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Implementation of Aadhar Card Based Voting Machine

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ABSTRACT: The main objective of this paper is to allow the voters to exercise their right to express their choices in particular issues, items of legislation, citizen initiatives, brings and/or to decide on their government and political representatives. The voting system is managed in a easier way as all the users should login by Aadhar card number and fingerprint verify to candidates to cast the vote. This features security in the sense that voter high security password is confirmed before the vote is accepted in the main database of ECI. The extra feature is that the voter will ensure if his/her vote has gone to correct candidate. The votes will be going to be done automatically, therefore saving an enormous time and facultative ECI to announce the result at intervals a very short period. The user must show his voter ID card whenever he goes into the booth in order to poll his vote. This is a time consuming process because the person needs to check the voter ID card with the list that he or she has and make sure it as an authorized card and then permits the respective person to poll his vote. In order, to avoid this type of issues, designed a finger print based voting machine. In this project, firstly the citizen need to entry their Aadhar card number using keypad and then Finger print reader reads the details from the finger. This information is passed to the controlling unit for the verification. The controller reads DATA from the reader and compares this data with the already existing data. In case if the data matches with the stored information, then the person is allowed to poll his vote. If not, then a message will be displayed on LCD and therefore the person isn't allowed to poll his vote. The polling process will be carried out manually using the switches. LCD is employed to display the related message.

KEYWORDS: aadhar card, radio frequency identification, fingerprint scanner, LCD display, buzzer, MPLAB IDE.

I. INTRODUCTION

The Fundamental rights to vote in elections form the basis for the democracy. Elections allow the people to choose their representatives and express their preferences for how they are governed. In earlier elections of India, such as state or central elections, a person casts his/her vote by marking with an stamp against their chosen candidate and then by folding the ballot paper as per the method, before dropping it in the ballot box. This is a time-consuming process and it is very much prone to errors. This method was continued till the electronic voting machines were introduced in the election process. Because of the EVMs, all the condensed materials like the ballot papers, ballot boxes and stamping is completely replaced into a simple box called ballot unit. EVMs retain all the characteristics of voting by ballot papers, while making polling a lot more expedientt. Human finger prints are different and unique to each person and it is also regarded as a sort of signature, certifying the person's identity. Fingerprints are one of the oldest and most widely used forms of biometric identification.

II. OVER VIEW

A.BLOCK DIAGRAM

The aadhar card based voting machine consists of several components such as PIC micro controller, RFID, Button, GSM module, LCD display, fingerprint scanner and a buzzer is shown in Fig.(a).

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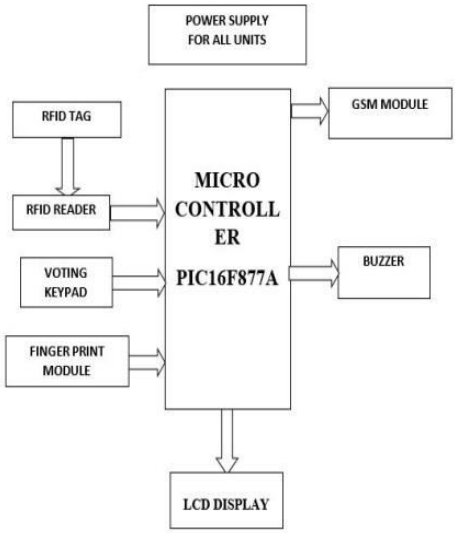

Fig.(a) Block diagram of aadhar card based voting machine

B.WORK FLOW

The main key features of proposed aadhar card based voting system is to reduce the staff and poling time in election, provide chance to avoid invalid votes, to minimize the time required for counting the votes, help in achieving fast, secure and accurate polling system.
Based on aadhar card it recognizes the voter by data stored in it and allows the voter to poles the vote for the candidate.

C.PIN DISCRIPTION

PIC16F877A consists of 40 pins enclosed in 5 ports. It has two 8 bit and one 16 bit timer. Each port holds 8 pins which are bidirectional input/output pins. It also consists of capture and compare module, serial and parallel ports and input/output ports. Pin diagram of PIC 16F877 is represented in Fig.(b).

