



E-Voting System Using BlockChain Technology

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ABSTRACT—

This abstract presents the concept of utilizing blockchain technology for e-voting systems. With the aim of addressing the challenges associated with traditional voting methods, blockchain offers decentralization, immutability, and transparency, ensuring the integrity and security of the electoral process. By leveraging distributed ledger technology, e-voting systems built on blockchain provide a tamper-proof and transparent infrastructure, where each vote is immutably recorded and verifiable by all participants. This abstract highlights the potential of blockchain-based e-voting in revolutionizing democratic processes by enhancing trust, transparency, and the credibility of election outcomes.

Keywords- Blockchain Technology for Voting, Aadhaar, Paperless Voting, Malware, Security, Verifiability.

Introduction

The fundamental pillar of any democratic society is the ability of its citizens to exercise their right to vote freely and securely. Over the years, traditional voting systems have faced numerous challenges such as concerns about transparency, security vulnerabilities, and the need for centralized authorities. However, recent advancements in blockchain technology have opened new possibilities for transforming the way we conduct elections. By leveraging the decentralized and immutable nature of blockchain, e-voting systems have emerged as a promising solution to address these challenges and enhance the integrity and transparency of the voting process.

Blockchain, originally introduced as the underlying technology for cryptocurrencies like Bitcoin, is a distributed ledger that records and verifies transactions across multiple computers or nodes. It operates on the principle of decentralization, where no single entity has complete control over the network, ensuring that decision-making power is distributed among participants. Each transaction or vote recorded on the blockchain is time-stamped, cryptographically secured, and linked to the previous transaction, creating an unalterable chain of information.

The integration of blockchain technology into e-voting systems offers several advantages. Firstly, it eliminates the need for a centralized authority to oversee the voting process, reducing the risk of manipulation or tampering. With each vote being securely recorded on the blockchain, it becomes extremely difficult for any unauthorized entity to alter the results without detection. Secondly, blockchain-based e-voting systems enhance transparency by providing all participants with the ability to independently verify the accuracy of the recorded votes. Since the blockchain is publicly accessible, anyone can audit the transactions, ensuring that the results are accurate and reliable. Moreover, blockchain technology provides robust security measures to protect the privacy and anonymity of voters.

the integration of blockchain technology into e-voting systems offers a transformative solution to address the limitations of traditional voting methods. By leveraging decentralization, immutability, transparency, and enhanced security measures, blockchain-based e-voting systems have the potential to revolutionize the democratic process, ensuring integrity, trust, and verifiability.

PROBLEM STATEMENT

The current electoral process often faces various issues, such as voter fraud, vote manipulation, and other forms of malpractice. These issues arise due to the lack of transparency, accountability, and security in the traditional voting system. Electronic voting (e-voting) is proposed as a solution to overcome these issues by providing a more efficient and convenient voting process. However, existing e-voting systems have their own set of vulnerabilities, including hacking, tampering, and other forms of cyber-attacks that can compromise the integrity and accuracy of the election results. To address these concerns, blockchain technology has been proposed as a possible solution to create a more secure and transparent e-voting system.

2.1 PROJECT SCOPE AND LIMITATIONS

SCOPE

The scope of e-voting using blockchain is vast. It could be used to improve the security, transparency, and accessibility of voting in a variety of ways. For example, blockchain could be used to:

- Create a secure and tamper-proof voting system that is resistant to fraud.
- Make it easier for people to vote, regardless of their location or ability to travel.
- Increase voter participation by making voting more convenient and accessible.
- Reduce the cost of elections by eliminating the need for paper ballots and other traditional voting materials.

LIMITATIONS

There are also some limitations to e-voting using blockchain. One of the biggest challenges is that blockchain technology is still in its early stages of development. This means that there is a lack of research and development in this area, and there are still some kinks that need to be worked out. Additionally, blockchain systems can be complex and difficult to use, which could make them inaccessible to some voters. Finally, there is a risk that blockchain technology could be used to manipulate election results. This is a serious concern that needs to be addressed before blockchain can be widely adopted for e-voting.

