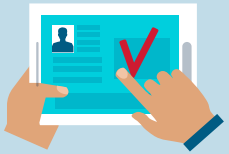
VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JNANA SANGAMA", BELAGAVI - 590018



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

What it is: A digital platform using blockchain to ensure a **secure, transparent, and tamper-proof** process.

Key Features:

•**Immutable Vote Recording:** Every vote is **permanent and unchangeable**.
•**Real-time Verification:** Builds trust by allowing result verification.
•**Decentralized Consensus:** Eliminates the need for a **single central** authority.
•**Our Project:** A blockchain-based voting system designed specifically for **local elections**.
•**The Goal:** To reduce fraud, ensure fairness, and build complete trust in our local election results.

02. Problem Statement

- **The "Black Box" Problem:** The voting process is opaque, preventing voters from verifying their vote.
- **Centralized Trust:** The system's integrity relies entirely on a single central authority, not a verifiable process.
- **Lack of Public Audits:** Real-time auditing by the public is difficult, leading to potential disputes.
- **Accessibility Barriers:** Physical polling stations and rigid times create hurdles, leading to low voter turnout.

03. Aim

To build a **secure, transparent, and tamper-proof** digital voting system using blockchain, specifically for **local elections.**

The goal is to enhance **community trust** and increase participation by:
- Ensuring voter anonymity and creating immutable records.
- Enabling **real-time verification** for all voters.
- Allowing **secure remote voting** to overcome accessibility barriers.
- Reducing inefficiencies to provide **faster, more reliable election** outcomes.

04.Scope

- **Security & Integrity:** Encrypted, tamper-proof records for all local votes.
- **Transparency & Trust:** A verifiable and auditable process to build **community confidence.**
- **Decentralization:** No central point of control, increasing reliability and removing single points of failure.
- **Anonymity & Privacy:** Guarantees voter confidentiality while ensuring each vote is valid and counted.
- **Accessibility:** Secure remote access to **increase voter turnout** in local elections.
- **Efficiency:** Faster, automated results, lower costs for the municipality, and no manual counting errors.
- **Automation:** Using Smart Contracts for error-free validation and tallying of local ballots.
- **Local Focus:** The system is purpose-built for the specific needs of a local election (e.g., wards, councils, and candidate lists).

05. Objectives

- **To ensure** secure, tamper-proof vote recording for the local election.
- **To implement** a safe and simple authentication process for eligible community voters.
- **To build** a decentralized platform that eliminates central control and enhances public trust.
- **To guarantee** complete voter privacy and the anonymity of their choices.
- **To provide** real-time, transparent results that are publicly verifiable.
- **To design** an accessible and intuitive interface, encouraging higher voter participation in local elections.

