

PRIVACY PRESERVING E-VOTING SCHEME BASED ON FACE BIOMETRICS AND BLOCK CHAIN TECHNOLOGY

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Abstract - *To implement block chain method for voting to verifying and tracking voting results. Blockchains were created for particular voting storage that have pre-established validation rules. Face Bio-metric verification will be implemented to provide voter verification. Blocks of time-stamped voting are stored on all systems across a value chain. Blockchain is a transaction ledger where members of a community record transfers of assets among them. The connection between two blocks is made the use of SHA-256 algorithm*

Keywords – Secure Hashing Algorithm(SHA)

I. INTRODUCTION

- Blockchain is currently a concept that has received significant attention in financial technology.
- It combines several computer technologies, including distributed data storage, point-to-point transmission, consensus mechanisms, and encryption algorithms.
- Blockchain is an append-only list of sets of cryptographically signed records or transactions (called blocks) that a number of parties want to update.
- Each time a block is appended to the chain, is linked to the immediately precedent block.

Problem description:

The security considerations of the votes are based on blockchain technology using cryptographic hashes to secure end-to-end verification. To this end, a successful vote cast is considered as a transaction within the blockchain of the voting application. Therefore, a vote cast is added as a new block (after successful mining) in the blockchain as well as being recorded in data tables at the backend of the database. The system ensures only one-person, one-vote (democracy) property of voting systems. This is achieved by using the voter's unique face image, which is matched at the beginning of every voting attempt to prevent double voting. The Face Recognition is the study of physical or behavioral characteristics of human being used for the identification of person. So implement real time authentication system using face biometrics for authorized the person for online voting system

II. FUNCTIONAL ARCHITECTURE

Modules:

- Voting Interface Creation
- Add Candidate Details
- User Credentials
- User Verification and Polling
- Block Chain Implementation
- Result Announcement

MODULES DESCRIPTION:

Voting Interface Creation

The e-voting process requires the features like privacy, security, anonymity, and verifiability as the core function of this solution, it is important that the choice of the underlying technology is consistent to meet these challenges. It has been identified that the Blockchain technology sufficiently. This module explains about interface creation for secure voting process. Admin can contain unique user name and password to enter into the system. Admin is responsibility to maintain all information in database up to date. In this module, admin can view voter information details are such as voter name, address, mobile number, age, gender and voter Aadhar card number and etc. these details are stored in the database. Admin can check the voter details in the system.

Add Candidate Details

This module explains about candidate adding process. The election commission is responsible for making the electoral lists available which are verifiable from the base records. Admin add candidate details like their name, symbol and Party name. These details are verified by candidates and added in voting database. During polling process candidate details will be shown to the voters.

User Credentials

User should enter their details for registration process. Once completion of registration process, users could allowed to access voting application. The details registered by users are Name, mobile number, age, gender, address, Aadhar card number, voter id, password and also capture face image for unique verification process. Admin can view voter registration information details. These details are stored in the system. And then admin can avoid illegal voter details in the system.

User Verification and Polling

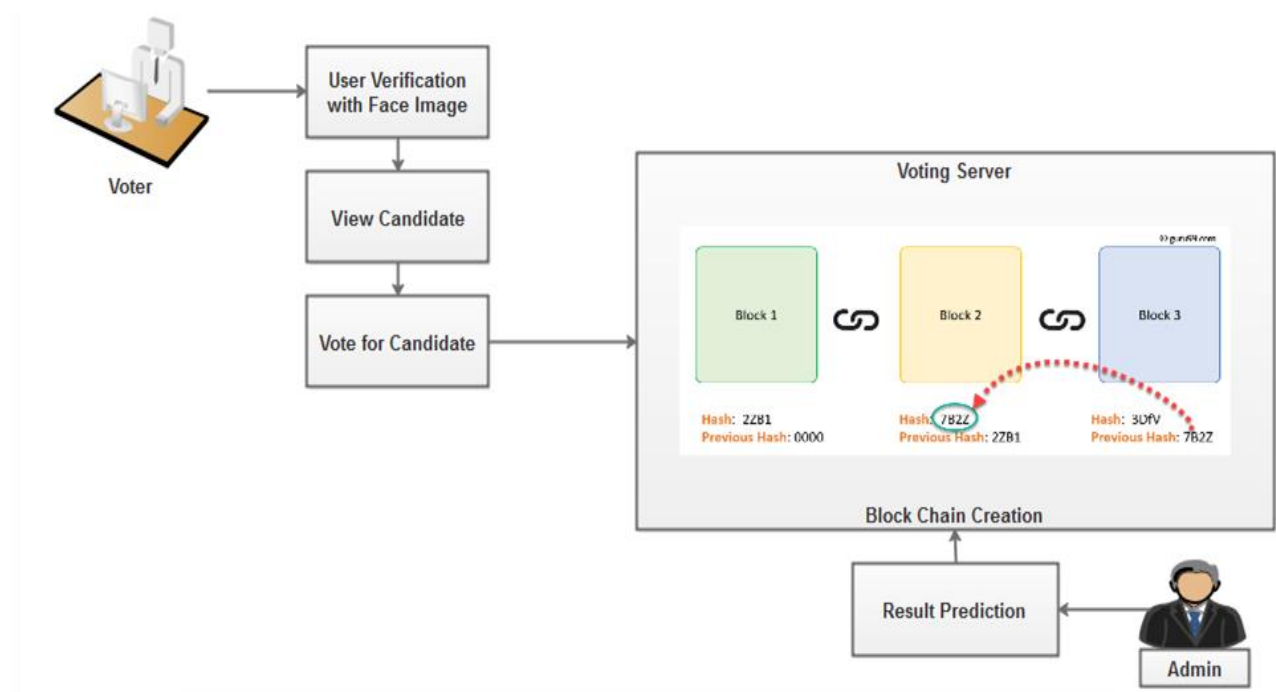
In this module, voter can login in the system using voter id and password. Once the entered details are verified by server, then face image will be capturing for verification. Facial features are extracted and matched with server. Using these parameters users are verified during login process. From the voting machine the names and respective party symbols of each candidate are displayed and the voter can vote according to his will. Then user could select the candidate to make voting. Once completion of voting, the details are transferred to the server in a secure manner. The voter can vote only once, and once the vote is casted is voting record is marked as 'voted' which restricts the voters from voting again.

