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VISVESVARAYA TECHNOLOGICAL UNIVERSITY - BELAGAVI

GOVERNMENT OF KARNATAKA

DEPARTMENT OF COLLEGIATE AND TECHNICAL EDUCATION

GOVERNMENT ENGINEERING COLLEGE NARGUND-582207

Major Project

REPORT ON

"A Modern Smart Voting Platform for Digital Election Management"

Submitted in partial fulfillment of the requirement for the degree of

Bachelor of Engineering

in

COMPUTER SCIENCE & ENGINEERING

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GOVERNMENT OF KARNATAKA

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(Affiliated To Visvesvaraya Technological University)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING 2025-26

Certificate

Certify that the project work entitled **“A Modern Smart Voting Platform for Digital Election Management”** carried out by, **Basappa Mallappa Baluragi(2NR22CS006), Naveengouda M K(2NR22CS022), Praveen Matti(2NR22CS026), Raghu M N (2NR22CS029)** are bonafide students of 7th semester in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering of The Visvesvaraya Technological University**, **Belagavi** during the year 2025-26. It is certified that all corrections or suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the aid degree.

Signature of the Guide	Signature of the Project Coordinator	Signature of the HOD	Signature of the Principal

External Viva

Name of the Examiners   Signature with date

1) ....   --

2) ....   --

DECLARATION

This is to declare that the Dissertation work entitled **"A Modern Smart Voting Platform for Digital Election Management "** is a bonafide work carried out by us at GEC, NARGUND in partial fulfillment of the requirements for the award of the degree of BACHELOR OF ENGINEERING in COMPUTER SCIENCE and ENGINEERING of VISVESWARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI under the guidance of **Prof. Nanda Hanchinal** Further it is declared to the best of our knowledge the work reported here in, does not form part of any other thesis or dissertation on the basis of which any other candidate was conferred a degree or award on earlier occasion.

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ABSTRACT

A Modern Smart Voting Platform for Digital Election Management aims to transform the traditional voting process by leveraging digital technologies to ensure secure, transparent, and efficient elections. Conventional voting systems often face challenges such as voter impersonation, long queues, manual errors, delayed result declaration, and limited accessibility. The proposed system addresses these issues by providing a secure digital voting platform that enables voters to cast their votes electronically using authenticated credentials. The platform integrates strong voter authentication mechanisms, such as unique voter identification, date of birth verification, and one-time password (OTP) validation, to prevent unauthorized access and duplicate voting. All voting data is securely stored and processed to maintain confidentiality, integrity, and transparency throughout the election process. The system also supports real-time vote counting and instant result generation, significantly reducing the time and resources required for election management. By offering a user-friendly interface and remote voting capability, the proposed smart voting platform improves voter participation while minimizing human intervention and operational costs. Overall, this digital election management system provides a reliable, scalable, and secure solution for conducting modern elections, making it suitable for institutional, organizational, and governmental voting applications.

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Chapter 1

INTRODUCTION

1.1 Overview

Elections are the foundation of any democratic system, as they provide citizens with the right to choose their representatives and participate directly in governance. Traditional voting systems, which primarily rely on paper ballots or standalone electronic voting machines, have served this purpose for decades. However, with the rapid advancement of digital technology and the growing demand for transparency, security, efficiency, and accessibility, conventional voting methods face several challenges. These challenges include long queues at polling stations, high operational costs, delayed result declaration, human errors, vote manipulation, and difficulties in ensuring user participation, especially in remote or urban areas. To overcome these limitations, the concept of a Modern Smart Voting Platform for Digital Election Management has gained significant attention.

A smart voting platform integrates modern information and communication technologies to digitize and automate the election process while maintaining the core democratic principles of fairness, secrecy, and trust. Digital election management systems aim to enhance the efficiency of elections by minimizing manual intervention, reducing logistical complexities, and ensuring accurate vote counting. By leveraging technologies such as mobile applications, web platforms, secure databases, biometric verification, Aadhaar-based authentication, One-Time Password (OTP) verification, and encrypted communication, smart voting systems provide a reliable alternative to traditional election processes.

One of the primary motivations for developing a smart voting platform is to increase user participation. In many regions, eligible users are unable to cast their votes due to reasons such as distance from polling stations, physical disabilities, time constraints, or lack of proper identification. A digital voting system enables users to participate remotely using secure authentication mechanisms, thereby making the election process more inclusive. This is particularly beneficial for senior citizens, differently-abled individuals, migrant workers, and students living away from their registered constituencies.

Security is a critical concern in any election system, especially when digital technologies are involved. A modern smart voting platform addresses these concerns by implementing multi-layered security measures. User authentication can be carried out using government-issued digital identities such as Aadhaar numbers, combined with Date of Birth (DOB) verification and OTP-based validation. This ensures that only eligible users can access the system and cast their votes. Additionally, encryption techniques are used to protect user data and voting records, ensuring confidentiality and preventing unauthorized access or tampering. Secure servers and audit logs further enhance system reliability and transparency.

Another significant advantage of digital election management is real-time monitoring and faster result processing. In traditional voting systems, vote counting can take several hours or even days, depending on the scale of the election. Smart voting platforms automate the vote tallying process, allowing election authorities to generate accurate results quickly after voting concludes. This not only saves time but also reduces the risk of manual counting errors and disputes. Moreover, election administrators can monitor user turnout, system performance, and security alerts in real time through centralized dashboards.

The integration of smart technologies also helps reduce the cost and environmental impact of elections. Traditional elections require large amounts of paper, printing, transportation, manpower, and physical infrastructure. Digital voting platforms significantly reduce these requirements by shifting the process to an online or mobile-based environment. This leads to cost savings for governments and contributes to environmental sustainability by minimizing paper usage.

From an administrative perspective, a smart voting platform simplifies election management. Tasks such as user registration, verification, polling station setup, vote counting, and result publication can be handled through a unified digital system. Automated workflows reduce the workload of election officials and minimize the possibility of human bias or errors. Additionally, data analytics tools can be used to study voting patterns and improve future election planning while maintaining user anonymity.

Despite its advantages, the adoption of smart voting systems also requires careful consideration of challenges such as digital literacy, internet accessibility, cybersecurity threats, and legal compliance. Therefore, a well-designed smart voting platform focuses on user-friendly interfaces, robust security frameworks, scalability, and compliance with electoral laws and data protection regulations. Awareness programs and pilot implementations play a crucial role in building public trust and acceptance of digital voting technologies.

In conclusion, a Modern Smart Voting Platform for Digital Election Management represents a significant step toward strengthening democratic processes through technology. By ensuring secure authentication, transparency, accessibility, and efficient election administration, smart voting systems have the potential to transform traditional elections into a more reliable and citizen-centric process. As digital transformation continues to shape governance worldwide, smart voting platforms stand as a promising solution for conducting free, fair, and efficient elections in the modern era.

1.2 Advantages

- **High security**

  The system ensures high security using Aadhaar–DOB verification and OTP authentication, preventing unauthorized access and duplicate voting.

- **Prevents fake voting**

  It prevents fake voting by verifying voters through Aadhaar, DOB, and OTP authentication, ensuring only eligible users can cast a vote.

- **Easy and convenient**

  The system is easy and convenient to use, allowing voters to cast their votes quickly through a simple and user-friendly digital interface.

- **Saves time**

  The system saves time by enabling fast online voting and instant result processing without the need for physical polling stations.

- **Cost-effective**

  The system is cost-effective, as it reduces expenses related to physical polling booths, paper ballots, and manual workforce.

- **Real-time results**

  The system provides real-time results, allowing instant vote counting and quick result declaration.

- **Increases voter turnout**

  The system increases voter turnout by enabling secure and convenient online voting from anywhere.

- **Eco-friendly**

  The system is eco-friendly, as it eliminates paper ballots and reduces resource consumption.

1.3 Disadvantages

- **Needs internet**

  The system requires an internet connection, which may limit usage in areas with poor or no network connectivity.
- **Cybersecurity risks**

  The system faces cybersecurity risks, as online platforms may be vulnerable to hacking, data breaches, or cyber-attacks if not properly secured.
- **Technical issues**

  Technical issues such as server downtime, software bugs, or application crashes may affect the smooth functioning of the voting process.
- **Privacy concerns**

  Privacy concerns may arise if voter data is not adequately protected, potentially risking unauthorized access to personal information.
- **Requires smartphone**

  The system requires a smartphone, which may exclude voters who do not own or have access to a compatible mobile device.

1.4 Relevant to Society

A Modern Smart Voting Platform for Digital Election Management is highly relevant to society as it enhances the efficiency, transparency, and credibility of the electoral process. By enabling secure digital voting through technologies such as authentication mechanisms, encryption, and real-time monitoring, the system reduces electoral fraud and human errors. It increases voter participation by providing easy access to voting for citizens living in remote areas, migrant workers, senior citizens, and differently-abled individuals. The platform also minimizes operational costs and time by eliminating paper-based processes and manual vote counting, while delivering fast and accurate election results. Additionally, it promotes environmental sustainability by reducing paper usage and supports good governance by ensuring free and fair elections, thereby strengthening democratic values in society.

1.5 Future scope of project

The feature scope of the smart voting system includes the development of a secure and efficient digital platform that supports the complete election process. The system provides online user registration using Aadhaar-based identification along with Date of Birth (DOB) verification to ensure user eligibility. OTP-based authentication is used to enhance security during login and vote casting. The platform allows users to access election details, view candidate information, and cast their vote electronically while ensuring the one user–one vote principle. It includes administrative features for managing users, candidates, and election schedules, as well as a government dashboard to monitor election progress and user turnout. The system securely encrypts and stores voting data, maintains audit logs for transparency, automatically counts votes, and publishes accurate election results. Overall, the smart voting system aims to reduce manual effort, minimize election costs, increase user participation, and ensure a transparent and reliable digital election management process.

1.6 Applications

- **Government Elections**

  The system can be used in local, state, or national elections to ensure fast voting, secure data storage, and accurate result counting. It helps reduce fraud, invalid votes, and manual errors.

- **Educational Institutions**

  Schools, colleges, and universities can use this system to conduct student council elections, class representative selection, and organizational committee voting. It makes the process easy and fair for students and faculty.

- **Corporate and Company Voting**

  Organizations can use this system for employee voting, decision-making polls, leadership selection, annual general meeting (AGM) voting, and internal policy approval.

- **Non-Government Organizations**

  NGOs can use the system to elect board members, plan committees, or make collective decisions during group discussions or meetings.

- **Residential and Community Associations**

  Housing societies, local communities, and resident welfare associations (RWA) can use the system to vote for committee members, society decisions, or event planning.

- **Political Party Internal Elections**

  Political parties can use this system to choose candidates, select party representatives, or conduct internal surveys securely.

Chapter 2

OBJECTIVES AND MOTIVATION

2.1 Problem Statement

Traditional voting systems, such as paper-based ballots and manual counting processes, often face several challenges including long queues, slow result processing, human error, vote duplication, and risk of tampering or manipulation. These issues reduce transparency, increase cost, and make the voting process inconvenient for both users and administrators. Additionally, maintaining security, accuracy, and user privacy becomes difficult with manual methods. In many cases, users are required to travel to polling stations, which can be time-consuming and inaccessible for elderly, disabled, or distant participants. Due to these limitations, there is a need for a modern and secure voting solution that can simplify the election process, ensure accuracy, protect user identity, prevent fraud, and provide fast result computation.

2.2 Objectives

- To provide a secure and reliable voting platform.
- To verify user identity accurately.
- To reduce manual work and human errors.
- To make the voting process more convenient and user-friendly.
- To increase transparency and trust in the election process.
- To support scalability and flexibility.
- To eliminate duplicate or fake votes.

2.3 Motivation

Elections play a vital role in maintaining democracy, as they allow citizens to express their opinions and choose their representatives. In India, the existing voting system mainly relies on physical polling stations and electronic voting machines. Although this system has been effective for many years, it still faces several challenges such as long queues, high operational costs, manpower requirements, limited accessibility, and delays in result processing. These issues motivate the need for a modern and technology-driven solution for election management.

One of the major motivations for this project is the need for increased user participation. Many eligible users are unable to cast their votes due to reasons such as geographical distance, work commitments, physical disabilities, or residing outside their home constituency or country. An online smart voting platform allows users to participate remotely using secure digital authentication, making the voting process more convenient and inclusive. By providing easy access to voting through the internet, the system encourages greater participation, especially among young users and citizens living abroad.

Another strong motivation is the requirement for transparency and fairness in elections. Traditional voting systems involve multiple manual processes, which may lead to errors, delays, or mistrust among users. A smart voting system minimizes human intervention by automating user registration, verification, vote casting, and counting processes. This reduces the possibility of manipulation and ensures that every vote is counted accurately, thereby strengthening public confidence in the election system.

Security concerns in the voting process also motivate the development of this project. The proposed system uses Aadhaar number, Date of Birth (DOB), and One-Time Password (OTP) authentication to verify user identity. These multi-level security mechanisms ensure that only authorized users can access the system and cast their votes. Additionally, email verification and alert notifications help detect and prevent fraudulent activities, making the system more secure and reliable.

The project is also motivated by the need to reduce election costs and administrative workload. Conducting large-scale elections requires significant resources, including paper ballots, voting machines, transportation, security personnel, and polling staff. A digital voting platform reduces dependency on physical infrastructure and manual labor, resulting in cost savings and improved efficiency. Election authorities can manage user data, candidates, and results through a centralized digital system.

Furthermore, the increasing adoption of digital governance and e-services motivates the shift toward smart voting systems. As citizens become more familiar with online services such as digital payments, online banking, and e-government portals, implementing a secure online voting system aligns with the vision of a digitally empowered society. This project contributes to modernizing the electoral process by leveraging current technologies.

In conclusion, the motivation for this project arises from the need to enhance user accessibility, improve security and transparency, reduce costs, and modernize the election process. A Modern Smart Voting Platform for Digital Election Management aims to provide a reliable, efficient, and secure solution that supports democratic values while adapting to technological advancements.