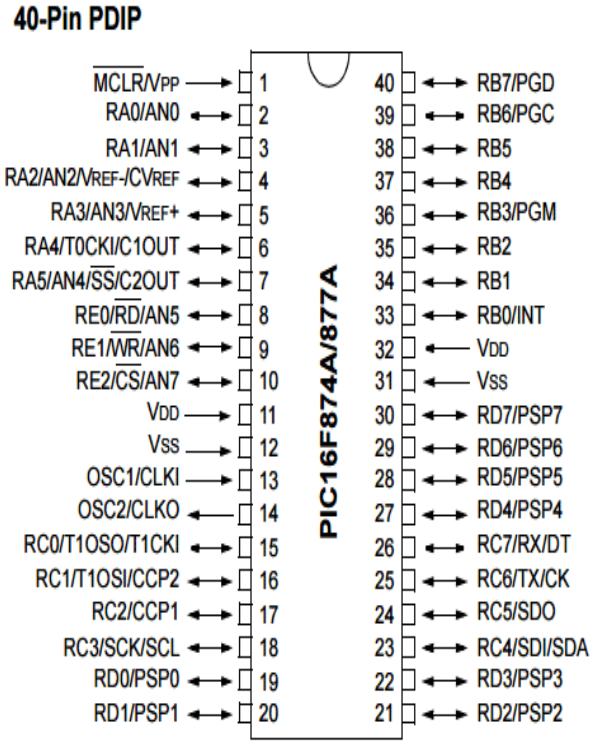

Fig.(b) Pin diagram of PIC 16F877A

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PIN 1: MCLR: Pin 1 represents the master clear pin of this IC.
PIN 2:RA0/AN0: Pin 2 represents the first pin of this port. This pin 2 will be used as an analog pin AN0. It has been built in analog to digital converter.
PIN 3: RA1/AN1: This will be the analog input 1.
PIN 4: RA2/AN2/Vref-: It can be act as the analog input 2 or a negative analog reference voltage can be given to it.
PIN 5: RA3/AN3/Vref+: It can act as the analog input 3 or it can be act as the analog positive reference voltage.
PIN 6: RA0/T0CKI: To the timer0 this pin will be act as the clock input pin, and the type of output will be open drain.
PIN 7: RA5/SS/AN4: This is the analog input 4. There will be a synchronous serial port in the controller and also this pin can be used as the slave select for that particular port.
PIN 8: RE0/RD/AN5: PORTE will be starting from pin 8 to pin 10 and this is a bidirectional input output port. It will be the analog input 5 or for parallel slave port it will be acting as a 'read control' pin which will be usually active low.
PIN 9: RE1/WR/AN6: It is the analog input 6. For the parallel slave port it can be act as the 'write control' which will be usually active low.
PIN 10: RE2/CS/A7: It is the analog input 7, or for the parallel slave ports it will be acting as the control select' which will be active low just like read and write control pins.
PIN 11 and 32: VDD: These two pins are the positive supply for the input/output and also for the logic pins. Both of the pins should be connected to 5V.
PIN 12 and 31: VSS: The pin12 and pin 31 are the ground reference for input/output and logic pins. They must be connected to 0potential.
PIN 13:OSC1/CLKIN: This is called the oscillator input pin or the external clock input pin.
PIN 14: OSC2/CLKOUT: This is called as the oscillator output pin. A crystal resonator will be connected in between the pin 13 and 14 in order to provide external clock to the microcontroller. ¼ of the frequency of OSC1 will be outputted by the OSC2 in case of RC mode. This will be indicating the instruction cycle rate.
PIN 15: RC0/T1OCO/T1CKI: PORTC will be consisting of 8 pins. It is a bidirectional input output port. Pin 15 is the first. It can be either clock input of timer 1 or the oscillator output of timer 2.
PIN 16: RC1/T1OSI/CCP2: It can be oscillator input of timer 1 or the capture 2 input/compare 2 outputs/ PWM 2output.
PIN 17: RC2/CCP1: It is the capture 1 input/ compares 1 output/ PWM 1 output.
PIN 18: RC3/SCK/SCL: It is the output for SPI or I2C modes and will be the input/output for synchronous serial clock.
PIN 19, 20, 21, 22, 27, 28, 29, 30: All of these port pins belong to PORTD which is a bidirectional input and output port. When the microprocessor bus is to be interfaced, it can be act as the parallel slave port.
PIN 23:RC4/SDI/SDA: It is the SPI data in pin or in I2C mode it can be data input/output pin.
PIN 24: RC5/SDO: It is the data out of SPI in the SPI mode.
PIN 25: RC6/TX/CK: It is the synchronous clock or USART Asynchronous transmit pin.
PIN 26: RC7/RX/DT: It is the synchronous data pin or the USART receive pin.
PIN 33-40: PORT B: All these pins belong to PORTB. Out of which RB0 can be used as the external interrupt pin and RB6 and RB7 can be used as in-circuit debugger pin.

