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BIOLOGICAL AUTHENTICATION VOTING SYSTEM USING BLOCKCHAIN

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Abstract – The "Biological Authentication Voting System using Blockchain" marks a significant advancement in electoral processes by introducing a secure and efficient online voting solution.This project integrates cutting edge biometric authentication specifically ,fingerprint and facial recognition with the transparency and immutability of blockchain technology. This cohesive integration aims to fortify the security, accessibility, and inclusivity of the electoral process .The core functionality of the system involves the incorporation of advanced biometric authentication during user registration, establishing a secure digital identity for both voters and candidates. This identity becomes the linchpin during the voting process, providing a robust security layer that not only mitigates identity theft but also ensures the legitimacy of participants.

***Key Words*:** Blockchain, Secure Voting, Biometric Voting.

1. INTRODUCTION

In the landscape of contemporary democracies, the integrity of electoral systems is paramount to ensuring a fair and transparent representation of the people's will. The "Biological Authentication Voting System using Blockchain" represents a pioneering response to the persistent challenges faced by traditional voting methods. As societies continue to grapple with issues of identity theft, fraudulent activities, and the need for enhanced accessibility, this project aims to redefine the electoral experience by integrating cutting-edge technologies

This project stands at the intersection of innovation and democratic principles, offering a holistic solution that not only addresses existing vulnerabilities but also sets a new standard for secure, accessible, and trustworthy elections. The following sections will delve into the intricacies of the system design, authentication processes, and the potential transformative impact of the "Biological Authentication Voting System using Blockchain" on the future of democratic participation. In an era where technological advancements redefine societal landscapes, the "Biological Authentication Voting System using Blockchain" emerges as a forward-looking initiative to revolutionize the democratic experience

2. RELATED WORKS

IRoopak T M, Dr. R Sumathi,Electronic Voting Based on Virtual ID of Aadhar using Blockchain Technology,The proposed system is an electronic voting system that uses virtual ID provided by UIDAI, which is unique. The Aadhar database is used to obtain demographic details, including the fingerprint details of the voters. The fingerprint is converted to a digital signature, which is used to ensure the security of the vote in the block while doing the encryption. The Blockchain technology ensures the security and verifiability of the votes. The system also uses SHA-256hashing algorithm to ensure integrity. The system is publicly verifiable, and only registered voters can 2 utilizes virtual ID provided by UIDAI, which is unique. The Aadhar database is leveraged to obtain demographic details, including the fingerprint details of the voters.

3. METHODOLOGY

There are mainly 6 steps:

- Create the architecture and components of the Online Voting System to ensure functionality and security.
- Establish a secure process to verify the identity of voters before granting access to the voting platform.
- Maintain a centralized database to securely store and update voter information for accuracy and accessibility.
- Include a module for administrators to validate and manage the election process effectively, ensuring transparency and control.
- Implement an additional layer of security with two-factor authentication for voter verification, enhancing system protection.
- Plan for future improvements, like a "Live Result Update" feature, to enhance transparency, reliability, and user experience in the Online Voting System.

4. PROPOSED SYTEM

The proposed online voting system aims to streamline the voting process by allowing voters to log in and exercise their voting rights securely. Voter information is managed within a centralized database maintained by the INDIA ELECTION COMMISSION, where details such as full name, age, Aadhar card number, mobile number, email address, and fingerprints are stored and regularly updated. During registration, voters must provide this information, which is verified bythe administrator. To cast their vote, voters need to enter their Aadhar ID for confirmation before selecting their preferred candidate. This system offers easier access to information, enhanced security measures, time-saving benefits, and utilizes a centralized database for efficient management of the voting process.

