VISVESVARAYA TECHNOLOGICAL UNIVERSITY

MINI PROJECT REPORT ON

"FINGER PRINT BASE VOTING SYSTEM"

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In partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN

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NEW HORIZON
COLLEGE OF ENGINEERING
New Horizon Knowledge Park, Ring Road, Marathalli
Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the Mini project entitled "**FINGER PRINT BASE VOTING SYSTEM**" is carried by **MATAM RISHI(1NH18EC070),PRASHANT.B(1NH18EC088),VB VASU(1NH18EC115), RISHEEK.DS(1NH19EC412**), bonafide students of NHCE, Bengaluru in partial fulfillment for the award of Bachelor of Engineering in Electronics and Communication of the Visvesvaraya Technological University, Belagavi during the year 2020-21. It is certified that all corrections and suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The mini project report has been approved as it satisfies the academic requirements in respect of the mini project work prescribed for the said degree.

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CHAPTER 01

INTRODUCTION

Elections are a feature of democratic governments where people rule themselves and can express their decisions on various topics, such as constitutional changes, legal texts or the choice of the right person as a manager. A voting system is in place to set the rules of election. Political elections are the most common form of choice, however, there are many different areas where choices are an integral part of their choice organizational functions. Elections are vital for businesses, informal organizations, and nonprofits. Elections are the way of the democratic world, but an election has to be conducted fairly was the challenge of every electoral body, especially in the country with high corruption, weak rules or laws and less transparency. In addition, elections have cost millions and billions of dollars to run. This study report mainly focuses on developing a prototype embedded system that deals with the fingerprint voting system, which can support the voting process in a robust manner and safe way.

The system integrates various hardware components such as micro controllers, fingerprint modules, LED s, switches, which enable a perfect voting system.To implement this system, the fingerprint sensor is used to take the user's finger Print the picture and store it in the internal memory, these pictures are processed and analyzed with Arduino. The user interface is implemented with an LCD screen, the mainly used to provide user instructions during the implementation of the voting process and the result.

Manipulation of the electoral process is not uncommon, even in some countries with strong rule of law. Ballot filling, voter suppression, multiple voting and annihilation legally cast ballots still hit the headlines in the newspapers. Since every person has the unique fingerprint in this world, their fingerprint can be used to cast their vote using the electronic fingerprint voting system. The proposed system is offline execution. The fingerprint voting system requires you to register your fingerprint when voting stand. The person can now vote on election day by simply verifying their identity her fingerprint. The system uses Arduino and fingerprint technology. Voting is political in nature, but also social, business and educational in nature.

Electronic voting machine (EVM) keeps all all features of voting by ballot paper when conducting elections much more functional. It is fast and absolutely reliable EVM saves a lot of time, money and personnel. And from of course contributes to the absolute voting secrecy without the use ballot. The electronic voting machine is nowadays a effective tool for voting. It ensures an error-free coordination and thus has spread further. It secures the voting rights of People. It avoids any kind of wrongdoing and invalid votes.Such a system will also be more economical because the resulting personnel costs are saved. It is also practical for the voter as he only has to press one key that belongs to its candidates.

Voting machines are the total combination of mechanics, electromagnetically or electronic equipment, which is used to define ballots; cast and count votes; to report or show election results; and to maintain and produce any

audit trail information. The first voting machines were mechanical, but it is increasingly common to use electronic voting machines.

A voting system includes practices and associate documentation used to identify system components and versions of said components; to test the system during its development and maintenance; to keep system logs errors or defects; to determine the specific changes made after initial certification; and make available any material for the voter (such as notices, instructions, forms, or paper ballots). Traditionally, a voting machine has been defined by the mechanism used by the system to cast votes and more categorized by the location where the system tabulates the votes.

The objective of this project is to develop a preferential EVM with the following characteristics: • This product should have a low budget design.

• The result of the product must be instantaneous

• It must be easy to maintain and operate.

Biometrics is the science and technology of measuring and analyze biological data. Biometrics refers to technologies that measure and analyze the characteristics of the human body, such as DNA, fingerprints, eye retinas and iris, voice patterns, facials manual measurements and patterns, for authentication purposes.The field of biometrics was formed and has since expanded into to many types of physical identification. Among the various human fingerprints remain a very common identifier and the biometric method of choice among law enforcement agencies. These concepts of human identification have led to the development of fingerprint scanners that serve to quickly identify people and assign access privileges. The basic point of these devices is also to examine the fingerprint data of an individual and compare it to a database of other fingerprints. In our project we have used the fingerprint for the purpose of voter identification or authentication. Like thumb print each individual is unique, it helps to minimize error. A database is created containing everyone's fingerprint images voters as needed. Illegal votes and re-voting is verified on this system with accurate coding.

CHAPTER 2

LITERATURE SURVEY

This biometric fingerprint system can make huge difference in overall election especially in the developing or underdeveloped countries where paper ballot system is still used and people have very little faith in election process because of various irregularities and corruption.

India, being a democratic country, elects leader through electoral system. India is among countries where paper ballot system is still in use. With high level of corruption and very low transparency, election often invites turmoil in the country. Electoral fraud, sometimes referred to as election fraud, election manipulation or vote rigging, is illegal interference with the process of an election, either by increasing the vote share of the favored candidate, depressing the vote share of the rival candidates, or both. Multiple voting by a person, ballot box theft and vote rigging are also very common. India being one of the poorest country in the world, spent about 60,000 crore rupees in the election in 2019.