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

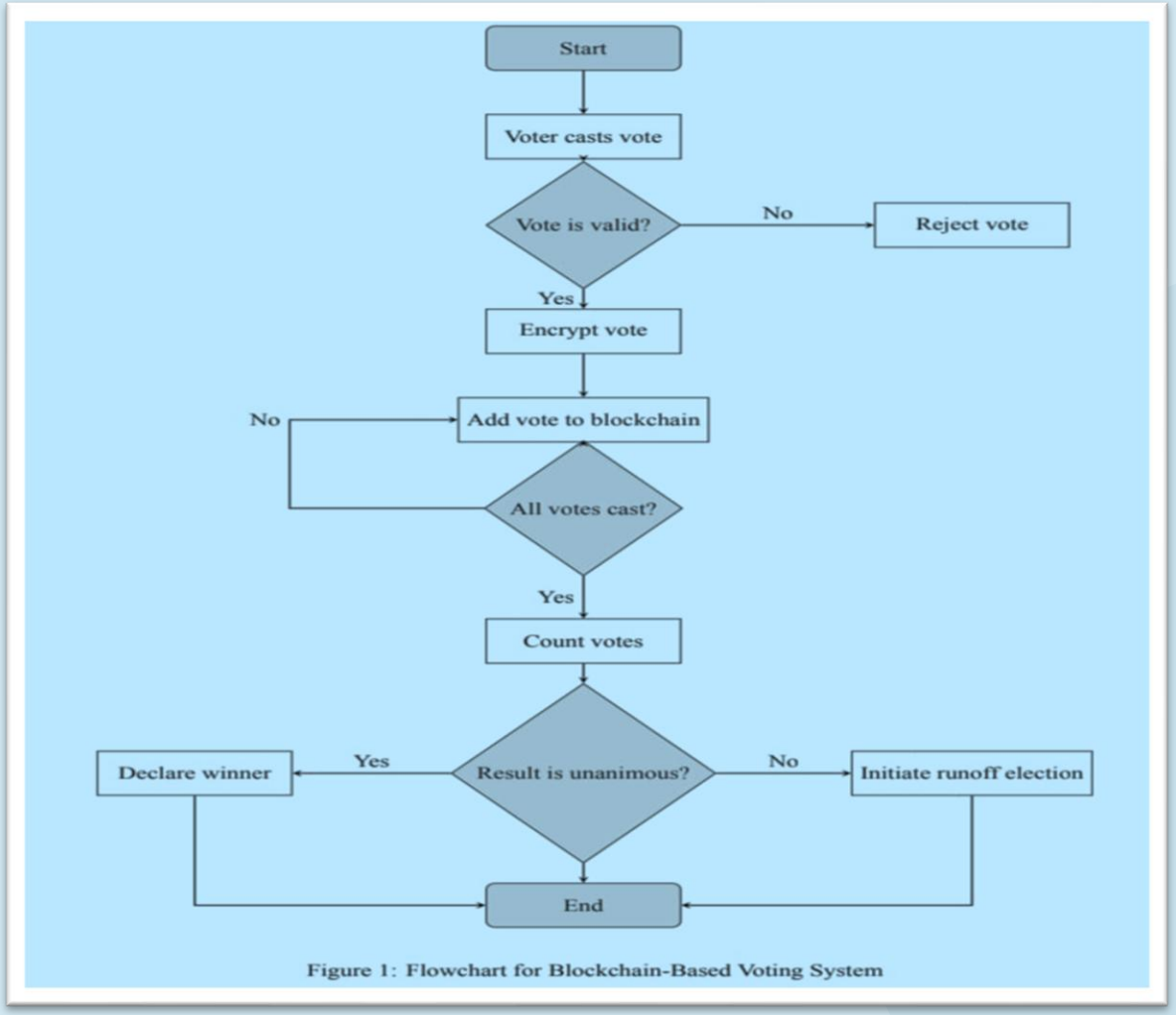


Figure 1: Flowchart for Blockchain-Based Voting System

09. Application

•**Community Voting:**
•Elections for housing societies, neighborhood associations, and resident welfare associations (RWAs).

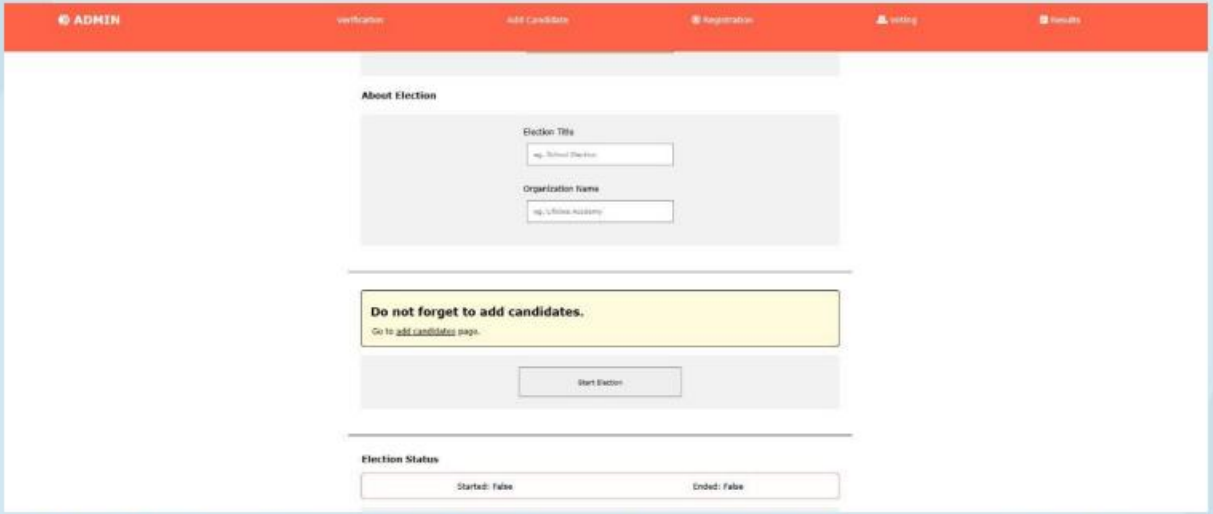
•**University & Campus Elections:**
•Voting for student councils, unions, clubs, and faculty representatives.

