DOMAIN : BLOCKCHAIN

PEC HACKS

Online Voting System using Blockchain

EVOCORE

Problem Statement

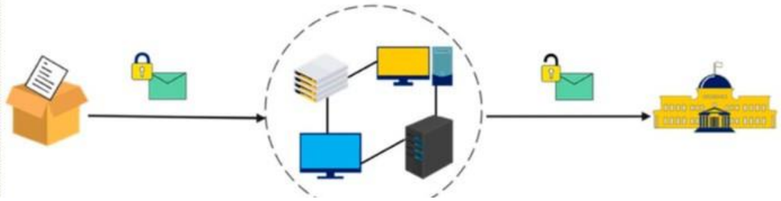
Elections are the foundation of democracy, but the current voting system in India faces significant challenges. Citizens abroad often struggles to participate, relying on outdated and insecure method like postal voting, which are not entirely trustworthy. From instances of vote manipulation to the misuse of votes by unauthorized individuals, the integrity of the process is frequently at risk. These challenges Jeopardizes the very essence of their representation, leaving many Indians unable to cast their votes securely.

To ensure that every votes count, and counts only once, a secure and reliable voting solution is needed – One that reflects the importance of each individual's role in shaping the future of their nation.

Solution

Significance:

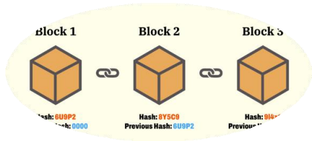
- political parties and candidates benefit from increased engagement, fostering stronger connections with constituents, advancing democracy, efficiency, and trust in the electoral process.
- provides convenient, accessible participation, reducing errors and boosting efficiency for election authorities.
- They offer cost savings, heightened security, and transparency for government.



This project aspires to develop a robust online voting system using blockchain technology, to ensure security, accessibility and make sure that all the potential voters cast their vote.

Upon completing the KYC (Know Your Customer) verification process, the voter receives an OTP (One-Time Password) after their entered details align with the government's recorded information. This OTP is then documented on the blockchain, effectively preventing unauthorized access and guaranteeing identity verification without any uncertainty.

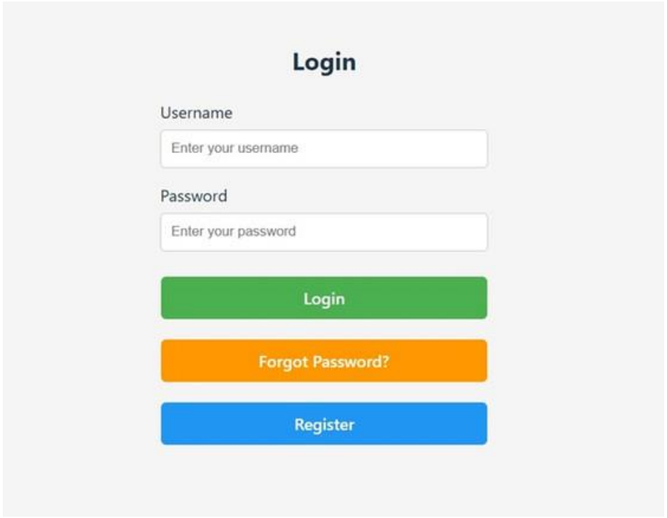
As an additional safety measure, voters can enhance security by utilizing fingerprint or facial recognition. This involves registering their face during the voting process, and the system compares it with the facial or fingerprint data stored in their Aadhar card for authentication.