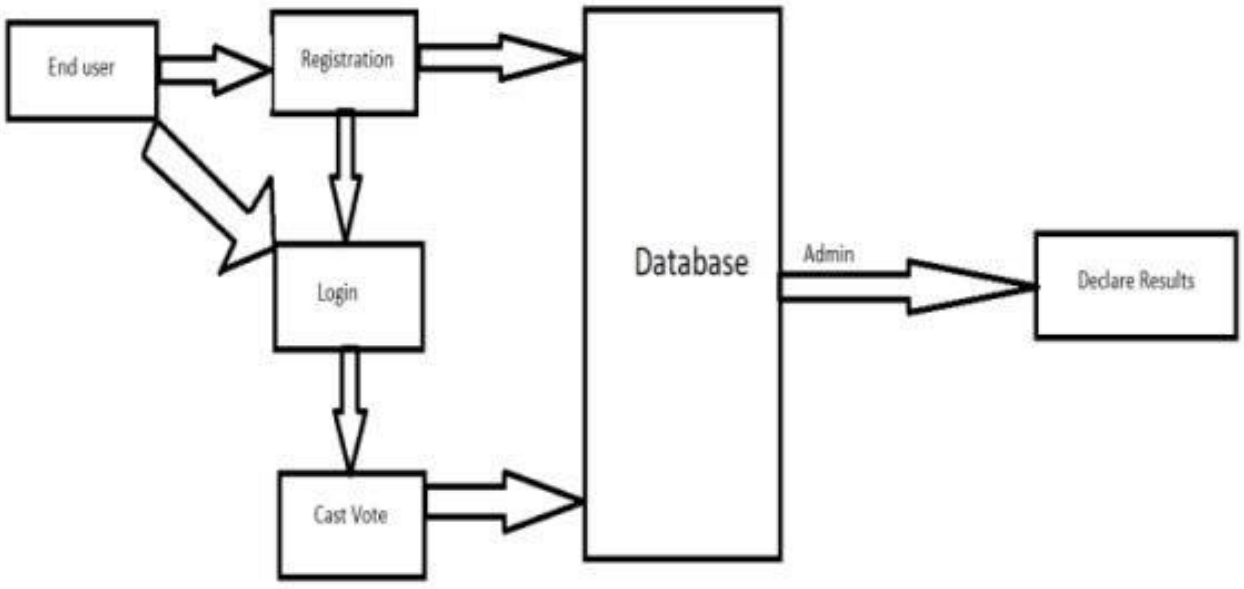

Fig 4.1 System Architecture

The above figure shows the system architecture for the home automation using Arduino UNO board device.

5. TECHNOLOGY USED

Arduino is open-source Arduino Software (IDE) makes it easier to write code and upload it to the board. It is also used to build low-cost scientific instruments to prove the principles of IOT with programming.

The Biological Authentication Voting System employs facial recognition and fingerprint authentication technologies alongside blockchain to fortify the integrity of electoral processes. Facial recognition verifies voters' identities through unique facial features, while fingerprint authentication adds an additional layer of security by cross-referencing individuals' fingerprints with registered data. These biometric methods bolster the accuracy ofvoter authentication, thwarting potential fraud or impersonation. Simultaneously, blockchain technology ensures the transparency and immutability of voting records by decentralizing data storage and providing tamper-resistantledgers.