Chapter 3

LITERATURE SURVEY

1. **"A Survey on E-Voting Systems Using Blockchain"** Y. V., M. Udaif P., N. V. S., N. K. Biju, F. Sali, L. Sebastian– This paper presents a comprehensive survey of blockchain-based e-voting systems. The authors analyze how blockchain ensures transparency, immutability, and decentralization in digital elections. The study compares traditional electronic voting systems with blockchain-enabled platforms and highlights security improvements such as tamper resistance and user anonymity. The survey concludes that blockchain can significantly enhance trust in modern digital election management systems.
2. **"Blockchain-Based Secure Online Voting Platform Ensuring User Anonymity, Integrity, and End-to-End Verifiability"** Y. Tahboub, A. Revilla, J. Lynch, G. Floyd– This research proposes a secure online voting platform built on blockchain technology. The system focuses on end-to-end verifiability, ensuring that votes are correctly cast, recorded, and counted without revealing user identity. Cryptographic techniques are used to preserve anonymity and integrity. The platform is suitable for modern digital elections where remote voting and high security are essential.
3. **"A Review of E-Voting System Based on Blockchain Technology"** G. Singh, S. Wable, P. Kharose– This review paper summarizes various blockchain-based e-voting approaches, highlighting their strengths and limitations. The authors discuss security challenges such as user privacy, scalability, and consensus mechanisms. The paper helps identify research gaps for designing advanced smart voting platforms.
4. **"A Quantum-Secure and Blockchain-Integrated E-Voting Framework with Identity Validation"** A. Poudel et al**.**– This research proposes a future-ready voting framework combining blockchain with quantum-resistant cryptography. The system integrates strong identity validation mechanisms to protect against emerging cyber threats. It demonstrates how modern smart voting platforms can remain secure in the post-quantum era.
5. **"Smart Online Voting System: A Secure and Accessible Solution for Democratic Participation"** A. Mishra, S. Khan, A. Meesh, S. Kumar– This paper presents a smart online voting system focused on accessibility and security. The system allows users to cast ballots remotely while ensuring authentication and vote integrity. The study highlights how digital platforms can increase user participation in modern democratic systems.

6. **“Advanced E-Voting System”** P. Poduval, S. Raut- This paper work proposes an advanced electronic voting system with improved authentication and data security features. The system focuses on reducing manual effort and speeding up election processes. It supports the concept of efficient digital election management.
7. **“Online Voting System”** M. Mehta, M. Lalwani, A. Harle-This paper describes a web-based online voting system designed to simplify the voting process. It focuses on secure login, vote recording, and result generation. The system demonstrates the feasibility of online voting platforms for small-scale elections.
8. **“Smart Voting System Using Java Servlets”** M. Rupa Satya Sri, K. Sravani et al– This research implements a smart voting system using Java Servlets. The system manages user registration, authentication, and vote counting through server-side applications. It demonstrates a practical implementation of digital voting using standard web technologies.
9. **“Open Vote Network Protocol (OV-Net)”** Feng Hao, Peter Ryan, Piotr Zieliński-This paper provides OV-Net is a cryptographic voting protocol designed for decentralized and transparent elections. It supports public verifiability and privacy preservation. The protocol influences modern blockchain-based voting platforms.
10. **“Helios Voting: An Open-Source Web-Based Electronic Voting System”** Ben Adida et al.- This paper gives Helios is a well-known open-source web-based e-voting system that provides end-to-end verifiability. It allows users to verify that their vote was counted without revealing their identity. Helios is widely used for academic and organizational elections.
11. **“Punchscan: User-Verifiable End-to-End Secure Voting System”** David Chaum et al.- This paper provides Punchscan is an end-to-end verifiable voting system that enables users to confirm election correctness. It uses cryptographic receipts without compromising vote secrecy. The system serves as a foundational reference for secure digital election designs.
12. **“Voatz Mobile Blockchain Voting System”** Voatz In-This paper gives Voatz is a real-world mobile blockchain voting system used in pilot elections. It enables secure remote voting using mobile devices and blockchain infrastructure. The platform demonstrates practical challenges and opportunities in deploying smart voting systems at scale.

Chapter 4

SYSTEM REQUIREMENT SPECIFICATIONS

4.1 Hardware Requirements

Requirements	Description
Android smartphone	The mobile app is developed using Android Studio with Java as the primary programming language, and it communicates with the backend server through web services.
Server/Network	The Smart Voting System uses a centralized server and network architecture to securely store, manage, and process voting data submitted through the Android application. The backend server is developed using Java-based technologies and is responsible for handling user authentication, secure vote storage, and real-time result processing.
Aadhar verification through OTP	Aadhaar OTP verification is used in the Smart Voting System to confirm the identity of the user before allowing access to the voting process. This step ensures that only registered and valid Indian citizens can participate in voting, preventing duplicate or fraudulent voting attempts.

Table 4.1. Hardware Requirements

4.2 Software Requirements

Requirements	Description
Android OS	Android Operating System is required to run the Smart Voting mobile application on smartphones. It provides the platform, APIs, and security features necessary for user interaction and application execution.
Android Studio	Android Studio is the official development environment used to design, code, test, and build the voting application. It provides tools such as an emulator, debugger.
Java/Kotlin	Java or Kotlin is used as the programming language to develop the business logic and functionality of the Android application. These languages support secure coding and API integration required for authentication and voting operations.
Firebase / SQL Database	A database such as Firebase or SQL is used to securely store user information, authentication details, and submitted vote records. It ensures reliability, scalability, and fast data retrieval for backend processing.
Aadhar Authentication JSON	Aadhaar Authentication JSON format is used to send structured identity data securely for verification. It ensures standardized communication between the client app and Aadhaar authentication system.
OTP Gateway/JS	An OTP gateway or JavaScript-based service is used to send a One-Time Password to the user’s registered mobile number. This provides secure two-factor authentication before voting access.
Backend framework	A backend framework (such as Spring Boot, Node.js, or Django) manages server-side processing, APIs, authentication validation, and vote storage. It ensures secure communication between the mobile app and database.

Table 4.2. Software Requirements

4.3 Functional Requirements

- The system shall allow eligible users to register by providing valid personal and identification details.
- The system shall verify user details before completing the registration process.
- The system shall allow registered users to log in using secure credentials.
- The system shall authenticate users during login to ensure authorized access.
- The system shall provide role-based access for users, administrators, and government officials.
- The system shall display election details and candidate information to users.
- The system shall allow authenticated users to cast their vote during the active election period.
- The system shall ensure that each user can cast only one vote per election.
- The system shall securely encrypt and store all cast votes in the database.
- The system shall display a confirmation message after a vote is successfully submitted.
- The system shall allow administrators to create, schedule, start, and end elections.
- The system shall allow administrators to add, update, and remove candidates.
- The system shall allow administrators to manage user records and eligibility status.
- The system shall automatically count votes and generate election results.
- The system shall allow authorized users to view published election results.
- The system shall provide a government dashboard to monitor election progress and user turnout.
- The system shall send notifications to users regarding election schedules and results.
- The system shall maintain audit logs for all user activities and voting operations.
- The system shall manage user sessions securely and log out inactive users.

4.4 Non-Functional Requirements

- System will support response time for addressing severe issues in less time.
- System will provide documentation to inform users of system functionality and any change to the system.
- System will provide friendly graphical Interface to ensure ease of use when end users utilize system functionality.
- The system will be able to be integrated in future if need be.
- The application will be available all the time for Users on Google play to download.

Chapter 5

METHODOLOGY

- **Requirement Analysis**

In this phase, the functional and non-functional requirements of the system are identified. Key needs such as user authentication, secure database storage, vote confidentiality, and real-time result generation are analysed. Discussions are made to understand system users like administrators, users, and election authorities. Based on this understanding, software, hardware, and security requirements are finalized.

- **System Design**

After requirements are finalized, the system architecture and interface are designed. This includes user interface (UI) layout, database schema, authentication mechanism, and backend workflow. Use case diagrams, data flow diagrams (DFD), and flowcharts are created to show how the system will function. Special focus is given to security features such as encryption, login authentication, and restricted access.

- **Implementation**

In this stage, the actual coding and development of the system take place. The system is developed using suitable programming languages and frameworks. Different modules such as user registration, login verification, vote casting, database storage, and admin panel are implemented step-by-step. The system ensures that each user can vote only once and the stored votes remain secure and confidential.

- **Testing**

Once the system is developed, various testing methods are applied to ensure that it works correctly. Functional testing checks that all features work as expected, while security testing verifies protection against fraud and unauthorized access. The system is tested to confirm that duplicate votes are not allowed, and results are generated accurately. Any errors or bugs found during this phase is fixed.

- **Deployment**

After successful testing, the system is deployed for real use. The system is made available to registered users, and administrators configure the voting options and candidate details. Training or demonstration may be provided to help users understand how to vote using the system.

- **Maintenance and Updates**

Post-deployment, the system is monitored for performance, user feedback, and security improvements. If new features are required or enhancements are needed, updates are applied. Continuous maintenance ensures smooth system performance during multiple election cycles.

5.1 Flowchart

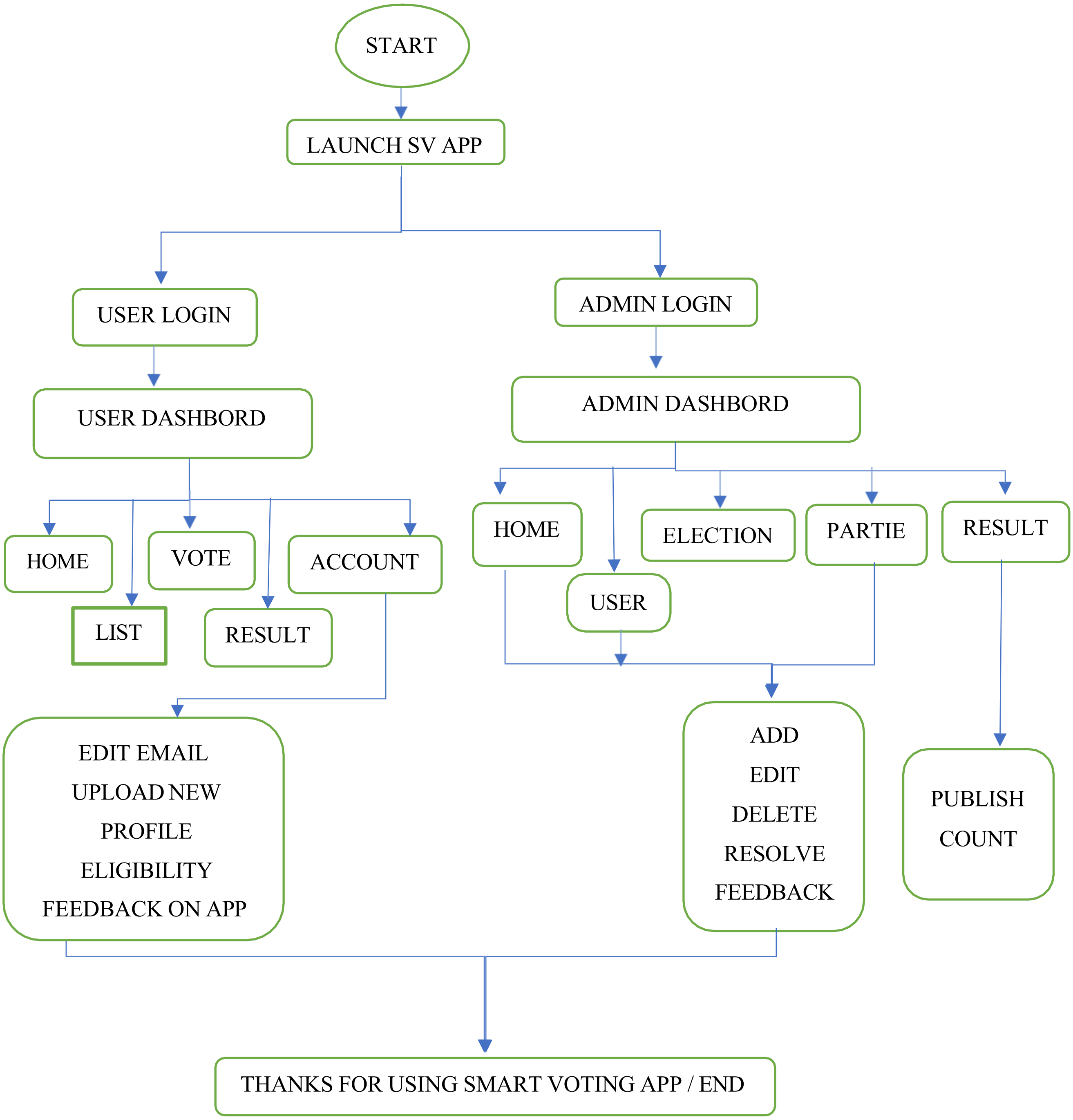


Figure 5.1 .Flowchart of smart voting system

The Figure 5.1 refers Smart Voting System starts with the Start process, which represents the beginning of the digital voting workflow. At this stage, the Smart Voting (SV) application is launched on the user's device, such as a mobile phone or computer. Once the application is opened, it initializes all required services, loads the system interface, and checks connectivity and security settings. After successful initialization, the system directs the user to the login screen, where they can choose between User Login for users or Admin Login for government authorities.

I. User Side Flow

- **Launch Smart Voting App:** The user opens the Smart Voting application on their device.
- **User Login:** The voter logs in using valid credentials (such as ID, Aadhaar, OTP, etc.).
- **User Dashboard:** After successful login, the user dashboard is displayed.
- **User Dashboard Options:**
  - **Home**: Shows general information and instructions.
  - **List**: Displays the list of candidates or elections.
  - **Vote**: Allows the user to cast their vote.
  - **Result**: Shows election results (if published).
  - **Account**: User can manage their profile.
- **Account Features:**
  - Edit email or personal details
  - Upload new profile information
  - Check eligibility status
  - Give feedback on the app
- **End:**

  After completing actions, the user exits the app.

