E-VOTING SYSTEM

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1. Introduction

1.1 Overview

This Software Requirements Specification (SRS) document outlines the functional and non-functional requirements for the **E-Voting System** (OES). The system will provide a secure and user-friendly platform for citizens to participate in elections through online voting, facilitating greater accessibility and convenience. The document is aimed at stakeholders, including the election commission and the development team, to ensure all requirements are met for the system's design and implementation.

1.2 Purpose

The purpose of this SRS document is to provide a comprehensive description of the system's functionality and constraints, intended for both system developers and stakeholders. It serves as a foundation for the software's development process, detailing the system's operations, performance, and security requirements.

1.3 Scope

The system’s scope is to enable electronic voting for users via a mobile or web application. The application will allow citizens to register, authenticate, cast votes, and ensure the integrity of the election process through secure methods like Aadhaar-based authentication, voter ID, and OTP validation. It aims to eliminate geographical limitations and make voting accessible to a broader population.

1.4 Definitions & Acronyms

1. **User**: A person who interacts with the e-voting system to cast their vote.
2. **Admin**: A person with the highest level of access and control over the system. They manage elections and monitor voting activities.
3. **Application Store**: An online platform, such as Google Play or Apple App Store, through which users can download the e-voting app.

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2. Overall Description

2.1 Product Perspective

The E-Voting System is a standalone product, meaning it is not dependent on any existing infrastructure or large system. The product consists of two main components:

1. **Admin Interface**: A web-based interface for the election commission (EC), allowing them to configure elections, manage candidates, and monitor voting activities.
2. **User Interface**: A mobile application used by voters to cast their votes in a secure and easy-to-use environment.

2.2 Product Functions

The primary functionalities of the E-Voting System include:

- Admins can create and manage elections, including posts, candidates, and electoral rolls.
- Voters can register using their Aadhaar ID and voter card, with OTP authentication.
- Voting results are securely recorded and transmitted.
- Users can view candidate information and make informed choices before voting.

2.3 User Characteristics

- **Election Commission (EC)**: Responsible for managing the system, inviting candidates, and setting election parameters. EC members must be familiar with using web-based applications.
- **Voters**: Voters must be eligible and aware of their responsibility to maintain the confidentiality of their OTP. They should have basic knowledge of using smartphones or computers.

2.4 Operating Environment

2.4.1 Hardware Environment

- **Voting Devices**: Smartphones, personal computers, and tablets are the primary devices used by voters.
- **Servers**: The system will be hosted on web servers to serve pages to users and application servers to manage the backend voting processes.

2.4.2 Software Environment

- **Frontend Software**: The mobile app and web interfaces, designed for ease of use and compatibility with most devices.
- **Backend Software**: Database management system for storing votes securely, authentication system for verifying voter identities, and encryption software for data protection.

2.5 Design and Implementation Constraints

- **Security Constraints**: The system must employ robust encryption (SSL) for all data transactions.

- **Usability Constraints**: The system should be intuitive for all voters, regardless of technical knowledge.
- **Legal and Regulatory Constraints**: The system must comply with applicable laws, including election regulations and data protection laws.

2.6 Assumptions and Dependencies

- **User Side**: Voters must have access to the internet and compatible smartphones or computers.
- **Server Side**: The system must be hosted on servers with the necessary infrastructure to handle peak voting periods, such as during national elections.

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3. Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interface

The mobile app and web interface should have a simple and clear GUI, featuring easy navigation and straightforward instructions. The interface will provide essential information like the election timeline, candidate details, and voting instructions. Help options will be available on each page except the voting page, which will be open for 3 minutes.

3.1.2 Hardware Interface

The system must support smartphones and tablets with touch capabilities. Optionally, the fingerprint sensor may be used for additional security during the voting process.

3.1.3 Software Interface

The system should integrate with government databases like the **UIDAI** and the **Election Commission's Voter ID database**. Secure gateways will be used for the encrypted transmission of data between the mobile app and the backend database.

3.2 Functional Requirements

3.2.1 Interactive Section

- **Candidate Check**: This module will display the candidates' credentials, including affidavits and links to their social media platforms for public verification.
- **Voter ID Registration**: Non-registered voters can register by providing their proof of identity, nationality, age, and address.
- **Help & Forum**: A customer support section with frequently asked questions, email, and phone contact details. A forum will allow voters to discuss and ask questions about the election process.

3.3 Non-Functional Requirements

- **Reliability**: The system must maintain a reliability rate of 98%, ensuring minimal downtime.
- **Security**: All sensitive data, including votes and personal details, must be encrypted during transmission and storage.
- **Maintainability**: The system should be easily extendable to accommodate future elections and additional features.
- **Performance**: The system should support simultaneous access by a large number of voters without degrading performance.

3.4 Other Requirements

- **Authentication**: Voters must log in using a secure PIN or fingerprint scan. Each voter can only vote once per election.
- **Session Time**: The voting session will be limited to 3 minutes to prevent delays and confusion.
- **Government Database Access**: Permissions from UIDAI and the Election Commission will be required for accessing the voter data.

