ELECTRONIC VOTING MACHINE FOR VISUALLY CHALLENGED

A Mini Project Report Submitted in Partial Fulfilment of the Requirement for the Award of the Degree of

BACHELOR OF TECHNOLOGY

in

ELECTRONICS AND COMMUNICATION ENGINEERING

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CERTIFICATE

This is to certify that the Mini Project entitled **"ELECTRONIC VOTING MACHINE FOR VISUALLY CHALLENGED"** is being submitted by **PULAPARTHI RAMYANJANI (19PA1A04D8), SHAIK KHAJA MASTAN AHMED (19PA1A04E9), SIRIGINEEDI SRI SIDDI SAI MAHESH (19PA1A04F0), NUTHALAPATI ANIL(19PA1A04C1), LIKITHAPUDI MAMATHARANI (20PA5A0420)** in partial fulfillment for the award of the degree of **Bachelor of Technology in Electronics and Communication Engineering** is a record of the bonafide work carried out by them under my guidance and supervision during the academic year 2021–2022 and it has been found worthy of acceptance according to the requirements of the university.

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ACKNOWLEDGEMENT

Our most sincere and grateful acknowledgment is due to this sanctum, **Vishnu Institute of Technology**, for allowing us to fulfill our aspirations and for the successful completion of engineering.

We express our heartfelt thanks to our Principal and Director **Dr. D. Suryanarayana** for providing us with the necessary facilities to carry out this project.

We express our sincere thanks to **Dr. N. Padmavathy**, **Head of the Department, ECE** and Guide for her valuable suggestions and encouragement throughout the project. We are indebted for her instruction guidelines that proved to be very much helpful in completing our project successfully in time.

We express our thanks to all other **Teaching and Non-Teaching Staff** of the department and also to our friends for their good wishes and constructive criticism which led to the successful completion of our project.

We express our deep sense of gratitude and sincere thanks to our **Parents** and **friends** for their good wishes and their encouragement throughout the project.

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LIST OF ACRONYMS

BEVSS	BIOMETRIC ELECTRONIC VOTING SYSTEM SOFTWARE
DRE	DIRECT RECORDING ELECTRONIC VOTING SYSTEM
EVM	ELECTRONIC VOTING MACHINE
GSM	GLOBAL SYSTEM FOR MOBILE
ID	IDENTITY DOCUMENT
LCD	LIQUID CRYSTAL DISPLAY
MP3	MPEG AUDIO LAYER-3
OS	OPERATING SYSTEM
PCU	POLLING CONTROL UNIT
PO	POLLING OFFICER
RFID	RADIO FREQUENCY IDENTIFICATION
UIDAI	UNIQUE IDENFICATION AUTHORITY OF INDIA
VCM	VISUALLY CHALLENGED MODE

LIST OF FIGURES

ABSTRACT

An electronic voting machine is a simple electronic device used to record votes in place of ballot papers and boxes used earlier in the conventional voting system. According to a recent survey in India, there are around 50 lakhs of people who are visually challenged, they depend on assistants to cast their votes which can be easily manipulated. It is time for visually challenged people to cast their votes independently. The existing EVM fails to support the vote casting by the visually challenged. So, to address the issue, the proposers have come up with an idea of making an electronic voting machine for such visually challenged people. The proposed machine mainly consists of Arduino and MP3 module included with voice commands that assist the visually challenged people while casting their votes as every vote is important. These voice commands include the party name and their respective member nominated for the election.

Keywords: Arduino, Elections, Electronic voting machine, MP3 Module, visually challenged, Voting, Voice Commands.

CONTENTS

CHAPTER 1

INTRODUCTION

1.1. Introduction

Election is the act of party casting votes [1-2] to elect on individual for some type of position. Election may involve a public or private vote depending on the position. Earlier days, majority of the elections (local panchayat, municipal, state and central) has conducted through conventional paper ballot. In paper-based elections, voters cast their votes by simply depositing sealed covers in the ballot boxes distributed across the electoral circuits around a given country. When the election period ends, all these boxes are opened and votes are counted manually in presence of the certified officials. In this process, [3] there can be error in counting of votes or in some cases voters find ways to vote more than once. Sometimes votes are even manipulated to distort the results of an election in favor of certain candidates. In order to avoid these shortcomings, [4-7] the government of India came up with direct-recording electronic (DRE) voting system which are usually electronic voting machine (EVM).

These devices have been praised for their simple design, ease of use and reliability. However, it has been found that EVMs are not tamper proof and are easily hacked. Moreover, these attacks, hardware as well as software, go without any detection but are quite simple to implement. This made us to bring forth a system that is secure, transparent, reliable as well as easy to use for the citizens. Even though, the technology has been growing rapidly in terms of making new inventions (EVMs) in the voting systems to cast the votes, there are high chances for casting fake votes when a visually impaired person need to cast his/her vote. Visual impairments people who are blind or have low vision is one of categories of the society that have right to participate in the elections as voter or even candidate. They should have an opportunity to cast their ballots (votes) independently and privately. Casting their vote individually is the fundamental right of every citizen in the country irrespective of their physical conditions.

