

# Bio-Metric Voting System Using Aadhaar Card Irrespective of Location

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**Abstract :** During elections, People in each district are divided into wards based on their locality and each ward has their respective polling booths. The people have to show their voter ID card whenever they go to the polling booth to poll their vote. This is a time consuming process as the person has to check the voter ID card, confirm it as an authorized card and then allow the person to poll his vote. The people belonging to different places have to poll their votes only in their respective booths. In our proposed system, a person can poll their vote from any location in any polling booth nearest to them irrespective of their locality. The user needs their Aadhaar card as an identity proof and fingerprint for authentication, this would be verified with the database already stored. In this project we have used RFID instead of Aadhaar card. Using the address in the card, his locality will be identified and a LCD display would show him the election candidates for his district. The voter can select the candidate of their choice using the provided keypad. The data of the casted votes would be collected and sent to their respective locality for counting. Thus the people can vote in the nearest booths and also false voting can be avoided since it links the fingerprint and the Aadhaar card.

**IndexTerms - BMV, Aadhaar card, Fingerprint, RFID, Wi-Fi.**

## I. INTRODUCTION

India is the most populous democracy in the world. As of now, it has 29 states and 7 union territories. . With over 1.3 billion people , it is very difficult to conduct secure elections in all the states. The main objective of voting is to give the citizen a chance to express their choices in choosing their own government and the political representatives. The elections are of different types. In case of Prime Minister, President, Governor , a single winner is elected to a unique position. On the other case, we have multiple winners such as board of directors and the members of the parliament etc.. So the voting system varies based on the type of election. The voting system is being updated from time to time. First we had paper ballot based voting followed by the electronic voting system and the online voting system. Also the current trend of India is 'Digitalization'. Based on this and to overcome the problems of the current voting system, we have developed an voting systems that enables a person to vote from any location within the state. This system includes the use of AADHAAR card and fingerprint for authentication purpose. This makes voting much easy, secured and user-friendly.

## II. DISADVANTAGES OF CURRENT VOTING SYSTEM

In the current voting system, voters cast their vote in their own locality. It involves multiple verification process that are done manually which is time consuming. This makes the voters to wait for a long time to cast their vote. This system does not have any proper authentication and so the possibility of illegal voting increases. The counting of votes can be done only at the end of the day . So, declaration of results takes a long time.

## III. ADVANTAGES OF PROPOSED SYSTEM

In the proposed system voters have the flexibility to vote from any location so the percentage of voting increases. The authentication is stronger when compared to the current voting system since it uses fingerprint. So, illegal votes can be avoided to larger extent. This system does not involve manual process which makes the process less time consuming. The counting can be done instantly. The results can be declared soon.

## IV. OVERVIEW

The proposed system uses fingerprint and RFID for authentication. Here RFID is used instead of Aadhaar card The RFID is scanned from which data of the respective voter is retrieved. Fingerprint is scanned and checked for match in the database. If it is matched then, the location of the user is tracked and the candidates belonging to the respective location is displayed. Based on the voter choice

the votes are casted. The votes belonging to different locality are transferred. Thus this system enables the voters to vote in the nearby polling booths.

## **V. BACKGROUND**

### ***PIC***

Peripheral interface controllers(pic) are used in the electronic circuits that require a set of processing. The PIC used here is PIC 16F877A which is a 8-bit microcontroller. It has 5 ports with 40 I/O pins. The PIC controller is used since they are inexpensive, simple to use and contains flash memory so that they can be reprogrammed.

### ***Fingerprint scanner***

Fingerprint is the unique for every individual and can be used for identification. Uniqueness in fingerprints are found by the difference in valleys and ridges of each fingerprint. The fingerprints are scanned using the Fingerprint scanner. There are two types of scanner, they are Optical scanner and Capacitance scanner. Both the scanner will produce the same image but the algorithm are different.

