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FINGERPRINT BASED ELECTRONIC VOTING MACHINE

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ABSTRACT

Voting is most pivotal process of democratic society through which people determine it's government. Governmentsaroundtheworldareincreasinglyconsideringthe replacement of traditional paper-based voting schemes with electronic voting systems. Elections of Bangladesh are conducted most exclusively using electronic voting machines developed over the past three years. In this paper we describe the design, constructionand operation of a digital voting machine using a microcontroller profoundly. Again we also portray counting systemof votes, market survey and cost analysis.

Keywords:Atmega16Microcontroller, Security of EVM, Voting analysis, Voting Syatem.

I.INTRODUCTION

Biometrics is the science and technology of measuring and analyzing biological data. Biometrics refers to technologies that measure and analyze human body characteristics, such as DNA, fingerprints, eye retinas and irises, voice patterns, facial patterns and hand measurements, for authentication purposes. The field of biometrics was formed and has since expanded on to many types of physical identification. Among the several human fingerprints remain a very common identifier and the biometric method of choice among law enforcement. These concepts of human identification have lead to the development of fingerprint scanners that serve to quickly identify individuals 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 [1]. In our project we have used fingerprint for the purpose of voter identification or authentication. As the thumb impression of every individual is unique, it helps in minimizing the error. A database is created containing the fingerprint images of all the voters as required. Illegal votes and repetition of votes is checked for in this system with accurate coding. Hence with the application of this fingerprint based EVM system elections could be made fair and free from rigging. Further that the elections would is no longer a tedious and expensive job.

II.BLOCKDIAGRAM

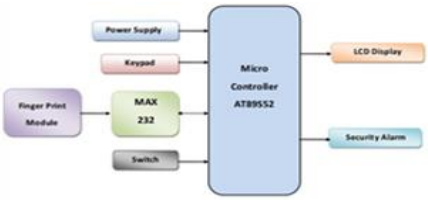

Fig1. Block Diagram

This block diagram includes microcontroller , keypad, max232, switches, finger print module, LCD display and security alarm.

III.OPERATION PRINCIPLE

Fingerprint processing includes two parts: fingerprint enrolment and fingerprint matching (the matching can be 1:1 or 1:N).When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1:N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result.

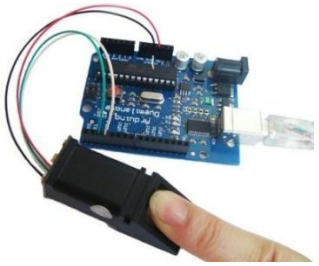

Fig2. Fingerprint Module

IV.METHODOLOGY

Micro controller: This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

Liquid-crystal display (LCD)

is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

GSM:

Global System for Mobile Communication (GSM) isa set of ETSI standards specifying the infrastructure for a digital cellular service. GSM is vulnerable to different class of attacks, each of them aiming a different part of the network.

Fig3.GSM Module

Buzzer:

A buzzer or beeper is a signaling device, usuallyelectronic, typically used in automobiles, householdappliances such as a microwave ovens, & gameshows. The word "buzzer" comes from the raspingnoise that buzzers made when they wereelectromechanical devices, operated from stepped downAC line voltage at 50 or 60 cycles. Othersounds commonly used to indicate that a button hasbeen pressed are a ring or a beep.

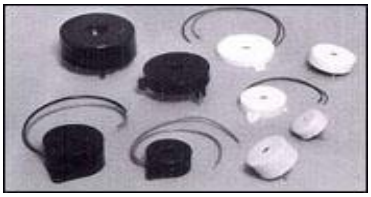

Fig4. Types of Buzzer

Program:

```
lcd.setCursor(0,0);
lcd.print("BJP");
lcd.setCursor(1,1);
lcd.print(votel);
lcd.setCursor(4,0);
lcd.print("INC");
lcd.setCursor(5,1);
lcd.print(vote2);
lcd.setCursor(8,0);
lcd.print("AAP");
 lcd.setCursor(9,1);
lcd.print(vote3);
lcd.setCursor(12,0);
lcd.print("OTH");
```

Pin configuration description:

