

# RFID Based Smart Electronic Voting System For Reducing Electoral Frauds Using Arduino

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## ABSTRACT:

*This paper describes the design and operation of Smart Electronic Voting Machine using Arduino UNO, RFID, to improve the election process by avoiding electoral fraud and to ensure safety, security, reliability, and smooth conduct of elections in the country. This paper talks about an innovative approach for the voting process where the device communicates with the RFID tag, which is embedded in the voter ID card. When the voter scans his card, the controller checks the ID, and if it matches, the LCD displays the result.*

**KEYWORDS:** ArduinoUNO, RFID, Electronic Voting Machine, Buzzer, LCD Display.

## INTRODUCTION :

The focus of the democracy is a ballot by which the people can elect the candidates for forming an efficient government to satisfy their needs and requests, and their standard of living can be improved. The general elections were just finished in India. Many different technologies were employed to ensure a good voting process. In our project We have developed a smart and intelligent system that can authenticate users easily and make the process hassle-free. This paper mainly focuses on this approach. The main advantage of this system is the voter is using the Radio frequency identification tag, which is embedded in the voter ID card . In any other case, the electronic voting machine would reject access to the voter. This makes the election process more reliable, safe, secure and also protects from frauds, rigging, and also from malpractices.

## EXISTING TECHNOLOGY:

Electronic voting systems were developed some years ago. The existing systems have only been approved in many developed countries. That too, not in all developed countries. The issues that are found in the existing systems are that increased costs, a single point of failure, and the message does not confirm that the vote is registered for the voter's favorite candidate to whom he/she had cast the votes. There is a possibility that the voter's vote is registered to some other candidate rather than the one for who he had cast his vote.

## PROPOSED TECHNOLOGY:

The related system is implemented to make the election process more effective and secure. To avoid electoral fraud, we implemented the EVM Machine by using RFID, LCD display, Arduino UNO, Buzzer. It reduces the manual work on the ballot. If the voter has cast a vote already then, the buzzer alarm is activated. If not, then the voter can cast his/her vote in EVM. This system is much better protected and works with higher efficiency than the system that is already present. If the Voter ID is not matched with the IDs that are stored in the electronic voting machine database, then the buzzer will alert the electoral officers, and the person will not be permitted to access the machine. The information can be displayed on the LCD.

## HARDWARE PROTOCOL:

- Arduino UNO
- RFID tags
- EM-18 Module
- LCD Display
- Buzzer
- Transformer

## SOFTWARE PROTOCOL:

- Embedded C

## ARDUINO UNO:

- Arduino UNO is otherwise called microcontroller-based ATmega328P
- Arduino has 14 digital input and output pins, 6 analog inputs, a 16 MHz ceramic resonator, a USB connection. It has a power jack and a reset button.



- Arduino has everything needed to support the microcontroller.



- Operating frequency:125KHz.
- Reading distance of em-module: 10cm, depending on TAG Integrated Antenna.



### RFID TAGS:

- RFID stands for “Radio Frequency Identification,” and RFID tags utilize Radiofrequency technology.
- An RFID tag works by transmitting and receiving information via an antenna and microchip.
- RFID tags have three main frequencies to transmit information:  
125 – 134 KHz known as Low Frequency,13.56 MHz, known as High Frequency, and 865 – 960 MHz, known as Ultra High Frequency.



### LCD Display:

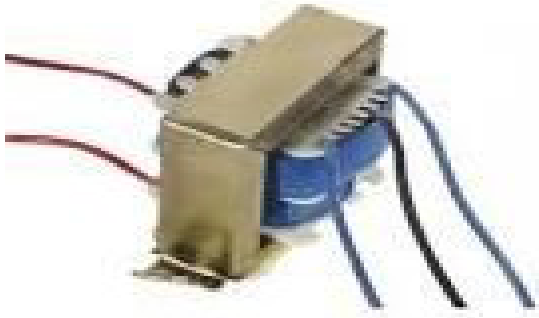
- A flat panel display is an LCD display or optical device that uses the light- modulating properties of liquid crystals combined with polarizers.
- Lcd display is used in a wide range of applications. It also including LCD televisions, computer monitors, instrument panels, aircraft cockpit displays, and indoor and outdoor signage.



