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IOT Based E-Voting System

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Abstract: ***The Election Commission of India, which oversees the country's elections, is still sticking to its position that the machines are "perfect" and "fully tamperproof". Everyone must be to recognize the vulnerabilities of EVMs. Like paper ballots, the ballots stored in an EVM are subject to tampering during and after the election, unless they are monitored carefully. But EVMs, unlike paper ballots, are also subject to tampering before the election, perhaps months or years in advance. Indeed, for many EVMs these pre-election vulnerabilities are the most serious problem. So which voting system should India use? For this question an idea came in our mind that let us make a system which will be Simple to use, Faster in operations, Flexible, Highly Secure, Cheap and Latest. In this project we made a demo model of a technology which can be a future of our India's Voting System. We use small server made up of RaspberryPi, controller based voting machine, data collection and verification unit, one web server for display of result. Once this system is get implemented we need not to worry about our voting as one of the main purpose of this system is a person can vote from any place in India to his/her native region in India. This will reduce time consuming factors, various travelling issues, fake voting, and displaying of result will be easy and fast.***
Keywords: Raspberry pi B+ model, Atmega8 Microcontroller, LCD display, Matrix Keyboard, USB to TTL Converter, Router etc.

I. INTRODUCTION

Nowadays in India, at the time of voting peoples face many problems, like they need to travel to their native place, they need to spend money for travelling (as voting is a free of cost thing), due to this various health related problems they face and finally mental stress due to all this. Also in case of Government, they need to keep all the ballots safe before voting, need to provide a live electricity supply until voting is completed, need to keep security guards at polling stations, and keeping ballots safe after voting. Finally counting of votes from different machines, adding them together, keeping data secrete and displaying of result. All these things are very costly, lengthy, time consuming, health and mental affecting. To minimize or to clear all these problems we made a new system, that is "IOT BASED E-VOTING". Now how we will overcome these problems? The answer is we need to build or design a system where people need not to do travel very long distance only for voting purpose, they need not to spend money from their pocket and very important thing is all the process should be hassle free. While doing all these things very important and considerable parameter is security of the system from both ends. This system will work on internet so it will be very helpful and useful for all of us in coming future.

II. PRINCIPLE

The basic principle of this paper is "A person can vote from any part/place of the country, to his/her native place where the actual voting is going on, over the internet." A novel study has also been done about current system and all the previous system which were used by our ECI (Election commission of India). Also other system which are used in other countries like United States of America (Electoral College System), United Kingdom (Ballot Paper System), France (EVM), China (Hierarchical Electoral System), Online Voting System by Elections Online (US). Finally after going through all this we planned to design system which will work online using Unique Identification Number of Voter. All the data of this voter is already saved in the raspberry Pi based server. Only after whole authorization and authentication from the system the voter will be able to give his/her vote and he/she is not allowed to revote again.

III. ARCHITECTURE REVIEW

A. Block Diagram

The following fig 1 shows the block diagram of IOT based e-voting system.

