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Chunav Seva: A Secure Online Voting Application

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Abstract— *Chunav Seva is a secure and user-friendly online voting system developed to conduct small-scale elections such as those held in colleges, organizations, housing societies, and local communities. The main objective of this system is to replace traditional paper-based voting methods, which are often time-consuming, costly, and prone to human errors, with a reliable digital alternative. The proposed system uses biometric authentication combined with One-Time Password (OTP) verification to provide strong two-factor authentication. This ensures that only authorized voters can access the system and cast their votes, thereby preventing impersonation and unauthorized access. Each voter is allowed to vote only once, effectively eliminating the problem of duplicate or fake voting. Chunav Seva simplifies the voting process by reducing manual work such as voter verification, ballot handling, and vote counting. All votes are securely stored in a centralized database, and the system automatically calculates and displays election results with high accuracy. This reduces delays and ensures transparency in the election process. Additionally, the system improves accessibility by allowing eligible voters to participate easily through a digital platform, saving time and resources for both voters and election administrators. Overall, Chunav Seva enhances efficiency, security, and trust in electronic voting systems, making it a practical and effective solution for modern small-scale elections.*

Keywords— Online Voting System, Biometric Authentication, OTP, Secure Systems.

I. INTRODUCTION

Voting plays a crucial role in democratic systems by enabling individuals to participate in decision-making processes. Traditional voting systems rely on paper ballots and manual procedures, which require significant time, manpower, and cost. These systems are also prone to errors such as incorrect counting, duplicate voting, and delays in result declaration.

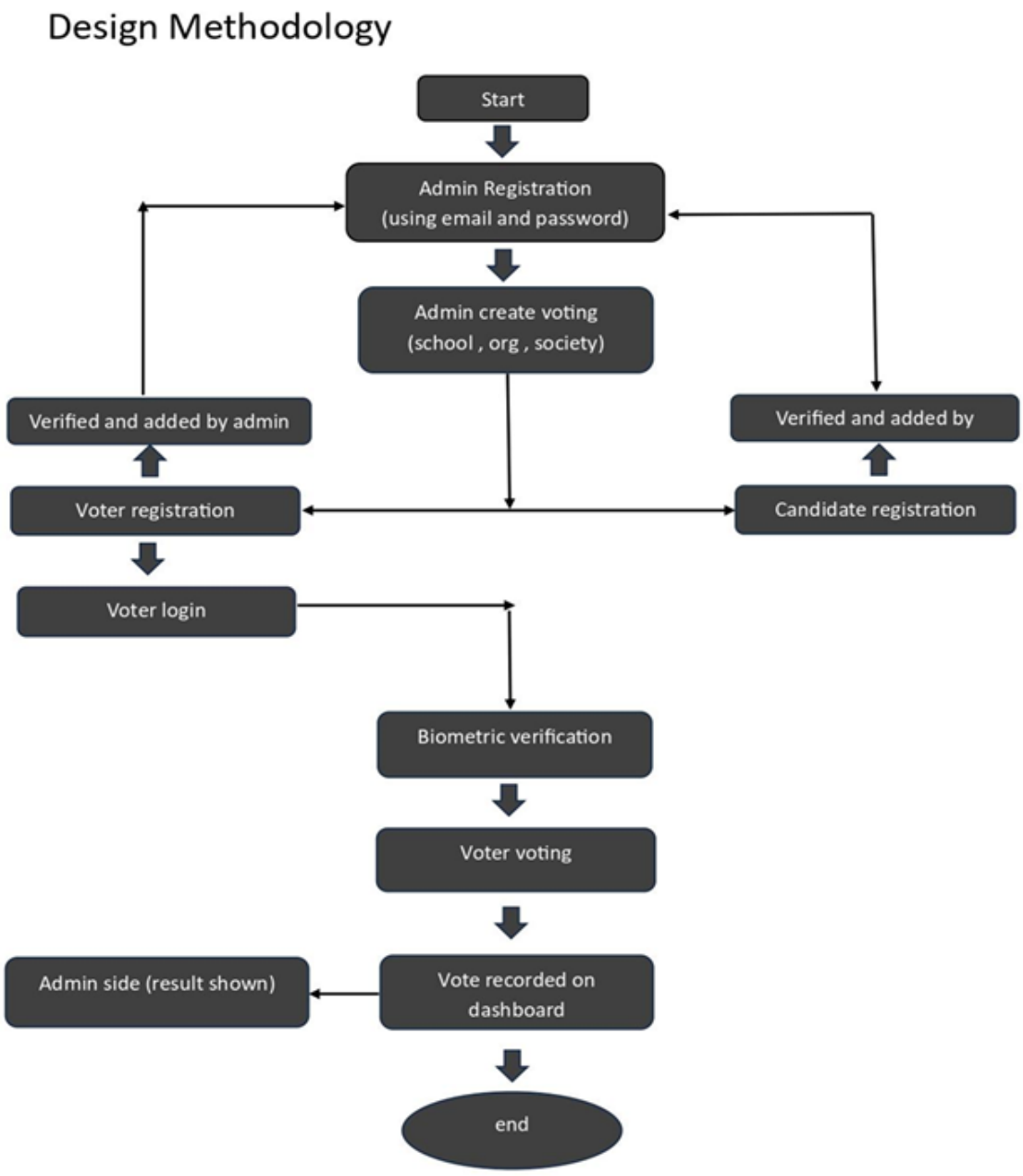
With the advancement of technology, online voting systems have emerged as a modern solution to these problems. However, many existing systems face security challenges such as unauthorized access and identity fraud. **Chunav Seva** is designed to address these challenges by providing a secure and efficient online voting platform. It integrates OTP-based authentication and biometric verification to ensure voter authenticity. The system improves accessibility, reduces manual work, and provides accurate and transparent results.

