SOLAR BASED FINGERPRINT AUTHENTICATION VOTING SYSTEM USING IOT

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Abstract – This paper deals to develop a Voting device which allows conduction of elections in easy and a right way using at most security features. • This device helps the authorities in taking care of security flaws, hard work that must be done while conducting elections. • The first and foremost thing that comes to our mind while using voting device is the security of the system. So, in these devices we use advanced security system to conduct elections in easy. and right way. • At the starting stage, the election commission should collect all the vote holder's data in a database. So that it will be used in later stage for verification. • Now the user data will be compared with the already taken data from the user. If the data matches with the user, then user must be allowed to cast his/her vote. • The system will be connected to internet through iot, and results will be stored in a database. • By using solar power, the conduction of elections takes place effectively without any intervention.

Key terms: PIC16F877, RFID READER, FINGERPRINT SCANEER, ESP8266.

I. INTRODUCTION

Voting is a process of electing or taking collective decision on opinions or choices especially in elections, debates and discussions. Fair voting will be used as a primary source in choosing the most suitable person for a certain position or work among several other candidates. In some cases, in democratic countries, voting plays a vital role in making major decisions like turning bills into laws etc. In the case of country and people, Voting is very important thing to take care of and to make valuable decision. Because through this voting, a person is going to be elected as a leader or a responsible person for some certain work for certain period. This voting mechanism is the main thing in maintaining things better, if it is not in a correct way then it will become the main reason for political instability. Voting mechanism is an integral part of the election system. Citizens of the country will cast the votes by a voting system. A set of rules and regulations will be declared in this voting system which should be followed by the citizens of the country in order to make their vote valid. This paper is presenting the proposal of designing the Electronic Voting Machine (EVM) which will run through the solar power system. Due to fast draining of fossil fuel reservoirs, the world is now mainly focusing on generating the renewable, regenerative, reliable and sustainable power generation. By considering the requirements and the things which are focused, solar power can be considered as an ideal choice to generate renewable energy source. This system will also help the nation to turn into digital nation by using digital technology which will speed up the nation in completing the tasks. For implementing this technology, Internet of things is being used here. Internet of things is the future focusing technology which is going to come into usage rapidly in coming generations. Internet of things is referred as the connection between the things through network to perform certain things successfully. IOT uses the quick wittedly attached devices and systems to grip and support the data gathered by the sensors which are embedded and machinery actuators. This IOT will create a new dimension of supportive services to establish a connected life which will improve the quality of life. Many major aspects of daily life like security, health, education can be adequately increasing the energy efficiency with the potential solutions of IOT. Machine to Machine (M2M) solutions which is a subset of the IOT will plays a vital role in connecting the devices and grabbing the data from the devices. To maintain this IOT

successfully, embedded system is being used here. Embedded system is referred as a process of containing a software which will be included in computer-hardware which will make a device or system to work for a specific application or specific part of application. As its name suggests, embedded means having the things attached to other things. Here in this device, embedded system is used in microcontroller which will only performs a specific task. Embedded system will also involve the sensors, this project is mainly focusing on developing of advanced level Electronic Voting Machine which will support free and fair way of conducting of elections and to reduce rigging, manual work.

II. PROBLEM STATEMENT

Public voting system decides the fate of the country. Normally in every country the people of the country elect the people of their choice. But in some cases, there may be an external influence of the parties which try to manipulate the output of the election with their power. Due to this external 12 influence people cannot get the desired output in the elections. So Due to this problem there exists a situation where we must develop a system in such a way that we can completely avoid the rigging in election and the people can happily to their choice of leader.