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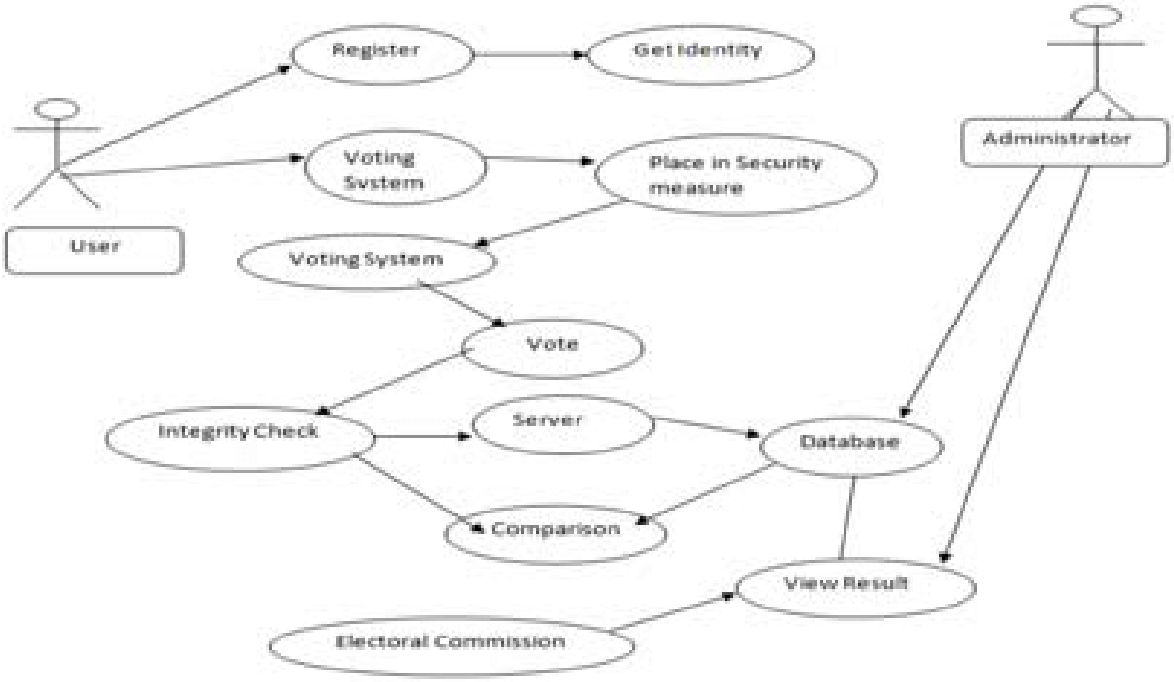
4. Appendices

4.1 Glossary

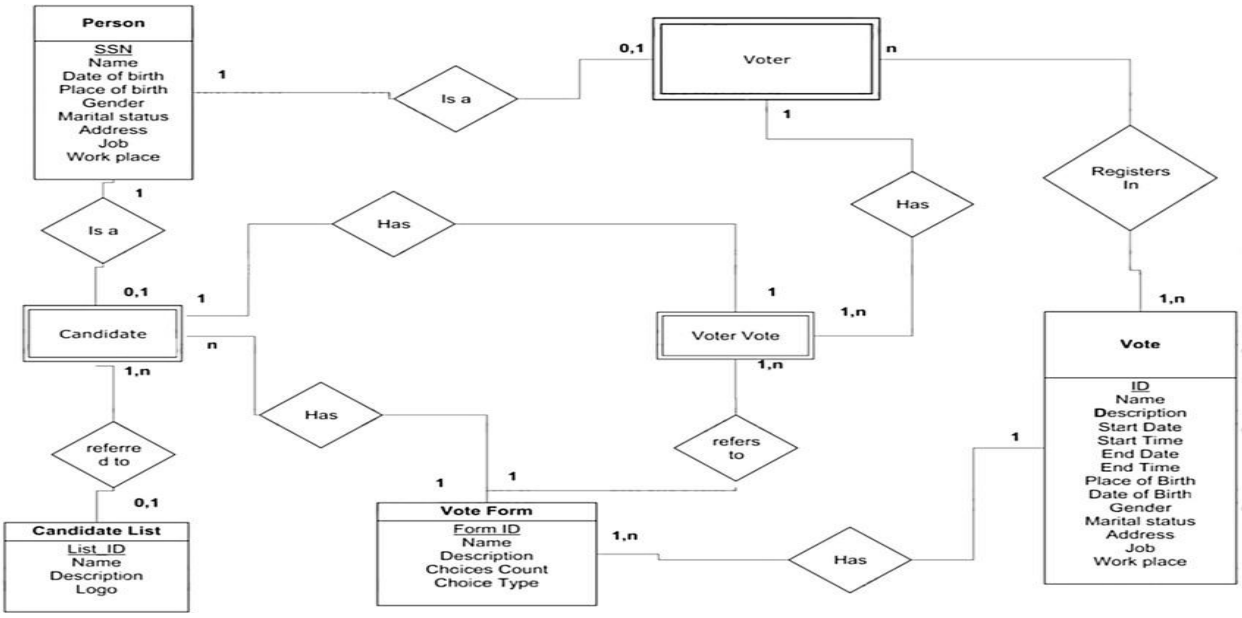
- **Admin**: Person responsible for managing the system and overseeing elections.
- **User**: An individual who votes in the election via the mobile or web application.
- **Database**: The storage system that holds all election-related data, including voter registration, candidate details, and votes.