•**Corporate & Organizational Voting:**
•Secure polling for shareholder meetings, board member elections, or internal union votes.

•**Secure Online Polls:**
•Providing a tamper-proof way for any private club, group, or online community to conduct a verifiable poll.

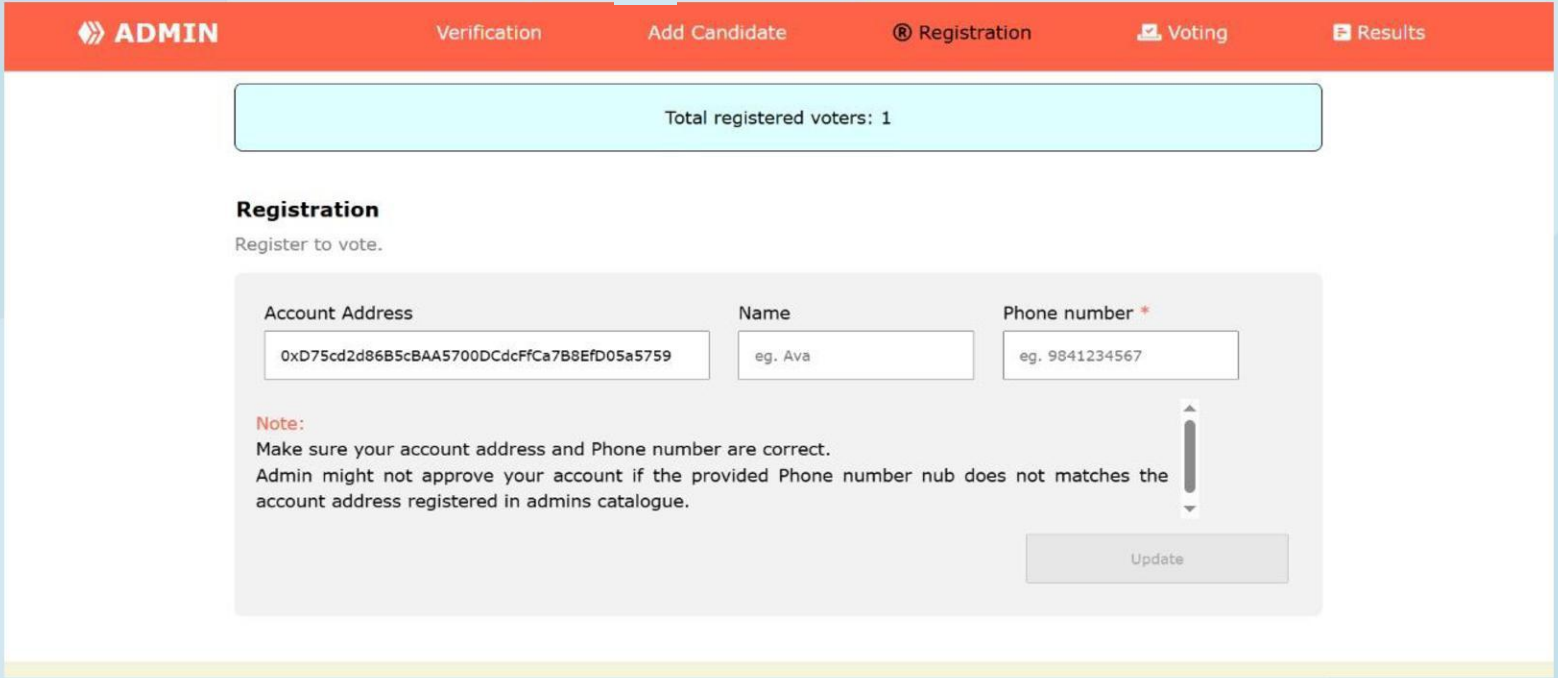
10. Implementation

Figure 6.1: About Admin



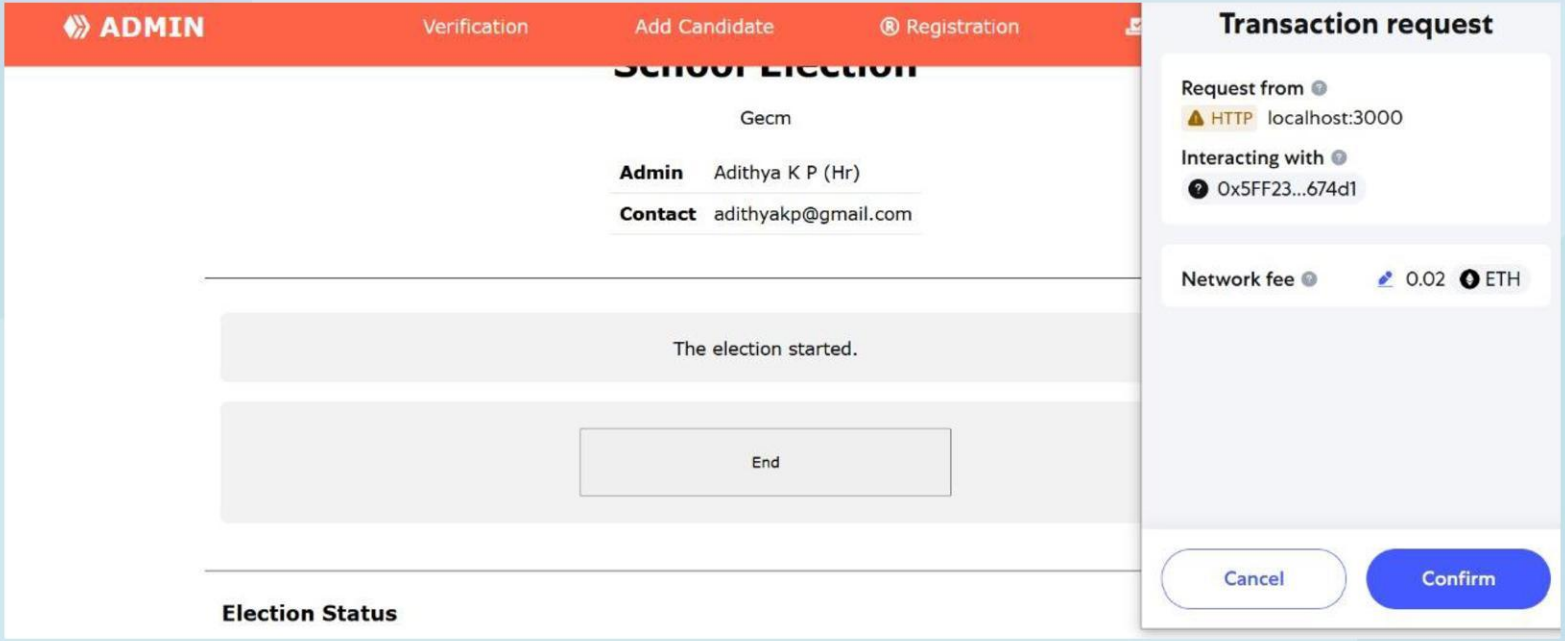
"About Admin" section displays the administrator's account address and provides fields to enter their full name and email. It also shows a notification indicating that the election has not yet been initialized, prompting the admin to set it up.

