A ADS PBL Project Report

On

# Online Voting App

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Finally, we express my indebtedness to all who have directly or indirectly contribute to the successful completion of our mega project part I.

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# Introduction

ANDROID BASED ONLINE VOTING SYSTEM is an online voting technique. In this system people who have citizenship of India and whose age is above 18 years of age and any sex can give his vote online without going to any physical polling station. There is a database which is maintained in which all the names of voters with complete information is stored.

In ANDROID BASED ONLINE VOTING SYSTEM a voter can use his voting right online without any difficulty. He has to be registered first for him to vote. Registration is mainly done by the system administrator for security reasons. The system Administrator registers the voters on a special site of the system visited by him only by simply filling a registration form to register voter. Citizens seeking registration are expected to contact the system administrator to submit their details. After the validity of them being citizens of India has been confirmed by the system administrator by comparing their details submitted with those in existing databases such as those as the Registrar of Persons, the citizen is then registered as a voter. After registration, the voter is assigned a secret Voter ID with which he/she can use to log into the system and enjoy services provided by the system such as voting.

If invalid/wrong details are submitted, then the citizen is not registered to vote.

## 1.1 Problem Statement

• Expensive and Time consuming: The process of collecting data and entering this data into the database takes too much time and is expensive to conduct, for example, time and money is spent in printing data capture forms, in preparing registration stations together with human resources, and

there after advertising the days set for registration process including sensitizing voters on the need for registration, as well as time spent on entering this data to the database.

• Too much paper work: The process involves too much paper work and paper storage which is difficult as papers become bulky with the population size. • Errors during data entry: Errors are part of all human beings; it is very unlikely for humans to be 100 percent efficient in data entry.

• Loss of registration forms: Some times, registration forms get lost after being filled in with voters details, in most cases these are difficult to follow-up and therefore many remain unregistered even though they are voting age nationals and interested in exercising their right to vote.

• Short time provided to view the voter register: This is a very big problem since not all people have free time during the given short period of time to check and update the voter register. • Above all, a number of voters end up being locked out from voting.

## 1.2 Project Purpose

The specific objectives of the project include:

• Reviewing the existing/current voting process or approach in India.

• Coming up with an automated voting system in India.

• Implementing a an automated/online voting system.

• Validating the system to ensure that only legible voters are allowed to vote.

## 1.3 Project Scope

It is focused on studying the existing system of voting in India and to make sure that the peoples vote is counts, for fairness in the elective positions. This is also will produce:

• Less effort and less labor intensive, as the primary cost and focus primary on creating, managing, and running a secure web voting portal.

• Increasing number of voters as individuals will find it easier and more convenient to vote, especially those abroad.

## 1.4 System Analysis

Design is a meaningful engineering representation of something that is to be built. It is the most crucial phase in the developments of a system. Software design is a process through which the requirements are translated into a representation of software. Design is a place where design is fostered in software Engineering. Based on the user requirements and the detailed analysis of the existing system, the new system must be designed. This is the phase of system designing. Design is the perfect way to accurately translate a customer requirement in the finished software product. Design creates a representation or model, provides details about software data structure, architecture, interfaces and components that are necessary to implement a system. The logical system design arrived at as a result of systems analysis is converted into physical system design.

### 1.4.1 Existing System

In existing system of voting, voter go on voting booth on the day of voting. There is no any centralized system, where we can cast our vote from remote location. There is no proper authentication present of an individual. There is manual work involved, so it may generate errors in the system. The Traditional approach is very time consuming and have got manual errors.

### 1.4.2 Proposed System

This system was proposed to eliminate the trouble of people to go and vote at the voting booth. Whenever schedule date notification is get on user android device, user can cast their vote from anywhere and at anytime. For casting the vote particular user should be authorized so the proposed system will done authentication of voter. With the help of OTP. This proposed system is based on OTP authorization. During registration the proposed system will get all user details. In proposed system advancement in android device is very easy and secure voting. The proposed system provides the specification and requirements for E-Voting using an Android platform.

### 1.4.3 Advantages Of Proposed System

The advantages of online voting systems include increased efficiency, improved accuracy, and greater voter engagement compared to paper ballots.

