

RFID BASED BIOMETRIC VOTING SYSTEM

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ABSTRACT

India is democratic country. Every citizen of India has the right to choose their leader who will lead their country. "Democracy is meant for people, it is run by people and it is for the sake of people". To choose the right representatives voting system is required. In early stages voting system was based on ballot paper but as technology is getting advanced, electronic voting machines are used for the safe and correct voting process.

Keywords-Adhar, Fingerprint Scanner, Biometric, Arduino

1. INTRODUCTION

India is the largest democratic country in the world. A democratic government means the rule of the people, by the people and for the people. To ensure this very rule by the people; elections are held election play a vital role in choosing the capable representative which in twin is capable to create an impression impact in Nation. Election Commission of India conducts a fair and correct election process. Previous some past few decades' election was held by ballot paper which was very risky as the technology get ajile. We change our ballot paper by electronic voting machine (EVM) but in this voting system whenever a person goes to polling booth to poll his vote the voters has to show his voter ID card.

This process is a time consuming process as the polling officer has to check the

voter id card with the list he has, confirm to has authorised voter and allow to voter to poll his vote. Thus to avoid this kind of problem we have designed RFID based biometric voting machine.

2. VOTING PROCESS

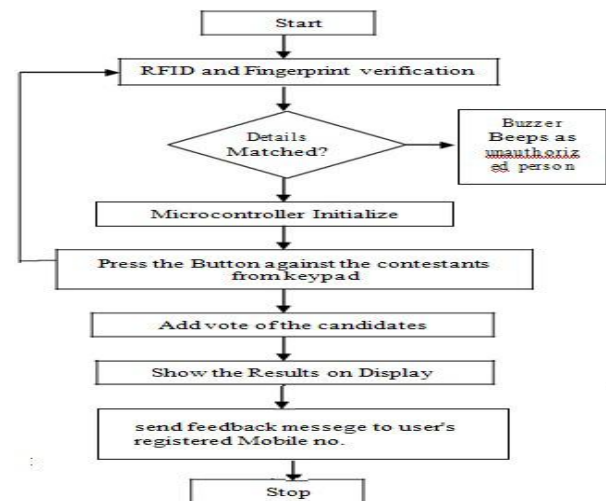
In any instance of an election involving the academic staff of the University of Ibadan, it has been observed that there are primarily two major issues that are usually sources of problems to the voting population. Firstly, it is usually commonplace that dispute over the issue of Eligibility or otherwise of the staff voters arises a lot. This is partly due to the varying staff levels on the academic ladder and also due to the time difference between dates of promotion to the next level. Secondly, there are always incidences of staff voters been required to wait on long queues during election period thus leading to a situation where they are tired before they get the chance to cast their vote and also due to the presence of the queue, aspirants and their campaign teams often exploit the situation to coerce voters into voting for them since all parties in the election are physically present.

The above factors combined to create a situation whereby any staff election is deemed not credible, and fair. Thus, there exists a vacuum for a system with features that would curb the ineffective To have a right voting process, the majority of voting system around the world includes proper citizen identification, proper authentication, proper

recording of the voting process and proper publication of the result. Voter identification is conducted in two stages. Firstly the voter registration should be done to allow a right citizen to exercise the voting. In previous stages voting criteria is done on ballot paper which was a very unsafe system for a corrective voting. It has been used for almost 5 to 6 decades (i.e. 50 to 60 years). With the advanced Technology Ballot paper voting system is replaced by EVM (Electronic Voting Machine) to overcome drawbacks of Ballot boxes, tearing of ballot papers, massive ranging & physical damage to the ballot papers by pouring fluids etc. In this voting system, the details of the voter will get from the previously stored database.

It was a newly developed database which is having all the information about the voter. By using this database we took the voter's information will be stored in the microcontroller. At the time of elections, for finger print accessing we are using finger sensing module. In this project first RFID tag is verified with the database of ATmega328 to check whether the voter belongs to that particular polling booth or not, and then fingerprint scanner is used to check whether the voter is original or not. If the data matches with the already stored information, the information is displayed on the LCD display and the voter is allow to cast his vote.

If the voter is not enroll in the database of microcontroller, or if the finger print doesn't matches with the database then a message is displayed on LCD display as "ACCESS DENIED", and security alarm will ring to inform the polling officer's and the person is not allowed to poll his vote. The project deals with microcontroller, finger print module, the interfacing unit RS232 that allow the communication between microcontroller and finger print module, the RFID module, buzzer and LCD display for displaying different messages.



When voters place the voting place he must have the RFID Tag that contain data of the individual voter. The RFID is verified with the data based the microcontroller atmega328 to check the voter belong to that particular polling booth or not. If the data matched with the already stored information, the information stored in the LCD display is allow to cast his vote. If it does not matched with the databased than messages display on LCD as does not allow to cast.

3. HARDWARE DISCRIPTION

3.1 RFID Module:

A Radio-Frequency Identification system uses tags, or labels attached to the objects to be identified. Two-way radio transmitter-receivers called interrogators or readers pass a signal to the tag and read its response. In this project, RFID tag contain the information related to individual voters. Our micro controller ATmega2560 contains the following details such as Name of the voter, voter ID, Date of Birth of the voter.

