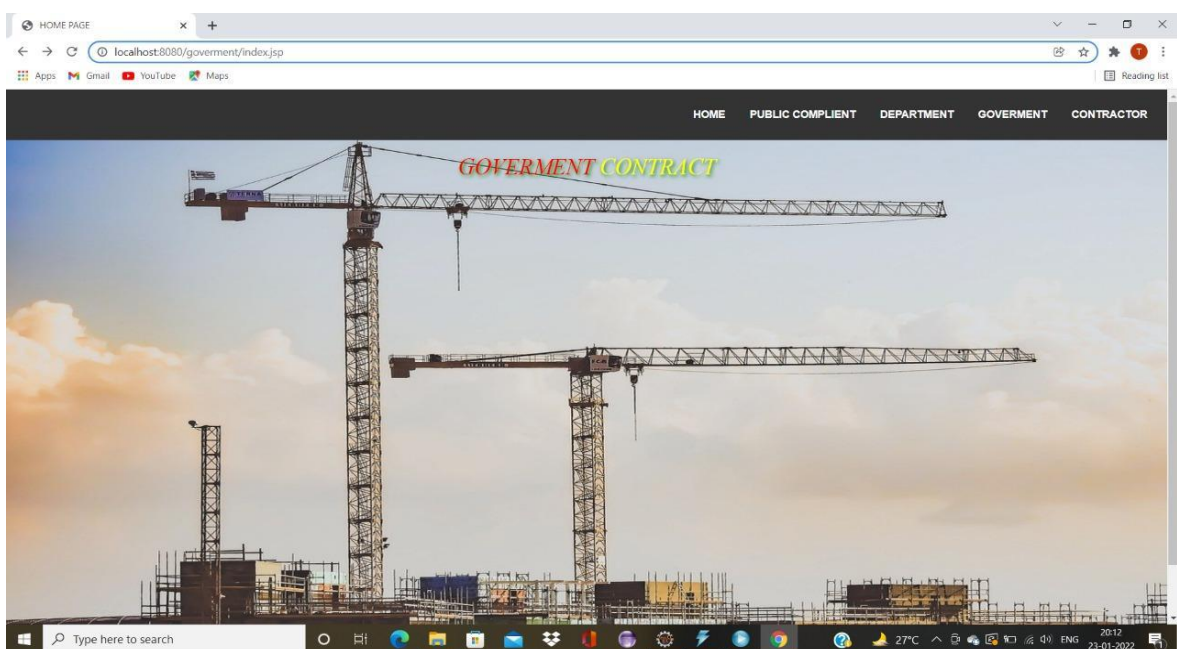
CHAPTER – 7

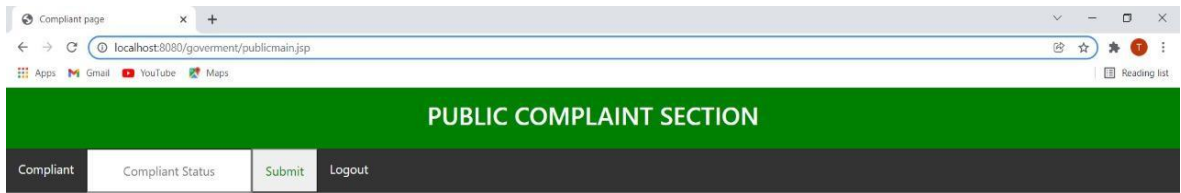
CONCLUSION

In this article, we have discussed on the need and benefits of using block chain technology in the government tender assignment process. We have used to implement the end-to-end edge computing framework for a government tender Workflow. The SHA algorithm is proposed to associate the best-suited constructors to the tender projects, thereby enhancing the profit of both the government Tenders and the construction companies. We have also studied the performance evaluation of the proposed model. The proposed model proves to give better results in terms of different tender parameters as compared to its counterparts.

