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NFC BASED VOTING SYSTEM

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Abstract: *- Election is the most important technique used to gauge public opinion when choosing a government or on any topic that is being debated. Electronic voting devices are thereby replacing the traditional paper-based voting systems. The manual counting of voter identities used in the conventional voting process is timeconsuming, difficult, and more susceptible to fraud. In this new model, research into cutting-edge technologies including NFC voter identification, fingerprint recognition, and the Internet of thing (IOT). This goal is to provide the most effective way to reduce election corruption and cross-voting. It boosts the number of voters and motivates people to cast ballots. As part of this effort, each voter will get one NFC tag for voter identification. If the personal information on the NFC tag does not match, the fingerprint sensor is not activated. In order to ensure a strong level of security for polling vote, voting statistics are uploaded to the cloud at the moment each new vote is cast if they match. If they do, the voter will then permit access to the fingerprint in order to confirm their candidacy before casting their ballot. No one can be reached, and there is no way to manipulate the findings in any way. With the help of the Internet of Things, information is immediately updated to the cloud as the vote count increases (IOT). Data from IOT devices are uploaded to a web site on the portal. Only the vote information and results are accessible to the Election Commission (EC). No one is informed of the outcomes, the vote percentage, etc., unless the electoral commission makes an announcement.*

Keywords - *EC, EVM, IOT, NFC, Reader, Voting.*

I. INTRODUCTION

With 814 million eligible voters, the general elections in India expand the notion that everyone should organise free elections and suppress evil tendencies. Due to the widespread corruption involved, the People have expressed scepticism about this exercise, and the general consensus is that the Democratic system has proven to be advantageous only for a handbreadth of wealthy people. Education and diligence are essential for successful elections. The general populace resumes its previous state of indolence after the elections. SY Quraishi, the former top Election Commissioner of India, stated on November 9, 2015 that booth capturing and other election violations are history. By applying vulnerability mappings, the Election Commission takes action to ensure smooth elections. A number of paramilitary. Throughout the elections in India, military are deployed, and security cameras have been put in polling places. Despite all of these efforts, news stories often feature events that are as dissimilar as chalk and cheese. During the 2014 general elections in India, there were claims of booth capture, proxy voting, names missing from the voter list, and a larger than projected voter turnout. When misbehaving poll employees in Assam were found engaged in booth grabs and exercise rigging, they were detained. In Nagaland, more than 40 polling places saw more than 40% of the votes cast. In Haryana, Orissa, and Maharashtra, there were reportedly almost 6 million names missing from the voter list. Bihar has recently been linked to the use of labour in elections. Today, though, a lot of money is utilised to sway votes in criminal frauds. SY Quraishi discussed the use of money in his book "Undocumented Wonder- the Creation of Great Indian Elections," emphasising how politicians hide the use of black money in order to increase voter turnout. On January 28, 2015, the rebels took control of the ballot boxes from roughly 30 voting booths, ensuring that 50% of the Chhattisgarh Panchayat candidates were elected without opposition. Stopping this menace and the evil of corruption are both important in order to maintain a reliable atmosphere for voting. The technology in use also has to be enhanced in order to take into account the needs of every citizen. A democratic society must be built from the ground up, and voting is a crucial part of that process. Today, though, a lot of money is utilised to sway votes in criminal frauds. SY Quraishi discussed the use of money in his book "Undocumented Wonder- the Creation of Great Indian Elections," emphasising how politicians hide the use of black money in order to

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II. EXISTING SYSTEM

The most frequently used components by researchers in the previous year were NFC, RFID modules, GSM modems, keyboard interfaces, microcontrollers, and microprocessors. This study describes a novel voting process in which the voting machine and the RFID tag on the voter identity card exchange information. After the voter scans his card, a controller examines his identification. If the two match, the controller generates an OTP and sends it to the voter's mobile device through a GSM modem. Microcontrollers are utilised in place of microprocessors since they are less expensive. In addition to having built-in Wi-Fi, the microcontroller used in this system is inexpensive and ideal for IOT applications. This system's microcontroller has the ability to sleep and operate in a low power mode. It can be used excessively and continuously without suffering any negative effects. Multiple microcontrollers are needed since one microcontroller is unable to control many NFC Readers. Utilizing a multiplexer rather than a multitude of microcontrollers is one approach to handle this. Since users can swipe on any NFC Reader they desire, the Multiplexer, which can only read data through one Reader Device at a time, cannot be used in this situation. Voter identification, real-time vote counting, and the outlawing of tampering and fraudulent voting have issues, but they can't satisfy all voter concerns, and no one is trying to fix them. By using NFC-based voter identification, fingerprint-based vote submission, and other advanced technologies, we can improve our system while also boosting security. It cloud-based real-time vote calculation, the detection of tampered or false votes, and the blocking of such activities.