The conventional voting systems are not suitable for visually impaired people to cast their votes with no support taken form their friends, family members etc. Hence, an electronic voting machine with distinct features for visually impaired is needed in order to achieve transparent election process. Therefore, this work focused on developing an electronic voting machine for visually impaired people who can cast their vote without any support from others. The proposed EVM has an ability to operate in two individual modes such as;

- EVM for Visually Impaired
- EVM for normal people

The proposed system can alter its mode of operation with the help of push buttons (see Fig.1).

Fig.1: EVM Mode of Operation

The control unit has a push switch to change the working model of EVM in two ways; such as visually challenged mode and normal mode. As shown in Fig.1, if the push switch enabled for mode VCM, then the proposed model is used for visually challenged people. Otherwise, the proposed model acted as normal EVM.

1.2. Research Gaps

Despite of several advantages of the existing electronic voting systems, there are also drawbacks in the system. The main drawbacks of the EVMs are;

- Vulnerability to hacking
- Voter verified paper audit trails
- Susceptibility to fraud
- Accuracy in capturing voters' intent
- Political ties of manufacturers
- Malicious software programming
- Physical security of machines
- Secure storage of cast votes

1.3. Motivation

Voting is one of the fundamental rights of every citizen of a democratic country. By utilizing the right of the voting, people elect their most suitable leader who will lead them. In this modern era where technology is being used in every aspect of life, election is a place to apply the best technology. The traditional EVMs have failed to support the visually impaired people to cast their votes without any help from others. The visually impaired people need voice assistance in the EVM for casting their votes. Hence, this work is motivated from the problem faced by visually impaired people while casting their votes. The main motive of this work is to fulfil the fundamental right of casting the vote privately for visually impaired people.

1.4. Objective

The main objective of this work is to develop an EVM which works for visually impaired and also normal citizens in order to cast their votes independently. The proposed EVM is also works for normal people by changing the mode of operation.

1.5. Assumptions

The proposed model of EVM for visually impaired has an ability to convert the mode of operation by using a push button in the control unit.

- The proposed EVM can be further modified to enhance the security of election process
- The interfacing has been done through Arduino which inherently reduce the cost of making EVM
- The proposed model can be improvised by incorporating the regional language

1.6. Thesis Organization

The thesis organized as follows;

Chapter1 focuses on how visually challenged people suffer from existing EVM systems and their drawbacks. The research gaps have been identified.

Chapter 2 presented the literature available on modern EVMs.

Chapter 3 describes the basic components required for developing an EVM for visually challenged people.

Chapter 4 describes the methodology adapted for developing the EVM prototype for visually challenged people. A flow chart for describing the working of the proposed EVM has been discussed.

Chapter 5 presents the experimental results.

Chapter 6 concludes the work. It includes an overview of presiding chapters and describes future areas of interest for the researchers in this area.

1.7. Summary

In this chapter, the challenges faced by the visually impaired people with modern existing EVM has been highlighted. The major drawbacks of modern voting systems have been summarized. The objectives for the proposed model have been identified.

CHAPTER 2

LITERATURE SURVEY

Globally, over 2.2 billion people have a near or distance vision impairment. Whereas, the estimated number of visually impaired in India was 18 million, of which eight million are blind. These visually impaired people cast their vote with the help of an assistant, relatives, and neighbours. India has more than 23.1 million registered and active voters which is massive when compared to all democratic countries across the world [1]. Among all the registered votes, 5 to 8 % of the people has the physical disabilities. Currently, EVMs are widely used for election process in which there is no specific option for visually challenged people for cast their vote independently. In order to increase the security and maintain the transparency in election procedure the EVMs should be equipped with recent advances. Numerous authors have contributed towards the enhancement of present election system by updating EVMs in terms of security, authentication aspects in order to achieve fair and transparent election process.

The authors in [8] deal with the design and development of a web-based voting system using fingerprint authentication. The proposed EVM compels the voters to scan their fingerprint, which in turn is matched with preloaded image within the database. Being nationally connected, a user can cast votes from anywhere in the country through the web only after successful progress through the validation procedures. Casted vote will be updated immediately. It is basically an extension of the previous where aspects like authenticated voters and polling data security for e-voting systems are discussed. The voter authentication in online e-voting process can be done by formal registration through administrators and by entering one time password. In Offline e-voting process authentication can be done using Iris reorganization, finger vein sensing which enables the electronic ballot reset for allowing voters to cast their votes. Also, the voted data details with voter details could be sent to the nearby Database Administration unit in a timely manner using GSM System with cryptography technique [9].

The implementation of Biometric Electronic Voting System Software (BEVSS) integrated and projected a biometric fingerprint machine allows eligible voters during the registration process with subsequent verification on Election Day. The BEVSS would be implemented on personal computers over a Local Area Network at each polling station [10]. This paper focuses on sophisticated voting system using RFID and Finger print technologies to ensure unique casting. RFID acts as a substitute for voter ID and the Fingerprint sensor data generates an alert depicting mismatches. Keypad is used for selecting the voting preferences. LCD is used to display the corresponding data for each key to the user [11]. The proposed work in [12] uses android mobile OS to develop an application and fingerprint supported biometric control information to make voting process more secure. Using android smart mobile device makes the system more robust. This project proposes a secure online e-voting system that uses UIDAI or

Aadhar database as its backend. The system ensures authentication of an individual by matching fingerprints and eligibility is checked by calculating the age of the voter thus, making the existing voting cards redundant [13]. A simple and secured method of polling vote by using biometrics – the proposal avoids false voting relying on fingerprint verification.

