VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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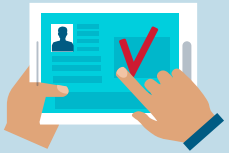

Project Synopsis on

BLOCKCHAIN-BASED VOTING SYSTEM

Submitted in partial fulfilment of the requirement for the award of Bachelor Degree

In

Computer Science and Engineering

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01.Introduction

A **blockchain-based voting system** is a digital platform that uses blockchain technology to ensure **secure**, **transparent**, and **tamper-proof** elections. It enables **immutable vote recording**, **real-time verification**, and **decentralized consensus** using **cryptographic encryption** and **smart contracts**, reducing fraud and eliminating the need for a central authority. Ideal for **government, corporate, and online voting**, it ensures trust and fairness.

02. Problem Statement

Traditional voting systems face issues like **vote tampering**, **lack of transparency**, **security risks**, and **accessibility challenges**. EVMs and online systems are vulnerable to **hacking** and **centralized control**, leading to **mistrust** and **disputes**. Manual vote counting is **slow** and **error-prone**. There's a need for a **secure**, **decentralized**, and **verifiable** system to ensure **fair and trustworthy elections**.

03. Aim

To build a **secure**, **transparent**, and **tamper-proof** digital voting system using **blockchain**, ensuring **voter anonymity**, **real-time verification**, and **immutable records**. The goal is to eliminate **fraud**, **hacking**, and **inefficiencies**, while enabling **remote voting**, **faster counting**, and enhancing **trust** in election outcomes.

04.Scope

- **Security & Integrity**: Encrypted, tamper-proof voting records
- **Transparency & Trust**: Verifiable and auditable process
- **Decentralization**: No central point of control or failure
- **Anonymity & Privacy**: Confidential yet traceable votes
- **Remote Access**: Global participation, higher turnout
- **Efficiency**: Faster results, lower costs, fewer errors
- **Smart Contracts**: Automated validation and tallying
- **Scalability**: Adaptable for government, corporate, and online voting

05. Objectives

- **Secure Voting**: Ensure tamper-proof vote recording
- **Voter Authentication**: Enable safe and simple registration
- **Decentralized Platform**: Eliminate central control, build trust
- **Privacy & Anonymity**: Protect voter identity and choices
- **Real-Time Results**: Live vote tracking with full transparency
- **User-Friendly UI**: Design an accessible and intuitive interface

06. Requirement Specifications

Hardware:

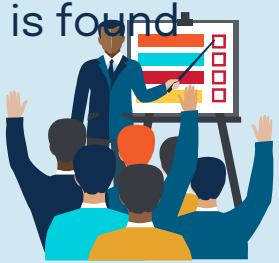
- Intel i3 / Ryzen 3 or higher
- 4GB RAM (8GB recommended)
- 128GB SSD or more

Software (Tools & Technologies Frontend):

- **Blockchain**: Ethereum
- **Frontend**: HTML, CSS, React.js
- **JavaScript Backend**: Solidity (Smart Contracts),node.js
- **Web3.js Testing**: Ganache
- **Truffle Wallet**: MetaMask

07. Methodology

- **Vote Casting**: Voter submits vote after authentication
- **Validation & Encryption**: Invalid votes rejected; valid ones encrypted
- **Blockchain Storage**: Encrypted votes added immutably to the blockchain
- **Smart Contract Tallying**: Automated, unbiased vote counting
- **Result Evaluation**: Declare winner or trigger runoff if needed
- **Runoff Voting**: Repeat until a clear winner is found



