BLOCKCHAIN E-VOTING DONE RIGHT: PRIVACY AND TRANSPERANCY WITH PUBLIC BLOCK CHAIN

[1] R.Swathi , [2]M. Sai Naga Mugdha, [3]Bodige Rishika Goud,[4]Satya Ashritha, [5]Ubba Geetha

[1]Assistant Professor in Department of CSE Sreyas Institute Of Engineering And Technology

[1]r.swathi@sreyas.ac.in

[2.3.4.5]UG Scholar in Department of CSE Sreyas Institute Of Engineering And Technology

[2]mugdhamathukumalli@gmail.com ,[3] rishikagoud0121@gmail.com ,[4] satyaashritha1310@gmail.com

[5] ubbageetha1132@gmail.com

Abstract

An Election is a method of selection of individuals to hold the public office in democracy. Ballot is basically a piece of paper that is used to cast vote during election. In ballot paper voting system each voter uses a ballot paper which is not shared and basically it is a paper printed with the name and symbols of the candidates. The Electronic Voting Machine is basically a memory recorder which records the vote casted by the voters. In this paper, main advantages of E-voting systems for country is highlighted, along with that OTP through recognition is also one of the main advantage, it is using block chain &etherum tool in this project. For constructing E-voting systems, every countries need to do great attention to Verification and Validation requirements. In this research, E-voting scheme with face recognition using Open CV technique is proposed. The process of casting vote is accomplished by block chain technology and blind signature mechanism. The main objective of the proposed scheme is to explore the positive effects of security and safety in online voting system.

Keywords: Blockchain Technology, E-Voting,Otp

I INTRODUCTION

Voting is a method for a group, such as a meeting or an electorate, in order to make collective decision or express an opinion usually following discussions, debates or election campaigns in smaller organizations, voting can occur in different ways. Formally via ballot to elect others for example within a workplace, to elect members of political associations or to choose roles for others. Informally voting could occur as a

spoken agreement or as a verbal gesture like a raised hand or electronically. In a democracy, a government is chosen by voting in an election a way for an electorate to elect, i.e., choose, among several candidates for rule. However, more than likely, elections will be between two opposing parties.

In the context of national elections, "security" refers to the protection of the election process from any unauthorized or malicious activities. "Integrity" means maintaining the accuracy and honesty of the elections. So, the primary aim of the project is to enhance security and integrity of the elections Traditional pen and paper voting methods can be vulnerable to various issues, such as people cheating (fraud), difficulty in tracking votes (lack of traceability), and problems in confirming the accuracy of results (limited verifiability).

To address these vulnerabilities, we are turning to Block chain technology. Block chain acts as a digital ledger, maintaining a secure and tamper-resistant record of transactions and data. It records transactions across a network of computers. Each transaction is added to a "block" and linked to the previous one, creating a continuous chain of data blocks. In the context of a block chain, transactions refer to the actions or…. operations that are recorded on the block chain ledger. These transactions can represent various types of data, depending on the specific use case of the block chain. In the case of an E-voting system transactions represent voting data, candidate details, voter details etc.

Block chain offers several advantages, including decentralization that is Unlike a traditional central authority (like a government), block chain operates on a network of computers. This means there's no single point of control, making it harder for anyone to manipulate the system.

- Transparency that is Every transaction or vote is recorded on the block chain and can be seen by anyone. This transparency allows voters to verify that their votes were counted accurately.
- Block chain uses advanced cryptography to secure data
- Once data (like votes) is added to the block chain, it can't be changed. This ensures the integrity of the voting process.
- Block chain is designed to keep functioning even if some of the computers in the network fail. This makes it a reliable system for recording votes