When RFID tag placed near to RFID reader, RFID reader activate the details of particular information of RFID tag which is preloaded into micro-controller memory. If that RFID tag exists in the database of micro-controller, then biometric authentication process begin. Else, our voting system goes to analysis next RFID Tag. In this way entire voting process goes on. RFID tags hold at least two parts: an integrated circuit for storing and processing information, modulating and demodulating a radio frequency (RF) signal, collecting DC power from the incident reader signal, and other specialized functions; and a receiver for receiving and transmitting the signal. The tag information is saved in a non-volatile memory.

An RFID reader transfers an encoded radio signal to interrogate the tag. The RFID tag receives the message and then responds with its identification and other information. The RFID reader is shown in the figure below:



FIG 1: RFID Reader



Fig.2: RFID Tag

3.2 Fingerprint Module:

Automated fingerprint identification is the process of automatically identifying one or many unknown fingerprints against a database of known and unknown prints. Fingerprint module is the important part of the EVM. It is used for scanning the fingerprint of the voter to ensure whether the voter is original or not, before starting the voting process and all the process of scanner is controlled by the ATmega2560. The scanner is connected to the micro-controller through a cable called "MAX232".



Fig 3: Finger Print Scanner

3.3 Switches:

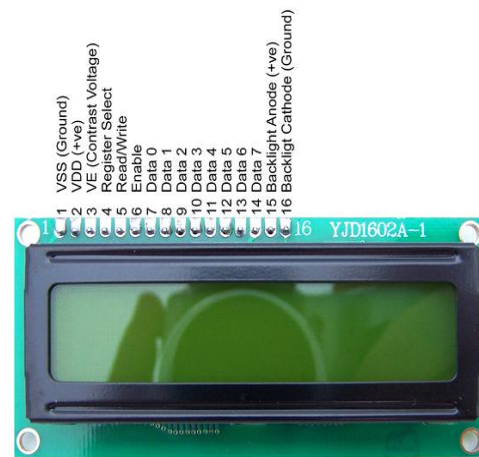
In this project, rather of EVM (Electronic Voting Machine), switches are used to cast vote by voters. Here four switches have been implemented named as SW1, SW2, SW3 and result button. These switches are connected to the LCD and are controlled by microcontroller Each and every switch belongs

to different political party except result button. If the person is already enrolled one, then only voter can cast the vote. When voter press a button named as SW1, SW2, SW3 vote is polled for respective political party. This EVM is auto-reset which means when one voter will complete the voting process after few seconds the machine will be reset for the next voter to vote. Like this, entire voting process goes on.

3.4 Liquid Crystal Display and Buzzer:

LCD (Liquid Crystal Display) screen is an electronic show module and finds a wide range of applications. A 16x2 LCD show is very basic module and is very commonly used in various devices and circuits. These modules are approved over seven segments and other multi segment LEDs. The reasons being: LCDs are efficient; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can show 16 characters per line and there are 2 such lines. In this LCD each character is shown in 5x7 pixel matrix.

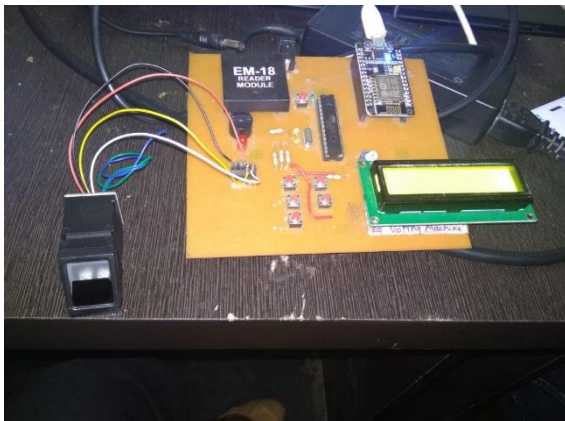
This LCD has two registers, especially, Command and Data. The command register saves the command instructions given to the LCD. A command is an instruction given to LCD to do a predeceased task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register saves the data to be displayed on the LCD. The data is the ASCII value of the character to be shown on the LCD.



4. RESULTS

The contestant name and the secured votes will be shown on the LCD when the controller receives results instruction through the switches. The proposed block diagram of electronic voting system. Initially when the candidate details like RFID and fingerprint are equated, allows the voting machine to take the vote. A push button is assigned to each party. When the push button of the desired party is pressed, the LED blinks.

The LED blink indicates the success of vote. If the fingers print value do not match, then buzzer rings and voting cannot be continued any more. To know the conclusion of the party, the push button of the respective party must be pressed so that the number of votes cast for the party is displayed on the LCD screen. This process is repeated to know the result of each party that who have got maximum vote and who win the election.



5. CONCLUSION

The Electronic Voting Machine using RFID and fingerprint module has been described successfully. Database consisting of the details like name, address, age, gender, fingerprint of the people should be updated every time before election. These Electronic voting systems have many advantages over the present voting system. Some of these advantages faster tabulation of results, improved accessibility, greater accuracy, and lower risk of human and mechanical errors. This system affords additional security by allowing voter to vote only once by imparting unique identification i.e. fingerprint. It is very difficult to design an ideal e- voting system which grant perfect security and privacy with no compromise.

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