THE POWER OF IOT AND RFID IN ELECTRONIC VOTING MACHINES

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ABSTRACT: This article explains the design and operation of a smart electronic voting system that uses Arduino UNO and RFID to improve the electoral process by eliminating electoral fraud and to ensure the safety, security, dependability, and efficacy of the country's elections. The device communicates with the RFID tag on the voter ID card in this paper's explanation of a novel voting technique. After scanning the voter's ID, the controller evaluates it, and if a match is found, the LCD displays the result in IOT.

Keywords: Electronic voting machine, RFID, arduino.

1. INTRODUCTION

Voting is what keeps democracy running. People get to choose who will run a good government that fits their needs and desires while also raising their standard of living. The most recent elections in India have recently concluded. A variety of technologies were employed to ensure that the voting process proceeded successfully. In our project, we created a clever and advanced system that makes logging in simple and pleasant for users. This method is the focus of this essay. The advantage of this system is that voters can use the RFID tag on their voter ID card. Otherwise, the electronic voting system would not allow the voter to vote. This increases the reliability, security, and likelihood of tampering or fraud in the voting process.

Because India is a democracy, the people vote for those who wish to be in office. Direct democracy is difficult to achieve in large populations, such as China, India, and many other countries. Elections defend people's freedom and prevent them from acting in ways that are anti-democratic. Because elections are what make a democracy function, they must be conducted in a successful manner. People can choose the party they want to support by using paper ballots, which are official ballots that are all the same but have the names of different parties written on them. The paper ballot was first used in the Australian state of Victoria, where it became known as the "Australian Ballot." The main issues with this approach are that it takes too long to count the votes, it depends too heavily on individuals, and it allows people to influence the results. Electronic voting machines are employed to address these issues. Because paper ballots require more paper to complete, computer voting machines are less expensive than paper ballots. EVMs are simple to operate since they include push buttons that allow for simple voting. It is easier to announce the results when votes from several EVM-equipped polling sites are relayed to a central unit. There are other issues with this electronic voting machine as well. Some security experts have rejected EVMs because hackers can gain access to them and render the machines useless. A vote of no confidence is equally problematic because the voter has no idea what he is voting for. Other issues with this system include cross-voting and button jamming. In this study, we discuss a voting device that leverages radio frequency identification technology to help solve the concerns with the other methods. RFID uses EMF waves to track and locate objects. An RFID reader emits a coded radio signal capable of reading the tag and a specific electronic product code.

2.LITERATURE SURVEY

SurendraRao et al. (2019) described an RFFID-based smart polling system. The purpose was to reduce manual switching and poll-cheating. It is

inexpensive and simple to use. It is not necessary to have a voter ID. To ensure security and openness, as well as to prevent people from voting fraudulently, microcontroller, RFID, and global system for mobile communications (GSM) technology were employed. In 2017, Kiruthika et al. created a voting machine that will prevent anyone from tampering with manual voting techniques. Abdulkadir et al. published a paper in 2019 describing their work with the Arduino Mega and how it was linked to a PC and GSM. Sudhakar et al. (2015) used the ARM9 CPU to create their basic, low-cost EVM with fingerprint module. A computerized polling machine stores information about voters. Following the voting, everything is done online. Prasad et al. used an Arduino board and a liquid crystal monitor in 2016. They linked the authentication to a list of Indian persons over the internet. Everyone in the country is assigned a unique number. Venkateswarlu et al. (2014) created a system with a fingerprint module using GSM. Kumar et al. (2016) used zigbee to connect the authentication to an Indian persons database. A microcontroller activated the fingerprint module in a system developed by Prabha et al. in 2016. This list has been saved to a computer. People who created and explained GSM. The authors discuss fingerprint authentication. The authors discuss sensor networks in their study. GSM technology is discussed in terms of safety. The work being given makes use of a database of four voters. In truth, there are many votes. This is why information is stored in database management systems. To store the massive amount of data, an external memory is required. The EVM must be turned on until the election is completed. The volatile memory is used by the microprocessor. This implies that the temporary information will be lost. It will be possible to determine the number of votes cast, but if the power goes out, details such as who voted and who did not would be lost. Anyone wishing to vote must present their previously issued voter ID to a poll worker. The poll worker will verify the ID and compare it to a list. The individual must be able to vote. This takes longer to complete. To save time, a new method of voting is recommended. It compares the RFID tag to the database on the microcontroller to ensure that the voter is from the same voting location. During this time, the fingerprint module compares the voter's legitimacy to the recorded data. If the match on the LCD reveals that the voter is who they say they are, they can vote. If the voter's fingerprint does not match the information saved, "ACCESS DENIED" appears on the LCD. When a warning light appears, the poll worker has the authority to remove the person from the voting line. Manual adjustments are used in the voting process. The current systems only require six-volt batteries, however protection is not guaranteed. The current election system is based on people doing things by hand. A large number of poll workers will come to your house before an election to provide you with a voter ID card. Figure 1 depicts the appearance of a voter ID card and how it should be presented at the polls. The person on duty will manually check each voter's record. The individual can only vote if both sets of information are identical. He cannot if they are not. Electronic voting, sometimes known as E-voting, is a method of voting that makes it easier to cast ballots and count them. Punch cards, optical scan voting machines, and customized voting booths, such as self-contained direct-recording electronic voting systems (DRE), are examples of electronic voting technologies. Votes and ballots can also be transmitted by the Internet, private computer networks, or phone. Of course, there are two types of electronic voting: e-voting that is physically observed by officials from independent or governmental electoral authorities, such as electronic voting machines at polling places, and remote e-voting, in which the voter has complete control over the process and is not physically observed by officials from independent or governmental electoral authorities, such as voting from a computer, cell phone, or television. Electronic voting machines can speed up ballot counting and make voting easier for those with impairments. Today's electronic voting devices

