BLOCKCHAIN-BASED SECURE FRAMEWORK FOR GOVERNMENT CONSTRUCTION ALLOCATION

A PROJECT REPORT

Submitted by

KAVYA P B [REGISTER NO: 211419104134]

POOJA K [REGISTER NO:211419104191]

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

PANIMALAR ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai)

APRIL 2023

PANIMALAR ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai)

BONAFIDE CERTIFICATE

Certified that this project report **"BLOCKCHAIN-BASED SECURE FRAMEWORK FOR GOVERNMENT CONSTRUCTION ALLOCATION"** is the bonafide work of "**KAVYA P B(211419104134), POOJA K(211419104191)"** who carried out the project work Mrs R DEVI M.E**.,** under my supervision.

SIGNATURE

Dr.L.JABASHEELA, M.E., Ph.D.,
HEAD OF THE DEPARTMENT

DEPARTMENT OF CSE,
PANIMALAR ENGINEERING COLLEGE,
NASARATHPETTAI,
POONAMALLEE,
CHENNAI-600 123.

SIGNATURE

Mrs.R.DEVI, M.E.,
SUPERVISOR
ASSISTANT PROFESSOR (G-1)

DEPARTMENT OF CSE,
PANIMALAR ENGINEERING COLLEGE,
NASARATHPETTAI,
POONAMALLEE,
CHENNAI-600 123.

Certified that the above candidate(s) was examined in the End Semester Project Viva-Voce Examination held on.....

INTERNAL EXAMINER **EXTERNAL EXAMINER**

DECLARATION

We **KAVYA P B (211419104134) , POOJA K (211419104191)** hereby declare that this project report titled "**BLOCKCHAIN-BASED SECURE FRAMEWORK FOR GOVERNMENT CONSTRUCTION ALLOCATION**" , under the guidance of **Mrs R DEVI M.E.,** is the orginial work done by us and we have not plagiarized or submitted to any other degree in any university by us.

KAVYA P B

POOJA K

ACKNOWLEDGEMENT

We would like to express our deep gratitude to our respected Secretary and Correspondent **Dr.P.CHINNADURAI, M.A., Ph.D.** for his kind words and enthusiastic motivation, which inspired us a lot in completing this project.

We express our sincere thanks to our beloved Directors **Tmt.C.VIJAYARAJESWARI**, **Dr.C.SAKTHI KUMAR,M.E.,Ph.D** and **Dr.SARANYASREE SAKTHI KUMAR B.E.,M.B.A.,Ph.D.,** for providing us with the necessary facilities to undertake this project.

We also express our gratitude to our Principal **Dr.K.MANI, M.E., Ph.D.** who facilitated us in completing the project.

We thank the Head of the CSE Department, **Dr. L.JABASHEELA , M.E.,Ph.D.,** for the support extended throughout the project.

We would like to thank our guide **Mrs R DEVI M.E.,** and all the faculty members of the Department of CSE for their advice and encouragement for the successful completion of the project.

KAVYA P B[2114191014134]
POOJA K[211419104191]

ABSTRACT

Block chain innovation is an illustration of such innovation that has been drawing in the consideration of Legislatures across the globe as of late. Upgraded security, further developed detectability, and least expense foundation engage the block chain to infiltrate different spaces. By and large, legislatures discharge tenders to some out sider associations for various tasks. During this interaction, various contenders attempt to snoop the delicate upsides of others to win the delicate. Block chain procedure utilized under different security administration with various model. It is utilized as backend data set model that keeps up with. Number of clients can enlist and make the delicate citation under different division. Administrator will check and give the reaction from the citation result. Administrator or authority check the experience and interaction the board level ability for universally useful. A portion of the administration processes, for example, government tenders incorporate misbehaviors like data spills, defilement, pay off, and so on. The vast majority of the current electronic administrations and IT framework have the previously mentioned constraints, in any case, new advancements, for example, blockchain can possibly extraordinarily improve the current issues. A permissioned blockchain organization can give the fundamental straightforwardness to execute government strategies to support theresidents of the nation and fix liabilities in the event of maltreatment of the framework.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVATIONS

SHORTCUT	ABBREVATION	PAGE NO.
ECDS	Elliptic curve digital signature algorithm	8
DOS	Disk operating system	4
SYN	Synchronize	4
PUF	Polyurethane foam	5
IoT	Internet of things	6
ER	Entity relationship	20
TLS	Transport Layer Security	23
SHA	Secure Hash Algorithm	26
PGP	Pretty Good Privacy	27

CHAPTER 1
INTRODUCTION

1.INRODUCTION

1.1. PROBLEM DEFINITION

There have been different endeavors to carry out the innovation to make government processes paperless and quick, for example, internet tagging frameworks, web based giving of tenders, recording government forms, and so on. Albeit the greater part of these frameworks appear to be vigorous and very much executed, every one of them depend on the possibility of a focal server that has a weak link, as programmers can undoubtedly hack or disturb its working by assaults, like DOS, Slow-loris,SYN Flooding,and so forth. In many states, muddled administrative frameworks frequently bring about exceptionally wasteful work process loaded with defilement, botch, and human mistakes. A portion of the administration processes, for example, government tenders incorporatemisbehaviors like data spills, defilement, pay off, and so on. The vast majority of the current electronic administrations and IT framework have the previously mentioned constraints, in any case, new advancements, for example, blockchain can possibly extraordinarily improve the current issues. A permissioned blockchain organization can give the fundamental straightforwardness to execute government strategies to support theresidents of the nation and fix liabilities in the event of maltreatment of the framework really.

CHAPTER 2
LITERATURE SURVEY

2. LITERATURE SURVEY

2.1 Proof-of-PUF Enabled Block chain: Concurrent Data and Device Security forInternet-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, providesdevice 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 cyberattack. In addition to this, we review the key areas of design, development, and implementation, which will give us the insight onseamless integration with legacy IoE systems, reliability, cyber resilience,and future research challenges.

ADVANTAGE:

Distribution Network Operators (DNOs) are moving forward towards a world where the Internet of Everything (IoE) is fueled by the fusion of safe, intelligent mobile edges, high-bandwidth communications with real-time data analytics.

DISADVANTAGE:

Applying these cryptographic approaches in IoE networks, power consumption and key storage are among the major concerns.

2.2 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.

ADVANTAGE:

We have used Ethereum to implement the end-to-end edge computing framework for a government tender workflow.

DISADVANTAGE:

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

2.3 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, ef_ciency, 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.

ADVANTAGE:

IoT devices need to be carefully provisioned with security measure and IoT with heterogeneous technology produce large amount of heterogeneous data increasing the attack surface.

DISADVANTAGE:

IoT system are composed of devices having limitation in terms of their software and hardware.

2.4 A Generalized Blockchain-Based Government Data Sharing Protocol

AUTHOR: Zilin Liu, Anjia Yang, Huang Zeng, Changkun Jiang, and Li Ma

YEAR:2022

PAPER EXPLANATION:

In order to catch the express train of the digital age and seize the opportunities brought by the development of blockchain technology, many government departments have begun to build blockchain-based data sharing protocols. Most existing data sharing protocols are built on different blockchains with different specific features. The interaction between them is not trivial, leading to the phenomenon of “data islands.” Therefore, we consider building a data sharing protocol compatible with various blockchains. In this work, we propose a generalized blockchain-based data sharing protocol, which takes fairness, privacy, auditability, and generality into account simultaneously. With adaptor signature and zero-knowledge techniques, the proposed protocol ensures a secure and fair data sharing process and is compatible with various blockchains since it only requires the underlying blockchain to perform signature verification. Finally, we implement our construction on an Ethereum test network and conduct a series of experiments. The results demonstrate the practicality of our construction while remaining good functionalities.

ADVANTAGE:

It would be compatible with a wide variety of blockchains.

DISADVANTAGE:

These data are widely stored in different units, departments, and network environments so it is difficult for them to be shared between departments.

2.5 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 byadopting the Block chain technology for all transactions by 2021. The Block chain is a disruptive technology thatis playing a vital role in many sectors. It's a revolutionary technology transforming the way we think about trust as it enables transacting data ina 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 enablesmart government services. This paper also highlights future research in the areas of concerns that required further investigation.

CHAPTER 3
SYSTEM ANALYSIS

3 SYSTEM ANALYSIS

3.1 EXISTING SYSTEM:

Government tenders are one example of a procedure where malpractices including information leaks, corruption, and bribery are present. The majority of the IT infrastructure and electronic services now in use have certain restrictions.We have utilised the ECDSA and AES algorithms because they offer a higher level of security with shorter key lengths. To effectively apply laws for the benefit of the nation's citizens, a permissioned block chain network will offer the transparency necessary. It will also create obligations in the case that the system is misused. The end-to-end edge computing infrastructure for a government tender workflow was implemented using Ethereum.

3.2 PROPOSED SYSTEM:

The Proposed System considers effective laws for the benefit of the nation's citizens, a permissioned block chain network will offer the transparency necessary. It will also create obligations in the case that the system is misused .In this proposed system, we have used SHA-256 algorithm which provides security .According to identity authentication, we can control data access by the network nodes. Only the nodes that are allowed to view or verify the particular data get access to the files.

- Public uploads complaint.
- Government view the complaint and send it to particular department.
- Department login will be unique for each person. After viewing the complaint ,they can take actions or they can forward it to government.

Allocate the Tender to the Contractors

3.3 FEASIBILITY STUDY

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of the existing business or proposed venture, opportunities and threats as presented by the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest term, the two criteria to judge feasibility are cost required and value to be attained. As such, a well-designed

description of the product or service, accounting statements, details of the operations and management, marketing research and policies, financial data, legal requirements and tax obligations. Generally, feasibility studies precede technical development and project implementation.

They are 3 types of Feasibility:

- Economic feasibility
- Technical feasibility
- Operational feasibility

3.3.1. Economic Feasibility:

Here, we track down the absolute expense and advantage of the proposed framework over current framework. For this venture, the primary expense is administration cost. This fills in as a straightforward web application which is cost productive. Additionally, it is basic in activity and doesn't cost preparing or fixes.

3.3.2. Technical Feasibility:

It incorporates figuring out advancements for the undertaking, both equipment and programming. Here, the base equipment prerequisite is 2GB RAM and Core i5 Processor and the product necessities incorporate Windows OS, MySQL and Eclipse IDE. The backend innovation utilized is JAVA. Since, it is stage free and can be utilized in assortment of uses.

