www.ijarp.com ISSN 2456-9992 Page: 01-06

International Journal Advanced Research Publications

Review Article

Volume: 02
Issue: 05

E – VOTING SYSTEM USING AADHAAR AND BIOMETRIC VERIFICATION

Dr. Shah S. N.*[1], Prof. Dhumal K. H.[1], Abhijeet Kadam[2], Pradip Kadam[3], Ashlesha Raut[4]

[1]Prof. of Computer Department

[2,3,4] BE Students of Computer Engineering

SSPM's Sharadchandra Pawar College of Engineering and Technology, Someshwarnagar, Baramati – 412306 Savitribai Phule Pune University, Pune.

Article Received: 31 March 2026, Article Revised: 21 April 2026, Published on: 11 May 2026

***Corresponding Author: Dr. Shah S. N.**

Prof. of Computer Department, SSPM's Sharadchandra Pawar College of Engineering and Technology, Someshwarnagar, Baramati – 412306 Savitribai Phule Pune University, Pune.

DOI: https://doi-doi.org/101555/ijarp.4414

ABSTRACT

In this way, the proposed voting system adopts Aadhaar identification along with biometric fingerprint authentication for improving the security and transparency of the voting system. The identity of voters will be verified using fingerprint and Aadhaar information which will help avoid frauds such as voting more than once, etc. Each voter is only allowed to vote one time to ensure fairness in the voting system.

In terms of implementation, it is achieved using a web-based system which includes automatic tallying as well as secure data storage. For fingerprints not matching, the alternative solution is the use of OTP authentication. This method is efficient and ensures accurate results.

KEYWORDS: Voting system, Aadhaar verification, biometric identification, electronic voting system, fingerprint matching, OTP authentication.

I. INTRODUCTION

General elections play a crucial role in India's political governance and act as one of its defining features, considering that India holds the record for being the world's biggest democracy. Conventional voting approaches have been used for ages but remain prone to practices like malpractice, ballot stuffing, and other kinds of fraud. In this regard, the

credibility and transparency of the process may be challenged. Thus, there are some ways to improve the process of voting through biometric technology in order to ensure that only eligible individuals vote.

In general, biometric authentication implies recognizing a voter based on their distinct biological feature. For the purpose of the proposed voting system, biometric identification will be performed based on fingerprints and Aadhaar numbers.

This paper considers the idea of developing a web-based application aimed at simplifying the voting process and decreasing the need for human assistance. Biometric authentication, automatic results calculation, and voting on the website are intended to ensure the system's efficiency.

II. MOTIVATION

The shortcomings associated with the traditional processes for conducting elections have been remedied by implementing an electronic voting process that utilizes Aadhar identification and biometrics authentication. The traditional system of conducting elections using paper ballots and electronic voting devices is vulnerable to fraud, identity theft, and manipulation. The new process ensures the rule of one-man-one-vote through fingerprint authentication based on Aadhar credentials. Moreover, the process promises to save time and other resources compared to the manual process of counting votes. Through secure identification, the project endeavors to uphold democracy in future elections.

III. LITERATURE REVIEW

Kashif Hussain Memon [1], In this research paper, a secured e-voting scheme for Pakistan has been proposed, where the fingerprint biometric method will be used for the implementation of a public voting system in Pakistan, aiming to increase transparency and efficiency in the election process while making voters happy. This client/server structure scheme can be executed by using a virtual private network, similar to automated teller machines and local area networks. This system will help in reducing cost and time, addressing many issues that arise in the existing voting system, such as low voter turnout rate, empty ballots, and cheating. The process of our proposed system consists of three phases: registration phase, administration phase, and vote casting phase.

Omkaresh Kulkarni [2], Election is a significant means of any democracy, through which each citizen is allowed to exercise their right to vote. While in-person voting is the most

commonly adopted technique to cast votes, factors such as a pandemic situation, natural calamities, or any location-based problem might discourage a person from voting.

Amitesh Yadu [3] , All that a person at the polling station needs to do is insert his or her finger into the finger print scanner and get their face captured through the web camera set at the counter of the polling station, thus obtaining the fingerprint and facial recognition of the voter who works. This information is then sent back to the control unit for authentication process. The controller receives the data sent from the reader and verifies the information against the already available information of the same voter obtained at the time of registration.

Tarun Kancherla [4], Electoral integrity is an important factor in ensuring a successful democracy, but conventional voting methods have been known to be prone to election rigging and voter fraud. This research paper discusses a biometric voting solution which uses fingerprint recognition as a method to ensure integrity in elections through implementation of this solution using C# and SQL Server Studio. As the name suggests, a biometric system makes use of biological recognition to identify a unique individual and eliminates any instances of impersonation or duplicate votes. System analysis results show 98% biometric matching accuracy.

Adhya Shetty P [5] , The proposed system uses fingerprints and facial feature detection systems to ensure a tamper proof and secure election process. In the registration stage, fingerprints and faces of the voters are collected and saved in a database, which prevents voters from registering more than once. On the election day, fingerprints and faces of the voters are scanned to match the database.

S. Abimanyu [6] , The biometric system allows users to scan their irises so that his or her credentials can be authenticated against already available iris images stored in the system's database. The current database of Aadhar will be used to authenticate the voters.

Ankit Mishra [7] , The new system includes all the latest advancements in terms of security and privacy. Votes cast will be encrypted using strong encryption algorithms, the blockchain and authentication mechanisms will be applied.

