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Modern Method of Online Voting

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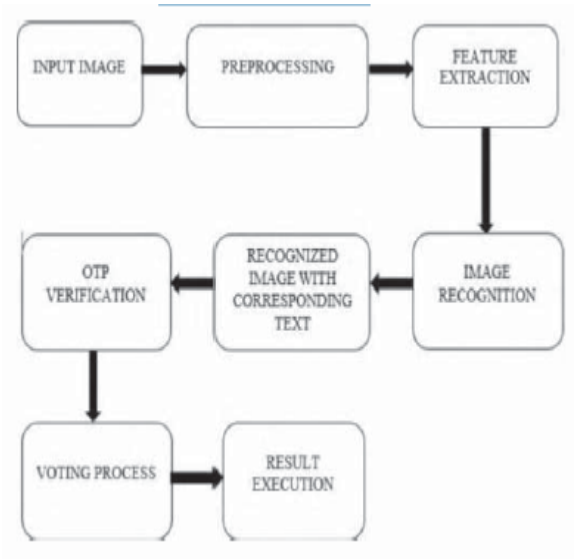
Abstract—
If you're looking for a democracy, go no farther than our nation, India. Therefore, it is critical to guarantee a fair election for the elected officials. The sole voting method in India is an antiquated offline system that takes too long to process and broadcast results and requires a huge number of human workers. So, a modification is necessary to the system that gets rid of these drawbacks for it to work. Simplified voting is a result of the new system, which does not need a person's physical appearance. Through a two-factor authentication system that combines facial recognition and one-time passwords, this article focuses on a system that allows users to vote remotely from any location using their computer or mobile phone. Voters are not required to physically visit the polling site. Users have the option to cast their votes offline if they prefer that method. Voters' faces may be recorded using the face scanning technology before the election and then retrieved during the voting process. Using radio frequency identification tags (RFID) instead of voter IDs improves the offline voting method. To further prevent circumstances that may lead to vote fraud, this system also allows users, who are citizens, to see the results whenever they choose. Search Terms: RFID, Face scanning, Polling station, Smart online voting system, Results whenever.

I. INTRODUCTION

Every democratic society must eventually have elections, and it is the shared duty of the government and the people to ensure that these processes go smoothly and without incident. The voter must record his or her face using this technique before to the election, and the results will be used for comparison throughout the voting process. After reading the information, the microcontroller sends the data captured via offline to the web in offline mode. Software execution using serial port. The Individual Database is managed by the web application's software. When a voter submits his ballot, the website notifies him via a "voted successfully" notification that his vote has been recorded. While they are casting their ballots, expressing their opinions, or making their voices heard. Assuring the creation of a voting system using facial recognition technology and an OTP system to enable voting from any location on Earth with an internet connection is the primary objective of this project. The database on the server keeps track of the votes. To keep up with the ever-evolving globe and achieve global standards, it is crucial to adapt to the digital age. This cutting-edge innovation is electronic voting systems, which allow for both online and offline voting with a centralized database to facilitate data transfers and the computation of results. Thus, in order for an impartial election to be held, it is necessary to develop and implement an electronic voting system.

II. ARCHITECTURE



II. LITERATURE SURVEY

Author "AMNA QURESHI" lays out the steps to take in order to create a secure and private online voting system that doesn't rely on paper ballots, uses fingerprint scanners as an additional layer of authentication, lets voters use whatever device they have on hand, and generates poll tags [1]. Author "Ishani Mondal" of the article "Secure and Hassle Free EVM through deep learning face recognition" used neural networks to retrieve a voter's reference for casting a ballot following facial feature

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extraction. The user may cast a vote if the information match the ones already on file [2]. Anooshmita Das, author of the article "VOT-EL: Three Tier Secured State-of-The-Art EVM Design Using Pragmatic Fingerprint Detection Annexed With NFC Enabled Voter -ID Card," suggests a solution that incorporates both biometrics and NFC technology. [3]. The authors of the paper "Secure and Electronic polling system" (Amna Qureshi, David MegÍas, and Helena Rifa-Pous) detailed Se-VEP, an online voting system that safeguards the privacy of voters, their unique information, the integrity of the polls, the prevention of duplicate voting, election fairness, resistance to coercion, and the prevention of virus-infected devices that alter voters' decisions and produce inaccurate results, among other issues [4].

V. EXISTING WORK

Electronic Voting Machines (EVMs) and Secret Ballet Voting are the current voting methods, however they are labor-intensive and need human intervention. Anyone who is at least eighteen years old may cast a ballot. Before a voter may cast a ballot, their information, including their ID, must be manually verified. It is necessary to verify and transfer the EVMs to various locations throughout the nation where the election is being held. Both physical power and security are necessary for it. Like ballet voting, the counting of votes cast in EVMs requires a lot of human labor and takes a whole day. Thus, the counting and voting might be skewed in a multitude of ways. Therefore, there is room for improvement, accessibility, and efficiency in the present system.