  Message displayed: *"Thanks for using Smart Voting App"*

II. Admin Side Flow

- **Admin Login:** The admin logs in using secure admin credentials.
- **Admin Dashboard:** After login, the admin is redirected to the government dashboard.
- **Admin Dashboard Options:**
  - **Home:** Overview of the system
  - **User:** Manage voter details
  - **Election:** Create and manage elections
  - **Parties:** Manage political parties and candidates
  - **Result:** Handle result publication
- **Admin Functions:**
  - Add, edit, or delete user and election data
  - Resolve user feedback and issues
  - Manage parties and candidates
  - Publish and count votes securely
- **Result Section:** Admin publishes results after vote counting.
- **End:** System ends with: *"Thanks for using Smart Voting App"*

5.2 USECASE DIAGRAM

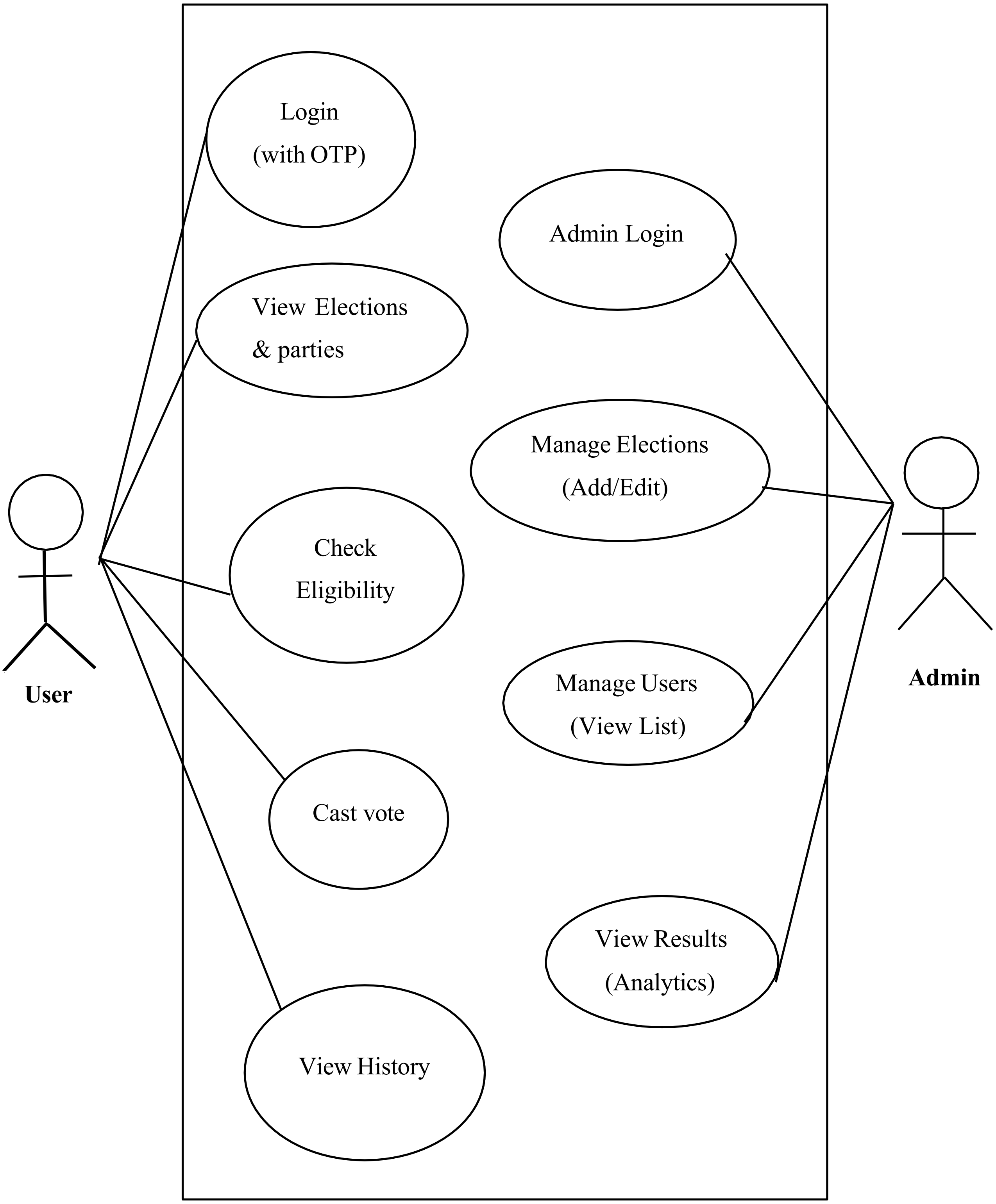


Figure 5.2. Use case diagram of the smart voting system

The Figure 5.2 represents a Use Case Diagram of a Smart Voting System. It shows how two actors User and Admin/Election Officer interact with the system. The user can register or authenticate, view the candidate list, confirm their vote, and check election status or results. The admin or election officer is responsible for managing elections, managing candidates, viewing vote confirmations, and generating final results. All these activities are handled and supported by the system/server, which processes data securely and ensures smooth operation of the voting system.

I. User Use Cases

- **Login (with OTP)**

This function allows the user to securely access the system using their registered mobile number or email. A One-Time Password (OTP) is sent to verify the user's identity, ensuring protection against unauthorized access and impersonation.

- **View Elections & Parties**

After successful login, the user can view a list of active and upcoming elections along with participating political parties or candidates. This helps users make informed decisions before casting their vote.

- **Check Eligibility**

This use case verifies whether the user is eligible to vote in a particular election. The system checks criteria such as age, user registration status, and whether the vote has already been cast, ensuring fairness and preventing duplicate voting.

- **Cast Vote**

This is the core function of the system. Eligible users can select their preferred candidate or party and submit their vote securely. Once the vote is cast, it is encrypted and stored safely to maintain confidentiality and integrity.

- **View History**

This feature allows users to view their voting history, such as elections they have participated in and the date of voting. It increases transparency while ensuring that the actual vote choice remains confidential.

II. Admin Use Cases

- **Admin Login**

  The admin logs into the system using secure credentials. This ensures that only authorized personnel can access sensitive system controls and election data.

- **Manage Elections (Add/Edit)**

  Admins can create new elections, set election dates, define constituencies, and update or modify existing election details. This ensures smooth election scheduling and management.

- **Manage Users (View List)**

  This use case allows the admin to view the list of registered users. The admin can monitor user status, verify registrations, and ensure the user database is accurate and up to date.

- **View Results (Analytics)**

  After the voting process ends, the admin can access detailed election results. The system provides analytics such as total votes, candidate-wise vote count, and graphical representations for better decision-making and transparency.

5.3 UML DIAGRAM

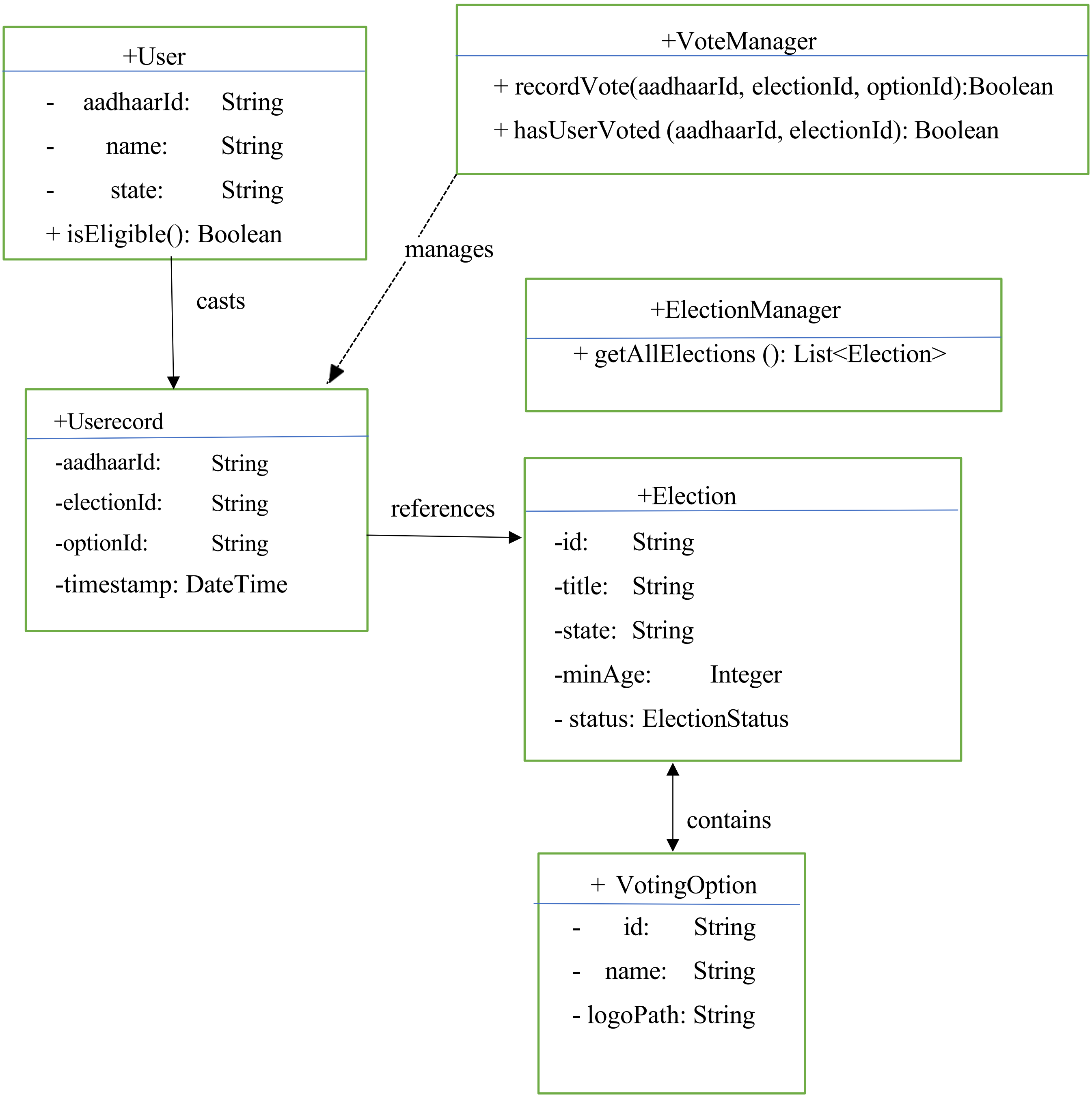


Figure 5.3. Uml diagram of the smart voting system

The Figure 5.3 depicts a Uml Diagram of a Smart Voting System. It shows the main classes involved in the system, their attributes, methods, and relationships. The User class contains details such as user ID, password, and name, and provides functions to cast a vote and view results. Each user has a corresponding User Profile, which stores additional personal information and is updated by the system. The Cast Vote class records voting details like candidate ID, user ID, and timestamp, and supports submitting a vote. It is linked to the Candidate class, which includes candidate information such as name, party symbol, and constituency, along with nomination-related operations. The admin class manages system activities, submits reports, and publishes resultsThe Voting Server processes votes, counts them, and sends reports. Finally, the Result class stores the final vote count for each candidate and displays election results.

- **User**

The User class represents a registered user in the system. It stores unique identification using the Aadhaar ID along with the user’s name and state. The isEligible () method verifies whether the user satisfies voting conditions such as age, state, and election rules before allowing the vote.

- **VoteManager**

The VoteManager class is responsible for controlling the voting process. It ensures vote integrity by recording votes securely and checking if a user has already voted in a particular election. This class prevents duplicate voting and enforces the “one person, one vote” rule.

- **ElectionManager**

The ElectionManager manages all election-related operations. It retrieves the list of ongoing, upcoming, or completed elections and provides them to users for selection. This class acts as a central controller for election data management.

- **Election**

The Election class represents an individual election event. It contains details such as election ID, title, state, minimum age requirement, and election status (active, upcoming, or closed). Each election is composed of multiple voting options, defining the choices available to users.

- **VotingOption**

  The VotingOption class represents candidates or political parties participating in an election. It stores identifying information such as option ID, name, and party logo path. These options are displayed to users during the voting process.

- **Use record**

  The Use record class keeps a permanent record of each vote cast. It stores the Aadhaar ID of the user, election ID, chosen option, and the timestamp of voting.

Chapter 6

SYSTEM ARCHITECTURE

6.1 System architecture

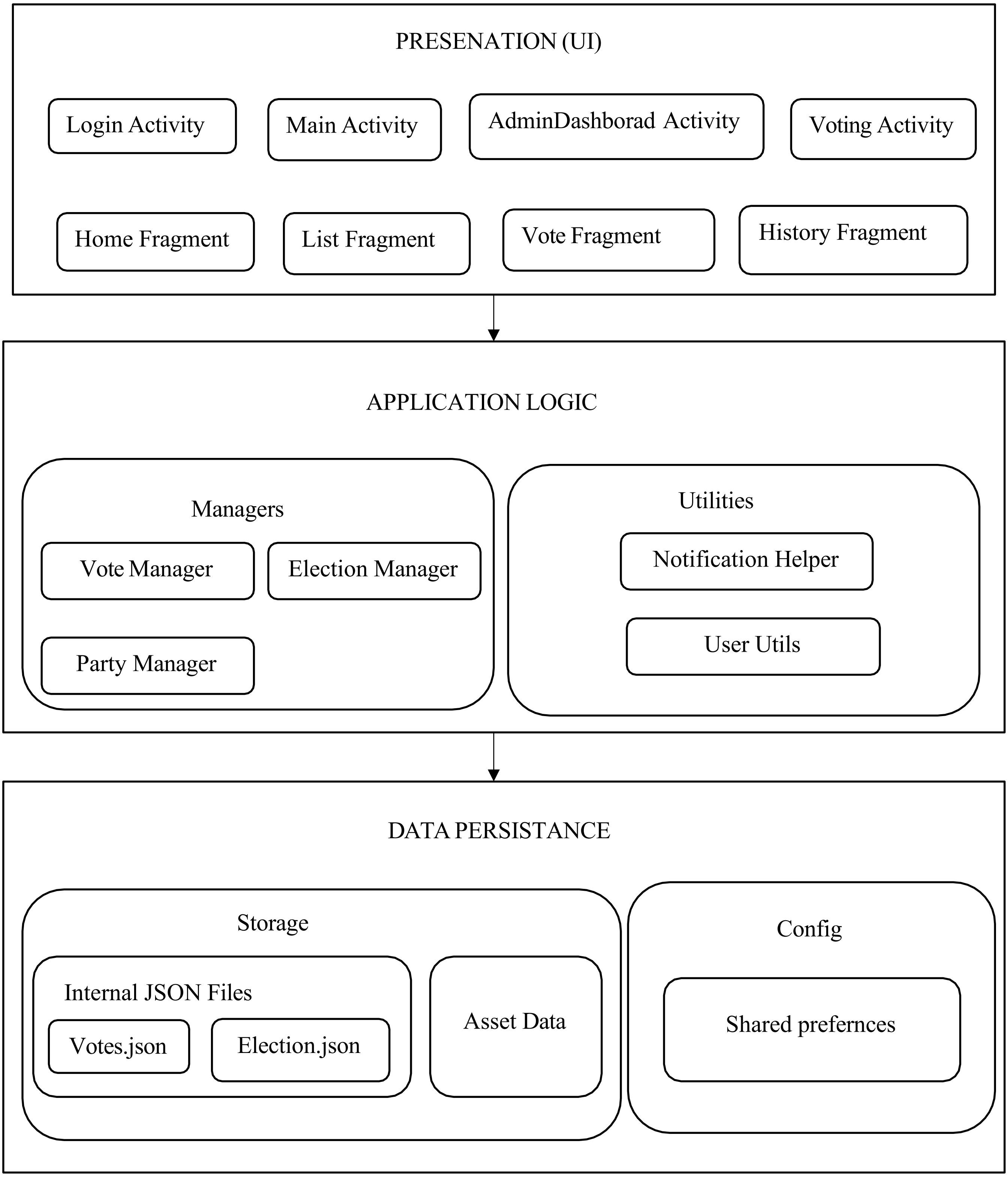


Figure 6.1. System Architecture

The Figure 6.1 illustrates the Three-Tier Architecture of the Smart Voting System. The Presentation Layer (Android App) handles the user interface and secure data capture (Aadhaar, OTP, DOB). This data is securely sent to the Application/Server Tier, which handles all authentication logic, eligibility checks, and vote anonymization. After successful verification, the vote is stored immutable while the user's status is updated in the User Database to prevent duplicate voting.