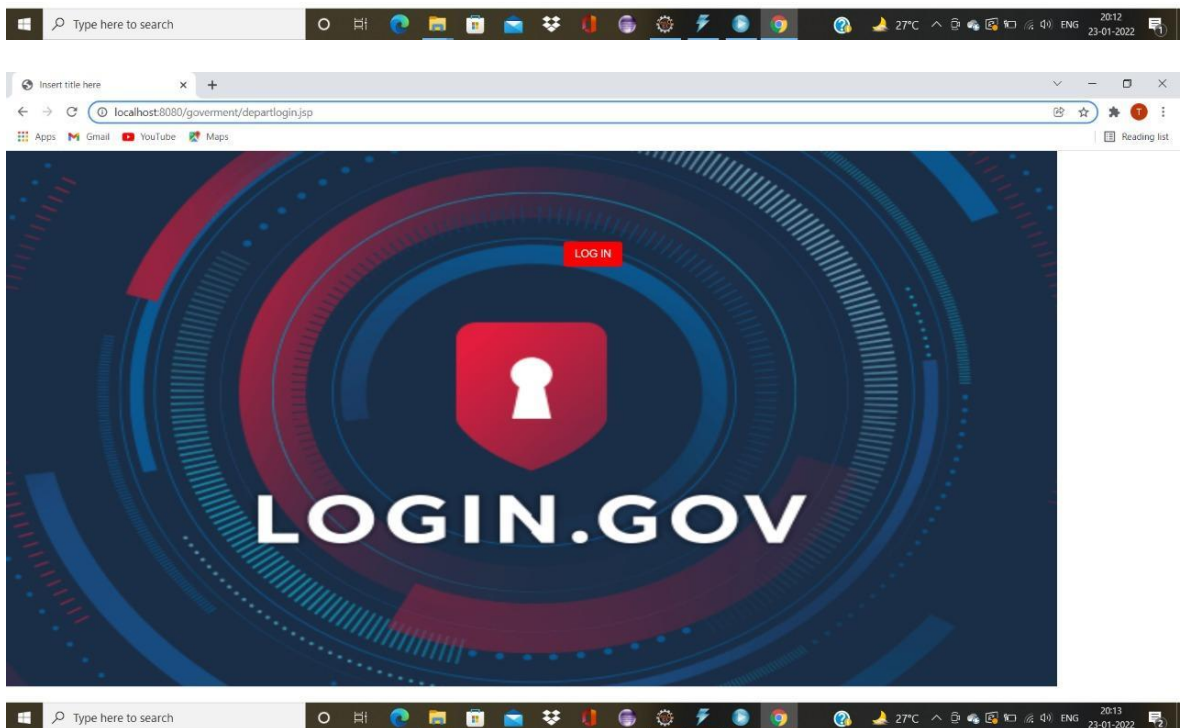
APPENDIX

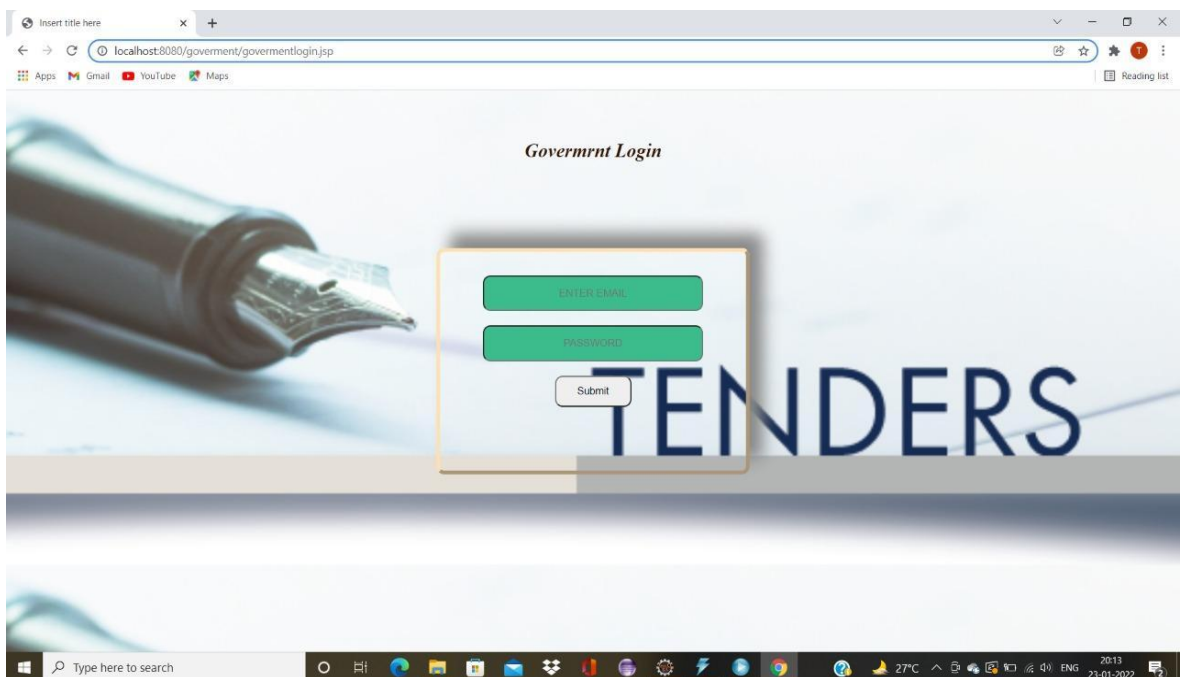
