HIGH SECURED VOTING MACHINE OUTLINE BY NFC BASED VOTER ID, BIOMETRIC CONFIRMATION AND PROTECTION BY IOT

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Abstract:

The traditional electoral process is tallying identity of voter manually, which is time consuming, complicated and more chance to fraud. In this new design, study of the emerging technologies NFC voter Id, in conjunction with fingerprint identification along with Internet of Things (IoT).

The aim of this paper is to provide the best solution to diminish corruption and cross voting in electoral process. It increases the voting percentage, encouraged them to participate in election. In this paper we are giving one NFC tag to each voter like Voter ID. NFC Reader verifies the NFC tag validity and personal details, if not matched, fingerprint sensor not enabled. If it matched then, the voter will allow accessing the Finger print to verify its candidature before cast their vote, to create strong security to polled votes, voting statistics are upload to cloud at every instant of new vote cast. Nobody can reach and no sort of manipulation of results at any cost. Whenever the vote count increment gets, automatically details update to cloud by using Internet of Things (IOT). Through IoT results upload to the cloud in to web portal (https://thingspeak.com/). Election Commission (EC) only accesses the voting details and results. Unless election commission announces no one get any information of results, voting percentage etc.

Key-words: NFC tag, NFC Reader, Fingerprint, IoT, Election Commission (EC)

I. INTRODUCTION

Elections are the fundamental function in every democratic country, which is being governed by the people expressing their choices and opinions in the form of voting. Electronic Voting Machine (EVM) is a gadget that is utilized to check and recorded votes. Now a day's people are astonished by watching results in Elections. People are opposed to doing it physically utilizing human asset to record and tally votes. The various issues related with direct counting of votes that it burdensome, erroneous and repetitive. As voting is a sensitive trouble, mismanagement can result in issues as huge and complex as political unrest. To overcome this problem we're going to propose this model.

II. PRESENT SYSTEM

As the post survey method, the directing officer gathers the EVMs, tallying stations and submits to the middle, different cross-checking components are implied in case of frauds, an electronic vote casting machine is a voting contraption wherein the election statistics is recorded, secured and arranged normally as automated bits of data. The achievement of races to a great extent relies upon edified masses, genuine residents. It needs an eye and lot of money is being required elections are fair and lawfully. Vagueness between the surveying comes about and the genuine decision (judgment) given by the general population. Lot of Man power and huge number of forces are required to conduct traditional elections; there is no security and privacy for ballot boxes.

E-Voting is suggested as "digital vote casting" and depicted as any balloting machine in which a digital approach is used for votes tossing and results checking. E-voting is a race framework that allows a voter to report their tallies in an electrically anchored system. A scope of electronic voting structures are used in colossal applications like optical scanners which analyze physically stamped votes to totally electronic touch show screen vote throwing structures. Particular balloting structures like DRE (Direct Recording electronic) balloting frameworks, nationwide IDs, the Internet, PC systems, and cell frameworks are involved in this function.

III. PROPOSED SYSTEM

This new Electronic Voting Machine (EVM) plan is a modest arrangement in light of down to earth biometric validation alongside incorporation of Close Field Correspondence (NFC) with IoT innovation. NFC label store the voter's points of interest like name, age, gender orientation and area which are utilized to verify, before they make their choice, it creates the voter certainty. To maintain the transparency, in the third tier of security level –after casts his/her vote, at every instant of new vote count increases, upload to web portal automatically. After announcement of results by EC every one can check it online by visiting specified portal

In this approach, the points of interest of the voter get from Aadhar (UID) card database. It became a these days created database which is having all the facts about the overall populace. By utilizing this database we took the

voter's records could be positioned away in the PC. Unique finger impression verification alludes to the programmed approach of confirming a fit as a fiddle between human fingerprints. Unique mark considers the example found on a fingertip. There is style of strategies to unique finger impression confirmation. A more style of unique mark gadgets are to be had than some other biometric. Special stamp check may be a not too bad need for in e-voting structures, where the system works in a controlled circumstance. It is not wonderful that the paintings-station get to application region is by using all money owed assemble only in light of fingerprints, because of the normally ease, little size, and instance of incorporation of precise finger influence validation devices trap the finger vein photograph and evaluation or suit with database, trap finger vein coordinated means this individual could be widespread for surveying section and if circumstance is fulfilled consequently, E-Voting device catches may be legitimate for surveying phase and if state of his/her vote casting process, a "Voting system finished" message may be shown at the display. The amount of votes is checked via E-Voting gadget and the facts may be sent to the close by election director.