08. Flowchart

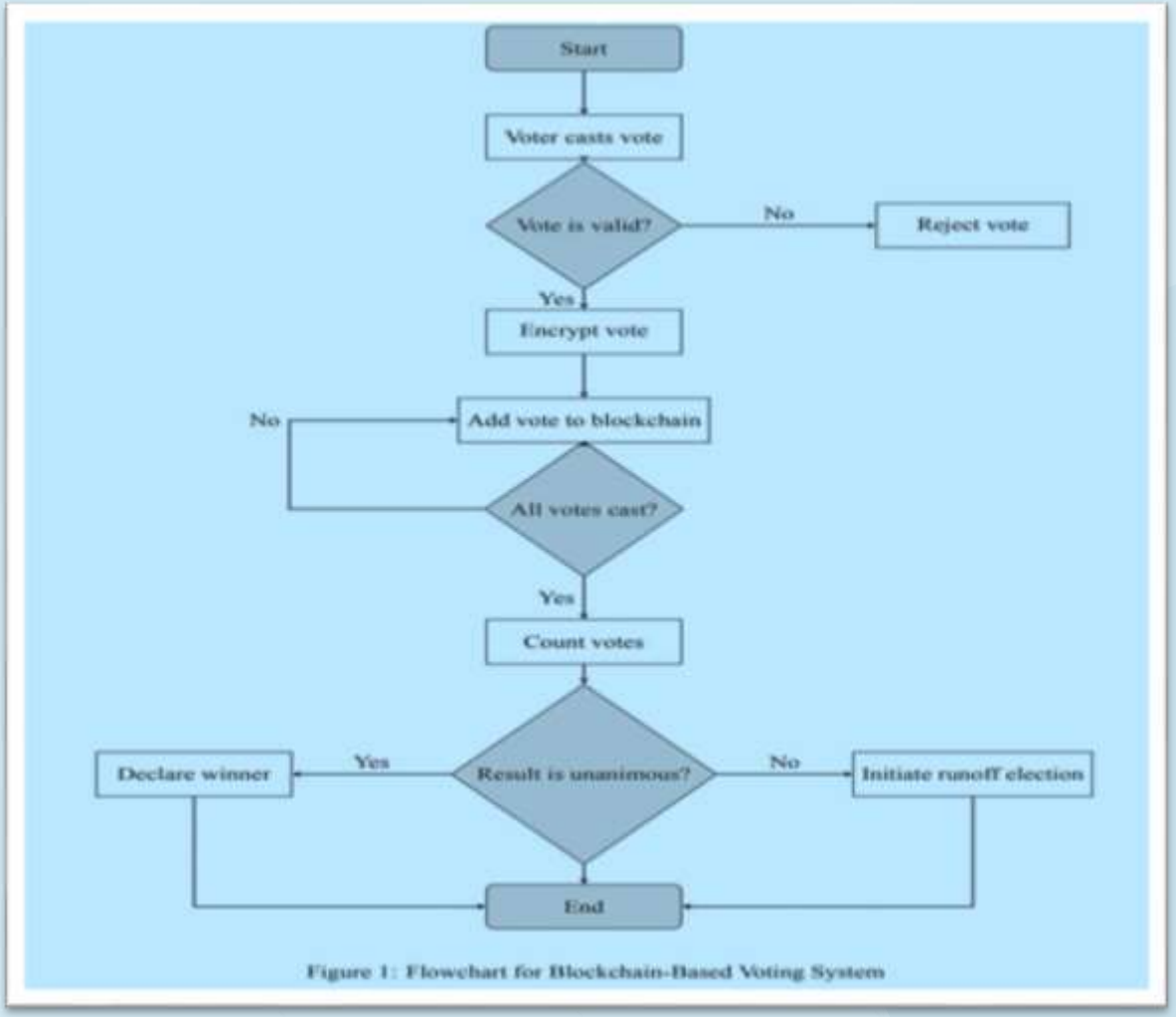


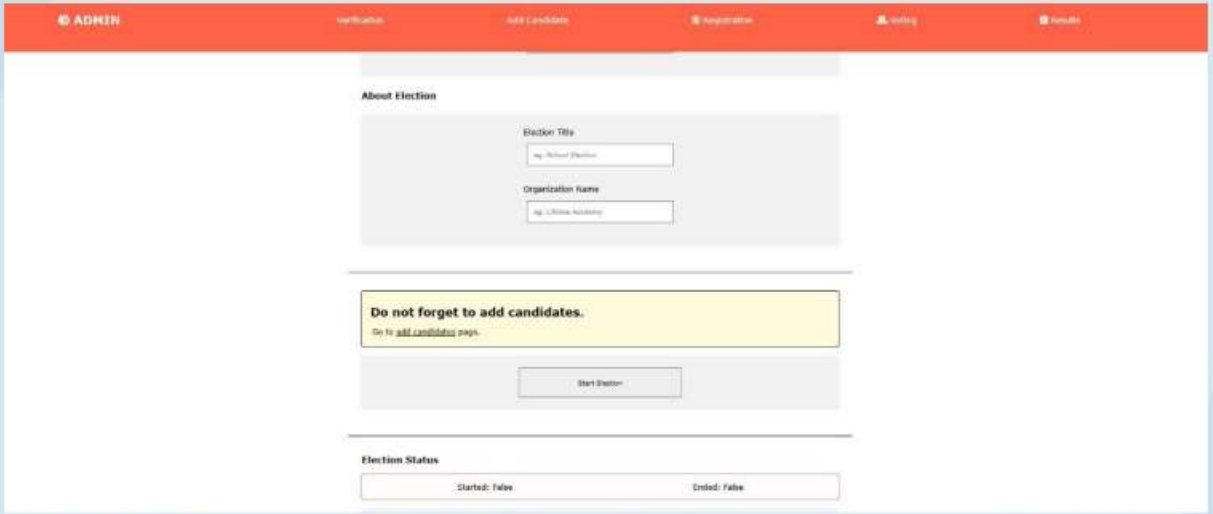
Figure 1: Flowchart for Blockchain-Based Voting System

09. Application

Blockchain-based voting can be used in **government elections**, **corporate decision-making**, **university elections**, **online polls**, **community voting**, and **political party primaries** to ensure secure, transparent, and tamper-proof results.

