# Online Voting Using Aadhaar Card with Multi-Factor Verification

**P.Sundarrajan, Dr. A.Poongodi**
Department of Computer Applications PG
Vels Institute of Science Technology and Advanced Studies

Abstract- The Project is developed for the threat free and user oriented Online Voting System. The Online Voting system is made for the people of the country residing around the world and wants to vote for their representative. The election can be conducted in two ways the paper ballot election and the automated ballot elections. The automated ballot elections are called the electronic voting. The online voting system is highly developed and the online polling system can be replaced by accurately and directly voting online and immediate results. The online voting system is done by the internet so it can be called the Internet Voting.

Keywords: Online Voting System, Threat-free, User-oriented, People of the country, Vote, Representative, Paper ballot election, Automated ballot election,Electronic voting, Online polling system, Accurate voting, Immediate results, Internet, Internet Voting.

## I. INTRODUCTION

A digital platform called the Online Voting System was created to allow eligible Indian residents to vote online, doing away with the need to go to actual polling places. Existing online services like the Online Reservation System served as the model for this system. Indian citizens who are 18 years of age or older, regardless of gender, are eligible users. By using a centralised database kept up to date by the Election Commission of India, which includes comprehensive voter data, such as identity and eligibility records, the system guarantees safe and verified voting.

The Online Voting System is a web-based tool created to help Indian residents vote in a safe, effective, and convenient manner. This method seeks to digitise the traditional voting process by enabling qualified voters to cast their ballots from any location without having to physically attend a polling station. It was inspired by other online services such as the Online Reservation method. Voting, secure login, user registration, and administrative control are some of the elements that make up this system. To guard against fraud and guarantee security, voter identity is confirmed using credentials like Voter ID, OTP verification, or even Aadhaar-based authentication. Voters can quickly choose from a list of candidates because to the user interface's straightforward and intuitive design. Using encrypted data processing techniques, the vote is safely saved and counted after it has been cast. Election data management, voting process monitoring, and real-time report generation are all accessible to administrators.This technology offers a number of advantages in offers a number of advantages by digitising the election process, including increased voter turnout, lower election expenses, the removal of physical ballot tampering,real-time result computation. A stride towards digital democracy, the online voting system makes sure that all qualified citizens, wherever they may be, can simply and safely take part in the political process.

The Online Voting System is a cutting-edge method of democratic governance that makes elections more convenient, transparent, and effective. With effective implementation and robust security, it has

the potential to transform India's electoral system and enable more people to take part in the democratic process.

## II. LITERATURE REVIEW

In this article, Himanshu Agarwal proposes a new online voting system for India based on AADHAAR ID. This system enables Indian residents to vote online, introducing a safe and effective way to conduct elections. The suggested model's main goals are voter authentication and improved security. To make sure that only authorised voters can cast ballots, the system checks a high-security password linked to the voter's Aadhaar ID before recording a vote in the central database kept by the Election Commission of India. The opportunity for voters to confirm if their vote was cast correctly for the candidate or political party of their choice is one of the system's most notable aspects, as it increases transparency and voter confidence.

The freedom this arrangement gives voters is another important benefit. It increases accessibility for those who might be travelling or temporarily residing in other regions by allowing them to vote from anywhere, even if they are outside of their designated constituency. By doing away with the requirement to physically be present at polling places, the approach eases logistical burdens and promotes increased voter turnout. Furthermore, vote counting is computerised, which drastically cuts down on the time needed to count ballots and enables the Election Commission to declare the results nearly instantly after the polls close. Through the integration of secure internet protocols with the AADHAAR ID system, this model offers a contemporary, dependable, and expandable approach to election administration in the biggest democracy globally.

L.F. Cranor's book "A Security-Conscious Electronic Polling System for the Internet" describes the development and deployment of Sensus, a useful and safe system for conducting surveys, elections, and polls over computer networks. Sensus uses blind signatures, a method that provides robust privacy protections, and builds on the seminal cryptographic work of Fujioka, Okamoto, and Ohta (1993). In order to protect voter privacy and anonymity, this system makes sure that only registered voters may cast ballots, that each voter may only cast one vote, and that no one can associate a voter with a particular vote.

The system's ability to enable voters to independently confirm that their votes have been accurately recorded and counted is one of its main advantages.Furthermore, the approach enables voters to anonymously contest election results in the event that their ballot is miscounted or handled improperly, guaranteeing accountability and process trust. The study lists and assesses seven fundamental characteristics of a safe and trustworthy voting system, including robustness,privacy,integrity,andverifiability, and shows how Sensus successfully meets each of these requirements. Sensus is actually proven to perform better than conventional,paper-based voting methods in a number of areas by providing improved security, increased transparency, and superior individual rights protection in a digital voting setting.

