

VoteBlock: Blockchain Based E-Voting System

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Abstract: *In the contemporary digital landscape, where the ease of hacking and system breaches prevails, the potential for data tampering looms, resulting in unfavourable circumstances. To mitigate this risk, blockchain technology emerges as steadfast solution, characterised by its near-impenetrable security features, rendering data alteration virally impossible. The act of voting, integral to any nation's democratic process, stands as a cornerstone of societal decision making. The consequences of vote miscalculation or manipulation by external forces are dire, emphasising the need for a secure and reliable system. It is in this context that blockchain technology plays a cubical role, offering an avenue to enhance the integrity and accessibility of the voting process.*

This paper presents a comprehensive proposal for decentralised national e-voting system build upon blockchain technology. The system incorporates an administrative panel designed to facilitate the scheduling of elections, candidate management, and the declaration of election results. Concurrently, a user-friendly web application empowers citizens with an interface for inputting their personal details, including their name, mobile number, and a live photo captured during the voting process.

To maintain the integrity of the voting system, voter eligibility is rigorously verified at the point of User ID entry. A crucial layer of security is added by confirming eligible voters through their registers phone numbers using One Time Passwords (OTPs). Subsequently, individual voters gain the privilege to cast their votes, with their actions monitored through a webcam or front cameras. Votes are securely recorded within a blockchain ledger, immune to tapering, while the system checks the voter's addressed corresponding constituency in the backend. The voting results are diligently declared on a predefined date and managed by the administrator, with graphical representations available to provide clarity and transparency. This holistic system not only upholds the sanctity of the voting process but also offers citizens a technologically advanced and secure means to exercise their democratic rights.

Keywords: E-Voting System, Online voting system, Blockchain, Machine learning, Deep learning.

I. INTRODUCTION

Tin the contemporary digital landscape, where hacking and system breaches have become increasingly prevalent, the technology offers a robust solution of r data can lead to dire consequences. Blockchain technology offers a robust solution for data storage, rendering it nearly impervious to alterations or unauthorised access due to its inherent security features. Voting represents a crucial cornerstone of various fields, ranging from political elections to selecting local community leaders, college presidents, school presidents, and numerous other pivotal events. The integrity of these electoral process id of paramount importance, as any manipulation by external entities could have severe repercussions. Our project introduces a decentralised Smart Election Voting System, harnessing the power of blockchain technology to ensure the integrity of the voting process. This system encompasses an administrative panel that facilitates the scheduling of elections, management of candidates, and the declaration of results. Furthermore, the web application provides users with user-friendly interface to input their personal information, including their name, mobile number, and a live photo of themselves captured at the moment of voting.

To maintain the security and accuracy of the voting process, the eligibility of each voter is rigorously verified at the point of User ID entry. Verified voters receive a One-Time Password (OTP) via their registered phone numbers, enhancing the validation process. Once a voter's eligibility is confirmed, they gain the privilege to cast their monitoring through a webcam or front camera, ensuring the transparency and fairness of the process. All votes are securely

recorded within a blockchain ledger, offering an immutable and transparent record of the election results. This not only prevents any tampering but also provides a level of security that instils confidence in the electoral process.

User registration involves the provision of personal data and facial authentication, granting each voter a unique login ID for casting their votes. After the voting phase is complete, the results are promptly and accurately declared on the same day, within the predetermined timeframe set by the administrator. This comprehensive system ensures the sanctity of the voting process, preserving the core principles of democratic decision-making. document is a template. An electronic copy can be downloaded from the website. For questions on paper guidelines, please contact the International Journal committee as indicated on the Journal website. Information about final paper submission is available from the website.

II. LITERATURE SURVEY

Numerous efforts have been undertaken to introduce innovations into electronic and online voting systems, employing a variety of techniques and approaches. While some of these methods provide a degree of confidentiality and security to the system, there is still a pressing need for more advanced systems to control and manage the voting process. These advanced systems are designed to assure and safeguard the security and privacy of both voters and their voting-related information.

A. Basic E-voting approach/architecture's

Digital voting systems created for casting votes through online portals and electronic devices employ a range of encryption and decryption methods to ensure the security of data transactions.

B. Homomorphic Encryption Technique

Homomorphic encryption is a widely recognized and potent method with numerous practical applications. Notably, it has found application in the development of online voting systems. In this voting system, the exponential ElGamal cryptosystem is employed. Prior to submission, each cast ballot's contents undergo encryption using exponential ElGamal encryption. The distinctive additive homomorphism property of this cryptographic system enables the direct aggregation of encrypted ballots, eliminating the need for decryption in the tallying process.

C. Summary of literature survey

E-Voting Sytem using Blockchain

Authors: Vivek S K, Yashank R S, Yashas Prashant, Yashas N, Namratha M.