The algorithm uses a cancelling approach, where each authorized person in the Government's database is striked off in a polling area on successful polling an attempt towards irradiating multicasting [14]. The authors [15] deals with the accessibility of biometrics in a practical application like polling of vote's e-voting use a physical entity (fingerprint, Voice Recognition) through computer network. In this version of EVM, user at the polling booth needs to place his finger on the device allowing the acquisition of an on-spot fingerprint from the voter which serves as an identification.

It is observed form literature review; the main motive of the authors is to increase the security and integrity of the elections. The existing system for election has to improve by interfacing a biometric authentication and enhanced security by a means of GSM. However, the existing systems are failed to consider the several features which are helpful for visually impaired people. Hence, in this work an electronic voting machine for visually impaired people is developed in order to ensure secure and fair voting process.

Summary

In this chapter, the contributions of the various authors have been discussed. The need of proposed system has been identified.

CHAPTER 3

OVERVIEW OF COMPONENTS

The main components required for developing an electronic voting machine for visually impaired people are listed as follows;

- Ultrasonic sensor
- MP3 module
- Speaker
- Headphone set
- Arduino Mega
- Buzzer
- Push Buttons
- Relay
- Buck Converter
- Power supply

Ultrasonic Sensor

This is the HC-SR04 ultrasonic distance sensor. This economical sensor provides 2cm to 400cm of non-contact measurement functionality with a ranging accuracy that can reach up to 3mm. Each HC-SR04 module includes an ultrasonic transmitter, a receiver, and a control circuit. There are only four pins that you need to worry about on the HC-SR04: VCC (Power), Trig (Trigger), Echo (Receive), and GND (Ground). This sensor has additional control circuitry that can prevent inconsistent "bouncy" data depending on the application.

Figure 3.1: Ultrasonic Sensor

MP3 Module

MP3-TF-16P MP3 Disk TF Card Module Serial Port is a compact and inexpensive MP3 module that can be connected directly to the speaker. Module with battery power supply, speaker, and the keypad can be used alone, or through the serial port control, as the Arduino UNO or any microcontroller with a serial port module. While the software supports TF card drivers to support FAT16, FAT32 file systems. It can be done by the simple serial command that plays the specified music, as well as how to play music and other functions, without tedious low-level, easy to use, stable, and reliable. The module itself perfectly integrated hardware decodes MP3, WAV, WMA.

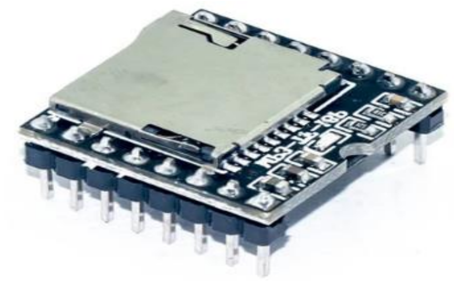

Figure 3.2: MP3 Module

Speaker

A speaker is an electroacoustic transducer that is a device that converts an electrical audio signal into a corresponding sound. A speaker system, also often simply referred to as a "speaker" or "loudspeaker", comprises one or more such speaker drivers (above definition), an enclosure, and electrical connections possibly including a crossover network. For a speaker to efficiently produce sound, especially at lower frequencies, the speaker driver must be baffled so that the sound emanating from its rear does not cancel out the (intended) sound from the front; this generally takes the form of a speaker enclosure or speaker cabinet, an often-rectangular box made of wood, but sometimes metal or plastic [18-22].

Figure 3.3: Speaker

Headphone Set

Headphones are a pair of small loudspeaker drivers worn on or around the head over a user's ears. They are electroacoustic transducers, which convert an electrical signal to a corresponding sound. Headphones let a single user listen to an audio source privately, Headphones originated from the telephone receiver earpiece and were the only way to listen to electrical audio signals before amplifiers were developed, as long as these devices are equipped with a headphone jack. Cordless headphones are not connected to their source by a cable. Instead, they receive radio or infrared signals encoded using radio or infrared transmission links, such as FM, Bluetooth, or Wi-Fi.

Figure 3.4: Headphone Set

Arduino Mega

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. The Mega 2560 board is compatible with most shields designed for the Uno and the former boards Duemilanove or Diecimila.

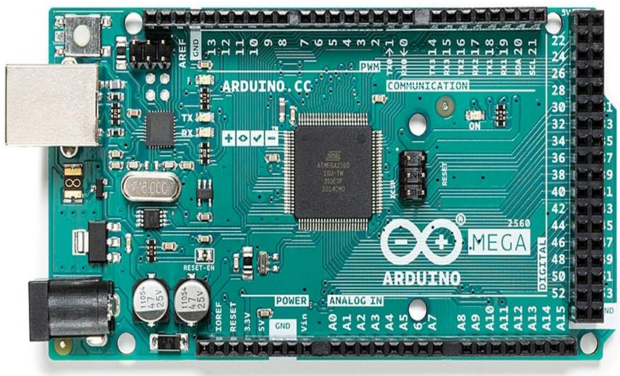

Figure 3.5: Arduino Mega

Buzzer

An audio signaling device like a beeper or buzzer may be electromechanical piezoelectric or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printers, alarms, computers, etc. Based on the various designs, it can generate different sounds like alarm, music, bell & siren. The pin configuration of the buzzer is shown below. It includes two pins namely positive and negative. The positive terminal of this is represented with the '+' symbol or a longer terminal. This terminal is powered through 6Volts whereas the negative terminal is represented with the '-'symbol or short terminal and it is connected to the GND terminal.

