Server Based Secured Voting Machine

Thesis submitted in partial fulfillment for the degree of Bachelor of Technology in Electronics and Communication Engineering of Maulana Abul Kalam Azad University of Technology (formerly known as West Bengal University of Technology)

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Certificate of Recommendation

This is to certify that the project entitled ***"Server Based Secured Voting Machine"*** submitted by **Saptarshi Roy(Roll No :14800316053), Himel Ghosh (Roll No :14800316096), Arijit Guin (Roll No :14800316120), Debarya Ganguly(Roll No :14800316107) & Utsav Roy Chowdhury (Roll No :14800316016) &** is absolutely based upon their own work under the supervision of **Mr. Anupam Patra** (Assistant Professor, Dept of ECE, FIEM) and that neither their thesis has been submitted for any degree/diploma or any other academic award anywhere before.

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22/6/2020

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1. INTRODUCTION

A voting machine is a machine used to register and tabulate votes. The first voting machines were mechanical but it is increasingly more common to use electronic voting machines. Traditionally, a voting machine has been defined by the mechanism the system uses to cast votes and further categorized by the location where the system tabulates the votes.

Voting is one of the fundamental rights of every citizen of a democratic country. By utilizing the right of the voting, people elect their most suitable leader who will lead them. In this modern era where technology is being used in every aspect of life, election is a place to apply the best technology.

India is the largest Democratic nation in the world. It comprises of approximately 1000 million voters who cast their vote in the elections. The Indian election commission is an autonomous body of the Constitution, which has successfully hold elections to the Parliament and many other legislative assemblies of the state for a few years in a concise, justified, authenticated and peaceful way. The Commission is popularly known as a Global Gold Standard in Election Management across the World. The Commission is well known as it has successfully embraced, adopted and later implemented the best state-of-the-art technological advances in achieving a global summit as per the process of election has been concerned. Thus, the Electronic Voting Machine(EVM) serves as the major tool to record the entry of votes, its processing and finally counting the votes without any manual discrepancy in a secure and credible fashion.

Voting is done to express an opinion or to make a collective decision. In a country, government is elected by means of voting. In the early days the voters used to cast their vote by using paper, punch card, mechanical lever and optical-scan machine. It later got evolved from that traditional voting system to using electronic voting machines. The traditional system also had issues about accuracy, flexibility, privacy, verifiability, security. The electronic voting system overcomes all those issues. So, currently the electronic voting system is being used in India.

1.1 OBJECTIVE

To deal with the different flaws and insecurities of the traditional EVMs, and to providing a safer mode of casting votes which will render tamper free and eventually fair, is the guiding factor of this project. Several demonstrations and claims have been made to show the disadvantages of the electronic voting machines that are in use, many new controversies have taken place including several political party leaders demanding the banning of EVM and moving back to the age-old ballot system of voting has raised questions on the credibility of either sides, that being a driving factor, this project aims to deal with the present shortcomings and provide an assured secured voting procedure. To actively use modern technology into the field of electoral system of this largest democracy is the biggest objective of this project.

1.2LITERATURE SURVEY

A Server-based Secured Voting Machine (SVM) which can provide us with accurate results, making the system secured enough with 2 level security providing biometric form of security and linking of Aadhar number with finger print and making a secured server-based view of vote count.

Kohno et al. [1] said that with significant U.S. federal funds now available to replace outdated punch-card and mechanical voting systems, municipalities and states throughout the U.S. are adopting paperless electronic voting systems from a number of different vendors. Draper et al. [2] described various empirical indications support the theoretical view that learning benefits depend upon putting the pedagogy (not the technology) at the focus of attention in each use. Kennedy et al. [3] proposed that previous investigations suggest that students' use of an EVS would be positively associated with their learning outcomes.

