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EVM Monitoring and Security over IOT

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Abstract - *This paper describes an advance Aadhaar and server based electoral system for Indian elections. The voting systems in an easier way that all voter can cast votes via biometric Aadhaar based authentication .It provides a higher security pre-casting which could reduce the chances of temperance as a simultaneous backup is created at State/Central level servers. In this system we renounce the use of traditional voter ID cards and election voter verification list. This method would help us to eliminate invalid votes, ends booth capturing and makes counting easier, faster and accurate.*

Key Words: **electoral system, Aadhaar, IOT, of traditional voter ID cards, biometric**

1. INTRODUCTION

Voting is the most pivotal process which is carried out to reveal the opinion of the people in selecting government or in any issue that is under consideration. So the conventional voting systems based on paper voting are being replaced by electronic voting machines. Voting is a decision making mechanism in a society and security is indeed an essential part of voting. The term "electronic voting" represents the practice of electronic means in voting to safeguard the security, reliability, and transparency. The crucial role in determining the result of an election, electronic voting systems should be developed with the greatest responsibility and security. Electronic voting machines aid blind users by reading off the instructions using headphones and also provide essential tools to help people with disabilities. Voting machines are the combination of mechanical and electronic equipments which are needed for casting votes and displaying the election results. The main proposal for using the voting machines was given in 1838 [1].There are large number of smart systems present which employ microcontrollers for their operation [2-4] and several other voting systems have been developed for ensuring a secured vote casting process [5-7].The design presented in [8] incorporates voter information facility for getting the information about the number of voters at a place. In this paper, GSM based design of an electronic voting machine has been presented for sending the polling results to a monitoring station via mobile network. This system is fully secured and chances of digital tampering are also avoided and turbidity sensors are used. Raspberry pi receives data from Arduino.

2. PROPOSED ARCHITECTURE

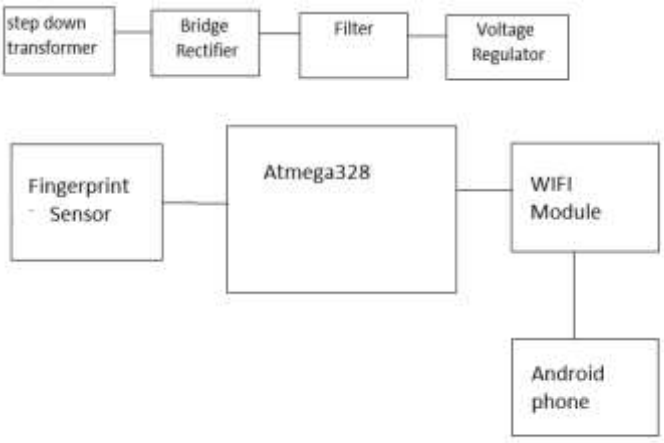

Figure 1: Proposed System.

1. Finger print module R305 is used to detect the finger prints of individual.
2. Finger print sensor will be interfaced to Raspberry pi using an interfacing circuit.
3. We will make a database of fingerprints to detect who the individual is.
4. We will also make the database of the candidates in different areas.
5. Once we detect the finger print we will indentify the individual.
6. Then we will pull up the details from which area the individual belongs.
7. The candidates of that area will be displayed on the monitor screen.
8. The individual then can vote by clicking in front of the the candidate using mouse.
9. During this whole process our raspberry pi that is been configured as an server will send all these actions on the monitoring system.
10. This monitoring system could a android phone.
11. Our android phone will be connected to our server via internet using an authorization code.
12. We will download an open source app from play store and configure it as per our project which will generate a authorization code.
13. This authorization code will be put in our raspberry pi server program.
14. So our android phone will be connected to our server only using authorization code.
15. All actions performed on our EVM system will be monitored on android phone.

16. Hence we create a centralize system for voting with monitoring system.

2.1. FINGERPRINT SENSOR:

Figure 2: Finger Print Sensor

Fingerprint processing includes two parts: fingerprint enrollment 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, success or failure.

2.2 ATmega328

Figure 3: ATmega328

The Atmel picoPower ATmega328/P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328/P achieves throughputs close to 1MIPS per MHz. This empowers system designer to optimize the device for power consumption versus processing speed. The device is manufactured using Atmel's high density non-volatile memory technology. The On-chip ISP Flash allows the program memory to be reprogrammed In-System through an SPI serial interface, by a conventional nonvolatile memory programmer, or by an On-chip Boot program running on the AVR core. The Boot program can use any interface to download the application program in the Application Flash memory. Software in the Boot Flash section will continue to run while the Application Flash section is updated, providing true Read-While-Write operation. By combining an 8-bit RISC CPU with In-System Self-Programmable Flash on a monolithic chip, the Atmel ATmega328/P is a powerful microcontroller that provides a highly flexible and cost effective solution to many embedded control applications.