Fingerprint voting system, if implemented, could solve many of India's electoral problems. Some advantages of using this system are discussed below:

- Safe: It is an utmost important that the voting process be secure and no one should be able to tamper with the result before, during and after voting process. Since the system is not connected to internet, no online external influence can occur. Also, it is very easy for security personnel to secure the device if needed,since it is compact, and light compared to many ballot boxes.
- Cost: The conventional paper voting system used in India is very expensive because of papers and printings, transportation, staff expenses and it takes several days to count the votes. On the other hand, the biometric fingerprint system is cheap, compact and can store any amount of data with proper upgrade.
- Accuracy and Reliability: The ink used to mark people who have voted already can be erased with modern technologies but the fingerprint voting system erases the chance of multiple voting and it is very precise. Also, there is a very slim chance of errors happening from electronic system so, people can rely on results to be accurate.
- Time Saving: It takes weeks to count the votes by election personnel sometimes. This time

frame is not peaceful for that area so it is ideal to get result as soon as possible. The manual vote counting technique can be seen in figure 20. With electronic device election results can be produced is minutes rather than days or weeks.The voters do not have to carry their ID with them since the fingerprint acts as

their ID when voting so queues can clear faster. Unauthorized or voters not enrolled in system before hand is not allowed to vote.

- Trees Conservation: Paper ballot system uses paper for voting process which is printed in millions of quantities. An example of sheer size of the ballot paper is shown in the fig. 23. Little to no paper is used in electronic voting so it helps trees conservation.

CHAPTER 03

HARDWARE AND SOFTWARE SPECIFICATION

Software:

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing

Hardware:

- **Arduino UNO MICROCONTROLLER:**

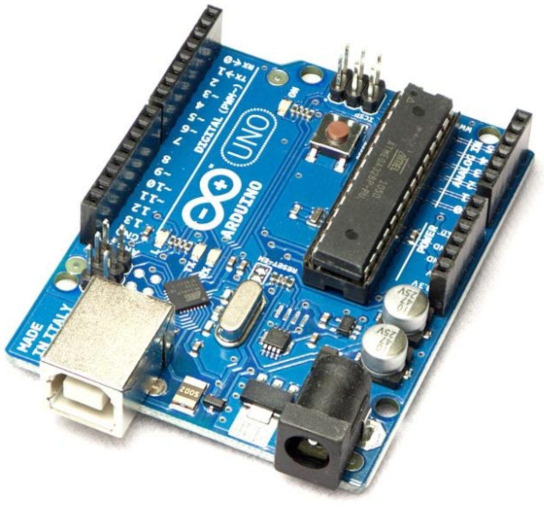


Fig.no (3.1) Arduino UNO

Arduino coding operates with two major blocks. The first one is called void setup. Void setup defines input and output pins. It helps start initializing variables and also start using library.

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board [7].

The Arduino Uno platform was chosen for this thesis project due to the fast response time of the pin, simple and clear programming environment, open source and availability. The Arduino Uno is an ATmega328P microprocessor controlled board. It comes with 14 digital I/O ports, 6 analog inputs, a 16MHz quartz crystal, a power connector, a USB connection, an ICP connector, and a reset button which can be seen in Figure 8. Arduino Uno can be turned on. Via the battery via the power port or by connecting via a USB A/B cable The official Arduino UNO schematic diagram can be seen in Figure 9. The pins and their functions are shown in detail in Table.

PARAMETRICS:

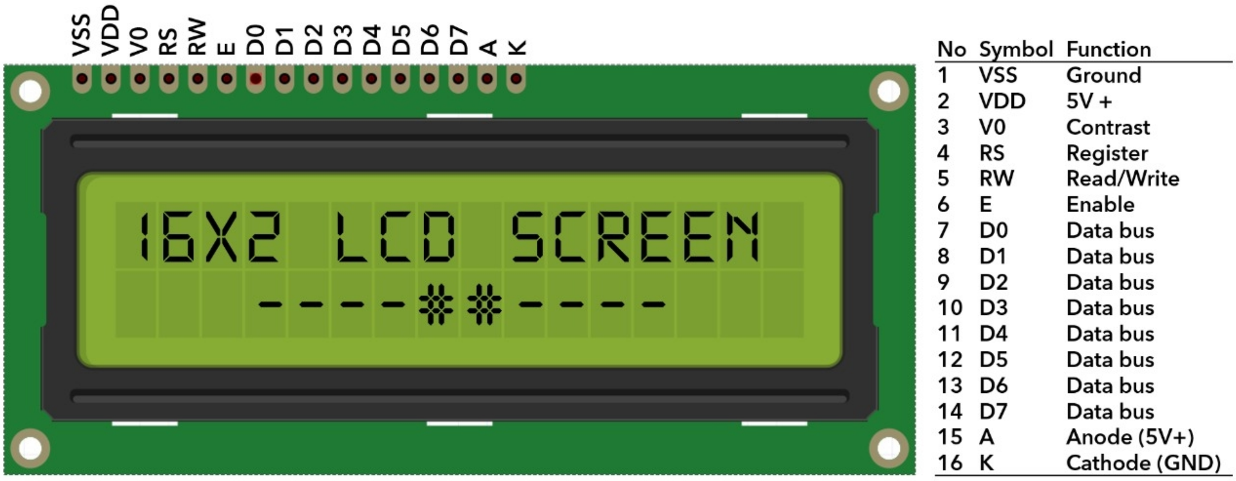
Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328P) of which 0.5 KB used by bootloader
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz

Table.no(3.1) PARAMETRICS TABLE

Pin Category	Pins	Description
Power	Vin 3.3V 5V GND	Vin: Input voltage to Arduino using external power source. 5V: Regulated power supply to MC and components. 3.3V: On board voltage regulator generated 3.3 V. GND: Ground pins
Reset	Reset	Resets the Microcontroller
Analog Pins	A0 – A5	Used to provide analog input in the range of 0-5V
Input/Output Pins	Digital pins 0 - 13	Can be used as input or output pins.
Serial	0(Rx), 1(Tx)	Used to receive and transmit TTL serial data.
External Interrupts	2, 3	To trigger an interrupt.
PWM	3,5,6,9,11	Provides 8-bit PWM output.
SPI	10,11,12,13	Used for SPI communication.
Inbuilt LED	13	To turn on the inbuilt LED.
TWI	A4(SDA), A5 (SCA)	Used for TWI communication.
AREF	AREF	To provide reference voltage for input voltage.