- Increased Efficiency: One of the most significant advantages of online voting systems is incredible efficiency. With traditional paper-based voting, there are a lot of steps involved, from printing ballots to counting votes by hand. You can avoid all of that with online voting.
  With an online system, you can send out electronic ballots to all of your voters in just a few clicks. And once the voting period is over, the system will automatically tally the results, so you don't have to do it yourself, saving your organization a lot of time and money.
- Improved Accuracy: Another advantage of online voting systems is that they tend to be more accurate than traditional paper-based systems. On the other hand, there's always the potential for human error with paper ballots, whether it's miscounting votes or mixing up

ballots. But with an online voting system, the votes are tallied automatically, so there's no chance for human error, giving you peace of mind knowing that your results are accurate.

- Greater Turnout And Voter Engagement: Another advantage of online voting is that it can increase voter turnout because it's more convenient for voters to cast their ballots online than to have to go to a physical polling place.In addition, online elections can also improve voter engagement. It can be easy for voters to feel disconnected from the process of traditional voting. But with online voting, they can see the results in real-time, making them feel more engaged in the process.

## 1.5 Overview

An online voting system is a digital platform designed to allow eligible voters to cast their ballots electronically via the internet. It represents a modernization of traditional paper-based voting systems and offers numerous advantages, but it also comes with its own set of challenges and considerations. Here's an overview of how an online voting system typically works:

1.Voter Registration: Eligible voters must register with the online voting system, providing necessary identification and personal information to verify their eligibility.

2.Authentication and Security: Strong authentication methods are employed to ensure that only eligible voters can access and use the system. This may

include username/password combinations, OTP authentication.

# 2 The Overall Descriptions

## 2.1 System Perspective

From a system perspective, an online voting system is a complex and interconnected network of components and processes designed to facilitate the electronic casting and counting of votes while ensuring the security, accessibility, and integrity of the entire electoral process. Here's a breakdown of the key components and their roles within the system:

1.User Interface:

This is the front-end component that voters interact with. It includes the website or application through which voters access the online voting system. The user interface should be user-friendly, accessible, and responsive to various devices.

2.Database Management:

The system stores and manages voter registration data, ballots, and vote records in a secure database. Data must be protected against unauthorized access and tampering.

## 2.2 System Functions

The system functions of an online voting system encompass various tasks and processes that are essential for its proper operation and management. These functions ensure the secure, efficient, and reliable execution of online elections. Here are the key system functions of an online voting system:

1.User Authentication and Authorization:

Verify the identity of voters through authentication methods like

username/password, biometrics, or two-factor authentication. Grant appropriate authorization and access permissions based on voter eligibility.

2.Voter Registration:

Allow eligible voters to register in the system. validate voter information against authoritative sources (e.g., government databases) to ensure eligibility.

## 2.3 Software Interface

The software interface of an online voting system is the user-facing part of the system that allows voters, administrators, and other authorized users to interact with the system. It comprises various screens, pages, and components that enable users to perform specific tasks and access information.

1.Voter Registration Interface: Voter registration screens for new voters to create accounts or profiles Options for existing voters to log in and update their information. Verification mechanisms to ensure eligibility and prevent duplicate registrations.

2.Dashboard for Voters: A voter dashboard or home page with relevant information, such as upcoming elections and voting instructions. Access to the electronic ballot when the voting period is open.

2.4 Hardware Interface: The hardware interface of an online voting system includes the physical components and infrastructure that support the operation of the system. This interface is responsible for the hardware requirements needed to ensure the system's reliability, availability, and security. Here are the key hardware components and considerations in the hardware interface of an online voting system:

1. Servers:

- High-performance servers are the backbone of the online voting system. They host the application, databases, and other critical components.
- Redundant server setups and load balancing can ensure high availability and reliability.

2. Data Storage:
   - Secure and scalable data storage solutions, such as databases and storage arrays, are required to store voter registration data, ballots, and vote records.
   - Data redundancy and backups are essential to prevent data loss.
3. Firewalls and Intrusion Detection Systems (IDS):Hardware firewalls and IDS appliances protect the system from unauthorized access and intrusion attempts.

# 3 Specific Requirements

This chapter describes about the requirements. It specifies the hardware and software requirements that are required in order to run the application properly. The Software Requirement Specification (SRS) is explained in detail, which includes overview of dissertation as well as the functional and non-functional requirement of this dissertation. A SRS document describes all data, functional and behavioral requirements of the software under production or development. SRS is a fundamental document, which forms the foundation of the software development process. Its the complete description of the behavior of a system to be developed. It not only lists the requirements of a system but also has a description of its major feature. Requirement Analysis in system engineering

and software engineering encompasses those tasks that go into determining the need or conditions to meet for a new or altered product, taking account of the possibly conflicting requirements of the various stakeholders, such as beneficiaries or users. Requirement Analysis is critical to the success to a development project. Requirement must be documented, measurable, testable, related to in identified business needs or opportunities, and defined to a level of detail sufficient for system design.

