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FUID SEVM Fingerprint Unique ID Smart Electronic Voting Machine

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Abstract: ***Secure voting is ensured by the Electronic Voting Machine. People should believe that their vote is secured and there are no unfair practices. The main objective of this project is to develop a secure Electronic Voting Machine using fingerprint identification method, we are using system database for fingerprint access. At the time of voting in elections, the verification of the electronic voting process can be done by scanning the veins on the fingers which allows voting to be reset so voters can cast their vote. We are also giving a barcode scan feature where user will scan to authenticate himself. System then show the list of candidate user, User will vote by pressing the button and all the data will be store in storage device. Fingerprint scanning is used to provide security to prevent fake, duplicate voting etc. It also increases the accuracy and speed of the process. The purpose of such a system is to ensure that only the legitimate user and no one else has access to the voting rights. If a particular pattern matches anyone in the available record, voting access is granted. But in case the pattern does not match the records in the database, or in the case of repetition, access to cast a vote is denied or the vote is rejected.***
Keywords**: *fingerprint sensor, barcode scanning, python, local data store security.***

I. INTRODUCTION

A separate commission called the Election Commission of India (ECI). This commission is not favorable or does not support any political party. Security is at the heart of the electronic voting process. Hence the need to design a secure electronic voting system is very important. Usually mechanisms that ensure safety and election privacy can be time-consuming, expensive for election administrators, and inconvenient for voters.

Our country, India is the largest democratic country in the world. So it is essential to make sure that the governing body is elected through a fair election. India has only offline voting system which is not effective and up to the mark as it requires more secure way to and publish the results.

Therefore, to be made effective, the system needs a change, which overcomes these disadvantages. The new method forces the person's physical appearance to vote, which makes the things easier. This project focusses on a system where the user can can't vote remotely from anywhere using his/her computer or mobile phone and it require the voter to got to the polling station through two step authentication of finger print recognition and barcode system. This project also allows the user to vote offline as well if he/she feels that is comfortable. The fingerprint system is used to record the voters prior to the election and is useful at the time of voting. The offline voting system is improvised with the help of barcode instead of voter id. This system also enables the user the citizens to see the results anytime which can avoid situations that pave way to vote tampering.

It is hard to make the voting system trustworthy only because it has high security requirements: confidentiality and integrity. Confidentiality means all voters get assured about the privacy of votes and prevent selling of votes. Integrity means the assurance of election results and the votes are counted correctly. Integrity is easy to get through a public show of hands, but this dissipates confidentiality and confidentiality comes from the secret ballots, but this fails the integrity.

II. PURPOSE

A. Identify Need of Project

Electronic voting has been an area of research focus for many years by using computing machines and equipment for casting votes and producing high quality and precise results in accordance with the sentiments of the participating voters. Initially computer counting system allowed the voter to cast vote on papers. If the voting system is well understood by the voters, the system's usability can be increased remarkably.

B. Identify Methods to implement

Voting system is contemplated as an interesting topic in information security research, voting system is a way that helps public to select their representatives and express their preferences for how they will be governed. Naturally, the belief of the election process is utmost important.

III. OBJECTIVE OF SYSTEM

1) To make such a system which will be easy to use and more e user friendly for our customer.
2) Centralized management system
3) To build a system this would enable voters to cast their votes on chosen candidates.
4) Study and implement a security method to be used to ensure that votes being cast in the system will not be compromised and any outside attack.
5) Avoid Internet used to avoid the status of hacking the data.