3.3.3 Operational Feasibility:

Operational feasibility is dependent on human resources available for the project and involves projecting whether the system will be used if it is developed and implemented. This project is operationally feasible for the users as nowadays almost everyone are familiar with websites and digital technology.

3.4 REQUIREMENTS ENGINEERING

These are the requirements for doing the project. Without using thesetools and software'swe can't do the project. So we have two requirements to do the project.

They are

- Hardware Requirements.
- Software Requirements.

3.4.1 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

3.4.2SOFTWARE 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	:	(JSP, SERVLETS)JAVASCRIPT
Back End	:	MY SQL 5.5
Operating System	:	Windows 07
IDE	:	Eclipse

CHAPTER 4
SYSTEM DESIGNS

4 SYSTEM DIAGRAMS

4.1 GENERAL

Design Engineering deals with the various UML [Unified Modeling language] diagrams forthe implementation of project. Design is a meaningful engineering representation of a thingthat is to be built. Software design is a process through which the requirements are translated into representation of the software. Design is the place where quality is rendered in software engineering. Design is the means to accurately translate customer requirements into finished product.UML is a standardized modeling language that can be used across different programming languages and development processes, so the majority of software developers will understand it and be able to apply it to their work. There are 14 UML diagram types that help to model the behaviors.

- Structure Diagrams. Class Diagram. Component Diagram. Deployment Diagram. Object Diagram. Package Diagram. Profile Diagram. Composite Structure Diagram.

- Behavioral Diagrams. Use Case Diagram. Activity Diagram. State Machine Diagram. Sequence Diagram. Communication Diagram. Interaction Overview Diagram.

4.1.1 USE CASE DIAGRAM

The use case diagram is the main building block of object oriented modeling. It is used both for general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. Forthis in our component diagram first propose a data In this proposed method we are using Hash-Solomon CodeAlgorithm to encrypt the data.

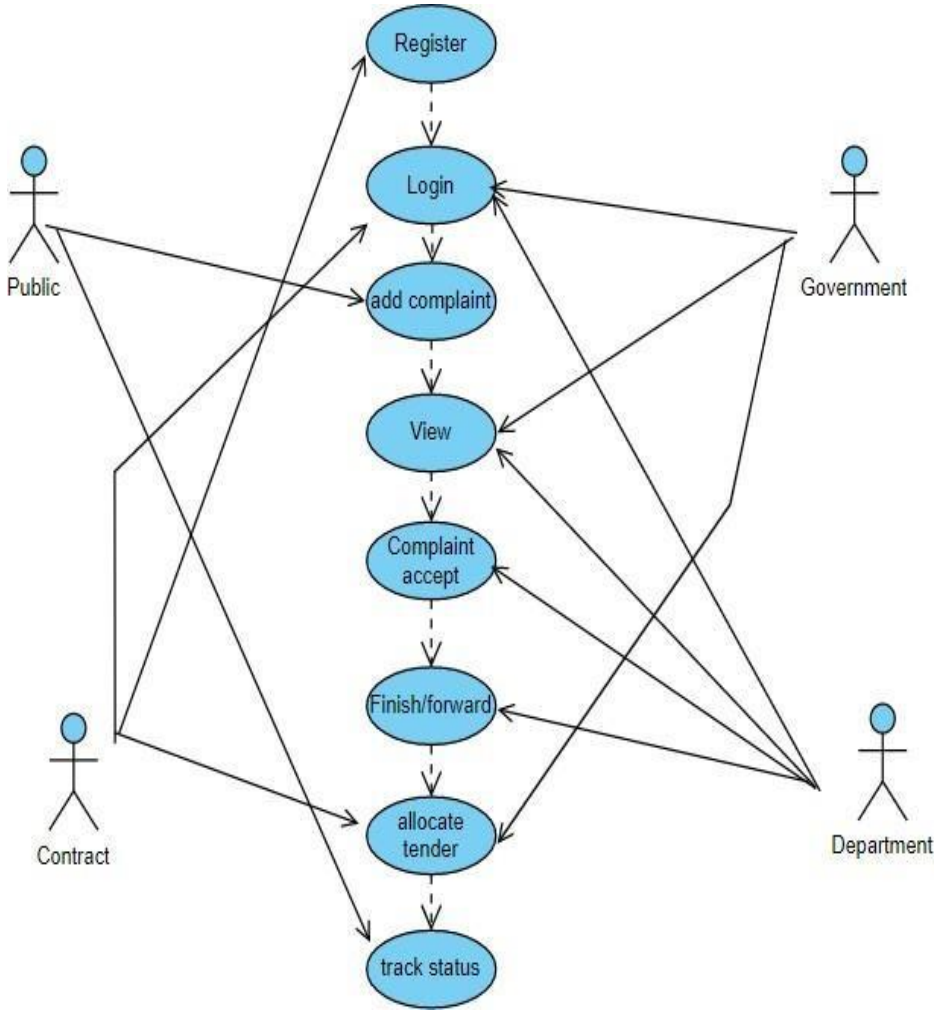


FIG 4.1.1 USE CASE DIAGRAM

4.1.2 STATE DIAGRAM

A state diagram is a type of diagram used in computer science and related fields to describe the behavior of systems. State diagrams require that the system described is composed of a finite number of states; sometimes, this is indeed the case, while at other times this is a reasonable abstraction. Many forms of state diagrams exist, which differ slightly and have different semantics.

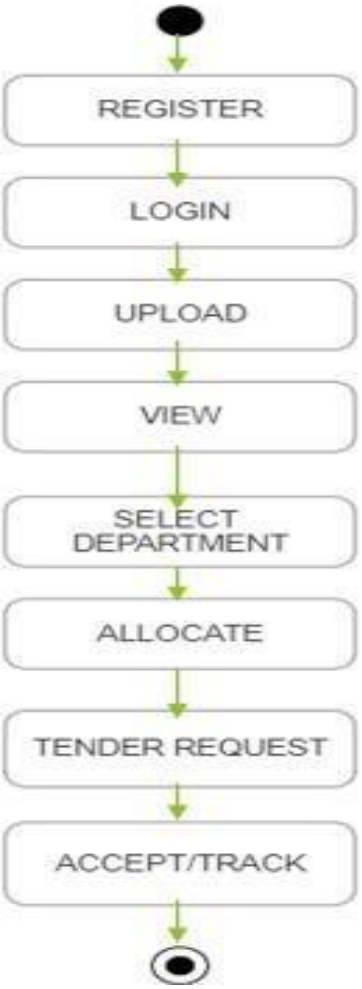


FIG 4.1.2 STATE DIAGRAM

4.1.3 ACTIVITY DIAGRAM:

Activity diagram is another important diagram in UML to describe the dynamic aspects of the system. Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. This flow can be sequential, branched, or concurrent. Activity diagrams deal with all type of flow control by using different elements such as fork, join, etc

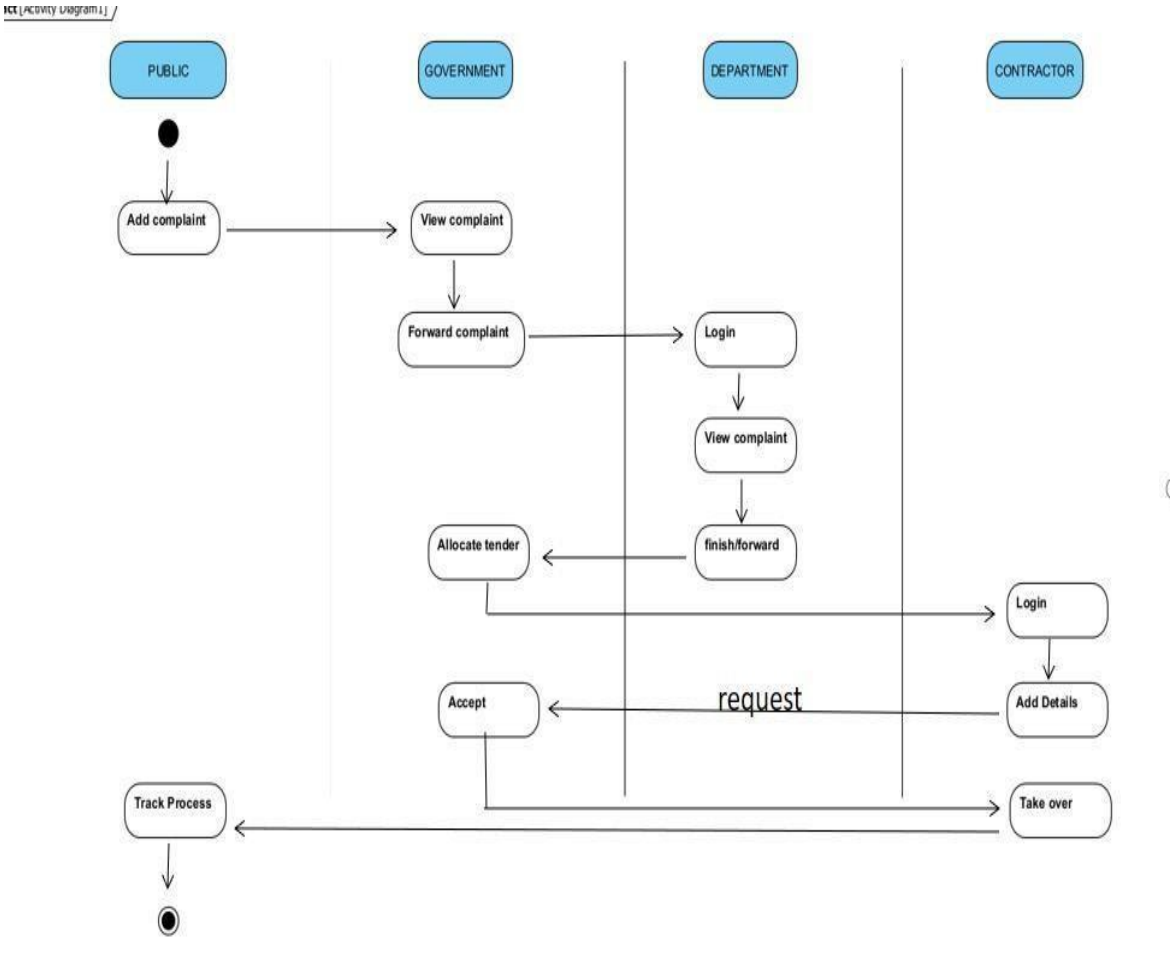


FIG 4.1.3 STATE DAIGRAM

4.1.4 CLASS DIAGRAM:

Class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, and the relationships between the classes. The classes in a class diagram represent both the main objects and or interactions in the application and the objects.