Figure 3.6: Buzzer

Buck Converter

A buck converter is a DC-to-DC power converter that steps down voltage from its input to its output. It is a class of switched-mode power supply typically containing at least two semiconductors and at least one energy storage element, a capacitor, inductor, or the two in combination. It is called a buck converter because the voltage across the inductor "bucks" or opposes the supply voltage. Switching converters, such as buck converters provide much greater power efficiency as DC-to-DC converters than linear regulators, which are simpler circuits that lower voltages by dissipating power as heat but do not step-up output current.

Figure 3.7: Buck Converter

Relay

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts or combinations thereof. Relays are used where it is necessary to control a circuit by an independent low-power signal, or where several circuits must be controlled by one signal. Relays were first used in long-distance telegraph circuits as signal repeaters: they refresh the signal coming in from one circuit by transmitting it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

Figure 3.8: Relay

Summary

In this chapter, the overview of the components has been presented. The working of each component has been presented.

CHAPTER-4

PROPOSED MODEL

4.1. Block Diagram

The Arduino based Electronic Voting Machine has been proposed, which is capable of operating in two different modes such as; EVM for visually impaired and EVM for normal people. The proposed voting system consists of a polling control unit authorized by respective polling officer. An ultrasonic sensor which identifies the blind people motion and activates the speaker and sends the voice instructions through the headset.

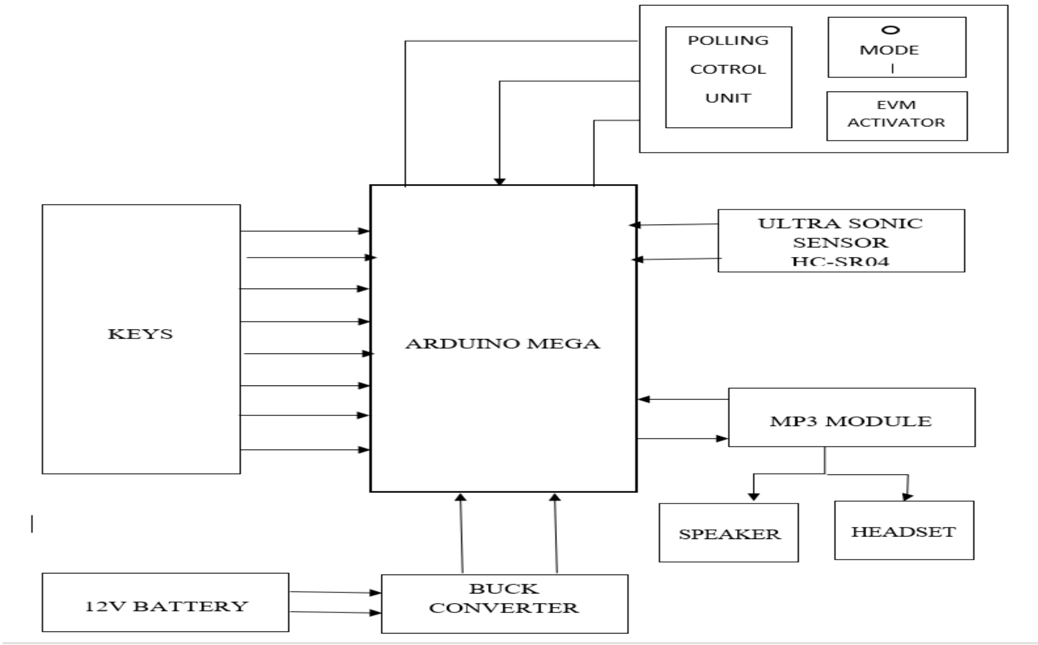

Figure 4.1: Block Diagram of the EVM System

4.2. Circuit Diagram

The proposed model is being implanted with Arduino Mega and the ultrasonic sensor used for human motion detection. Fig.4.2 shows the circuit implementation of the proposed model. The polling control unit is handled by polling officer who gives access to the person who would cast their vote. The PO unit consists of two switches one for the EVM activation and the other one is a mode transfer switch which transfers the mode of EVM from one mode to another. The polling officer will activate once they confirmed voter is genuine and normal government procedure after the activation, the polling officer will change the mode transfer switch based on the person entry. Once the EVM is activated depending on the mode if the mode is in visually challenged mode the procedure goes as follow.

Step-1: The buzzer present in the EVM will start making sound indicating the EVM is activated.

Step-2: An ultrasonic sensor presented in front of the EVM for identifying the human motion.

Step-3: The EVM starts working when a visually impaired person has entered in a certain range of the ultrasonic sensor. If the ultrasonic sensor identifies any human motion, then, the buzzer will stop and certain instructions will be provided in the speaker out.