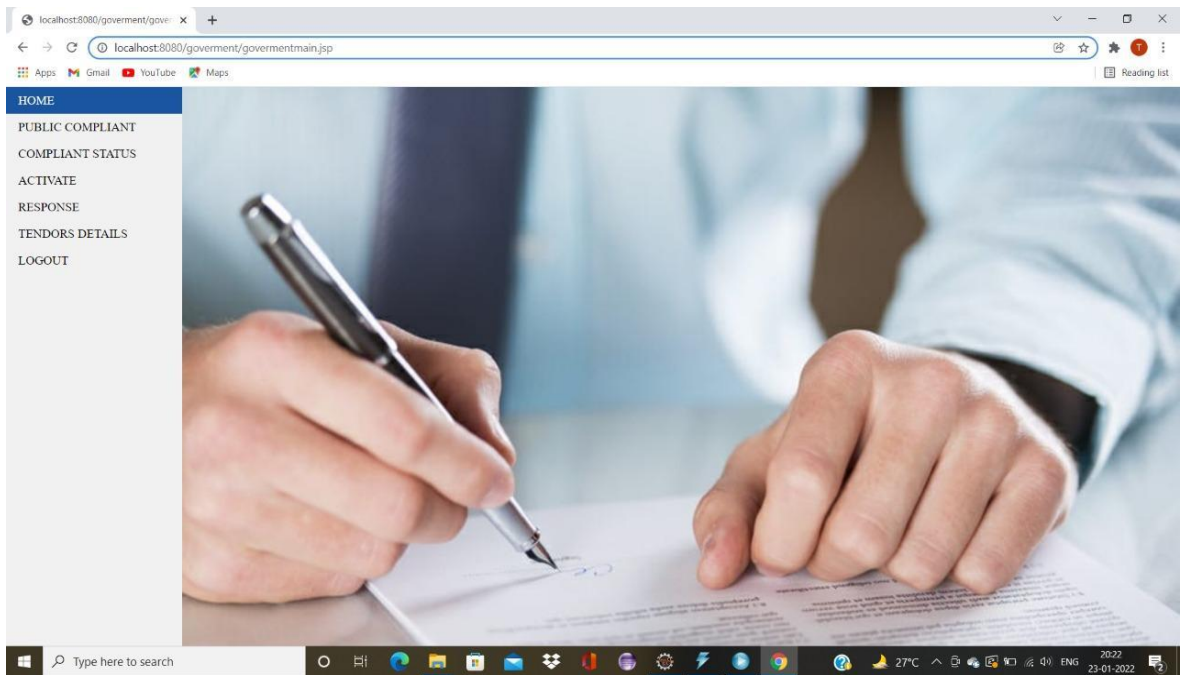
A. SCREEN SHOTS OF THE APPLICATION