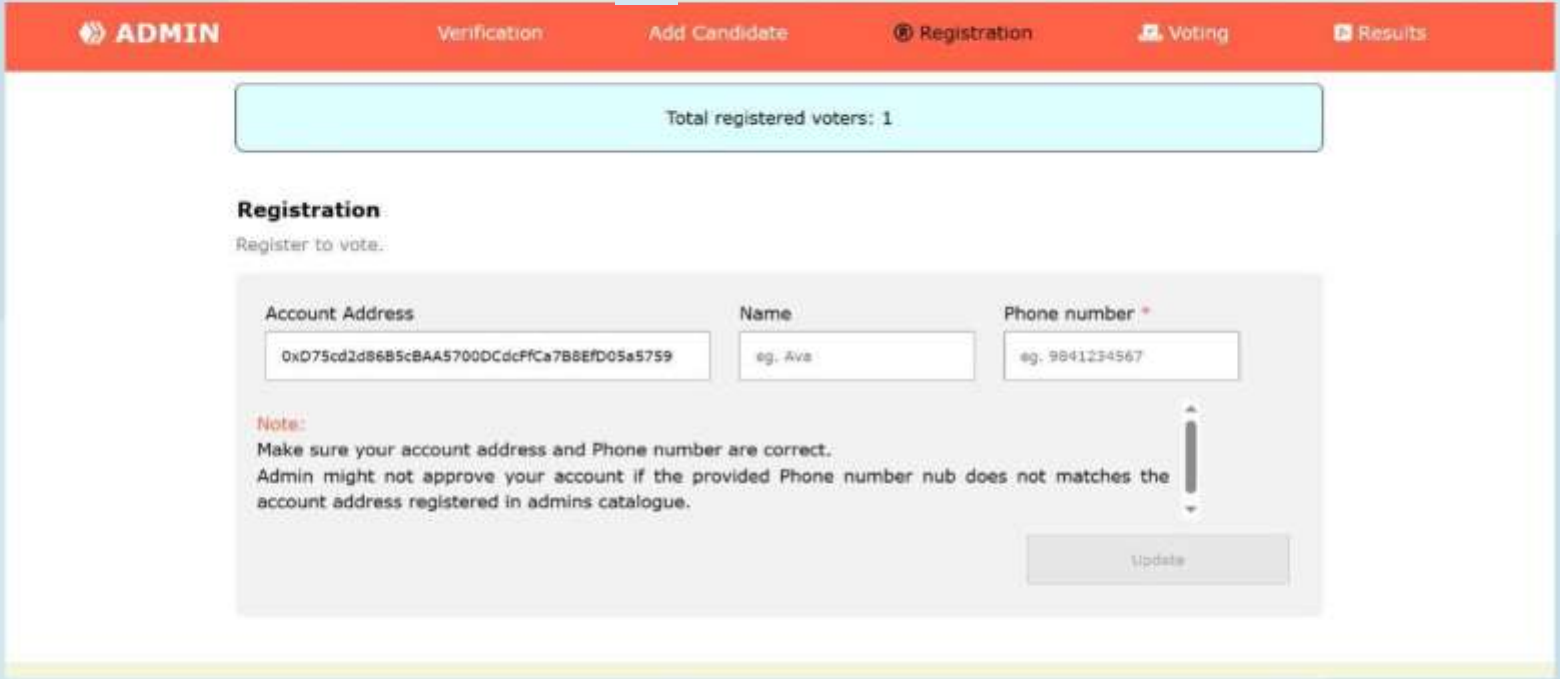
10. Implementation

Figure 6.1: About Admin



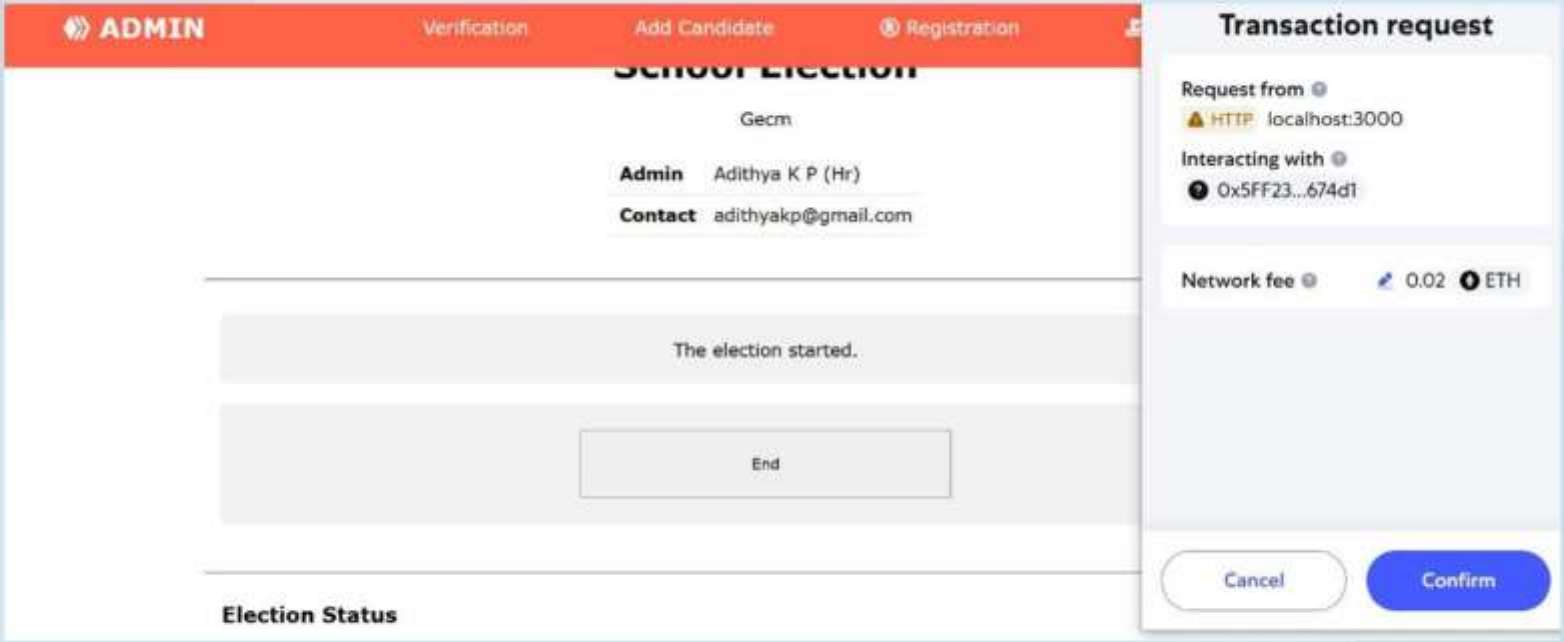
"About Admin" section displays the administrator's account address and provides fields to enter their full name and email. It also shows a notification indicating that the election has not yet been initialized, prompting the admin to set it up.