Instructions:

- Welcome to the electronic voting machine.
- Please wear your headphones,
- Candidate name is ramesh and the symbol is an apple,
- Candidate name is raju and the symbol is a bat,
- Candidate name is krishna and the symbol is a watch,
- Candidate name is srinath and the symbol is a flower,
- Candidate name is shashank and the symbol is a telephone,
- Candidate name is nota,
- your vote has been casted successfully.

Step-4: So, the visually challenged people will follow the orders and he should wear the headphones provided there and starts the push buttons for casting the vote.

Step-5: The voter can push the buttons provided, the headphones will activate and start announcing the candidate's name and the party symbol.

Step-6: The visually impaired can hear all the party names and candidate name through the headphone commands.

Step-7: After the successful casting of his /her vote, the buzzer will make a sound and conveyed about the casted vote.

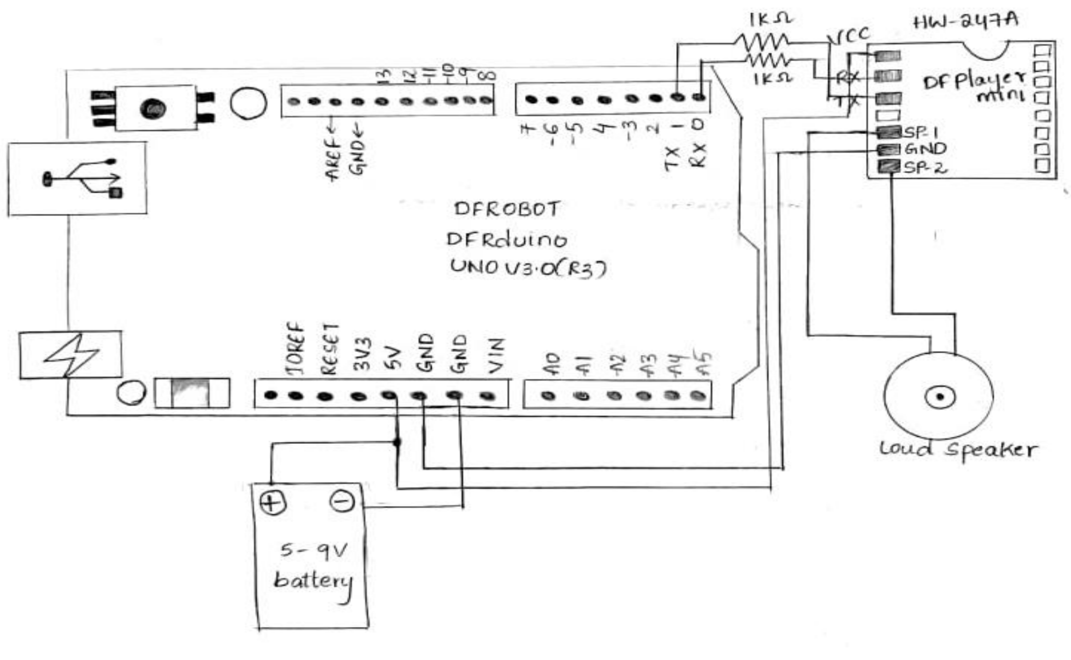

Fig.4.2: Circuit Diagram

4.3. Flow Chart

A flow chart (see Fig.4.3) has been developed for understanding the working principle of the proposed hardware model. The step-by-step working operation given below;

Step1: Initialize all the hardware components (ultrasonic sensor, mp3 module, speakers, headphones, buzzer, push buttons, relay, buck converters etc.,), switch on the power supply and dump the software code into Arduino board.

Step 2: Select the mode of EVM operation.

Step 3: Activate EVM at the polling control unit with the help of polling officer.

Step 4: Identify if any person movements in front of the EVM with the help of Ultrasonic sensor.

Step 5: When ultrasonic sensor detects any human motion, then the speaker delivers voice instructions to the visually impaired people about wearing headset.

Step 6: Casting the vote by instructions received from headset.

Step 7: Finally, the blind person here a voice command about the casted vote.