II LITERATURE SURVEY

***Smart and Secure Voting Machine Using Biometrics*:**

There is a big total of populations who are appropriate to vote are called as voters, in India to identify each voter, a unique number is provided with the voter id. Besides, for verification purposes, biometrics traits can be used. A fingerprint is unique to each human being, which provides much better protection than any secret keywords or passes keys. Thus, the biometric concept can provide a better protected system for polling. In EVM there is no module that can confirm if the citizen's vote cast or not. So, the paper is proposed to include an SMS module and GSM module to confirm the vote cast by the voter is registered via a confirmation message to the registered mobile phone. This will improve the consistency and proficiency of the system. The proposed system has a double verification for a more secure system. This system uses a cloud database; hence it will be more efficient than the existing system. There is additional GPS in the system, this will prevent the system from theft if the system is stolen it can be located easily and immediately through satellites. Through GSM, we can get a confirmation message about to which candidate the vote got registered to, this way the elector can verify that the voter is pitched to his favourite's candidate.

Arduino Based Secure Electronic Voting System with IoT

Internet of Things (IOT) is the network of integrated physical devices that are set with connectors, actuator and communication media that allow them to send and receive data over the internet [1]. This technology is simplifying the lives of people and making everything easier day by day in every walk of life [2]– [4]. The use of IoT in elections also improves the voting procedures. This system also looks after for the number of functional and nonfunctional requirements which are very important in every phase of system design. The precision, reliability and efficiency of the voting process will also be greatly increased and the overall time to declare the results of the elections will also be reduced. There are basically two types of online voting developed; one which is deployed at polling stations and it is officially supervised by the officer of electoral authorities. The second is remote online voting system which is connected with the internet and voter can submit their vote electronically from any location. The second technology of casting vote from any location can greatly increase the overall turnout of the voters for the voting process. This technology is very useful for those people who are living far away from polling stations and they cannot go to polling stations to cast their vote. By the use of IoT this system is very easy to use and maintain and it will also provide the capability of handling various modules at various centers and will provide efficient scalability for larger elections. The overall performance of online voting system is based

on its user interface, usability and security. Top of line security measure in online system make them more advanced and robust.

A Survey on Smart Electronics Voting System through Block Chain Technology

In this system Block Chain Concepts are applied to Online Voting System when we are developing a Smart E-voting system by taking advantage of block Chain concepts with web Interface. In this we are using 2 modules i.e. Admin and Voter Module 1 - Administrator (Admin): - Admin Add Candidate, Candidate details and check user(Voter) are legal or not. Module 2 - User (Voter): - Voter can cast the vote to the candidate. This paper described, an electronic Voting system for small to medium sized Internet-based public opinion systems that provides privacy of vote, voter's authentication, audit ability, double-voting prevention, fairness voting device from manipulating the authenticated voters voting choices. In this paper, used of Aadhar card provided by UIDAI with QR code present in it. Online instead of offline mode and storing the voting data to secured online server. Results can be displayed by admin after entering user id and password.

III EXISTING SYSTEM

In existing they introduce a Auditable Block chain Voting System (ABVS) is a electronic voting solution aimed at bolstering transparency and trust in the electoral process. ABVS leverages block chain technology and a voter-verified paper audit trail (VVPAT) to address auditing and verification challenges. Voters access a secure online portal, cast their votes electronically, and receive a VVPAT receipt. Votes are recorded on an immutable blockchain, ensuring transparency and security. Voters can verify their choices via the VVPAT, and independent auditors can cross-reference electronic votes with paper records. ABVS enhances election integrity, reduces fraud potential, and fosters voter confidence. Challenges include scalability and accessibility, but ABVS offers a promising path toward more secure and trustworthy electronic voting.

Disadvantages

1. The existing system faces security vulnerabilities, making it susceptible to hacking, tampering, and cyberattacks, which could undermine the integrity of elections.

2. The existing system lacks transparency, making it difficult for voters and auditors to verify the accuracy of results, which can erode trust in the process.

