Fingerprint based Biometric Voting Machine

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Abstract *:* India is the largest democracy in the world. Elections are held every five years. A large percentage of India's already considerable population votes during these elections During early times ballot boxes were used. These days EVM or electronic voting machines are used instead, Despite being the largest democracy in the world, there are certain factors which affect it. Various factors include corruption, women's rights, caste issues, politics etc. Buying votes is not uncommon. People also vote more than once. All this affects the integrity of the elections. Some of these problems can be solved by the use of biometric based voting. so by keeping all this in mind we designed a project called biometric voting machine. In this project we use fingerprint based voting machine. The fingerprint voting system allows the user to scan his/her fingerprint, in order to examine his acceptable by comparing his current fingerprint with the one already stored in the system's database, Once the users complete the identification process, they will be allowed to cast their vote . In this we have used lcd to display all the information and the push buttons are used as voting keys. This project ensures that single person gets to vote only once**.**

KEYWORDS- Fingerprint sensor module, Fingerprint, Biometric, LCD display, Push buttons .

I. INTRODUCTION

Democracy is a system in which people elect the government to rule. In India the government is of the people, for the people by the people as India is a democratic country. The term democracy comes from a greek word demokratia which means rule of the people. Democracies are mainly of two types. One is called direct democracy and another one is called indirect democracy. In direct democracy people directly participate in the political decision making. This type of democracy was followed in ancient Greece. It is impractical now since population has increased vastly. In indirect democracy the people elect their representatives which in turn take the political decisions .Thus a nation is truly democratic when the people's political, social and economical aspirations are fulfilled. This is classified into 2 main categories 1)political conditions and 2) social and economic conditions. To achieve proper political conditions we need Constitution to vest power in the people. A democratic government also has to make sure that social development takes place. This should reflect the social security ,welfare and status of people. The deprived and poor should be economically improved**.**
Following table is from 2014 elections :

	Male	Female	Others	TOTAL
No.of electors	437035372	397018915	28527	834082814
No. of electors who voted at polling stations	292826400	260192272	1968	553020648
Polling percentage	67%	65.54%	7%	66.03%

In India there are around Fifteen thousand to Twenty thousand bogus voters registered in every assembly segment . Also around 1.25 lakh to 1.5 lakh bogus voters are present in every Parliamentary constituency. With around 8-9 lakh bogus voters in Mumbai itself. What is needed is a concrete voting mechanism which eliminates the possibility of human intervention as much as possible. This can be achieved by using biometrics. Basically biometrics is the science that measures and analyze biological data. Biometrics refers to technology that measure and anatomize human body characteristics such as fingerprints, eye retinas for authentication purpose. Among the several human fingerprints remain a very common identifier and the biometric method of choice among law enforcement. These concepts of human identification have commanding to the development of fingerprint scanners that benefit to quickly identify individuals and assign access privileges.
 This project uses fingerprint sensor technology for voting. This means that people can't fake vote since each person has a unique fingerprint. This would massively reduce fake voters as well as duplicate voters. It also reduces need for using voter id cards since the data will be processed by the computers. which would store the fingerprint information along with the voters required information. Double voting cannot be stopped using the conventional methods. Use of biometrics can eradicate fake voting. Since a fingerprint is unique to every person, it cannot be faked. Thus fingerprint based voting ensures that each person votes only once. In the future biometrics based voting is the only way to ensure real electoral results. In addition to fingerprint, face recognition could also provide additional layer of defense against malpractices

II. Literature review

Before starting with the project, we have gone through many reports regarding the defects in the voting system and the projects used to prevent this. We have also gone through the project reports on various smart voting system. Some are listed down below:

'Smart Voting System for Digital India'

This report specifies the traditional voting system is dull and inconvenient. Voters have to wait in a long queue for several hours. This may cause in degradation of voting percentage. Apart from this, this system has several issues such as – corrupt votes, fraud in voting system, discomfort to aged and handicapped people etc".

'A Finger Print based Voting System'
In this project they have used ARM processor as microcontroller and lcd for displaying all the information.