LITERATURE SURVEY

Z.A. Usmani; Kaif Patanwala; Mukesh Panigrahi; Ajay Nair, We Proposed that the voting system is the backbone of every democracy and organization. The voting system has experienced many efficient changes in the past few decades. There are various voting techniques used such as Paper Ballot Voting System, E-Voting System also known as Electronic Voting System, Internet Voting System, SMS, and Miss Calls Voting System. In this paper, we have discussed various voting system and their advantages and disadvantages. The primary goal of this paper is to make the voting system multipurpose and make it work multiplatform on any operating system.

Adrià Rodríguez-Pérez, In This System We Proposed that Can the principle of secret suffrage be ensured when voters are offered the possibility to cast their votes using internet voting? With the steady introduction of different forms of remote electronic voting since 2000, it has become apparent that internet voting fails at providing the privacy guarantees offered by traditional paper-based voting systems. Against this assumption, the current proposal suggests reviewing the traditional configuration of the principle of vote secrecy. With this in mind, the proposal will: (1) assess current accepted standards on voters' anonymity for traditional and internet-based voting systems; (2) evaluate the core elements of lawful relaxations to the principle of secret suffrage, and especially those traditionally associated to different forms of remote voting, and assess whether they can be applied to internet voting; and (3) study how current technical developments in the field of elections (and more broadly, in the field of e-governance and e-democracy) may result in further relaxations of the principle of secret suffrage in the future. Overall, the goal of the proposal is to approach the principle of secret suffrage against the specificities of internet voting and, instead of evaluating electronic voting systems using traditional standards for voters' privacy and anonymity.

PAPER TITLE	AUTHORS	PAPER NUMBER	CONCLUSION
Blockchain and Aadhaar based Electronic Voting System	Amit Kumar Tyagi Terrance Frederick Fernandez Aswathy S U	IEEE Xplore Part Number: CFP20J88-ART; ISBN: 978-1-7281-6387-1	Developing Tamper proof electronic voting systems and recognize the legal and technical drawbacks of using Block Chain As a Service (Baas)to implement such systems.
Aadhaar Base Voting System Using Blockchain Technology	Ms. Sayali B. Khatal, Ms. Vaishnavi R.Musmade , Ms. Trupti A. Waman, Ms. Shubhada B. Shinde, Mr. Narayan B. Vikhe.	IJSDR Volume 6 Issue 5 May 2021	Aadhar Card voting system introduced by utilizing VID (Virtual ID) to it.

Decentralized E-Voting System Using Blockchain	Dr S.Sekar , C.Vigneshwar, J.Thiyagarajan , V.B.Soorya Narayanan, M.Vijay	IRJET Volume: 07 Issue: 03 Mar 2020	Block Chain digital vote casting device that utilizes clever contracts to allow cozy and fee efficient election even as guaranteeing citizen privacy.
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EXISTING SYSTEM

Blockchain technology has been widely recognized as a potential solution to address the limitations of traditional voting systems. Existing systems leverage blockchain's decentralized and transparent nature to provide secure and tamper-proof e-voting platforms. These systems utilize smart contracts to automate and enforce the voting process, ensuring accuracy and integrity. Votes are recorded on the blockchain, making them immutable and verifiable by participants. Notable examples include projects such as Democracy Earth's Liquid Voting, Follow My Vote, and various academic research prototypes. These existing systems demonstrate the feasibility and potential of blockchain in enhancing security, transparency, and trust in e-voting, laying the groundwork for further advancements in this field. There have been a few primary drawbacks within the present system. Few of them are listed below:

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- Less User Friendly: The existing system is not user friendly because the retrieval of day-to-day activities data/records is very slow, and records are not maintained efficiently and effectively.
- Lengthy time: Every work is done manually so we cannot generate report in the middle of the session or as per the requirement because it is very time consuming.