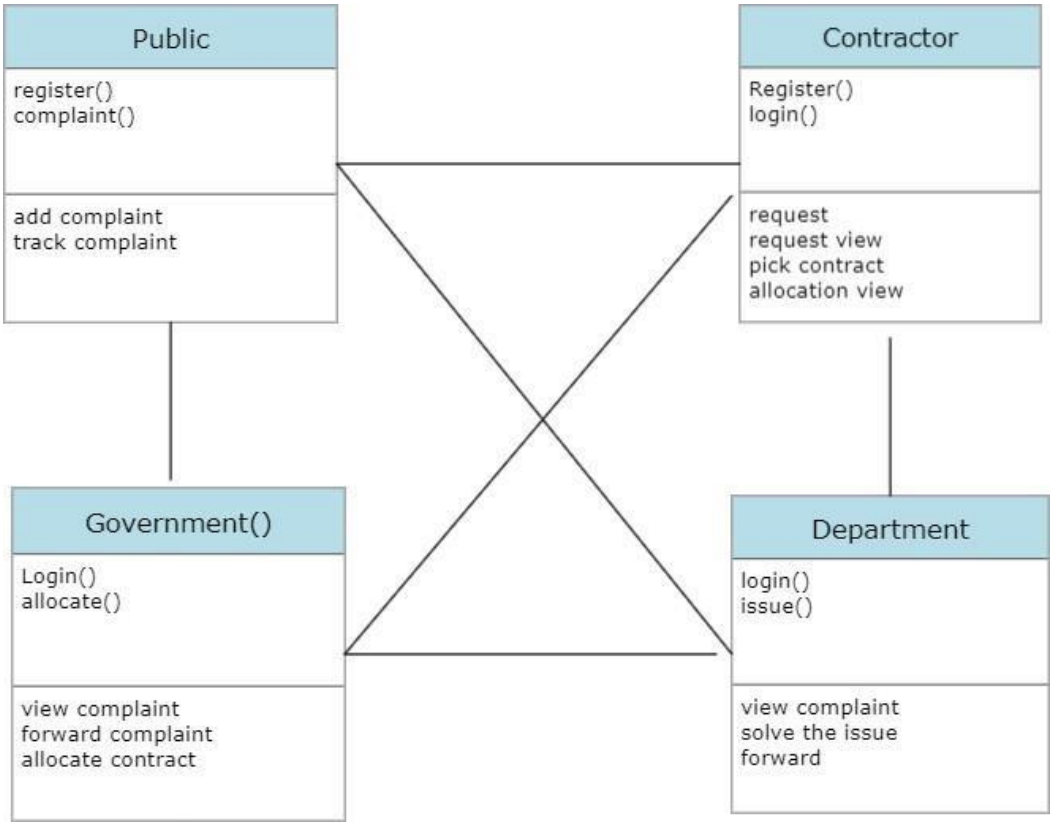


FIG 4.1.4 CLASS DIAGRAM

4.1.5 SEQUENCE DIAGRAM:

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carryout the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios. A sequence diagram shows, as parallel vertical lines, different processes or objects that live simultaneously, and,as horizontal arrows, the messages exchanged between them, in the orderin which they occur. This allows the specification of simple runtime scenarios in a graphical manner.

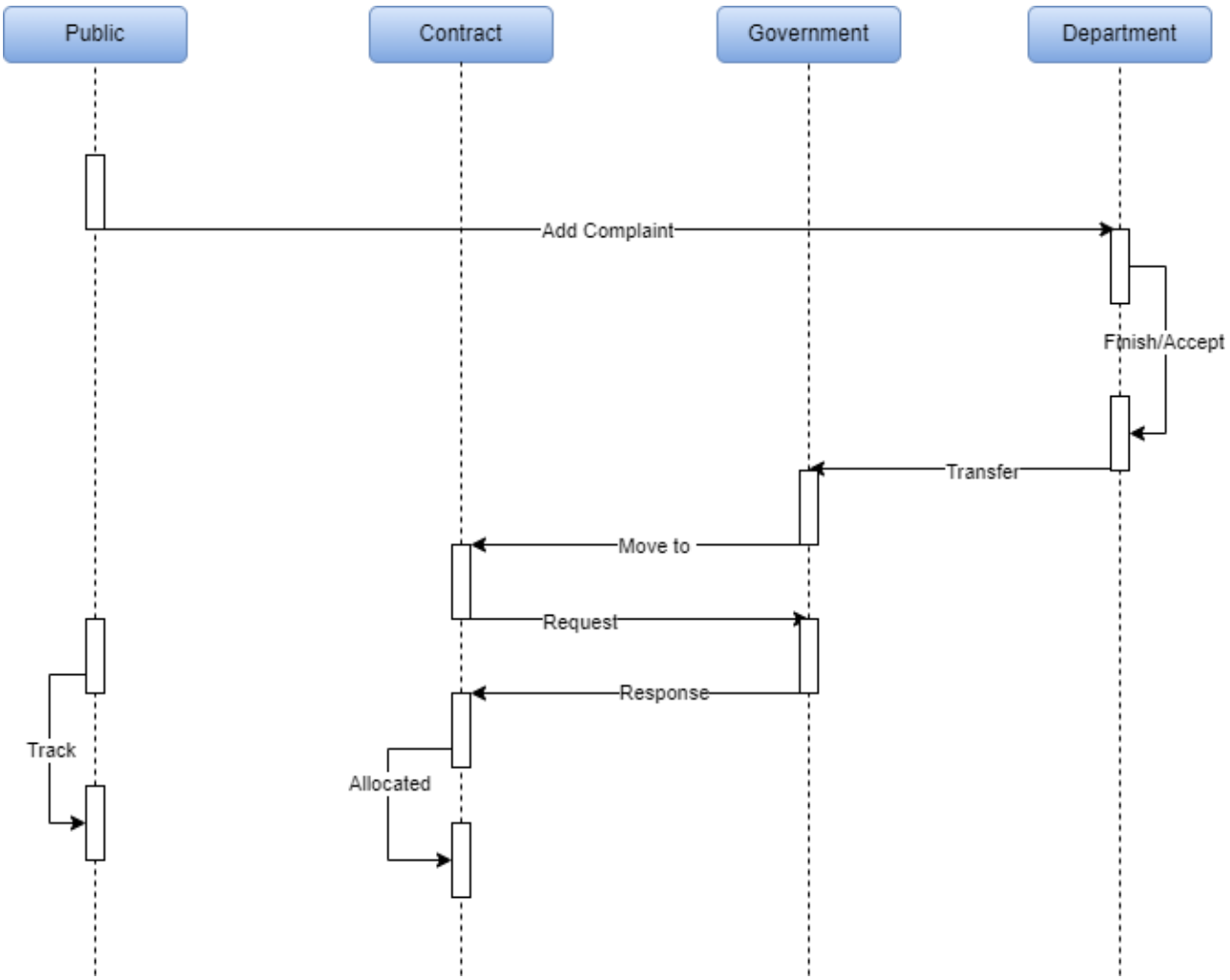
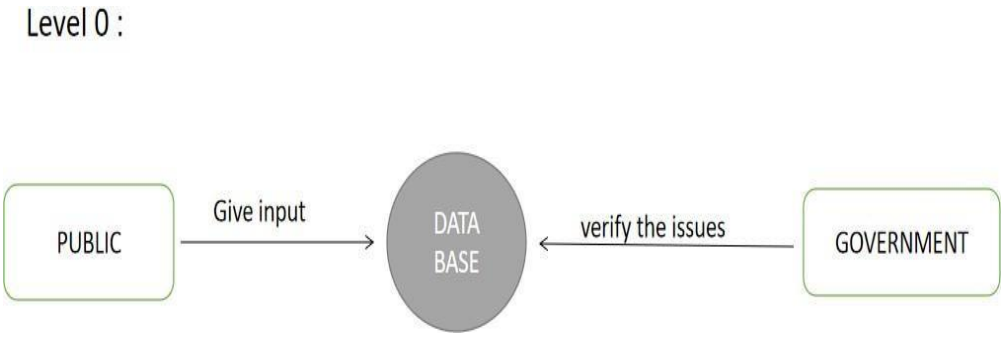


