DEVELOPMENT OF A NEW AGE VOTING MACHINE

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Abstract— The New Age electronic voting (NAE-Voting) system is a voting system in which the digital database to be used in election is recorded, stored and processed primarily. There are two types of NAE-voting: On-Line and Offline. On-line, i.e. use modulated network connection, and offline, by using a NAE-voting module independent .Fingerprint Reader (For Thumb Reading), Barcode Readers (for UID Cards) for Voting machines and other existing identification units are discussed and implemented in this project. Authentication of Voters, Security of voting process, Securing voted data and "booth capture" immune polling system are the main challenges of NAE-voting. This is the reason behind to design a secured NAE-voting system is very important. In many time the security of the system relies mainly on the conventional electronic voting machine. But Data security, privacy of the voters and the accuracy of the votes are also main aspects that have to be taken into consideration while building secure NAE-voting system. In this project the authenticating voters and polling data security aspects for Electronic voting systems was discussed. It ensures that vote casting cannot be altered by unauthorized activist. The voter authentication in online NAE-voting process can be done by Fingerprint and Barcode Reorganization with back end modulated network connectivity. In Offline NAE-voting process authentication can be done using Fingerprint and Barcode Reorganization and sensing which enables the electronic ballot reset for allowing voters to cast their votes. Also the voted data and voters details can be sent to the nearby Database unit in a timely manner using GSM System with cryptography/Modulating technique.

Keywords—NAEVM, EPIC, UID, VID, CCD.

I. INTRODUCTION

The head discussion at the end of every election is the allegations made by losing parties on the basis of bogus voting. It is true to some extent as ruling parties at the time of election misuse their power to secure power. Also it denies the people of their basic right to select a leader of their choice. So in order to protect the rights of the citizen, a fool proof mechanism/System of voting is needed.

Our project aims to fulfill this requirement by adding finger print verification and barcode reader to the EVMs. We choose this technology because. Government of Maharashtra is working on a project named "EPIC"to attach adhar Card (UID) database to Election ID card Database.

Since, finger print is a unique gift of nature which differs from every single human being and UID Cards are equipped with barcode .so we are using two stage verification..

SYNOPSIS:

- CONCEPT
- BARCODE READER MODULE
- FINGER PRINT VERIFIER MODULE
- MICRO CONTROLLER
- VOTING MODULE
- SYSTEM TESTING
- SCOPE AND FUTURE DIRECTIONS

CONCEPT:

Government of India initiated project named "EPIC" is initial stage of our project .Database needed is already available to us through biometric UID Database. Recorded finger prints are stored in the finger print module of the NAE-Voting Machine to be sent to the respective polling booth of the voter. The finger print module which we are using here can store up to 750 finger prints in its memory. During polling the voter's ID of the voter is manually verified and sent to the EVM chamber.

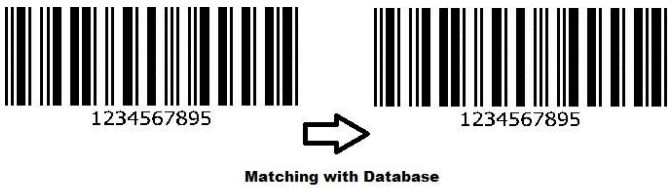
Firstly UID Barcode is scanned to have biometric data from UID Database. After that, voter allowed to place finger on sensor. Now the finger print sensor which has optical scanner takes a picture of the finger print and compares it with the one already stored in the EVM. When both the finger print matches, then the Fingerprint module will give a signal to the microcontroller. The microcontroller is programmed in such a way that it will give supply to the Ballot module only if it receives the signal. The Ballot module remains off otherwise. Once the Ballot module gets supply, the voters can register their votes by pressing the appropriate button allotted for each candidate. On completion, there will be a long beep which ensures that the voting process has been successfully completed. At the end of the beep, the finger print of the particular voter gets deleted automatically from the memory.