III.DESIGN AND IMPLEMENTATION

A.COMPONENTS

A. RADIO FREQUENCY IDENTIFICATION [RFID]

Radio frequency identification is simply called as RFID and the RFID module is shown in Fig.(c). It is a term of an applied science that will be explaining the IT-infrastructure that is required to gather, filter and it also advance the raw RFID information before it were processed to the backend systems. The radio waves will be available for the automatic recognition of people and objects; the RFID has the components such as READER, RF tags, and controllers. There are various methods available for the recognition or identification but the most commonly used method is the saving of a serial number that recognizes a person or object and also other data. A RFID transponder or a RFID tag is combined of a chip and the antenna, the antenna empowers the chip to end the identified data to a reader. The reader changes the radio waves into a form of digitalized data and then it will be sent to a computer which makes the use of it.

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Fig.(c) Radio Frequency Identification [RFID] module

B. BUTTON

A simple switch will be having an open state and closed state. However, a microcontroller has to see a definite high or low voltage level at a digital input. A switch usually requires a pull-up or pull-down resistor in order to produce a definite high or low voltage when it is open or closed. A resistor placed in between a digital input and the supply voltage is known as "pull-up" resistor because it usually pulls the pin's voltage up to the supply. A switch placed in between the digital input and the ground will short the digital input to ground when it is pressed. This means that the voltage seen at that particular input will be high when the switch is open and low when the switch is closed.

A resistor placed between a digital input and ground is called a "pull-down" resistor because it normally pulls the pin's voltage down to ground which is shown in Fig.(d). A switch placed between the digital input and the voltage supply will short the digital input to the voltage supply when it is pressed. This means the voltage seen at the input will be low when the switch is open and high when the switch is closed. Of this energy, 527 watts is infrared light, 445 watts is visible light, and 32 watts is ultra violet light.

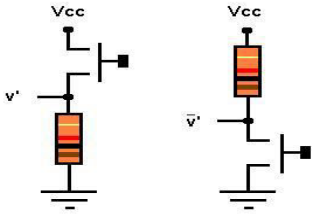

Fig.(d) Circuit diagram of Pull-down resistor

C. FINGERPRINT SCANNER

Biometrics normally consists of automated methods of recognizing a person based on their unique physical characteristic. The biometric system is different in application that consists of at least one similarity: This biometric must be based upon a distinguishable human character such as the person's fingerprint, iris, voice pattern and also even facial pattern.

Nowadays fingerprint are the most popular form of biometric security used, within a variety of systems on the market accidental for general and mass market usage. Long gone are the huge and bulky fingerprint scanners; now with only a fingerprint scanning device can be small enough to be incorporated into a laptop for security.

Fingerprint is made up of a pattern of ridges and furrows and also as a characteristic that occur at Minutiae points (ridge bifurcation or a ridge ending). Fingerprint scanning mainly provides an identification of a person based upon the acquisition and also with the recognition of those unique patterns and ridges in a fingerprint. A sample fingerprint model is shown in Fig.(e).

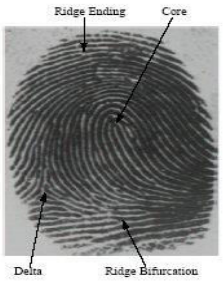

Fig.(e) Sample fingerprint model

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D. LCD DISPLAY

A liquid crystal display is a flat panel display which is shown in Fig.(f). LCD can be fully controlled with only 6 digital lines (Any analog/digital pins can be used). The Data pin8 (DB7) of the LCD is busy flag and is read when R/W = 1 & RS = 0. It is busy with the internal operations. By before passing any data to LCD, its command register should be read and busy flag should be checked. The LCD, data is first written to the data pins (to select the data register). The high to low pulse is given at EN pin when data is sent.