## 3.1 Functional Requirements

Functional requirements of an online voting system outline the specific features and capabilities that the system must possess to meet its intended purpose effectively. These requirements ensure that the online voting system functions reliably, securely, and in accordance with the needs of voters, election authorities, and other stakeholders.

Voter Registration:

- Allow eligible voters to register online by providing necessary personal information.
- Verify voter eligibility based on citizenship, age, and residency.
- Prevent duplicate registrations to maintain a clean voter database.

Voting Process:

- Enable voters to access and complete electronic ballots during designated voting periods.
- Allow voters to review and modify their selections before submitting their votes.

- Provide mechanisms to confirm the successful submission of votes.

Administrative Tools:

- Equip election administrators with tools to manage voter registration, candidate information, and election settings.
- Implement monitoring and auditing tools to oversee system activity.

## 3.2 Non-Functional Requirement

Non-functional requirements, also known as quality attributes or system qualities, are critical aspects of an online voting system that define how it should perform and operate beyond its basic functionality. These requirements focus on qualities such as security, performance, scalability, usability, and compliance.

1.Security:

- Authentication: Ensure secure and robust user authentication, including options for two-factor authentication (2FA).
- Data Protection: Encrypt sensitive data in transit (e.g., using SSL/TLS) and at rest to protect voter information and votes.

2.Reliability and Availability:

- High Availability: Ensure that the system is available and responsive even during peak voting times.

- Redundancy: Implement redundancy at various levels to minimize downtime in case of hardware or software failures.

## 3.3 Hardware Requirements

The hardware requirements of an online voting system are essential for ensuring that the system operates reliably, securely, and efficiently. The specific hardware needs may vary depending on the scale and complexity of the system, but here is a general list of hardware components and considerations for an online voting system:

1.Server Infrastructure:

- High-performance servers are at the core of the system to host the online voting application, databases, and related services.
- Redundant server setups and load balancing may be necessary to ensure high availability and fault tolerance.

2.Data Storage:

- Secure and scalable data storage solutions, such as relational databases or distributed storage systems, are needed to store voter registration data, ballots, and vote records.
- Data redundancy and regular backups are essential to prevent data loss.

## 3.4 Software Requirements

The software requirements of an online voting system outline the necessary software components, platforms, and functionalities that are essential for the system's proper operation and security.

1. Operating System (OS):

- Specify the supported operating systems for the servers, including versions and any necessary updates.
- Ensure that the OS provides robust security features and is regularly patched and updated.

2. Database Management System (DBMS):

- Choose a reliable and secure DBMS (Firebase Realtime Database) to store voter registration data, ballots, and vote records.

Ensure that the DBMS is properly configured for data integrity and high availability.

# 4 Software Model

System development method is a process through which a product will get completed or a product gets rid from any problem. Software development process is described as a number of phases, procedures and steps that gives the complete software. It follows series of steps which is used for product progress. The development method followed in this project is waterfall model.

## 4.1 Model Phases

The waterfall model is a sequential software development process, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of Requirement initiation, Analysis, Design, Implementation, Testing and maintenance.

• Requirement Analysis: This phase is concerned about collection of requirement of the system. This process involves generating document and requirement review.

• System Design: Keeping the requirements in mind the system specifications are translated in to a software representation. In this phase the designer emphasizes on algorithm, data structure, software architecture etc.

• Coding: In this phase programmer starts his coding in order to give a full sketch of product. In other words system specifications are only converted in to machine readable compute code.

• Implementation: The implementation phase involves the actual coding or programming of the software. The output of this phase is typically the library, executables, user manuals and additional software documentation.

• Testing: In this phase all programs (models) are integrated and tested to ensure that the complete system meets the software requirements. The testing is concerned with verification and validation.

• Maintenance: The maintenance phase is the longest phase in which the software is updated to fulfill the changing customer need, adapt to accommodate change in the external environment, correct errors and oversights previously undetected in the testing phase, enhance the efficiency of the software.

## 4.2 Reasons For Choosing Waterfall Model As Development Method

• Clear project objectives.

• Stable project requirements.

• Progress of system is measurable.

• Strict sign-off requirements.