Electronic voting systems for electorates have been in use since the 1960s when punched card systems debuted. Their first widespread use was in the USA where 7 counties switched to this method for the 1964 presidential election [4]. But there may be some pre-made backdoors flaws in those old EVM systems rather they are not secured enough and tampering can be done easily. In this regard the newer optical scan voting system tends to solve the problems by allowing a computer to count a voter's mark on a ballot. In our project the registered voter needs to first give his 12-digit Aadhar number, then he needs to scan his finger on the finger print scanner to provide his identity then he has to cast his vote in the ballot box when the panel of button opens. After giving the vote the panel closes, after that the view of the vote count can be obtained from the server by the counting officer only.

1.3SCOPE

The secured casting of votes by the voters is the main focus of this project. A proper database will be created keeping the vote counts as achieved by the contesting parties in a democratic electoral process that will not be vulnerable to tampers by anyone.

A server-based system is incorporated in which the votes will be accepted by the eligible electors based on their biometric information and Adhar number which will be locked after casting of vote so that the same elector cannot cast vote more than once.

The user end hardware is simple. The elector needs to enter the adhar number when prompted, and when it gets matched with that in the database, then another prompt allows the elector to match finger print by the scanner, after that the machine allows the elector to cast the vote to the respective candidate. Then a SMS prompting a message about the casting of vote will be sent to the elector's adhar registered phone number to alert the elector even if the elector didn't cast the vote, that message will serve as an alibi in lawsuit. There are several levels in which the process is more secure than what it is practiced at present.

2. SYSTEM ANALYSIS

2.1 IDENTIFICATION OF NEED

System analysis is a process of gathering and interpreting facts, diagnosing problems and the information to recommend improvements on the system. It is a problem-solving activity that requires intensive communication between the system users and system developers. System analysis or study is an important phase of any system development process. The system is studied to the minutest detail and analyzed. The system analyst plays the role of the interrogator and dwells deep into the working of the present system. The System is viewed as a whole and the input to the system are identified. The outputs from the organization are traced to the various processes. System analysis is concerned with becoming aware of the problem, identifying the relevant and Decisional variables, analysis and synthesizing the various factors and determining an optimal or at least a satisfactory solution or program of action.

A detailed study of the process must be made by various techniques like interviews, questionnaires etc. The data collected by these sources must be scrutinized to arrive to a conclusion. The conclusion is an understanding of how the system functions. This system is called the existing system. Now the existing system is subjected to close study and problem area are identified. The designer now functions as a problem solver and tries to sort out the difficulties that the enterprise faces. The solutions are given as proposals. The proposal is then weighed with the existing system analytically and the best one is selected. The proposal is presented to the user for an endorsement by the user. The proposal is reviewed on user request and suitable changes are made. This is loop that ends as soon as the user is satisfied with proposal.