PROPOSED SYSTEM

This segment makes use of Blockchain and Aadhaar to provide our new version for free, paperless and open balloting nationwide. As mentioned above, many troubles are faced through the modern balloting machine due to the fact the centralized government are with inside the fee for managing and resolving issues. But, dire straits take place if those responsible government attempt to meddle with the balloting. For that, electronic balloting structures (popular without Blockchain) are suggested however there's a danger for an outside or inner attacker to alternate or tamper the information bases (that's centralized or decentralized). Hence, to keep away from such crucial cases, it is required to suggest a machine, which have to be distributed, decentralized and open to public all of the time and get right of entry to it, at each time and anywhere. Such structures can construct agree with in residents of a kingdom and the elected government. Below are the steps about how our system would work successfully without any interruption: -

- Firstly, as a user if anyone opens our website it will show a homepage regarding each, and every small detail mentioned of the project such as how to vote or the about us section and many other sections.
- Secondly if the user isn't registered, he/she must register using his/her name, phone number, age and date of birth.
- After registering successfully, the user will be thrown to the log in page where he/she must enter the correct phone number which was entered at the time of registering.
- Before logging into the system, we have kept a validation of the Age i.e., the user must be above 18 and if not, then the user registration can't take place inside the system.
- To log in successfully the user must enter the number correctly, as we have kept a security function i.e., whenever the user enters his/her phone number, an OTP will be sent to his/her registered phone number to confirm the user is registered successfully or not.
- After log in is done successfully, the user will be thrown to the homepage again indicating the vote button (now enable) to caste his/her vote into the system.
- We have also kept the face recognition system at the time of registering as well as at the time of vote, as to verify that it is the same user that has registered back then.
- Here the user can be able to see different candidate with their respective symbols and the user can easily press the button where he/she wants to vote.
- Once the voting is done the user can easily logout from the system and the vote is then stored in the block which we have implied in the system.

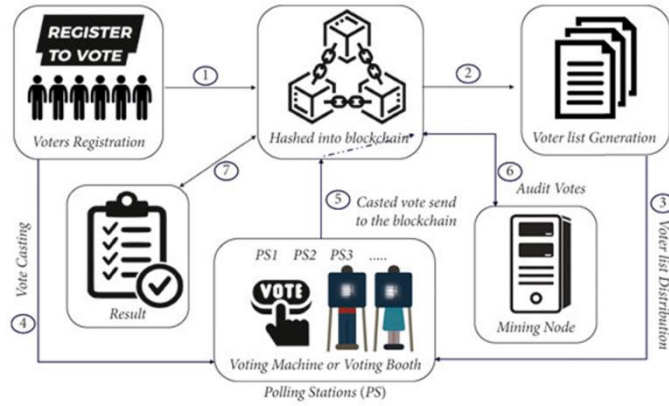


Fig: - System Architecture

DIAGRAMS

Below diagram shows the data flow i.e., in which manner will the data flow in our system.