Block diagram:

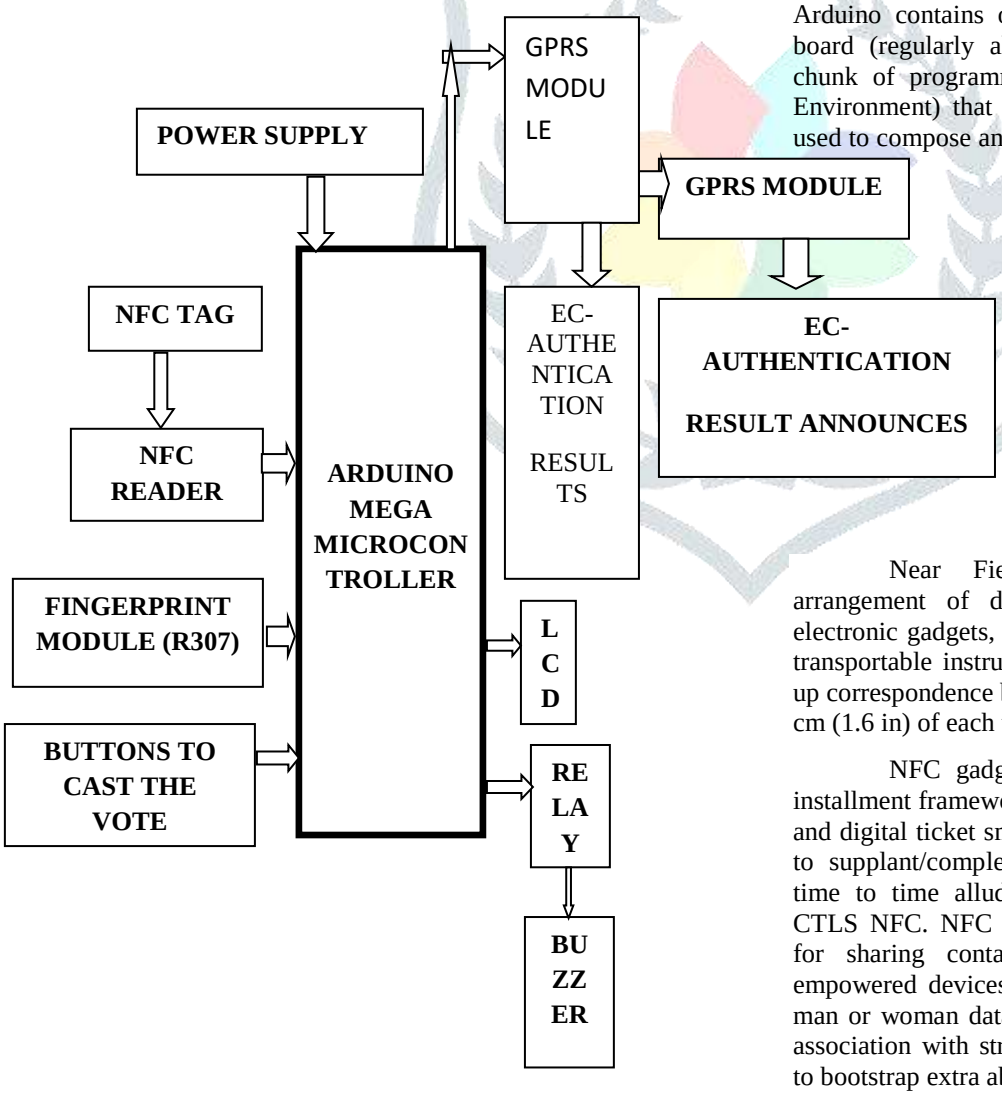


Fig: Architecture of the proposed system

IV. HARDWARE DESCRIPTION

a. Arduino Mega Microcontroller

The Arduino Microcontroller is a open source platform which has With 54 digital I/O pins, in which 15 pins for Digital (PWM) output pins 16 analog inputs 4 UART serial ports Controller includes 16Mhz Crystal oscillator one power jack and one USB jack for code dumping. Basically connect it to a PC with a USB connection or power with an AC to DC connector to interface with it.

Fig: Arduino mega pin diagram

Arduino contains of each a bodily programmable circuit board (regularly alluded to as a microcontroller) and a chunk of programming or IDE (Integrated Development Environment) that continues going for walks to your PC, used to compose and transfer PC code to the physical board.

b. NFC Reader

Near Field Communication (NFC) is an arrangement of dispatch conventions that permit two electronic gadgets, one among which is for the most part a transportable instrument which incorporate a phone, to set up correspondence by methods for bringing them inside four cm (1.6 in) of each unique.

