

Web-Based Online Voting System for Secure Digital Elections

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Abstract: *Online voting systems have been increasingly significant in recent times, especially in relation to the digital transformation process within electoral procedures. In this study, we provide an overview of our web-based online voting system. Our system enables users to register, cast votes, and check vote status without restrictions on geographical distance, as long as the users are using devices connected to the internet.*

The functionality provided by the system includes user registration and login, authentication of the users, vote casting and verification of the status, and finally, candidate management by the system administrator who will declare results after the voting process is completed. Our system is built with the use of HTML and CSS for the design of the graphical user interface, PHP for the backend and MySQL for database management. Users are only permitted to cast one vote per election, which reduces possibilities of double counting of votes. Results declaration is done exclusively by the administrator, ensuring confidentiality of the results before their declaration.

Keywords: Online Voting System, Web Application, PHP, MySQL, Digital Election, Security, User authentication, Data Integrity, Secure Voting

I. INTRODUCTION

One of the most important foundations of democracy is the act of voting. The citizens choose who to represent them in the government by voting. In this system, individuals have to travel to polling stations to cast their votes. This results in a lot of time being wasted, along with queues and manual errors during the counting process. Due to these problems, a new and more efficient system for voting has become essential.

With the advent of technology and specifically the Internet, there is now an online voting system. The web-based system makes it possible for people to cast their vote through a website. In addition, this is done without wasting a significant amount of time or creating queues.

The key objective of this particular project is to design and develop a secure system that allows users to vote online. The system ensures that the users can only cast a vote once, and also provides security and transparency in the voting process.

II. EXISTING SYSTEM

The conventional way of voting is manual and involves a number of steps including using a ballot paper. In this case, people travel to polling stations to cast their vote, after which ballot papers are manually counted.

This system suffers from various shortcomings. First, it is quite expensive in terms of time, manpower, and vulnerability to human mistakes while tallying votes. Moreover, it may result in vote rigging and the inability to ensure the safety of voters' details. Besides, the announcement of results also consumes a lot of time. Clearly, these constraints make it imperative to devise an electronic voting system.



III. PROPOSED SYSTEM

Proposed system is an online voting software implemented on the web. Users can register themselves, login and vote using an easy-to-use web interface.

In the proposed system, users will be able to vote only if they have successfully registered and logged in. The users can see their voting status after casting their vote. But at last, it is up to the administrator when he announces the final results after voting time expires.

This software cuts down the effort involved manually and increases speed and accuracy of the process.

IV. METHODOLOGY

The development of the Web-Based Online Voting System follows a systematic approach to ensure reliability, security, and proper functionality. Initially, the requirements of the voting process were analyzed, including user registration, authentication, vote casting, vote storage, and result declaration. Based on these requirements, the system design was planned with separate modules for users, admin, and database management.

The user interface was designed using HTML and CSS to provide a simple and accessible voting platform. The backend logic was implemented using PHP to handle user authentication, session management, vote validation, and communication with the database. MySQL database tables were created to store user details, candidate information, vote records, and result status.

After integrating all modules, the system was tested in a local server environment to verify that users could register, log in, vote only once, and check their vote status. The admin functionalities for adding candidates and declaring results were also tested to ensure proper control over the election process.

V. SYSTEM ARCHITECTURE

The online voting system is based on a layered architecture to ensure the separation between UI, processing and data access for optimal performance and security of the system.

The system comprises of three layers; namely Frontend Layer, Backend Layer, Database Layer and Admin Control Module to manage result announcement and candidate management.

Frontend layer ensures an interactive UI for user registration, login and voting process. Backend layer processes all the request and handles the processing logic of the application. The database stores all user details, candidate details and voting details in a secure manner.

VI. IMPLEMENTATION

The system implementation uses HTML and CSS for creating the front end of the system.

Backend activities are implemented using PHP, which include login activities, vote counting, and executing logic processes. MySQL database is employed for storing all the data required by the application.

Session variables help maintain user login status. Voting procedures are restricted so that users can cast their votes only once. The result can be announced using the admin console.

VII. RESULTS AND DISCUSSION

The design project effectively implements a voting process using a web-based application. The registration of the users, login, and voting process is achieved seamlessly without any hindrance. The system ensures validation of the users and non-duplication of votes through database validation before allowing submission of votes.

The management of candidate data and declaring the result is efficiently done via the administration module of the system. Before the declaration of the final results, users have to be restricted from accessing the results until the result status of the admin has been activated.

Test results indicate that the web application functions without error within the local server environment. The application saves time and avoids counting errors during the voting process.



VIII. CONCLUSION AND FUTURE WORK

Web-Based Online Voting System created in this project represents a very reliable mechanism to carry out digitalized elections with the use of web technologies. It offers features such as registration, login, voting, and checking one's vote status via an easy-to-use web interface developed in HTML and CSS languages. In addition, PHP was used as the language for back-end operations, while data about user details, candidates, votes, and results were saved in MySQL database.

In order to ensure that only one vote is cast by a user, his/her data are verified prior to submission. The admin section allows adding of candidates, monitoring voting and making the declaration of the results. The results are only made public after being declared by the admin; therefore, this process ensures equality of the procedure of online voting. This project serves as an example of replacing traditional ways of voting with web-based methods, which help in reducing time and efforts involved into counting votes.

The future directions include enhancement of the application interface and its deployment into live servers for practical usage.

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