IV. LITERATURE SURVEY:

1) Published Year: 2021 – 2022

Title: A visionary approach to smart voting system

Rohit Sroa, Priyanshu Sinha, Ritiwik Sharma, Parth Rustagi and Moolachand Sharma

Abstract: With the emergency of COVID-19 as a global pandemic, the need for an online voting system is becoming appallingly evident in India. Unfortunately, India still suffers from a flawed electoral system in today's scenario. Ballot rigging, hacking of the EVM, election manipulation, and polling booth capturing are the significant issues in the voting system. To avert a costly predicament in the future, many countries are currently experimenting with block chain based voting system. This system preserves participant's anonymity while still being open to publish inspection. The voter is authenticated using their voter ID, aadhaar card number and face recognition. The voters can also assure their cast is stored in a highly encrypted unique ID generated by our system and the voter data is stored in highly secured database. Finally, it is also equipped with a chat bot that works as a support to the voters. In conclusion this paper presents an in-depth evaluation of the scheme that successfully demonstrates its effectiveness in achieving and end-to-end verifiable online voting system.

Methodologies:

Voter Authentication and Credentials: Take advantage of investment in enrolment campaigns, leveraging biometrics to improves voter check in at polling stations on the day of an election.

Voter Registration: A necessary precondition for the online voting system is voter registration. In the case of electronic voter identification additional arrangement need to be in place to ensure that the voters identity many not be linked to content of his/her vote.

Casting of Votes: Once the user logs in the backend issues a short lived JWT and long lived opaque token. Both of these are send to the frontend via HTTP only and secure cookies.

2) Published Year: 2021

Title: Online Smart Voting System Using Biometric Based Facial and Fingerprint Detection on Image Processing and CNN

S. Jehovan Jireh Arputhmoni, Dr. A. Gnana Saravanan

Abstract: India begin a democratic country still conducts its election by using voting machines which involves high cost and manual labor. Web-based system enables voter to cast their votes from anywhere in the world. Election commission will collect the fingerprint and face image from voters the database and server will store the image. When the image is obtained on casting day, it will be compared with the database and provide a secure voting on election day. The current system requires the physical presence of voter which is inconvenient to many voters. The process consumes less time as well. Using the detection of face and fingerprint images, the number of fake voters can be reduced.

Methodology:

Face Detection using Haar cascade: Face detection, object detection algorithm used to identify objects in an image for video. The algorithm is trained to detect a face by Haar feature sequence of square-shaped functions.

Pre-processing using ten print image: When the two fingerprint images are same we can use ten print image method. Ten fingerprint images are taken and features are recorded for each fingerprint image in the database.
Fingerprints recognition using minutiae CNN deep learning: fingerprints of voter can take by sensor and store in the server database. Input fingerprint is compered by the fingerprint given by the election commission. fingerprint recognition can be a verification of fingerprint. The vote of a person verification using his/her fingerprint.
Voting: The voting page where he/she can vote to any political party they prefer from the list of options displayed. Once they click on their preferred party, the choice cannot be changed and the rest of option will be disabled as well. The authentication is face detection and fingerprint matching secured voting system.

3) Published Year: 2021
Title: Smart Online Voting System
Ganesh Prabhu S., Prabu. S, R R Thirunavukkarasu, Nizarahammed A, Raghul S, P Jayarajan

Abstract: Our country, India is the largest democratic country in the world. So it is essential to make sure that the governing body is elected through a fair election. India has only offline voting system which is not effective and up to the mark as it requires large man force and it also requires more time to process and publish the results. Therefore, the system need a change which overcomes their disadvantages. The project allows the user to vote offline as well if he/she feels that is comfortable. The face scanning system is useful at the time of voting. The offline voting system is improved with the help of RFID tags instead of voter ID.

Methodologies:
Arduino Uno: This microcontroller is based on ATMEGA 328p. it is an open source computing platform. In our project the Arduino is used the main microcontroller for receiving the data from the RFID module and it also receive the face data using the MATLAB and compare with the face of the user. If the data matches, then it allows the user to cast the vote.
LCD Display: Display model which can display number and alphabets and are common replacement to cathode ray tube in the screen industries. It is less expensive simply programmable and has less limitation to display custom characters. The option for selecting automatic and manual mode of the meter is made available on this LCD display. Once the RFID reads the data the LCD will display the user data.
RFID: It is a tracking system with the help of radio frequency technology. Barcode are used to identify any information some RFID tags use electromagnetic energy transmitted from the RFID reader ad power source while some used battery. Each RFID tag has an unique ID and some tags claim to have sequential ID's they are used to identify specific commodities. We can encode RFID tags with our desired data.
Push Button: A push button typically simulates a change in the circuit or produced an output when the button is physically pressed. One is to select a party to vote, the second one is de-select the party, the third one is to traverse through the list of parties and the final one is to confirm and cast vote to the selected party.