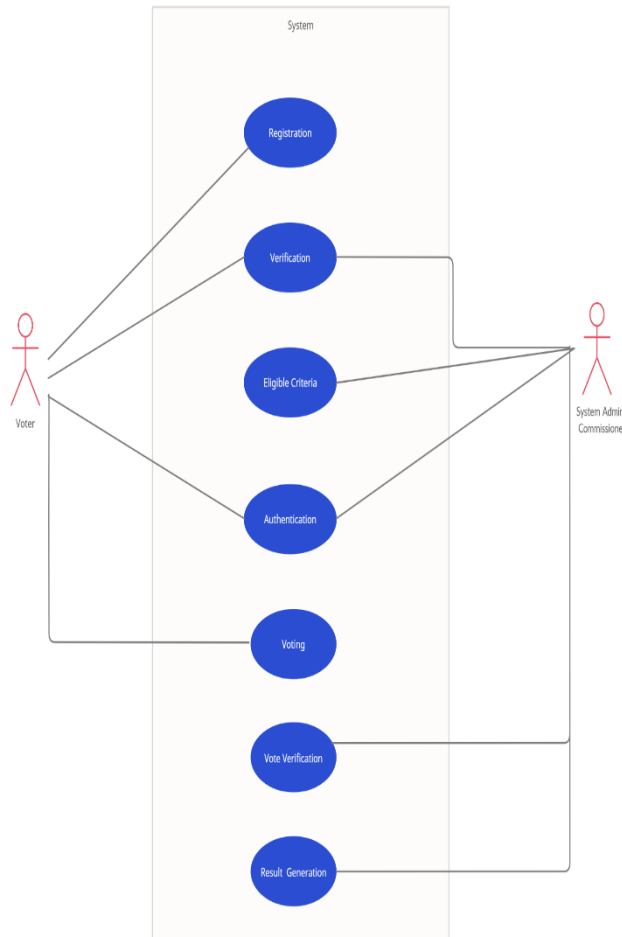


Fig: - UML DIAGRAM

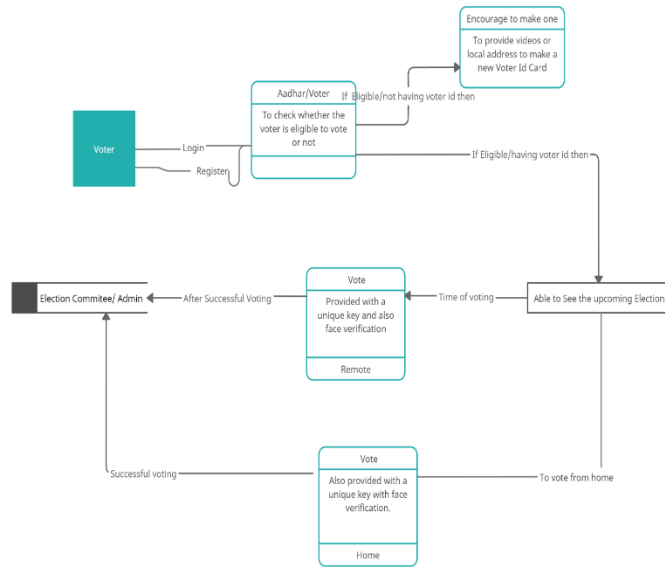


Fig:- DFD Level 0

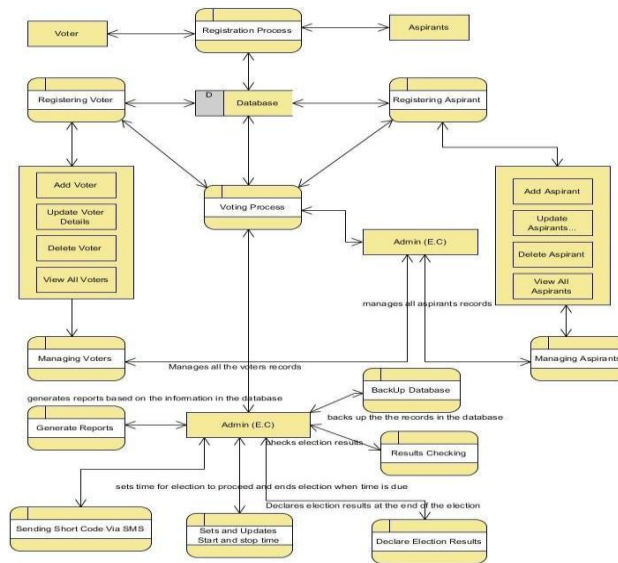


FIG: - DFD LEVEL 1

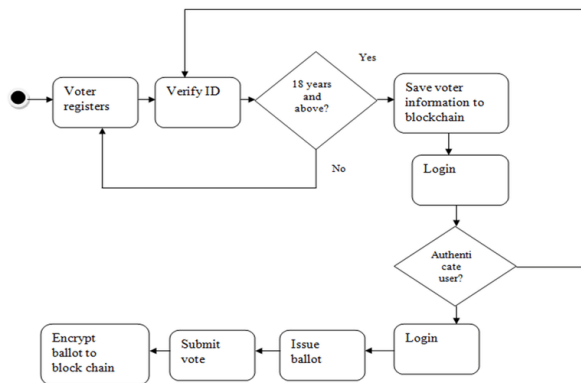


FIG: - ACTIVITY DIAGRAM

RESULTS OF OUR PROJECT

Below are the Result pages of our project.