Figure 6.2: User Registration



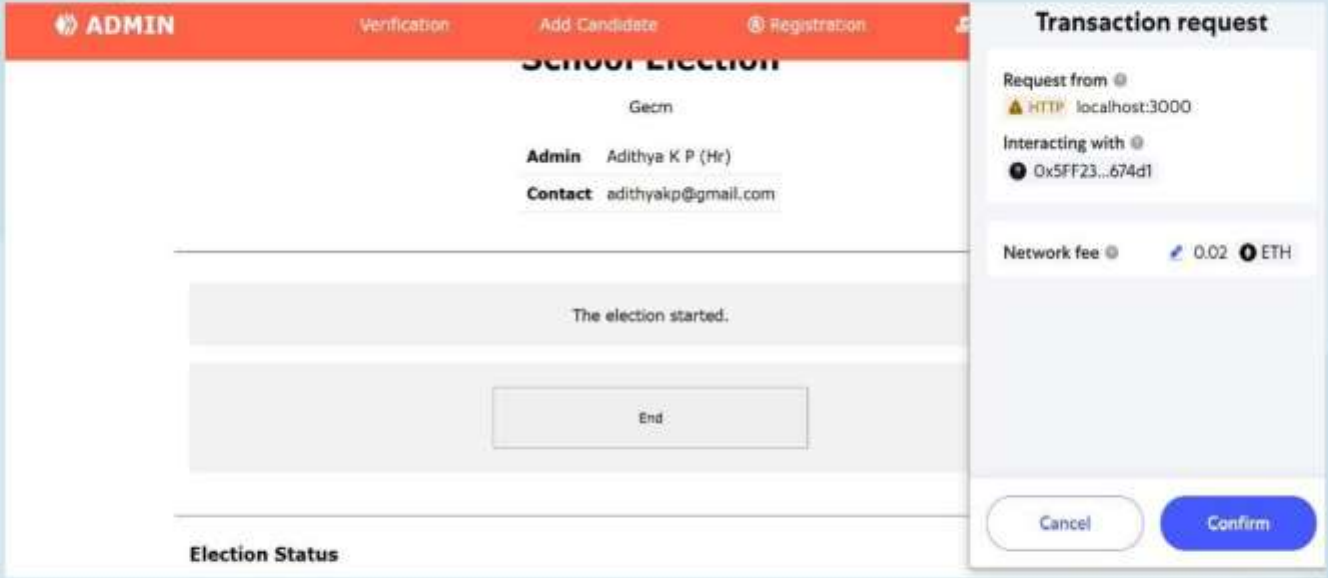
User register with account addresss,name,Phone number