Table.no(3.2) PIN CONFIGRATION TABLE

- ## 16*2 LCD DISPLAY YELLOW:



No	Symbol	Function
1	VSS	Ground
2	VDD	5V +
3	V0	Contrast
4	RS	Register
5	RW	Read/Write
6	E	Enable
7	D0	Data bus
8	D1	Data bus
9	D2	Data bus
10	D3	Data bus
11	D4	Data bus
12	D5	Data bus
13	D6	Data bus
14	D7	Data bus
15	A	Anode (5V+)
16	K	Cathode (GND)

Fig.no(3.2) 16*2 LCD DISPLAY YELLOW

The term LCD stands for liquid crystal display. It is a type of electronic display module used in a wide range of applications such as various circuits and devices such as mobile phones, calculators, computers, televisions, etc. These displays are primarily preferred for multi-segment and seven-segment light emitting diodes. The main benefits of using this module are economic; simply programmable, animations, and there are no limitations to display custom characters, and even special animations, etc.

PIN CONFIGURATION:

- Pin1 (Ground / Source Pin): This is a display GND pin, used to connect the GND terminal of the microcontroller unit or power supply.
- Pin2 (VCC / Source Pin): This is the display voltage supply pin, which is used to connect the supply pin of the power supply.
- Pin3 (V0 / VEE / Control Pin): This pin regulates the screen difference, which is used to connect an interchangeable POT that can supply 0 to 5 V.
- Pin4 (Register Select / Control Pin): This pin toggles between command or data register, is used to connect a microcontroller unit pin and gets 0 or 1 (0 = data mode and 1 = command mode).
- Pin5 (Read / Write / Control Pin): This pin toggles the display between read or write operation, and is connected to a pin of the microcontroller unit to obtain 0 or 1 (0 = Write operation and 1 = Operation Reading).
- Pin 6 (Enable / Control Pin): This pin must be kept high to execute the read / write process, and it is connected to the microcontroller unit and must be constantly kept high.
- Pins 7-14 (data pins) - These pins are used to send data to the display. These pins are connected in two-wire modes such as 4-wire mode and 8-wire mode. In 4-wire mode, only four pins are connected to the microcontroller unit as 0 to 3, while in 8-wire mode, all 8 pins are connected to the microcontroller unit as 0 to 7.
- Pin15 (+ ve pin of LED): this pin is connected to + 5V

Pin 16 (LED pin -ve): This pin is connected to GND.

FEATURES: LCD16x2 Features

The features of this LCD screen mainly include the following.

- The working voltage of this LCD screen is 4.7V-5.3V
- Includes two rows where each row can produce 16 characters.

- Current draw is 1 mA with no backlight.
- Each character can be built with a 5 × 8 pixel box
- The alphabets and numbers on the alphanumeric LCD displays
- The screen can work in two modes like 4-bit and 8-bit
- These can be obtained with blue and green backlight
- Show some custom generated characters.

• PUSH BUTTON SWITCHES:

FIg.no(3.3) PUSH BUTTON SWITCHES

A push button switch is a type of switch that consists of a simple electrical mechanism or an air switch mechanism to turn something on or off. Depending on the model, they could operate with a momentary action or interlock function. The button itself is usually constructed of a strong and durable material, such as metal or plastic. Pushbutton switches come in a variety of shapes and sizes. We have a selection of pushbutton switches here at Herga. Pushbutton switches are used in industrial and medical applications and are also recognizable in everyday life. For uses within the industrial sector, pushbuttons are often part of a larger system and are connected through a mechanical link. This means that when a button is pressed, it can cause another button to be released.

- **12V POWER ADAPTER:**

Fig.no(3.4)12V POWER ADAPTER

12V power supplies (or 12V DC power supplies) are one of the most common power supplies in use today. In general, a 12VDC output is obtained from a 120VAC or 240VAC input using a combination of transformers, diodes, and transistors. 12V power supplies can be of two types: regulated 12V power supplies and unregulated 12V power supplies Regulated 12V power supplies come in three styles: switching from regulated AC to DC, AC linear to DC regulated and DC to DC regulated switching. Switching regulated 12V DC power supplies, sometimes referred to as SMPS power supplies, switches, or switch mode power supplies, regulates the 12V DC output voltage using a complex high-frequency switching technique that employs width modulation. pulse and feedback. Acopian's switch-regulated power supplies also employ extensive EMI filtering and shielding to attenuate common and differential mode noise conducted to the line and load. Galvanic isolation is standard on our 12V DC switches, allowing our users to isolate input to output and output to ground for maximum versatility. Acopian's switch-regulated power supplies are highly efficient, small, and lightweight, and are available in DC-DC configurations and AC-DC wide-tuned output. Our low profile wide setting output switches can be voltage or current regulated and are externally programmable. Linearly regulated 12V DC power supplies regulate the output using a dissipative regulator circuit. They are extremely stable, have very low ripple, and have no switching frequencies to produce EMI. Galvanic isolation is standard on our 12VDC lines, allowing our users to isolate input to output and output to ground for maximum versatility. Acopian linear regulated power supplies are available with easily adjustable AC to DC outputs. Unregulated 12V DC power supplies are basic power supplies with one AC input and one unregulated 12V DC output. The output voltage changes with the input voltage and the load. These power supplies are inexpensive and extremely reliable.

- ## R307 FINGERPRINT SENSOR:

Fig.no(3.5) R307 FINGERPRINT SENSOR

This is the R307 Optical Fingerprint Reader Sensor Module. The R307 fingerprint module is a fingerprint sensor with a TTL UART interface for direct connections to the UART microcontroller or PC via the MAX232 / USB-Serial adapter. The user can store the fingerprint data in the module and set it to 1: 1 or 1: N mode to identify the person.

Characteristics:

- Integrated image collection and algorithm chip together, ALL in one.
- The fingerprint reader can do secondary development, can be integrated into a variety of end products.
- Low power consumption, low cost, small size, excellent performance.
- Professional optical technology, precise module manufacturing techniques.