IV. METHODOLOGIES

The Atmega328p is the foundation of the ARDUINO UNO microprocessor. It is a platform for computing that is open source. Both 3.3 and 5 volts are sufficient for its operation. Two external interrupts are available, along with three SPI pins for SPI communication, two TTL serial data receiver and transmitter lines, five pulse width modulation (PWM) pins for 8-bit PWM output, and two TWI communication lines. It also includes 32 KB of flash memory, with the bootloader using half of it. It runs at 16 MHz and contains 2 KB of SRAM and 1 KB of EEPROM. The Arduino serves as the project's primary microcontroller, receiving data from the RFID module and comparing it with the user's face utilizing mat lab data. The user is able to cast their vote if the data is a match. The 16*2 LCD is an alphanumeric display module that can show a total of 32 characters, including numerals and alphabets, in a configuration of 16 columns and two rows. When turned off, the backlight uses just 1mA of electricity. To construct each character box, a 5 by 8 pixel box is used. A voltage range of 4.7 v to 5.3 v is its working voltage. It is compatible with 8-bit and 4-bit modes. The backlight may be either green or blue. It has eight data pins, as well as four for power, data, contrast, register select, read/write, enable, and the positive and negative pins for the LEDs. In the screen industry, LCDs are a typical substitute for cathode ray tubes. You can show more custom characters, it's easy to program, and it's cheaper. Due to its tiny profile, low power consumption, and direct current power source, this gadget often has a shorter lifespan than others. You may choose between the meter's automated and manual modes with this LCD display. After the RFID has read the data, the user's data will be shown on the LCD. Radio frequency identification, or RFID for short, is a method of tracking objects using radio waves. Barcodes may be used to identify a wide variety of data. The power source for some RFID tags is the electromagnetic energy sent by the RFID reader, whereas other tags rely on batteries. Both active and passive RFID tags use radio frequency identification technology. In contrast to active RFID tags, which utilize either 433 or 915 MHz to transmit data, passive tags use one of three frequencies: 125–134 kHz, 13.56 MHz, or 865–960 MHz. There is continuous signal transmission from the RFID tags. A radio frequency identification tag's internal components include an integrated circuit, antennas, and a substrate or protective material layer. In terms of supply chain management, they are unparalleled. There is a unique identifier (ID) for every RFID tag, and some tags even claim to have sequential IDs; these tags are used to track certain goods. It is possible to encode RFID tags with any data that we choose. An example of a physical button is the "push button," which, when physically pushed, causes an output or changes the circuit. Its flat, press-friendly surface and sturdy construction make it ideal for this task. Momentary switches are another name for these types of switches. The size of the buttons changes depending on their function. In the event of a fire, a red push button of a modest size is often used. In certain commercial settings, pressing one button causes the other to spring into action. Color coding these buttons helps users prevent accidentally pressing the wrong one. The smart online voting system project makes use of four push buttons, each of which performs an own purpose. The first is to choose a political party; the second is to unselect that party; the third is to go through all of the parties; and the last is to confirm your choice and vote for it.

V. WORKING

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The user has the option to cast their vote either online or offline using our suggested online voting system. An RFID tag, supplied by the government, is required for those who want to cast their votes offline. An RFID card reader reads it and compares the information to those in the database.

Fig(2) Image Training Setup

Traditional use cases involving fingerprints and voter ID are also applicable to users who cast their ballots offline. Voters who choose to cast their ballots online are required to utilize the given facial recognition software. Each user's distinct facial features and associated data are recorded in the provided database after several captures. At the moment of voting, accuracy is ensured by capturing several occurrences. The voter is prepared to cast their ballot once they have entered their personal information and verified their identity in the system. Only at the designated election time is the whole voting procedure accessible on the internet. A user with a camera and a reliable internet connection may utilize facial recognition with ease. Completes a two-factor authentication process at election time. The first one uses face recognition. When a user logs in using their camera, the system checks the person's face against a database of recorded photos. The next round of authentication is initiated when the user has already registered to vote and is a legitimate voter. The next stage of authentication involves sending a one-time password (OTP) to the user's registered cell phone. The next step in the voting process is for the user to input their OTP into the system. After verifying that their credentials are correct and the OTP is matching, the user may cast their vote. A user's vote may be cast by selecting a political party. The voting has been successfully conducted. With this method, everyone in the family may cast a vote from the convenience of their own computer or mobile phone, and the procedure can be repeated an unlimited number of times. Voting results will be available on the specified website after the procedure is finished or even before the user has voted. Because the hardware arrangement transmits data to the database using a wifi module and is updated often to minimize errors, the result publishing website is a central database that gathers data both from the online voting website and from offline voters. The time it takes to publish the results and tally the votes is drastically reduced since the computer handles it in a couple of seconds. So, the approach not only saves time, money, and labor, but it also significantly reduces the mayhem that goes on during election season.

VI. CONCLUSION

The goal of the suggested approach is to build a foolproof online voting system that uses facial recognition technology to address all the problems with the existing voting system. Many positive qualities, such as accuracy, verifiability, ease, etc., characterize the suggested method. Any voter, from any location, with an internet connection and a face scanner, may cast their ballot using this system—no poll worker, paper ballot, or electronic voting equipment needed.

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