Figure 6.3: Home Page



It represents Home page

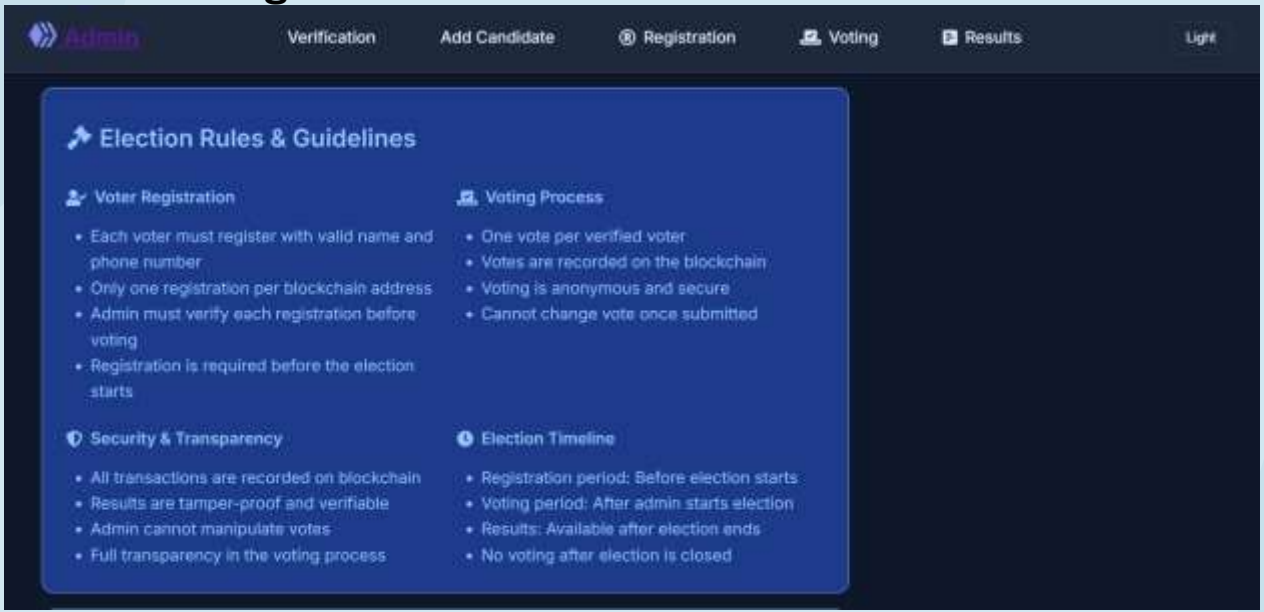
Figure 6.4: Election End



The **"Election End"** section allows the admin to officially end the election process. Upon clicking the "End" button, a blockchain transaction is initiated, requiring confirmation along with a network fee to finalize and record the election's conclusion