I. Presentation Layer (Frontend – Android App)

The Presentation Layer consists of the Android mobile application that provides a user interface for users to interact with the Smart Voting System. It is developed using Android Studio with Java or Kotlin for application logic and XML for designing the user interface layouts. This layer allows users to register, authenticate using Aadhaar, OTP, and DOB, view candidate details, and securely cast their vote. It focuses on delivering a simple, responsive, and user-friendly experience while communicating with the backend through secure JSON Files**.** It ensures proper input validation to avoid incorrect or malicious data entry. The frontend is designed to work efficiently on different screen sizes and Android versions, ensuring accessibility for all eligible users.

II. Application Layer (Backend Server)

The Application Layer is responsible for executing the core logic of the Smart Voting System, including Aadhaar verification, OTP generation, authentication, and vote processing. It is developed using backend technologies such as Java which handle secure communication between the frontend and the database. This layer ensures that only verified and eligible users can cast a single vote and prevents duplication or unauthorized access.

The server also validates all incoming requests, manages encryption, and ensures data privacy during transmission. Additionally, it handles session management, error handling, and real-time response generation to maintain smooth and reliable operation throughout the voting process.

III. Data Layer (Database Server)

The Data Layer is responsible for securely storing all essential information, including user records, authentication logs, and submitted votes. It uses Firebase, MySQL, or SQL Server as the backend storage system to ensure data consistency and reliable access during the voting process. This layer ensures that data remains accurate, tamper-proof, and available only to authorized system components. It also supports backup and recovery to protect user information and vote counts from loss or corruption. Additionally, proper indexing, role-based access control, and encryption techniques are implemented to maintain high security and performance throughout the election process.

Chapter 7

IMPLEMENTATION DETAILS

7.1 Project Foundation & Architecture

7.1.1 Architectural Design

The application follows a Model-View-Controller (MVC) architecture, ensuring a clean separation of concerns:

- **Model Layer**: Defines the data structures (Users, Votes, Elections) and business rules (e.g., age eligibility).
- **View Layer**: Utilizes Material Design 3 components to provide a modern, accessible, and responsive user interface.
- **Controller Layer:** Manages the flow of data between the user (View) and the backend logic (Model).

7.1.2 Environment & Compatibility

The project was initialized with a focus on broadly compatible Clean Architecture, supporting Android devices ranging from Android 7.0 (Nougat) to the latest Android 15.Strict version control protocols were established immediately, isolating local configuration files to prevent environment conflicts across different development machines.

7.1.3 Security Perimeter (Manifest)

- **Component Isolation:** The application explicitly defines its entry points. Only the Splash Screen and Government Login are "exported" (accessible externally); all internal voting logic is sealed off from other apps.
- **Permissions:** The app requests only the absolute minimum permissions required (Camera for profiles, Biometrics for login), adhering to the principle of least privilege.

7.2 Authentication & Identity Management

7.2.1 Dual-Factor User Authentication

The system implements a rigorous two-step verification process for users:

- **Identity Validation:** Users must input a valid Aadhaar ID, which is checked against strict regex patterns (length and format) and verified against the encrypted local user database.
- **Biometric Lock:** Upon ID validation, the app invokes the device's hardware security module (BiometricPrompt) to require a fingerprint or face scan. This ensures that possession of the ID number alone is insufficient for access.

7.2.2 Government/Admin Access

A separate, secure login channel is provided for election officials.

Access is guarded by specific department codes and hardcoded security rules.

- **Session Management:** A persistent session state is maintained securely, ensuring admins remain logged in during operations but are auto-logged out if the app is tampered with.

7.3 User Experience (UX) & Navigation Architecture

7.3.1 Single-Activity Navigation

To optimize memory usage and performance, the app runs primarily as a single "Activity" (window) that swaps out secure "Fragments" (screens).This approach reduces battery drain and facilitates smoother transitions between the Dashboard, Election Feed, and Profile sections.

7.3.2 Dynamic Dashboard

- **Live Status Indicators:** The home screen performs a real-time health check of the user's profile, displaying "Eligible" (Green) or "Ineligible" (Red) status based on age and registration data.
- **Smart Feed:** The "Active Elections" list is automatically filtered. A user in "Karnataka" will only see elections relevant to their constituency, filtering out noise.

7.3.3 Profile & Privacy

Users can manage their profiles and capture photos.

- **Sandboxed Storage:** All user photos and data are saved to the app's "Internal Private Storage". This is a protected area of the phone's memory that no other app—not even file managers—can access, ensuring total user privacy.

7.4 The Voting Engine (Core Functionality)

7.4.1 Atomic Voting Transactions

The voting process is designed to be "atomic"—it either happens completely or not at all, preventing partial or corrupt states.

- **Pre-Flight Check**: Before the ballot screen loads, the system scans the vote history. If the user has already voted in this election, access is immediately blocked, and they are redirected to the results page.
- **Ballot Interface:** Candidates are presented on distinct cards. Selecting a candidate provides immediate tactile and visual feedback (highlighting/borders).
- **Secure Commit:** When the "Submit" button is pressed, the vote is cryptographically timestamped and written to the secure database in a single, synchronized operation.

7.4.2 Offline-First Database

Instead of relying on a potentially unstable internet connection, the app uses a custom, high-performance JSON-based NoSQL database stored locally.

- **Concurrency Control:** The system uses "Manager" singletons to handle file access, ensuring that two processes never try to write to the database at the exact same millisecond, which prevents data corruption.

7.5 Administration & Analytics

7.5.1 Real-Time Tabulation

The Admin Dashboard provides instantaneous election results.

- **Aggregation Algorithm:** A custom algorithm iterates through thousands of vote records in milliseconds, grouping them by candidate ID to calculate total votes and percentage share without needing a server.

7.5.2 Voter Roll Management

Admins can view the list of registered users.

- **Privacy Masking:** To protect user identity during administrative reviews, sensitive IDs are automatically masked (e.g., displaying `XXXX-XXXX-1234` instead of the full ID).

7.5.3 Issue Resolution System

A built-in Help Desk allows users to submit complaints or queries.Admins have a dedicated interface to view these "Pending" tickets, reply to them, and mark them as "Resolved," updating the user's view instantly.

7.6 Advanced Security & Optimization

7.6.1 Performance Engineering

- **Memory Management:** The app proactively cleans up large resources (like bitmaps) when screens are closed to prevent crashes on older devices.
- **Data Streaming:** For reading large datasets, the app uses a "streaming" approach, processing data piece-by-piece rather than loading it all into RAM at once.

7.6.2 Hardening Measures

- **Anti-Screenshot:** The voting screen is protected by OS-level "Secure Flags." This physically prevents the phone from taking a screenshot or screen recording while the ballot is visible, protecting the secrecy of the vote.
- **Root Detection:** The app scans the device for signs of "rooting" or jailbreaking. If detected, sensitive features are disabled to prevent tampering.
- **Encryption:** Critical files are encrypted using keys generated by the Android Keystore System, meaning the data is unreadable even if copied off the device.

7.7 Release & Deployment

7.7.1 Final Build Process

- **Obfuscation:** The code passes through a "minification" process (ProGuard/R8) which renames all internal classes and logic to random characters (e.g., `VoteManager` becomes `a.b`), making it nearly impossible for hackers to reverse-engineer the app.
- **Digital Signing:** The final application package (APK) is cryptographically signed with a private developer key, guaranteeing that the installed software is authentic and unaltered.

7.8 Software testing & test cases

The testing strategy for this project involves a mix of manual and automated testing principles to ensure data integrity, security, and a seamless user experience.

- **Automated Test**: Tests executed automatically by scripts or tools (e.g., Selenium, Key-driven frameworks) without human intervention. These are efficient for repetitive steps and regression testing.
- **Manual Test**: Tests executed by a human QA tester who interacts with the application UI/API directly to identify bugs or usability issues. These are essential for exploratory testing and user experience verification.

7.8.1 Initial Setup & Data Integrity

Test Case ID	Feature	Test Scenario	Pre-Conditions	Expected Result	Manual	Automated
TC01	Data Sync	Asset to internal storage sync	Fresh install	Data synced, login works	No	Yes
TC02	Data Persistence	Data after restart	User edited	Data persists	Yes	No

Table 7.8.1. Initial Setup & Data Integrity

7.8.2 Authentication

Test Case ID	Feature	Test Scenario	Pre-Conditions	Expected Result	Manual	Automated
TC03	User Validation	Invalid Aadhaar	Login screen	Error shown	Yes	Yes
TC04	User Validation	Non-existent user	User not in DB	User not found	Yes	Yes
TC05	OTP	Generate OTP	Valid credentials	OTP sent	Yes	No
TC06	OTP	Verify OTP	OTP sent	Login success	Yes	No
TC07	OTP	OTP expiry	OTP sent	OTP expired	Yes	No
TC08	Admin Login	State admin login	Admin screen	State dashboard	Yes	Yes
TC09	Admin Login	Super admin login	Admin screen	Global dashboard	Yes	Yes
TC10	Admin Login	Invalid credentials	Admin screen	Error message	Yes	Yes

Table 7.8.2. Authentication

7.8.3 Administration

Test Case ID	Feature	Test Scenario	Pre-Conditions	Expected Result	Manual	Automated
TC11	User Management	Add user	Admin logged in	User added	Yes	No
TC12	Access Control	State admin adds user	State admin	State locked	Yes	Yes
TC13	Access Control	Super admin adds user	Super admin	State selectable	Yes	Yes
TC14	Edit User	Modify details	User exists	Changes saved	Yes	No
TC15	Search User	Search user	User list	Filtered results	Yes	Yes
TC16	Election	Create election	Election tab	Election created	Yes	No
TC17	Party	Add party	Party tab	Party added	Yes	No

Table 7.8.3. Administration

7.8.4 Citizen Experience

Test Case ID	Feature	Test Scenario	Pre-Conditions	Expected Result	Manual	Automated
TC18	Dashboard	View parties	User logged in	Details shown	Yes	No
TC19	Eligibility	Ineligible vote	User ineligible	Blocked	Yes	Yes
TC20	Voting	Cast vote	Election active	Vote saved	Yes	No
TC21	Voting	Duplicate vote	Already voted	Error shown	Yes	Yes
TC22	Profile	View profile	Account tab	Correct data	Yes	No
TC23	Feedback	Submit feedback	Form open	Feedback saved	Yes	No

Table 7.8.4. Citizen Experience

7.8.5 Post-Election (Results & Analysis)

Test Case ID	Feature	Test Scenario	Pre-Conditions	Expected Result	Manual	Automated
TC24	Results	View results	Votes cast	Correct count	Yes	Yes
TC25	Result UI	Check result UI	Result screen	Clean layout	Yes	No

Table 7.8.5. Post-Election (Results & Analysis)

Chapter 8

RESULTS AND DISCUSSION

8.1 USER INTERFACE(UI) SNAPSHOTS

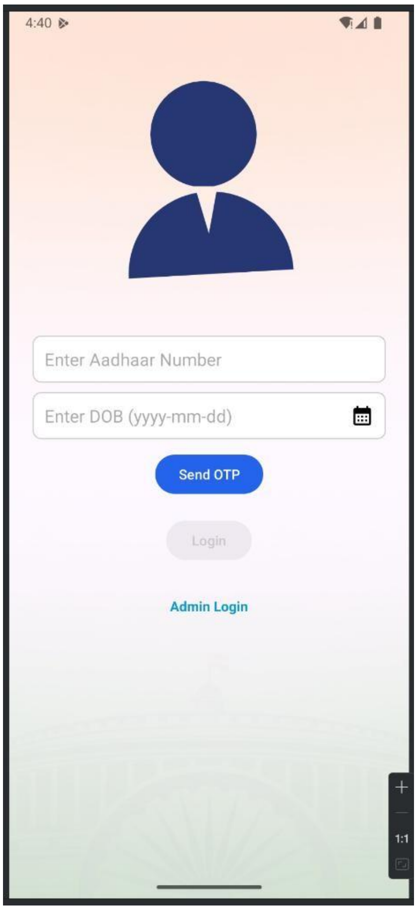
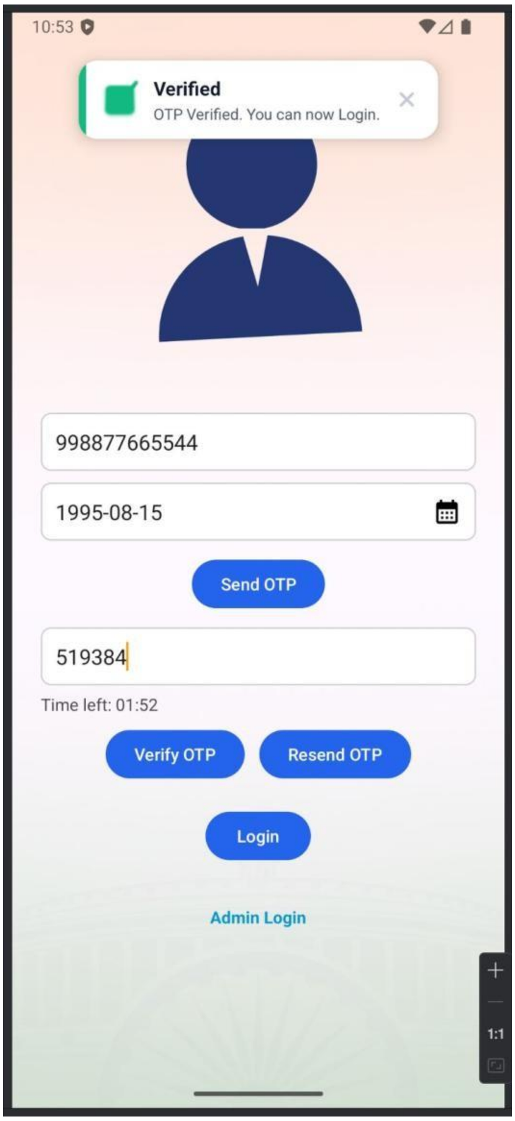


Figure 8.1(a). Aadhaar-Based User Login Interface

The Figure 8.1(a) shows a user login interface of a smart voting mobile application. At the top, there is a user profile icon, indicating user authentication. Below it, the screen contains an input field to enter the Aadhaar number and another field to enter the Date of Birth (DOB) in the format *yyyy-mm-dd*, with a calendar icon for easy selection. A "Send OTP" button is provided to initiate OTP-based verification. The Login button remains disabled until OTP verification is completed. At the bottom, there is a "Admin Login" option, allowing authorized government officials to access a separate login portal.