• Helps you to be perfect.

• Logic of software development is clearly understood.

• Production of a formal specification

• Better resource allocation.

• Improves quality. The emphasis on requirements and design before writing a single line of code ensures minimal wastage of time and effort and reduces the risk of schedule slippage.

• Less human resources required as once one phase is finished those people can start working on to the next phase.

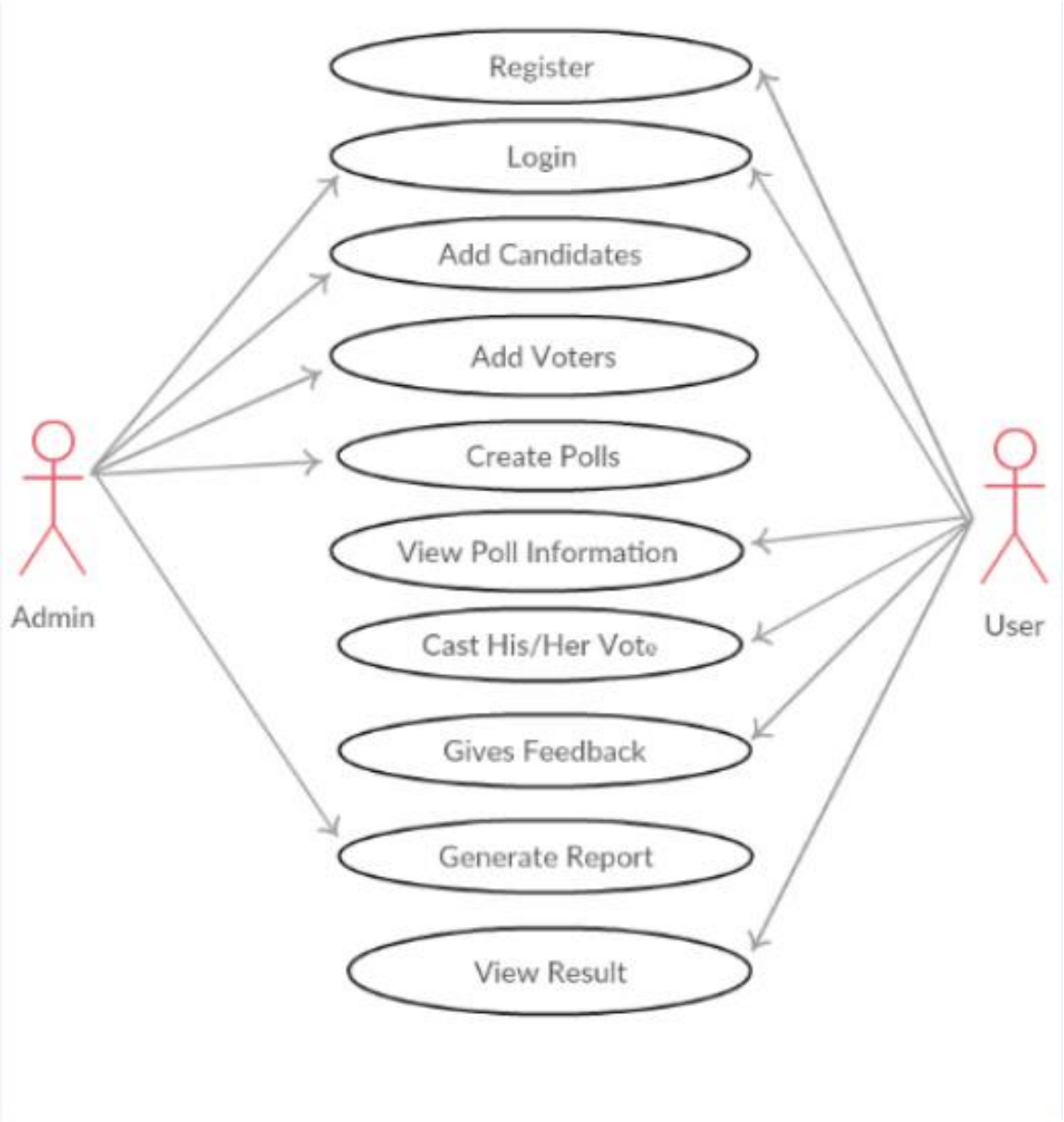
# 5 Analysis Modules

## 5.1 Data Flow Diagram

A data flow diagram (DFD) is graphic representation of the flow of data through an information system. A data flow diagram can also be used for the visualization of data processing (structured design). It is common practice for a designer to draw a context level DFD first which shows the interaction between the system and outside entities. DFDs show the flow of data from external entities into the system, how the data moves from one process to another, as well as its logical storage. There are only four symbols: 1. Squares representing external entities, which are sources and destinations of information entering and leaving the system. 