Conducting post-election audits in the existing system can be complex and may not provide a reliable means of verifying votes

IV PROPOSED SYSTEM

The proposed system aims to revolutionize the electoral process by introducing an electronic voting platform accessible via computers, eliminating the need for traditional paper ballots. Leveraging block chain technology, this system ensures the utmost security and transparency in recording and storing votes. Block chain's tamper-resistant digital ledger guarantees that once a vote is cast, it remains immune to unauthorized alterations or deletions, bolstering the integrity of election data. Dual authentication mechanisms, including facial recognition and email OTP verification, confirm the voter's identity, preventing unauthorized access and ensuring the authenticity of participants. The user-friendly interface, built using the Django web application framework, simplifies the voting process for citizens while ensuring scalability and robustness to handle large user volumes, making it a dependable and secure solution for modernizing the electoral process

Advantages

1. The proposed system introduces dual authentication mechanisms, including facial recognition and email OTP verification, which significantly improve the security of voter authentication compared to the existing system. Blockchain technology ensures tamper-resistant vote recording.

2. The user-friendly interface built with Django simplifies the voting process, making it more accessible to a wider range of citizens, potentially addressing some of the accessibility gaps seen in the existing system.

3. The block chain-based approach guarantees data integrity, as once votes are recorded, they are immutable. This enhances transparency and trust in the election results.

4. The proposed system is designed to handle large user volumes, addressing one of the scalability challenges faced by the existing system, especially during high-stake elections.

V IMPLEMENTATION

- ***Register*:** In this module, eligible voters sign up to use the electronic voting system. Users provide their personal information, such as name, email, address, and identification details. The system validates and verifies the provided information, ensuring that only eligible voters are registered. Users may also need to upload a photo for identification purposes.

- ***Admin Login:*** This module is for authorized administrators who manage the electronic voting system. Administrators enter their unique login credentials to access the system. Once logged in, administrators can perform various tasks, such as adding or updating candidate information, monitoring the voting process, and generating reports.

- ***Add Party Details***: In This module, administrators add information about political parties participating in the election. This includes party names, logos, candidate lists, and any relevant details. The information is securely stored in the system and made available for voters to view during the election.

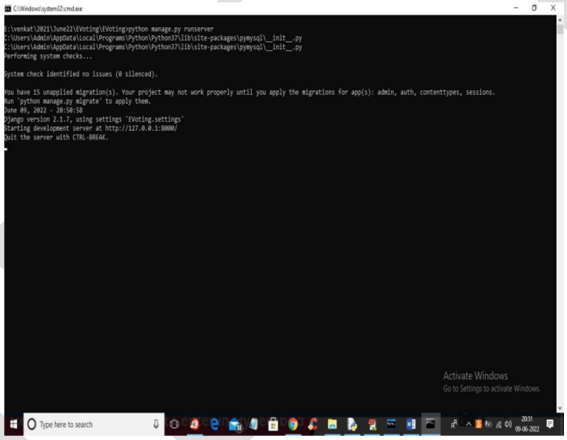
- ***View Party Details*:** This module allows both voters and administrators to see information about the political parties and their candidates. Voters can use this information to make informed decisions about their votes. Administrators can review and update party details if needed.

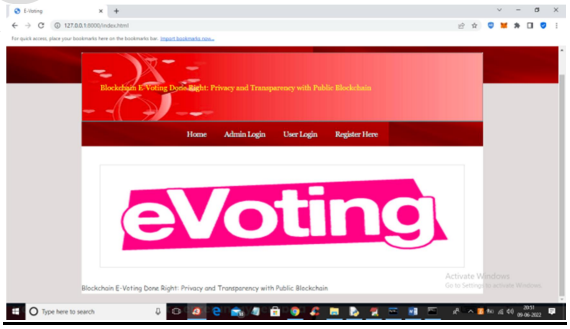
- ***View Votes*:** This module provides a summary of the votes cast in the election. It shows the total number of votes for each party or candidate, allowing administrators and the public to track the progress of the election.