Figure 6.2: User Registration



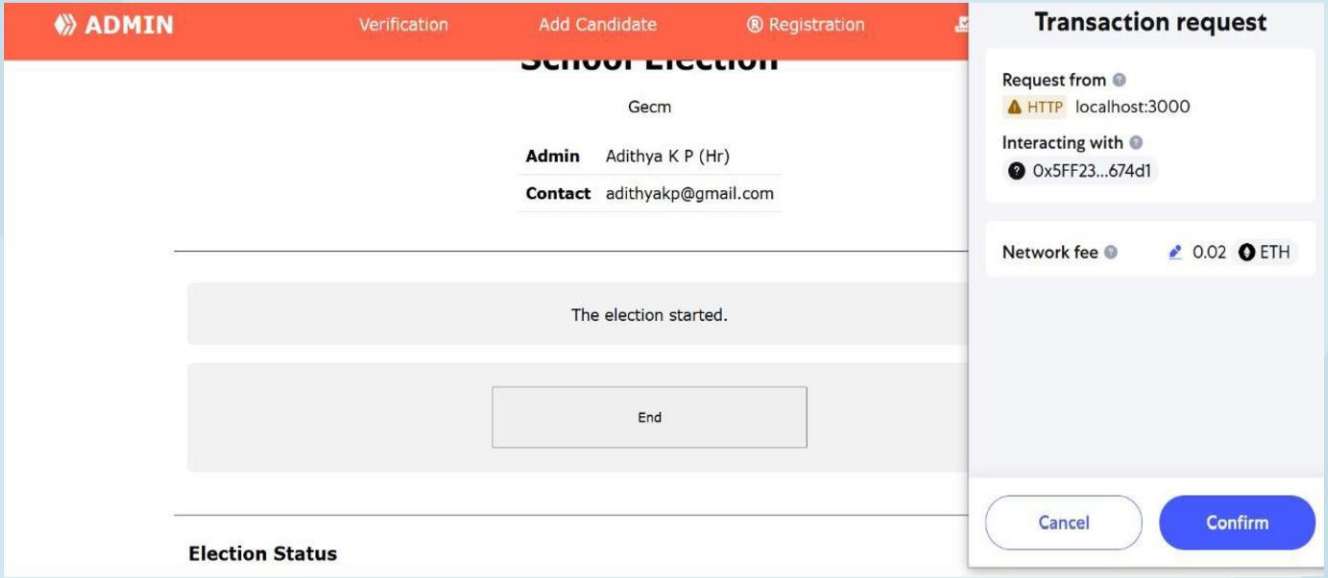
User register with account addresss,name,Phone number