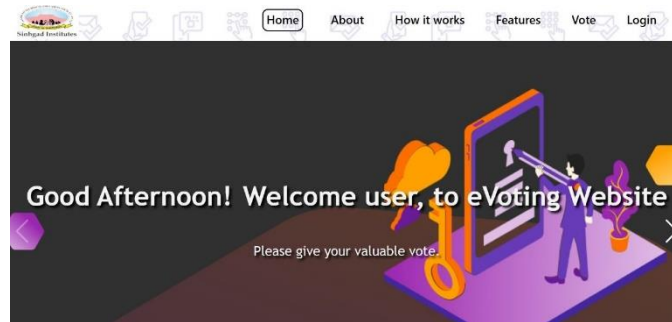


Fig 1: - FIRST PAGE



Fig 2: - Where one can REGISTER by clicking the button Downside.

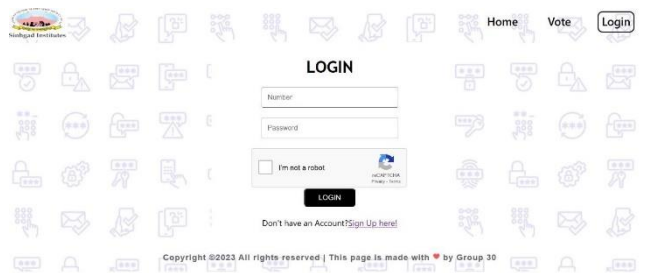