III .BLOCK diagram:
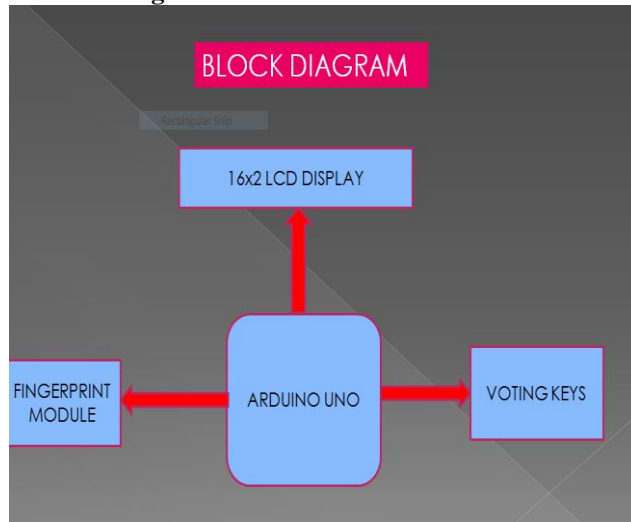
The hardware components that are used in project are :
1 Arduino Uno
 2 R307 Finger Print Sensor Module
 3 Push Buttons
 4. 1K Resistor -5
 5. Potentiometer
 6. Connecting wires
 7. 16x2 LCD
 8. PCB.

Arduino Uno :

Fig 1: The Arduino Uno board

The microcontroller used in this project is Arduino Uno board which is based on the ATmega328. It has fourteen digital input/output pins (of which six of the pins can be used as PWM outputs), six as analog inputs, a sixteen MHz ceramic resonator, a USB connection, a power jack, ICSP header, and a reset button are used. It contains all the important things that are required to support the microcontroller, connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards, it doesn't use the FTDI USB-to-serial driver chip. Rather than, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Fingerprint module(R307):

Fig 2: R307 Fingerprint Module

This is a fingure print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can cache the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The FP module can candid interface with 3v3 or 5v Microcontroller. A level converter (like MAX232) is compulsary for interfacing with PC serial port.
Optical biometric fingerprint reader with great notability and can be fix into a variety of end products, such as: access control, attendance, safety deposit box, car door locks

16x2 LCD display :
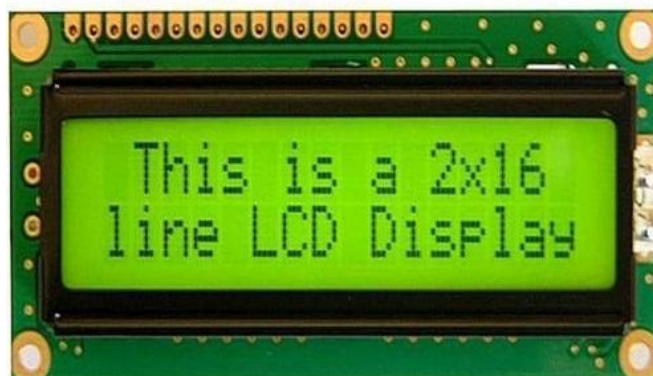
Fig 3: 16x2 LCD DISPLAY :

An LCD is an electronics display module that are used for liquid crystal to produce a visible image. The 16×2 LCD display is very basic module commonly used in DIYs and circuits. The 16×2 translates o a display16 characters per line in 2 such lines. In LCD each character is exhibit in a 5×7 pixel matrix. LCD module is one of the display device that well used for electornics equipments. Its ability to display alpha-numeric characters has contributed the improvement of function of the electronics devices. Especially its very low power consumption is suitable for battery powered devices.In this project we have used LCD display to display all the functioning going on.