Block Chain Implementation

The block creation in the electoral process is a basic entity and the voters can't record their vote if the block is not created. The voters can vote and the transactions are recorded in the blocks, by the time the polling time ends, the blocks are required to be sealed by the hash functions. The data of the block (i.e. the entire result) will be hashed using the SHA-256 algorithm. This is done by concatenating the results inside the block and hashing them in pairs the block is hashed based on the hashed contents of the block. Every proceeding blocks that confirms the completion of the transactions will have used the hash of previous block, a new random number, and hash of the block to generate the hash value that will be used by the proceeding blocks. The sealing of the block means that the block has now been sealed with a hash function and the contents of the block can't be changed by ensuring the application.

Result Announcement

The collection of the results is done from the stored data on the blocks through the significant organization of the nodes in the blockchain. Once the polling process is complete and the results have been announced, there will be no further need for continuing the mining or block creation activity.



System Architecture

III. Related Work

- *Digital Voting*: A Blockchain-based E-Voting System using Biohash and Smart Contract- (<https://ieeexplore.ieee.org/abstract/document/9214250/>)- Syada Tasmia Alvi, Mohammed Nasir Uddin, Linta Islam- A hash value which is generated from the voters' information will be stored in the genesis block as a list of voter and each vote will be stored in chain as a block.
- *SeVEP*: Secure and Verifiable Electronic Polling System- <https://ieeexplore.ieee.org/document/8636908>- Amna Qureshi David Megías, And Helena Rifà-pous- Developed a functioning prototype of SeVEP, and were evaluated its scalability and usability in real-world deployment
- An Anti-Quantum E-Voting Protocol in Blockchain With Audit Function- <https://ieeexplore.ieee.org/document/8804187>- Shiyao Gao, Dong Zheng, Rui Guo, Chunming Jing, And Chencheng Hu - Provided the feature of the audit by combining with the traceable ring signature process, to maintain the fairness and accuracy of the election.

IV. Existing System

- The existing system of Election voting system is running manually.
- E-voting provide the possibility of making the voting through online.
- Vote counts are stored on database for further analysis.
- Also vote counting has to be done on server.
- All the information of the voter or candidate is to be stored on database.
- The management of the election is difficult to the election commission like voting arrangements and verification of the person.

V. Proposed System

- Voters are verified using Face Bio-metric based authentication process.
- The participating nodes in the block chain system are all equal.
- All nodes jointly make decisions and verify the legitimacy of the voting counts.
- Even if some nodes in the system are attacked and destroyed, it will not damage the entire block chain system.
- Hash generation making the secure blocking of voting in time based blocking approach.
- Entire block based voting maintenance improve the performance of voting process.

VI. MERITS OF THE PROJECT :

- Elimination of error handling through real-time tracking of voting result with no double spending.
- The block chain guarantees traceability and non-degradability of information.
- It decreases the success rate of attackers.
- It provides security, transparency and efficiency.

VII. TEST CASE :

S.NO	FUNCTION	DESCRIPTION	EXPECTED OUTPUT	ACTUAL OUTPUT	STATUS
1	Framework construction	Interface for user and admin	Admin and user contains individual page	GUI for admin and user	Success
2	Add candidate details	User details are added with face	User details are added with face	Face register	Success
3	Voter verification	Voter id and face verification	Pooling phase can be opened	Pooling phase can be opened	Success
4	Block chain implementation	Secure the transactions	Hash values are generated	Hash values are generated	Success
5	Result announcement	Wining candidates	Result in chart	Result in chart	Success

Table 1. Test Case

VIII. IMPLEMENTATION AND WORKING :

- *Operating System* : Windows 10
- *Programming Language* : C#.NET
- *Backend* : SQL SERVER
- *Tools used* : VISUAL STUDIO

- In this project design the framework for voting with face biometric and block chain technology.
- It contains two modules such as training phase and testing phase.
- Training phase, admin can add the candidate details and voter details.
- Voter face details can be added to the database.

IX. REFERENCES :

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