NFC gadgets are applied as part of contactless installment frameworks, like those utilized as a part of Visas and digital ticket smartcards and permit flexible installment to supplant/complement these frameworks. This is from time to time alluded to as NFC/CTLS (Contactless) or CTLS NFC. NFC is utilized for interpersonal interaction, for sharing contacts, pix, recordings or files. NFC-empowered devices can move approximately as electronic man or woman data and keycards. NFC gives a low-speed association with straightforward setup that may be applied to bootstrap extra able remote associations.

NFC is an arrangement of brief-go faraway advances, usually requiring a partition of 10 cm or much less. NFC works at 13.56 MHz on ISO/IEC 18000-three air interface and at charges walking around 106 Kbit/s to 424 Kbit/s. NFC dependably includes an initiator and an objective; the initiator efficaciously produces a RF subject which can control a uninvolved goal. This empowers NFC focuses to take rather simple body factors, as an instance, unpowered labels, stickers, scratch coxcombs, or cards. NFC shared correspondence is conceivable, given the 2 gadgets are fueled.

c. Fingerprint Module (R307)

Coordinated R307 is a unique mark confirmation module; It comprises of optical unique finger impression sensor, superior DSP processor and Flash. Its capacities, for example, unique mark Enrolment, unique mark cancellation, finger impression confirmation, finger impression transfer. It works on Image-based Fingerprint Matching Algorithm. Now a day's Biometric identification can be achieved in a span of time with accuracy. It is best tolerance to poor finger quality and also operated with only 3.3V supply.

TECHNICAL PARAMETERS

Specification	R307 function
Capacity (templates)	1000
Operating voltage	3.3V
Finger detect output	YES
Fingerprint matching	1:1
Fingerprint searching	1:N

Steps involved in Fingerprint Module

Fig. a) Fingerprint Enroll and search

Fig. b) Finger Matched "valid voter"

Fig. c) "Time out or Invalid voter"

d. GPRS Module

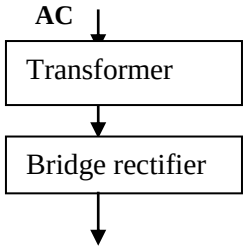
The introduction of second generation cellular mobile systems witnessed an impressive growth in the number of mobile subscribers. The most prevalent second era frameworks are GSM and IS-95. The GSM framework depends on FDMA-TDMA innovation and is broadly utilized as a part of Europe. This facilitates the casting details into cloud at every instant of new vote casted.

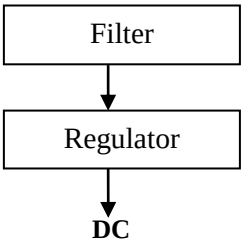
Fig: GPRS Module

e. Power Supply:

The main supply AC230V will reduce by transformer as 12V. This 12V is then step-down to 5V by regulator. Bridge rectifier functioning as it converts AC to DC. Filter is functioned as pulsating DC to pure DC. It delivers the supply of 5V constantly to all the components of circuit

Flow chart of power supply:





f. LCD Display unit:

Here we are using LCD (liquid crystal display) with size 16*2 which means 16 columns and 2 rows. We can use LCD to display the authentication and to casting the vote. LCD operated in two modes: 1. 4-bit mode and 2. 8-Bit mode.

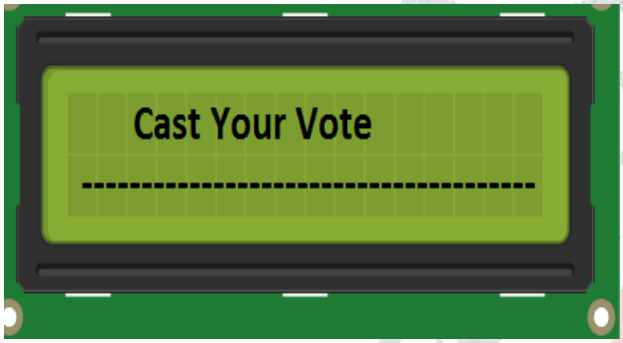


Fig: LCD display

g. 4x4 Matrix Keypad:

This keypad provides to choose selected party to cast the vote by clicking party ID Number.

Features:

I. Ultra-thin outline.

ii. Fantastic Price/execution proportion.

iii. Simple interface to any microcontroller.

iv. Menu choice.

v. Data entry for embedded system

h. Relay

Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit.

Fig: Relay switch

i. Buzzer

Buzzer is an electric signaling device that makes a buzzing sound. Here it is used for verification alarming. If voter details found buzzer keep quiet, if not buzzer will give beep sound.