Compliant Section





B. PUBLICATION AND PLAGIARISM REPORT

**NCCICN 2022 - PAPER
REGISTRATION ON OR BEFORE** ★
March 20 ,2022. Inbox



Sathyabama National C... 12 Mar

to bcc: me ▾



Dear Authors,

We are pleased to inform you that your article has been accepted for oral presentation at the **NCCICN 2022** conference and also for further publication in one of the Scopus Indexed Journals [IEEE/Springer].

You are advised to strictly follow the following deadlines, the bank details for registration are enclosed with this mail.

Registration Deadline : March 20th, 2022

Delegate Fees

Research Scholar / UG or PG Students : INR 8000

Academicians/Industrial Participants : INR 10000

Also, you are asked to check your paper for plagiarism. If plagiarism is above 15%, Kindly reduce the plagiarism below 10-15%. You are requested to attach the Camera-ready paper along with the Registration Form at the earliest.

Kindly attach the manuscript in Journal format not exceeding more than 10 pages in MS Doc format. Collect the conference and publication receipt upon successful registration.

Note :

It's mandatory for one author to register for the conference without fail.

Registration Form : <https://forms.gle/Zrm6bfMLzLWwWgL3A>



A Blockchain and Edge-Computing-Based Secure Framework for Government Tender Allocation.docx

by A Blockchain And Edge-computing-based Secure Frame A Blockchain And Edge-computing-based Secure Frame

Submission date: 28-Feb-2022 12:59PM (UTC-0500)

Submission ID: 1773099447

File name: ing-Based_Secure_Framework_for_Government_Tender_Allocation.docx (1.36M)

Word count: 6092

Character count: 30858

A Blockchain and Edge-Computing-Based Secure Framework for Government Tender Allocation

Tharathish Charan
Department of Computer Science and Engineering
Computer Science and Engineering
Sathyabama Institute of Science and Technology
tharathish@gmail.com

Dr.M.Kanipri
Department of
Sathyabama Institute



the long term. Further developed security, further developed checking, and less expensive foundation empower blockchain to arrive at more areas. By and large, the public authority gives an assortment of ventures to individual associations. Practically speaking, various contenders attempt to comprehend the worth of different rivals to win the market. Defilement laborers additionally take hush-money to pick others. In this article, we will present a dependable and effective method for giving public obtainment utilizing blockchain. Blockchain is utilized as a solid and changeless news source for the upkeep of openly available reports that favor criminal operations. The point is to make a proficient and solid framework for public acquisition to execute projects and approaches that decrease public oversight.

Catchphrases - Suspension, computerized signature, conveyance of note pad innovation, market estimations, ethers, work ensures, brilliant agreements.

I. Introduction

There is a fast advancement in the utilization of blockchain innovation close to the area and in all areas of the planet. Blockchain innovation is a dependable arrangement that can be utilized as open obtainment to increment security, protection, straightforwardness, and speed. Blockchain permits all gatherings to acknowledge it being important for a solitary organization, a one-of-a-kind market for bit by bit observing [1]. The state run administrations of Georgia, the United Kingdom, the United Arab Emirates, Australia, China, Japan, and Russia are becoming accustomed to it. The Dubai government has significant designs to kill paper utilizing innovation. Throughout the long term, states in many emerging nations, like India, have created different activities and arrangements to fit innovation. There have been endeavors to carry out innovation like internet-based deals frameworks, web-based offering, and tax collection so the public authority can deal with paper quicker and quicker. Albeit the greater part of the frameworks appears to be strong and very much

