

A Secure Web-Based Voting Management System for Educational Institutes with Real-Time Result Analysis

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Abstract:

This paper presents the design and implementation of a secure online voting management system tailored for Diploma educational institutes (MSBTE). The system aims to digitize the traditional electoral process, ensuring transparency, convenience, and efficiency. It utilizes a two-factor authentication mechanism (Student ID and Password/OTP) to verify voter identity and prevent duplication. The system features a real-time vote counting module with graphical analytics, an automated results declaration system, and an admin dashboard for managing candidates and election phases. The proposed model addresses common challenges such as ballot stuffing, voter turnout tracking, and result tabulation errors. A prototype developed using HTML/CSS, JavaScript, and PHP/MySQL demonstrates high accuracy in vote logging and instant result generation, making it a viable replacement for manual voting in a campus environment.

I. INTRODUCTION

The electoral process is the cornerstone of democratic functioning, whether in a nation or a small educational institution. Currently, many Diploma colleges under MSBTE still rely on paper ballots or show-of-hands methods for student council elections. These methods are often time-consuming, resource-heavy (printing, manpower), and prone to arithmetic errors or invalid votes. As digital literacy increases among polytechnic students, there is a need for a robust digital alternative.

This project proposes a Online Voting Management System that allows authorized students to cast their votes from any terminal (computer lab or mobile) during a specified time window. Unlike traditional methods, this system provides 'One Person, One Vote' enforcement via database constraints, ensures results are available instantly after polling ends, and reduces the administrative burden on faculty. The scope of this paper includes the system architecture, database schema, security protocols, and a case study of its implementation in a mock MSBTE campus election.

II. LITERATURE SURVEY

1. Blockchain-Based Secure Online Voting Platform (Tahboub et al., 2025): This paper proposes a hybrid blockchain model storing encrypted votes on a private ledger anchored to a public blockchain. While highly secure, the complexity makes it unsuitable for a simple Diploma project.
2. E-Voting System Usability (ATHENE Center, 2026): Emphasizes intuitive UI and clear feedback

for user adoption.

3. VOTAN: A Web E-voting System with Data Analysis: Integrates data analytics for predicting outcomes.
4. Adoption of E-Voting in Developing Countries (TEM Journal, 2025): Highlights trust and usability factors.

III. PROPOSED WORK

System architecture includes Client Layer (HTML/CSS/JS), Application Layer (PHP), and Data Layer (MySQL). It implements 2FA authentication, secure voting workflow, and real-time analytics dashboard.

IV. CONCLUSION

This system provides a secure, efficient, and cost-effective voting solution for MSBTE colleges, eliminating errors and delivering instant results.

V. REFERENCES

1. Tahboub et al., 2025.
2. ATHENE Center, 2026.
3. Arinze et al., 2025.
4. Chalabi et al., 2025.
5. PHP Manual, 2024.
6. Chart.js, 2024.