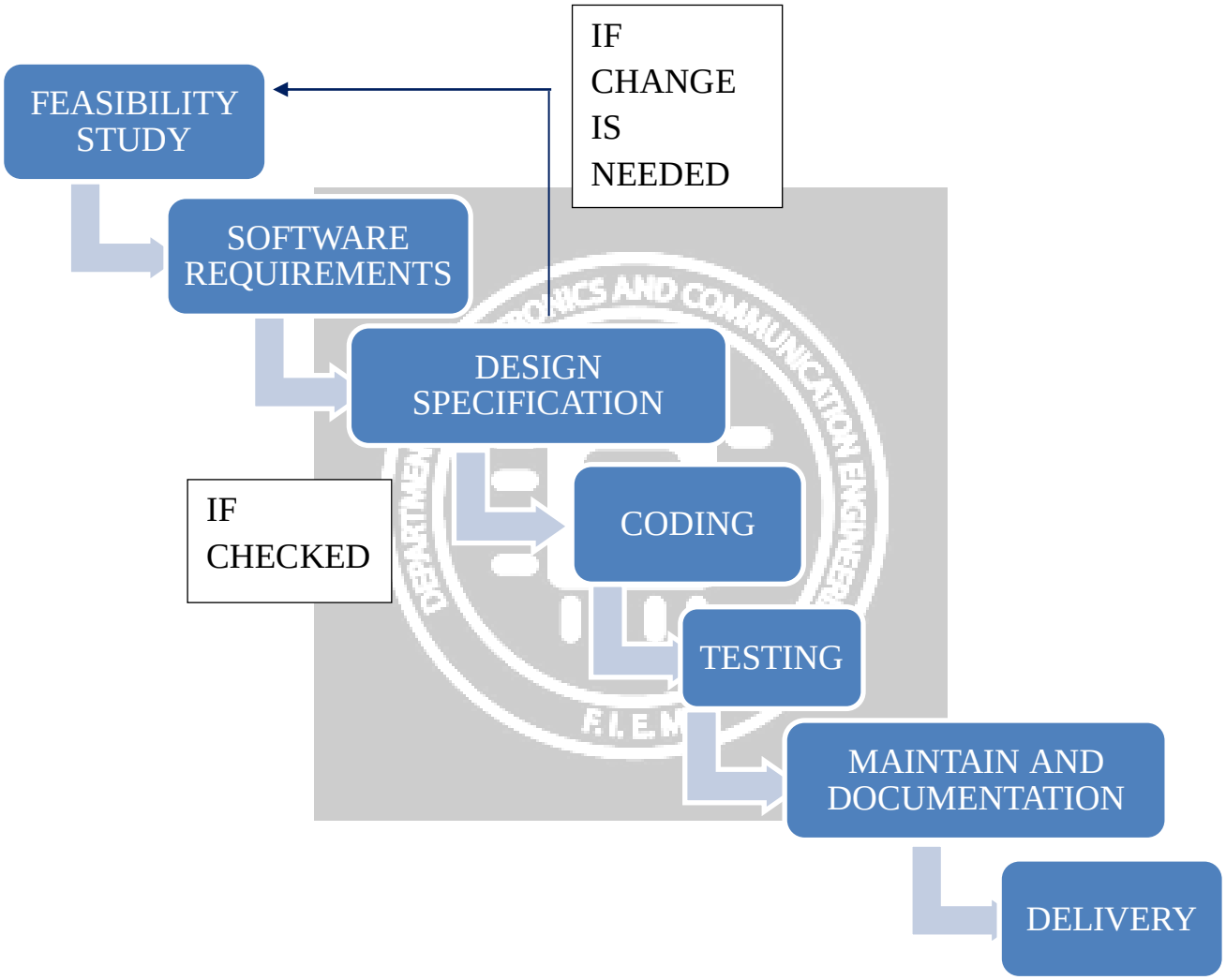
2.2 FEASIBILITY STUDY

Feasibility study is made to see if the project on completion will serve the purpose the organization for the amount of work.

Effort and the time that spend on it. Feasibility study lets the developer foresee the future of the project and the usefulness. A feasibility study of a system proposal is according to its workability, which is the impact on the organization, ability to meet their user needs and effective use of resources. Thus, when a new application is proposed it normally goes through a feasibility study before it is approved for development.