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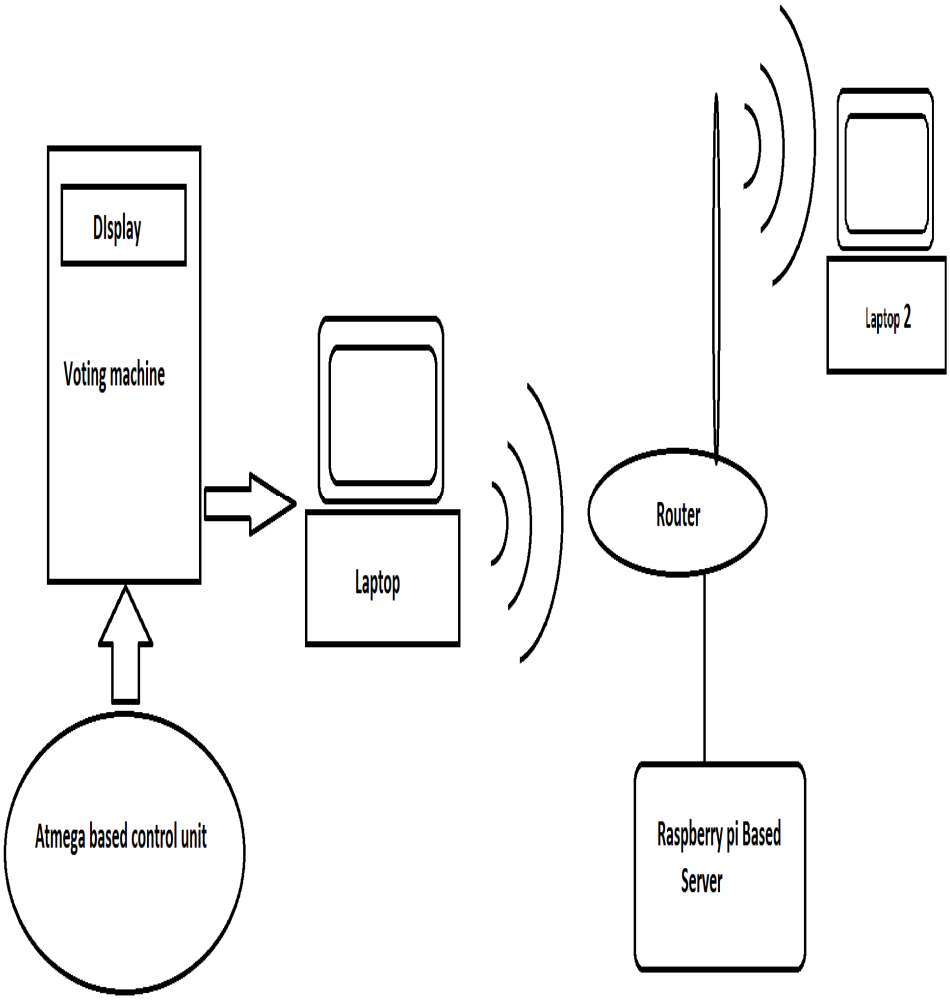


Fig 1: Block Diagram of IOT based e-voting system

A. Working

First we need to do some initial settings before starting the system. Starting from server, when we start the server it will act as centre start looking for client PC's to connect. This connection can be wired or wireless. As it will be over large area and spread across every part of the country connecting all cities. So this transmission media can be varied but the motto behind it is, it should provide fastest connection to system. Now for the client side where the actual voting will be done. One Atmega8a controller based voting machine is developed which contain push buttons for the voting purpose and also one 4x4 matrix keypad is provided on it. A voter will use this keypad to punch his/her Unique Identification Number. Voting machine is connected to laptop using USB to TTL converter. It provides connectivity between USB and serial UART. Then laptop is connected to server using transmission media. Final working steps are like this – when voter comes to vote system will show welcome message and ask for Unique Identification number then he/she need to punch his Unique Identification Number in 4x4 matrix keypad. Then voting machine will send this data to laptop and to server. After authentication of the data server give authorization to voter to do vote. Then voting machine will activate the push buttons on it for the voting purpose. When voting is done it will show message to particular candidates name on its screen to whom vote is given and thank you message. High security is provide to this system that every part of this system has different password and only high authority in election commission have access to connect server. As all the votes are counted in server so no any manipulation of data will be occurred. Displaying of results will be also becomes very easy.

B. Circuit Diagram

The following fig 2 shows the circuit diagram of IOT based e-voting system.