Fig 3: - LOGIN PAGE

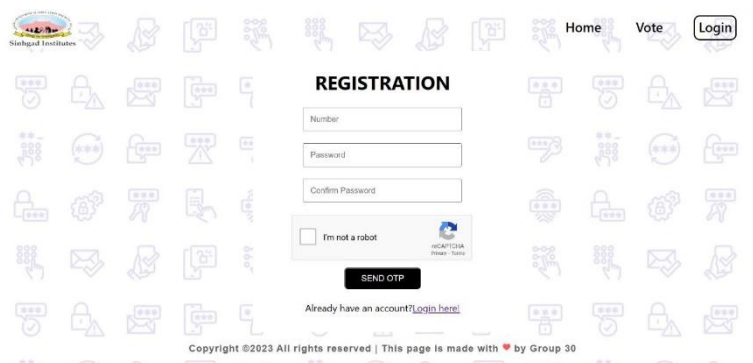


Fig 4: - REGISTRATION PAGE

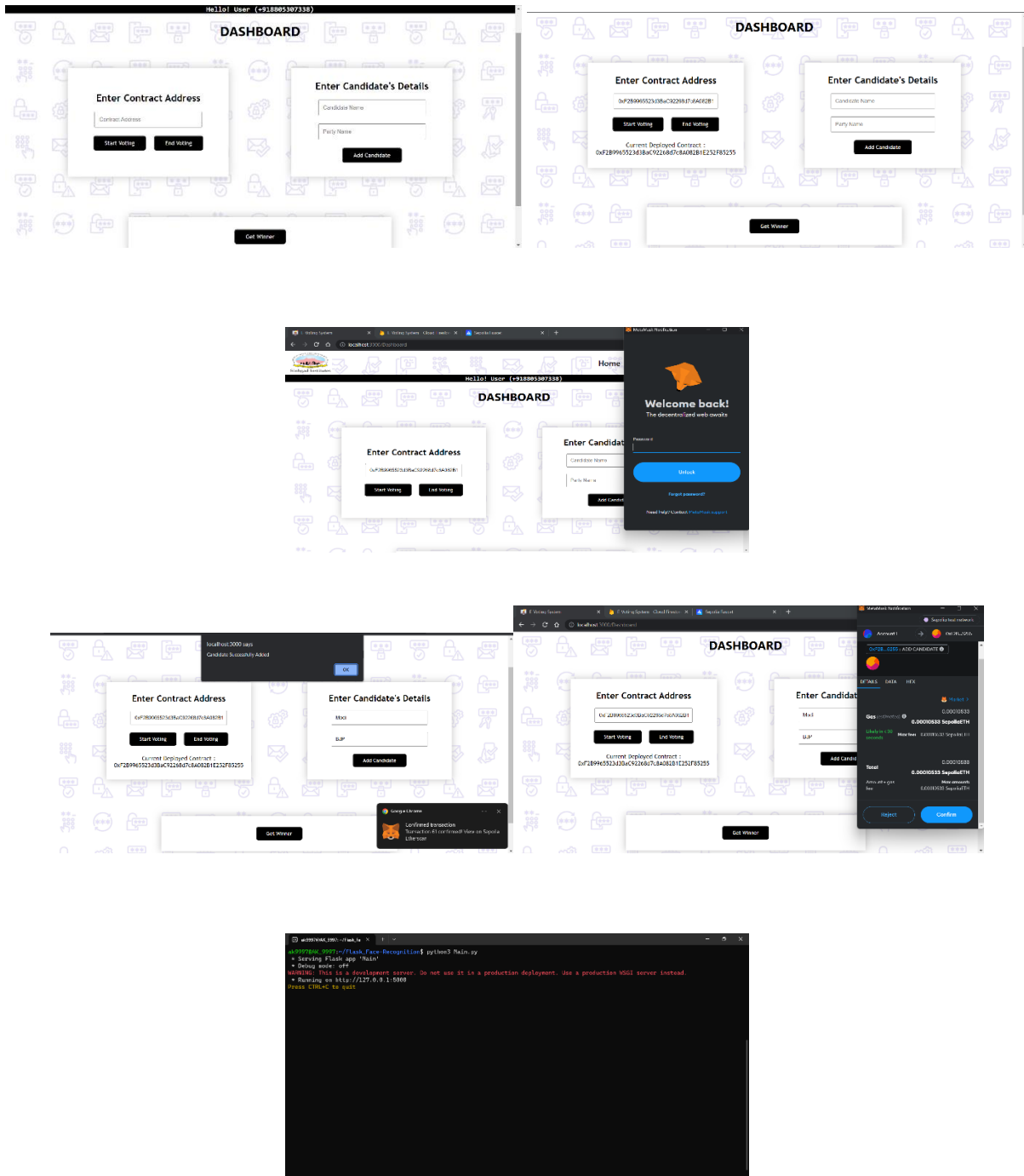
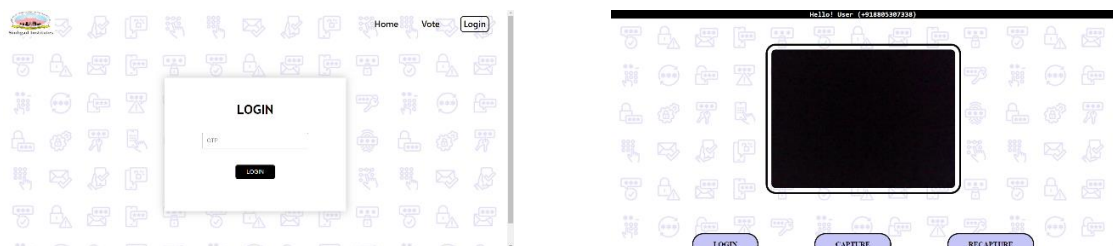


