A Study on E Voting System in India

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Abstract: The concept of electronic voting, also known as e-voting, has been developed to solve the problem in the democratic process using technology. India is the largest democracy in the world, and it is very difficult to hold an election with millions of voters from diverse geographical areas. The use of Electronic Voting Machines has improved the democratic process in India by avoiding human error and speeding up the process of vote counting. Nevertheless, many issues are still to be resolved in the process of e-voting in India. This research paper is based on the study of e-voting systems and their possible implementation in India. Various voting systems have been discussed in earlier studies, such as cloud-based voting systems, secure online voting systems, and virtual voting systems, etc. According to the findings, the use of cloud computing, encryption algorithms, and authentication can improve the democratic process in India by increasing efficiency in the system along with security features.

Keywords: *E-Voting, Electronic Voting Machine, Online Voting System, Cloud Computing, Election Security.*

I. INTRODUCTION

In India, initially, paper ballots were used for conducting elections. Although this was a simple approach for conducting elections, this approach faced a number of drawbacks such as slow results, cheating through ballots, and higher costs. In order to solve these problems, the Election Commission in India introduced a new approach called Electronic Voting Machines (EVMs). The introduction of this approach helped in making the Indian election process more efficient.

Even though this approach has solved a number of problems in the Indian election process, still this approach requires voters to physically come to the polling stations for casting their votes. Because of this drawback in the current approach, researchers have come up with different electronic voting systems for conducting Indian elections through different electronic platforms [1].

Cloud-based voting systems have been proposed as an option for dealing with elections of huge magnitude and managing voter data in a secure manner [1]. The importance of using cryptography has been emphasized for maintaining vote secrecy and system integrity in voting systems [2]. Secure online voting systems with authentication mechanisms like OTP and CAPTCHA have been proposed for secure voting systems [3].

In recent years, virtual voting systems are also developed so that voting can be done in a remote manner and at the same time security can be ensured through digital verification technologies [4]. Several other research works were done on the security aspects of e-voting systems and emphasized the need for encryption algorithms and secure communication and authentication technologies [5, 6, 7, 9].

Thus, it can be understood that the study on electronic voting systems is important in order to understand the ways in which the latest technologies can be employed in India for the purpose of improving the transparency and efficiency in the voting system.

II. LITERATURE REVIEW

Several researchers have worked on the electronic voting system to increase the transparency and efficiency of the election process.

P. K. Malviya has proposed a cloud computing-based e-voting system for the Indian environment. In the study, the researcher has focused on the importance of cloud computing in managing voter information and election results efficiently [1].

Ofori-Dwumfuo and Paatey have proposed an electronic voting system with the main aim of increasing voter privacy.

In the study, the importance of cryptographic security is emphasized in the system [2].

Nadaph et al. have introduced a secure online voting system with the main aim of increasing security through the implementation of one-time passwords and CAPTCHA [3].

Kumar et al. have proposed a virtual voting system with the main aim of increasing voter turnout through the implementation of electronic voting system technologies. In the system, the researcher has focused on the importance of implementing secure authentication systems [4].

Several other researchers have worked on the security issues and technological framework of the electronic voting system. In the studies, the importance of encryption algorithms and secure communication is emphasized in the system [5, 8, 9].

From the above studies, it is evident that the electronic voting system has the potential to increase the efficiency of the election process. However, the security framework is essential in the system to increase public trust.

III. ANALYSIS OF EXISTING METHODOLOGIES

A secure e-voting system comprises different modules to ensure proper voter authentication, vote storage, and result processing.

The first module of the e-voting system is the Voter Registration Module, which stores voter details in a secure database.

The next module of the e-voting system is the Authentication Module, which authenticates voters by using different techniques such as Aadhaar or OTP or biometric authentication.

After authenticating voters, they are directed to the Voting Interface Module, where voters can select their preferred candidate by using a secure digital interface.

After casting their vote, it is encrypted and stored in the Secure Vote Storage System, which may use cloud databases to store vote data in a secure manner.

The last module of the e-voting system is the Result Processing Module, which automatically generates results for the election.
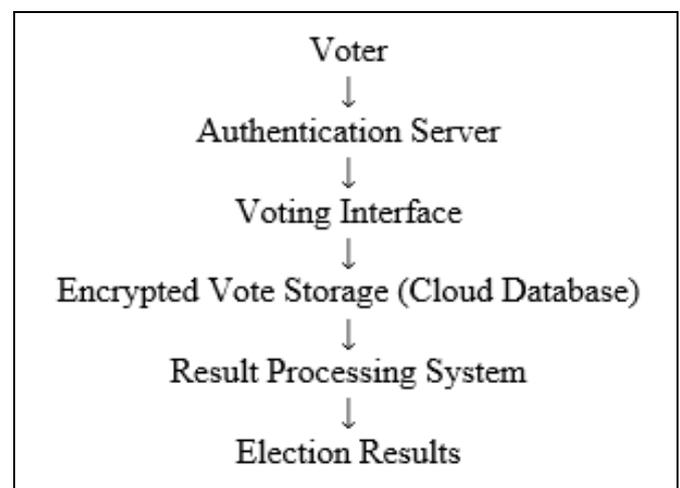

Fig 1 Flow Diagram

Table 1 Comparative Analysis

Voting System	Advantages	Limitations
Paper Ballot	Simple and transparent	Slow counting and high error rate
Electronic Voting Machine	Faster counting and reduced invalid votes	Requires physical presence
Online Voting	Remote voting and higher accessibility	Vulnerable to cyber attacks
Cloud-Based E-Voting	Scalable and centralized management	Requires strong security mechanisms

The traditional paper ballot system was used in the past in the conduct of elections. Although the system ensured transparency, there was a significant time delay in the counting of the results. Moreover, the system was very expensive to operate.

The introduction of Electronic Voting Machines has ensured the efficient conduct of elections. It has minimized the time taken to count the results and has ensured that the number of invalid votes is minimal. However, the system requires the voter to physically visit the polling station to cast the vote.

Online voting systems have been suggested as a means to increase the accessibility of the system. This would enable the voter to cast the vote from anywhere. However, there is a potential risk of cybercrime.

Cloud computing would provide the required platform to efficiently conduct the election. However, the system would require the application of advanced encryption techniques to secure the system.

IV. CONCLUTION

An electronic voting system is an important advancement in the technology being used in the electoral process. In a country like India, the number of voters is in the millions, and the voting process is not without its challenges.

Though the Electronic Voting Machines have already streamlined the electoral process, the latest advancements in the e-voting system can be used to improve the voting process. Authentication technologies, encryption methods, and cloud computing can be used to create a reliable voting system.

But it is important that stringent cyber security is in place to make the electronic voting system reliable and trustworthy.

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