2. Rounded rectangles representing processes, in other methodologies, may be called 'Activities', 'Actions', 'Procedures', 'Subsystems' etc. which take data as input, do processing to it, and output it. 3. Arrows representing the data flows, which can either, be electronic data or physical items. It is impossible for data to flow from data store to data store except via a process, and external entities are not allowed to access data stores directly. 4. The flat three-sided rectangle is representing data stores should both receive information for storing and provide it for further processing.

## 5.2 Use Case Diagram

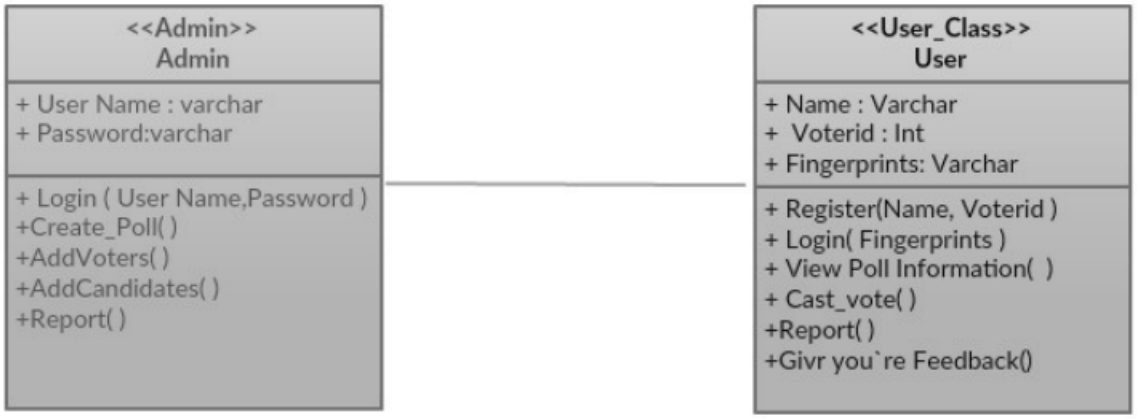
A use case defines a goal-oriented set of interactions between external entities and the system under consideration. The external entities which interact with the system are its actors. A set of use cases describe the complete functionality of the system at a particular level of detail and it can be graphically denoted by the use case diagram.




## 5.3 Class Diagram

UML class diagram shows the static structure of the model. The class diagram is a collection of static modeling elements, such as classes and their relationships, connected as a graph to each other and to their contents. The class 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. Class diagrams can also