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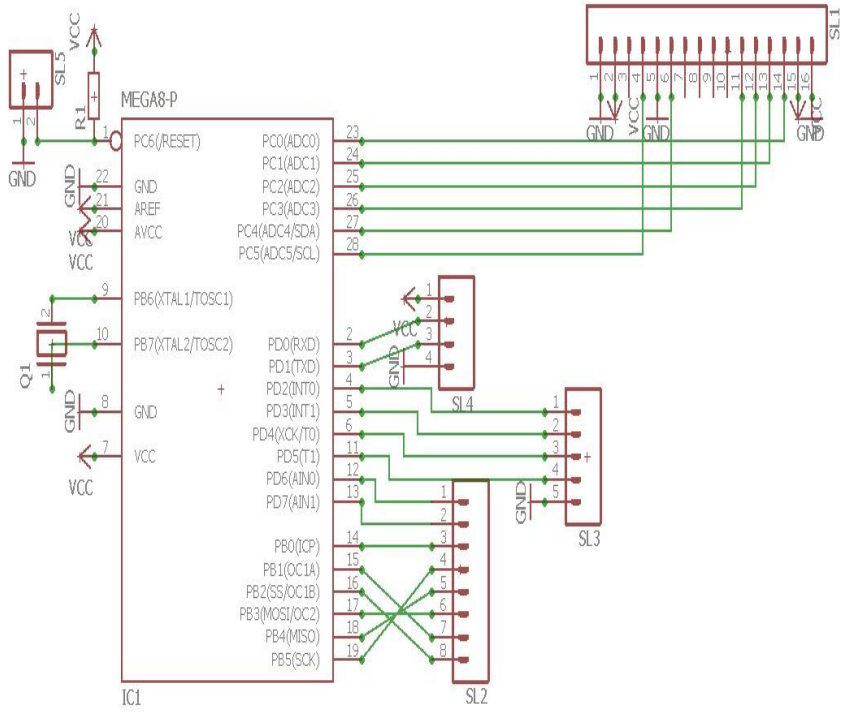


Fig 2: Circuit Diagram of e-voting system

IV. SOFTWARE IMPLEMENTATION

For proper functioning and simultaneous working of the e-voting system the algorithm of the system must be accurate and well hierarchy manner Raspberry piB+ is used as Server which will contain all data of voters and vote count and other all connected peripherals. The Atmega8a controller will acquire the data and process this data then send to server through USB to TTL which uses Tx and RX into D+ and D- form of data.

A. Hardware's Used

Raspberry pi B+, 16*2 LCD Display, Push Buttons, 4x4 Matrix Keypad, USB to TTL converter, router, laptop, Power adapter, Battery for backup, etc.

B. Software's Used

Putty, apache, python, embedded coding, Arduino etc.

C. Algorithm

Step 1: Start the methodology.
Step 2: Voter punch Unique Identification Number on Authorization unit
Step 3: Data sent to Laptop
Step 4: Data sent to Server
Step 5: Server data verification
Step 6: If No, Display No Authorized user/voter
Step 7: Go to step 2 and repeat the process
Step 8: If Yes, Display Authorized used information
Step 9: Go to voting machine
Step 10: Vote for your preferred candidate
Step 11: Press reset button for next voter
Step 12: End process.

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V. CONCLUSION AND FUTURE SCOPE

A. Conclusion

Minimizes resources waste and improves the system. The project is intended from small companies to the very large scale that is up to any country size. By using advanced verification system like biometric scanner and retina scanner. The circuit is designed to work efficiently and reliably. If we compare it with all previous systems the we can say that this will be best solution on all issues.

1. The system is used for long distance voting.
2. The system increases number of vote count.
3. It saves time, money, extra efforts to reach to polling booth.
4. System gives high data security, so illegal activities can be stopped.
5. No any manipulation in voters details or final vote count will be done.
6. Displaying of result will be easy and quick.
7. We are grabbing the future technology.

B. Future Scope

In Future work, an exhaustive research about the e-voting should be done. It aimed to analyze the new technology for reliable transmission which improves the efficiency of the voting system. It includes some new algorithm for enhancing the system and its services. We can further extend this project to such a state that Voter can do his voting even from his own mobile phone or PC or Laptop. All kind of security aspects are kept in mind and then that system will be developed. We know it is difficult as in some villages there are lot of basic problems, but we can make some hybrid system for them as well. All these efforts are only for better tomorrow.