10:53

Verified
OTP Verified. You can now Login.

998877665544

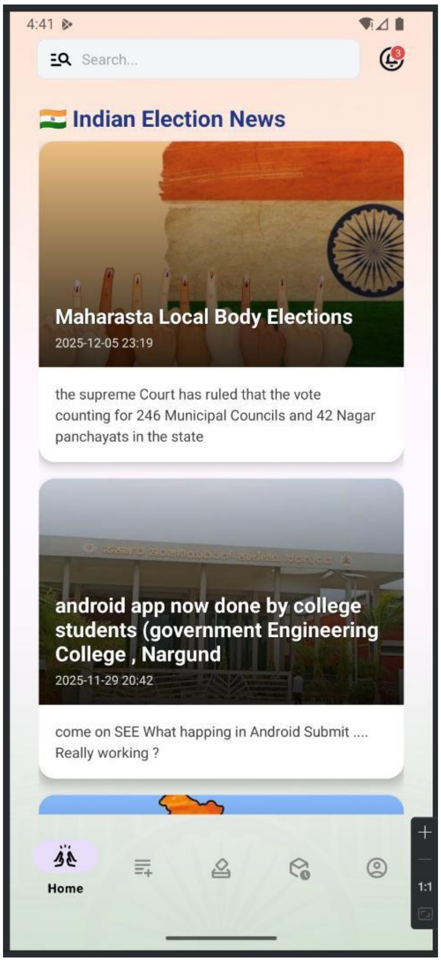
1995-08-15

519384

Time left: 01:52

Figure 8.1(b). OTP Verification and Secure User Login Screen

The Figure 8.1(b) shows the OTP verification and secure user login screen of the Smart Voting System mobile application. The user's Aadhaar number and Date of Birth are already entered, and an OTP verification notification appears at the top confirming successful authentication. Below this, an input field is provided to enter the received OTP, along with a countdown timer indicating the remaining validity time of the OTP. The screen includes options to verify the OTP, resend the OTP if required, and a Login button that becomes active after successful verification. At the bottom, a Government Login link is available for authorized officials. This screen ensures secure, two-factor authentication before allowing users to access the voting system.



Indian Election News

Maharasta Local Body Elections

2025-12-05 23:19

the supreme Court has ruled that the vote counting for 246 Municipal Councils and 42 Nagar panchayats in the state

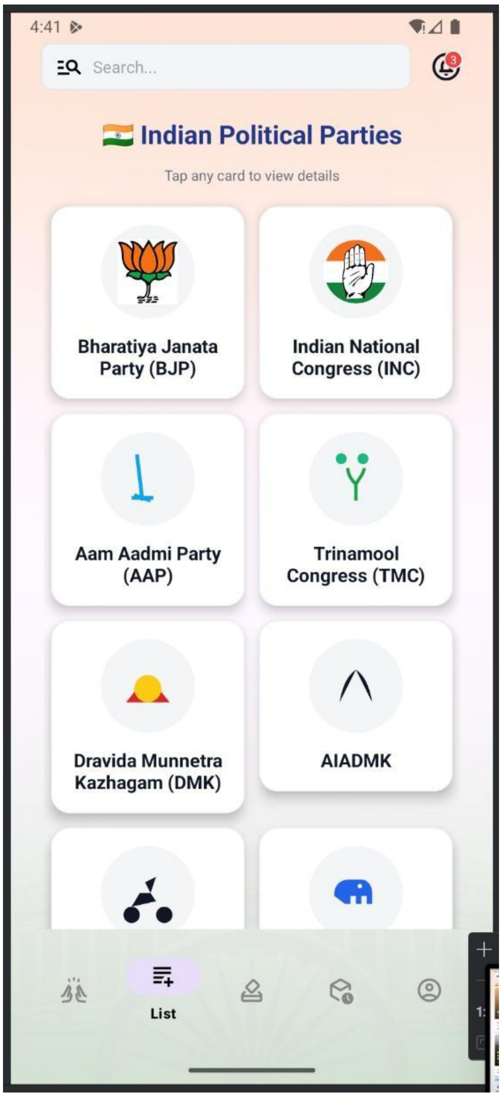
android app now done by college students (government Engineering College , Nargund

2025-11-29 20:42

come on SEE What happing in Android Submit .... Really working ?

Figure8.1(c). Indian Election News Dashboard

The Figure 8.1(c) displays the Indian Election News dashboard of the Smart Voting System mobile application. This screen provides users with latest election-related updates and announcements from across the country. At the top, a search bar allows users to search for specific election news, while notification icons indicate recent alerts. The news section is categorized into tabs such as National, State, EC Updates, and Party News, enabling users to filter information easily. Each news card contains an image, headline, date, and brief description of the election-related event. This dashboard helps users stay informed and aware of current election developments, thereby promoting transparency and informed participation in the electoral process.



4:41

Search...

🇮🇳 Indian Political Parties

Tap any card to view details

Bharatiya Janata Party (BJP)

Indian National Congress (INC)

Aam Aadmi Party (AAP)

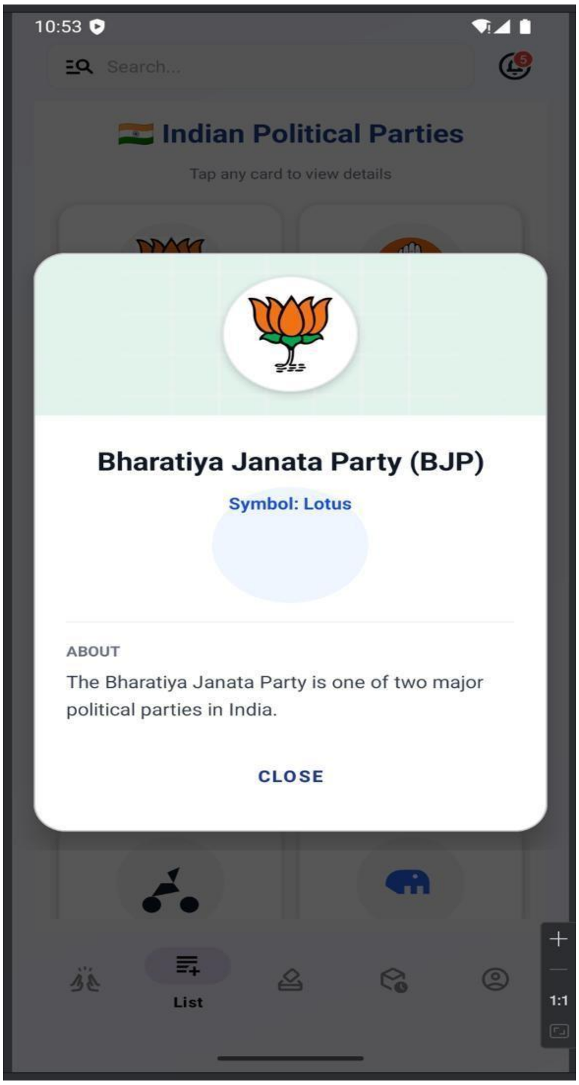
Trinamool Congress (TMC)

Dravida Munnetra Kazhagam (DMK)

AIADMK

Figure 8.1(d). Indian Political Parties List Interface

The Figure 8.1(d) shows the Indian Political Parties list interface of the Smart Voting System mobile application. This screen displays various national and regional political parties in a card-based layout, each represented by its party symbol and name. Parties such as Bharatiya Janata Party (BJP), Indian National Congress (INC), Aam Aadmi Party (AAP), Trinamool Congress (TMC), Dravida Munnetra Kazhagam (DMK), and AIADMK are clearly listed. Users are instructed to tap on any card to view detailed information about the selected party, including its profile and candidates. This interface helps users easily identify political parties, understand their options, and make informed decisions during the voting process.



Bharatiya Janata Party (BJP)

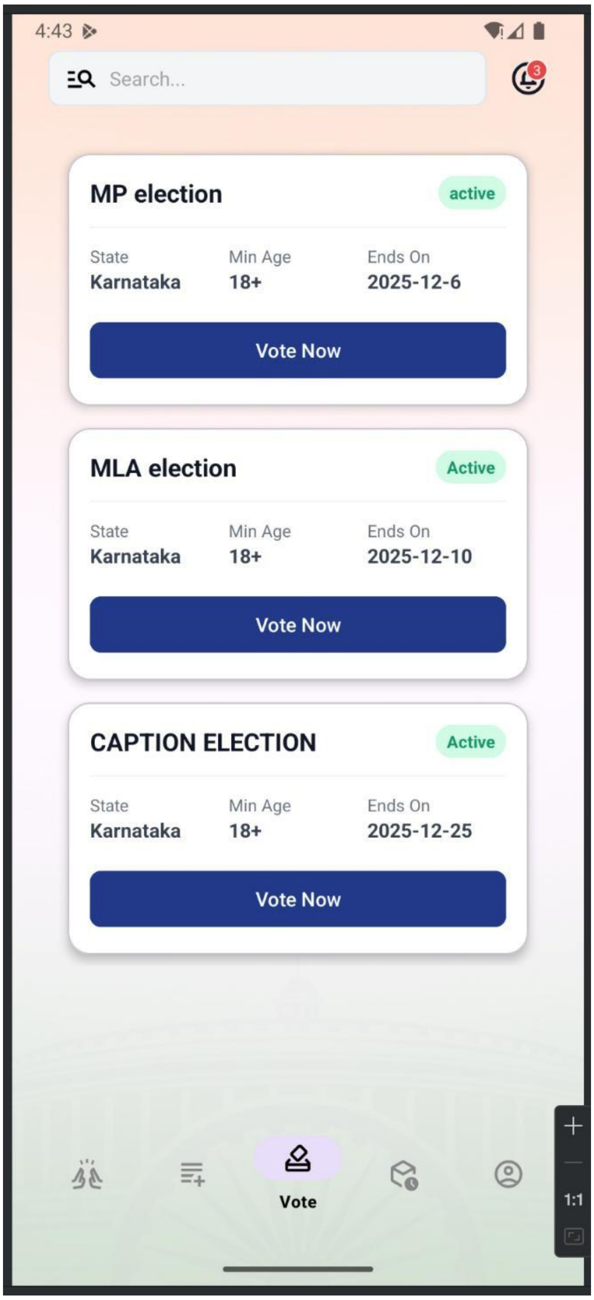
Symbol: Lotus

ABOUT

The Bharatiya Janata Party is one of two major political parties in India.

Figure 8.1(e). Political Party Detail View (Bharatiya Janata Party)

The Figure 8.1(e) shows the political party detail view in the Smart Voting System mobile application, specifically displaying information about the Bharatiya Janata Party (BJP). When a user selects a party from the list, a pop-up detail window appears showing the party symbol (Lotus) and the full party name. The screen also includes a brief about section describing the party and its role in Indian politics. A Close button is provided at the bottom to return to the main party list. This interface helps users clearly understand party identity and basic details before making informed voting decisions.



MP election — active

State: Karnataka | Min Age: 18+ | Ends On: 2025-12-6

MLA election — Active

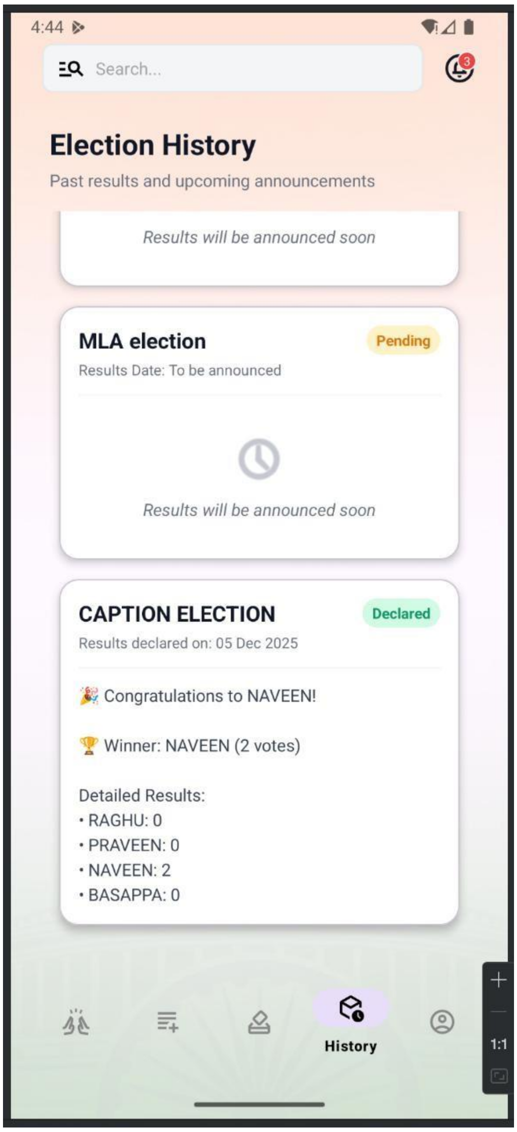
State: Karnataka | Min Age: 18+ | Ends On: 2025-12-10

CAPTION ELECTION — Active

State: Karnataka | Min Age: 18+ | Ends On: 2025-12-25

Figure 8.1(f). Active Elections and Vote Now Interface

The Figure 8.1(f) illustrates the Active Elections voting screen of the Smart Voting System mobile application. This interface displays a list of ongoing elections such as MP Election, MLA Election, and Caption Election, each marked with an “Active” status indicator. For every election, important details including the state (Karnataka), minimum eligible age (18+), and election end date are clearly shown. Each election card contains a “Vote Now” button, allowing eligible users to directly participate in the selected election. This screen enables users to easily identify active elections and cast their votes securely and conveniently through the application.