6. OUTPUT

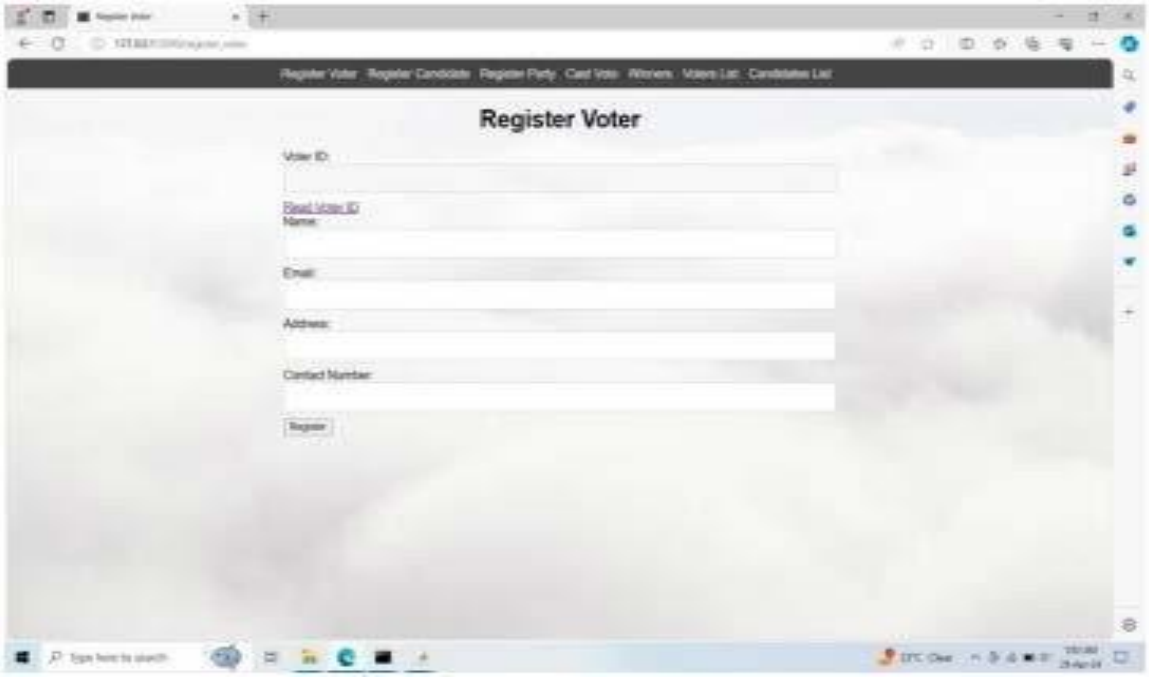

Fig 7.1: Register Voter

Fig 7.1 illustrates the seamless process of enrolling voters using secure biometric authentication, ensuring the integrity and accuracy of voter registration data.

Fig 7.2: Register candidate

Fig 7.2 illustrates how candidates are signed up to run in elections, detailing the steps to check if they meet the requirements and making sure the process is fair and transparent.

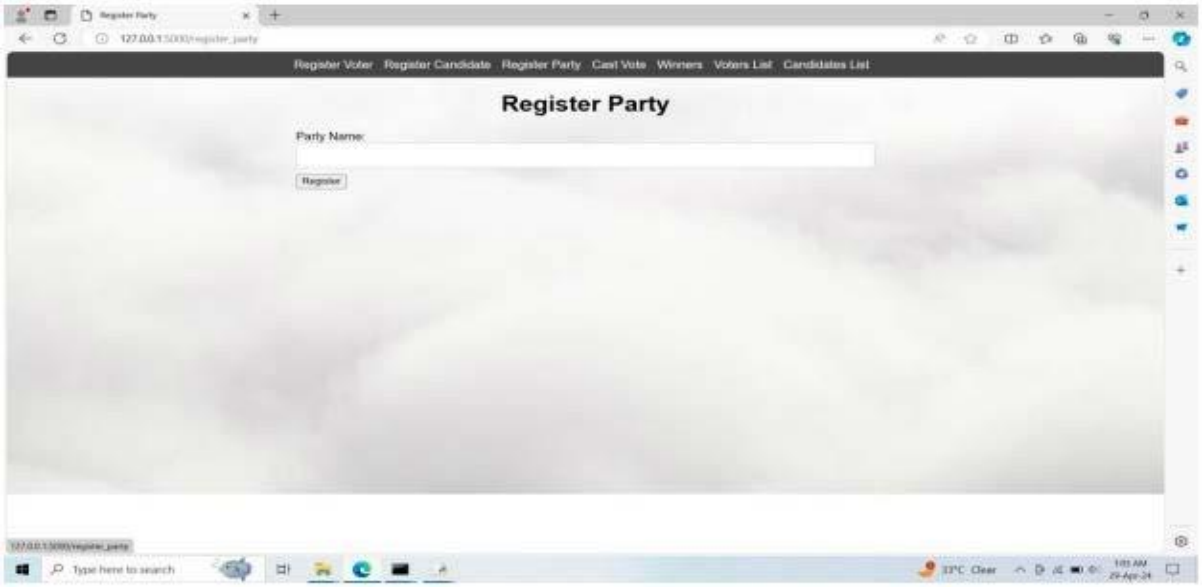

Fig 7.3: Register party

Fig 7.3 illustrates how candidates are signed up to run in elections, detailing the steps to check if they meet the requirements and making sure the process is fair and transparent.