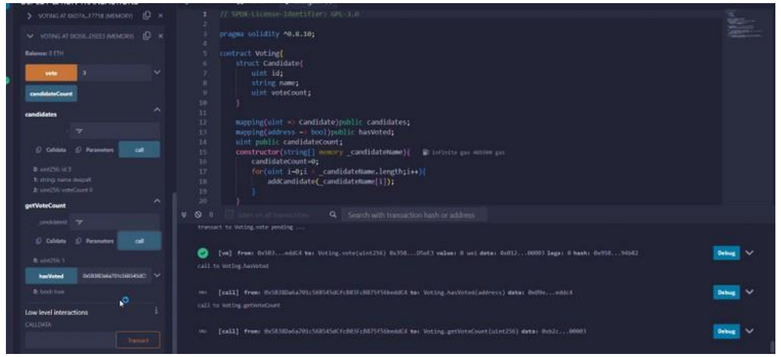


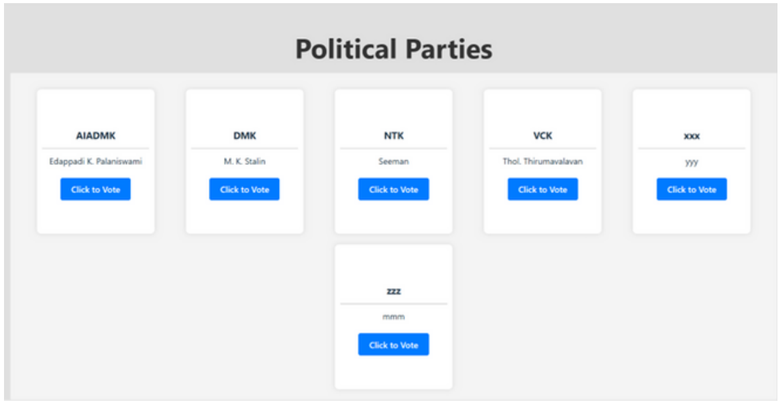
Implement privacy-preserving techniques, such as zero-knowledge proofs, to protect voter anonymity. This allows voters to cast their votes without revealing their preferences publicly.

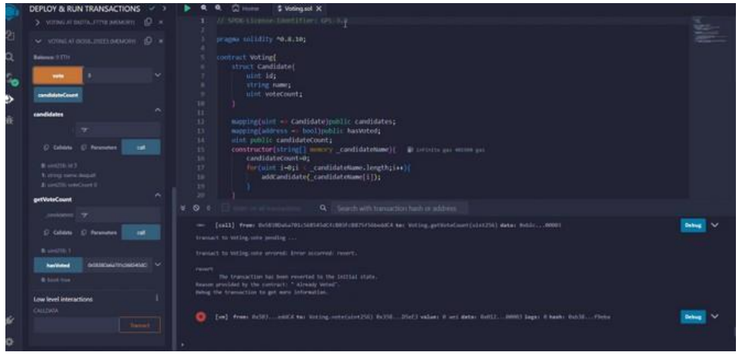
Store votes as immutable records on the blockchain which cannot be altered or deleted, enhancing the integrity of the system.

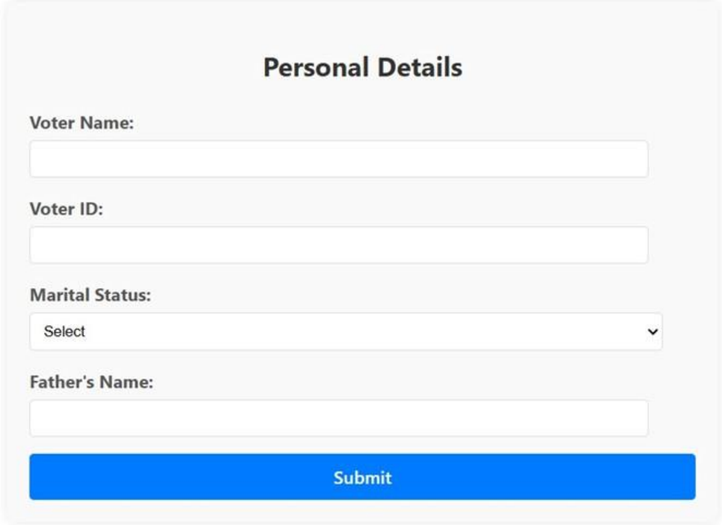
Design an intuitive and accessible user interface for voters. Ensure compatibility with various devices to encourage widespread participation.