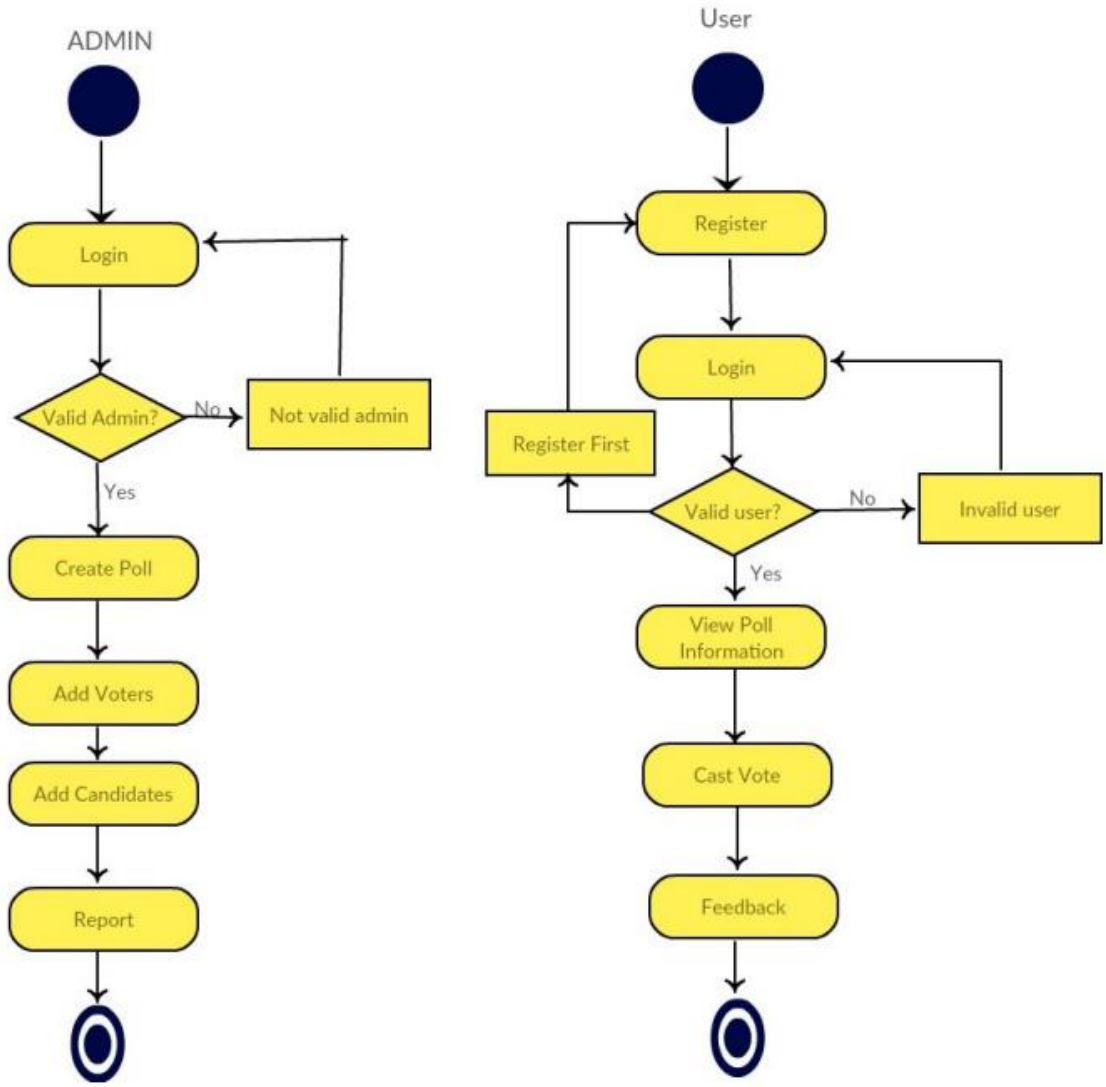
be used for data modeling. The classes in a class diagram represent both the main objects and or interactions in the application and the objects to be programmed.




## 5.4 Activity Diagram

An activity diagram shows the sequence of steps that make up a complex process. An activity is shown as a round box containing the name of the operation. An outgoing solid arrow attached to the end of the activity symbol indicates a transition triggered by the completion. 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. Activity is a particular operation of the system. Activity diagrams are not only used for visualizing the dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in the activity diagram

is the message part.




## 5.5 Sequence Diagram

Sequence diagram are an easy and intuitive way of describing the behavior of a system by viewing the interaction between the system and the environment. A sequence diagram shows an interaction arranged in a time sequence. A sequence diagram has two dimensions: vertical dimension represents time, the horizontal dimension represents the objects existence during the interaction.

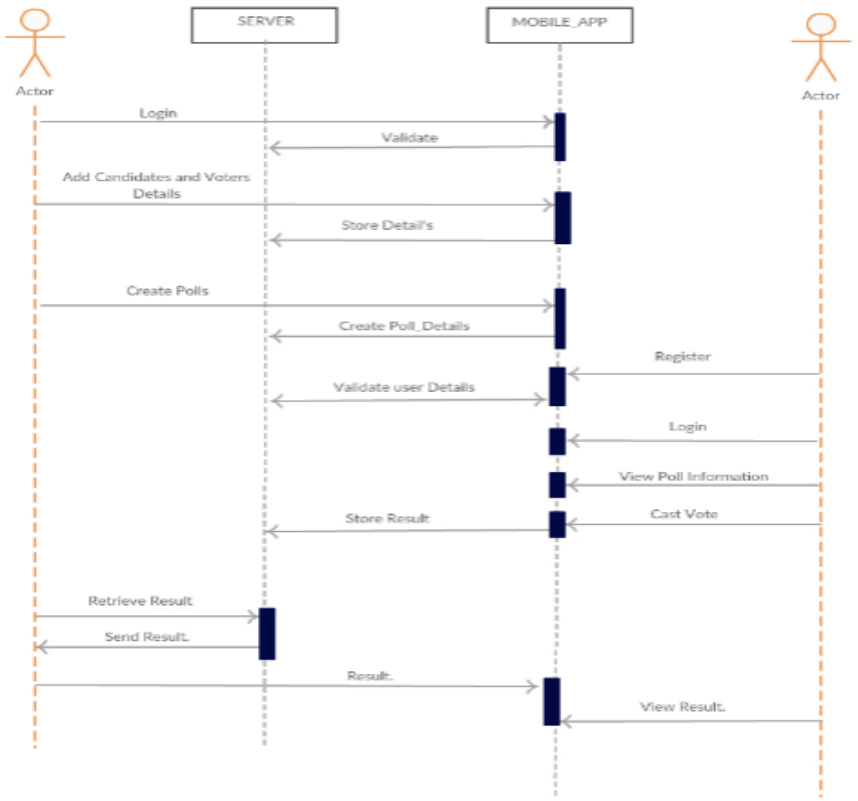
Basic elements:

• Vertical rectangle: Represent the object is active (method is being performed).

• Vertical dashed line: Represent the life of the object.

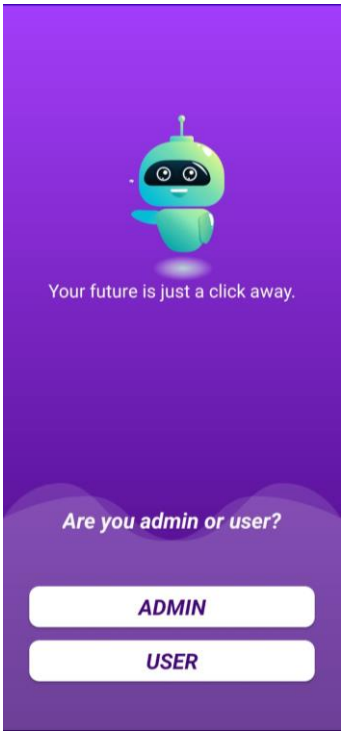
• X: represent the life end of an object. (Being destroyed from memory)

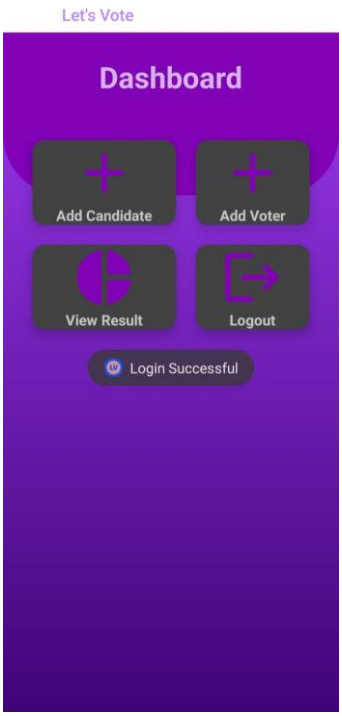
• Horizontal line with arrows: Messages from one object to another.