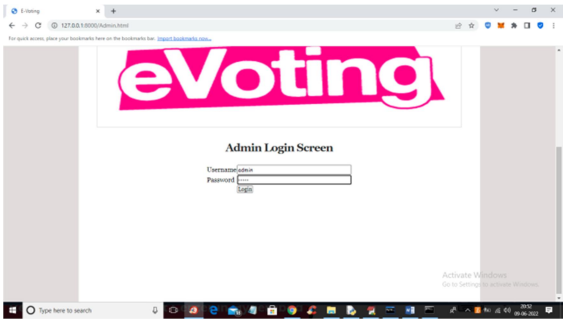
- ***User Login*:** The "User Login" module is for registered voters who wish to cast their votes. Voters enter their login credentials, which include facial recognition and email OTP verification, to access the voting interface. Once logged in, voters can proceed to cast their votes securely.

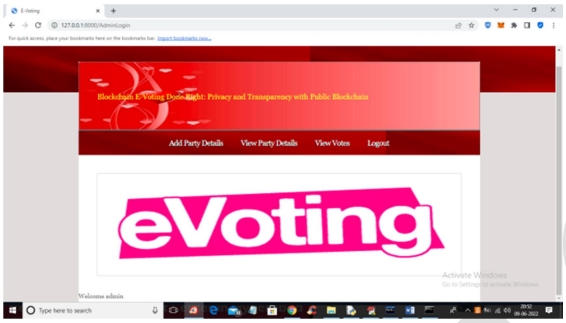
- ***Cast Your Vote*:** In this module, voters make their selections for candidates or parties. They follow the on-screen instructions to choose their preferred options. The system ensures that each voter can only submit one valid vote, preventing duplicate votes. After casting a vote, the voter receives confirmation, and their choice is securely recorded in the blockchain-based system.