Figure: - Coding snippet



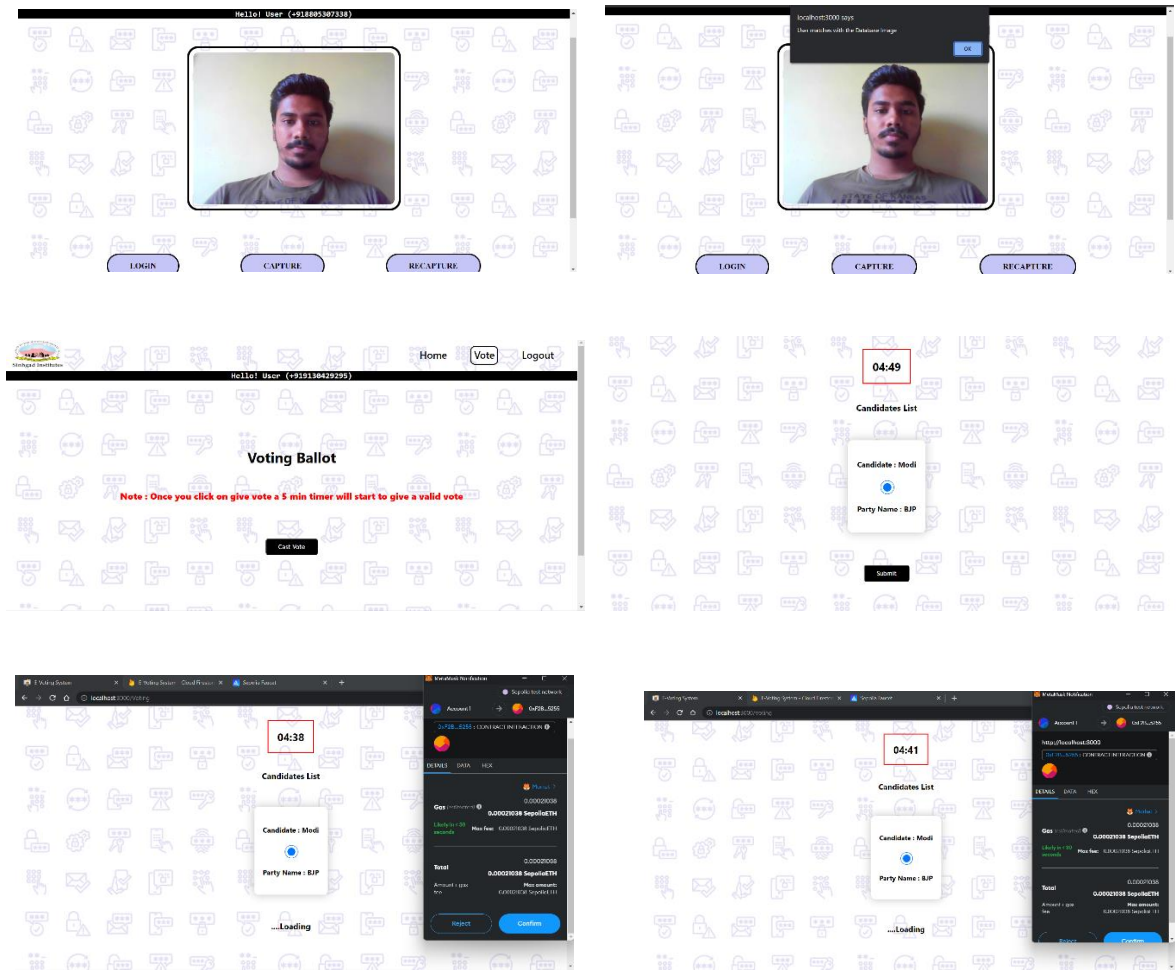


Fig: - Voting Ballot(User's View)

CONCLUSION

In conclusion, this implementation paper has presented the design and development of an e-voting system utilizing blockchain technology. Through the implementation process, it has been demonstrated that blockchain provides a secure, transparent, and tamper-resistant infrastructure for conducting elections. The integration of smart contracts has automated and enforced the voting process, ensuring accuracy and integrity.

The utilization of blockchain in e-voting systems offers several advantages over traditional methods. The decentralized nature of blockchain eliminates the need for a centralized authority, reducing the risk of manipulation and fraud. The immutability of the blockchain ensures that votes are recorded and stored securely, providing a reliable and transparent audit trail.

FUTURE SCOPE

The use of blockchain technology in e-voting systems offers several benefits such as increased transparency, security, and immutability.

Linking application with Government Aadhar System (Digi locker System) and government voting system data.

Local languages can be included which will play a vital role for people living in rural areas as well as uneducated people.

A Candidate's earlier social work and candidate qualifications can be added for a voter to have better choice.

A complaint system can be included, that allows the people to file complaint against a candidate.

Use of honeypots.

More accessible to people with disabilities, such as visual or hearing impairments. This could lead to greater participation in the voting process by individuals who may have previously been excluded due to physical limitations.

Overall, the future of e-voting systems using blockchain technology looks promising, with the potential to improve the security, transparency, and accessibility of the voting process. However, it will be important to address the challenges of scalability and regulatory issues to ensure the widespread adoption of this technology.

Acknowledgment

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