### EM-Module:

- EM-18 Reader is a module. It reads the ID information stored in RFID tags. This ID information is unique for every tag.
- Operating voltage of EM-18: +4.5V to +5.5V.
- Current consumption:50mA and can operate on LOW power.

- Transformer is used to transfers electrical energy from one electrical Circuit to another circuit or multiple circuits.
- It is most commonly used for increasing low AC voltages at high current is called Step up transformer and decreasing high AC voltages at low current is called Step down transformer in electric power applications, and for merging the stages of signal-processing circuits.



**BUZZER:**

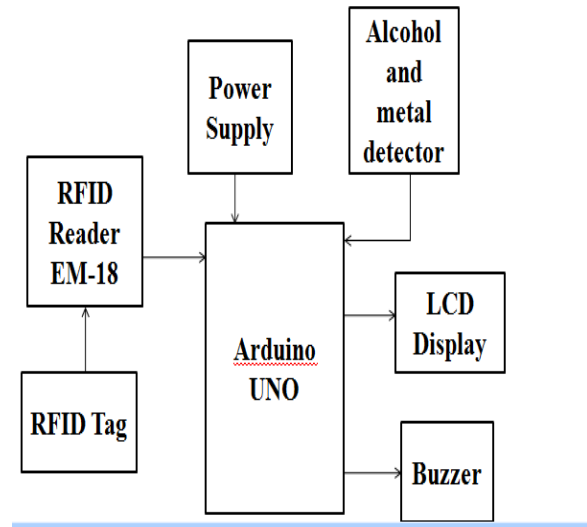
- Buzzer is also known as Beeper. It is an Signalling device, which may be a mechanical, electromechanical, or piezoelectric.
- uses of buzzer such as timer, and confirmation of user input such as a mouse click or keystroke.
- In our project buzzer is used to indicate a wrong voter through a beep sound.



**EMBEDDED C:**

- Embedded C is the programming language in the software field for developing electronic gadgets.
- Embedded C is performing a specific function by the processor.
- We use many electronic devices such as washing machines, digital cameras, mobile phones, etc. These all device is based on a microcontroller that is programmed by embedded C.

**BLOCK DIAGRAM**



**WORKING PRINCIPLE:**

RFID tag acts as a Voter ID card. The RFID tag information comprising of each individual's names, dates of birth, gender, mail id, address, state, district, and passport size photos are stored in the admin database. From the RFID tag data, voter id is generated for people above 18years of age as it is the eligibility criterion for voting. When the voter enters the voting booth, he shows his voter ID card in front of the EM-18 Module. The EM-18 Module reads the data stored inside of the tag. The EM-18 Module sends the data to the microcontroller. The Microcontroller checks the information. When the received data from the EM-18 Module matches the data stored inside of the microcontroller, then the LCD display shows "Your Vote is Valid"; otherwise, it shows "Your Vote is Invalid."

**MERITS**

- It reduces manual work and time consumption during the election process.
- It avoids some flaws such as Frauds, Riggings, and also Malpractices.

**CONCLUSION**

India has less voting percentage will struggle to develop as choosing the right leader for the nation is essential. Unfortunately, our nation lacks 100% voting. This process is mainly due to the failure of the security level in

the existing voting system. Our application tends to make our nation into a developed country by increasing the percentage of the vote by developing a secure voting system. We make our country smart, and We make our nation become a super-power.

#### FUTURE SCOPE:

RFID has problems in terms of performance, cost, hardware, interferences, etc. The problem is related to the cost, even though in recent years the cost was very less. There are some burdensome standards that have been more difficult problems for RFID.

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