

# SMART E-VOTING SYSTEM WITH FINGERPRINT AUTHENTICATION USING ARDUINO

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**Abstract** – In Democratic countries like India, the voting system down a major role during elections. Traditionally, the election commission in India uses electronic voting machines which need more manpower, time-consuming and also they are less accurate. For avoiding misconceptions during elections, there are a lot of advanced techniques are being proposed using various methods. But in the field of biometric identification, we can get better results and it is also trustworthy. In this paper, we provide the various works which are being proposed based on the voting system which uses biometric identification as a major concept. The fingerprint module was already stored in the government database. Hence this project provides the best solution to avoid false voting. The electronic voting machine was connected with the computer. The computer is having the full database list of the peoples who are having the eligibility to vote. For each polling, the corresponding person identity was deleted. So it avoids false voting. A touch screen is used, so it is user-friendly.

**Key Words:** Vote, electronic voting machine, fingerprints, voter id, Authentication

## 1. INTRODUCTION

In a manual election, the electorates cast their votes for choosing their candidates, where they simply put their designated votes in sealed boxes distributed across the election circuits around a given country. By the end of the election process, all these boxes are opened and votes will be counted manually in the presence of certified authority person of all the candidates until the numbers are checked. This phenomenon warrants transparent at vote casting time and at counting time. Sometimes, counting errors take place. Also in some cases, voters find ways to vote more than once. Introducing irregularities in the final count results, which could, in rare cases, it require a repeat of the election process! Moreover, in some nations, purposely introduced manipulate of the votes take place. To distort the results of an election in favor of particular candidates. Here, all such mishaps can be avoided with accurately scrutinized election process. But when the electoral votes are too large, problems can still occur. Sometime international monitoring bodies are required to maintain elections in some countries. This naturally calls for the automated online computerized election process. In addition to overcome commonly encountered election errors, electoral vote counts are done in the real time that by the finishes of all election process of elections day, the results are automatically display. The election process can be easily enhanced with some features base on the acknowledgements and requirements of different nations around the world.

Due to worldwide ratio in computer and the underlying infrastructures, e-Voting is no longer a North American or Western phenomenon. This newest high tech method of casting a votes has spread far beyond the **United States**, expanding throughout the entire world. E-Voting, along with its benefits and features, can now be found from the developed nations of Europe to the developing countries of Asia and South America. The introduction of e-voting has been the biggest change to the Irish electoral system since the establishment of the state over 80 years ago. E-Voting may become a worldwide reality or a worldwide nightmare. Besides reliable e-Voting techniques, there is a dire need for international standards to govern the technology, the software reliability, hardware reliability and accuracy, the processes and techniques deployed within the techniques, and the checking of all hardware, software, and protocols involved. Such standards will allow elections to proceed in any part of the world without the need for maintaining bodies.

## 2. PROBLEM STATEMENT

There are several problems and issues which are the most important drawbacks that have to be cleared and verified. There are some of the important problems High manpower, takes lots of time to give the count, long-distance communication is not available, less accuracy, less security etc. According to the current system, votes could be counted manually so that there is more opportunity for occurring errors, such as duplicates counting and completely missed counting.

## 3. LITERATURE REVIEW

1] Smart Electronic Voting System Based on Biometric Identification-Survey: In this paper, we provide the various works which are being proposed based on the voting system which uses biometric identification as a major concept. Some other works have

different algorithms being used and some other works have different techniques provided are based on the multimodal biometric identification. In this paper, we proposed the concept of getting the fingerprint impression of a voter which is entered as input to the system. Then compared with the available data in the database. If the particular data matches with anyone on the available record, access to cast a vote is granted. Then the result is instantaneous and counting is done via IOT.

2] Secured Electronic Voting Machine using Biometric: The electronic voting systems can be employed that replace the incident and most importantly error-prone human Component. Our project proposes and implements a simple and secure method of polling vote by using biometrics. Due to the changes occurred in the technology, so many advancements were introduced in the field of voting. The main aim at increasing the flexibility security, reliability, scalability of the model and provide less time consumption to system for announce the result. Nowadays, the voting procedure was held by manually operating machines and even through SMS also. But this electronic voting machine is a unique and new concept which saves a lot of time and avoids the false voting by a false person. In this system, the user has to use his fingerprint to poll the authenticated vote.

3] Based biometric voting machine linked to Aadhar for safe and secure voting: The objective of the voting system is to allow voters to cast their votes for the procedure of selecting the government and political representative. In this paper, the voting system uses the Aadhar card for the authentication of the voting. By using the Aadhar card based voting system to defend the security, reliability, and transparency. People have a right to cast the vote to choose their leader. In this system, voter does not need to carry the voter ID card. The voter only scans the fingerprint which is already existing in the Aadhar card database.

#### 4. OBJECTIVES

- The main objective behind this E-voting is to "vote" by which the people can elect the candidates for forming an efficient government to satisfy their needs and requests such that their standard living can be improved.
- Understanding the use of E-voting in the election system, which type of algorithms are used in this system, Applications and future uses of E-voting.