4.2 Analysis Models

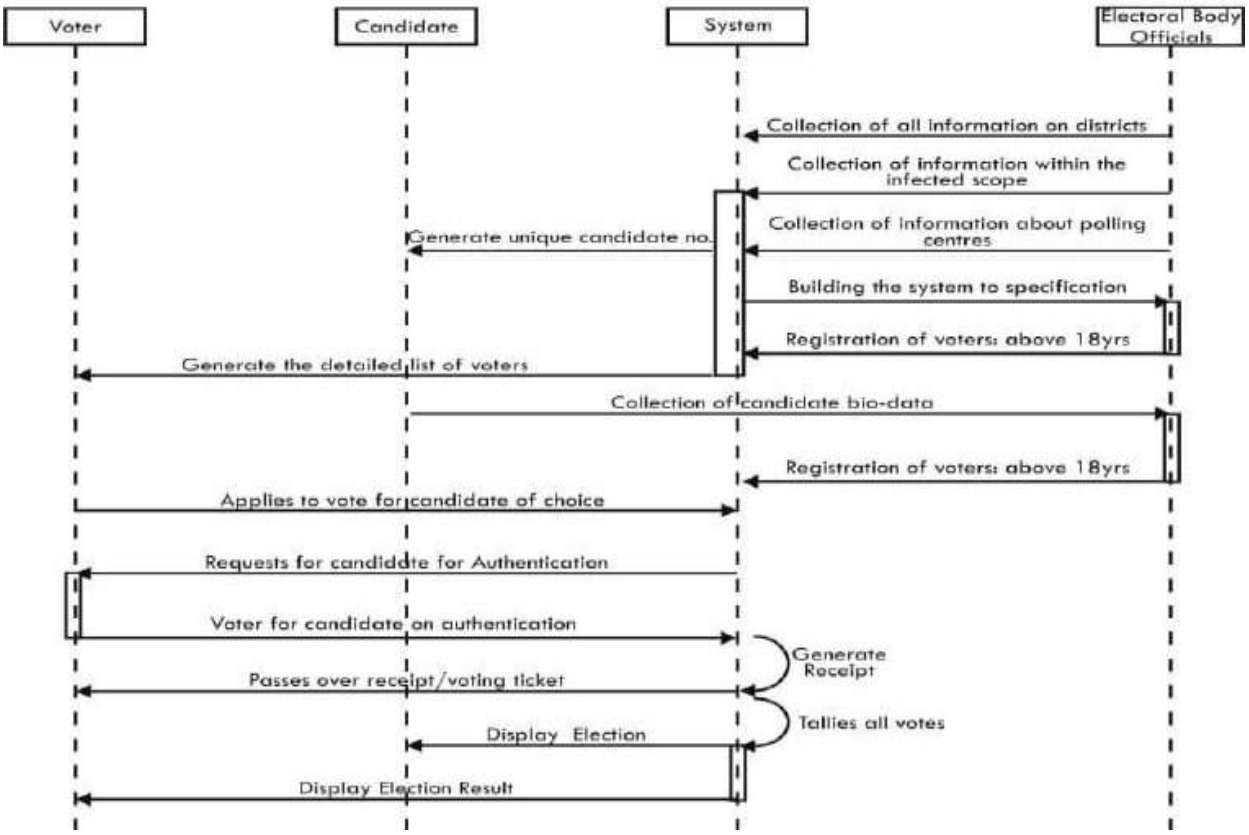
4.2.1 Use Case Diagram



4.2.2 Entity-Relationship Diagram



4.2.3 Sequence Diagram



4.3 Issues

4.3.1 Accessibility and Inclusivity

- **Digital Divide**: Addressing the issue of unequal access to technology, which might exclude certain demographic groups.
- **Accessibility for Disabled Users**: Ensuring the system is accessible to people with disabilities, including those with visual or motor impairments.

4.3.2 Public Trust and Perception

- **Building Trust**: Gaining public confidence in the system by offering transparency and providing education about the e-voting process.

4.3.3 System Reliability and Availability

- **Scalability**: Ensuring the system can handle large volumes of concurrent users during peak voting times.

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5. References

1. IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications.

2. R. S. Pressman, Software Engineering: A Practitioner's Approach, McGraw Hill.

This expanded version is now more detailed, including in-depth sections on functional, non-functional, and external interface requirements. It also includes clearer explanations and assumes a wider range of technical and user-related details. Feel free to add the visual diagrams where needed.