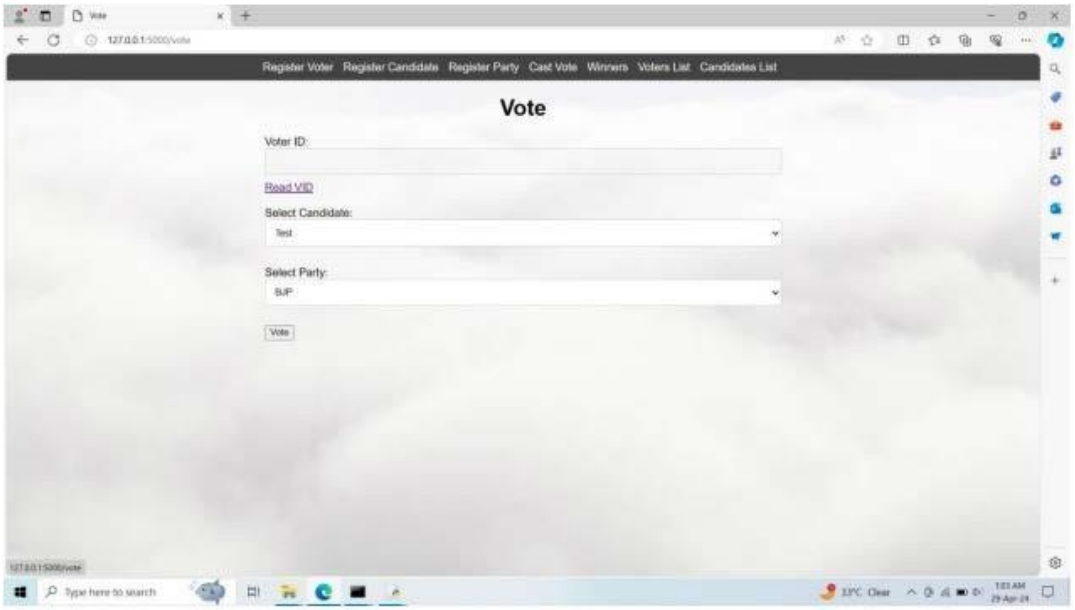

Fig 7.4: Cast Vote

Fig 7.4 illustrates how votes are submitted during elections, outlining the steps voters take to make their choices securely and ensuring their votes are accurately recorded.