### ***RFID***

Radio-frequency identification identifies the electronic tags by using electromagnetic fields. The tags are of two types, passive tags and active tags, the contain electronically stored information. The passive tag collects energy from the RFID reader while the active tag uses the local power supply for its energy. RFID is one method for Automatic Identification and Data Capture(AIDC).

### ***Wi-Fi***

The Wi-Fi is a candidate technology in IOT. TCP/IP protocols are used in Wi-Fi to transmit data. Wi-Fi can be used to connect things to internet by using its access points. Thus the remote agents in the cloud can easily take care of handling the things in partially or fully automated manner. Wi-Fi is the simple and cost effective scenario for IOT.

### ***LCD Display in BMV***

LCD is an electronic display module. The LCD can be used in both read and write mode. There are two registers data and command registers. The data is displayed using the data registers and the command is given to the command register. The LCD display is used because it is inexpensive and simple for using.

### ***Relay in BMV***

A relay is an electrically operated switch. Relays are used where a single signal is used to control various components or circuits. The relays use electromagnet or solid state relays to mechanically operate a switch.

## **VI. FEATURES IN THE BMV SYSTEM**

### ***PIC in BMV***

The major controls in this system are performed using PIC controller. The database of the voters and the casted votes are stored in the controller. It also controls the data to be displayed in the lcd and transfer of data between the connected components.

### ***Fingerprint scanner in BMV***

The fingerprint scanner in this system is used for authentication. It scans the fingerprint of each voter and allows them to cast their vote.

### ***RFID in BMV***

In our system instead of AADHAAR card RFID tags are used. The RFID tags are scanned using the RFID scanner. The scanned information is then sent to the PIC controller which will retrieve the data of the respective voter from the database.

### ***Wi-Fi in BMV***

The votes that are casted by the voters belonging to the different location are transferred to the respective polling booths by Wi-Fi.

### ***LCD Display in BMV***

The 16x2 LCD is used in our system. It is used for displaying the candidates of the respective locations of the voters. The votes are casted by choosing the candidates of their choice.

### Relay in BMV

PIC controller can communicate with only one device at a time. It transfers and receives data from various components at different times. So, the connection between the PIC controller and a particular component must be switched. For this switching purpose, relays are used.

## VII. WORKING

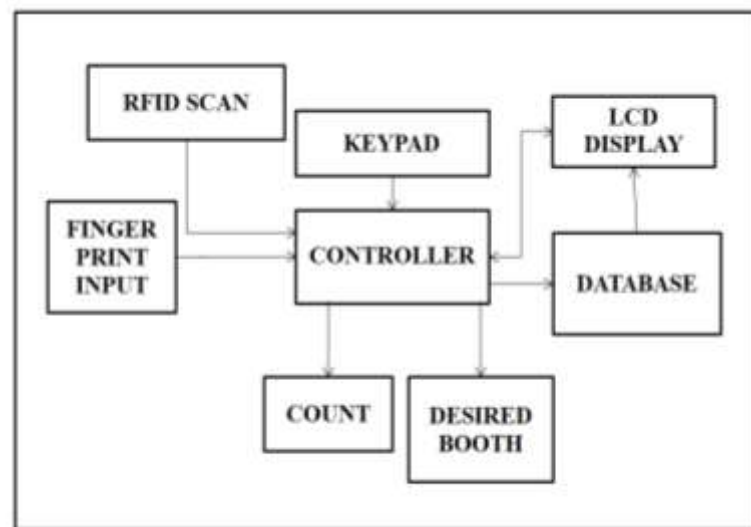


Fig.1 Block diagram of Biometric voting system

The RFID of the voter is scanned first. After scanning, the controller will retrieve the data of the respective voter. The fingerprint of the voter is scanned and checked for match with the data. If the fingerprint matches then the voter is allowed to vote. Once the fingerprint is matched then the location of the voter is tracked by using the address in the database. Then, the candidates belonging to the respective location is displayed in the LCD screen. The candidates are chosen using the push buttons provided. Then the votes are casted successfully. If the voter belongs to the same location then the casted vote is stored for the counting purpose. If the voter belongs to a different locality then, the vote is transferred to the respective polling booth. Once an RFID is scanned and vote is casted successfully, then the same cannot be used again in any other booth. This decreases the number of false voting.