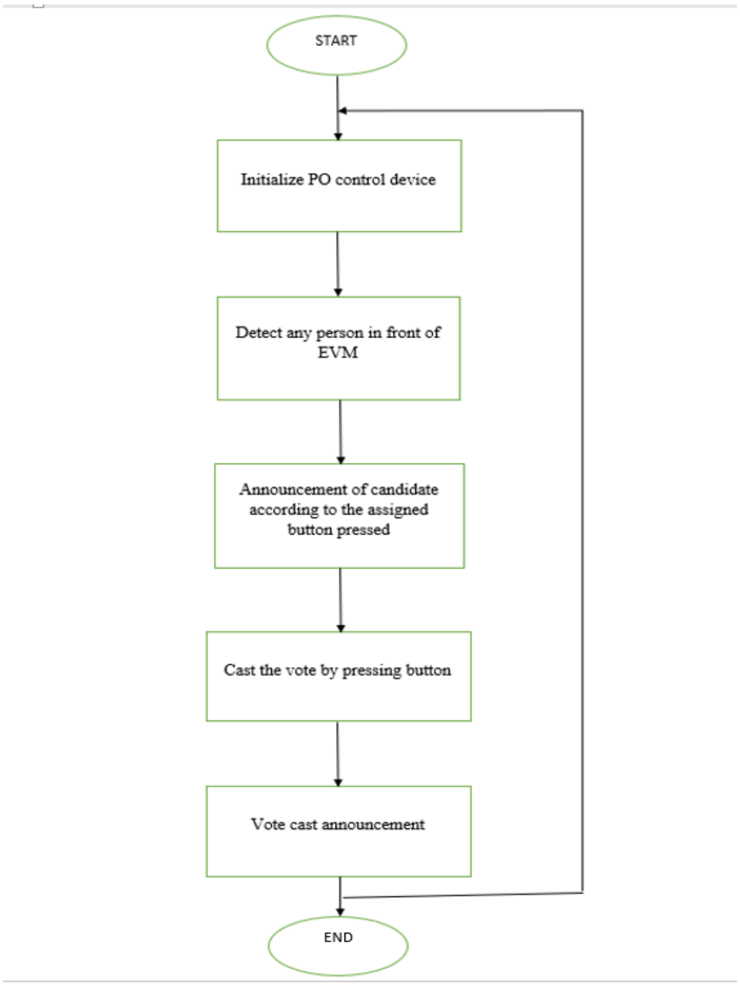

Figure 4.3: Flow Chart

4.4. Summary

In this chapter, the block diagram for proposed model has been developed. The circuit diagram to implement the prototype has been developed. Finally, a flow chart has been designed to understand the working principal of proposed EVM.

CHAPTER 5

RESULTS AND DISCUSSION

In this project, the experiment has been carried out by arranging the prototype with necessary input output components as shown in Fig. 5.1. The experimental results show that, the proposed EVM is best suitable for visually impaired people in order to fulfill their fundamental right of casting their vote individually. The proposed EVM has the capability to provide privacy and independence to the visually challenged people to cast their vote which leads to increase the participation of voters during the elections.

Fig.5.1: Designed Prototype showing Ultrasonic sensor

The designed prototype is equipped with candidate names which is attached with voice instructions as shown in Fig. 5.2. After hearing voice instructions from the headset about candidate name the visually impaired people can able to cast their votes by pressing push buttons simultaneously as shown in Fig 5.3.

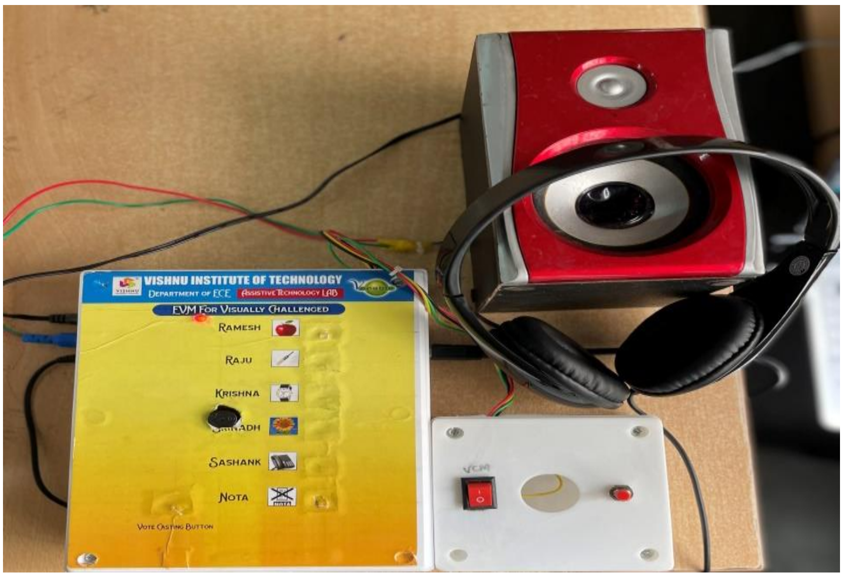

Fig.5.2: Designed Prototype showing Candidate names

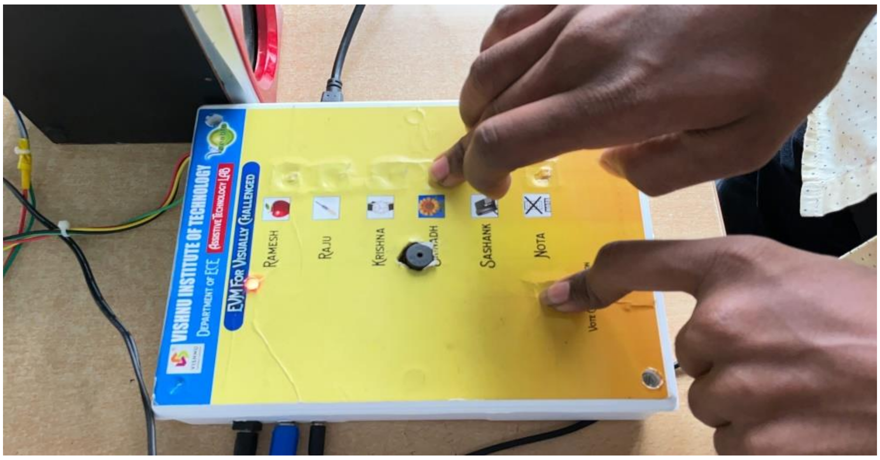

Fig.5.3: Designed Prototype showing Voting Procedure

Once the total votes have been cast, one can check the votes that have been casted by clicking certain command. The votes will be stored in electrically erasable programmable read-only memory. The statistics of the casted votes are depicted in Fig 5.4.