2.3 WIFI MODULE (ESP8266)

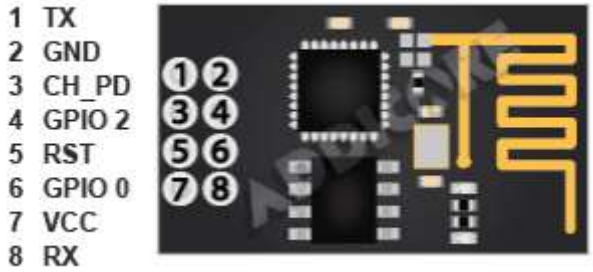

Figure 4: Wi-Fi Module

ESP8266EX delivers highly integrated Wi-Fi SoC solution to meet users' continuous demands for efficient power usage, compact design and reliable performance in the Internet of Things industry. With the complete and self-contained Wi-Fi networking capabilities, ESP8266EX can perform either as a standalone application or as the slave to a host MCU. When ESP8266EX hosts the application, it promptly boots up from the flash. The integrated highspeed cache helps to increase the system performance and optimize the system memory. Also, ESP8266EX can be applied to any microcontroller design as a Wi-Fi adaptor through SPI / SDIO or I2C / UART interfaces. ESP8266EX integrates antenna switches, RF balun, power amplifier, low noise receive amplifier, filters and power management modules. The compact design minimizes the PCB size and requires minimal external circuitries. Besides the Wi-Fi functionalities, ESP8266EX also integrates an enhanced version of Tensilica's L106 Diamond series 32-bit processor and on-chip SRAM. It can be interfaced with external sensors and other devices through the GPIOs. Software Development Kit (SDK) provides sample codes for various applications. Espressif Systems' Smart Connectivity Platform (ESCP) enables sophisticated features including fast switch between sleep and wakeup mode for energy-efficient purpose, adaptive radio biasing for low-power operation, advance signal processing.

3. FLOW CHART:

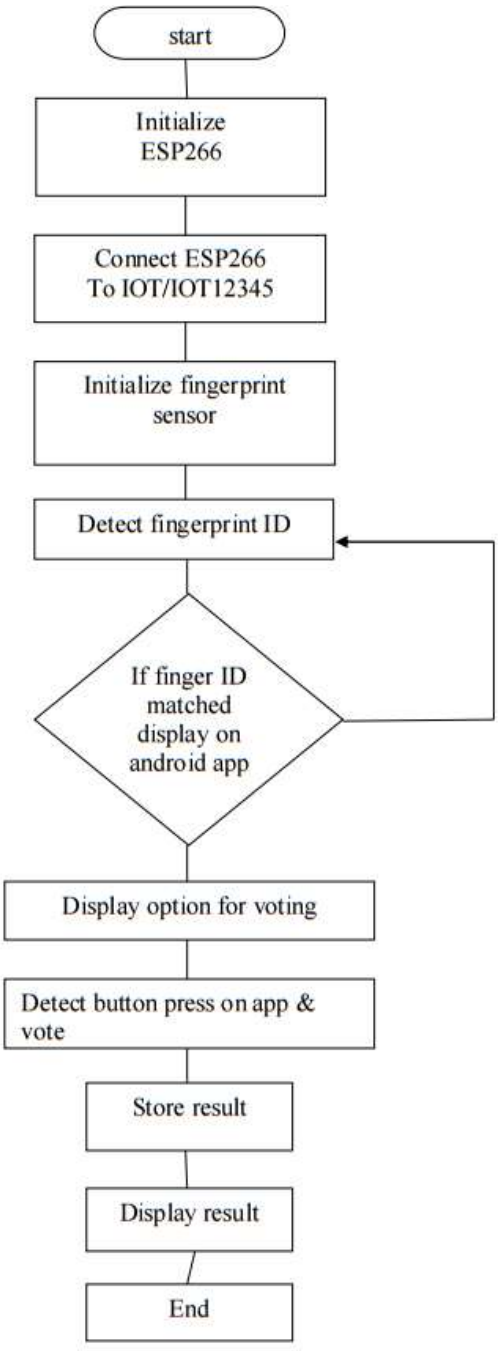

Figure 5: Flow Chart

3. CONCLUSIONS

A IOT based electronic voting machine design with voter tracking has been proposed in this system which is found to be appropriate. The software of the system has been written in Embedded C language and Proteus Professional Software has been used for simulating the behavior of the machine. The simulation of the machine is working properly under normal conditions. Polling switches are used to give votes to the candidates and infrared sensors have been used to track the voter entries. The count of the voter entries previously stored in the register is matched with the total votes casted and votes rejected to avoid any mistakes thus making the system more protected. After the voting process has been over, the results are displayed on the machine LCD by entering the correct password and sent to the monitoring station via GSM for analysis and the declaration of the final verdict. Table 1 shows the comparative study of different voting systems. The design presented here is cost effective, highly secured and appropriate according to the modern day requirements.

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