#### 5. SYSTEM ARCHITECTURE

The Smart E-Voting system with fingerprint authentication using Arduino. The idea about any voting system is one person is equal to one vote, it stand to claim that they never voted previously in this election at another location. The main purpose of our system is to preventing fraudulent voting. The proposed system divided in five main module as listed below:

- Voter registration.
  - Fingerprint verification.
  - Cast the vote.
  - Alert the wrong/double voting.
  - Generate result.
- 1) Voter Registration: in registration process first upon voter saves their fingerprint with the help of fingerprint module. The unique id is stored in fingerprint module memory of the controller. After all registration the system is ready for cast the vote.
  - 2) Fingerprint verification: When the voter cast their vote before that process system has to check for validity to the voting. During this process voter should scan their fingerprint after scanned, it is compared with stored data. If it match found then the voter cast their vote. If the fingerprint did not match then system not allowed for votes.
  - 3) Cast the vote: After the fingerprint verification the voter can cast the vote. In that process voter have to cast the vote for any one party. If voter select party button that time one count is added for that selected party and save that vote in database. If any voter select more than one party that time alert message is ON.
  - 4) Alert the wrong/double voting: If any voter fingerprint not match with stored data that time alert system will be worked. Also if any votes cast the double vote that time alert system be worked as message display on LCD or any buzzer sound will be occurred.
  - 5) Generate result: After completion of vote casting to find who is winner and which party is win in election and done by final voting report. The system admin has authority to shown final report that which party is win.

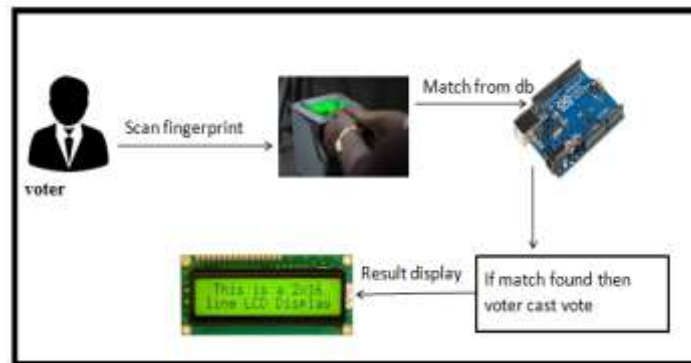


Fig: System architecture

## 6. HARDWARE DESCRIPTION

### A) Arduino:

Arduino is the main part or brain of our system. Arduino is a simple microcontroller board that used to make computers that drive all the function and creative projects alike. Now we can use Arduino for voting machine with database matching. After completion of all the voters then all the record send to PC for generate the voting result.

### B) Fingerprint Module:

Biometric identification from a fingerprint made by an impression of the ridges in the skin of a thumb or finger is often used as evidence in criminal investigations. Now we can use the same biometric identification technique to build our own hobby projects like as biometric authenticate and control system with the help of readily-available Fingerprint Identification Modules.

### C) LCD 16\*2:

LCD screen functions as interface between the voter and Arduino, which displays messages. Also voter ID and also whether their vote is valid or not. Also it displays “welcome” messages initially and we can set other messages as per our requirement.

### D) Switches:

In this undertaking, rather than EVM (Electronic Voting Machine), changes are utilized to make choice by voters. Here four switches have been given named as SW1, SW2, SW3 and result catch. Every last change has a place with their individual political gathering aside from result catch. Additionally, in creator's undertaking for selecting voters, Enroll Button is given. While making choice, the client needs to press a catch named as Authentication Button. On the off chance that the individual is already selected one, at that point just vote throwing happens. At the point when voter press a catch named as SW1, the vote is surveyed for the individual political gathering. Like this, the whole casting a ballot procedure finishes. After the casting a ballot procedure finishes, when the race commission opens the outcome by utilizing specific private secret key, at that point the main rundown of surveyed votes to a specific political gathering will be appeared on the LCD screen. In view of that data, the client needs to choose who is the champ?

## 7. PROPOSED METHODOLOGY

A smart e-voting systems can improve voter identification process by utilizing fingerprint recognition. Fingerprint is becoming an essential component of personal identification solutions, since fingerprint identifiers cannot be shared or misplaced, and they represent any individual's identity. Therefore, security, confidentiality, reliability and accurate were the heart of computerized e-voting system were election data are recorded, stored and processed as digital information in the modern era.

### Algorithm of fingerprint voting system:

Step 1: Start.

Step 2: Registration.

Step 3: Scan finger.

Step 4: Fingerprint matched.

Step 5: Match found.

Step 6: Match not found go to step 1.

Step 7: Cast the votes.

Step 8: Press candidate button from list.

Step 9: Candidate selected.

Step 10: Vote successful.

Step 11: Follow all step at last voter cast their vote.

Step 12: Count added for party.

Step 13: Result display.

Step 14: Stop

## 8. ADVANTAGES

- Avoid invalid votes.
- Reduces polling time.
- Reduces manpower of voting center.
- It gives accurate counting without any troubles.
- Time conscious.
- Convenient.

## 9. CONCLUSION

Altogether, this framework conquers the greater part of the issues looked amid the casting a ballot period by the paper vote system. The proficiency of this system relies on the web interface, its ease of use. This will without a doubt guarantee a more secure casting a votes strategy which is especially what is required for a solid development of a creating country. In this paper, the proposed Fingerprint based voting system which is preferred and quicker over past frameworks. The new system anticipates access to illicit voters, gives usability, straightforwardness and keeps up the honesty of the casting a voting procedure. The framework additionally keeps numerous votes by a similar individual and checks the authentication of the voter. It additionally enables a man to cast a voted from anyplace given that the voter is inside discretionary cutoff points. The unique mark based voting system has given an opportunity to evade invalid votes, It decreases the surveying time, Easy to conveying to surveying focus from the surveying box, Reduce the staff of the casting a ballot focus, It gives simple and exact tallying with no inconveniences, Provisioning of voting preventive measures.

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