are secure means to vote. It has grown in popularity since it ensures that votes are appropriately counted. They feel secure in the knowledge that their votes will be protected. It prevents all forms of fraud and illegitimate voting. As a result, the approach is also less expensive because it requires less work. It will also be simple for the voter because he will only have to press one key to select the people for whom he want to vote. A wire connects a balloting device with a button for each choice to the electronic ballot box on the voting machine. An EVM is composed of two parts: Voting and control unit A five-meter wire connects the two units. While the Control Unit remains with the Presiding Officer or a Polling Officer, the Balloting Unit enters the voting area. The person in charge of the control unit will hit the vote button instead of handing out ballots. The voter can then select the candidate and sign by clicking the blue button on the voting machine. The business permanently etched the running program onto silicon when creating the controller used in EVMs. After the controller is built, the code cannot be altered. The biggest disadvantage of this system is that voter IDs must be manually checked, which implies that the wrong individual could vote unlawfully. It is also feasible for the same person to vote multiple times.

2.PROPOSED SYSTEM

RFID-based electronic voting machines (EVMs) eliminate the issues associated with wired electronic voting. The system in this plan includes a buzzer alert, an LCD screen, an RS232 cable, an RFID reader, and an RFID tag. The deployment of a biometric-based voting technique by the government will prevent people from voting dishonestly. Every RFID voter's information will be saved in the computer. A microcontroller stores a library. While voting, a computer compares the voter's information to a database. When someone with RFID enters the polling booth for the second time, the buzzer sounds. The RFID base EVM will help you save time. The voting mechanism proposed in this study should be faster and more accurate than the current voting system. There will be little information released on the voters. To get the overall number of votes cast, the button at each polling location must be pressed.

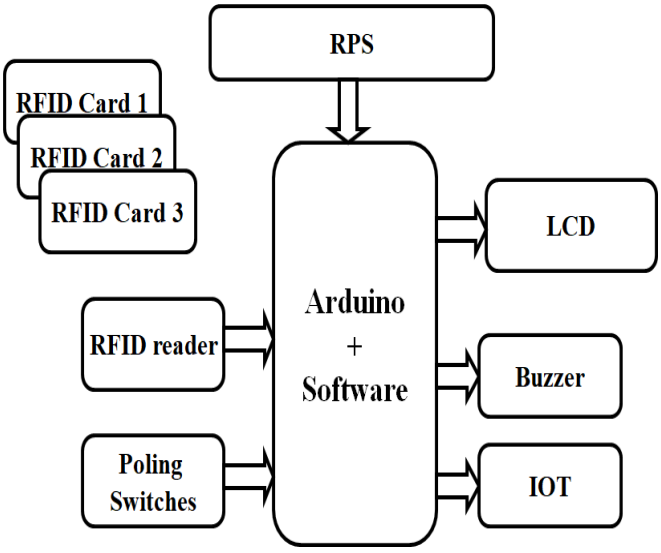

Fig. 1: The envisioned system's block diagram.

The procedure in question is implemented to improve the effectiveness and safety of the election process. We created the EVM Machine using RFID, LCD, Arduino UNO, and a buzzer to prevent election fraud. As a result, the ballot requires less physical labor. If the individual has previously pressed the button, the buzzer sounds. If not, they can vote using an electronic voting machine. This system is more secure and effective than the one currently in place. The buzzer will notify poll workers, and the person will be unable to use the machine if their voter ID does not match one in the electronic voting machine database. The data can be displayed on the LCD.

The student automation system project was created as a critical component of the proposed system so that RFID may be utilized to automatically track attendance. The basic components of the system are a 16x2 LCD, an RFID reader, an RFID tag, an Arduino uno buzzer, and momentum switches. To begin the process, the LCD panel displays five alternatives. The first four are outcomes, attendance, no records left behind, and enrollment. This means that, in our proposed architecture, before we can begin taking attendance, we must either register the children or connect the database to their Adaar

database. When students and staff join up, their information is saved in the database for the first time. He or she can then register for classes.