Fig.5.4: casted votes

The end result consists of the total votes which were casted successfully,

The result will be in the following format: Time line: Candidate Name: Total number of votes secured (20.02.2021-12.30: Ramesh total votes=4).

The following observation has been made while performing an experiment. Those are;

- Giving voice assistance to the people who are visually-challenged and helping them vote with privacy and independence.
- Storing the total vote cast throughout the process so reducing the time of counting the votes.
- Reducing the risk of malpractice during the election.

Summary

The proposed EVM working has been analyzed in this chapter. The proposed EVM works in two different modes by changing the mode through push buttons. The results have been explained.

CHAPTER 6

CONCLUSION

In every democratic country, the election process must be reliable and secure in order to achieve high-quality governance. The modern election systems must ensure a fair and robust to withstand numerous fraudulent behaviors, be transparent in which the voters and representatives should accept the results of an election. The modern voting systems failed to consider the fundamental rights of the visually impaired people to cast their votes. The visually impaired people relay on another person's to cast their votes. This phenomenon degrades the fairness in the election process and also leads to fake voting. Hence, in this work an efficient EVM has been developed which is helpful for visually impaired people to cast their votes by taking inputs from voice commands. The proposed EVM also works for normal people by changing its mode.

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APPENDIX 1:

Github Code link: https://tinyurl.com/3d9bp5kh

CODE:

```
#define echoPin 29 // attach pin D2 Arduino to pin Echo of HC-SR04
#define trigPin 27 //attach pin D3 Arduino to pin Trig of HC-SR04
// defines variables
long duration; // variable for the duration of sound wave travel
int distance; // variable for the distance measurement
#include <EEPROM.h>
#include "Arduino.h"
#include "SoftwareSerial.h"
#include "DFRobotDFPlayerMini.h"
SoftwareSerial mySoftwareSerial(11, 10); // RX, TX
DFRobotDFPlayerMini myDFPlayer;
void printDetail(uint8_t type, int value);
int dist(void) ;void result();
void setup()
{
    pinMode(trigPin, OUTPUT); // Sets the trigPin as an OUTPUT
  pinMode(echoPin, INPUT); // Sets the echoPin as an INPUT
  pinMode(7,INPUT);  // button 1
   pinMode(6,INPUT);  //Button 2
    pinMode(5,INPUT);  //button 3
     pinMode(4,INPUT);  // Button 4
      pinMode(3,INPUT);  //button 5
       pinMode(2,INPUT);  //Button 6
        pinMode(25,INPUT); // vote casting button
         pinMode(23,OUTPUT);  //Buzzer
          pinMode(31,INPUT);  // person mode(blind/normal)
           pinMode(33,INPUT_PULLUP); // EVM activation
```

```
        pinMode(35,OUTPUT); // sp/head set chng
              digitalWrite(23,LOW);
         digitalWrite(35,LOW);

       mySoftwareSerial.begin(9600);
    Serial.begin(9600);



  if (!myDFPlayer.begin(mySoftwareSerial)) {   //Use softwareSerial to communicate with mp3.
    Serial.println(F("Unable to begin:"));
    Serial.println(F("1.Please recheck the connection!"));
    Serial.println(F("2.Please insert the SD card!"));
    while(true){
      delay(0); // Code to compatible with ESP8266 watch dog.
    }
  }
  Serial.println(F("DFPlayer Mini online."));

  myDFPlayer.volume(20);  //Set volume value. From 0 to 30
 delay(1000);
 if(!digitalRead(25))
 {EEPROM.write(1,0);delay(100);EEPROM.write(2,0);delay(100);
 EEPROM.write(3,0);delay(100);EEPROM.write(4,0);delay(100);
 EEPROM.write(5,0);delay(100);EEPROM.write(6,0);delay(100);}
  if(!digitalRead(2))result();
}

void loop()
{ int cst=0; int val,mem;
```

```
 if(!digitalRead(31))//visually challeged people mode
 {

   while(digitalRead(33));
    digitalWrite(23,HIGH);
    while(!cst)
    {
      while(dist()>20);
     digitalWrite(23,LOW);
     digitalWrite(35,LOW); delay(1000);
     myDFPlayer.play(2);  delay(15000);
    digitalWrite(35,HIGH);delay(800);

    while(!cst)
     {
   if(!digitalRead(7))
  {myDFPlayer.play(3);
delay(5500);mem=EEPROM.read(1);delay(100);if(!digitalRead(25)){EEPROM.write(1,mem
+1);delay(200);myDFPlayer.play(1);  delay(4500);cst=1;}}
  else if(!digitalRead(6))
  {                                                          myDFPlayer.play(4);
delay(5500);mem=EEPROM.read(2);delay(100);if(!digitalRead(25)){EEPROM.write(2,mem
+1);delay(200);myDFPlayer.play(1);  delay(4500);cst=1;}}
   else if(!digitalRead(5))