fumble, and botch. A few regulatory exercises, like public obtainment, incorporate falsehood, debasement, and defilement. Numerous e-administration exercises and data innovation framework have their constraints, yet new advancements, for example, blockchain can enormously lessen existing issues [5], [6]. The lawful structure gives the light expected to public approach to be executed to support individuals of the nation, and can correct risk when abuse of the framework [7], [8]. Notwithstanding the absence of data, defilement in the work environment and superfluous postponements are different issues confronting the common assistance. Public authorities misuse their power and request a lot of pay-offs to offer.

In such manner, we expect to make a straightforward and secure public acquisition framework that doesn't need public oversight and support, yet in addition to empower government oversight and strategy update over the long haul. To address this, we require the utilization of innovation to disclose obtainment simpler, more clear, more straightforward and more actual.

The remainder of this article is ready as follows. Ongoing exercises connected with the improvement of government employees utilizing innovation and other profession exercises are displayed in Section II. Fundamental data on suspension innovation is given in Section III. Part IV frameworks the overall framework. The ground breaking strategy was made utilizing savvy contracts and the most ideal way to follow through on the cost given in segment V. Area VI sums up the example and Section VII finishes up this conversation.

II. RELATED WORK

Luckily, very little examination has been done on government closure programs, and very little exploration has been done on this theme. This clarifies the distinctions in the idea of blockchain innovation comparable to government exercises and other key areas of exploration. Along these lines, the utilization of blockchain in government obtainment is intriguing [13]. Jacoud and Saade [14] examined various cases and various spaces utilized by blockchain. Howe [15] clarified exhaustively the advantages and benefits of utilizing innovation to decrease the time and exertion expected to oversee and keep up with the

common help. Knowledge arrangements have been started to address against debasement and hostile to defilement exercises across the country. Moreover, they radically diminish the time it takes to finish administrations, sendoff new administrations, and work on the nature of administration they give to residents. Neslens and Jansen [16] proposed the advancement of straightforwardness among government and individuals through boundaries. Data might be mysterious, and public exercises might be checked and controlled to work on by and large reasonableness.

Neslens [17] proposed the utilization of a predictable way to deal with obstructing and putting away monetary data on the blockchain to work on the nature of the credit framework. Rama and others. [18] requested a Chinese divider plan to battle misrepresentation during government obtainment. Dello and Yoshida [19] required an e-acquirement strategy in Tanzania to make a superior obtainment experience. Hui and Yang [20] talked about China's cutthroat market and gave the electronic market bidders.

a model for taking care of a current issue, Fukui and Kobayashi [21] proposed a method for giving the state market to organizations in light of numerous attributes, like value, quality, and lapse date.

Character the executives has been perhaps the main parts of mental advancement in late year. Dunfi and Peticolas [22], Lin and others. 23 [25] requires an assortment of electronic democratic strategies to make the democratic cycle protected and simple. The nearness of individuals to strikes can diminish the gamble of uneven, degenerate administration. Zhang and others. [26] gave an instance of working with the administration of public data and sharing it in light of online data.

As of late, endeavors have been made to move the public acquirement program to other people, yet the public premium in the public authority and development area has not been considered. The proposed structure is pointed toward further developing the most recent development experience of government employees. The reason for the model is to make a last computation so that all parts are important for similar organization and the legitimate capacities work without a hitch and decently.

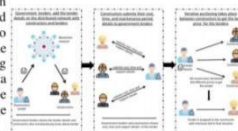


Figure 1. Bit by bit guidelines.