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Arduino IDE

What is Arduino IDE?

The Arduino Integrated Development Environment (IDE), often known as the Arduino Software, is also available. This includes a code editor, a message area, a text terminal, a toolbar with buttons for frequently performed operations, and a number of options. It connects to the Arduino hardware, allowing programs to be uploaded and communicated with.

A program for Arduino hardware can be written in any computer language that has compilers that can convert source code into binary machine code that the target processor understands. For their 8-bit AVR and 32-bit ARM Cortex-M microcontrollers, Atmel provides two programming environments. The earlier one is known as AVR Studio, whereas the current one is known as Atmel Studio.

Schematic diagram

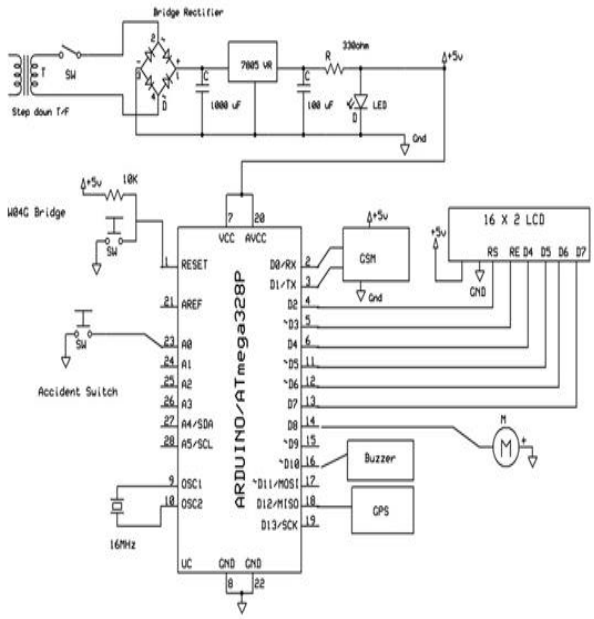
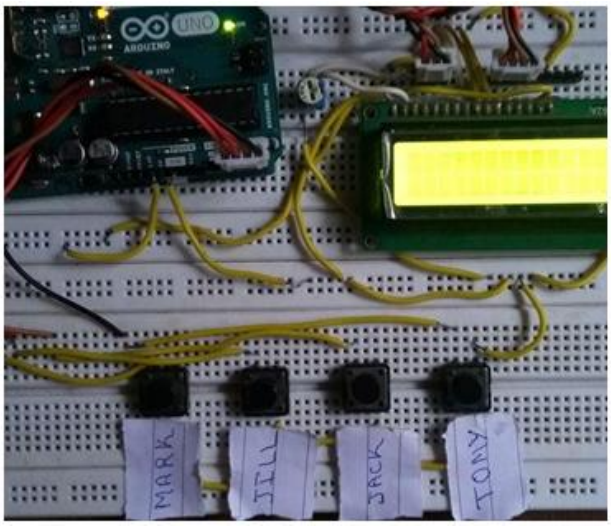
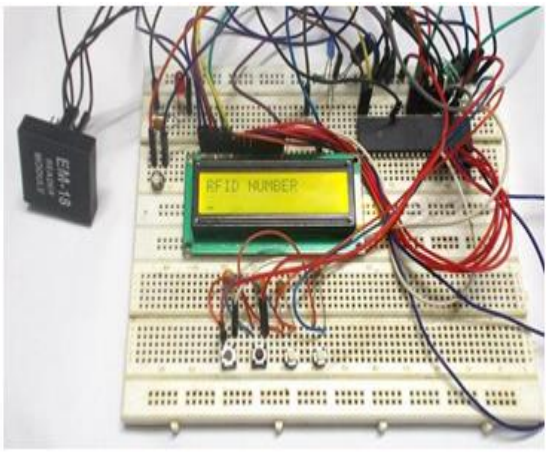


Fig. 2: A visual representation of the intended arrangement.

3.RESULTS





4. CONCLUSION

RFID-based electronic voting machines (EVMs)

with fingerprint readers eliminate the difficulties associated with wired EVMs. To identify voters, an RFID tag will be utilized. The system employed in this study was built with an LCD, RS232 cable, RFID reader, RFID tag, fingerprint module, and buzzer warning. It is not acceptable to lie about your vote. Every RFID voter's information will be saved in the computer. A microcontroller stores a library. While voting, a computer compares the voter's information to a database. When someone with RFID enters the polling booth for the second time, the buzzer sounds. The RFID base EVM will help you save time. The voting mechanism proposed in this study should be faster and more accurate than the current voting system. There will be little information released on the voters. To get the overall number of votes cast, the button at each polling location must be pressed. In the future, we can add a biometric element to ensure that the elections are entirely secure.

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