V. PROPOSED SYSTEM

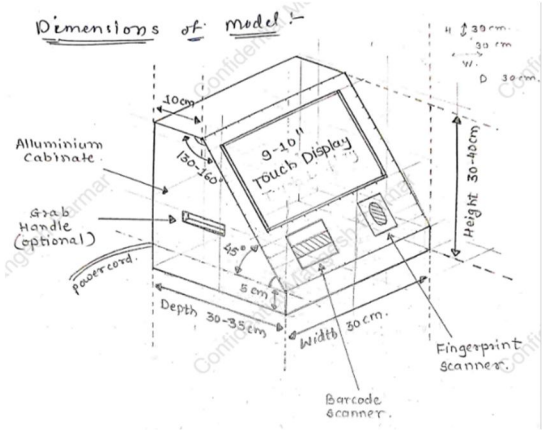


Fig-1: Proposed System Design

1) Scan the barcode card by placing it in front of the barcode scanner.
2) Screen will display next message scan the finger to verify the user for the second time
3) Screen will display the voting list of candidate user have to select it.
4) User have to click one of the position to proceed for the further and if he/she does not want to vote to anyone above they can press NOTA button.
5) If they vote the candidate and there are more position need to be voted, screen will automatically change.
6) First it will save count the current vote and then it will go to next screen.
7) This process will continue until voter finishes the screen will display thank you for voting and screen will reset to home screen again
8) Our data will be stored in storage device like Pen drive, HDD, SDD which is protected by code.
9) The storage device will get attached to the machine from the access door.
10) When the device is plugged in the machine to activate admin needs to enter password of 6 digit so data will be unlocked. (Minimum 6 digits or maximum 12 digit to increase security.)
11) After the passcode is entered the data gets unlocked and screen will show please scan barcode