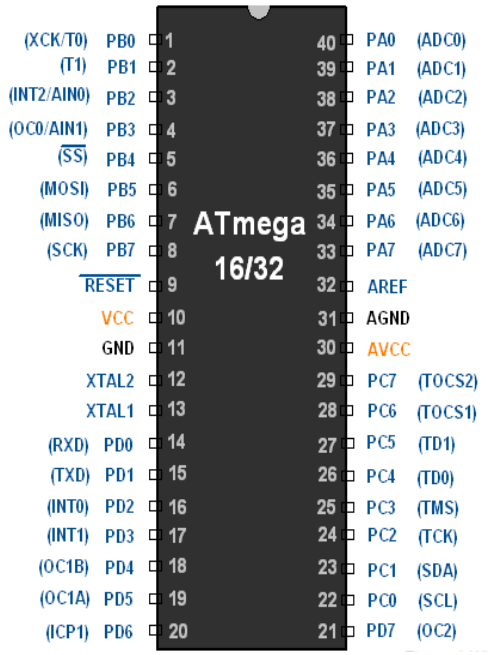

Fig5. Pin Diagram of Atmega16

PIN1	I/O , T0 (Timer0 External Counter Input) ,XCK : USART External Clock I/O
PIN2	I/O, T1 (Timer1 External Counter Input)
PIN3	I/O, AIN0: Analog Comparator Positive Input , INT2: External Interrupt 2 Input
PIN4	I/O, AIN1: Analog Comparator Negative Input, OC0 : Timer0 Output Compare Match Output
PIN9	Reset Pin, Active Low Reset
PIN10	VCC=+5V
PIN11	GND
PIN12	XTAL2
PIN13	XTAL1
PIN14	(RXD) ,I/O PIN 0,USART Serial Communication Interface
PIN15	(TXD) ,I/O Pin 1,USART Serial Communication Interface
PIN16	(INT0),I/O Pin 2, External Interrupt INT0
PIN17	(INT1),I/O Pin 3, External Interrupt INT1
PIN18	(OC1B),I/O Pin 4, PWM Channel Outputs
PIN19	(OC1A),I/O Pin 5, PWM Channel Outputs

PIN20	(ICP), I/O Pin 6, Timer/Counter1 Input Capture Pin
PIN21	(OC2),I/O Pin 7,Timer/Counter2 Output Compare Match Output
PIN22	(SCL),I/O Pin 0,TWI Interface
PIN23	(SDA),I/O Pin 1,TWI Interface
PIN24-27	JTAG INTERFACE
PIN28 :	(TOSC1),I/O Pin 6,Timer Oscillator Pin 1
PIN29 :	(TOSC2),I/O Pin 7,Timer Oscillator Pin 2
PIN30 :	AVCC (for ADC)
PIN31 :	GND (for ADC)
PIN33 – PIN40	PAx: I/O,ADCx (Where x is 7 – 0)

V.WORKING

Circuit Diagram:

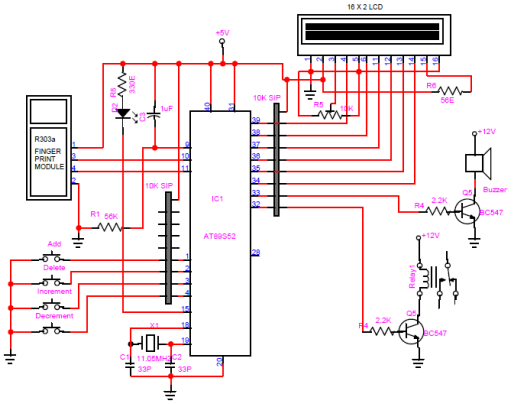

Fig6. Circuit diagram of the project

Circuit Components:

1. Power supply- fixed positive voltage regulator
2. Fingerprint recognition module
3. RS232 Communications
4. Microcontroller unit
5. Alarm
6. Keypad
7. LED
8. 16x2 LCD display
9. EEPROM

Flow Chart:

This process basically consist of two stages

1. Voter enrolment

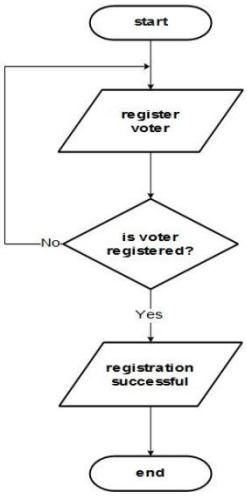

Fig7. Voter enrolment.

2. Vote casting

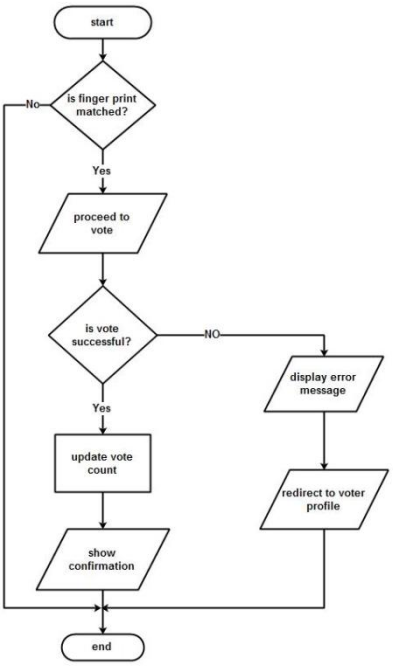

Fig8. Vote casting.