Election History

Past results and upcoming announcements

Results will be announced soon

MLA election

Pending

Results Date: To be announced

Results will be announced soon

CAPTION ELECTION

Declared

Results declared on: 05 Dec 2025

🎉 Congratulations to NAVEEN!

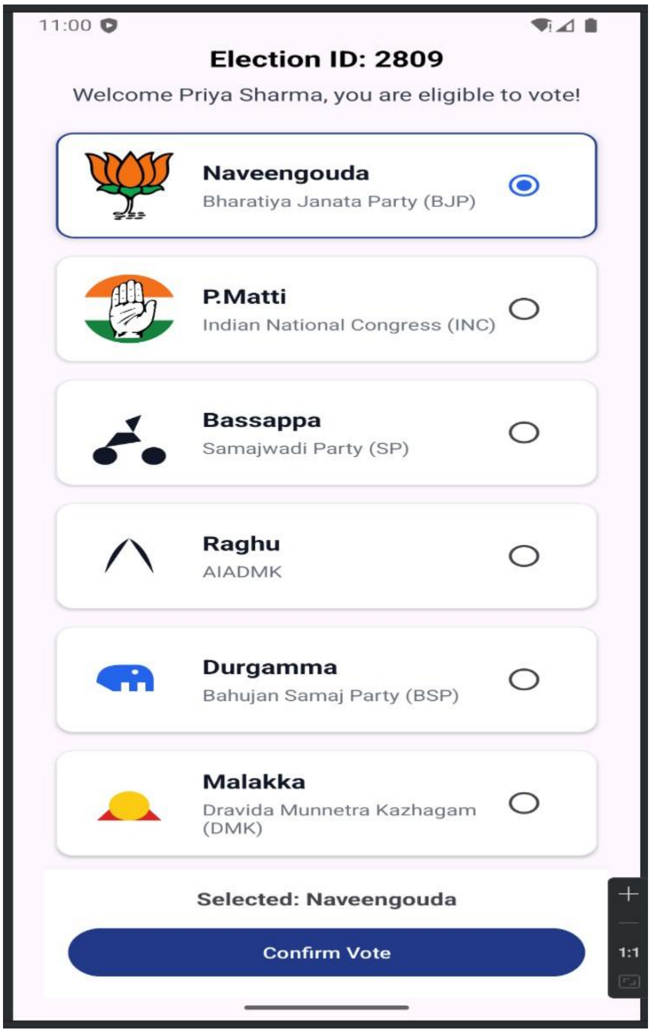
🏆 Winner: NAVEEN (2 votes)

Detailed Results:

- RAGHU: 0
- PRAVEEN: 0
- NAVEEN: 2
- BASAPPA: 0

Figure 8.1(g). Election History and Results Dashboard

The Figure 8.1(g) illustrates the Election History screen of the Smart Voting System mobile application. This interface presents information about past election results and upcoming announcements in a clear, card-based format. Elections with results yet to be released, such as the MLA Election, are marked with a Pending status and display a message indicating that results will be announced soon. Elections with finalized outcomes, such as the Caption Election, are marked as Declared and show detailed results including the winner’s name, total votes received, and individual vote counts for each candidate. This screen helps users track election outcomes transparently and review historical voting results within the system.



11:00

Election ID: 2809

Welcome Priya Sharma, you are eligible to vote!

Naveengouda
Bharatiya Janata Party (BJP) ●

P.Matti
Indian National Congress (INC) ○

Bassappa
Samajwadi Party (SP) ○

Raghu
AIADMK ○

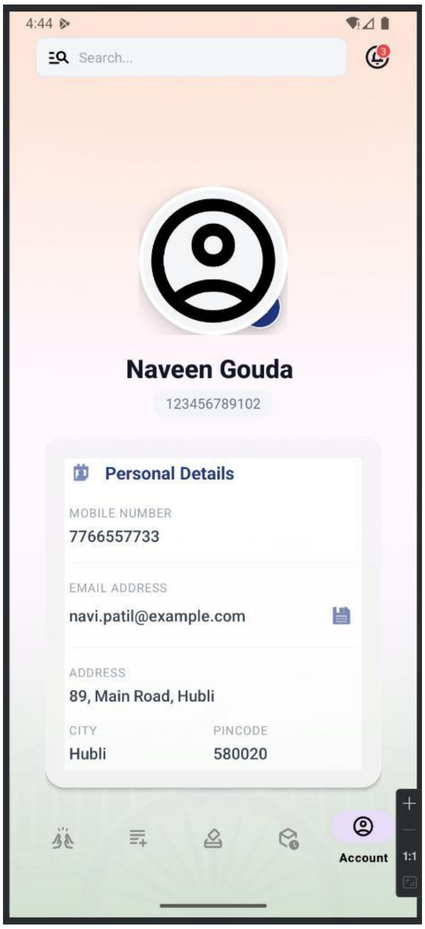
Durgamma
Bahujan Samaj Party (BSP) ○

Malakka
Dravida Munnetra Kazhagam (DMK) ○

Selected: Naveengouda

Figure 8.1(h). Online Voting Candidate Selection Screen

The Figure 8.1(h) illustrates a mobile-based online voting interface displaying the list of candidates for Election ID: 2809. The screen welcomes the eligible user and presents multiple candidates along with their respective political parties and party symbols. Each candidate is shown in a separate selectable card with a radio button, allowing the user to choose one option before proceeding. The layout is designed to ensure clarity, fairness, and ease of selection during the digital voting process.



4:44

Search...

Naveen Gouda

123456789102

Personal Details

MOBILE NUMBER
7766557733

EMAIL ADDRESS
navi.patil@example.com

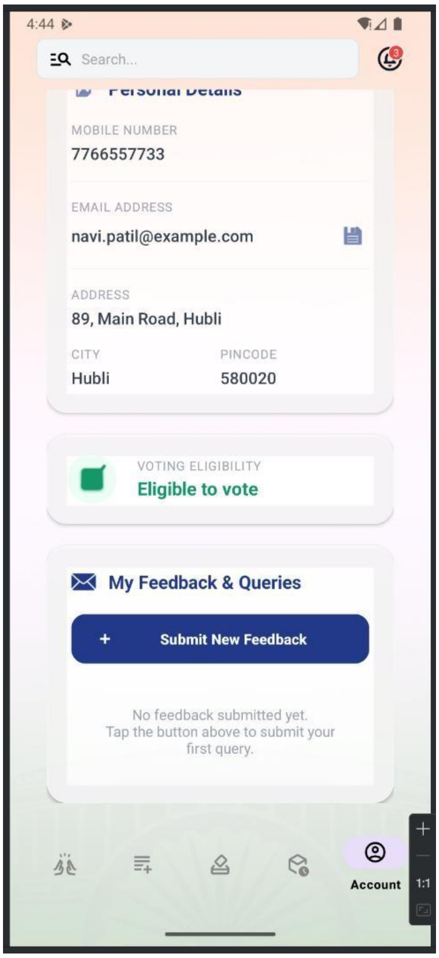
ADDRESS
89, Main Road, Hubli

CITY
Hubli

PINCODE
580020

Figure 8.1(i). User Profile and Eligibility Details Screen

The Figure 8.1(i) shows a mobile application screen displaying the user’s profile information and voting eligibility status. The interface presents personal details such as mobile number, email address, residential address, city, and PIN code in a structured card layout. Below the personal details, the system clearly indicates the user’s eligibility status as “Eligible to vote.” The screen also includes navigation icons and an account section, supporting secure profile management within the digital voting application.



4:44

Search...

Personal Details

MOBILE NUMBER
7766557733

EMAIL ADDRESS
navi.patil@example.com

ADDRESS
89, Main Road, Hubli

CITY
Hubli

PINCODE
580020

VOTING ELIGIBILITY
Eligible to vote

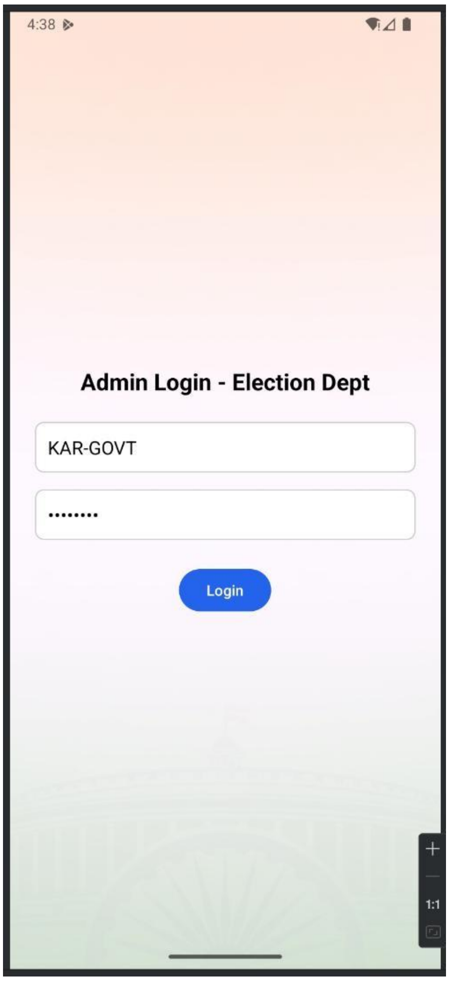
My Feedback & Queries

+ Submit New Feedback

No feedback submitted yet.
Tap the button above to submit your first query.

Figure 8.1(j). My Feedback & Queries – User Support Dashboard

The Figure 8.1(j) shows a mobile application screen titled “My Feedback & Queries”, which allows users to submit and track issues related to the system. At the top, there is a Submit New Feedback button for raising new queries. Below it, previously submitted issues are listed with their status marked as Resolved. Each feedback entry displays the problem title, user message, submission date, and an Admin Response section showing the resolution message and resolution date. The interface is clean and user-friendly, designed to help users communicate problems and view administrative responses efficiently within the smart voting system.



4:38

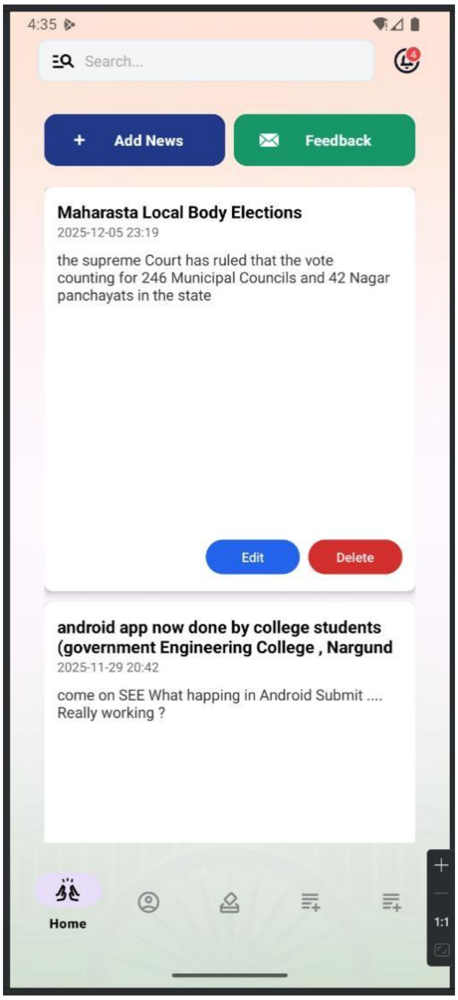
Admin Login - Election Dept

KAR-GOVT

••••••••

Figure 8.1(k). Admin Login – Election Department Interface

The Figure 8.1(k) shows the Admin Login screen for the Election Department in a smart voting system mobile application. This interface is designed for authorized election officials to securely access the administrative dashboard. It includes input fields for Department Code and Password, ensuring role-based authentication. A Login button is provided to validate the credentials and grant access. The simple and clean layout emphasizes security and ease of use, allowing only verified administrators to manage elections, monitor voting activities, and oversee system operations.