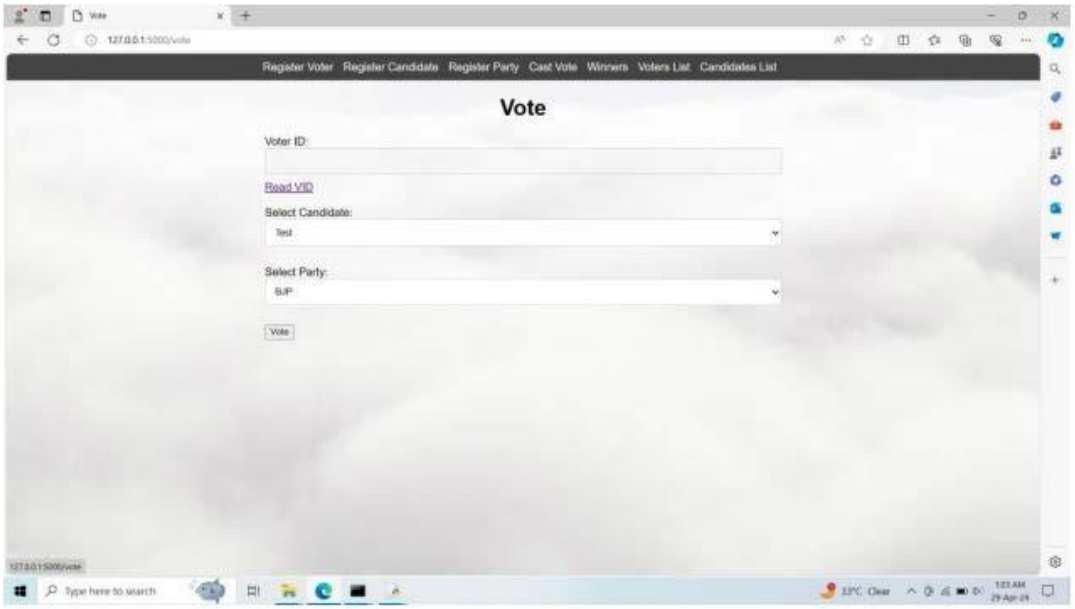

Fig 7.5: Voting

Fig 7.5 illustrates the process of making choices in an election, outlining how voters select their preferences securely to ensure accurate recording of their votes.

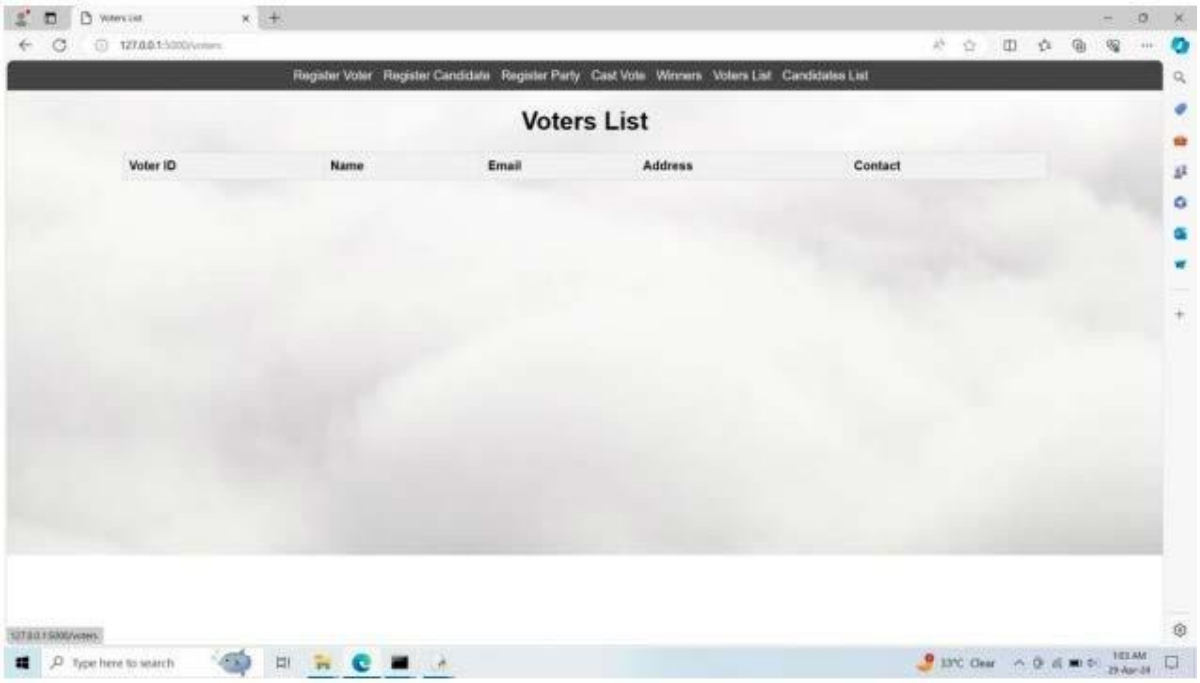

Fig. 7.6: Voter List

Fig 7.6 illustrates details the compilation of eligible voters for an election, outlining the process of creating and maintaining a comprehensive list of individuals eligible to cast their votes.