Vibhu Chinmay's study "Online Voting System Linked with AADHAR" examines the creation of an intelligent and safe online voting system (OVS) with the goal of modernizing the election process. The design of the suggested system is straightforward but sturdy, with a heavy emphasis on security and usability. The use of biometric authentication using fingerprint scanners, which capitalizes on each person's distinct fingerprint to guarantee safe and precise voter identification, is a significant advance in this concept. By immediately connecting this biometric information to the voter's AADHAR card, an extra degree of verification is added, and the likelihood of fraudulent or duplicate voting is reduced.

This method greatly improves the system's security and dependability because no two fingerprints are

2

alike. By making the voting process more accessible and user-friendly, particularly for individuals who might find it challenging to go to actual polling places, the adoption of this technology is anticipated to boost voter turnout. Additionally, the approach significantly lowers the likelihood of impersonation and bogus votes, guaranteeing more reliable and accurate election outcomes. This article offers a progressive alternative that can help make India's voting process more technologically sophisticated, inclusive, and transparent by combining biometric technology with a nationalidentification system like AADHAR.

Mohib Ullah's paper "An Efficient and Secure Mobile Phone Voting System" offers a revolutionary method of electronic voting that improves accessibility and convenience for voters, especially in rural or Geographically distant locations. The suggested method offers a voting procedure based on mobile phones that complies with privacy regulations and democratic ideals, acknowledging the pervasiveness of mobile phones. Several cryptographic approaches are combined in the protocol's hybrid cryptosystem to guarantee security and confidentiality during the voting process. Online registration, where voters are verified and enrolled; vote casting and collecting, where voters safely cast their ballots using mobile devices; and the result phase, where votes are counted and declared, are its three main stages.

## III. IMPLEMENTATION


Fig 1: Admin Login

In order to manage and keep an eye on the electoral process, the admin login page for an online voting system that uses Aadhaar card authentication is essential. As seen in the picture, this interface is made to allow authorized usersusually election officials or system administrators—to safely access the system's backend. Upon entering valid credentials, such as the Admin Name and Password, the administrator gains access to critical functionalities like managing voter registrations, verifying Aadhaar-linked identities, monitoring votes, and ensuring the integrity and transparency of the election process. With clean navigation options like Home, Login, New Register, and Admin at the top, the interface is simple and safe, prioritizing usefulness above design. This protects the democratic process against manipulation or unwanted access by guaranteeing a regulated environment in which only confirmed administrators are able to carry out high-level duties.


Fig 2: Customer Registration

One essential element that allows citizens to safely register for digital voting is the Registration Page of an online voting system that uses Aadhaar card identification. Essential voter data is collected on this form, including the voter's full name, date of birth, gender, Aadhaar number, password for account security, and contact information, including email, address, and mobile number. This system's biometric fingerprint upload is a noteworthy feature that guarantees voter identity is safely and uniquely validated. When combined with Aadhaar information, this biometric layer improves security by thwarting fraudulent or duplicate registrations.

Users can complete their registration by clicking the "Create Account" button after all fields have been filled out and validated. Despite its simplicity, the interface maintains stringent security and identity verification guidelines while guaranteeing a simple and easy registration experience. This aids in creating a strong and reliable basis for holding online elections that are free from tampering.
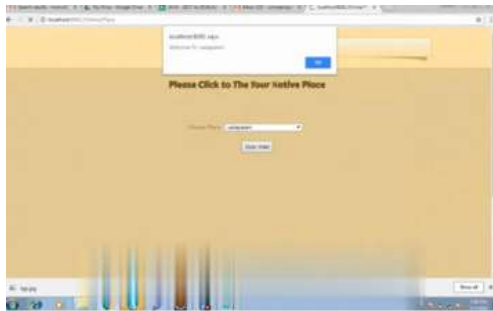

Fig 3: Location-Based Voter Verification

The last and most important step in the digital election process is the Voting Page in an online voting system that employs Aadhaar card identification. To make sure their vote is cast in the right jurisdiction, voters are asked to choose their home district or place of residence from a dropdown list, as seen in the image. Each voter can only cast a ballot for candidates in their registration region thanks to this location-based filtering. The voter is taken to the ballot interface where they can view and choose their favorite candidates after choosing the location (such as "Vadapalani") and clicking the "Go to Vote!" button. Only eligible voters can access the system and cast a single vote thanks to biometric checks and previous Aadhaar authentication. Usability is largely dependent on the interface's clarity and simplicity, which enable even inexperienced users to cast confidence votes. All things considered, this stage leverages the potential of digital innovation while combining security, accuracy, and accessibility to support democratic integrity.