Fig: buzzer

Working:

Nobody have same finger prints in the world. So by using fingerprint module, before election process begins. For extra security we use NFC cards matched to the fingers. When both fingerprint and card matched only the people can give their votes to the desired contestants.

By using this EVM we are creating three tiers of security. One is verified by NFC reader whether the person is valid voter or not. Second tier of security is biometric verification because it accepts only once to cast the vote, it does not allow same person for revolting or bogus voting. The entire polling status was sent to cloud which is not manipulated by anyone by using GPRS Module. This is the highly confidential and only election commission is access the results. EC will announce the results.

V. WORK FLOW OF THE PROPOSED SYSTEM

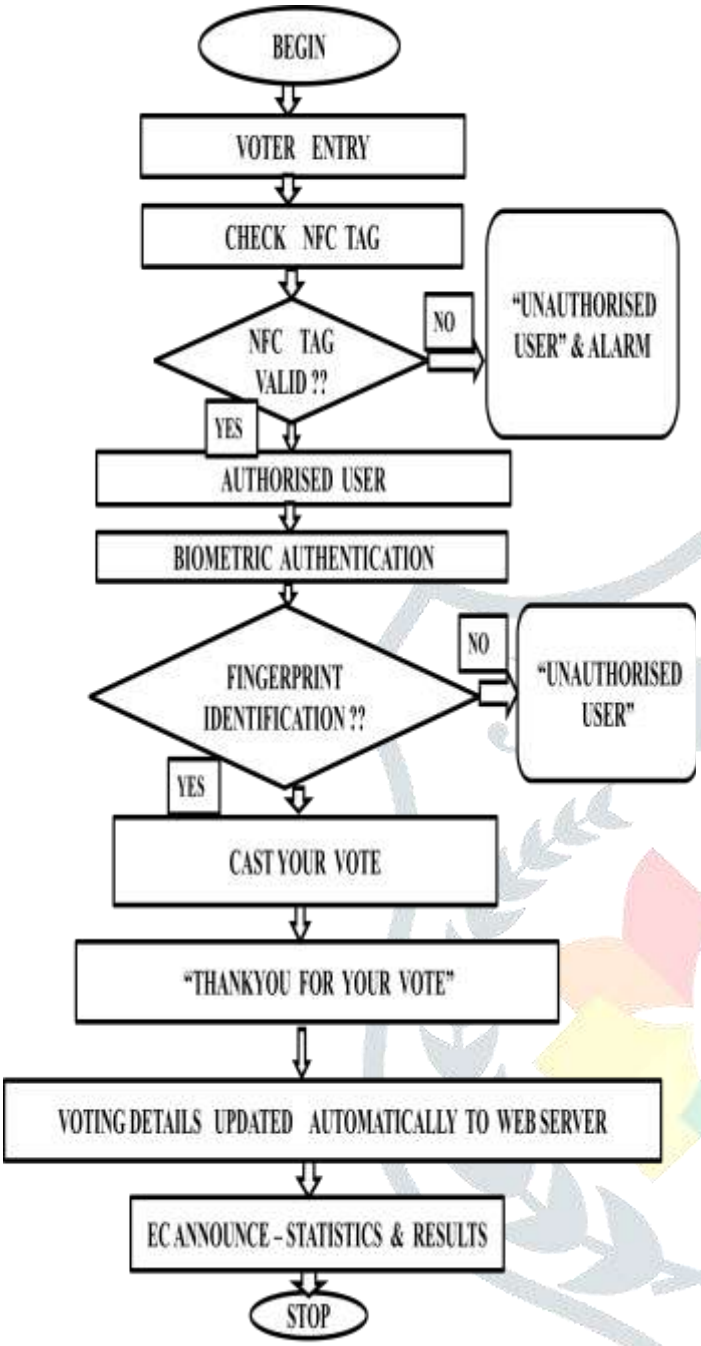


Fig: Flowchart of architecture

security	Supervision of manual force	**3 levels** 1. NFC 2. Biometric identification 3. IoT
Isolation	No	yes
Use ability	All age group	All age group
Quality	No	yes
Power limit	yes	No
Budgetary	Cost is to high	yes
Encase	No	Yes
Duplicate	Yes	No
Results display	GUI interface	Web portal based