C.M. Nalayini [8], This scheme is designed to enhance election security through a fingerprint identification algorithm for verifying voter identity. Thus, all eligible voters can take part in the election process regardless of their geographical location. There may be situations such as the COVID-19 epidemic, wherein holding an actual election is impossible, but this model helps to overcome the problem.

IV. EXISTING SYSTEM

The traditional voting process involves the use of simple EVMs and paper ballots. Despite the popularity of these procedures, their use is often associated with certain drawbacks such as delay in tallying results, vote rigging, ballot tampering, and voter impersonation. The primary authentication process involved in this approach relies on the use of voter IDs. However, the system is prone to misuse, and hence individuals may vote illegally using fake voter IDs. In addition, the traditional voting process is characterized by cumbersome and tedious manual counting processes. Even in instances where EVMs have been introduced, the lack of biometric authentication creates security weaknesses within the system. Thus, there is a necessity for improvement through the introduction of an innovative voting process involving Aadhaar biometric authentication.

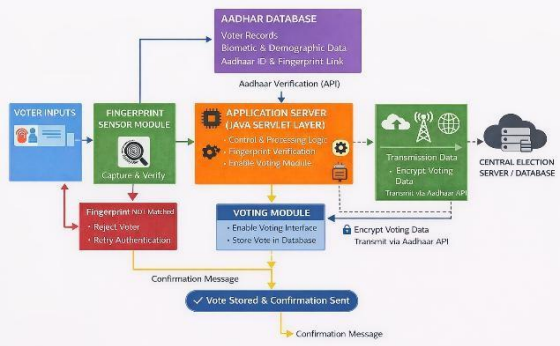
V. PROPOSED SYSTEM

The Proposed Initiative E-Voting System with Aadhaar and Biometric Verification. The proposal suggests developing an electronic voting platform that will be secure, reliable, and user-friendly to eliminate possible mistakes in manual voting. In addition, the use of Aadhaar numbers and biometric fingerprint verification helps verify voter identity and prevent participation of individuals who have no right to participate in the voting process. At present, the existing method of manual voting encounters several problems such as voting fraud, booth capturing, long queues, and delayed vote counting. For this reason, the suggested solution includes the development of a web platform where all stages of the voting process occur in a digital format. After inputting his or her Aadhaar number, the user completes biometric authentication and casts his or her vote. As a result, the main purposes of developing such a system include the possibility to ensure that all voters cast one ballot, have their identities verified, and can rely on automatic vote counting. In turn, this innovation will help decrease the involvement of humans into the voting process and increase its speed.

The key features of the suggested innovation:

- Login of users using their Aadhaar numbers
- Biometric fingerprint verification
- Role-based access (admin vs. voter)
- Automatic counting and computing results
- Votes encryption for confidentiality purposes

Such a system may become more advantageous than the current one due to a number of reasons. First, it minimizes the chances to encounter fake and duplicate voting. Secondly, it helps lower the expenses of holding elections. Thirdly, the proposed innovation allows calculating results faster. Finally, the use of Aadhaar and biometric verification ensures the legitimacy of voters.



VI. CONCLUSION

The suggested E-Voting system using the concept of Aadhaar and biometric authentication provides an effective method for modern-day elections. This system combines the authentication method of fingerprints along with Aadhaar for guaranteeing the participation of genuine voters in the election process to avoid cases of duplicate voting. The proposed system is efficient in minimizing human efforts and errors made in conventional voting systems and manual tallying of votes. The proposed system makes sure that every voter casts one vote and the output is delivered efficiently.

VII. REFERENCES

1. Suresh, A., Gupthan, A., Abhishek, S., & Anjali, T. (2023). *Secure Vote: AI-powered Fingerprint Authentication for Next-Generation Online Voting*. In 2023 7th International Conference on Electronics, Communication and Aerospace Technology (ICECA), pp. 993-1000. IEEE.
2. shaikh, T. I., Gugale, S. S., Ranadhir, H. K., Patil, V. P., & Kulkarni, O. (2022). *A Survey on Biometrics Based Secured E-Voting System*. International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Vol. 9, Issue 3, pp. 63-72.
3. Yadu, A., & Chandrakar, O. (2024). *A SMART VOTING SYSTEM COMBINING FINGERPRINT AND FACIAL RECOGNITION FOR ENHANCED SECURITY*. ShodhKosh:Journal of Visual and Performing Arts, 5(1), 362-366.
4. Shetty P., Adhya, Anushree, Ashwitha, Mayoori P. (2024). *Secure Vote – Augmenting*

Democracy with Aadhaar linked Biometrics. International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE). DOI: 10.17148/IJARCCE.2024.134218.

5. Abimanyu, S., Anbarasan, R., Dhinakaran, S., & Abhirami, K. (2021). *Iris Detection based Authentication for Secure Voting System*. INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) ICRADL – 2021, Vol. 09 Issue 05.
6. Poduval, P., Raut, S., Raut, S., & Hampe, T. G. (2025). *Advanced E-Voting System*. IJRASET Journal for Research in Applied Science & Engineering Technology. DOI: 10.22214/ijraset.2025.71342.
7. Nalayini, C. M., Vishnupriya, K., Dhivyabharathi, A., & Yuvapriya, H. (2023). *Biometric based Mobile Voting Application*. Journal of Information Technology and Digital World, 5(2), 159-168.
8. Kancherla, T. (2025). *Fingerprint-Based Voting System Using C#: A Secure Biometric Approach to Modern Elections*. IJRASET Journal for Research in Applied Science & Engineering Technology. DOI: 10.22214/ijraset.2025.68176.