Good image processing capabilities can successfully capture an image up to 500 dpi resolution.

• BREAD BOARD:

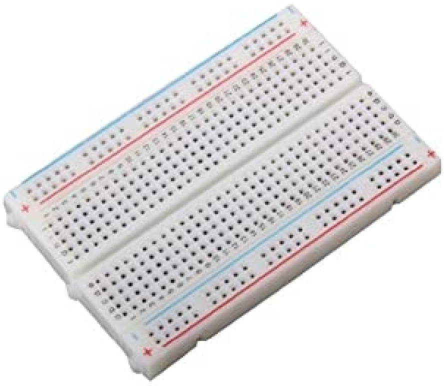


Fig.no(3.7)BREAD BOARD

A breadboard is a rectangular plastic plate with lots of little holes. These holes allow you to easily insert electronic components into a prototype (that is, build and test an older version) of an electronic circuit, such as this one with a battery, switch, resistor, and an LED (light-emitting diode). Technically, these breadboards are called solderless breadboards because they do not require soldering to make the connections. Soldering (pronounced SAW-der-ing) is a method in which electronic components are joined together by fusing a special type of metal called solder. Electronic components can be soldered directly to each other, but are most commonly soldered on printed circuit boards (PCBs). PCBs are what you will see if you remove the cover from many electronic devices, such as a computer or cell phone. Engineers will often use solderless breadboards to prototype and test a circuit before building the final, permanent design on a PCB. This image shows the same circuit (battery, switch, resistor, and LED) built in three different ways: on a solderless breadboard (left), with the components soldered directly to each other (center), and on a printed circuit board (right).

● JUMPER CABLES:

Fig.no(3.8) JUMPER CABLES

A jump wire (also known as a jumper, jumper wire, jumper wire, cable, or DuPont wire) is an electrical wire, or a group of them in a wire, with a connector or plug at each end (or sometimes , without them, simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

CHAPTER 04

PROPOSED SYSTEM

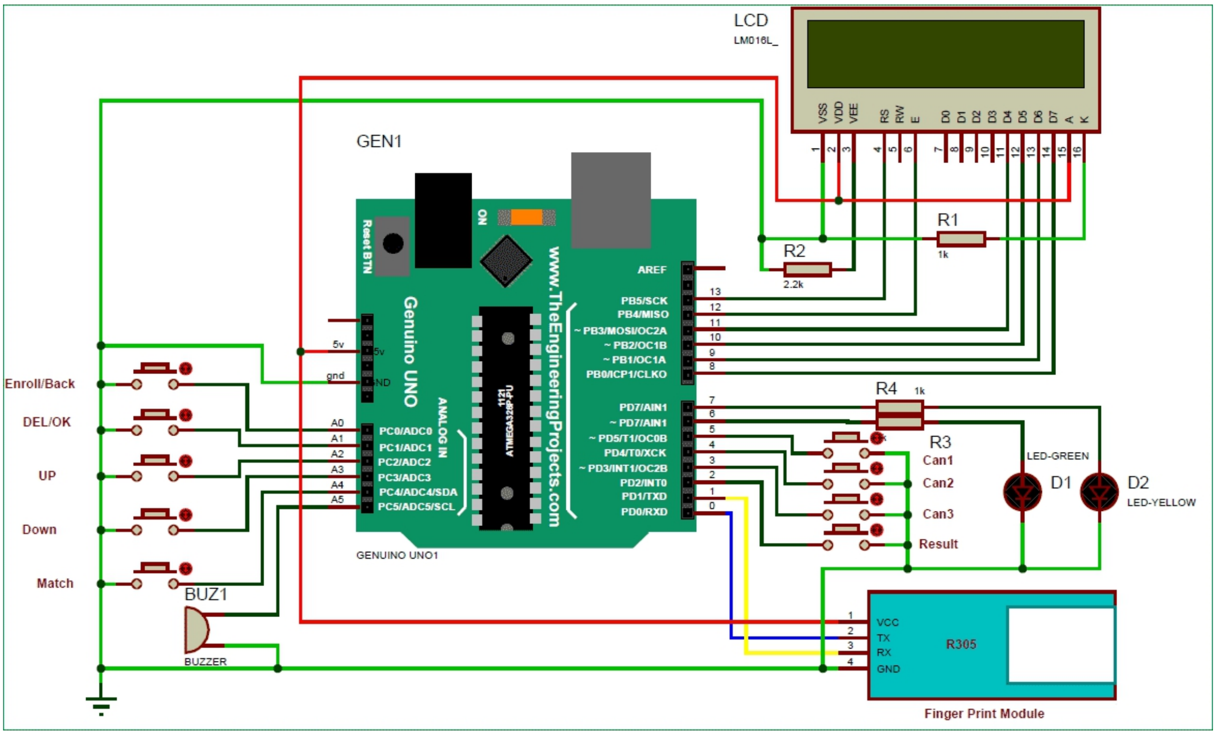


Fig.no(4.1) BLOCK DIAGRAM/CRICUIT DIAGRAM

The block diagram defines the working of the module, When the module is turned on the finger print takes 200ms time to boot at that time the LCD display shows **Initializing**.On the next step the user gives the input and he gets two options **start/enroll,**Start takes to the voting process and the enroll takes to the registration process. After **start** the user has to vote the candidate and the process is to end .