III. LITERATURE SURVEY

Many countries round the world use electronic voting device however those machines were developed considering their own country needs. whereas planning a voting device for our country we've to contemplate acquisition rate, electricity handiness, social facts that do not seem to be mirrored in those machines. Republic of India introduced associate degree electronic voting device that reflects their social facts. Republic of India used battery-based machine victimization silicon chip that consists an effect unit and a ballot unit. [1] Whereas Asian nation used engineering and developed software-based mechanical device that is just too value per machine utilized in national elections. they are developed the voting device that is not possible in rural areas wherever no electricity is not obtainable. A microcontroller-based voting device is additionally projected however there is no feature of victimization elector ID. No initial and run time checking procedure is projected to examine the practicality of the machine. In this system a minute delay in thought of to forestall device hijacking and false selection which will weigh down the method which might simply be solved victimization elector ID. [2] Designed associate degreed enforced an E-voting with software system created beneath Borland C++ tool. To cut back software system vulnerability our supply codes are checked with open supply scanning tool. Voting machine is provided with a contactless IC card reader and every legal vote are going to be problems with a contactless IC card at place public knowledge are going to be written on IC cards, like the election name, the candidates, and therefore the electoral district before polling that might facilitate reducing inputting the duplicate info. These knowledges must be compelled to be scan before elector forged a ballot. [3] Electronic voting device employing a microcontroller and a sensible card is bestowed. The identity management that was done manually is eliminated and replaced by a sensible card. The simulation is finished victimization Proteus skilled

software system. [4] Issues of ballot secrecy just in case of a corrupted voting device associate degreed propose associate degree approach victimization an encapsulated style that improves ballot secrecy. Peoples doesn't recognize that receipts area unit checked and therefore the drawback of receipt stealing. several selection schemes with receipts share this vulnerability. [5] Accepted and rejected paper records should be clearly distinguishable electronic records area unit generally protected and should be extracted victimization the vendors' proprietary software system. [6] On-line registration of voters earlier. throughout the method of registration, the user provides all the small print and specify the selection of OTP generation. If the user chooses it as mail-id or mobile else each (optional) and click on send, the OTP are going to be sent, severally. the necessities of this method 14 embrace the subsequent elements. mobile, committee Server (ECS), committee Databases (ECD), Vote collection and Result part Server (VCRPS) and committee workplace (ECO). This consists of 3 phases as: on-line Registration part, selection part, Vote collection and Result part. [7] Method are going to be done through SMS electronic messaging thus there will be wastage of cash. Not compatible with current trends. identical user will forge their select paper ballot additionally. thence no security is ensured. [8] Associate degree electronic selection framework could be a selection framework within which the choice info is recorded, place away and ready primarily as advanced knowledge. E- selection is alluded as "electronic selection" associate degreed characterized as any voting procedure wherever an electronic suggests that is employed for votes throwing and comes concerning attributable to checking. numerous electronic selection frameworks area unit used as a region of Brobdingnagian applications like optical scanners that scan physically sealed votes to entirely electronic touchscreen selection frameworks. Specific selection frameworks like DRE (coordinate account electronic) selection frameworks, RFID, national IDs, the web, PC systems, and cell frameworks