It is an asset that remembers chiefs for finance, banking, the Internet, the help area, industry and innovation. Notwithstanding the closure, the critical element of Ethereum is the capacity to associate flawlessly to savvy contracts in the organization. This permits you to make remarkable organizations that must be put away in a unique index that is apparent to the organization members. Various degrees of government can be taken in various ways, and the organization of the office can access and screen the exercises connected with this division.

I. PROPOSED MODEL FOR GOVERNMENT TENDERS

Figure 1 diagrams the means to appropriate obtainment from public banks to development organizations. To begin with, government contributors and engineers come to the heart of the matter of halting, setting up market counting framework. The moneylender imparts subtleties to every one of the pertinent developers. Moreover, there is a twofold sale among financial backers and state-claimed development. Then, at that point, the delicate will be proposed to the bidders or the ground. The proposed model comprises of a low area-based development that consolidates wellbeing protection, and open and straightforward activity. The objective of the model is to guarantee solid a, productive public obtainment. The framework comprises basically of three sorts: 1) government employees; 2) outer gatherings, for example, a development organization or an individual; and 3)



the member and the public key. Brilliant agreements are made with business markets, bringing about a key-esteem list written in books and put away on the web.

B. Decentralized Document Storage

Because of the enormous number of exercises that include various kinds of records to be handled, a three-section record capacity framework has been presented that takes into consideration coordination, decentralization, and decentralization of all reports bid. Workers for hire declare tenders and give offering expected for a specific movement. The affectionate time, expenses, and support time. Agreement is a type idea of the capacity administration keeps one point of head agreement. When an extra line is gathered, it from being lost and gives quicker admittance to exceptional duplicates on the web.

- 1) Step 1: First, the individual approved by the Dept. will sign the solicitation and the autonomous key made utilizing the circular mark calculation.
- 2) Step 2: Once the solicitation is marked, the consolidated advance (AES-256) steps quickly to give the 32-B sent message.
- 3) Step 3: This passage will currently enter the secret word (RSA-512). Saved with the public key displayed in B.
- 4) Step 4: The archive is currently added to the public storehouse, supported by the shrewd agreement, and connected to all hubs Government loan specialists improve quality resources anticipating endorsement by the other agreement.
- 5) Step 5: Once the solicitation has been looked into and endorsed, it will be reconsidered and saved for use and use.

In the above exercises, we utilize three disciplines. The initial segment utilizes ECDSA, which confirms the honesty of the record, yet in addition checks the particular data endorsed by them. The subsequent part utilizes AES-256 to conceal the record, which can't be attractive developer. These rules incorporate the time changed while sitting tight for a permit from. The third expected to finish the delicate, the expense, the nature part takes the sentence from the subsequent level and of the work, the post-delicate upkeep time frame, and

C. Consensus Algorithm

We take a gander at instances of organizations that incorporate numerous developers, government moneylenders, and markets. Government loan specialists are happy with the offered and indicate the normal time, cost, and support time expected after the decentralization, and decentralization of all reports bid. Workers for hire declare tenders and give offering expected for a specific movement. The affectionate time, expenses, and support time. Agreement is a type idea of the capacity administration keeps one point of head agreement. When an extra line is gathered, it from being lost and gives quicker admittance to exceptional duplicates on the web.

V. OPTIMAL PRICE FORMULATION

In this segment, we present a minimal expense method for expanding public interest in building and loaning. Government loan specialists improve quality resources at lower costs, while developers improve quality bonds. The innovative part is communicated by $\zeta C = (C_x | x \in X)$. $X = \{0, 1, 2, \dots, X\}$. The rundown was given by the public authority

CL (Ly Y), Y are addressed by $0, 1, 2, \dots$, while the sources are addressed by $\zeta T (Tz Z)$. Z, $0, 1, 2, \dots$. We want to think about five vital elements. We want to think about five vital elements. These rules incorporate the time expected to finish the delicate, the expense, the nature of the work, the post-delicate upkeep time frame, and

the overall political race. Ly credit expresses that the market should meet all necessities. Dzy, Pzy, Qzy, Szy, Vzy determine the normal time, cost esteem, nature of work, upkeep, commotion, and development time in the Tz market. The scales are shown on a network where everything manufacturers can peruse the portrayal.