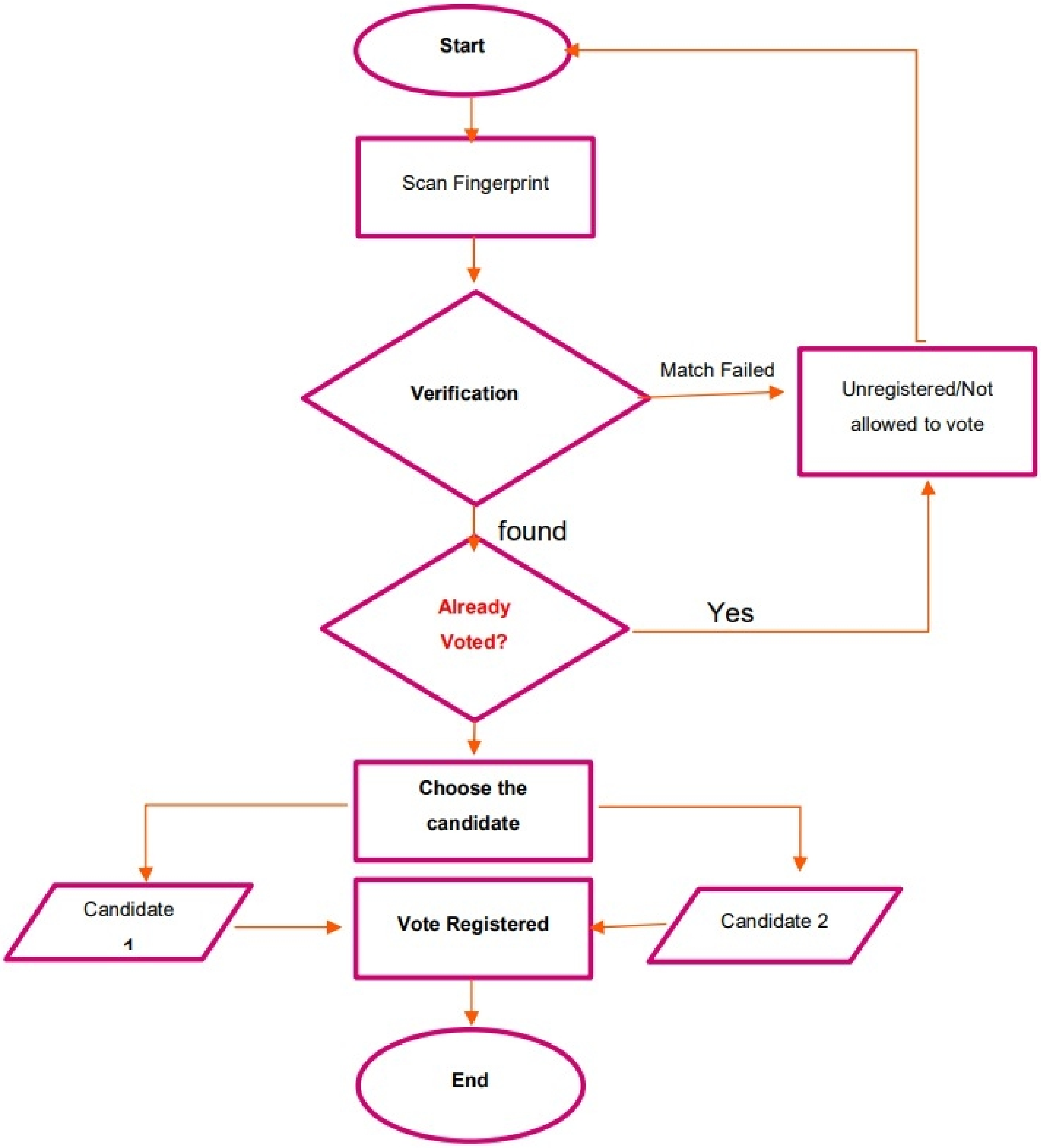


Fig.no(4.2) FLOW CHART

Program Code:

```
#include<EEPROM.h>
#include<LiquidCrystal.h>
LiquidCrystal lcd(13,12,11,10,9,8);

#include <Adafruit_Fingerprint.h>
uint8_t id;
Adafruit_Fingerprint finger = Adafruit_Fingerprint(&Serial);

#define enroll 14
#define del 15
#define up 16
#define down 17
#define match 18
#define indVote 6

#define sw1 5
#define sw2 4
#define sw3 3
#define resultsw 2
#define indFinger 7
#define buzzer 19
#define records 25
int vote1,vote2,vote3;

int flag;

void setup()
{
```

```
 delay(1000);
 pinMode(enroll, INPUT_PULLUP);
 pinMode(up, INPUT_PULLUP);
 pinMode(down, INPUT_PULLUP);
 pinMode(del, INPUT_PULLUP);
 pinMode(match, INPUT_PULLUP);
 pinMode(sw1, INPUT_PULLUP);
 pinMode(sw2, INPUT_PULLUP);
 pinMode(sw3, INPUT_PULLUP);
 pinMode(resultsw, INPUT_PULLUP);
 pinMode(buzzer, OUTPUT);
 pinMode(indVote, OUTPUT);
 pinMode(indFinger, OUTPUT);

lcd.begin(16,2);
 if(digitalRead(resultsw) ==0)
 {
   for(int i=0;i<records;i++)
     EEPROM.write(i+10,0xff);
   EEPROM.write(0,0);
   EEPROM.write(1,0);
   EEPROM.write(2,0);
   lcd.clear();
   lcd.print("System Reset");
   delay(1000);
 }

 lcd.clear();
 lcd.print("Voting Machine");
```

```
  lcd.setCursor(0,1);
  lcd.print("by Finger Print");
  delay(2000);
  lcd.clear();
  lcd.print("Circuit Digest");
  lcd.setCursor(0,1);
  lcd.print("Saddam Khan");
  delay(2000);

 if(EEPROM.read(0) == 0xff)
 EEPROM.write(0,0);

  if(EEPROM.read(1) == 0xff)
 EEPROM.write(1,0);

  if(EEPROM.read(1) == 0xff)
 EEPROM.write(1,0);



  //finger.begin(57600);
  Serial.begin(57600);
  lcd.clear();
  lcd.print("Finding Module");
  lcd.setCursor(0,1);
  delay(1000);
  if (finger.verifyPassword())
  {
   //Serial.println("Found fingerprint sensor!");
   lcd.clear();
   lcd.print("Found Module ");
```

```
   delay(1000);
  }
  else
  {
  //Serial.println("Did not find fingerprint sensor :(");
  lcd.clear();
  lcd.print("module not Found");
  lcd.setCursor(0,1);
  lcd.print("Check Connections");
  while (1);
  }

 lcd.clear();
 lcd.setCursor(0,0);
 lcd.print("Cn1");
 lcd.setCursor(4,0);
 lcd.print("Cn2");
 lcd.setCursor(8,0);
 lcd.print("Cn3");
 lcd.setCursor(12,0);
 lcd.print("Cn4");

 lcd.setCursor(0,1);
 vote1=EEPROM.read(0);
 lcd.print(vote1);
 lcd.setCursor(6,1);
 vote2=EEPROM.read(1);
 lcd.print(vote2);
 lcd.setCursor(12,1);
 vote3=EEPROM.read(2);
 lcd.print(vote3);
```

```
  delay(2000);
}

void loop()
{
 lcd.setCursor(0,0);
 lcd.print("Press Match Key ");
 lcd.setCursor(0,1);
 lcd.print("to start system");

 digitalWrite(indVote, LOW);
 digitalWrite(indFinger, LOW);
 if(digitalRead(match)==0)
 {
  digitalWrite(buzzer, HIGH);
  delay(200);
  digitalWrite(buzzer, LOW);
  digitalWrite(indFinger, HIGH);
  for(int i=0;i<3;i++)
  {
     lcd.clear();
    lcd.print("Place Finger");
    delay(2000);
    int result=getFingerprintIDez();
    if(result>=0)
    {
      flag=0;
        for(int i=0;i<records;i++)
        {
          if(result == EEPROM.read(i+10))
          {
             lcd.clear();
```

```
             lcd.print("Authorised Voter");
             lcd.setCursor(0,1);
             lcd.print("Please Wait....");
             delay(1000);
             Vote();
             EEPROM.write(i+10, 0xff);
             flag=1;
             return;
           }
          }

          if(flag == 0)
          {
          lcd.clear();
          lcd.print("Already Voted");
          //lcd.setCursor(0,1);
          //lcd.print("")
          digitalWrite(buzzer, HIGH);
          delay(5000);
          digitalWrite(buzzer, LOW);
          return;
          }
       }
     }
     lcd.clear();
   }
   checkKeys();
   delay(1000);
 }

 void checkKeys()
 {
  if(digitalRead(enroll) == 0)
  {
   lcd.clear();
   lcd.print("Please Wait");
   delay(1000);
   while(digitalRead(enroll) == 0);
   Enroll();
  }

  else if(digitalRead(del) == 0)
  {
   lcd.clear();
   lcd.print("Please Wait");
   delay(1000);
   delet();
  }
}

void Enroll()
{
  int count=0;
  lcd.clear();
  lcd.print("Enter Finger ID:");

  while(1)
  {
   lcd.setCursor(0,1);
    lcd.print(count);
    if(digitalRead(up) == 0)
    {
      count++;
      if(count>25)
      count=0;
      delay(500);
    }

    else if(digitalRead(down) == 0)
    {
      count--;
      if(count<0)
      count=25;
      delay(500);
    }
