IOT BASED ELECTRONIC VOTING MACHINE USING FINGERPRINT SENSOR

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Abstract: An electronic voting machine is an e voting system which allows the voter to vote without any circumscription over the global network (Internet). There are many voting system available all over the world but each of them having its drawbacks and each system is restricted. The main purpose behind developing and electronic voting machine using IoT is to provide safe and secure voting process and avoid manipulation of votes. This system uses a safe database. Which is a secure data base system and it is difficult to manipulate. At the time of database enrollment the election commission will enroll name, photo, date of birth, fingerprint or iris and various other information of the voter and will allot an unique identification number. When the voter cast their vote the count of the vote will update directly to google sheets with help of IoT. This system is easy to use, gives faster result, less costly and more secure.

Keywords: IoT, Security, Fingerprint scanner, Electronic voting machine, Raspberry pi model B+.

1. Introduction:

In a democratic country like India, vote of every person matters and people are given right to vote by their own choice. The Election Commission of India was established in India for carrying out the election processes in the year of 1950 whose functions are performed by following the set of guidelines made by the committee. As per the guideline, the citizens of India, who are aged above 18, are considered to be eligible voters and they are given full rights to choose their own representative under the basic principle of right to vote. The Voters make their choice by
polling process and the candidate opted for the election who secures the highest number of votes is declared as leader. Since large scale election frauds are taking place in the current scenario, this paper explains the advantage of using aadhaar and biometric authentication to make voting process reliable and secure. Electronic voting reefer's to voting using electronic means to either aid or take care of the chores of casting and counting votes depending on the particular implementation ,e-voting may use standalone electronic machine (also called EVM)or computer to the internet .This paper describe an online electoral system for Indian election is proposed for 1st time there are number of voting system develop all over the world with each of them having it's limitation's this system uses the fingerprint sensor to scan thumb of the voter's in order to provide high performance with high security to the voting counter also as we using internet of thing i.e.(IOT)to make the voting system more practical. This system used to displays the data-base of the user (voter).After receiving the instruction from the polling officer, then the voter can cast their vote.

2. Internet Of Things(IOT):

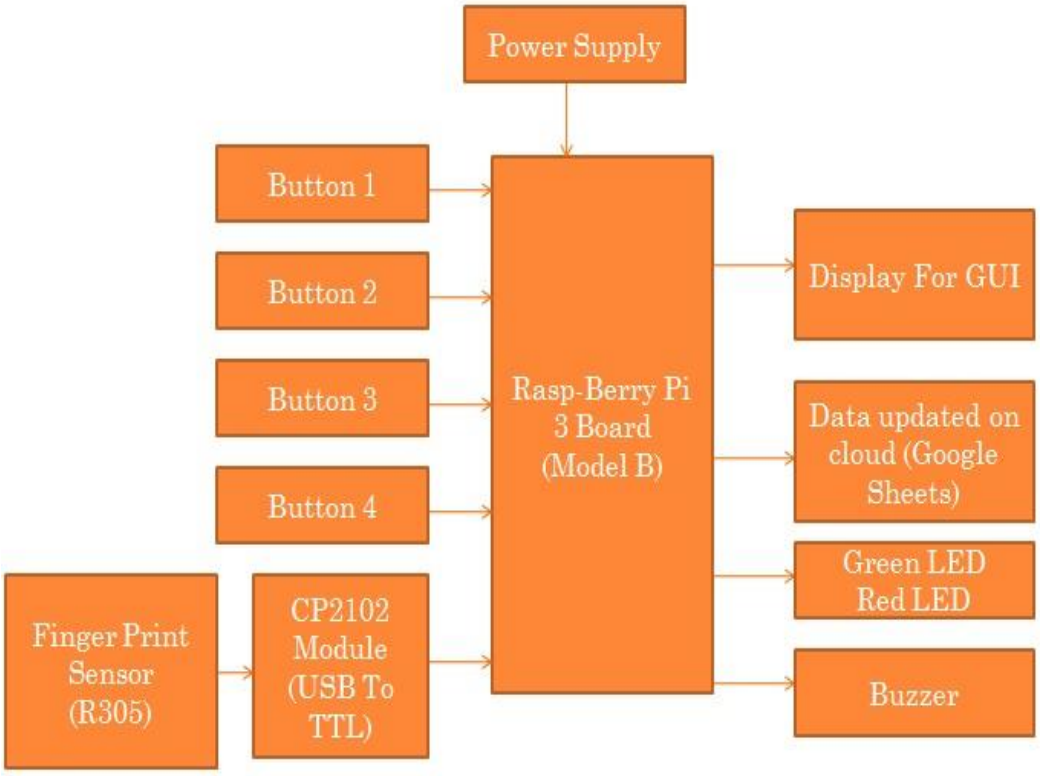
The internet of things (IOT) is the inter-networking of physical devices, vehicles, building and other items embedded with electronics, software, sensors, actuators and network connectivity which enables these objects to collect and exchange data. The IOT allows objects to sense or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based system, and resulting in improve efficiency, accuracy and economic benefit in addition to reduce human intervention. In the broadest sense, the IOT encompasses everything connected to the internet, but it is increasingly being use to define objects that "talk" to each other. Simply, the Internet of things is made up of device from simple sensors to smart phones and wearable's-connected together. For making an IOT infrastructure where we configure the hardware with software and control the devices over the internet this can be with help of raspberry pi. the raspberry pi is platform for developing the internet of things environment.