   {myDFPlayer.play(5);
delay(5500);mem=EEPROM.read(3);delay(100);if(!digitalRead(25)){EEPROM.write(3,mem
+1);delay(200);myDFPlayer.play(1);  delay(4500);cst=1;}}
   else if(!digitalRead(4))
   {myDFPlayer.play(6);
delay(5500);mem=EEPROM.read(4);delay(100);if(!digitalRead(25)){EEPROM.write(4,mem
+1);delay(200);myDFPlayer.play(1);  delay(4500);cst=1;}}
   else if(!digitalRead(3))
  {                                                          myDFPlayer.play(7);
```

```
delay(5500);mem=EEPROM.read(5);delay(100);if(!digitalRead(25)){EEPROM.write(5,mem
+1);delay(200);myDFPlayer.play(1);  delay(4500);cst=1;}}
     else if(!digitalRead(2))
   {                                                                myDFPlayer.play(9);
delay(5500);mem=EEPROM.read(6);delay(100);if(!digitalRead(25)){EEPROM.write(6,mem
+1);delay(200);myDFPlayer.play(1);  delay(4500);cst=1;}}

    }
      digitalWrite(23,HIGH);delay(1500); digitalWrite(23,LOW);delay(1000);
    }

  }

  else    //Normal people mode

  {



   while(digitalRead(33));
     digitalWrite(23,HIGH);delay(1000); digitalWrite(23,LOW);
     while(!cst)
     {

    if(!digitalRead(7))
   {mem=EEPROM.read(1);delay(100);digitalWrite(23,HIGH);delay(1000);
digitalWrite(23,LOW);if(!digitalRead(25)){EEPROM.write(1,mem+1);delay(200);cst=1;}}
   else if(!digitalRead(6))
   {mem=EEPROM.read(2);delay(100);digitalWrite(23,HIGH);delay(1000);
digitalWrite(23,LOW);if(!digitalRead(25)){EEPROM.write(2,mem+1);delay(200);cst=1;}}
    else if(!digitalRead(5))
    {mem=EEPROM.read(3);delay(100);digitalWrite(23,HIGH);delay(1000);
digitalWrite(23,LOW);if(!digitalRead(25)){EEPROM.write(3,mem+1);delay(200);cst=1;}}
    else if(!digitalRead(4))
```

```
    {mem=EEPROM.read(4);delay(100);digitalWrite(23,HIGH);delay(1000);
digitalWrite(23,LOW);if(!digitalRead(25)){EEPROM.write(4,mem+1);delay(200);cst=1;}}
    else if(!digitalRead(3))
   {                          mem=EEPROM.read(5);delay(100);digitalWrite(23,HIGH);delay(1000);
digitalWrite(23,LOW);if(!digitalRead(25)){EEPROM.write(5,mem+1);delay(200);cst=1;}}
     else if(!digitalRead(2))
   {                          mem=EEPROM.read(6);delay(100);digitalWrite(23,HIGH);delay(1000);
digitalWrite(23,LOW);if(!digitalRead(25)){EEPROM.write(6,mem+1);delay(200);cst=1;}}

    }
     digitalWrite(23,HIGH);delay(1500); digitalWrite(23,LOW);delay(2500);

  }



}



int dist(void)
{
  // Clears the trigPin condition
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  // Sets the trigPin HIGH (ACTIVE) for 10 microseconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration = pulseIn(echoPin, HIGH);
  // Calculating the distance
  distance = duration * 0.034 / 2; // Speed of sound wave divided by 2 (go and back)
  // Displays the distance on the Serial Monitor
```

```
  return distance;
}

void result()


{        Serial.print("RAMESH        Total        votes=        ");delay(100);
Serial.println(EEPROM.read(1));delay(100);
    Serial.print("RAJU        Total        votes=        ");delay(100);
Serial.println(EEPROM.read(2));delay(100);
   Serial.print("Krishna        Total        votes=");delay(100);
Serial.println(EEPROM.read(3));delay(100);
   Serial.print("Srinadh        Total        votes=");delay(100);
Serial.println(EEPROM.read(4));delay(100);
   Serial.print("Sashank        Total        votes=");delay(100);
Serial.println(EEPROM.read(5));delay(100);
   Serial.print("NO votes=");delay(100); Serial.println(EEPROM.read(6));delay(100);


}
```

APPENDIX 2:

Arduino IDE:

The Arduino Integrated Development Environment (IDE) is a cross-platform application (For Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common inputs and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that is compiled and linked with a program stub main () into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE employs the program argued to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware. By default, argued is used as the uploading tool to flash the user code onto official Arduino boards.

Arduino IDE is a derivative of the Processing IDE, however, as of version 2.0, the Processing IDE will be replaced with the Visual Studio Code-based Eclipse Theia IDE framework. With the rising popularity of Arduino as a software platform, other vendors started to implement custom open-source compilers and tools (cores) that can build and upload sketches to other microcontrollers that are not supported by Arduino's official line of microcontrollers. In October 2019 the Arduino organization began providing early access to a new Arduino Pro IDE with debugging and other advanced features.