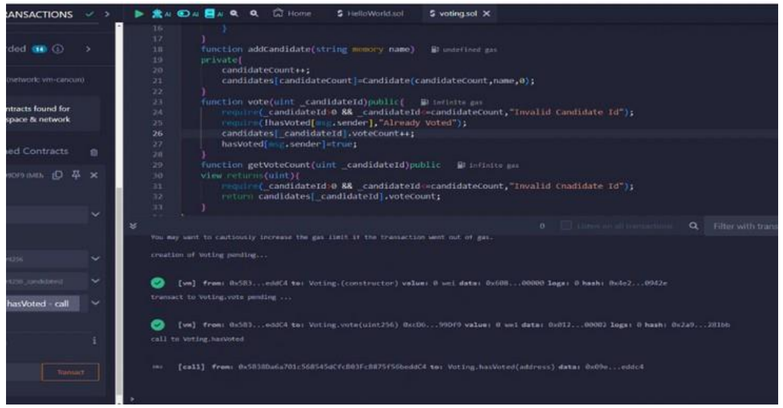












LINK for outputs:
https://voteoplink.tiiny.site

Dependencies

Digital Literacy and infrastructure

Voters need access to basic internet and smartphones to participate. Both voters and election officials will require awareness about this new system

Legal Approvals

Legal frameworks and government support are essential. Reliable integration with government databases for KYC verification and biometric data (like Aadhar).

Show Stopper

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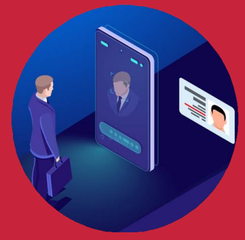
Scalability Challenges

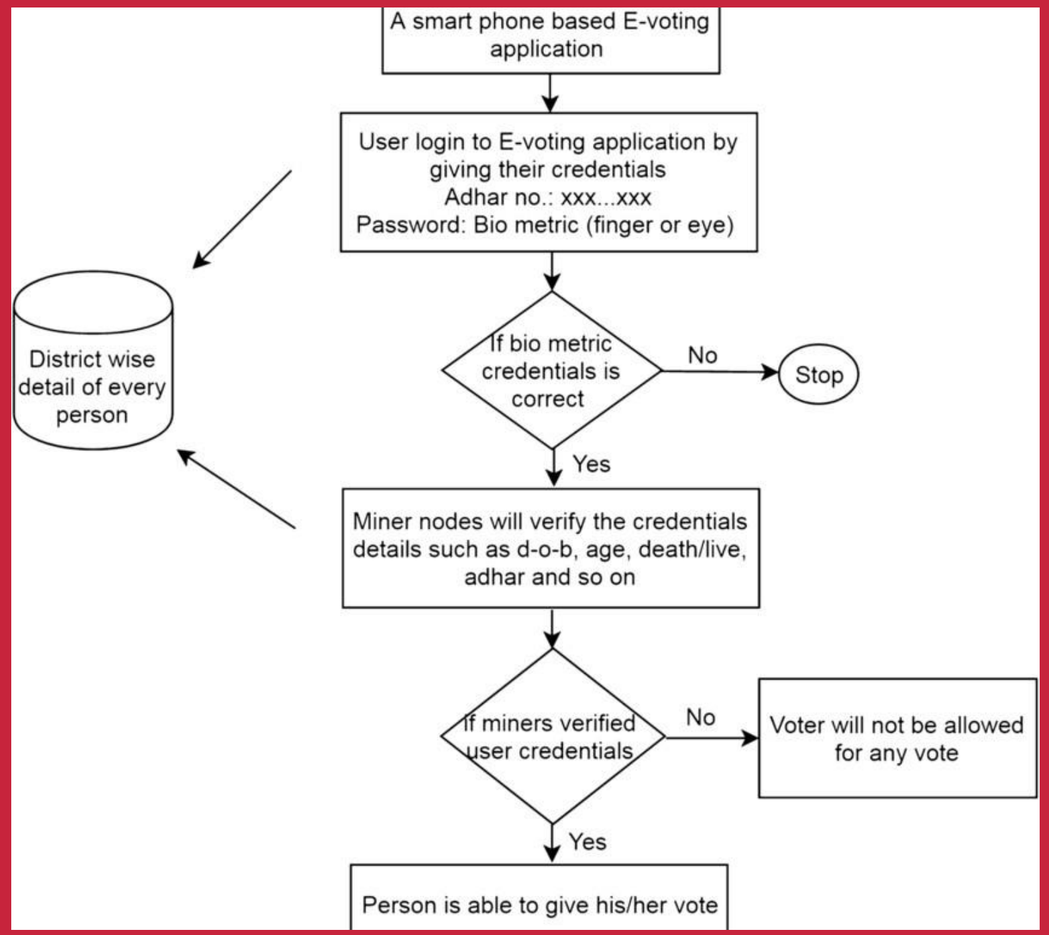
System scalability-Handling a large number of voters simultaneously during peak voting periods without causing system slowdowns or crashes.