Fig.(f) Multipurpose LCD display

E. GSM [GLOBAL SYSTEM FOR MOBILE]

Global System for Mobile communications is also simply known as GSM. A GSM modem is a wireless modem which will be working with a GSM wireless network. The major difference is that a dial-up modem sends and receives the data through a fixed telephone line at the same time a wireless modem sends and receives data through radio waves. A GSM modem is a special type of modem which normally accepts a SIM, and it will be operated over a subscription to a mobile operator, as a mobile phone. A GSM modem exposes an interface which allows applications such as SMS to send and receive messages over the modem interface.

The mobile operator charges for this particular message sending and receiving as it was performed directly on a mobile phone. In computers use AT commands to control modems.GSM modems and dial-up modems support a common set of standard AT the standard AT commands, GSM modems support an extended set of AT commands. These longer parts of AT commands are defined in the GSM standards.

Reading and writing of SMS messages and phone book entries, it also sends and deletes the SMS messages.

It is also used for the Monitoring of the signal strength.

Monitoring the charging status and charge level of the battery is done.

F. BUZZER

A buzzer is also called as a beeper which is a signaling device. A buzzer with small-enclosed-piezo-electronic-buzzer-alarm in Fig.(g). Usually it is an electronic device, typically used in automobiles and also in household appliances such as microwave oven and game shows. In game shows it is normally known as a "lockout system," because when one person signals ("buzzes in"), all others are locked out from signaling. Many game shows will be having a large buzzer buttons which are identified as "plungers".

The word "buzzer" originates from rasping noise that the buzzers were made with electromechanical devices that will be operated from stepped-down AC line voltage at 50 or 60 cycles. Some other sounds can also be indicated when the button has been pressed by a ring or a beep.

Fig.(g).Buzzer with small-enclosed-piezo-electronic-buzzer-alarm

G. PIC MICROCONTROLLER

The name PIC referred to "**Programmable Interface Controller**. PIC microcontroller are very much popular in industrial developers due to low cost, widely available, large user base, large collection of application notes, free

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development tools, and serial programming (and re-programming with flash memory) capability. The main advantage of PIC is that it can be write-erase as many times as possible because it use FLASH memory technology. It has about 40 pins and 33 pins are used for input and output. PIC16F877A is used in many PIC micro controller projects.

B.SOFTWARE IMPLEMENTATION

MPLAB IDE

MPLAB is a free integrated toolset which is commonly used for the development of embedded applications mainly on microcontrollers. It is developed by Microchip Technology. MPLAB X is the latest edition of MPLAB.

MPLAB and MPLAB X mainly support the project management, code editing, debugging and programming of Microchip 8-bit, 16-bit and 32-bit PIC microcontrollers. MPLAB is basically designed in order to work with the MPLAB-certified devices such as the MPLAB ICD 3 and MPLAB REAL ICE, for programming and debugging PIC microcontrollers using a personal computer. PICK it programmers are also supported by MPLAB.

MPLAB 8.X is the last version of the legacy MPLAB IDE technology, custom built by Microchip Technology in the Microsoft C++. MPLAB supports project management, editing, debugging and programming of Microchip 8-bit, 16-bit and 32-bit PICmicrocontrollers. MPLAB will be working on only Microsoft Windows. MPLAB is available from Microchip's archives, but it will not be recommended for new projects.

MPLAB supports the following compilers:

MPLAB MPASM Assembler

MPLAB ASM30Assembler

MPLAB C Compiler forPIC18

MPLAB C Compiler for PIC24 and dsPIC

MPLAB C Compiler forPIC32

HI-TECHC

MPLAB X is the latest version of MPLAB IDE built by the Microchip Technology, and it is based on the open-source Net Beans platform. MPLAB X will be supporting editing, debugging and programming of Microchip 8-bit, 16-bit and 32-bit PIC microcontrollers.

MPLAB X is the first version of the IDE to support for Mac OS. Thus it also supports X and Linux in addition to Microsoft Windows.

CODING USING MPLAB IDE(c language in PIC microcontroller).

IV.CONCLUSION

Fast track voting could be used in the small scale elections such as resident welfare association and panchayat level election and other society level elections, where the results can be done instantly.

It could be used in order to conduct opinion polls at the time of annual shareholders meeting.

It could also be used to conduct general assembly elections where number of candidates are less than or equal to eight in the current situation, on a small scale basis.

This system allows only authenticated voting than the existing equipment as the person is identified based on his Fingerprint which is unique to each individual with cost effective and low power consumption.

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