III. PROBLEM IDENTIFICATION

A voting apparatus that collects, secures, and often organises voting statistics as automated data is known as an electronic vote casting mechanism. The directing officer gathers the EVMs and tallying stations as post procedure and delivers them to the centre. Education levels and the presence of actual residents are key factors in race success. Elections must be handled fairly and lawfully, which costs a lot of money. Uncertainty over the connection between survey findings and the actual judgement (decision) made by a general public. Voting machines are neither private or secure, and traditional elections require a lot of labour and resources.

IV. MAIN COMPONENT USED

1. **NodeMCU ESP12-E Microcontroller**:

Microcontroller IOT platform NodeMCU is free source. Tackle grounded upon this ESP- 12 module and firmware that runs on Espressif Systems ' ESP8266 Wi- Fi SoC are also included. Rather of the development accoutrements , the name " NodeMCU " as dereliction refers to a firmware. Lua Is a scripting language used by the firmware. Multitudinous opensource enterprise are utilised, including SPIFFS and lua-cjson.

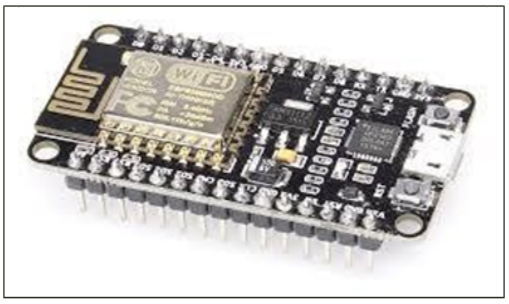

Fig.1. NodeMCU ESP12-E Microcontroller

2. **RC-522 RFID/NFC Scanner**:

A MF RC522 is a completely integrated transmission module that operates at13.56 MHz for contactless communication. ISO 14443A/ MIFARE mode is supported by the RC522. The exceptional modulation & demodulation algorithm of the RC522 NFC/ RFID anthology facilitates simple RF communication on13.56 MHz. The13.56 MHz RF transition will be added to your design more fluently with the aid of the S50 NFC/ RFID Cards. To connect with microcontrollers, the module use SPI. Multitudinous open tackle systems using Arduino and the RC522 – NFC/ RFID Communication – formerly live.

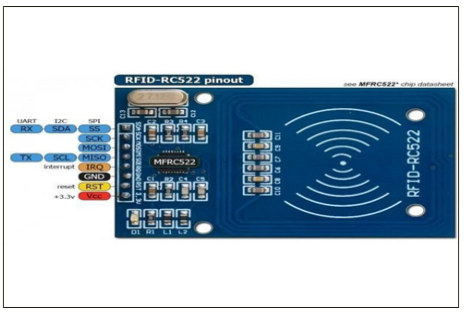

Fig.2. RC-522 RFID/NFC Scanner

3. Fingerprint Sensor:

With stable performance, a straightforward structure, fingerprint access, image recognition, fingerprint matching, search, template storage, and other features, the fingerprint module is made up of an optical fingerprint sensor, a high-speed DSP processor, a highperformance fingerprint synchronisation algorithm, high-capacity FLASH chips, and other hardware and software components.