If the fingerprint scanned does not match with the data in the database, the voter is not allowed to vote. Since, fingerprint of the authenticated voter is already stored in the database. Counting of the votes can be done instantly, which is displayed on the computer.

## VIII. ALGORITHM

- Step 1 : RFID tag is scanned by the RFID reader.
- Step 2 : The LCD display asks for the input fingerprint.
- Step 3 : The fingerprint of the voter is scanned by the fingerprint scanner.
- Step 4 : The input fingerprint and the fingerprint in the database are checked for match.
- Step 5 : If the fingerprint matches, the address of the voter is tracked from the database.
- Step 6 : The candidates for his location would be displayed in the LCD.
- Step 7 : The voters can vote for the candidate of their choice using the push buttons.
- Step 8 : The votes will be recorded.
- Step 9 : If the candidate vote in his own locality, the votes are stored.
- Step 10 : If the candidate vote in a different locality, the votes are transferred to the respective polling booths
- Step 11 : Counting of votes can be done faster and the results can be declared.

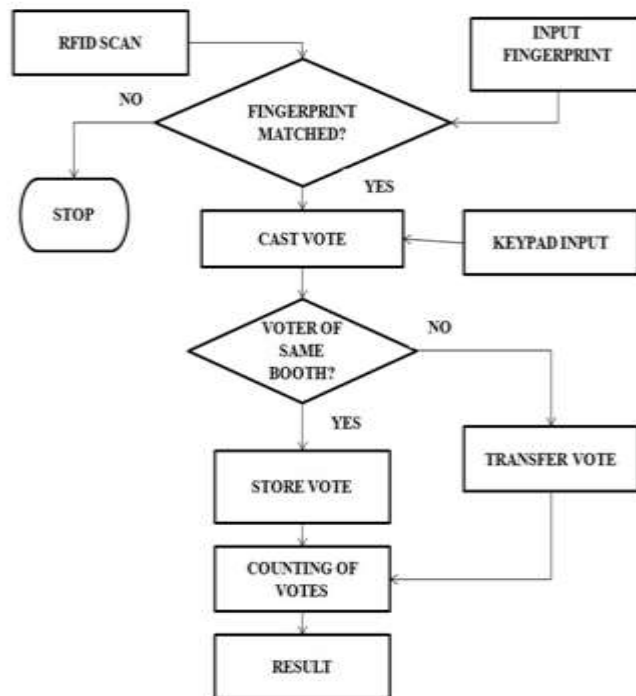


Fig.2 Flow chart

## IX. CONCLUSION

Recent advances in new technologies are being developed in every nook and corner of the world. To keep ourselves competitive we have to be up to date. In this paper, we have proposed a model, that overcomes the challenges of the conventional voting system such as paper printing, distribution, storage huge investments in transportation etc. It provides robustness, accessibility, improved speed and accuracy in counting, voting in nearby location etc. It provides comfortable facility to the busy electorates to cast their valuable vote. The voter's percentage would also increase, thus supporting democratic process. With the use of this BMV system, many of the issues, that have been faced in the current voting system, are bound to be resolved providing peace of mind to both electorates and election candidates. This model is transparent, secure, easy to understand and can be implemented as an option with the other existing technologies.

## X. FUTURE WORK

In the future the authentication process can be further improved by scanning the iris or by scanning the voter while entering the booth. Thus the voter need not to scan the fingerprint, and can vote directly once they enter the booth. This will also reduce the time consumption and also increases the security. This system can also be developed as an application, so that the voter can cast their vote after proper authentication by the electoral officers. So, the voting process becomes more faster and secured.

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