    else if(digitalRead(del) == 0)
    {
       id=count;
       getFingerprintEnroll();
       for(int i=0;i<records;i++)
       {
         if(EEPROM.read(i+10) == 0xff)
         {
           EEPROM.write(i+10, id);
           break;
         }
       }
       return;
    }

      else if(digitalRead(enroll) == 0)
    {
       return;
    }
  }
}
```

```
void delet()
{
  int count=0;
  lcd.clear();
  lcd.print("Enter Finger ID");

  while(1)
  {
   lcd.setCursor(0,1);
    lcd.print(count);
    if(digitalRead(up) == 0)
    {
      count++;
      if(count>25)
      count=0;
      delay(500);
    }

    else if(digitalRead(down) == 0)
    {
      count--;
      if(count<0)
      count=25;
      delay(500);
    }
    else if(digitalRead(del) == 0)
    {
        id=count;
        deleteFingerprint(id);
        for(int i=0;i<records;i++)
        {
          if(EEPROM.read(i+10) == id)
          {
            EEPROM.write(i+10, 0xff);
            break;
          }
        }
        return;
     }
     else if(digitalRead(enroll) == 0)
     {
        return;
     }
  }
}

uint8_t getFingerprintEnroll()
{
  int p = -1;
  lcd.clear();
  lcd.print("finger ID:");
  lcd.print(id);
  lcd.setCursor(0,1);
  lcd.print("Place Finger");
  delay(2000);
  while (p != FINGERPRINT_OK)
  {
    p = finger.getImage();
    switch (p)
    {
    case FINGERPRINT_OK:
      //Serial.println("Image taken");
      lcd.clear();
    lcd.print("Image taken");
    break;
  case FINGERPRINT_NOFINGER:
    //Serial.println("No Finger");
    lcd.clear();
    lcd.print("No Finger");
    break;
  case FINGERPRINT_PACKETRECIEVEERR:
    //Serial.println("Communication error");
    lcd.clear();
    lcd.print("Comm Error");
    break;
  case FINGERPRINT_IMAGEFAIL:
    //Serial.println("Imaging error");
    lcd.clear();
    lcd.print("Imaging Error");
    break;
  default:
    //Serial.println("Unknown error");
     lcd.clear();
    lcd.print("Unknown Error");
    break;
  }
}

// OK success!

p = finger.image2Tz(1);
switch (p) {
  case FINGERPRINT_OK:
    //Serial.println("Image converted");
    lcd.clear();
```

```
    lcd.print("Image converted");
    break;
  case FINGERPRINT_IMAGEMESS:
    //Serial.println("Image too messy");
     lcd.clear();
     lcd.print("Image too messy");
    return p;
  case FINGERPRINT_PACKETRECIEVEERR:
    //Serial.println("Communication error");
        lcd.clear();
    lcd.print("Comm Error");
    return p;
  case FINGERPRINT_FEATUREFAIL:
    //Serial.println("Could not find fingerprint features");
        lcd.clear();
    lcd.print("Feature Not Found");
    return p;
  case FINGERPRINT_INVALIDIMAGE:
    //Serial.println("Could not find fingerprint features");
            lcd.clear();
    lcd.print("Feature Not Found");
    return p;
  default:
    //Serial.println("Unknown error");
            lcd.clear();
    lcd.print("Unknown Error");
    return p;
  }

  //Serial.println("Remove finger");
```

```
lcd.clear();
lcd.print("Remove Finger");
delay(2000);
p = 0;
while (p != FINGERPRINT_NOFINGER) {
  p = finger.getImage();
}
//Serial.print("ID "); //Serial.println(id);
p = -1;
//Serial.println("Place same finger again");
 lcd.clear();
    lcd.print("Place Finger");
    lcd.setCursor(0,1);
    lcd.print("   Again");
while (p != FINGERPRINT_OK) {
  p = finger.getImage();
  switch (p) {
  case FINGERPRINT_OK:
    //Serial.println("Image taken");
    break;
  case FINGERPRINT_NOFINGER:
    //Serial.print(".");
    break;
  case FINGERPRINT_PACKETRECIEVEERR:
    //Serial.println("Communication error");
    break;
  case FINGERPRINT_IMAGEFAIL:
    //Serial.println("Imaging error");
    break;
  default:
    //Serial.println("Unknown error");
    return;
   }
  }

  // OK success!

  p = finger.image2Tz(2);
  switch (p) {
    case FINGERPRINT_OK:
      //Serial.println("Image converted");
      break;
    case FINGERPRINT_IMAGEMESS:
      //Serial.println("Image too messy");
      return p;
    case FINGERPRINT_PACKETRECIEVEERR:
      //Serial.println("Communication error");
      return p;
    case FINGERPRINT_FEATUREFAIL:
      //Serial.println("Could not find fingerprint features");
      return p;
    case FINGERPRINT_INVALIDIMAGE:
      //Serial.println("Could not find fingerprint features");
      return p;
    default:
      //Serial.println("Unknown error");
      return p;
  }