Figure 6.3: Home Page



It represents Home page

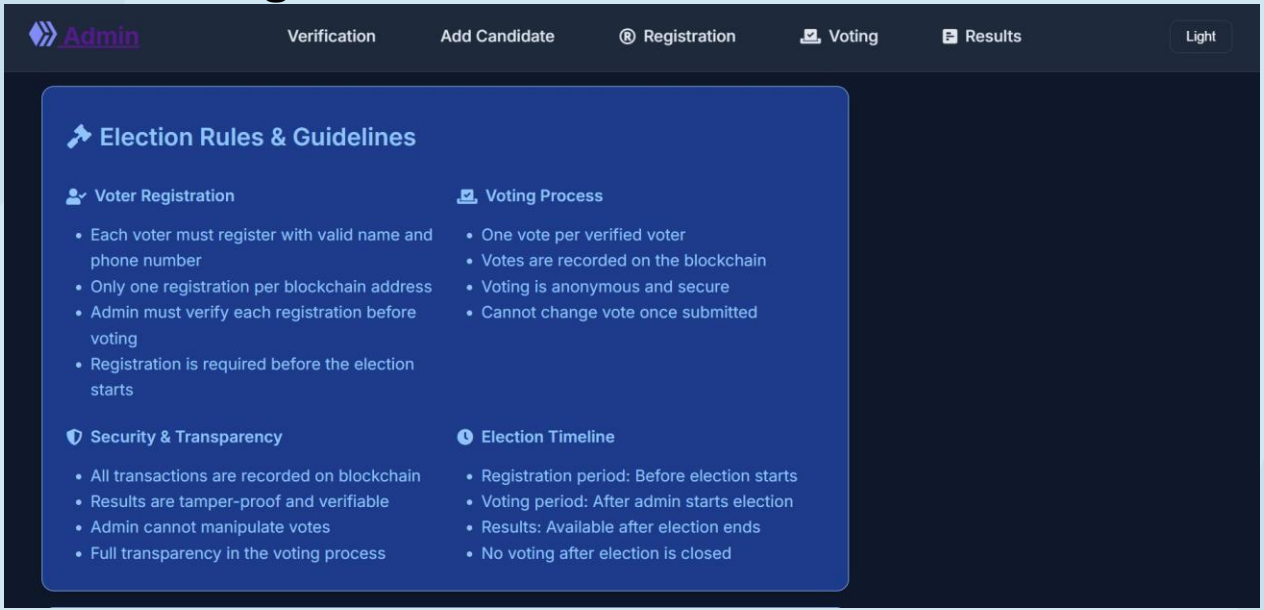
Figure 6.4: Election End



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

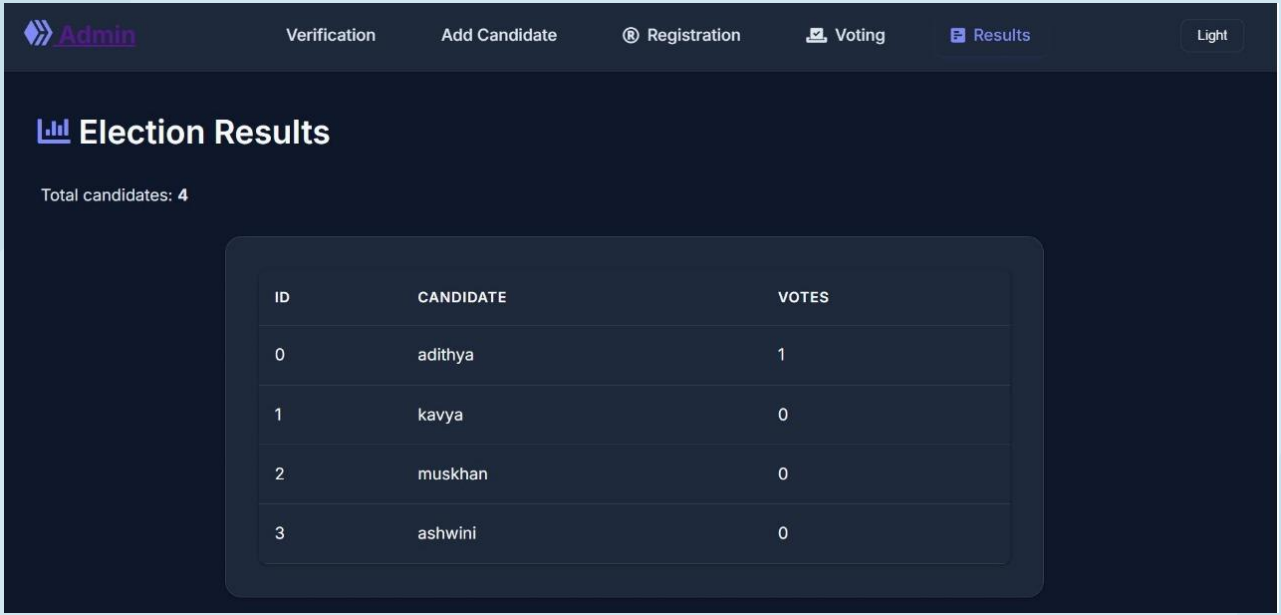
11.Results

Figure: Election Rules & Guidelines



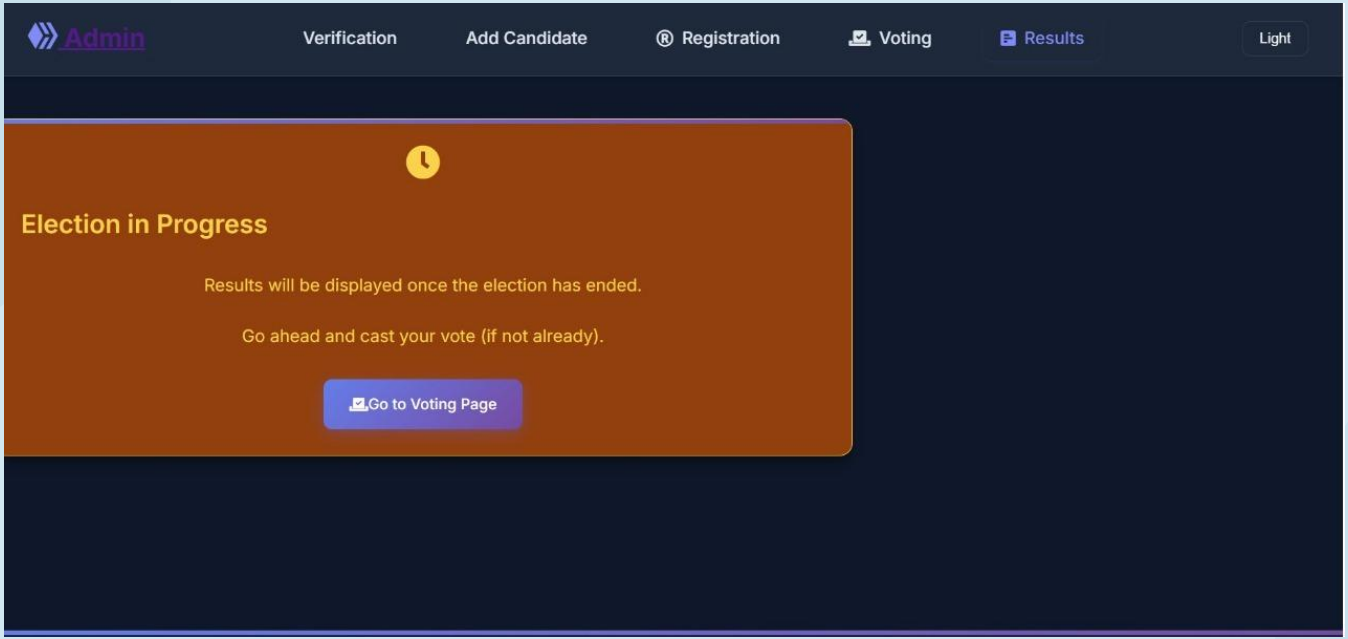
“ **Election Rules & Guidelines**” This page explains the rules of voter registration, secure voting process, and blockchain-based transparency. It highlights one-vote-per-user policy, tamper-proof results, and clear election timelines to ensure fair and trustworthy elections."