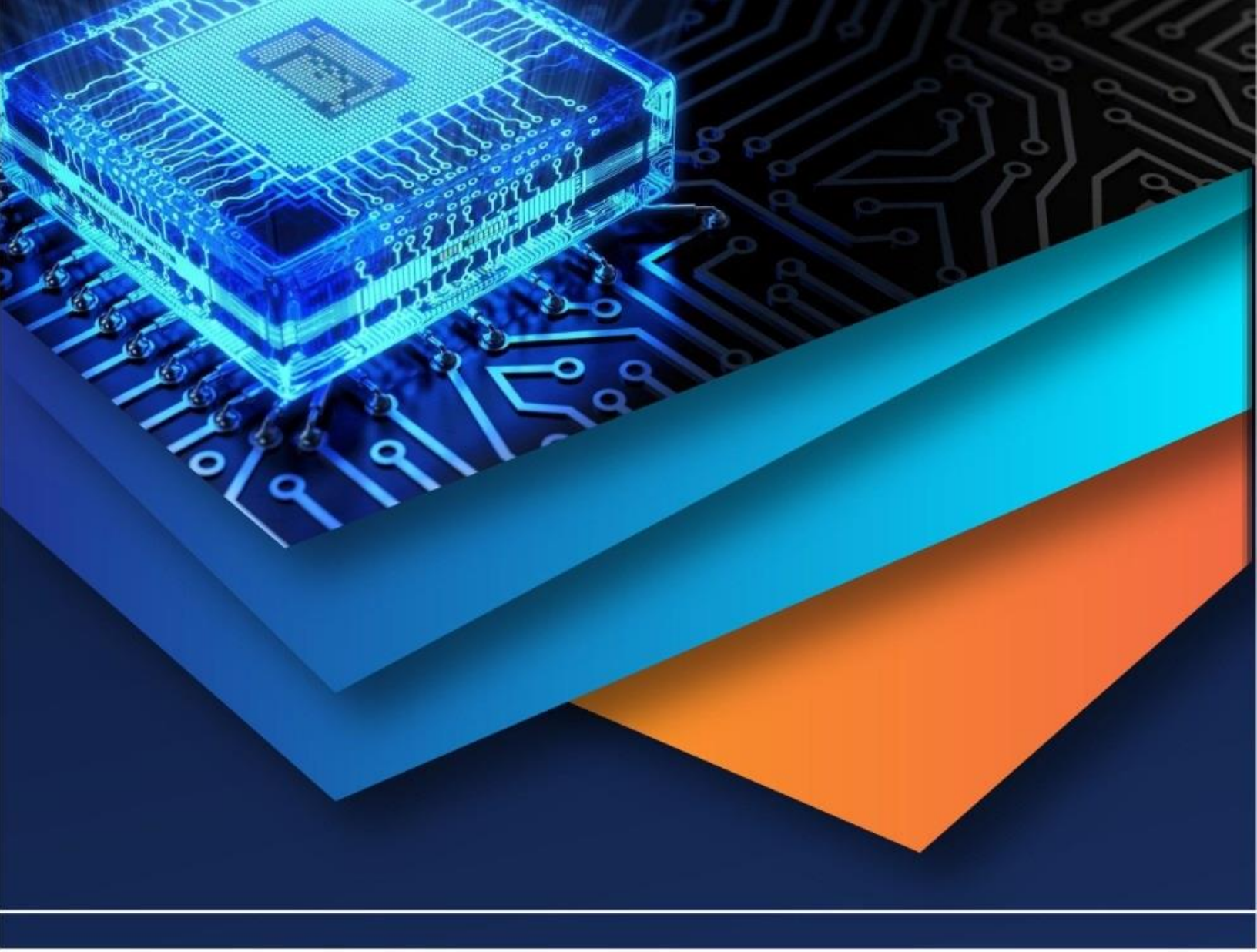
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