IV. PROPOSED WORK
## 4.1 BLOCK DIAGRAM:
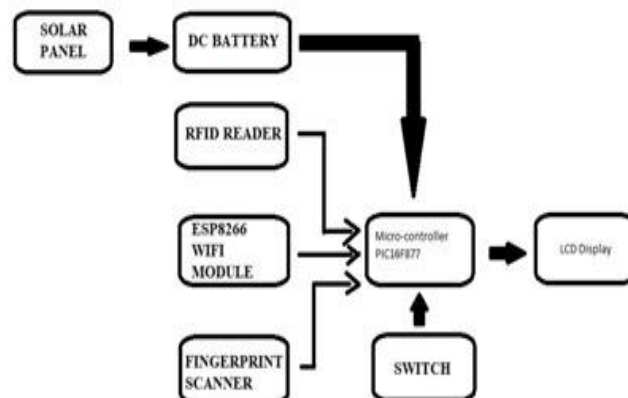
4.2 FLOW CHART:
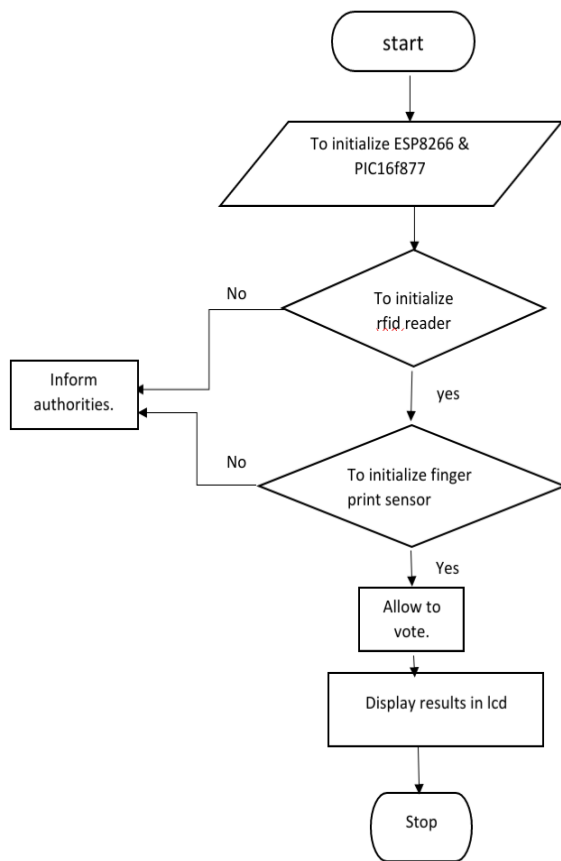
4.3 FLOW CHART DESCRIPTION:

1. Switch on the power supply. Initialization of the ESP8266 module and microcontroller
   - The solar energy is stored in Dc batteries and it acts as power supply.
   - The ESP8266 module is connected to the wi-fi network and verify whether microcontroller ix in active state.
2. Initialization of rfid reader
   - After initialization, the admin will use his rfid reader to authenticate the system. After that the user will be allowed to verify their rfid reader.
3. Initialization of Fingerprint scanner
   - The fingerprint sensor detects persons fingerprint and verifies with the existing database. If the results match then the user can enter his vote using the switch, otherwise the system will notify the authorities.
4. Verifying the status:
   - The microcontroller processes the given information and runs the code, it will either allow the user to vote or intimate authorities about issue.
5. If the data matches with the existing data then user is allowed to vote.
6. Enrolling the vote
   - The user is allowed to enroll their vote to their desired candidates. And results will be displayed in lcd display.

4.4 PIC16F877:

PIC is one of the series of the microcontroller. Here in this project, microcontroller with PIC series is being used. It is CMOS fabricated first RISC based microcontroller which uses distinct bus form instructions and allows data contemporary access of data memory and program. Various microcontrollers contain different types of memories. There are memories like FLASH, EEPROM, EPROM and FLASH is the memory which developed recently. FLASH technology is being used in PIC16F877 which is being used in this project. Due to this, though the power is switched off, the data can be retained without any hurdles. Erasing data and easy programming is the two main plus points of this memory.
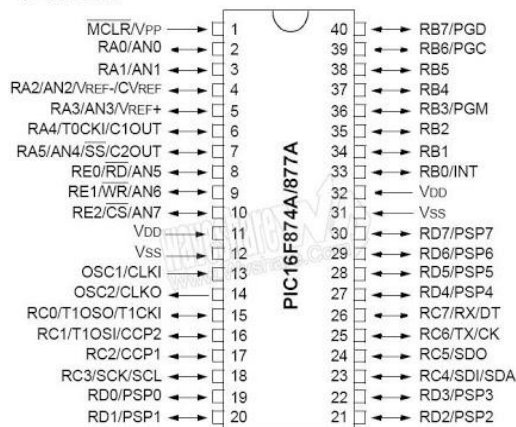
4.5 ESP8266 MODULE:

ESP8266 is low value Wi-Fi microchip used for TCP/IP. It permits the users to attach microcontroller to Wi-Fi network and build easy TCP/IP connections victimization.
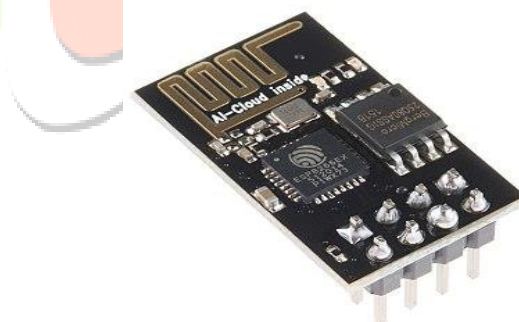
4.6 RFID READER:

It is reader used for communicating with the receiver. It acts as sender which collects the information from chip and verifies and allows the user to enter the details.
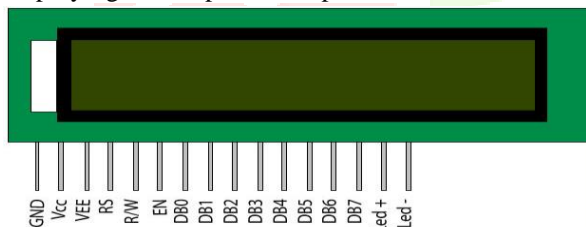

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4.7 FINGERPRINT SCANNER:

A fingerprint scanner is used for verifying the biometrics of a person. The scanner is used for scanning the persons information.

4.8 LICQUID CRYSTAL DISPLAY:

LCD is a digital display device. An LCD consists of sixteen pins. liquid crystal display screen is used in displaying the output of the process.

4.9 SOLAR PANEL:

A solar panel is used for generating the current. The solar panel runs with the help of voltaic effect. It has silicon layer used for generation of current.

4.9.1 DCBATTERIES:

Batteries are used for storing the energy and utilize the energy whenever needed. It has two portions they are positive and negative. It has charging as well as discharging capacity.

V.   RESULTS AND DISCUSSION

Prior to hardware implementation the voting system is virtually build in Proetus software and the results are verified using it. After that the system is build using both the hardware and software components. The rfid,finger print sensor senses the input and send it to the system to verify it. And after the sensing the input the microcontroller verifies it allows the user to vote.

Fig: Initial setup
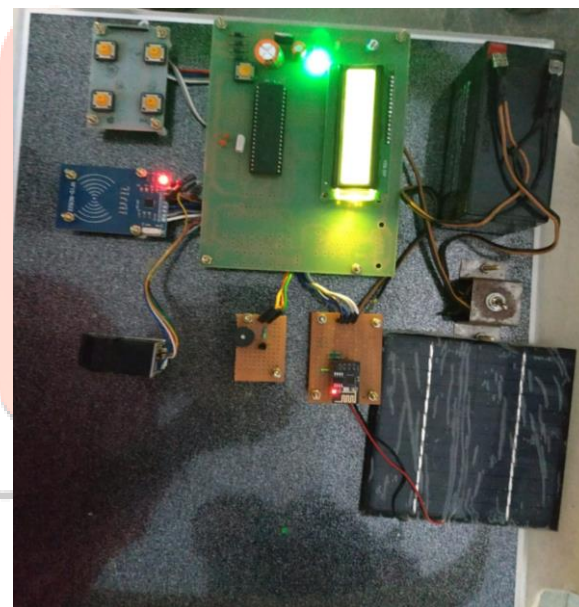
Fig: Working of the voting system

VI.   CONCLUSION AND FUTURE WORK

In this project, we represented the specification associate with design of an Electronic voting device. This approach permits for the straightforward development of applications. The project is an economical and less personnel is needed and conjointly saves transportation value because of its compact size. it is conjointly time acutely aware, as less time is needed for balloting and reckoning. It avoids any invade balloting and therefore the secrecy of the citizen is very maintained. Overall, it is an awfully effective project and convenient for a citizen need.

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