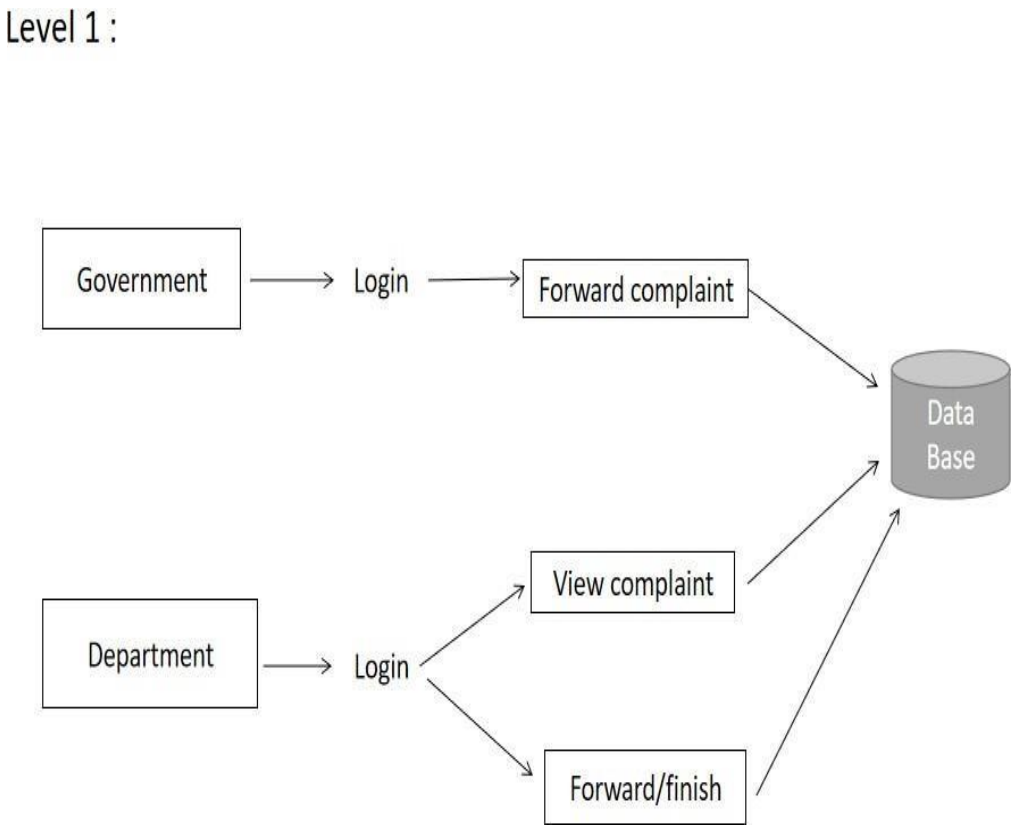
FIG 4.1.5 SEQUENCE DIAGRAM

4.2 DATA FLOW DIAGRAM:

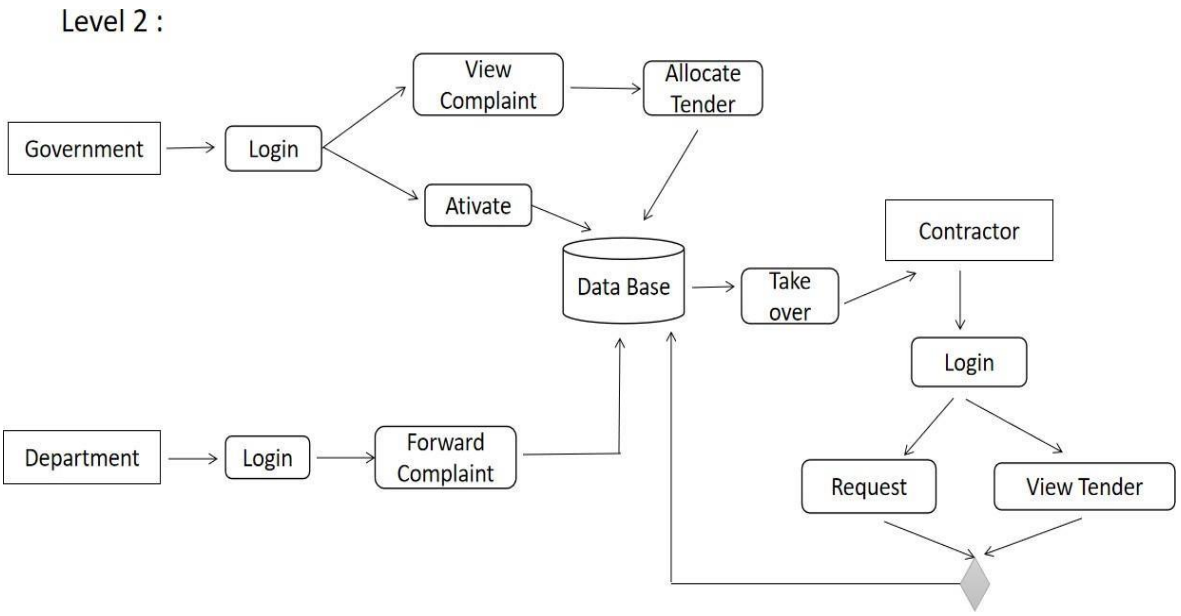
LEVEL-0:



4.2.1 LEVEL 0 DFD DIAGRAM



4.2.1 LEVEL 1 DFD DIAGRAM



4.2.3 LEVEL 2 DFD DIAGRAM

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or a system (usually an information system). The DFD also provides information about the outputs and inputs of each entity and the process itself. A data-flow diagram has no control flow; there are no decision rules and no loops. Specific operations based on the data can be represented by a flowchart.

4.3 E-R DIAGRAM:

An entity is represented as rectangle in an ER diagram. For example: In the following ER diagram we have two entities Student and College and these two entities have many to one relationship as many students study in a single college. We will read more about relationships later, for now focus on entities.

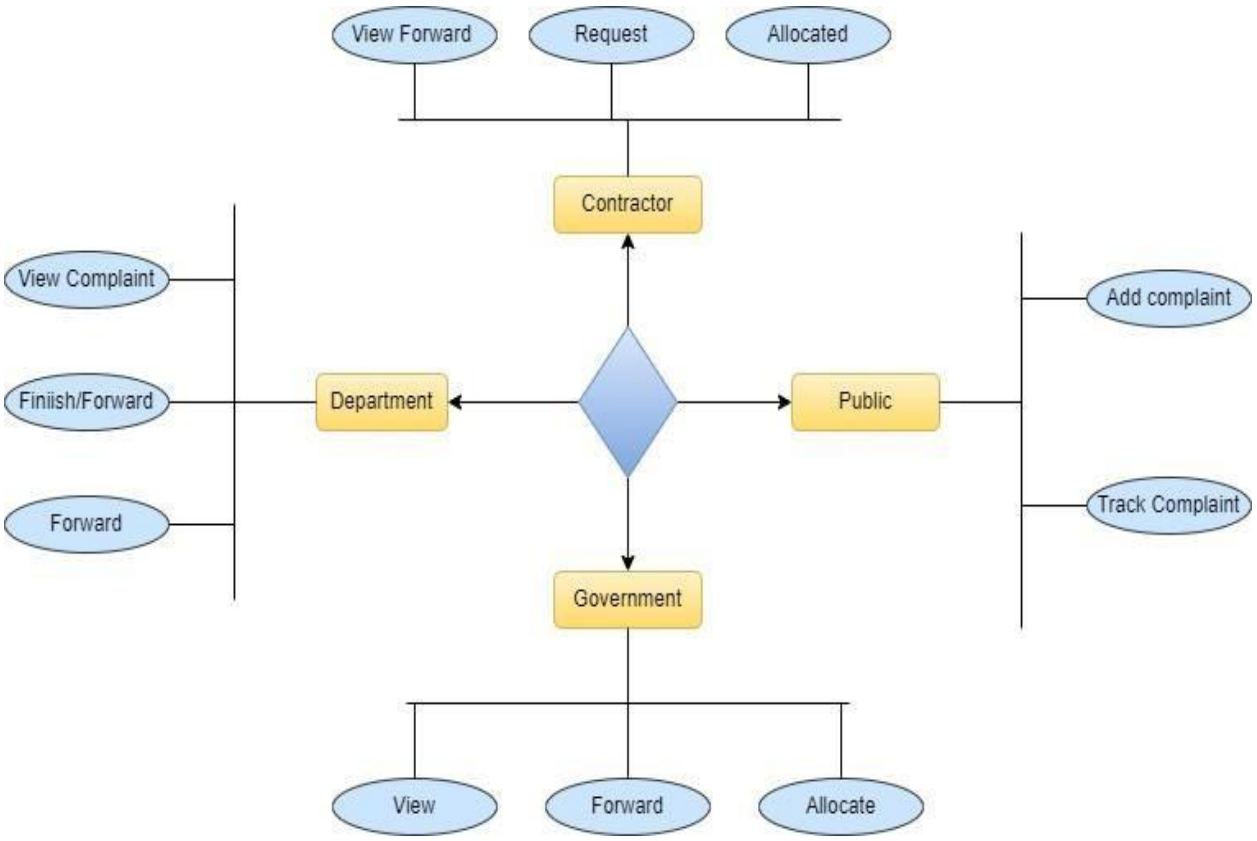
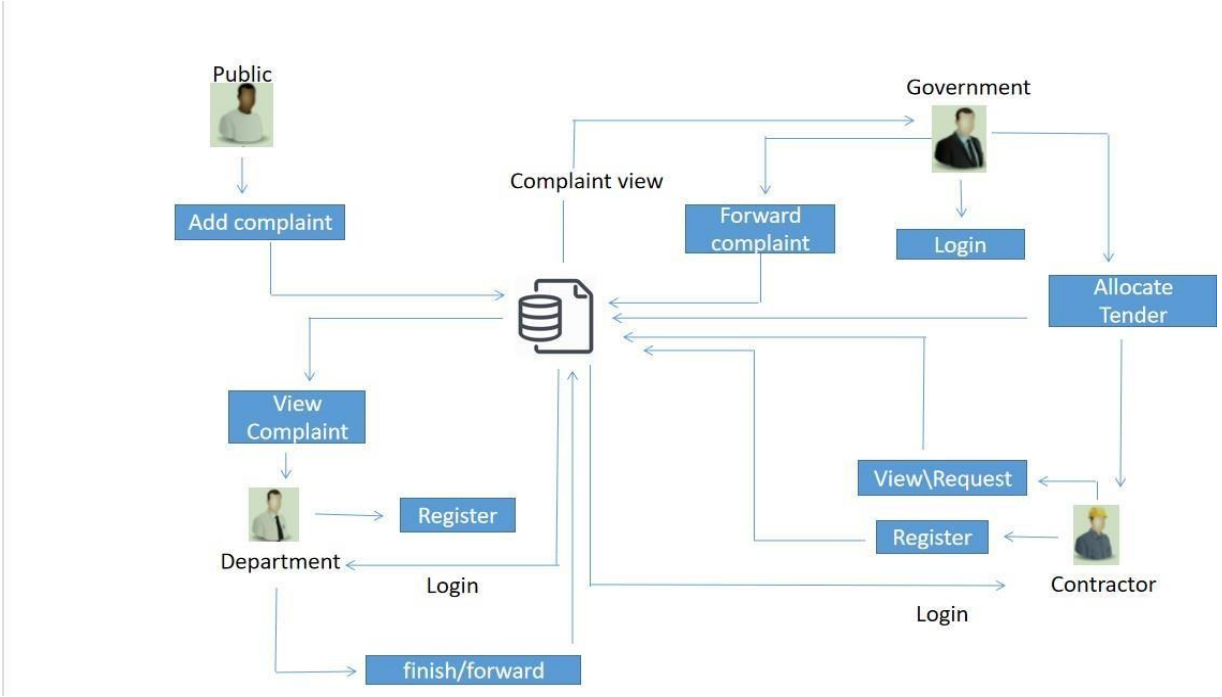


FIG 4.3 ER DIAGRAM

CHAPTER 5
SYSTEM ARCHITECTURE

5.1 SYSTEM ARCHITECTURE:



EXPLANATION:

System architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. A system architecture can consist of systemcomponents and the sub-systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture; collectively these arecalled architecture description languages.