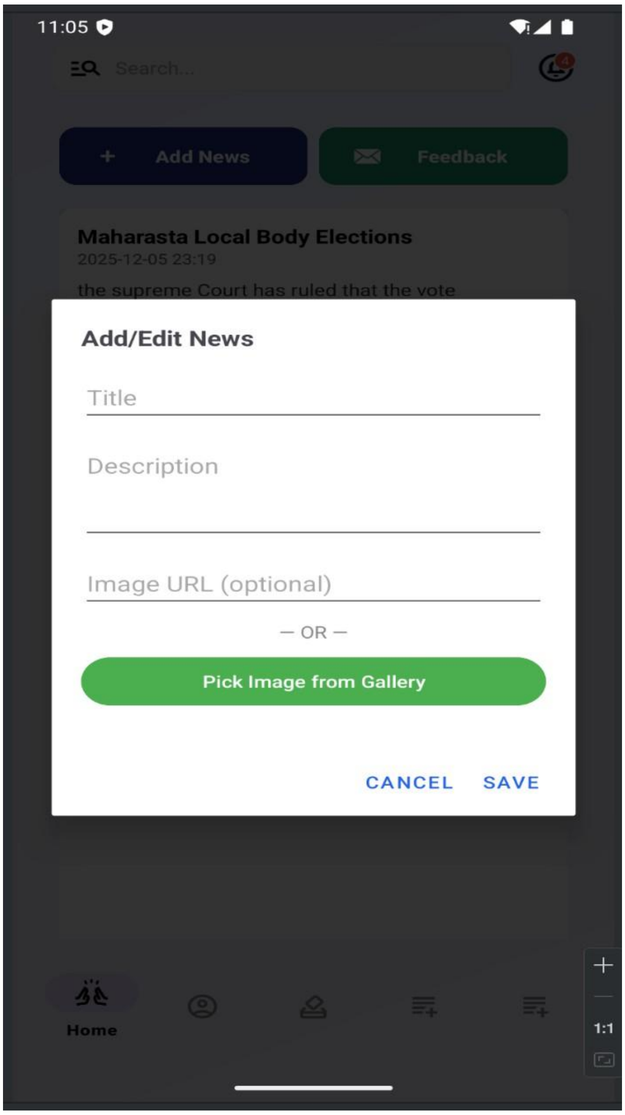


Maharasta Local Body Elections
2025-12-05 23:19
the supreme Court has ruled that the vote counting for 246 Municipal Councils and 42 Nagar panchayats in the state

android app now done by college students (government Engineering College , Nargund
2025-11-29 20:42
come on SEE What happing in Android Submit .... Really working ?

Figure 8.1(l). Admin News Management Dashboard

The Figure 8.1(l) displays the Admin News Management screen of a smart voting system mobile application. This interface allows authorized administrators to add, view, edit, and delete election-related news and announcements. At the top, options such as Add News and Feedback are provided for content management and user interaction. Each news item shows a title, date and time, and detailed description, ensuring transparency and timely information dissemination. Action buttons like Edit and Delete enable administrators to manage updates efficiently. This dashboard helps keep users informed about election updates, official notices, and system-related announcements.



11:05

Search...

Maharasta Local Body Elections

2025-12-05 23:19

the supreme Court has ruled that the vote

Add/Edit News

Title

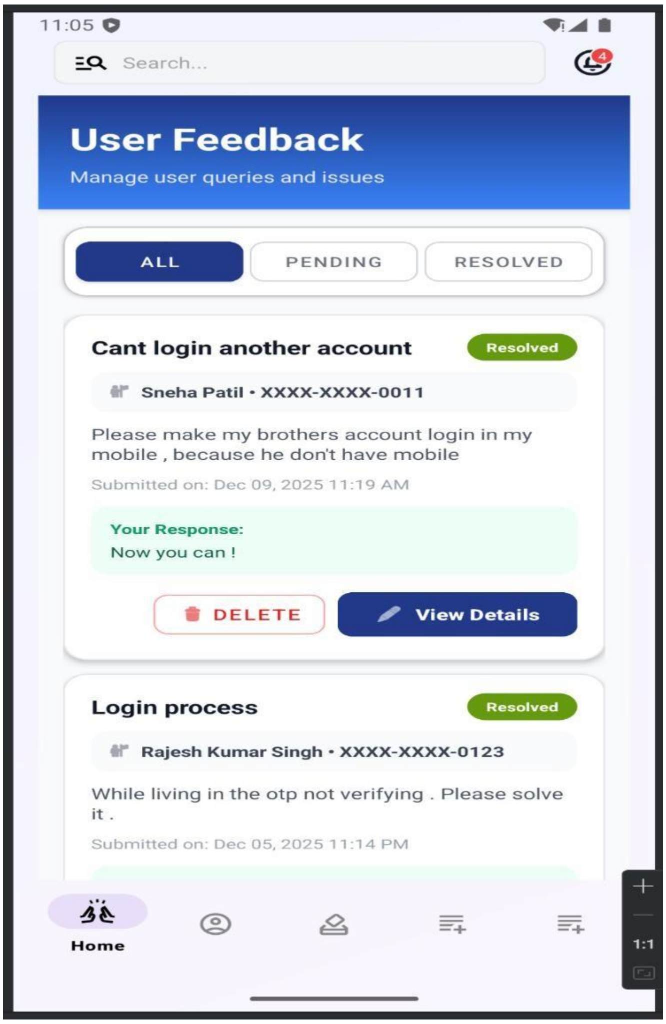
Description

Image URL (optional)

— OR —

Figure 8.1(m). Add/Edit News Dialog Interface

The Figure 8.1(m) shows the Add/Edit News pop-up window in the admin module of a smart voting system mobile application. This interface allows administrators to create or update news and announcements related to elections. It includes input fields for Title and Description, along with an optional Image URL field. Administrators can also upload an image directly using the Pick Image from Gallery option. Action buttons such as Save and Cancel are provided to confirm or discard changes. This dialog ensures efficient content management and helps administrators publish accurate and informative updates for users.



User Feedback

Manage user queries and issues

Cant login another account

Sneha Patil • XXXX-XXXX-0011

Please make my brothers account login in my mobile , because he don't have mobile

Submitted on: Dec 09, 2025 11:19 AM

Your Response:
Now you can !

Login process

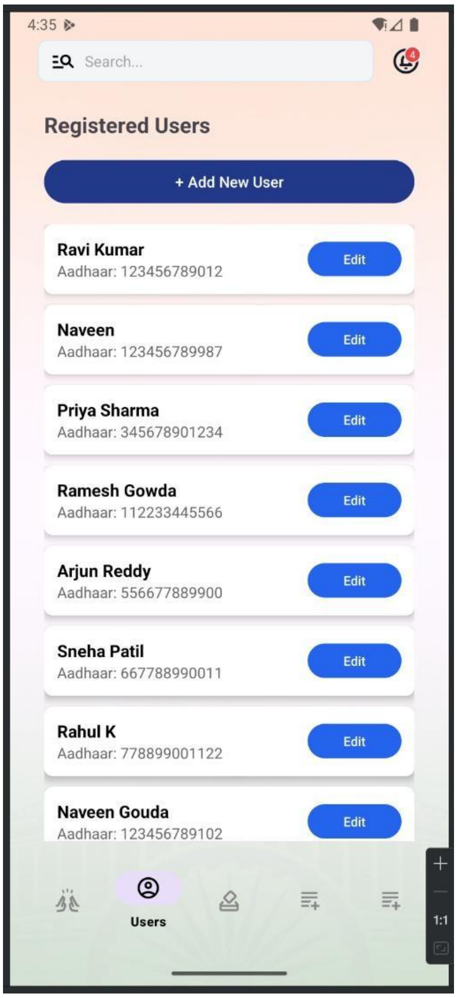
Rajesh Kumar Singh • XXXX-XXXX-0123

While living in the otp not verifying . Please solve it .

Submitted on: Dec 05, 2025 11:14 PM

Figure 8.1(n). User Feedback Management Dashboard (Admin Panel)

The Figure 8.1(n) shows the User Feedback management screen used by administrators in a smart voting system. This interface helps admins monitor and manage user queries and issues. It includes filter options such as All, Pending, and Resolved to easily track complaint status. Each feedback entry displays the issue title, user name (masked ID), problem description, submission date, and resolution status. Administrators can view details, respond to users, or delete feedback once resolved. This module ensures effective communication between users and election authorities, improving system reliability and user satisfaction.



Registered Users

Ravi Kumar
Aadhaar: 123456789012

Naveen
Aadhaar: 123456789987

Priya Sharma
Aadhaar: 345678901234

Ramesh Gowda
Aadhaar: 112233445566

Arjun Reddy
Aadhaar: 556677889900

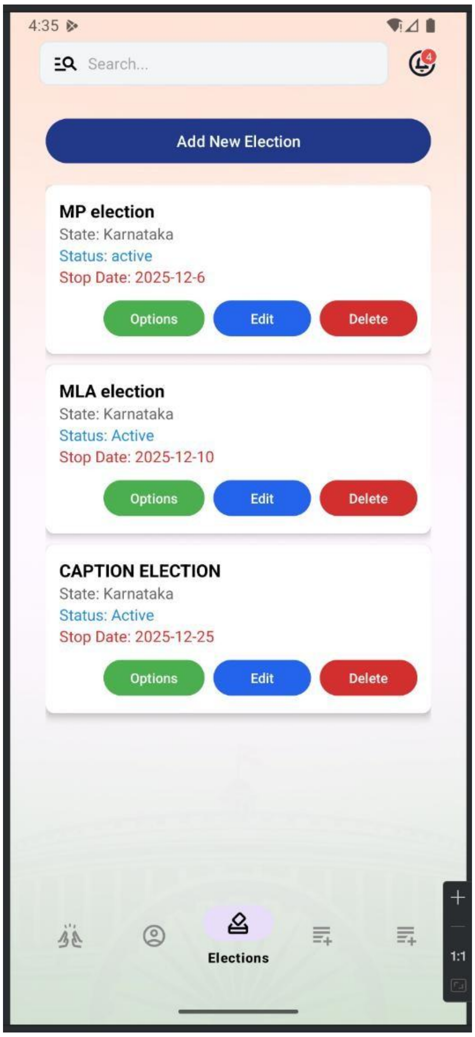
Sneha Patil
Aadhaar: 667788990011

Rahul K
Aadhaar: 778899001122

Naveen Gouda
Aadhaar: 123456789102

Figure 8.1(o). Registered Users Management Interface (Admin Panel)

The Figure 8.1(o) displays the Registered Users screen of the admin module in a smart voting system. This interface allows administrators to view, add, and manage registered users. A “Add New User” button is provided at the top for enrolling new users into the system. Below it, a list of registered users is shown, each displaying the user’s name and Aadhaar number, along with an Edit button to update user details. This module helps election authorities efficiently maintain user records, ensure data accuracy, and manage user information securely.



Add New Election

MP election
State: Karnataka
Status: active
Stop Date: 2025-12-6
Options Edit Delete

MLA election
State: Karnataka
Status: Active
Stop Date: 2025-12-10
Options Edit Delete

CAPTION ELECTION
State: Karnataka
Status: Active
Stop Date: 2025-12-25
Options Edit Delete

Figure 8.1(p). Election Management Interface (Admin Panel)

The Figure 8.1(p) shows the Election Management screen of the admin module in a smart voting system. This interface allows election authorities to create, view, and manage different elections. A prominent Add New Election button is available at the top for creating new election events. Each election card displays the election name, state, current status (Active), and stop date, along with action buttons such as Options, Edit, and Delete. This module enables administrators to control election schedules, update election details, and manage active or upcoming elections efficiently and securely.

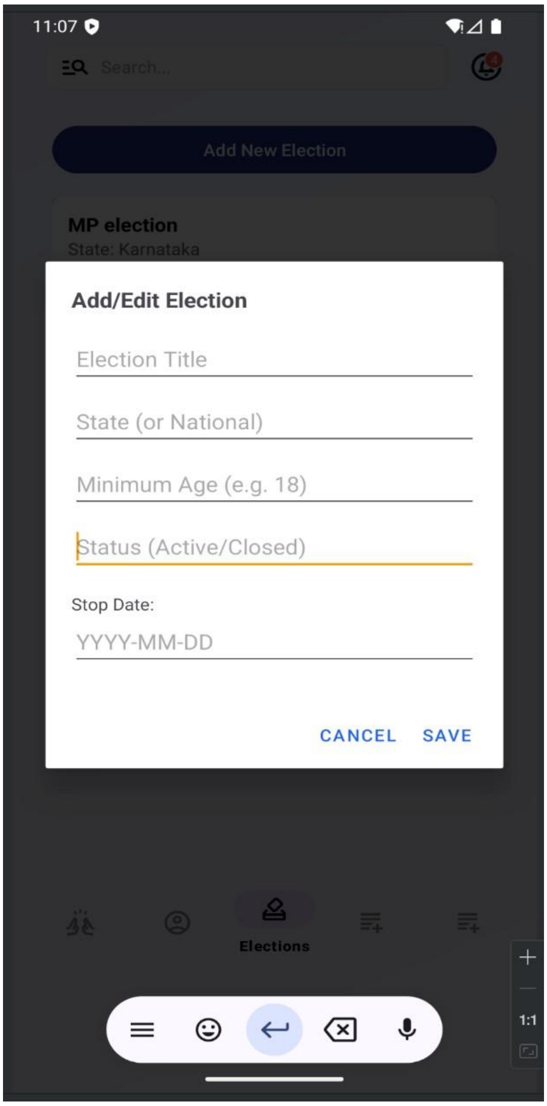
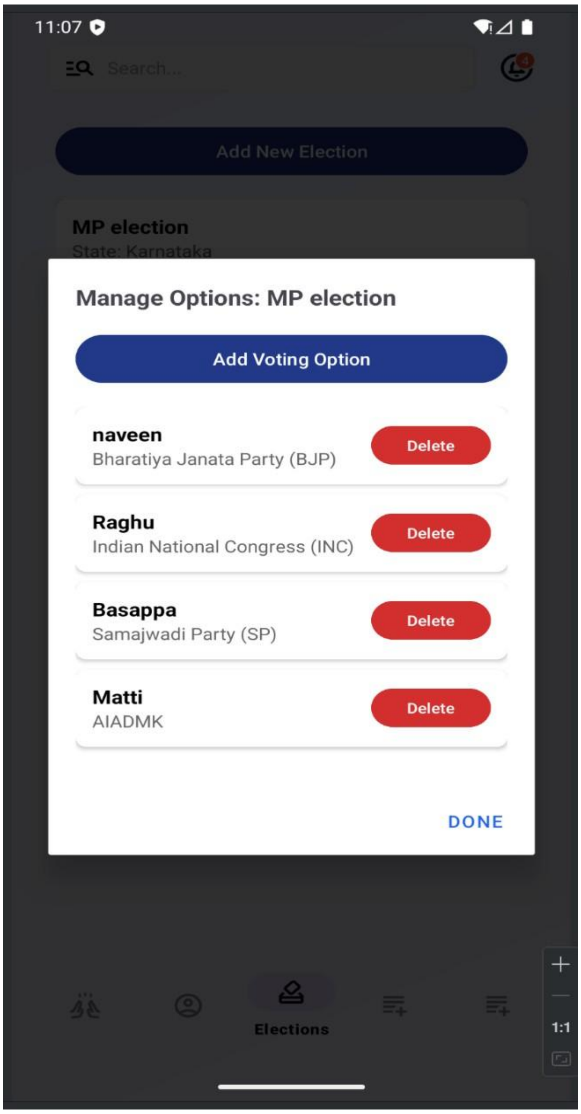


Figure 8.1(q). Add/Edit Election Dialog Interface

The Figure 8.1(q) shows the Add/Edit Election pop-up window in the admin section of a smart voting system. This interface allows election authorities to create new elections or modify existing election details. It includes input fields for Election Title, State (or National level), Minimum Age requirement, Election Status (Active/Closed), and Stop Date. The dialog provides Save and Cancel options to confirm or discard changes. This feature ensures structured and secure management of election configurations, helping administrators control eligibility rules and election timelines effectively.