BARCODE READER MODULE :

A **barcode reader** (or **barcode scanner**) is an electronic device that can read and output printed barcodes to a computer. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain *decoder* circuitry analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

CCD (Charge Coupled Device) readers use an array of hundreds of tiny light sensors lined up in a row in the head of the reader. Each sensor measures the intensity of the light immediately in front of it. Each individual light sensor in the CCD reader is extremely small and because there are hundreds of sensors lined up in a row, a voltage pattern identical to the pattern in a bar code is generated in the reader by sequentially measuring the voltages across each sensor in the row. The important difference between a CCD reader and a pen or laser scanner is that the CCD reader is measuring emitted ambient light

from the bar code whereas pen or laser scanners are measuring reflected light of a specific frequency originating from the scanner itself.



FINGER PRINT VERIFIER MODULE:

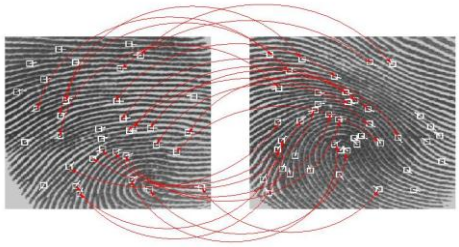
In this module, you can Add a fingerprint, Delete a fingerprint and also Identify a fingerprint. To identify a finger print, press the Identify button and if the finger print matches, then further process takes place. The finger print module consists of an optical scanner. A fingerprint scanner system has two basic jobs -- it needs to get an image of your finger, and it needs to determine whether the pattern of ridges and valleys in this image matches the pattern of ridges and valleys in pre-scanned images.

The heart of an optical scanner is a charge coupled device (CCD), the same light sensor system used in digital cameras and camcorders. A CCD is simply an array of light-sensitive diodes called photosites, which generate an electrical signal in response to light photons. Each photosite records a pixel, a tiny dot representing the light that hit that spot. Collectively, the light and dark pixels form an image of the scanned scene.

The scanning process starts when you place your finger on a glass plate, and a CCD camera takes a picture. The scanner has its own light source, typically an array of light-emitting diodes, to illuminate the ridges of the finger. The CCD system actually generates an inverted image of the finger, with darker areas representing more reflected light and lighter areas representing less reflected light.

Before comparing the print to stored data, the scanner processor makes sure the CCD has captured a clear image. It checks the average pixel darkness, or the overall values in a small sample, and rejects the scan if the overall image is too dark or too light. If the image is rejected, the scanner adjusts the exposure time to let in more or less light, and then tries the scan again.

If the darkness level is adequate, the scanner system goes on to check the image definition (how sharp the fingerprint scan is). The processor looks at several straight lines moving horizontally and vertically across the image. If the fingerprint image has good definition, a line running perpendicular to the ridges will be made up of alternating sections of very dark pixels and very light pixels.



If the processor finds that the image is crisp and properly exposed, it proceeds to comparing the captured fingerprint with fingerprints on file. If the finger print matches, a signal will be sent to the programmed microcontroller.

MICRO CONTROLLER:

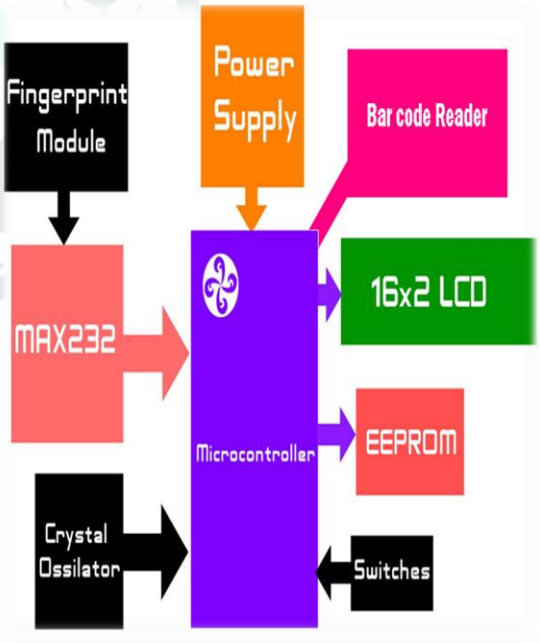
The signal from the Barcode Reader and finger print module are given as the input to the micro controller. Then the output of the particular micro controller is directly given to the voting module of the EVM. The micro controller will be programmed based on the algorithm given below:

- The micro controller senses the signal from its input port.
- After receiving the signal it will give supply to the voting module through its output port so that the voting module gets on.
- If there is no signal in the input port, the there is no output. Hence the voting module will not get supply.
- Once the voting machine gets the supply, the micro controller enables the delete operation in the finger print module and the finger print of the person who is in use at that time gets deleted.

Any type of micro controller can do this simple programmed operation

VOTING MODULE:

The Electronic Voting Module consists of two interconnected units, the Ballot Unit where the voter casts his vote by pressing a button alongside the name of the candidate and symbol of the party for whom the person chooses to vote for and the Control Unit where all related data like number of votes polled for each candidate, total number of votes cast etc. resides. The Control Unit is the main unit which stores all data and controls the functioning of EVM. The program which controls the functioning of the control unit is burnt into a micro chip on a "one time programmable basis". Once burnt it cannot be read, copied out or altered. The EVMs use dynamic coding to enhance security of data transmitted from ballot unit to control unit. The new EVMs have also got real time clock and date-time



Stamping facility which enables them to record the exact time and date whenever a key is pressed. On completion of Barcode and finger print verification, the voting module powers on and the person can cast his vote by simply pressing the button corresponding to the name of the desired candidate.

SYSTEM TESTING

INTRODUCTION:

The testing phase involves the testing of the developed system using various kinds of data. An elaborated testing of data is prepared and a system is tested using the test data. It is mainly used to improve the quality and for verification and validation. While testing, errors are noted and corrections remade, the corrections are also noted for future use.

UNIT TESTING:

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program input produces valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration.

This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

Each units in the system are separately tested and is managed to get the expected output. These units in the system are the separate modules that are used in the system and they represent a process implemented in the system. the functionality of the system is tested with the help of this process of testing method.

INTEGRATION TESTING:

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components. When the modules are tested separately, they are also tested for the integration between them. when the first module is executed, it must make its path itself to the next module. These are said to be event driven and this is referred using the integration testing.

TEST CASE:

The system is tested by providing the invalid images or the images that is not present in the database. For a QR image present in the database, providing the inappropriate fingerprint image will also result in the disqualification of the user. Thus, validating the system.

INPUT A	INPUT B	RESULT
User 1.Barcode	User 1.Fingerprint	True
User 2.Barcode	User 1.Fingerprint	False
User 2.Barcode	User 2.Fingerprint	True

CONCLUSION

The proposed voting system benefits in user authentication method through fingerprints, the polling process is made easy with the use of the QR codes. The main benefit is time consuming comparatively less than the older voting system. The system can be implemented easily in any areas where voting needs to be done.

The future enhancement is to analyze the compatible support over the various distances in wide area manner. The implementation can be simple and is made. effectively with the accuracy. This system can also be used in any organization or even an association which conducts the voting to select their respective presidents. In those areas, all the members can be given only with the QR codes that were made in the private manner specially to use inside the organizations. The use of QR code is itself a secure one where the biometrics can stay only as a additional security feature in the system. In future, we could only see the trend of QR codes vastly. Though they are mainly used for the purpose of advertisements now, their implementation in a system for authentication would definitely bring a change in the future world. This can be implemented using phones if the emerging fingerprint scanners in smart phones like iPhone 5s and Samsung s5 reaches to the hands of the entire society. Thus, making it online and easy.

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