5.2 MODULE DESIGN SPECIFICATION

MODULES:

- PUBLIC REGISTER
- GOVERNMENT LOGIN
- DEPARTMENT LOGIN
- GOVERNMENT TENDER ALLOCATION
- CONTRACTOR REGISTER

MODULE EXPLANATION

1.PUBLIC 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.

2.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.

3.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 provide.

4. GOVERNMENT TENDER ALLOCATION:

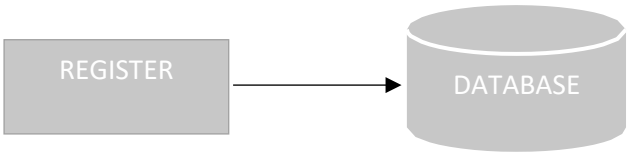
In this module the government will allocate the tender for the governmentproject. Analysisdetails will be responsible for your file stored in database.

5. CONTRACTOR LOGIN:

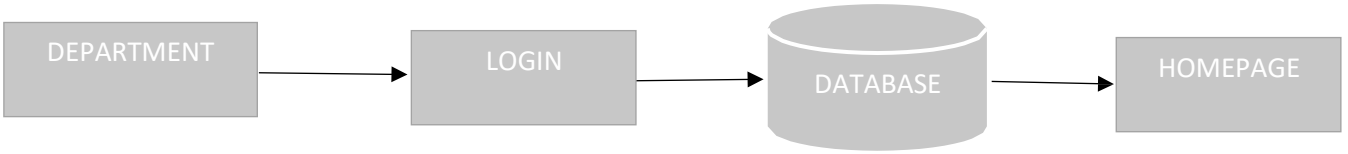
In this module in our project, here symbolizes a unit of work performed within a database management system (or similar system) against a database, and treated in a coherent and reliable way independent of other transactions. A transaction generally represents any change in database user will transfer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

MODULE DIAGRAM:

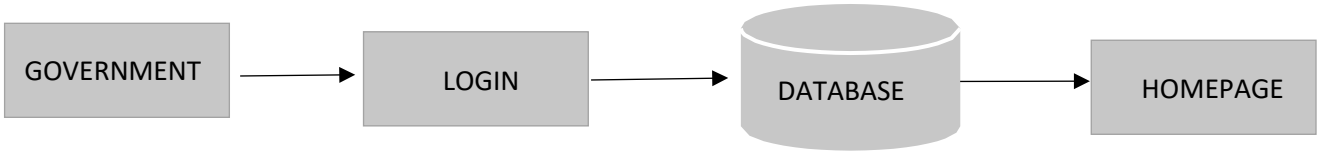
1. PUBLIC REGISTER:



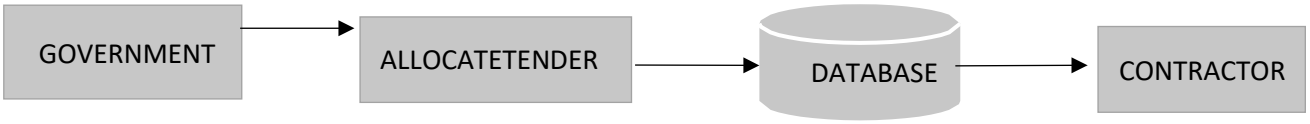
2. DEPARTMENT LOGIN:



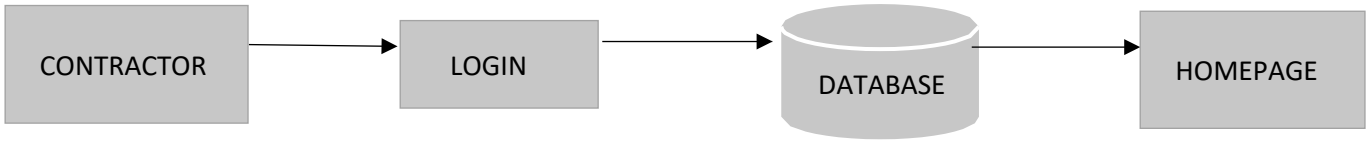
3. GOVERNMENT LOGIN:



4. GOVERNMENT TENDER ALLOCATION



5. CONTRACTOR LOGIN:



5.3 ALGORITHM

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 placein all the majority of cryptanalytic techniques and coding standards which is mainly aimedto 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.

APPLICATION OF SHA-256:

- Digital Signature Verification
- Password Hashing
- SSL Handshake
- Integrity Checks

CHAPTER 6
IMPLEMENTATION

6.IMPLEMENTATION

GENERAL:

In this we implement the coding part using eclipse. Below are thecoding's that are used to apply for the various schemes available.

6.1 CLIENT-SIDE CODING:

Index.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>HOME PAGE</title>
<link rel="stylesheet" href="css/bootstrap.min.css">
<link rel="stylesheet" href="css/fontawesome.min.css">


<style>
ul {
  list-style-type: none;
  margin: 0;
  padding: 10px;
  overflow: hidden;
  background-color: #333;
}

li {
  float: right;
}

li a {
  display: block;
  color: white;
  text-align: center;
  padding: 14px 16px;
  text-decoration: none;

}

li a:hover:not(.active) {
  background-color: #00f;
```

```
}

.active {
  background-color: #4CAF50;
}

body {
     background: url(image/gm1.jpg)no-repeat 0px 0px;

    background-size: 100% 100%;
    min-height: 795px;
          position:relative;
}
h2{
  text-shadow: 2px 2px 5px green;
  font-style: italic;
  font-family: "Times New Roman", Times, serif;
  color:yellow;
   font-size: 30px;
}

/* img{
padding-right:20%;
} */
span{
color:red;
}
</style>


</head>
<body>

<ul>

  <li><b><a href="contactorfirst.jsp">CONTRACTOR</a></b></li>
  <li><b><a href="govermentlogin.jsp">GOVERNMENT</a></b></li>
  <li><b><a href="departlogin.jsp">DEPARTMENT</a></b></li>
  <li><b><a href="publicmain.jsp">PUBLIC COMPLIENT</a></b></li>
  <li><b><a href="#home">HOME</a></b></li>
</ul>

<center><h2><span>GOVERNMENT</span> TENDER <span>ALLOCATION</span>
</center><br></h2>

</body>
```

```
</html>
```

Department_login.jsp:

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Insert title here</title>
<script type='text/javascript' src='js/jquery-3.6.0.min.js'></script>

</head>
<style>
body{
background-image:url("image/gm8.png");
background-repeat:no-repeat;
background-size:1375px 700px;
]
}
@import "bourbon";

* {
  box-sizing: border-box;
}

.login-wrapper {
  width: 300px;
  margin-center: 100px 100px;
}

button {
  padding: 8px 15px;
  border: 0;
  outline: 0;
  color: white;
  background: red;
  font-size: 14px;
  text-transform: uppercase;
  border-radius: 4px;
  box-shadow: 0 4px 0 darken(#1BBC9B, 5%);
  &:active {
    margin-top: 2px;
    box-shadow: 0 2px 0 darken(#1BBC9B, 5%);
  }
```

```
}

.login-container {
  position: relative;
}

.login-form {
  display: none;
  position: absolute;
  padding: 20px;
  margin-top: 10px;
  background: #b73333;
  border-radius: 4px;
  box-shadow: 0 4px 0 darken(#ddd, 5%);
  input {
    width: 100%;
    padding: 8px;
    margin-bottom: 10px;
    border: 0;
    outline: 0;
    background: #f1f1f1;
    font-weight: 300;
    font-style: italic;
    border-radius: 2px;
    &:last-child {
    margin-bottom: 0;
    }
  }
  input[type="submit"] {
    color: #ffF;
    background: #1BBC9B;
    font-style: normal;
    box-shadow: 0 4px 0 darken(#1BBC9B, 5%);
  }
}

@include keyframes(slide) {
  0% {
    opacity: 0;
    @include transform(translateY(20px));
  }
  100% {
    opacity: 1;
    @include transform(translateY(0));
  }
}
```

```
.open {
  @include animation(slide 1s);
  display: block;
}
a{
 text-decoration-line: none;}
</style>
<body>
<center><br><br><br><br><br><br>
<div class="login-wrapper">
  <button id="login-button">log in</button>
  <div class="login-container">
    <form action="deparlogin" class="login-form" method="post">
        <input type="text" placeholder="Staff Name" name="name"
style="width:280px;height:40px;border-radius: 10px;text-align:center;"><br><br>

    <select name="department" id="cars" style="width:280px;height:40px;border-radius:
10px;text-align:center;"><br><br>>
_<option value="WATER MANAGEMENT">WATER MANAGEMENT</option>
  <option value="WASTE MANAGEMENT">WASTE MANAGEMENT.</option>
  <option value="BULIDING DEVELOPMENT ">BULIDING DEVELOPMENT </option>
  <option value="ROAD SECTOR">ROAD SECTOR</option>
 <option value="EB ELECTRICITY">EB ELECTRICITY</option>

</select><br><br>
     <input type="password" placeholder="Password" name="pass"
style="width:280px;height:40px;border-radius: 10px;text-align:center;"><br><br>
      <input type="submit" value="SUBMIT" style="width:90px;height:30px;border-radius:
10px;text-align:center;" >
       <a href="departreg.jsp">New Staff Reg here</a>
    </form>
  </div>
</div>
</center>
</body>
<script>
$('#login-button').click(function() {
          $('.login-form').toggleClass('open');
         })
</script>
</html>
```

Government.jsp:

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Government Login</title>

<style>
body{
background-image:url("image/h33.jpeg");
background-size: 100%;
}
.myDiv {
 3;
  background-color: #fff5e6;
  border-radius: 10px;
  width:400px;
  height:250px;
  margin: auto;
  padding-top:30px;


}
.myDiv2 {
  font-size:25px;
font-style: italic;
font-weight: bold;
color:#331100;
}
input[type=text]{
  background-color: #3CBC8D;
color: white;}
input[type=email]{
background-color: #3CBC8D;
color: white;
}