Figure : “Election Results”



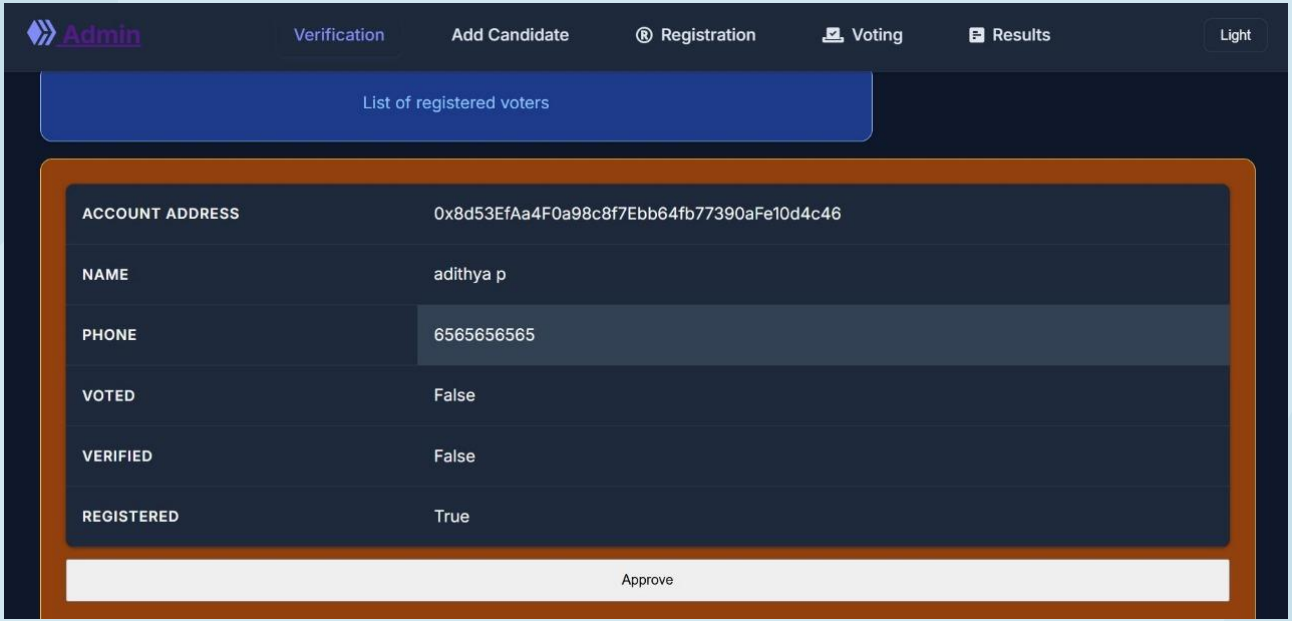
“**Election Results**“ This page displays the final vote count for each candidate in a transparent manner. Results are recorded on the blockchain, ensuring accuracy, security, and tamper-proof verification.

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. Conclusion

- Our blockchain-based system provides a **secure, transparent, and tamper-proof** solution perfectly tailored for **local-level elections.**

- By leveraging decentralization, we solve key challenges of **trust and accessibility** for community members.

- This technology ensures voter privacy and provides **verifiable, trustworthy results**, giving every member confidence in the outcome.

- This model can revolutionize democratic processes not just in local elections, but in any local-scale vote, from **university councils to housing societies**, making them more efficient, inclusive, and credible.

14. References

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Thanks!