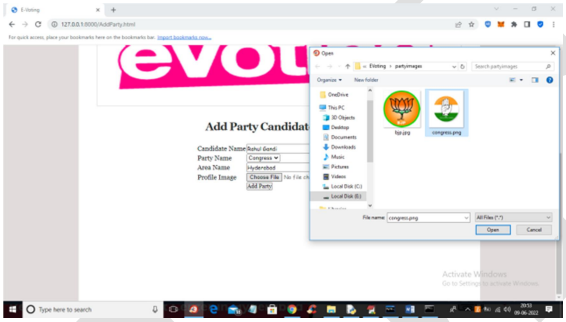
VI RESULTS

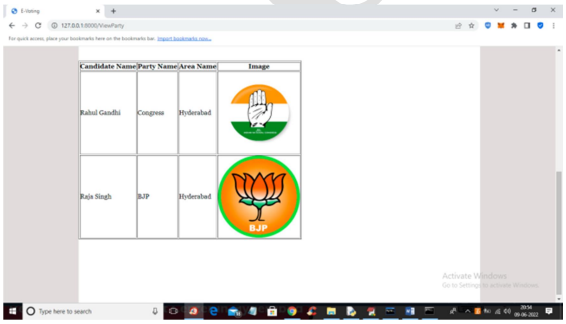


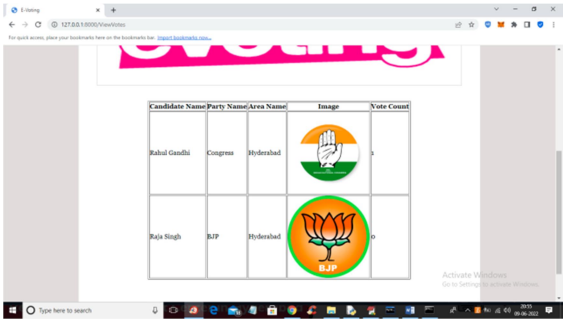


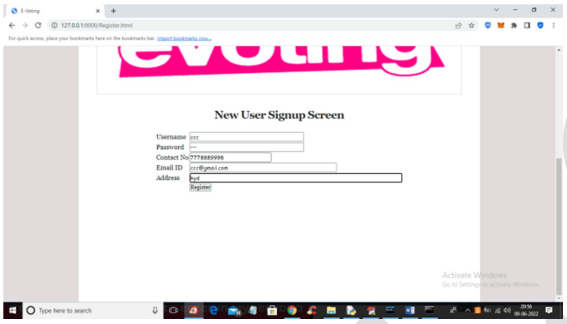

eVoting
Admin Login Screen
Username admin
Password
Login

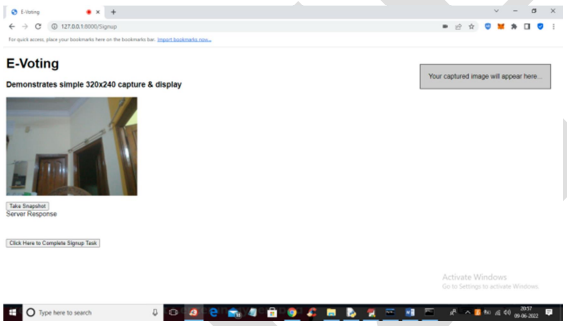

Blockchain E-Voting Done Right: Privacy and Transparency with Public Blockchain
Add Party Details
View Party Details
View Votes
Logout
eVoting

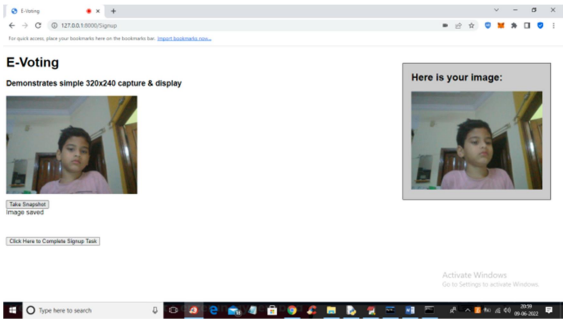

Add Party Candidat
Candidate Name Rahul Gandi
Party Name Congress
Area Name Hyderabad
Profile Image
Choose File
Add Party

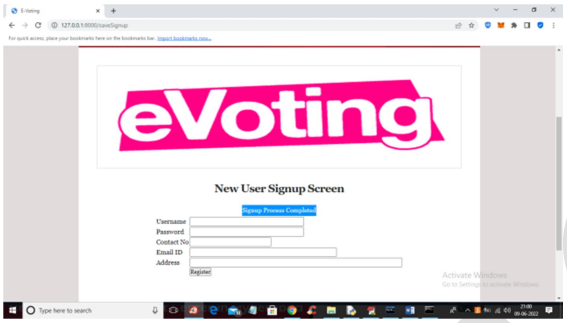

Candidate Name
Party Name
Area Name
Image
Rahul Gandhi
Congress
Hyderabad
Raja Singh
BJP
Hyderabad
BJP


Candidate Name
Party Name
Area Name
Image
Vote Count
Rahul Gandhi
Congress
Hyderabad
Raja Singh
BJP
Hyderabad
BJP


New User Signup Screen
Username
Password
Contact No
Email ID
Address
Register


E-Voting
Demonstrates simple 320x240 capture & display
Your captured image will appear here...
Take Snapshot
Server Response
Click Here to Complete Signup Task





VII CONCLUSION

The project successfully reached its main goals by using block chain technology.Blockchain keeps an unchangeable record of all votes, so voters can check their votes anytime. It also makes a public record of every action, which builds trust among everyone involved.The project made the system super secure by using two checks to confirm users' identities. One is face recognition, and the other is an email otp verification this ensures that only authorized users can vote, and no one else can sneak in.

The SHA-256 cryptographic algorithm ensured the integrity of data and strengthened the prevention of duplicate votes, making sure that each voter can cast only one vote. The system is built to handle many users, especially during large elections. It won't break or have problems, ensuring a smooth voting process for everyone. The website where users vote is designed to be user-friendly. It's like using any other website, making it easy for all users to navigate and interact with the system. It's designed for both regular users and administrators, ensuring a simple and smooth experience for all.

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