VII. RESULTS

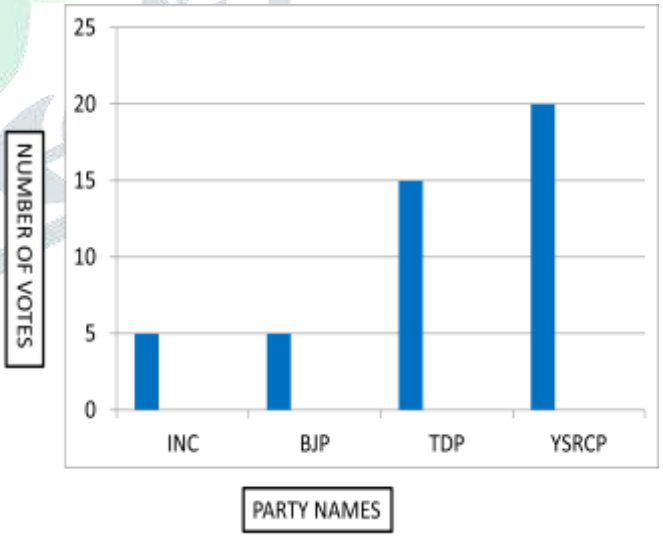


Fig: Sample results in bar graphs in web portal

VI. COMPARISON WITH EXISTING SYSTEM

Feature	Present EVM	Proposed EVM
Device	Embedded system	Real time Embedded system

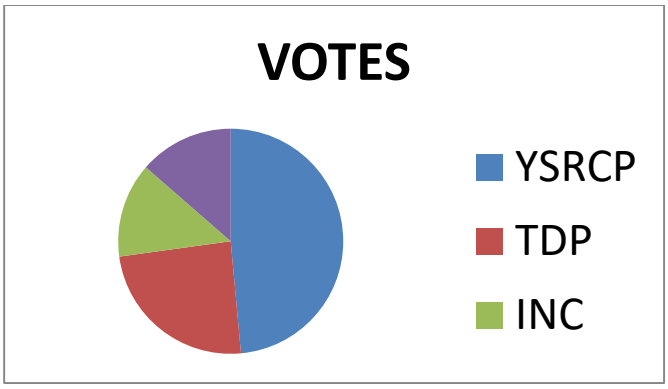


Fig: Sample results pie chart

VIII. ADVANTAGES and APPLICATIONS

1) Especially designed for Election Purposes

2) The voter cannot be involved in any sort of bogus voting

3) More reliable and more compatible

4) It is operated with Low power

5) This design is economically acceptable and cheap.

6) It can also useful for Railways and Banking sector to check candidature.

IX. CONCLUSION

To gain the confidential on election procedure digitizing the process with available technology is prominent. No one can do any tampering and cross voting by this model. Fingerprints of every person are unique and hence the design completely diminishes the chance of illegal voting. This model guarantees that the voter is not a Cheated one. Biometric capture and using NFC tag which adds security and privacy. To avoid any manipulations by candidates entire election statistics are uploading to cloud to secret webpage with an authentication. Unless election commission releases, nobody can change the results at any cost. This model is under the limits of democracy, privacy, reliability, accuracy and usability criterion. This model encourages the all demographic age groups to participate in elections.

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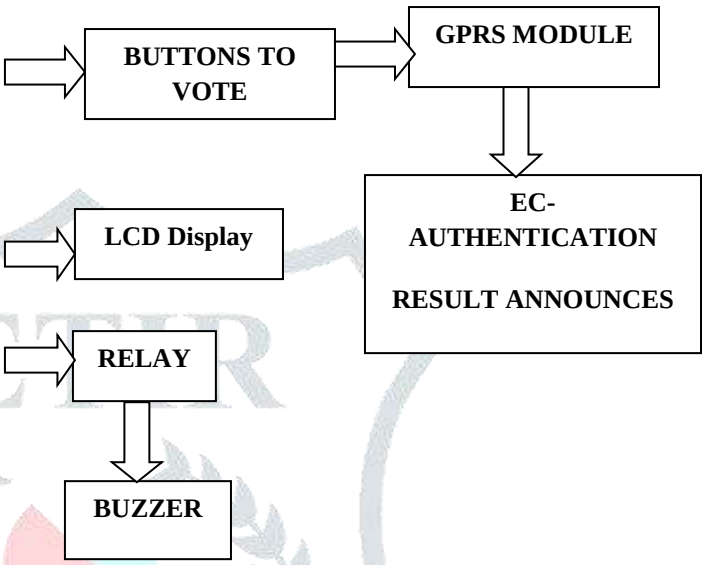
BUTTONS TO VOTE
GPRS MODULE
EC-
AUTHENTICATION
RESULT ANNOUNCES
LCD Display
RELAY
BUZZER