.myDiv {

    background-color: #f9f5f000;
    border-radius: 10px;
    width: 400px;
```

```
        height: 250px;
        margin: auto;
        padding-top: 30px;


    </style>


    </head>
    <body>

    <br><br><br>
    <center>
    <div class="myDiv2">
     Government Login
    </div>
    </center>
    <br><br><br><br><br><br>
     <form action="govelogin" method="post">
    <div class="myDiv">
    <center>


     <input type="email" name="email" placeholder="ENTER EMAIL"
    style="width:280px;height:40px;border-radius: 10px;text-align:center;"><br><br>
      <input type="text" name="pass" placeholder="PASSWORD"
    style="width:280px;height:40px;border-radius: 10px;text-align:center;"><br><br>
      <input type="submit" value="Submit" style="width:100px;height:40px;border-radius:
    10px;"><br><br>


      </center>
    </div>

     </form>

    </body>
</html>
```

6.2 SERVER-SIDE CODING:

Bean.java:

```
package  bean;
import java.util.Date;
import servlet.StringUtil;
public class Block {
    public String hash;
    public String previousHash;
    private String data; //our data will be a simple message.
    private long timeStamp; //as number of milliseconds since 1/1/1970.
    public Block(String data,String previousHash ) {
            this.data = data;
            this.previousHash = previousHash;
            this.timeStamp = new Date().getTime();
            this.hash = calculateHash(); //Making sure we do this after we set the other values.
    }
    public String calculateHash() {
            String calculatedhash = StringUtil.applySha256(
```

```
                    previousHash +Long.toString(timeStamp) +
                    data );
            return calculatedhash;
    }
}
```

Database.java:

```
package dbcon;
import java.sql.Connection;
import java.sql.DriverManager;
public class Database {
    static Connection con;
    public static Connection create()
    {
    try
    {
            Class.forName("com.mysql.jdbc.Driver");
            con=DriverManager.getConnection("jdbc:mysql://localhost:3306/contract","root","roo
    t");
```

