

E-Voting System: Applied Blockchain Concept for Implementation

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Abstract: One framework that lowers the proportion of abstention and guarantees security against vote tampering is the electronic voting system. Blockchain is a distributed, decentralized ledger that is used to efficiently and verifiably record transactions. Voter fraud is prevented by integrating Aadhar into the electronic voting system. With the use of voter's VIDs (virtual IDs) that are gathered from the Aadhar database and biometric information, the proposed scheme offers a secure electronic voting method. The digital signature is used as the key to encrypt the votes within the block.

Due to the present surge in interest in the use of blockchain technology for several applications, including identity, money, and healthcare, more attention has been paid to the legal ramifications of this technology than to its usefulness in administration.

Thus, to eliminate the drawbacks of the current Indian voting system, and provide a better, more dependable, safe, and transparent form of public governance, we can create an application utilizing blockchain as an effective option for public voting. Blockchain technology is a means of governance, not only an object of regulation and governance.

The powerful cryptography used by these technological elements offers a security level that is on par with or higher than any database that has ever been known..

Keywords: Blockchain

I. INTRODUCTION

The present voting system in India is prone to political manipulation in rural areas, lack of transparency, phony voter identification, and delays in the announcement of results, to name a few issues. By substituting a blockchain-based electronic voting system for any existing voting option, all of the difficulties that have been identified can be effectively remedied.

a blockchain-based digital voting platform that is connected with UIDAI's Aadhar identity system, offering enhanced security and transparency. The goal of merging a citizen's Aadhar with their voter ID through UIDAI is to reduce the problems with duplicate and fraudulent voter IDs that are present in our current system.

System Architecture

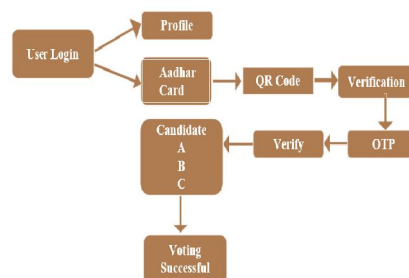


Fig. 1.1: System Architecture

Blockchain era is a framework that makes use of many databases, known as the "chain," linked through peer-to-peer nodes, to save public transactional information or blocks. This type of storage is commonly known as a "digital ledger." The virtual signature of the proprietor authorizes every transaction on this ledger, making sure of its authenticity and stopping any manipulation. Because of this, the statistics inside the virtual ledger are extraordinarily safe. To put it another way, the digital ledger is essentially a network of multiple computers sharing a Google spreadsheet where transactional data is kept according to actual purchases. The intriguing aspect is that while everyone may view the data, it cannot be altered.

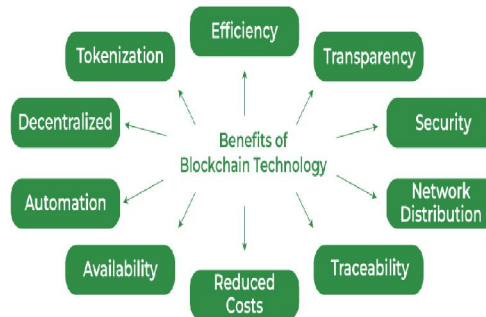


Fig. 1.2: Blockchain System

Admin Login

The initial module of the Aadhar virtual ID-based electronic voting program is the admin login. Using their candidate login credentials, candidates who enrolled in our first module can now use the e-voting application.

Candidate Registration

The second element of the Aadhar-based virtual identification e-voting program is candidate registration. Here, candidates register using their name, party symbol, and party affiliation. By entering this data, the candidate registers for the application process and moves forward. Voters will then select a candidate, and the outcome will be shown. Multiple candidates may register for the voting process in this module.

Voter list

The third module of the Aadhar virtual ID-based electronic voting program is the voter list. Upon checking in with their login credentials, the administrator can view the list of voters who have already registered.

User login or registration

The fourth element of the Aadhar-based virtual ID e-voting program is user login or registration. Users can register by providing personal details such as name, mobile number, gender, address, password, and Aadhar card number. Upon successful registration, the user can access the application and cast their ballot on election day.

QR code scanner

The fifth element of the Aadhar-based virtual ID e-voting application is a QR code scanner. Here, an Aadhar QR code is scanned by a QR code scanner to ensure voter security and prevent fraudulent voting. The OTP is created and delivered to the registered mobile number after the QR code is scanned.

BlockchainManager

The sixth module of the Aadhar-based virtual ID e-voting application is called Block Chain Manager. Voter security can be managed by a blockchain manager. We will be able to combat candidate and user data corruption with the use of this technology.