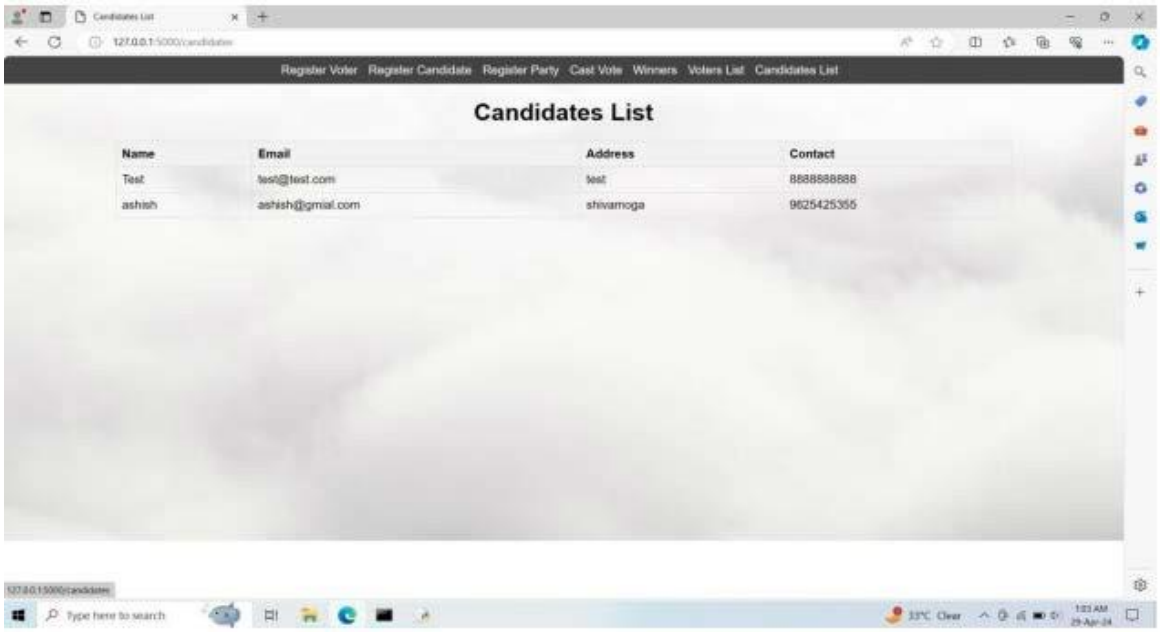

Fig. 7.7: Candidates list

Fig 7.7 illustrates on the compilation of individuals running for election, outlining the process of creating and maintaining a comprehensive list of candidates vying for public office.

7. CONCLUSION

In conclusion, the integration of facial recognition and fingerprint authentication with blockchain technology offers a promising solution to address the longstanding challenges of security and transparency in electoral systems. Through the development and implementation of the Biological Authentication Voting System, we have demonstrated the potential to enhance the authentication process, ensure the integrity of votes, and foster greater trust in democratic processes. By leveraging these cutting-edge technologies, we pave the way for a more secure, inclusive, and resilient electoral landscape. Continued research and collaborationare necessary to refine and scale this approach, ultimately reinforcing the foundations of democracy and empowering citizens to participate with confidence in the electoral process.

8. FUTURE SCOPE

The future scope of the Biological Authentication Voting System is vast and promising. Further advancements could include the integration of additional biometric authentication methods, such as iris recognition or voice recognition, to enhance the accuracy and inclusivity of voter verification. Additionally, research could focus on optimizing the scalability and efficiency of blockchain technology to accommodate large-scale elections with millions of voters while maintaining security and performance. Moreover, exploring applications of machine learning and artificial intelligence algorithms could enable the system to adapt and evolve in response to emerging threats and vulnerabilities. Furthermore, collaboration with policymakers, election officials, and cybersecurity experts will be crucial to navigate legal and regulatory frameworks and ensure the widespread adoption and acceptance of this innovative voting solution. Overall, the future scope of the Biological Authentication Voting System lies in continuous innovation, refinement, and collaboration to advance the integrity, transparency, and accessibility of electoral processesworldwide.

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