IV.WORKING*:*

    In this project we have used arduino uno as a controller then we have collected all the database of fingerprints of voter .For voting first we will ask user to scan his/her fingerprint and then we match the scanned fingerprint with the fingerprint stored in the database.If the match is found the LCD will display the voter is valid and further voter will be allowed to cast his/he vote by pushing the push button on the pcb board and if the fingerprint is not matched the voter will not allowed to vote. For checking the result we have given authority fingerprint, unless and until this fingerprint is matched the result will not get displayed .
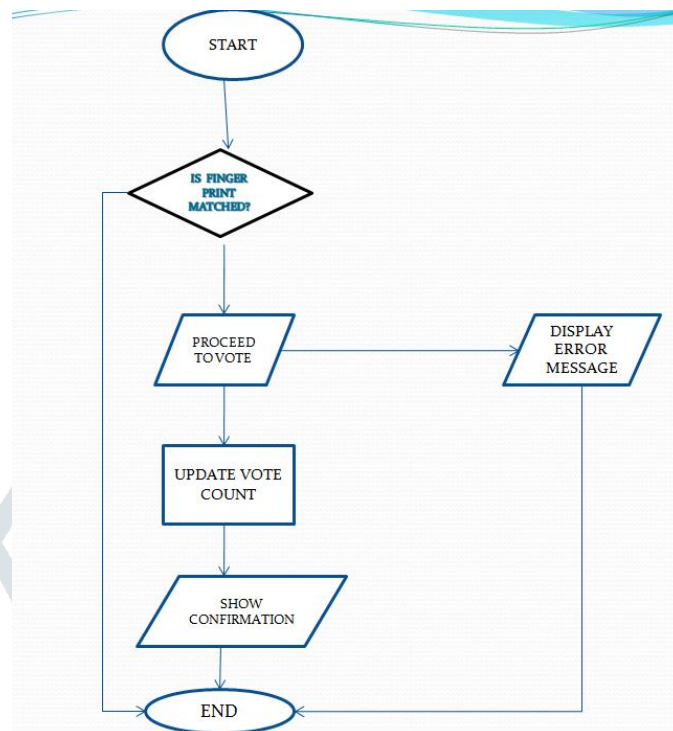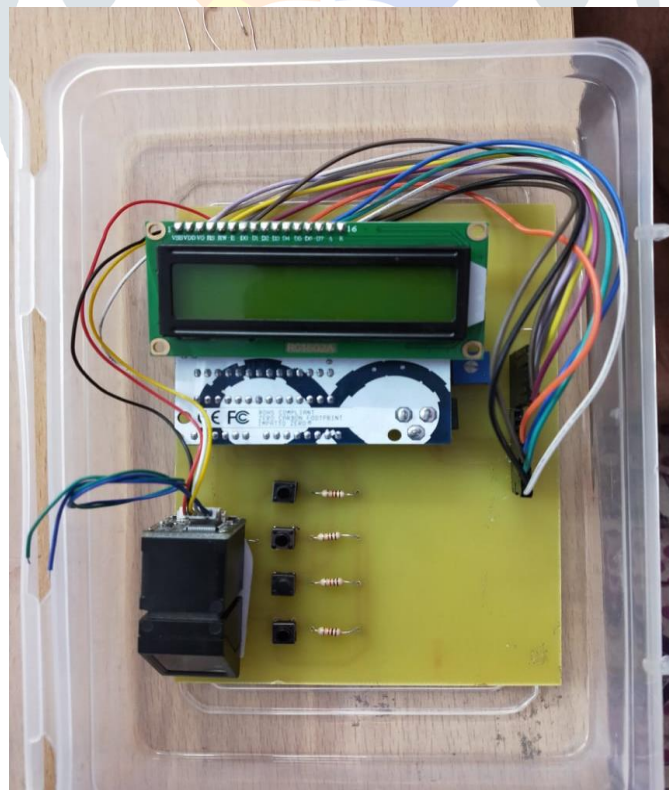

Fig.4 Flow chart
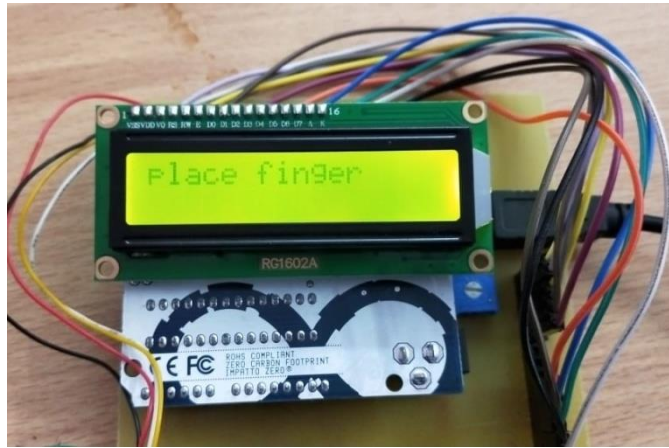

Fig. 5 Circuit

RESULTS:

Fig 6. LCD display for finger scanning.