3. Goals and Objectives:

1. To identify the fake voter.
2. To generate the result on Google sheet.
3. To collect immediate result.
4. To develop the level of security.

4. Method:

A. Block Diagram:-

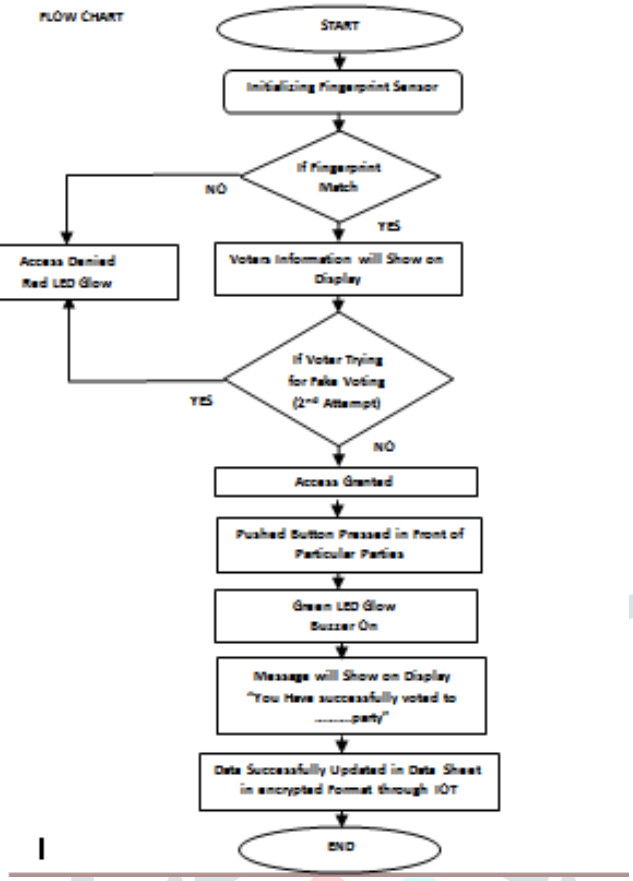


B. Description:

1. Design Overview:

1) **Power Supply: -** 5V/2.5A DC via micro USB connector or 5V DC via GPIO header is used to power this circuit.
2) **Push Buttons: -** Here we use 4 push buttons for 4 particular parties. Voter will press one button from these buttons. Input will given to Raspberry pi. according to button pressed.
3) **Finger Print Sensor:** - Finger print sensor is mainly use for security purpose to avoid fake and double voting. Voter will scan his\her finger if finger print matches with database then he/she will allow to vote otherwise not. Input power required 3.6V – 6V DC where input current required 100mA.
4) **CP2102 Module: -** It is nothing but USB to TTL converter. Which converts output from finger print sensor into the compatible input for Raspberry pi. It consists 4 pins TXD, RXD, GND, 3V3 which is optional output pin for output circuitry.
5) **Raspberry pi.:** - Raspberry pi. 3 Model B+ is used. It uses uses a Broadcom BCM2837B0 SoC with a 1.4 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache. All the input from push buttons and Finger print sensor via USB to TTL logic is given to the raspberry pi. device.
6) **Display for GUI: -** Simple display is use for showing GUI. Project contains two Forms of GUI on for Finger Enrollment and another for voting purpose which is contain voter information and candidate names of political parties.
7) **LED: -** Two types of LEDs Green and Red which shows successful or unsuccessful voting respectively. Input power required for LEDs is 1.9V – 2.1V.
8) **Buzzer: -** buzzer will blow as a indication of vote is stored successfully.

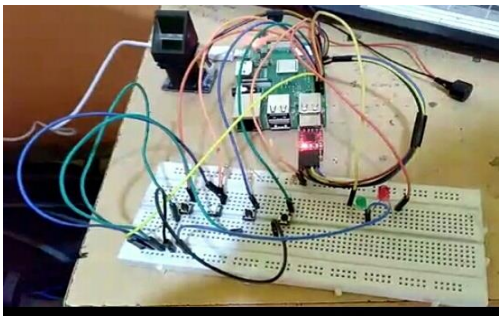
2. Flowchart:

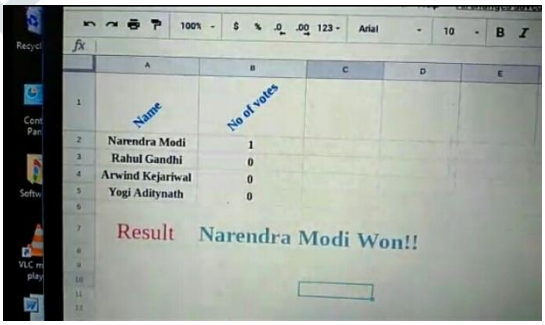


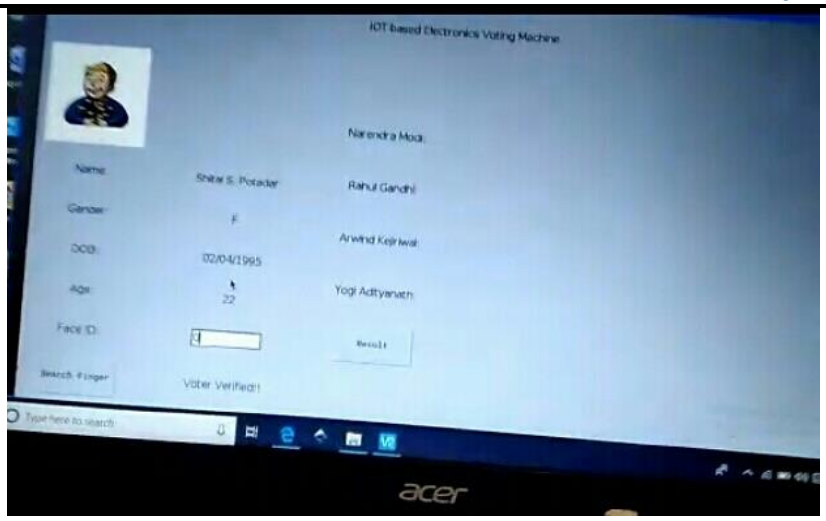
5. Methodology:

This project is mainly based on Raspberry Pi kit. In this project Raspberry Pi 3 board (Model B+) is use. Power Supply is given to this kit. 4 buttons, Finger print Sensor (R305) is given as input. Display, Green LED, Red LED, is given as output. 4 Buttons as input is for 4 particular Political parties. This is simply a push buttons. Voter has to be press one of the 4 buttons and input is given to Controller according to press button. Voter has to be scan his finger on finger print sensor for security purpose. The output of finger print sensor is given to the USB to TTL logic circuit, which converts output of finger print sensor in the compatible form for the controller. Controller checks the output of USB to TTL logic circuit in the database. According to Voting Raspberry Pi shows the output on Display. Green LED is for successful voting and Red LED is for unsuccessful voting. Buzzer blows when voting is successfully done. All the data is stored on google sheet in encrypted format. Only authorized person can access these sheets.

6. Output Result:







7. Advantages:

Electronic voting system have many advantages over the traditional way of voting system. Some of those are:-

1) Less costly. Because in this system human intervention is less
2) Due to real time approach counting of votes could be done at the same time while voting
3) Less Time take to cast vote.
4) Cross voting is cannot be done due to use of fingerprint scanner
5) The hacking is not possible due to use of encryption and decryption technique.
6) Installation is effortless.

8. Future Scope:

1) Audio output can be used for illiterate people.
2) This advanced system will be referred in future to making the voting system online.
3) External memory can be provided for storing fingerprint images
4) For enhancing the system and its service new algorithm can be include.
5) We can further use iris scanner for more security.
6) With the help of some modification in this project the voter can cast their votes even from mobile, PC or laptop.

9. Conclusion:

Corruption is a major issue n our country. Our election process s also highly corrupted but this issue can be resolved with the help of honesty and sincerity. This system is a small contribution toward the fair election. This system avoids fake votes, manipulation of votes and proxy votes and provide highly secured, quick to access and easy to maintain all information of voting. This system becomes highly efficient and reliable due to the use of fingerprint scanner. This reduces unwanted human error and provides better scalability for large election. It uses biometric scanner which is a advanced verification system as well as it is provide high data security so illegal activities can be stop. Manipulation is not possible and final vote count be done. This system gives quick final result.

10. References:

[1] Timaedeepkaurameja, jasleenkarubassi ,D amanjeet kaur" Implementation of electronic voting machine through FPGA" International journal of soft computing and artificial intelligence volume-2,isshu-1.
[2]Hari K. Prasad J. Alex haldermanRopGonggrijp "security analysis of India's electronic votingmachine,"proc.17th ACM Conference on computer and communication security (CCS'10).
[3] SalilPrabhakar,2001"Fingerprint Classification and matching using filter bank".
[4] DavideMaltoni, AnilK. Jain, 2009,"Handbook of fingerprint Recognatio 2nd edition.
[5] Ashok Kumar .D., Unmalsariba Begum T.,"A novel design of electronic voting system using fingerprint", International Journal of Innovative Technology & creative Engineering (ISSN:2045-8711) ".vol1 no 1.pp:12 19,January 2011
[6] Junichsakamoto, 2008 "Hybrid fingerprint Recognition.