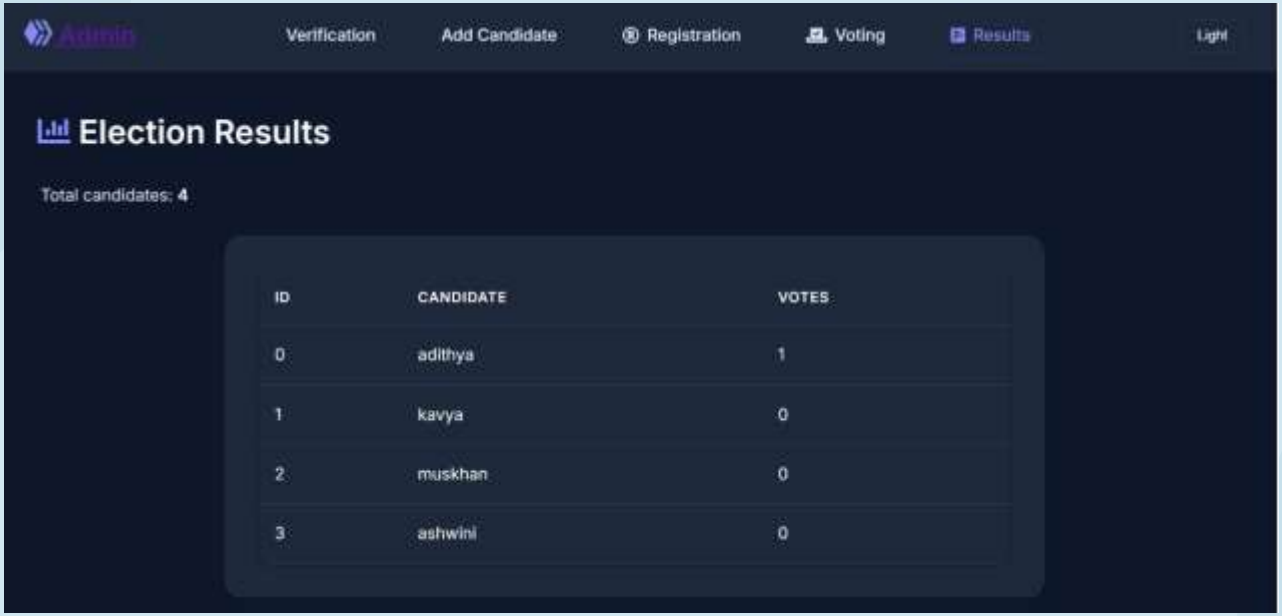
11.Results

Figure: Election Rules & Guidelines



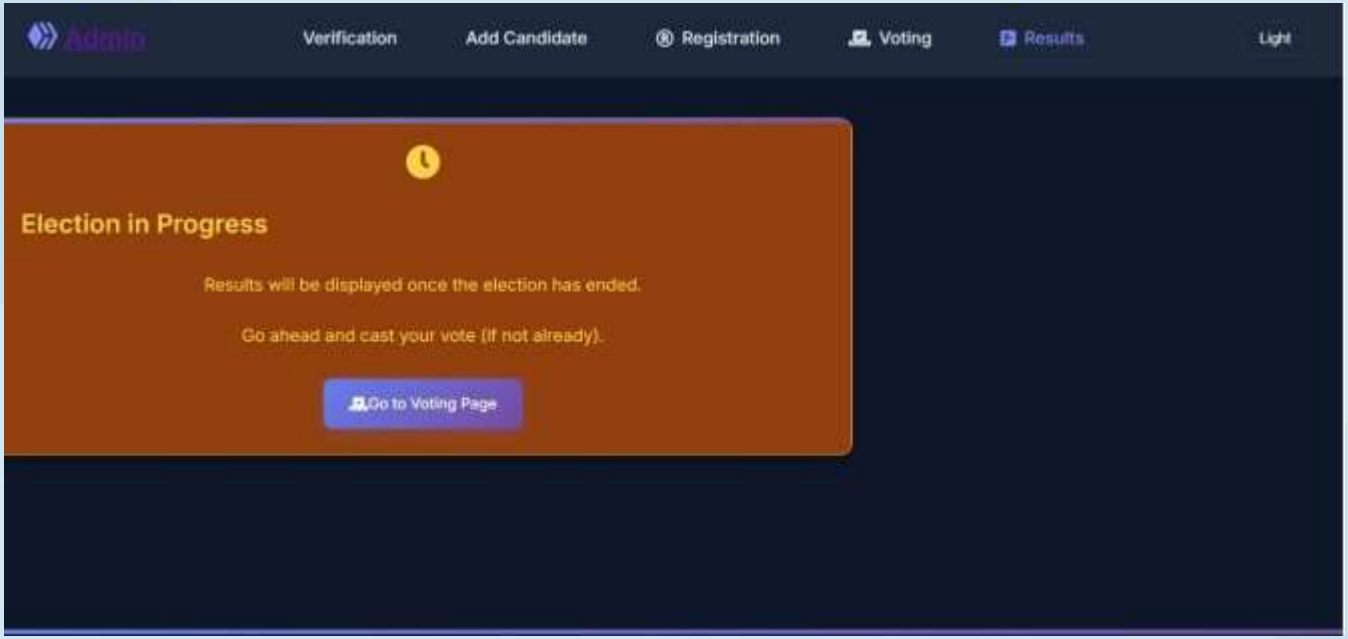
" **Election Rules & Guidelines**" This page explains the rules of voter registration, secure voting process, and blockchain-based transparency. It highlights one-vote-per-user policy, tamper-proof results, and clear election timelines to ensure fair and trustworthy elections."