Whenever banks have set their principles, intrigued market financial backers can start the main period of cutthroat offering. Customary frameworks select and advertise the best structure quality as per building guidelines connected with time, cost, nature of work, support time, and commotion. The given example incorporates various cutthroat tenders to appropriately assess the ten-year-old structure given by the public authority. After one of the manufacturers twofold checks, the test go on until the delicate is won. We accept this is the proper thing to do, and the market is for manufacturers. Dzx, Pzx, Qzx, Szx, Vzx Specify the normal time, cost, nature of work, possession time, clamor, and development Cx.

where Tz in the market X, X 0, 1, 2, ..., and z, Z 0, 1, 2, ...

We then, at that point, ascertain the standard time, cost, and upkeep time, and select all developers to meet the models set by the loan specialist. We start by clarifying the standard boundaries as adheres to

$$\begin{aligned} ND &= \frac{Dx - \min(D)}{\max(D) - \min(D)} \\ NP &= \frac{Px - \min(P)}{\max(P) - \min(P)} \\ NQ &= \frac{Qx - \min(Q)}{\max(Q) - \min(Q)} \\ NS &= \frac{Sx - \min(S)}{\max(S) - \min(S)} \\ NV &= \frac{Vx - \min(V)}{\max(V) - \min(V)} \end{aligned} \quad (5)$$

Here, ND, NP, NQ, NS, NV address the ordinary qualities of time, cost, nature of work, support time, and clamor. The cutoff time might be set by the state support or by the developers addressed by an and b. Along these lines, c, d, e, f, g, h, i, j show the most extreme worth and the least expense, the nature of the work, the upkeep time, and the stockpile proposition. This data isn't expected for development, loaning or

The time zth can be communicated as the market and the xth structure

$$D_{zx} = \min(D) - (b - a) \cdot \bar{a}, \quad (6)$$

Note that in the above condition, $\min(D)$ and $\max(D)$ mean $\min(D_{zx})$ and $\max(D_{zx})$ for all constructions. Also, the ordinary cost of NPzx, the nature of work of NQzx, the help life of NSzx, the decision of NVzx in the zth market. If it's not too much trouble, note that we accept that project workers who take an interest in the delicate don't take part in the delicate, which is more costly than the loan specialist. For instance, developers will quite often invest more energy, address greater expenses, give less an ideal opportunity to keep up with, and give less stockpile than government requirement, use, upkeep, and casting a ballot. Because of this thought, we have a breaking point

Additionally, the rules set by the loan specialist are not accessible, and one of the developers will be unable to appropriately perceive the market under these circumstances. We are mentioning a two-way closeout, which is likely to change on the off chance that the moneylender's rate contrasts fundamentally from the cost set by all manufacturers. We will examine the sale plan two times in the following area.

A. Double Auctioning Model

For this situation, ensure the loan specialist is Ly given by the state advance should be inside the specified time NDzx, NPzx value, NSzx support time $\bar{b}$ given by the producer ζC who wish to offer.

1) Improvement of costs between moneylenders: NDzy is relied upon to be given by the loan specialists given by the bank Ly should be inside the recommended NDzx period given by the moneylenders. This condition is affirmed by the way that the worth of NDzy is near the assessed worth of NDzx in the wake of arranging in rising or plummeting request. By contrasting the worth of NDzy in the center line of the worth of NDzx given by the author of ζC , we can make sure that the worth of NDzy is actually equivalent to the worth of NDzx given by ζC . In the wake of arranging the qualities given by the ζC grouping, track down the center space μ as follows.

Measures, for example, time, cost, work excellence, support time, and serious offers incorporate.