VI.RESULT

Enrolment

Voter enrolment

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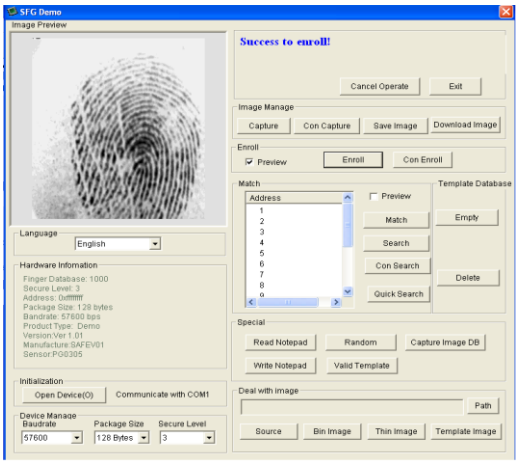

Fig9. Enrolling of the user

Search of registered voter

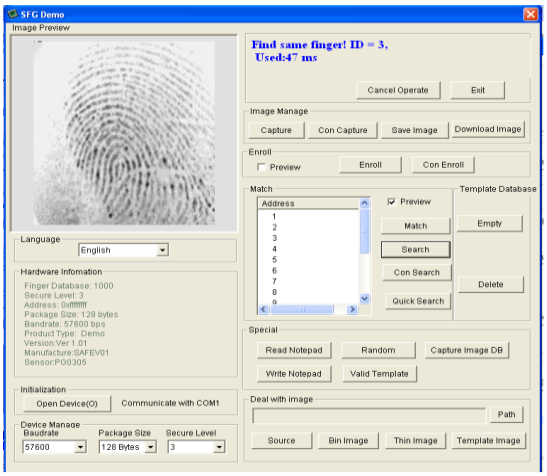

Fig10. Presearch of the registering user

Voting:

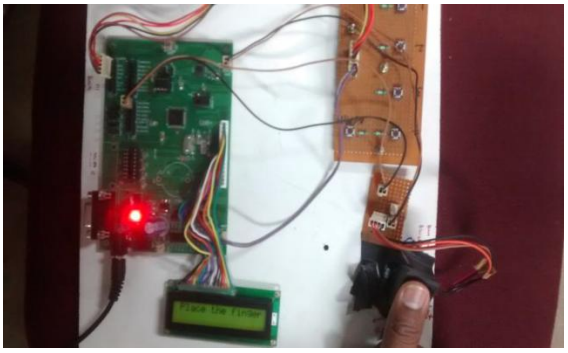

Fig11. How voting is done.

VII.ADVANTAGE&DISADVANTAGE

Advantages

• Cost effective

• This system allows only authenticated voting than theexisting equipment as the person is identified basedon his Fingerprint which is unique to eachindividual.

• Low power consumption

• It is economical

• Less manpower required

• Time conscious, less time required for voting &counting

• Avoids invalid voting as it prevents unregisteredvoters from voting.

• Ease of transportation due to its compact size.

• Convenient on the part of voter.

Disadvantages

• Before voting the user has to enroll first.

• Sensitivity of finger print module causes sometimesCombine character error.

VIII.APPLICATIONS

This project can be used as a voting machine to preventrigging, during the elections in the polling booths.

Fast track voting which could be used in small scaleelections, like resident welfare association,"panchayat" level election and other society levelelections, where results can be instantaneous.

It could also be used to conduct opinion polls duringannual shareholders meeting.

It could also be used to conduct general assemblyelections where number of candidates are less than orequal to eight in the current situation, on a small scalebasis.

IX.CONCLUSION

Fingerprint Based Voting Machine is designed to make the procedure of voting easier and more convenient as it is a modified system. It has proved to be very advantageous in providing security EVM is capable of saving considerable printing stationery and transport of large volumes of electoral material. It is easy to transport, store, and maintain. It completely rules out the chance of invalid votes. In total, the complete system (including all the hardware components and software routines) is working as per the initial specifications and requirements of our project. So certain aspects of the system can be modified as operational experience is gained with it. As the users work with the system, they develop various new ideas for the development and enhancement of the project. The proposed system has been designed and implemented successfully using a PIC microcontroller, which was shown to be superior over the existing Electronic Voting Machine. The proposed system has the benefit of using a biometric authentication and controls the process of voting avoiding unnecessary things like rigging, ballot papers, casings etc.

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