Figure : “Election Results”



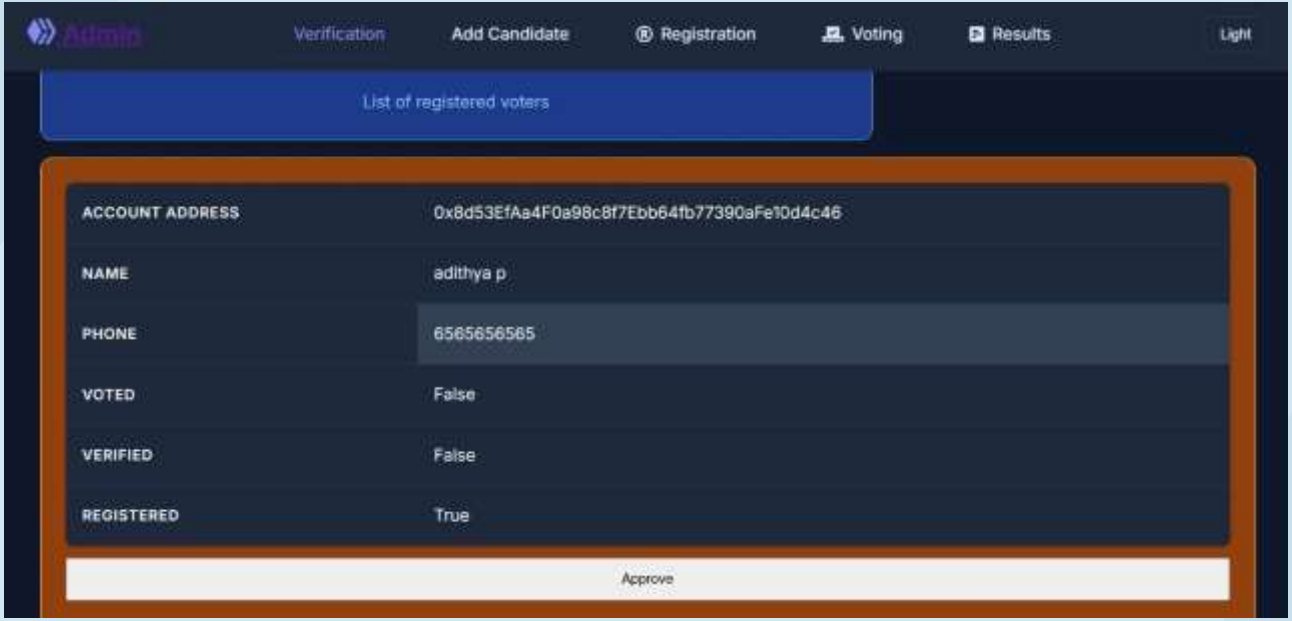
“**Election Results**“ This page displays the final vote count for each candidate in a transparent manner. Results are recorded on the blockchain, ensuring accuracy, security, and tamper-proof verification.

Figure : “Election in Progress”



“Election in Progress” This page indicates that the election is currently active and results will only be visible after completion. It allows verified voters to cast their votes during the voting period."

Figure : Voter Verification



“Voter Verification” This page allows the admin to verify registered voters before participation. It displays voter details like account address, name, phone, and status, ensuring only verified users can cast their votes."

12. Work Done So For:

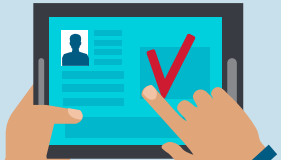
- Add candidate functionality (managed by Admin)
- Implement voter registration (by Admin)
- Enable voter verification process
- Develop voting interface for users
- Create result interface for displaying outcomes
- Improve overall UI/UX design for better user experience

13. Work to be done

- Voter Registration Fault Correction
- UI & UX Enhancements
- Validation in Every Registration Page

13. Conclusion

A **Blockchain-Based Voting System** offers a **secure**, **transparent**, and **tamper-proof** solution to modern electoral challenges. By leveraging **decentralization**, **encryption**, and **smart contracts**, it ensures **voter privacy**, **real-time verification**, and **trustworthy results**. This technology has the potential to **revolutionize democratic processes**, making elections more **efficient**, **inclusive**, and **credible** worldwide.



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Thanks!