  // OK converted!
  //Serial.print("Creating model for #");
//Serial.println(id);
```

```
 p = finger.createModel();
 if (p == FINGERPRINT_OK) {
  //Serial.println("Prints matched!");
 } else if (p ==
FINGERPRINT_PACKETRECIEVEERR) {
  //Serial.println("Communication error");
  return p;
 } else if (p ==
FINGERPRINT_ENROLLMISMATCH) {
  //Serial.println("Fingerprints did not
match");
  return p;
 } else {
  //Serial.println("Unknown error");
  return p;
 }

 //Serial.print("ID "); //Serial.println(id);
 p = finger.storeModel(id);
 if (p == FINGERPRINT_OK) {
  //Serial.println("Stored!");
  lcd.clear();
  lcd.print("Stored!");
  delay(2000);
 } else if (p ==
FINGERPRINT_PACKETRECIEVEERR) {
  //Serial.println("Communication error");
  return p;
 } else if (p == FINGERPRINT_BADLOCATION)
{
  //Serial.println("Could not store in that
location");
  return p;
 } else if (p == FINGERPRINT_FLASHERR) {
  //Serial.println("Error writing to flash");
  return p;
 }
 else {
  //Serial.println("Unknown error");
  return p;
 }
}

int getFingerprintIDez()
{
 uint8_t p = finger.getImage();

 if (p != FINGERPRINT_OK)
 return -1;

 p = finger.image2Tz();
 if (p != FINGERPRINT_OK)
 return -1;

 p = finger.fingerFastSearch();
 if (p != FINGERPRINT_OK)
 {
  lcd.clear();
  lcd.print("Finger Not Found");
  lcd.setCursor(0,1);
  lcd.print("Try Later");
  delay(2000);
 return -1;
```

```
  }
  // found a match!
  //Serial.print("Found ID #");
  //Serial.print(finger.fingerID);
  return finger.fingerID;
}

uint8_t deleteFingerprint(uint8_t id)
{
  uint8_t p = -1;
  lcd.clear();
  lcd.print("Please wait");
  p = finger.deleteModel(id);
  if (p == FINGERPRINT_OK)
  {
    //Serial.println("Deleted!");
    lcd.clear();
    lcd.print("Figer Deleted");
    lcd.setCursor(0,1);
    lcd.print("Successfully");
    delay(1000);
  }

  else
  {
    //Serial.print("Something Wrong");
    lcd.clear();
    lcd.print("Something Wrong");
    lcd.setCursor(0,1);
    lcd.print("Try Again Later");
    delay(2000);
    return p;
```

```
  }
}

void Vote()
{
  lcd.clear();
  lcd.print("Please Place");
  lcd.setCursor(0,1);
  lcd.print("Your Vote");
  digitalWrite(indVote, HIGH);
  digitalWrite(indFinger, LOW);
  digitalWrite(buzzer, HIGH);
  delay(500);
  digitalWrite(buzzer, LOW);
  delay(1000);
  while(1)
  {
        if(digitalRead(sw1)==0)
        {
          vote1++;
          voteSubmit(1);
          EEPROM.write(0, vote1);
          while(digitalRead(sw1)==0);
          return;
        }
        if(digitalRead(sw2)==0)
        {
          vote2++;
            voteSubmit(2);
            EEPROM.write(1, vote2);
          while(digitalRead(sw2)==0);
          return;
```

```
}
if(digitalRead(sw3)==0)
{
  vote3++;
    voteSubmit(3);
    EEPROM.write(2, vote3);
  while(digitalRead(sw3)==0);
  return;
}

 if(digitalRead(resultsw)==0)
 {
     lcd.clear();
     lcd.setCursor(0,0);
     lcd.print("Can1");
     lcd.setCursor(6,0);
     lcd.print("Can2");
     lcd.setCursor(12,0);
     lcd.print("Can3");
     for(int i=0;i<3;i++)
     {
       lcd.setCursor(i*6,1);
       lcd.print(EEPROM.read(i));
     }
     delay(2000);
   int vote=vote1+vote2+vote3;
   if(vote)
   {
    if((vote1 > vote2 && vote1 > vote3))
    {
     lcd.clear();
     lcd.print("Can1 Wins");
     delay(2000);
     lcd.clear();
    }
    else if(vote2 > vote1 && vote2 >
vote3)
    {
     lcd.clear();
     lcd.print("Can2 Wins");
     delay(2000);
     lcd.clear();
    }
    else if((vote3 > vote1 && vote3 >
vote2))
    {
     lcd.clear();
     lcd.print("Can3 Wins");
     delay(2000);
     lcd.clear();
    }

   else
   {
     lcd.clear();
     lcd.print("   Tie Up Or   ");
     lcd.setCursor(0,1);
     lcd.print("   No Result   ");
     delay(1000);
     lcd.clear();
   }

  }
   else
```

```
     {
      lcd.clear();
      lcd.print("No Voting....");
      delay(1000);
      lcd.clear();
     }
     vote1=0;vote2=0;vote3=0;vote=0;
     lcd.clear();
     return;
    }
 }
  digitalWrite(indVote, LOW);
}

void voteSubmit(int cn)
{
  lcd.clear();
  if(cn == 1)
    lcd.print("Can1");
  else if(cn == 2)
    lcd.print("Can2");
  else if(cn == 3)
    lcd.print("Can3");
  lcd.setCursor(0,1);
  lcd.print("Vote Submitted");
  digitalWrite(buzzer , HIGH);
  delay(1000);
  digitalWrite(buzzer, LOW);
  digitalWrite(indVote, LOW);
  return;
}
```