Security Breaches

Technical difficulties in ensuring seamless facial or fingerprint recognition, which could lead to authentication issues.

BLOCK DIAGRAM



Business Model Canvas

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SUPPLIERS

Developing an online voting system with blockchain and two-factor authentication to boost security, accessibility, and voter participation in India.

COUSTOMERS/ MARKETS

The primary customers for online-based voting systems using blockchain are governments, electoral commissions, and organizations conducting secure and transparent elections. Market demand is driven by the need for efficient, tamper-proof voting solutions, ensuring trust, integrity, and accessibility in electoral processes worldwide.

KEY ACTIVITIES

- To ensure its functionality, security, and integrity.
- Prevent duplicate voting which involve KYC (Know Your Customer)procedures.
- User Education and Training

PROCESSES

- Voter Registration
- Ballot Creation and Distribution
- Voting Process
- Vote Tallying and Results Verification
- Security Measures

PRODUCTS / SERVICES

The focus remains on refining the online voting system's security and accessibility features while potentially expanding into new markets to promote democratic participation

FINANCIAL STRUCTURE

The financial structure should be initially cost-center driven for system development and implementation, transitioning later to profit-center as revenue streams mature from widespread adoption.

ASSETS / INFRASTRUCTURE

Server farms with robust security measures and redundant power supply, along with high-speed network connections and data centers for secure storage, are essential infrastructure components for supporting the online voting system.

SYSTEMS / DATA

Blockchain technology for decentralized identity verification and tamper-resistant voter registration. Aadhar database integration for two-factor authentication via phone numbers.

RESOURCES

The project will require blockchain developers, cybersecurity experts, UI/UX designers, and legal advisors. Traditional polling station staff may become redundant due to the shift towards online voting and decentralized identity verification.

TECH STACK

HTTP

HTTP (Hypertext Transfer Protocol) can be used as the communication protocol between the voting machine and the election application server. The voting process can be initiated by a secure HTTP connection, somewhere the choice of voters and the secure transmission of their information

Ethereum

ETHEREUM

Ethereum is a blockchain platform that enables self-driving smart contracts that directly written in code. It allows smart contract-based DApp development and came up with ERC-20 tokens that had predefined rules. This capability enhances conversations exchanges by enabling cross-chain asset exchanges between different platform blocks. Furthermore, Ethereum ensures that user data is safely stored on its network.

JavaScript

JavaScript

JavaScript is a versatile programming language used for web development, known for client-side verification to ensure that data provided by voters meets certain criteria before being uploaded to the blockchain, which blocks errors and malfunctions

TensorFlow

TensorFlow

Use of web browser to capture images of candidates. Pre-processing of images using tensorFlow to ensure accuracy in size, color and quality. Use pre-trained models of tensorFlow for face recognition and recognition.

Browser Extension Framework and APIs

Utilize Chrome Extensions API or Firefox Add-ons SDK to develop custom extensions that control tab behavior, notifications, and other user activities. Implement Page Visibility API, Focus Management APIs, and Notification API to detect tab switching, manage focus, and block or mute notifications during voting sessions, ensuring a secure and uninterrupted voting experience.

CSS

CSS was mainly used for front-end purposes. It will address the design, process and presentation of the voting process to users, providing an intuitive and visual experience. CSS can be used to create elements such as buttons, forms, tables, all page layouts, while blockchain will handle voting recording and verification.

FUTURE ENHANCEMENT

- Enhanced Voter Privacy: We will implement facial and fingerprint recognition technology to ensure the security and integrity of the voting process. This will add an extra layer of protection against fraud and unauthorized access.

- Real-Time Vote Tracking: A live voting percentage dashboard will be introduced, allowing participants to monitor the rise and fall of candidates in real-time. This will create a more transparent and engaging voting experience.

- Unalterable Vote Recording: Utilizing blockchain technology with sharding, we will establish a system where votes cannot be modified or tampered with after being cast. This will guarantee the accuracy and reliability of the election results

EVOCORE:

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