A Blockchain and Edge-Computing-Based Secure Framework for Government Tender Allocation.docx

ORIGINALITY REPORT

5%

SIMILARITY INDEX

1%

INTERNET SOURCES

5%

PUBLICATIONS

0%

STUDENT PAPERS

PRIMARY SOURCES

- 1 Vikas Hassija, Vinay Chamola, Dara Nanda Gopala Krishna, Neeraj Kumar, Mohsen Guizani. "A Blockchain and Edge-Computing-Based Secure Framework for Government Tender Allocation", IEEE Internet of Things Journal, 2021
Publication 4%
- 2 www.ijeast.com
Internet Source <1%
- 3 www.semanticscholar.org
Internet Source <1%
- 4 www.comoxvalleyrd.ca
Internet Source <1%
- 5 Hassan Karim, Danda B. Rawat. "TollsOnly Please—Homomorphic Encryption for Toll Transponder Privacy in Internet of Vehicles", IEEE Internet of Things Journal, 2022
Publication <1%

- 6 Geeta Mahadeo Ambildhuke, Barnali Gupta Banik. "Fog based Integrated Nutrient Management System for Macronutrients Recommendation", 2022 IEEE Fourth International Conference on Advances in Electronics, Computers and Communications (ICAECC), 2022
Publication <1%

Exclude quotes On

Exclude matches Off

Exclude bibliography On



REFERENCES

- [1] V. Hassija, V. Chamola, V. Saxena, D. Jain, P. Goyal, and B. Sikdar, “A survey on IoT security: Application areas, security threats, and solution architectures,” *IEEE Access*, vol. 7, pp. 82721–82743, 2019.
- [2] A. Alketbi, Q. Nasir, and M. A. Talib, “Blockchain for government services—Use cases, security benefits and challenges,” in *Proc. IEEE 15th Learn. Technol. Conf. (L&T)*, 2018, pp. 112–119.
- [3] coindesk. *The Indian Government Is Preparing a National Framework to Support the Wider Deployment of Blockchain Use Cases*. Accessed: Nov. 27, 2019. [Online]. Available: <https://www.coindesk.com/indiaplans-to-issue-a-national-blockchain-framework>
- [4] H. Cho, “Correction to asic-resistance of multi-hash proof-of-work mechanisms for blockchain consensus protocols,” *IEEE Access*, vol. 7, 2019, Art. no. 25086.
- [5] V. Hassija, V. Chamola, S. Garg, N. G. K. Dara, G. Kaddoum, and D. N. K. Jayakody, “A blockchain-based framework for lightweight data sharing and energy trading in V2G network,” *IEEE Trans. Veh. Technol.*, vol. 60, no. 6, pp. 5799–5812, Jun. 2020.
- [6] V. Hassija, V. Chamola, D. N. G. Krishna, and M. Guizani, “A distributed framework for energy trading between UAVs and charging stations for critical applications,” *IEEE Trans. Veh. Technol.*, vol. 69, no. 5, pp. 5391–5402, May 2020.
- [7] E. Androulaki *et al.*, “Hyperledger fabric: A distributed operating system for permissioned blockchains,” in *Proc. ACM 13th EuroSys Conf.*, 2018, p. 30.
- [8] V. Hassija, V. Chamola, G. Han, J. J. Rodrigues, and M. Guizani, “DAGIoV: A framework for vehicle to vehicle communication using directed acyclic graph and game theory,” *IEEE Trans. Veh. Technol.*, vol. 69, no. 4, pp. 4182–4191, Jan. 2020.
- [9] C. D. Clack, V. A. Bakshi, and L. Braine, “Smart contract templates: Essential requirements and design options,” 2016. [Online]. Available: arXiv:1612.04496.
- [10] C. Cachin, “Architecture of the hyperledger blockchain fabric,” in *Proc. Workshop Distrib. Cryptocurrencies Consensus Ledgers*, 2016, p. 310.