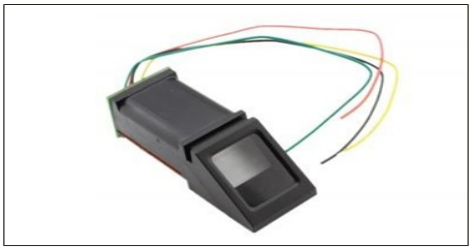

Fig.3. Fingerprint Sensor

V. METHODOLOGY

1.1 Block diagram

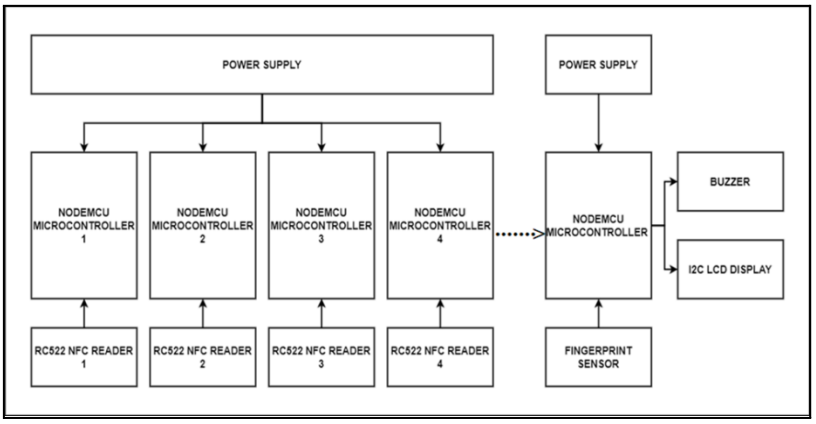

Fig.4. Block Diagram of NFC Base Voting System

1.2 Working Principle

A primary NodeMCU-based system, four NFC readers, and four NodeMCU microcontrollers make up the system. A different party is meant for each 4NFC reader. To each user will be provided an NFC voting card. When a user enters an election office and cast his vote, he just scan his NFC card just on party he wishes to support. The system will check to see whether the card is authentic and will also see if the user has previously voted. If the user has a valid card and hasn't previously voted, their information is wirelessly transmitted to the fifth or main NodeMCU. On the I2C LCD connected to this NodeMCU, details like the voter's user name and or the party they cast their vote for will be shown. The vote will be immediately revoked if the user desires to do so after waiting 10 seconds. If the user wants to advance with the vote, they must go through fingerprint authentication. If a user fingerprint authentication is successful, the vote is cast and the data is sent to the cloud server. Votes are promptly tallied and shown on the cloud server's Thing Speak Dashboard.

1.3 Circuit Diagram

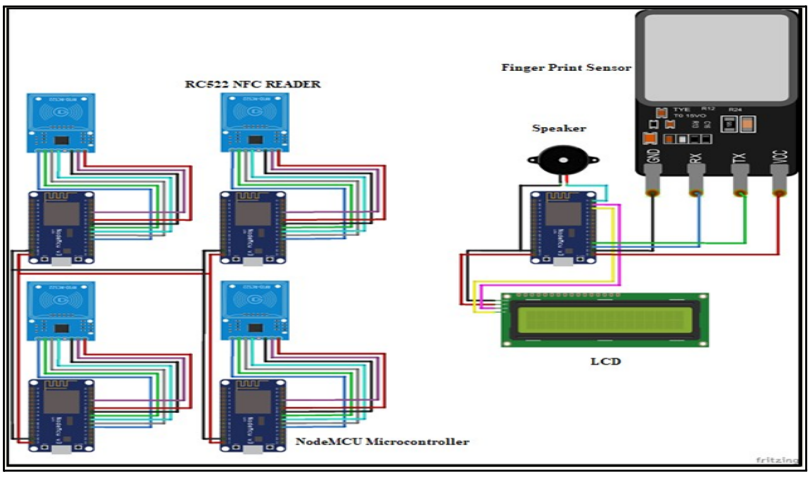

Fig.5. Circuit Diagram of NFC Base Voting System

VI. CONCLUSION

The project is found to be very helpful in overcoming the difficulties faced during voting times. Also, it efficiently uses both the Finger Print Recognition and NFC Tag as voter ID. This serves to be an efficient method to reduce manpower requirements and other illegal activities. Also, it eliminates manual errors incurred during voting and displays the polling results at the end. The process can be extended to help the government during elections and reduce fraudulence to a great extent. This project aims at providing a more secure and transparent method of voting. This system prevents the loss of votes due to mechanical faults this is a contactless process. It is a secure authenticated voting system based on NFC and Finger Print Recognition Technology. To ensure the security of the voter and preserve the sanctity of the method, a two-layer security scheme is introduced. We assume this method is useful in conducting fair and open elections.

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