II. MATERIAL AND METHODS

The Chunav Seva system is developed using a modular approach consisting of multiple components such as user registration, authentication, voting process, and result generation

Component	Description
User Registration	Users register using their basic details such as name and email
OTP Verification	An OTP is sent to the registered email for identity verification
Admin Verification	The admin verifies the user before granting access
Voting Module	Verified users can securely cast their votes
Database Management	All data is stored securely in an encrypted database
Result Generation	Results are automatically calculated and displayed in real-time

This structured approach ensures system reliability, security, and ease of use.



III. RESULTS AND DISCUSSION

The implementation of Chunav Seva shows that online voting can be conducted efficiently and securely. Users were able to register, verify their identity, and cast votes without any technical difficulties. The OTP and biometric verification ensured that only genuine voters participated, reducing fraudulent activities. The admin panel simplified election management, and real-time result generation eliminated the need for manual counting.

Overall, the system reduced time, effort, and errors compared to traditional voting methods. User feedback indicated high satisfaction in terms of usability, security, and reliability.

3.1 System Interfaces

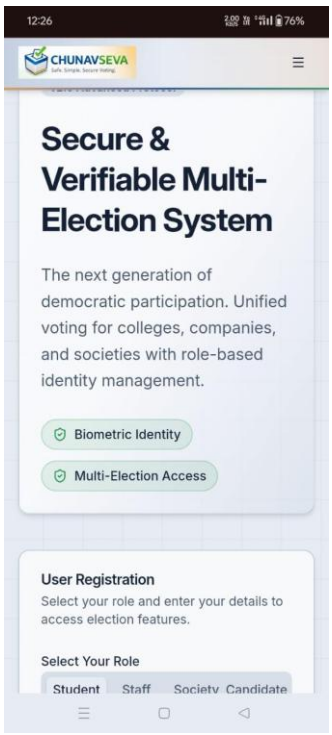


Figure 1: Home Page

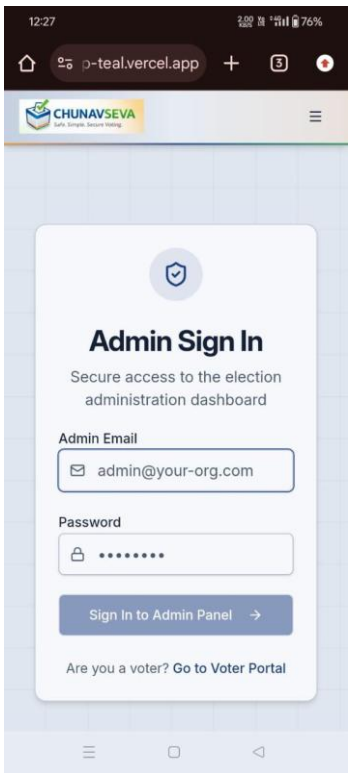


Figure 2: Admin Login Page

Figure 3: System Administration Dashboard

Figure 4: Election Creation Wizard

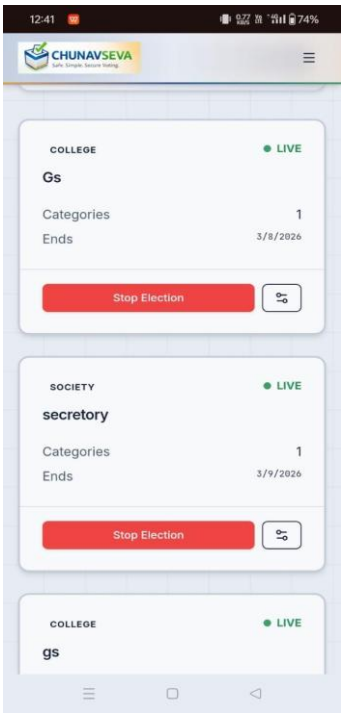


Figure 5: Active Election Status

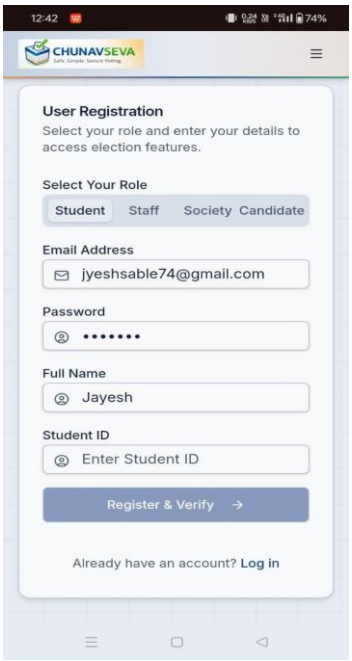


Figure 6: User Registration Interface