CHAPTER 05

ADVANTAGES AND APPLICATION

1. Security: From a security point of view, it is a great improvement on passwords and identity cards. Fingerprints are much more difficult to forge, they also change very little throughout life, so data stays up-to-date for much longer than photos and passwords.
2. Ease of use: for the user they are simple and easy to use. No longer will you have to struggle to remember your last password or get locked out of leaving your photo ID at home. Your fingerprints are always with you.
3. Non-transferable: Fingerprints are not transferable, which rules out sharing passwords or "clocking in" on behalf of another user. This allows for more accurate monitoring of the workforce and provides additional security against theft of sensitive materials.
4. Responsibility: The use of fingerprint recognition also provides a higher level of responsibility at work. Biometric proof that you have been present when a situation or incident has occurred is difficult to disprove and can be used as evidence if necessary.
5. Cost-effective: From a technology management perspective, fingerprint recognition is now a cost-effective security solution. Small portable scanners are easy to set up and benefit from a high level of precision.
6. Proxy votes : The person who works for bribe will be easily identified and can be punished.

CHAPTER 06

RESULT AND DISCUSSIONS

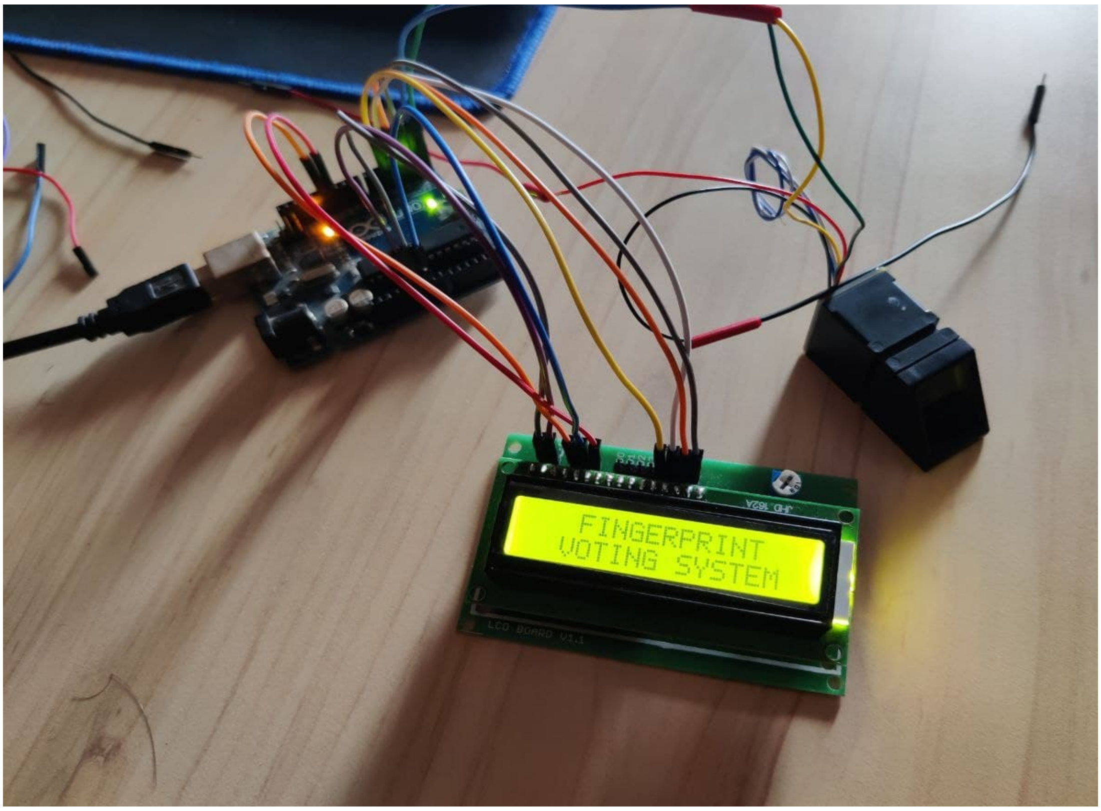


Fig.no(6.1) FINAL OUTPUT

CHAPTER 07

FUTURE SCOPE

1) The total percentage of votes will increase.

2) It will reduce electoral expenses.

3) You can be more secure by using advanced security methods like biological metrics.

4) It could connect with the printer to get the printed copy of the result almost instantly from the machine itself.

5) Once the result is on the server, it can be transmitted over the network to various offices of the electoral authority.