VI. SYSTEM ARCHITECTURE

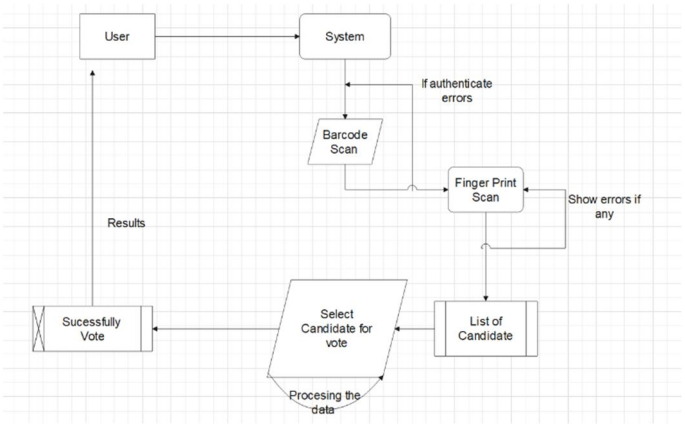
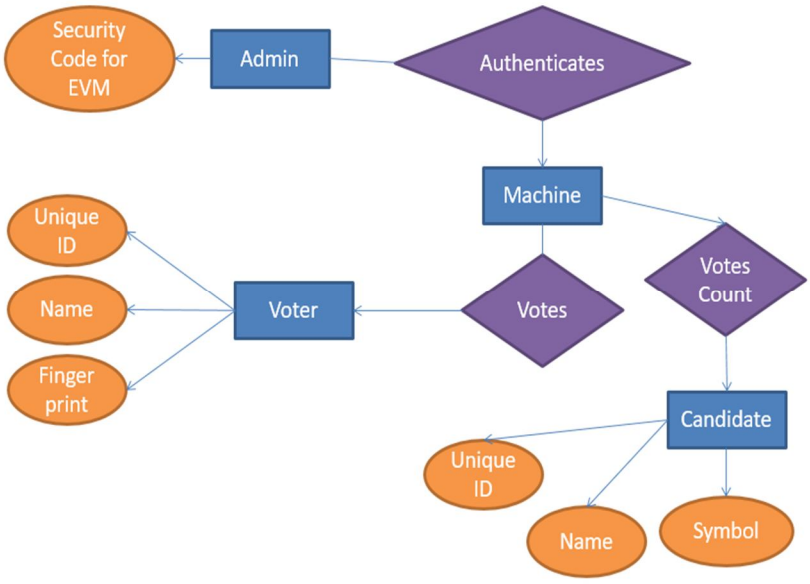
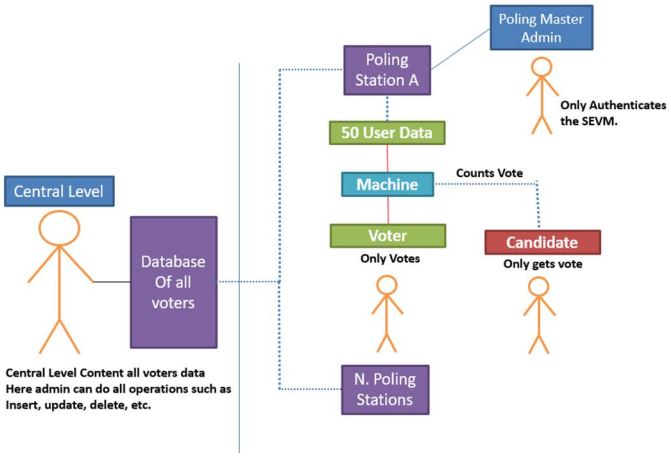


Fig -1: System Architecture Diagram

A. *ER Diagram*



B. UML Diagram



VII. ADVANTAGES

1) Providing the preventive measures system for voting.
2) It completely rules out the chance of invalid votes.
3) Easy to used system
4) Avoid the internet
5) Following the traditional vote.

VIII. SYSTEM REQUIREMENTS

A. Software Used

1) Operating System: Windows XP and later versions Front End: HTML,CSS
2) Programming Language: Python
3) Tool: Arduino IDE
4) Domain: IOT
5) Algorithm: Hashing.

B. Hardware Used

1) Processor – i3 or above
2) Hard Disk – 150 GB
3) Memory – 4GB RAM
4) Micro Controller
5) Finger print sensor
6) Barcode Scanner

IX. ALGORITHMS

1) *Hashing & Mapping:* A cryptographic hash function (CHF)is a mathematical algorithm that maps data of an arbitrary size (often called the "message") to a bit array of a fixed size (the "hash value", "hash", or "message digest").
2) It is a one-way function, that is, a function for which it is practically infeasible to invert or reverse the computation. Ideally, the only way to find a message that produces a given hash is to attempt a brute-force search of possible inputs to see if they produce a match, or use a rainbow table of matched hashes. Cryptographic hash functions are a basic tool of modern cryptography.
3) *CNN:* A Convolutional Neural Network is a Deep Learning algorithm which can take in an input image, assign importance to various aspects/objects in the image and be able to differentiate one from the other.
4) *MQTT (Message Queuing Telemetry Transport):* MQTT is a lightweight, publish-subscribe network protocol that transports messages between devices. The protocol usually runs over TCP/IP, however, any network protocol that provides ordered, lossless, bi-directional connections can support MQTT.

X. CONCLUSION

Hence, In the proposed framework, we have tried to build a secure voting system. We are overcoming the drawback of existing system also provide better performance system as compare to existing system.