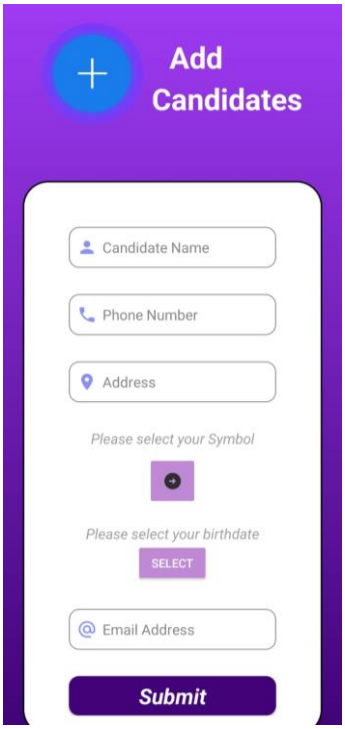


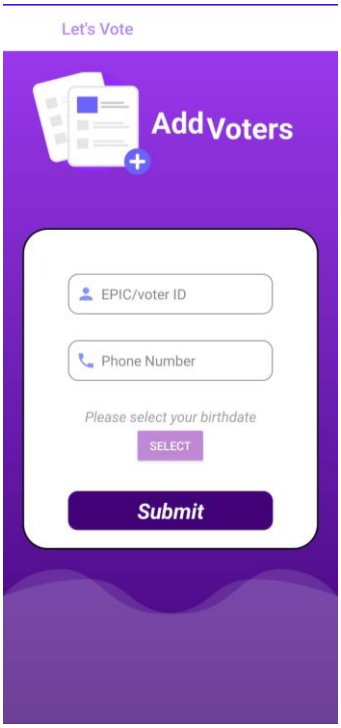
# 6 Implementation

## 6.1 Images Of Admin Module

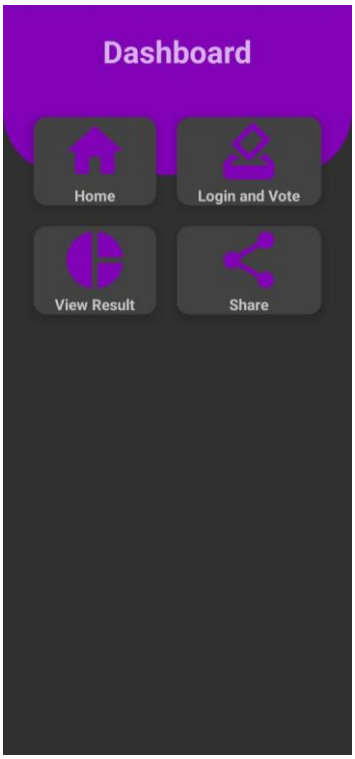


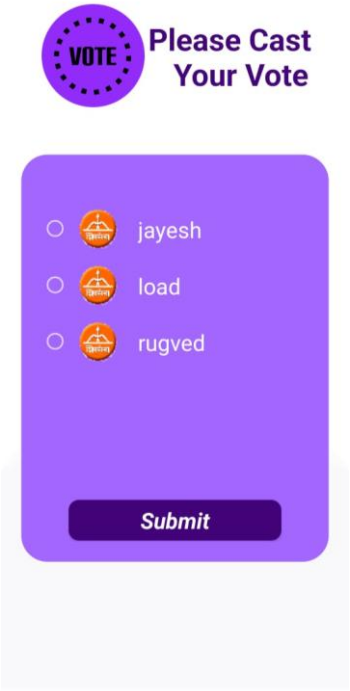



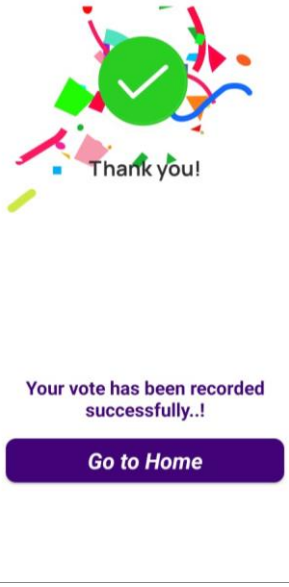



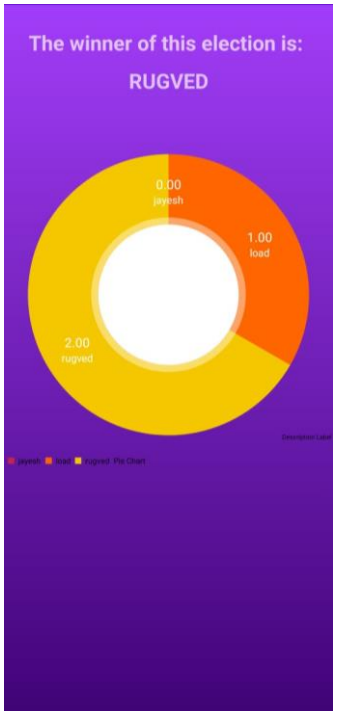



## 6.2 Images Of User Module



# 7 Conclusion

This Online Voting system will manage the Voters information by which voter can login and use his voting rights. The system will incorporate all features of Voting system. It provides the tools for maintaining voters vote to every party and it count total no. of votes of every party. There is a DATABASE which is maintained by the ELECTION COMMISION OF INDIA in which all the names of voter with complete information is stored.In this user who is above 18 years register his/her information on the database and when he/she want to vote he/she has to login by his id and password and can vote to any party only single time. Voting detail store in database and the result is displayed by calculation. By online voting system percentage of voting is increases. It decreases the cost and time of voting process. It is very easy to use and It is vary less time consuming. It is very easy to debug.

# 8 Future Scope

This project was the first implementation of a system of this nature. We identify that the work done both in terms of analysing and implementing the system is by no means complete. In this section we list the things that were either left open by this project or were opened by the analysis performed and the lessons learned during our interaction with the subject.

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