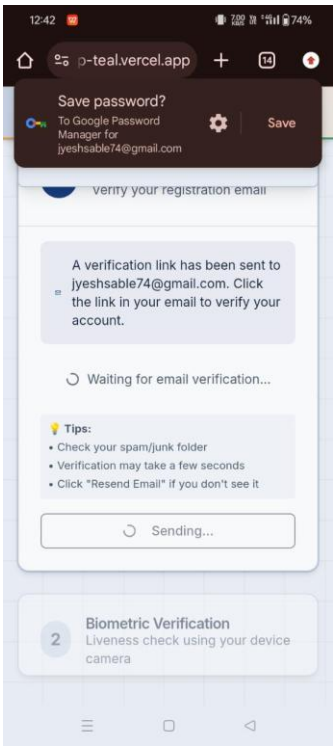


Figure 7: Email Verification Process

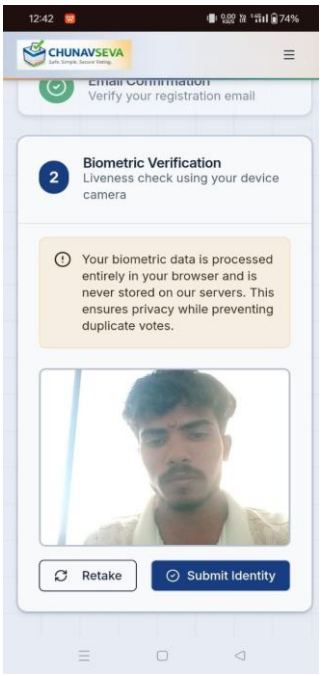


Figure 8: Biometric Verification

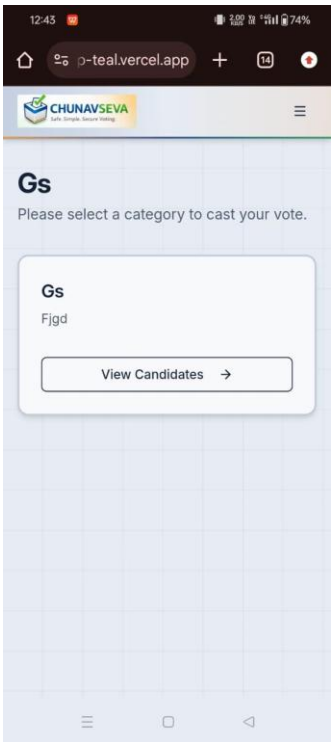


Figure 9: Live Voting Interface

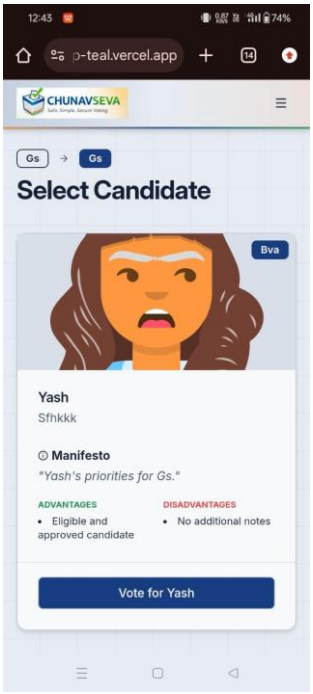


Figure 10: Selected Candidate

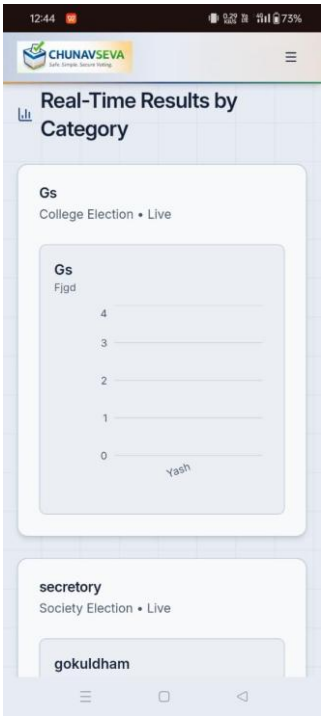


Figure 11: Real-Time Voting Results

Figure 1: Home Page — Shows the home page highlighting a secure and verifiable multi-election platform with options for biometric identity verification and role selection (Student, Staff, Society, or Candidate).

Figure 2: Admin Login Page — Provides secure access to the administration dashboard requiring valid admin email and password credentials.

Figure 3: System Administration Dashboard — Allows the admin to manage elections, create new elections using the Election Wizard, monitor ongoing elections, and stop active elections.

Figure 4: Election Creation Wizard — Enables the admin to configure election details such as title, type, schedule, start/end date/time, voting categories, and candidates.

Figure 5: Active Election Status — Displays active election status on the admin dashboard, including category count, end date, and option to stop the election.

Figure 6: User Registration Interface — Allows individuals to select their role (Student, Staff, or Society Candidate) and enter details for secure account creation.

Figure 7: Email Verification Process — Sends a confirmation link to the registered email address for account activation, ensuring user authenticity.

Figure 8: Biometric Verification — Confirms user identity using live camera capture, processing facial data locally to protect user privacy.

Figure 9: Live Voting Interface — Allows users to select a category to cast their vote, showing available positions and candidate lists.

Figure 10: Selected Candidate — Displays the selected candidate's name, position, manifesto, advantages, and disadvantages, with a "Vote" button to securely cast the vote.

Figure 11: Real-Time Voting Results — Displays real-time voting results categorized by position, using dynamic graphs for visual analysis and transparency.

IV. CONCLUSION

The implementation of Chunav Seva demonstrated that online voting can be conducted securely, efficiently, and transparently for societies, institutes, and organizations. The system successfully verified users through email-based OTP and manual document validation, ensuring that only legitimate voters participated. During testing, users were able to register, verify, and cast their votes smoothly.

The admin panel effectively managed all backend operations such as voter approval, election setup, and result monitoring. The real-time result display provided accurate outcomes instantly after voting closed, eliminating the need for manual counting.

Overall, the results showed that Chunav Seva reduces time, paperwork, and human error compared to traditional voting methods. The system was easy to use, secure, and reliable. This approach can be a practical solution for small to medium-scale elections, with the potential for further enhancement using advanced technologies such as blockchain or AI-based verification in the future.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper. This project has been developed purely for academic and research purposes and has not received any external funding or financial support from any organization. The authors confirm that there are no personal, financial, or professional relationships that could have influenced the work reported in this study.

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