```
    }catch(Exception e)
    {
       e.printStackTrace();
    }
    return con;
    }
}
```

CHAPTER 7
PERFORMANCE ANALYSIS

7.1. TEST CASES & REPORTS

TESTCASE OBJECTIVES

- Login
- Add Complaint
- Government login
- Department login
- Government allocate tender
- Contractor login
- View

Test Case Id	Test Cases Name	Input	Expected Output	Actual Output	Test Result (Pass/Fail)
TC01	Login	address, Phone number, Email ID,	Can view the complaint page	User can view the complaint page	Pass
TC02	Add complaint	Issue	Data added successful	Data added Successful	Pass
TC03	Government login	Username,login	Uploaded Successfully	Uploaded Successfully	Pass
TC04	Department login	Username,login	They view the complaint	They view the complaint	Pass

TC06	Government allocate tender	Request to tender	Accepted	Accepted	Pass
TC06	Contractor login	Contractor details,user name,pass word	Activated	Activated	Pass
TC07	View	View File	Available Files are shown	Available Files are shown	Pass

REPORTS

All the testcases (TC01, TC02, TC03, TC04, TC05, TC06, TC07) have passedand the proof of the actual output is added below in the appendices column (Fig. A.2, Fig. A.3, Fig. A.7, Fig. A.5, Fig. A.16, Fig. A.6, Fig A.13).

CHAPTER 8
CONCLUSION

8.CONCLUSION

8.1 CONCLUSION:

In this article, we have talked about on the need and advantages of utilizing block chain innovation in the public authority delicate task process. We have used to execute the start to finish edge processing system for an administration delicate Work process. The SHA calculation is proposed to relate the most appropriate constructors to the delicate undertakings, subsequently improving the benefit of both the public authority Tenders and the development organizations. We have likewise concentrated on the presentation assessment of the proposed model. The proposed model demonstrates to give improved brings about terms of various delicate boundaries when contrasted with its partners.