Year: Sep 2020

In this exploratory literature survey, the reviewers reviewed the existing e-voting systems and suggested that an e-voting system developed using Ethereum-based blockchain system with an Multi chain Architecture will be the most secure choice for deployment. Suggested that the conjunction of elliptic Curve Cryptography with implementation of Bind Signature and Short-Linkage Ring Signature procedure to be performed on the hash value can further increase the security to be performed on the hash value can father increase the security of the system.

Decentralised Voting Platform Based on Ethereal Blockchain

Authors: David Khoury, Elie F. Kfoury, Ali Kassem, Hamza Harb

Year: Nov 2018

In this research paper, researchers proposed a novel approach for a decentralised trust voting platform that relies on Blockchain Technology to resolve the issues regarding trust and transparency of the conduct. Researchers suggested that the Ethereum Virtual Machine (EVM) to be used as the Blockchain Runtime Environment, on which transparent, consistent and deterministic smart contracts can be deployed the organisers for each voting session.

The Future of E-Voting

Authors: Hitesh Tewari, Pavel Tarasov

Year: Dec 2017

In this research paper, researchers identified the security issues in the previously proposed E-Voting System due to the lack of protocols which could be useful to build a well-defined and reliable E-Voting System. Researchers introduced a system integrated with Leash Secure Transaction Scheme which can ensure anonymity of the voters during elections. Researchers further suggested that the future work in the protocols would enable to a much efficient and wide spanning Blockchain-Based Voting System.

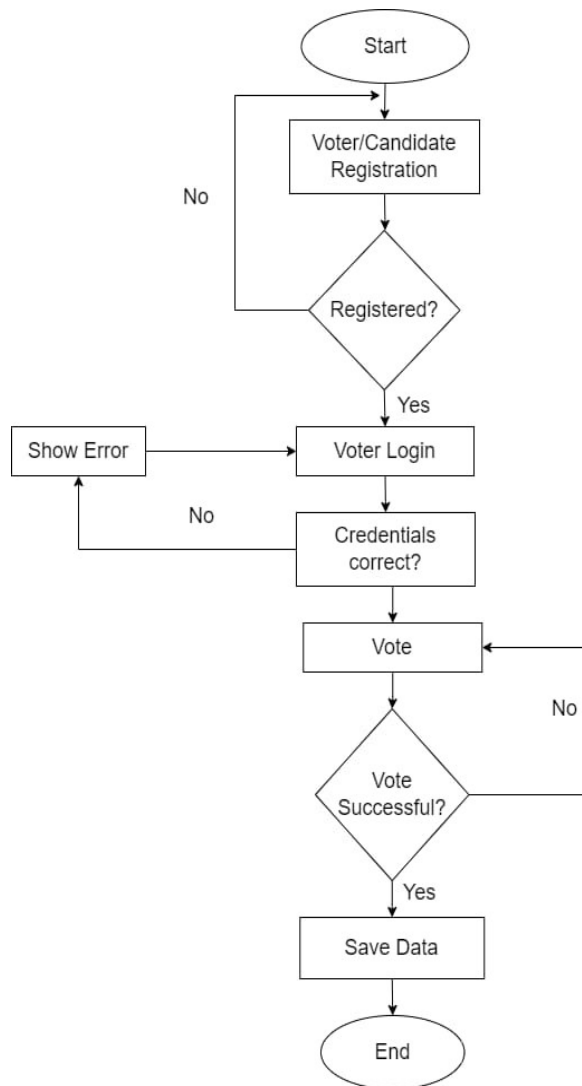
III. PROPOSED SYSTEM

The Local Voting System has a substantial track record of fraudulent and duplicate voting, with instances of individuals tampering with the voting machine system to cast multiple votes.

Within the Local Voting System, there's also the concern of booth capturing due to political coercion, which can significantly impact the actual voting results.

IV. PROPOSED METHODOLOGY

4.1 Flow Chart



4.2 Details of Software and Hardware Software Requirements:

- Operating System: windows 10
- VS code
- Node.js
- Metamask (Browser Extension)
- Nextjs and React
- Hardware Requirements:
- I5 Processor
- 8GB RAM
- 1TB HDD

IV. CONCLUSION

Voting holds immense significance in various domains, including politics, the election of local community leaders, school and college presidents, and more. However, the traditional voting methods have inherent vulnerabilities that can be easily manipulated. The objective of our system is to address these shortcomings within the conventional ballot system and offer Indian citizens a straightforward and secure means of voting. Additionally, our system contributes to the conservation of paper resources, indirectly aiding in the preservation of trees, a pressing environmental concern given the substantial paper consumption in traditional voting. Leveraging today's technology, our aim is to pave the way for a more promising future in the realm of voting.

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