Create a new block.

The seventh module of the e-voting application, which uses the virtual ID of an Aadhar, is called Create New Block. Following voting, a hash function is used to construct and encrypt a block of votes. to prevent the user from casting multiple votes. The user is unable to vote again as a result.

Result

The outcome is the eighth module of the Aadhar-based virtual ID electronic voting program. Following the completion of the admin registration and login procedure, user registration and login process, voting process, blockchain-encrypted vote, and computation of final votes for each candidate result, the results are shown here.

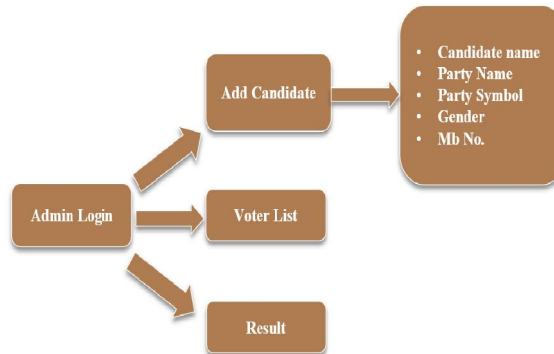


Fig. 1.3: Admin Login

II. ALGORITHM

- Step 1: Get going.
- Step 2: Register as a candidate.
- Step 3: Sign in.
- Step 4: Enter user information in the cloud.
- Step 5: Verify Aadhar information by scanning it.
- Step 5: If the user is eligible to vote, begin.
- Step 5: Give up.

III. LITERATURE SURVEY

Kashif Mehboob Khan, Junaid Arshad, and Muhammad Mubashir Khan 2019^[1]
 Topic: Secure digital voting systems based on blockchain technology.
 Since the VID is temporarily durable during encryption, the use of the UID number allows us to authenticate and verify the user's demographic details.
 Declaration of effects in a totally brief time.
 Lack of transparency^[1]

Roopak T. M., Dr. R. Sumathi
 2020 [2]
 Topic: Electronic voting based on the virtual ID of Aadhar using blockchain technology
 Voting is one of the processes that allow citizens to identify themselves with society, and it is also one of the rights to choose the right and humble leader for society.
 Faster, transparent, and cost-efficient
 The main idea of the project is to encourage e-voting during a pandemic. [2]

Mohammed Nasir Uddin, Linta Islam
 2020 [3]
 Publisher: IEEE
 Topic: Digital Voting: A Blockchain-based EVoting System Using BioHash and Smart Contracts.
 The digital signature, which is converted from fingerprint data, plays an important role in ensuring security.
 Accurate counting of work [3]

Pradeep Katta, Ovaiz A. Mohammed
2021 [4]

Topic: Smart Voting using Fingerprint, Face, and OTP Technology with Blockchain

Many voting systems are not secure, so the blockchain is used to ensure security by integrating Aadhar verification using VID.

Voting can be done from anywhere and is also comfortable for senior citizens. Accurate counting of work. [4]

IV. METHODOLOGY

The three stages of the FEUP technique corresponded to the pre-, during-, and post-election periods. The team convened multiple times before Election Day to decide on the criteria and sub-criteria, on the members of the auditing team's allocation to the electronic voting systems (EVS) and voting windows, as well as the inquiries and information requests that each company should get.

Each auditor visited at least two distinct EVS on Election Day to provide a comparison classification of systems for the same criteria and sub-criteria. The operations research team led a lengthy final meeting for the auditing team where they discussed the scores assigned to each EVS on each sub-criterion, now that they had all the information they needed.

V. CONCLUSION

Voting is one of the processes that allow citizens to identify themselves in society.

Many voting systems are not secure, so the blockchain is used to ensure security by integrating Aadhar verification using VID.

Since the VID is briefly dependent on encryption, using the UID range lets us authenticate and confirm the user's demographic details.

VI. FUTURE SCOPE

Blockchain functions successfully for a limited number of users. However, the number of users increases when the network is used for large-scale elections, which raises the cost and lengthens the transaction time. Scalability issues are made worse by the blockchain network's expanding node count. The system's scalability is already a major problem in the election scenario.

The blockchain-based system's scalability will be further impacted by the integration of electronic voting. Table 3 provides a comparative examination of a few blockchain-based platforms, including Bitcoin, Ethereum, Fabric, Ripple, Dogecoin, and others, and attributes that are fundamental to all blockchain frameworks.

Sharding, or parallelizing blockchains, is one technique to improve their scale.

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