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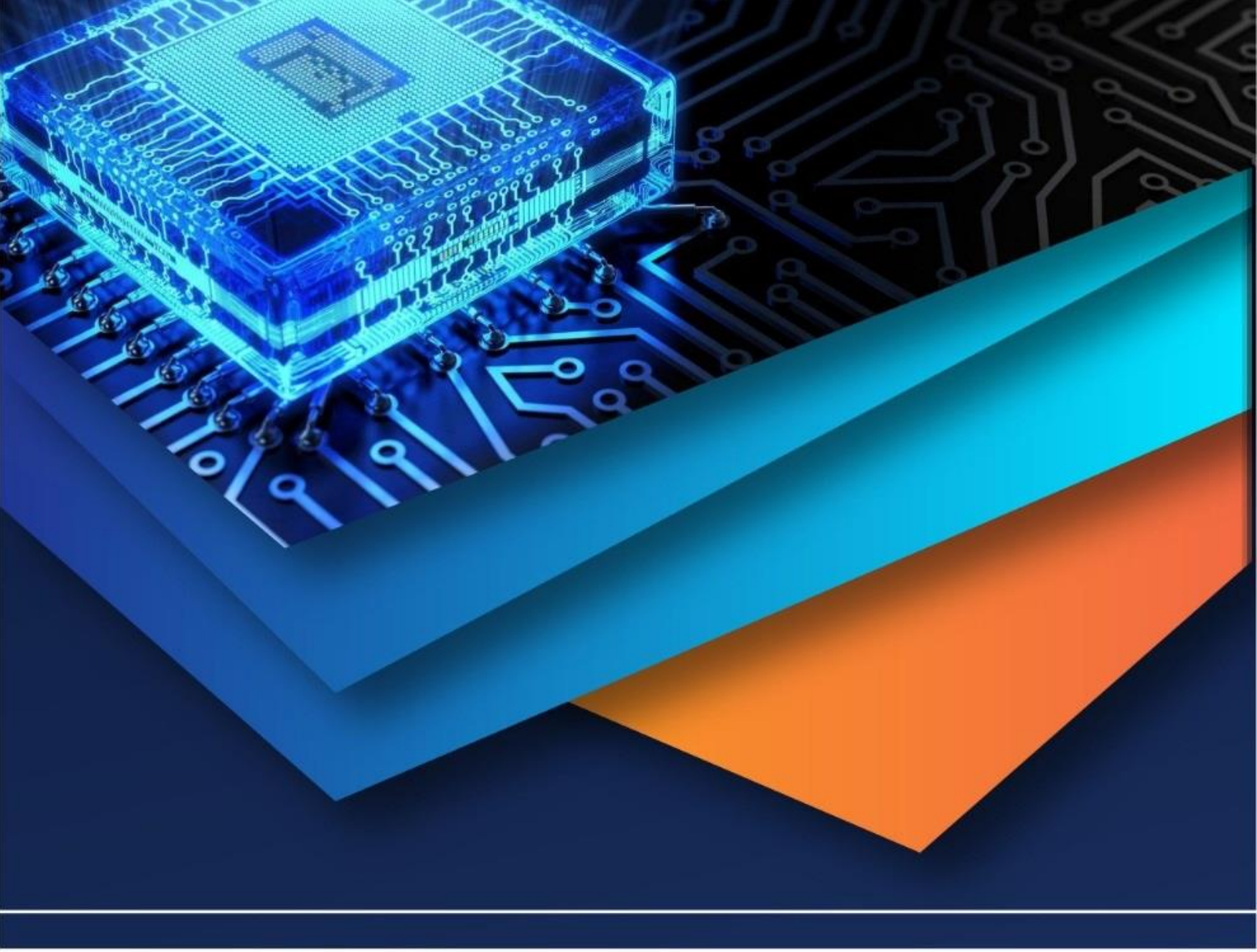

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