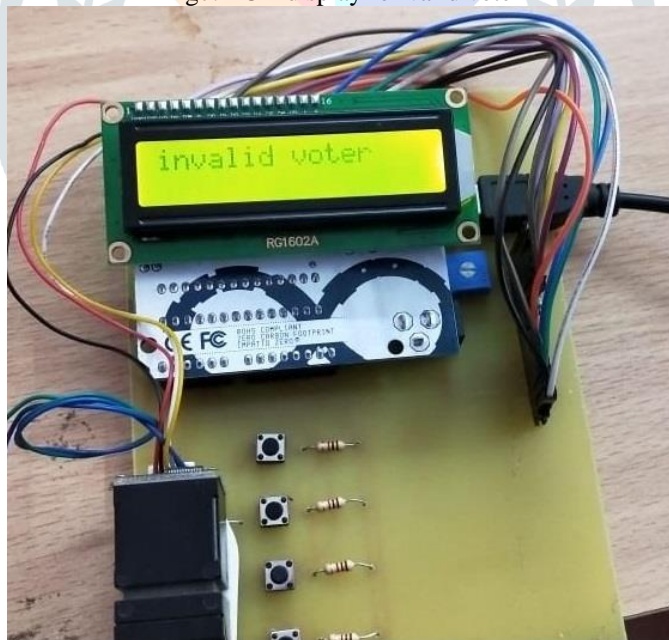Fig7. LCD display for valid voter

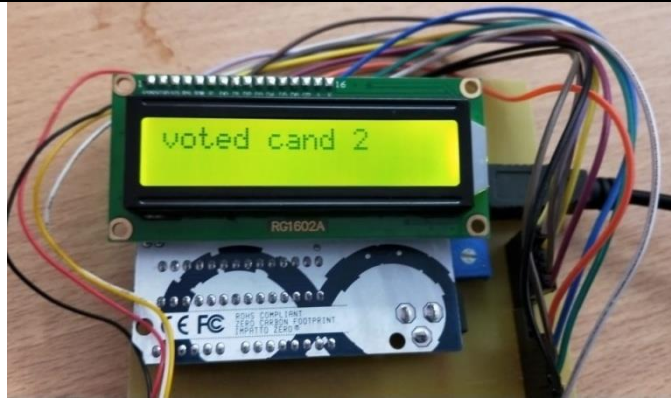Fig 8. LCD display for invalid voter

Fig 9. LCD display for voting

Fig 10. LCD diplay for result.

V .CONCLUSION:

we have made a project fingerprint based biometric voting machine using arduino uno ,fingerprint sensor and LCD display. As we are using biometric this project can be used to reduce fake voting and double voting.

VI. Future Scope:

Currently we have used R307 fingerprint sensor memory for storing data which has some limitation. Thus a person whose fingerprint is not stored in the local database will not be able to vote. This can be solved by using cloud storage for storing fingerprints. A secure end-to-end encrypted solution for storing fingerprints can be used. Using cloud storage will eliminate the need for on site storage facility. Also by having all the fingerprints available at every voting center, people belonging to certain constituency can also vote elsewhere. This is particularly useful for people who are staying in a different city for work,education, etc. In india the voting age limit is above 18 so after 18 we need to register for voting with the help of this project no need for separate registration as soon as the citizen completes his/her 18 years according to aadhar database his/her name will be directly added to voter database and he/she will be able to vote. so it will also save reduces all the resources , effort and money that government need to invest on registration process.

VII. ACKNOWLEDGEMENT:

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