Manage Options: MP election

naveen
Bharatiya Janata Party (BJP)

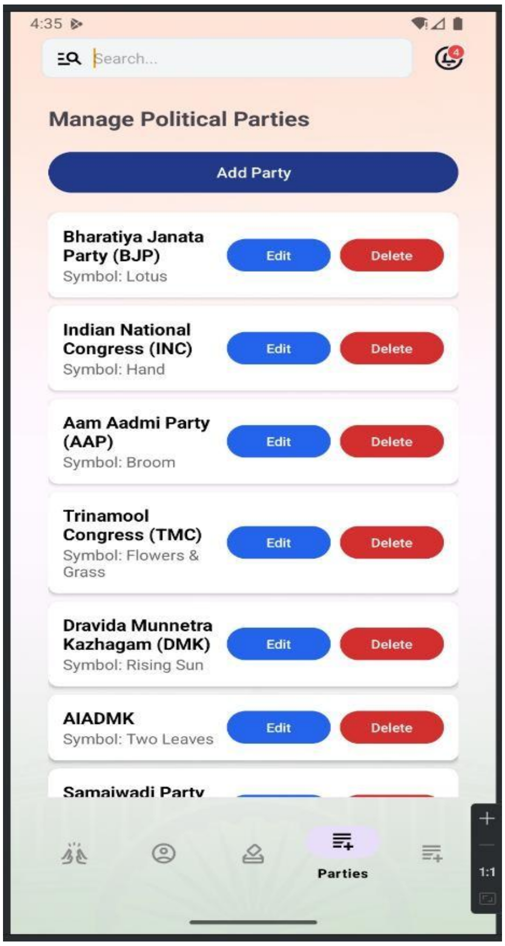
Raghu
Indian National Congress (INC)

Basappa
Samajwadi Party (SP)

Matti
AIADMK

Figure 8.1(r). Manage Voting Options Interface (Candidate Management)

The Figure 8.1(r) shows the Manage Options screen for an MP election in the admin module of a smart voting system. This interface allows election administrators to add, view, and remove voting options (candidates or parties) for a specific election. A prominent Add Voting Option button is provided to register new candidates. Each listed option displays the candidate name along with their political party, and includes a Delete button for removal. A Done button is available to finalize changes. This module ensures accurate candidate management and enables administrators to control the ballot configuration for each election securely.



Manage Political Parties

Bharatiya Janata Party (BJP)
Symbol: Lotus

Indian National Congress (INC)
Symbol: Hand

Aam Aadmi Party (AAP)
Symbol: Broom

Trinamool Congress (TMC)
Symbol: Flowers & Grass

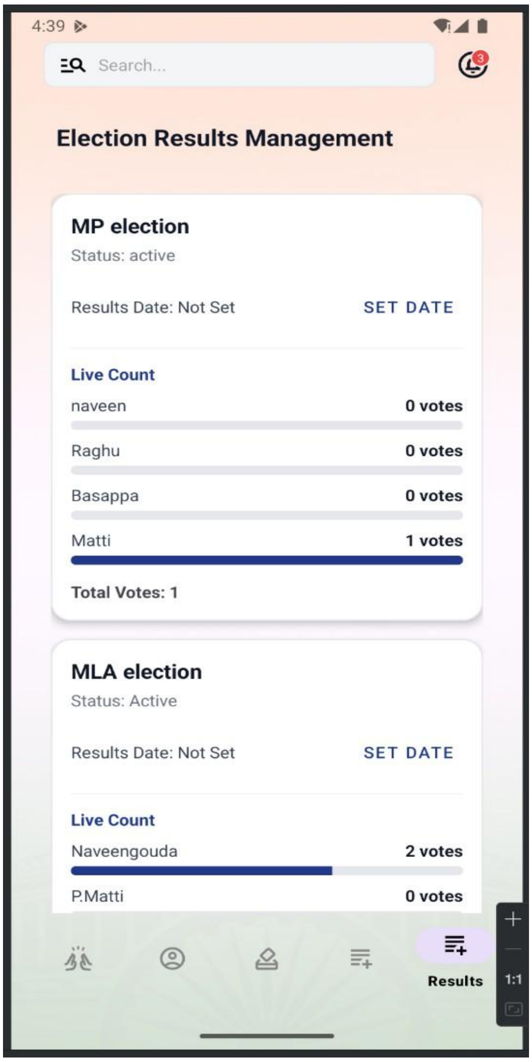
Dravida Munnetra Kazhagam (DMK)
Symbol: Rising Sun

AIADMK
Symbol: Two Leaves

Samajwadi Party

Figure 8.1(s). Manage Political Parties Interface (Admin Panel)

The Figure 8.1(s) displays the Manage Political Parties screen in the admin module of a smart voting system. This interface allows administrators to add, edit, and delete political party information used in elections. A prominent Add Party button is provided at the top for registering new parties. Each listed party shows the party name, abbreviation, and election symbol, along with Edit and Delete action buttons. This module ensures accurate party data management, supports fair ballot representation, and helps maintain consistency across all elections in the system.



Election Results Management

MP election
Status: active

Results Date: Not Set

Live Count

naveen	0 votes
Raghu	0 votes
Basappa	0 votes
Matti	1 votes

Total Votes: 1

MLA election
Status: Active

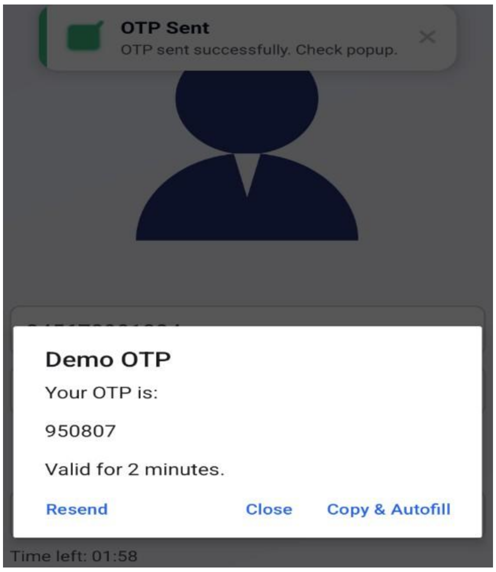
Results Date: Not Set

Live Count

Naveengouda	2 votes
P.Matti	0 votes

Figure 8.1(t). Election Results Management Interface (Admin Panel)

The Figure 8.1(t) shows the Election Results Management screen of the smart voting system used by administrators to monitor and manage election outcomes. This interface displays ongoing elections such as MP election and MLA election, along with their current status and results date. A Set Date option allows administrators to schedule the official result declaration. The Live Count section shows real-time vote counts for each candidate using progress bars, along with the total number of votes cast. This module ensures transparency by providing live updates and enables election authorities to securely publish and manage election results.


OTP Sent
OTP sent successfully. Check popup.

Demo OTP
Your OTP is:
950807
Valid for 2 minutes.

Time left: 01:58

Figure 8.1(u). OTP Verification Popup (Demo OTP)

The Figure 8.1(u) shows a Demo OTP verification popup displayed during the user authentication process in the smart voting system. It confirms that the OTP has been sent successfully and displays the generated one-time password (OTP) along with its validity period of 2 minutes. The popup provides options to Resend the OTP, Close the dialog, or Copy & Autofill the OTP for quick verification. This interface ensures secure, time-bound user authentication and enhances usability during Aadhaar/DOB-based login or voting verification.

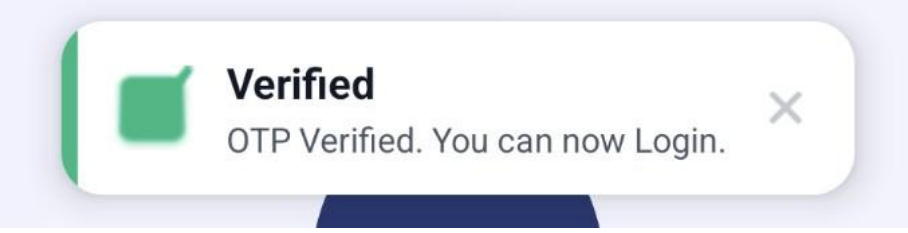
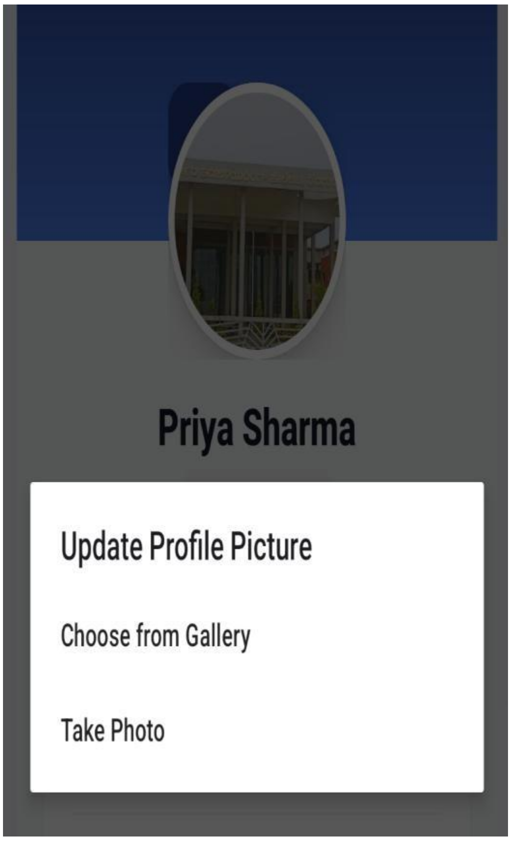

Verified
OTP Verified. You can now Login.

Figure 8.1(v). OTP Verified Success Message

The Figure 8.1(v) shows a Verified confirmation message in the smart voting system. This alert appears after the user successfully enters the correct One-Time Password (OTP). It confirms that the OTP has been verified and informs the user that they can now proceed to log in. This message indicates successful multi-factor authentication and ensures secure access to the system.



Priya Sharma

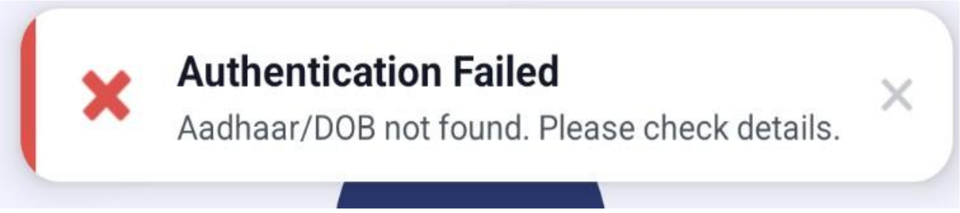
Update Profile Picture

Choose from Gallery

Take Photo

Figure 8.1(w). Update Profile Picture Dialog Interface

The Figure 8.1(w) shows the Update Profile Picture pop-up dialog in the user account section of the smart voting system. This interface allows users to update their profile photo by selecting one of two options: Choose from Gallery to upload an existing image, or Take Photo to capture a new picture using the device camera. The dialog appears over the user profile screen (showing the user name), providing a simple and secure way for users to personalize and maintain their account information.

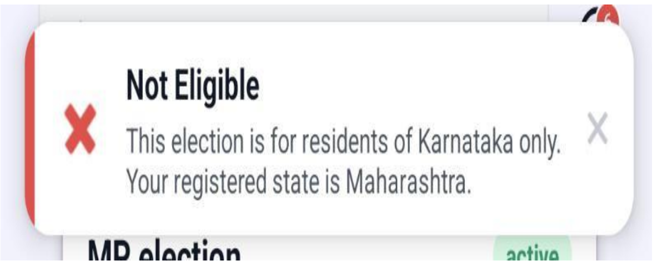


✖ Authentication Failed

Aadhaar/DOB not found. Please check details.

Figure 8.1(x). Authentication Failed Error Message

The Figure 8.1(x) shows an Authentication Failed alert displayed in the smart voting system. This error message appears when the system is unable to verify the user's identity due to invalid or missing Aadhaar number or Date of Birth (DOB) details. The alert clearly informs the user to check and re-enter the correct credentials, helping prevent unauthorized access and ensuring secure authentication during the login or verification process.



✖ Not Eligible

This election is for residents of Karnataka only. Your registered state is Maharashtra.

Figure 8.1(y). Not Eligible Notification Message

The Figure 8.1(y) shows a Not Eligible alert message in the smart voting system. This notification appears when a user attempts to participate in an election for which they do not meet the eligibility criteria. In this case, the election is restricted to residents of Karnataka, while the user's registered state is Maharashtra. The message clearly explains the reason for ineligibility, helping users understand access restrictions and ensuring that voting rules and regional eligibility requirements are strictly enforced.

Chapter 9

CONCLUSION

The Smart Voting System based on ID proof offers a secure, transparent, and efficient solution to modernize the voting process. By integrating ID-based authentication and digital voting technology, the system ensures user integrity, prevents fraud, and simplifies the overall election process. It enhances accessibility, especially for remote users, and reduces the chances of human error and tampering. This system has the potential to build trust in digital elections and can be effectively implemented in institutions, organizations, and even national elections with proper infrastructure and legal support. The Smart Voting System provides a modern, secure, and efficient solution for conducting elections using mobile technology. By integrating Aadhaar authentication, OTP verification, and a reliable backend architecture, the system ensures that only verified and eligible users are allowed to vote. The use of Android applications makes the system easy to access, user-friendly, and eliminates the need for physical polling booths. Through secure data storage and encrypted communication, the system ensures transparency, accuracy, and prevents duplicate or fraudulent voting. Overall, this digital approach improves the voting experience, reduces human error, and supports faster result processing, making it a practical and scalable solution for future election systems.

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