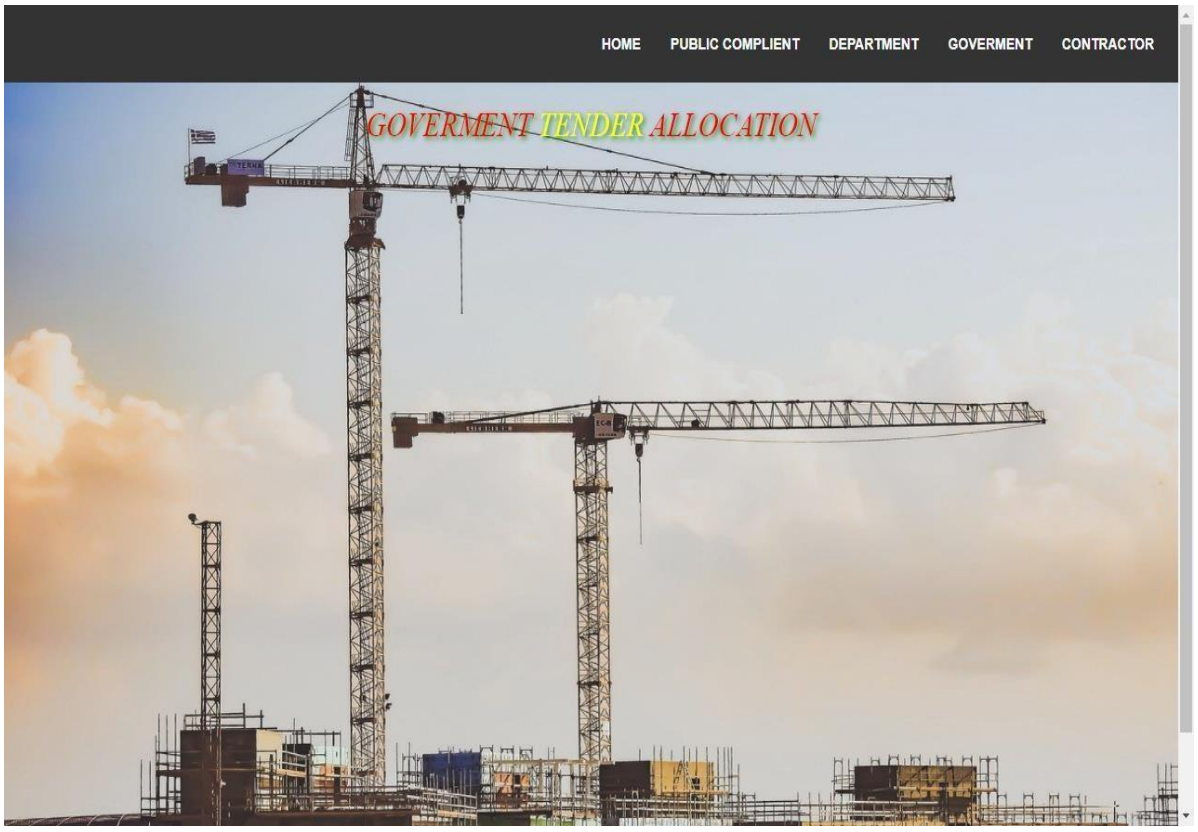
8.2 FUTURE ENHANCEMENTS:

- Implementing a real-world database system to the government projects.
- Improving the efficiency of protocols, in terms of number of tender exchanged and in terms, as well.
- Implement using two are more algorithms.

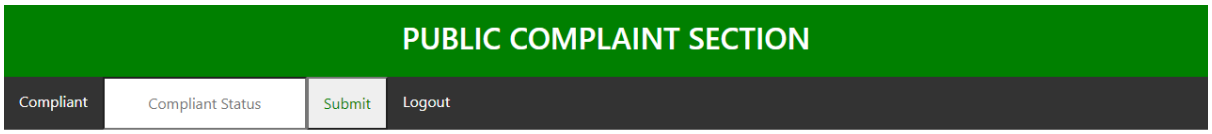
APPENDICES

APPENDICES

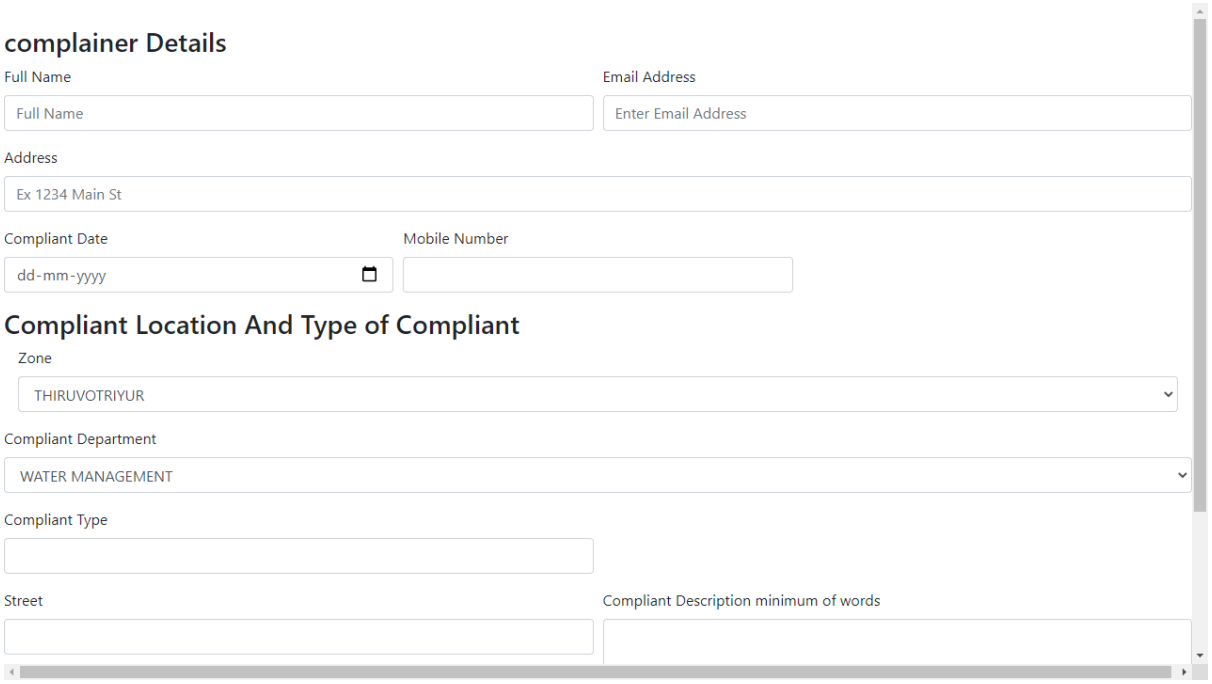
A.1 SCREENSHOTS:



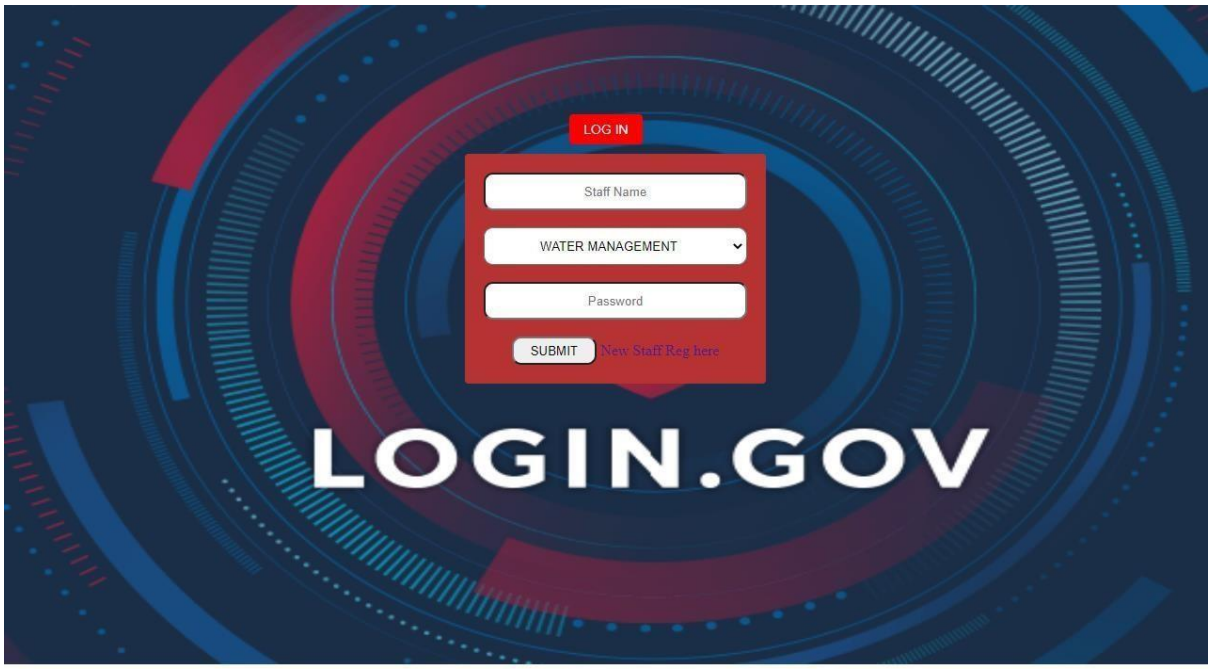
A.1 Home page



A.2 Public Complaint Page

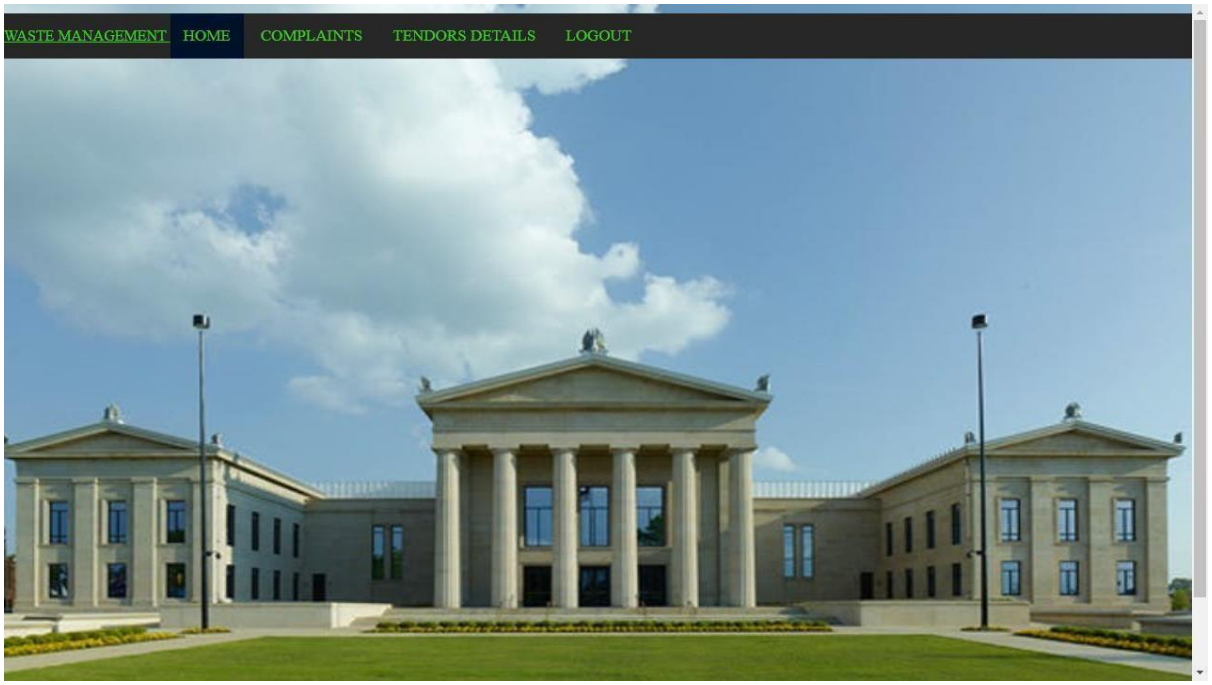


A.3 Complaint Form



A.4 Department Login Page

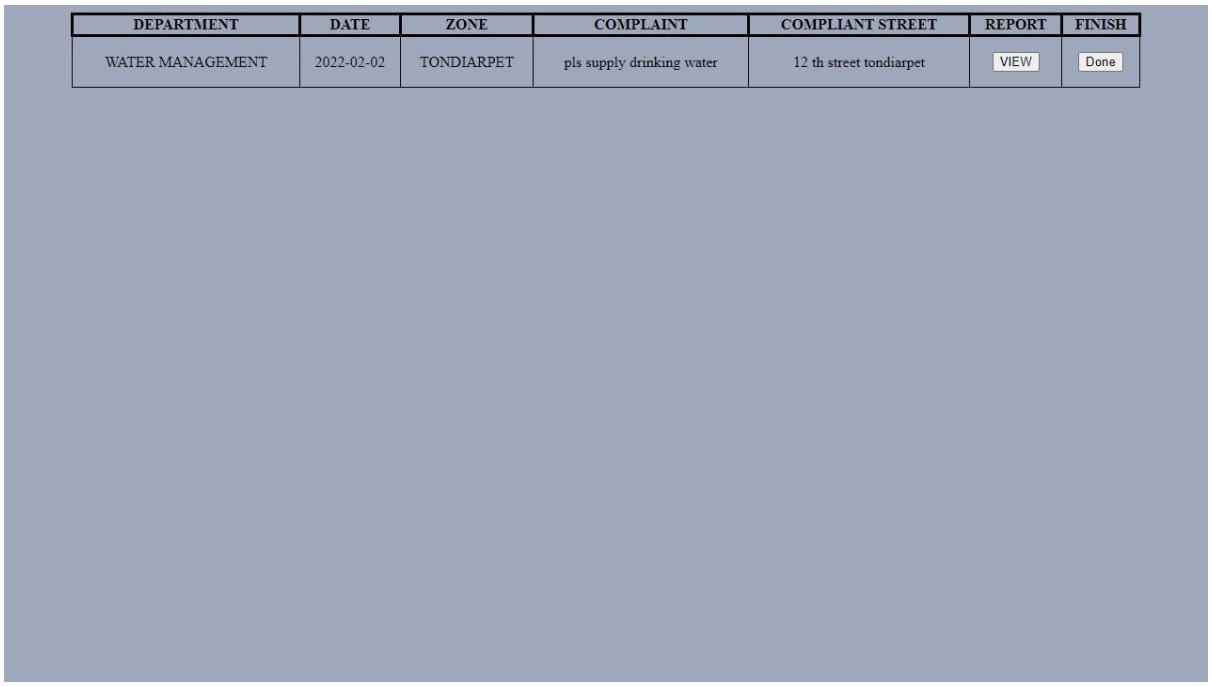
A.5 Department Register Page



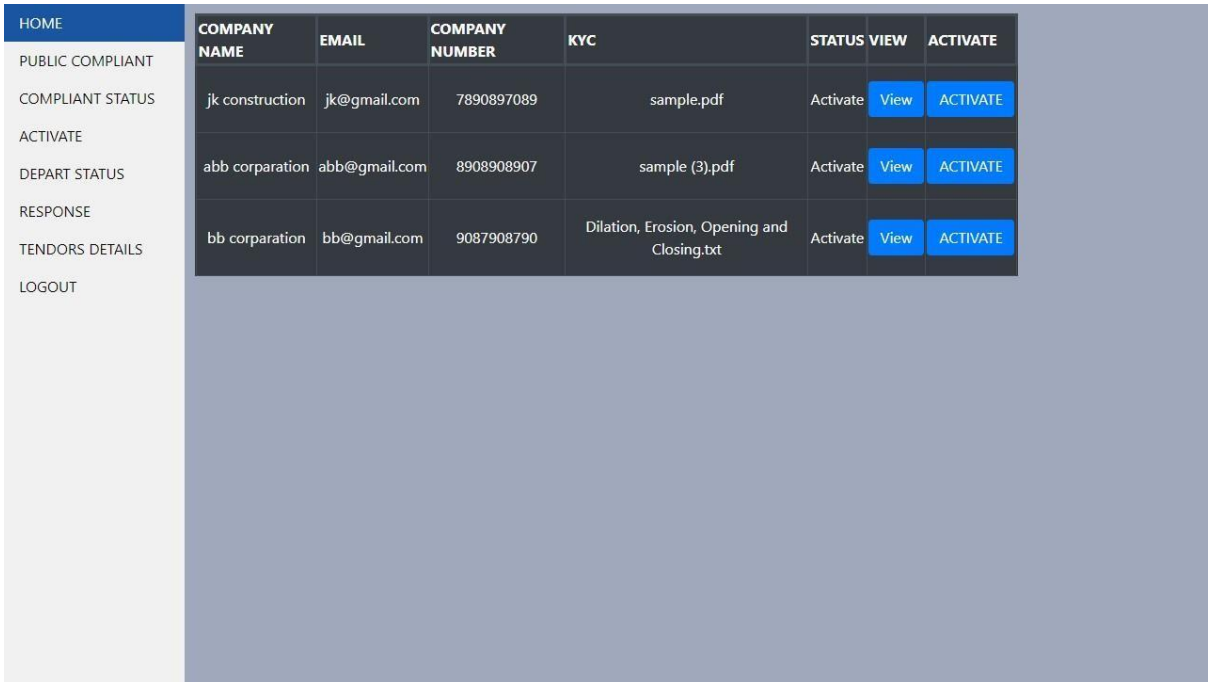
A.6 Department Main Page

A.7 Government Main page

A.8 Government Main page



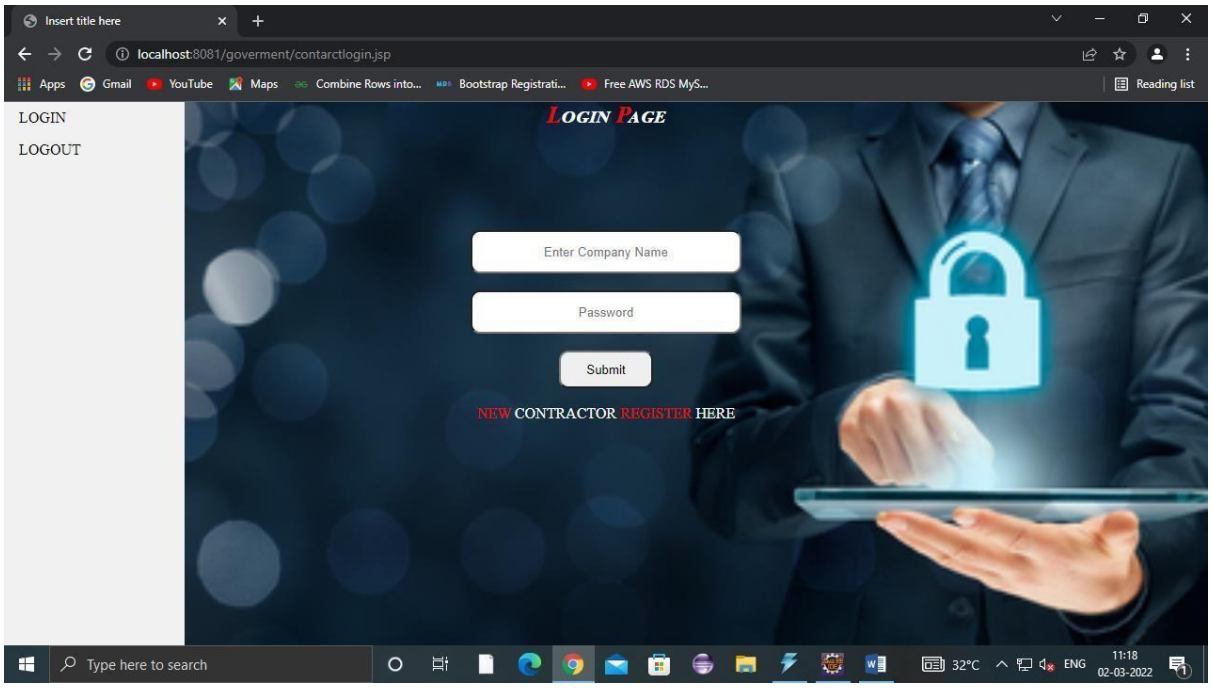
A.9 Complaint Status Page



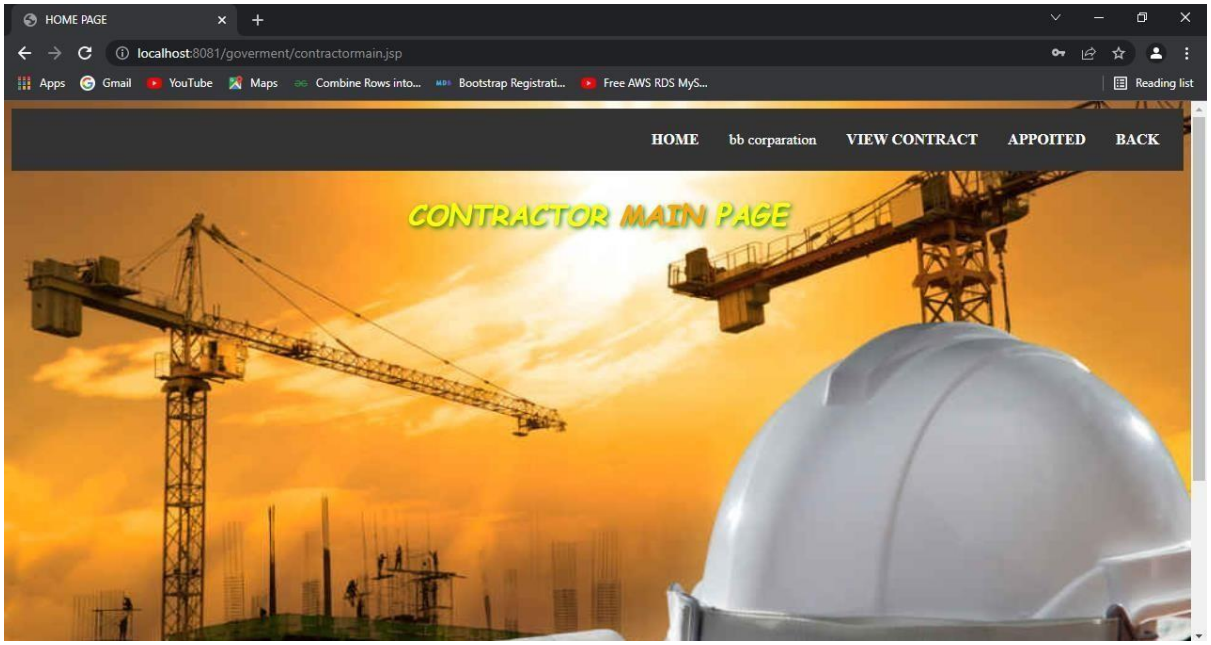
A.10 Construction Activate Page

Zone	Address	Department	Company Name	Project Details	Duration	Allocate Date	Total Cast
THIRUVOTRIYUR	Gandhi Nagar	WATER MANAGEMENT	abb corparation	link.txt	6 months	2022-02-02T17:49	110000
MANALI	12 th street tondiarpet	ROAD SECTOR	abb corparation	Dilation, Erosion, Opening and Closing.txt	3 months	2022-02-02T17:58	1300000
PERUNGUDI	2nd street annanagar	WATER MANAGEMENT	jk construction	Edge Detection & Image Gradients.txt	3 months	2022-02-02T18:04	90000
TONDIARPET	1 st tondaiarpet quartrus	ROAD SECTOR	bb corparation	sample.pdf	3 months	2022-02-04T17:35	1100000

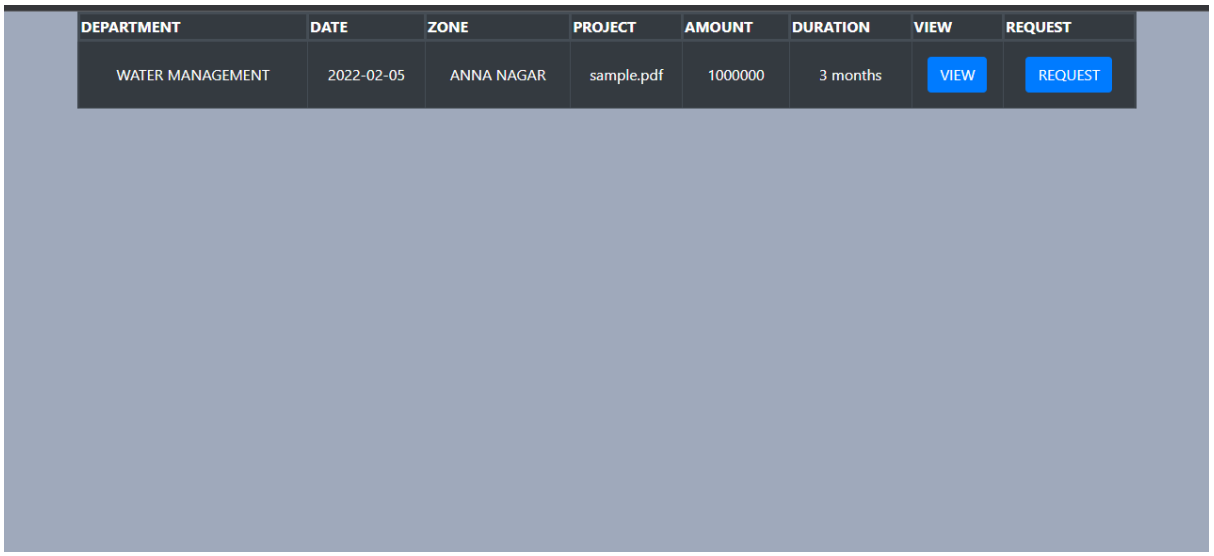
A.11 Tenders Details



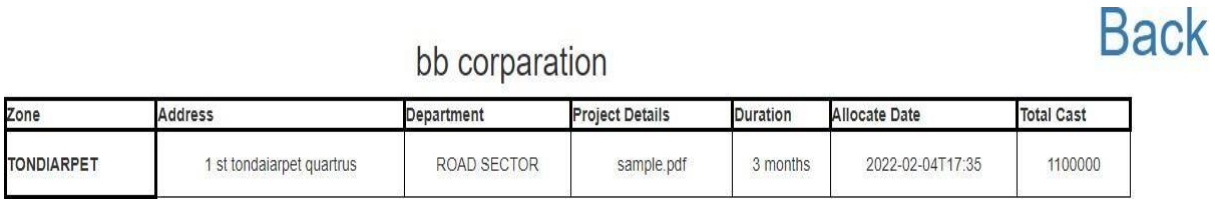
A.12 Contractor Login Page



A.13 Contractor Main Page



A.14 Contract View



A.15 Confirmation View

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 governmentservices—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 Frameworkto 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.