Fig 4: Secure Candidate Selection Interface

As seen in the illustration, the Voting Interface of an online voting system based on Aadhaar is intended to provide a safe and open election process. Following successful native place selection and Aadhaar identification, the voter is taken to a customized ballot screen with comprehensive candidate information. This comprises the candidate's name, party post (such an MLA), party name, and party symbol. To cast their vote, the voter only needs to click the "Vote" button after confirming or entering their choices. For users of all backgrounds, this simple design maximizes accessibility and reduces confusion. The solution guarantees accurate, safe, and one-time voting for each validated Aadhaar ID by integrating biometric authentication with a simple and straightforward voting interface. By providing a comfortable digital platform, the combination of Aadhaar and online voting improves election credibility, guards against fraud, and promotes increased voter turnout.


Fig 5: Mayiladuthurai constituency

Voting is made easy, safe, and region-specific with an online voting system based on Aadhaar. As seen in the picture, the system shows qualified candidates from that constituency following Aadhaar identification and the voter's choice of their hometown (in this case, Mayiladuthurai). Before choosing their favorite option, voters can read party specifics such the name, emblem, and candidate details. To provide total voter flexibility, a NOTA (None of the Above) option is also included. By using their Aadhaar as a unique identification to avoid duplicate or fraudulent voting, this digital arrangement guarantees transparency, lowers human error, and enables citizens to participate in elections from any location.
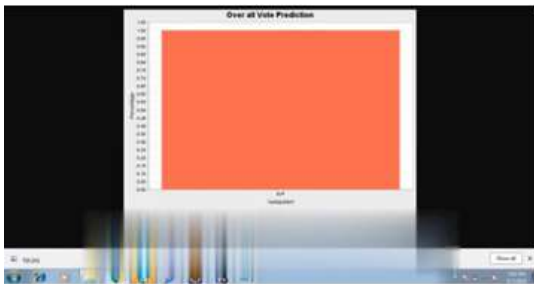

Fig 6: Collected Medicine Page

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An innovative strategy to improve the effectiveness and openness of India's electoral process is online voting using an Aadhaar card. By connecting a voter's Aadhaar number to the electoral record, the system guarantees a safe and distinct identity, lowering the possibility of fraudulent or duplicate votes. Using OTP-based Aadhaar authentication, voters can access a secure portal that authenticates them before enabling them to cast their ballots. By doing away with the need to physically attend polling places, this strategy not only streamlines the voting process but also increases participation, particularly among residents who live overseas or in rural areas. Additionally, as demonstrated in the "Overall Vote Prediction" image, real-time vote counting and data visualization improve the

election's accessibility and integrity. To preserve voter privacy and system security, however, effective deployment necessitates robust data protection protocols and dependable digital infrastructure.

## IV. CONCLUSION

The suggested model for India's online voting system is explained in this paper. Compared to the conventional voting method, the suggested solution is far more effective and safe. It is simple to prevent vote manipulation and outcome delays. Our suggested model is centered on a distinct AADHAAR identity. It makes it simpler to verify candidates and voters alike. We have attempted to create a safe online voting system in the suggested architecture that is impervious to unwanted access while voters cast their ballots.

The model for an online voting system designed specifically for India is presented in this paper with the goal of enhancing the security, effectiveness, and transparency of conventional voting methods. The model tackles important issues that frequently undermine the legitimacy of traditional voting procedures, like vote manipulation, illegal access, and delays in result releases. The distinctive AADHAAR identity, which acts as a centralized method of voter and candidate verification, is at the heart of this system. The method lowers the possibility of impersonation and fraudulent voting by utilizing the biometric and demographic information linked to AADHAAR to guarantee that only authenticated and legitimate people can cast ballots.

The server infrastructure in the suggested framework is dispersed so that no one authority may change or manipulate the votes, with a significant emphasis on security architecture. Accountability and confidence in the process are increased by the division of responsibilities between servers and administrators. The system also protects voter confidentiality and data integrity

5

during the vote-casting phase by preventing unauthorized access. The suggested model is anticipated to greatly improve the transparency, dependability, and general credibility of the Indian electoral process by combining digital identity verification with a distributed and secure backend, opening the door for a more technologically sophisticated and inclusive democracy.

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