



## Study of Biometric Voting System

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**ABSTRACT:** This project discusses the development and implementation of a new technology for voting machines. It devises a new modern approach which can replace the traditional mechanical voting system with a biometric one. The main objective is to design a biometric voting machine that uses an individual's finger print as the medium of identification. It aims to remove the traditional use of documents or voter ID at polling booth during elections. The project suggests a more modern system which is biometric in nature, and also less time consuming.

### I. INTRODUCTION

In traditional Voting System, each voter has to carry an identity proof which is used to establish the identity of the person. The identification process takes a lot of time since every person has to prove his identity individually and then only he or she is allowed to cast the vote. Also, voting is a very sensitive process because the chances of forgery are high. In order to simplify the process and avoid various errors, we have developed a biometric voting machine which uses a person's finger print as the proof of his identity. There will be no need for the person to carry documents regarding his identity.

The voter will scan his finger at the finger print scanner which will read the data and pass it for verification from the database. If the data matches with the information from the database, the person will be eligible to cast the vote. Otherwise, the LCD module will display a text that the person is not qualified for casting the vote. Similarly, the LCD will display various messages regarding the voting, and the casting of votes will be done via push buttons or switches.

The project is designed with the combination of embedded systems and finger print module. The basic components required include a microcontroller, push buttons, LCD module, finger print module and a unit for interfacing the microcontroller with the finger print module.

### II. BACKGROUND

The microcontroller will act as the brain of the device, and will be connected with the other components. In simple words, it will be responsible for controlling and instructing components such as the push buttons and the LCD display.

An interfacing unit will be required between the microcontroller and the finger print module so that the microcontroller is able to read and analyze the data that is being fed into the finger print module, match it with the information already stored in the database, and give necessary instructions to other components based on this information.

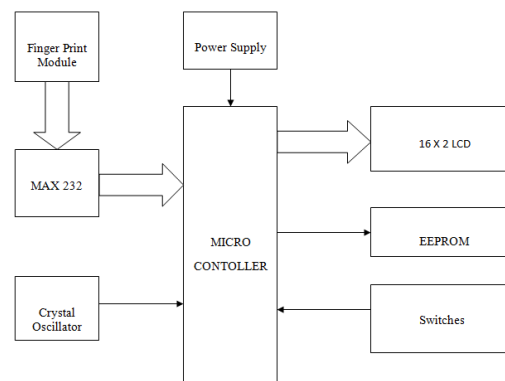
### III. PROJECT DESIGN

The design of the project is done in two parts.

-The Hardware

-The Software

In the first part, a schematic is drawn on a piece of paper which works as a reference for designing and testing the circuit on the breadboard. If this design is found satisfactory, a PCB layout is made and a PCB is designed according to this layout. The entire process of PCB designing like etching, drilling and shouldering of components is done and the designed hardware is tested to achieve the objective of the project. The power supply contains basic components like Transformer,



Rectifier, Capacitor Filter, and Voltage regulator. The primary components include a Microcontroller IC, Max232 IC, Finger print module, LCD Display, and Switches.

The second part deals with the software used in the project. In this, the programming of the microcontroller IC is done.

The microcontroller acts as the heart of the project and controls the operation of the interfaced components. PCB layout is designed on the pad2pad software and the Keil software is used as the development tool for writing and compiling the source code. Programming of the microcontroller is done in Embedded C.

#### IV. WORKING PROCEDURE

In simple words, a finger print based voting machine is an embedded system which can make things smoother during the process of elections.

Usually, every individual has to bring an identity proof in order to cast his vote at the polling station. This makes the process of casting the vote too long and insecure. After the implementation of this project, the person will have no need to carry an external Voter card. The voting card will be the finger print of the individual himself which will store the different details of the individual. The finger print module will read the data when the individual will scan his finger print.

Basically, this project will work in 3 modes,

1. Mode of enrolling
2. Mode of identification and vote casting
3. Result mode

On turning on the power, the voting machine will display a message somewhat like, 'welcome to electronic voting machine' on the LCD display. The mode in which the voting machine will work depends on the input user will give through the push buttons/switches.

##### A. Mode of Enrolling

When this command is given, the microcontroller scans the finger print of the user through the finger print scanner and the LCD displays the text, 'Enrolling...'

A character code is generated which is unique for every user based on his finger print. During this, the LCD will display the text, 'Character code is generating...' This code is saved in the memory of the Microcontroller (EEPROM).

Only the users previously enrolled in the machine system will be able to cast their vote during the elections.

##### B. Mode of Identification and Vote Casting

In the identification mode, the user scans his finger in the module and the LCD displays the message, 'Identifying...'

If the user is already enrolled in the memory of the microcontroller, he is eligible to cast the vote. The LCD will display a text, 'Cast your vote...'

The user will press the push button pertaining to the candidate he wants to vote for, and the vote will be stored in the memory of the microcontroller in the form of a four bit code. If the same person tries to vote again, the access will not be granted. The system will return to the initial mode of identification and will wait for the next vote.

##### C. Result Mode

The votes stored in the memory of the microcontroller will be displayed in the LCD along with the names of the candidates and the number of votes they secured. The result mode will be selected via the push buttons once the vote casting is completed.

#### V. CONCLUSION

- a. The implementation of the finger print based voting system is done successfully.
- b. Voting becomes more efficient from the process of reading the data and verifying it from the already stored data in the system.
- c. This implementation provides portability, flexibility, and data transmission at low power.

#### VI. FUTURE SCOPE

- a. Number of active candidates may increase.
- b. It could be interfaced with the computer and results can be displayed quickly and easily or the result can be stored in the central server whose data can be stored in the backend servers.
- c. It could be interfaced with the printer so that the hardcopy of the data can be taken.
- d. It could make the results available at any corner of the world in minimum time.

#### REFERENCES

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