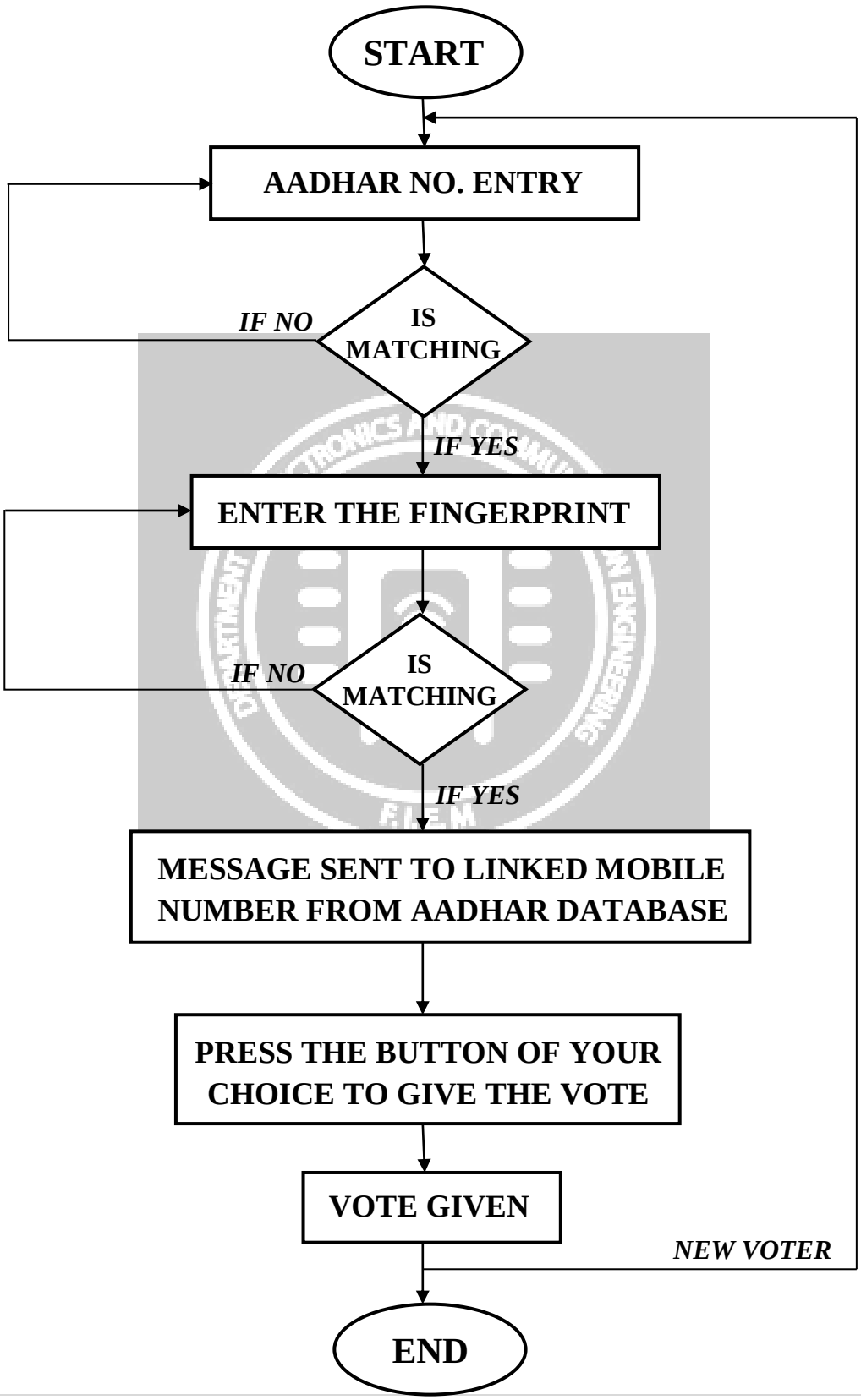
The document provides the feasibility of the project that is being designed and lists various area that were considered very carefully during the feasibility study of this project such as Technical, Economic and operational feasibilities.

2.3 WORK FLOW



WATER FLOW MODEL

FLOW CHART


START
AADHAR NO. ENTRY
IF NO
IS MATCHING
IF YES
ENTER THE FINGERPRINT
IF NO
IS MATCHING
IF YES
MESSAGE SENT TO LINKED MOBILE NUMBER FROM AADHAR DATABASE
PRESS THE BUTTON OF YOUR CHOICE TO GIVE THE VOTE
VOTE GIVEN
NEW VOTER
END

Description of the Flowchart:

At the very beginning the entire system will be started and initialized and the necessary connections will be made with the server and the database by the admin. When the system is ready to go, it will prompt for the UIDAI Adhar Number of the elector; after receiving the required data from the voter, the system will verify the authenticity and existence of the adhar id in its database, and if it doesn't exist, the system will prompt again for the adhar details. If the adhar id is matched with the database and the database has shown voting status null with respect to that adhar id, then the system will again prompt the voter to enter fingerprint on the scanner available with the system. If the fingerprint data and the adhar data doesn't comply or the system fails to map the data in the database, then this event will be reset and the system will again prompt for the fingerprint again. When the system successfully maps the fingerprint details and the adhar data in its database with no voting status, the system immediately sends a particular message to the associated phone number telling about the arrival of the voter to vote for the election, in order to ensure an extra layer of confirmation and security against rigging. Then, the system requests the voter to press the button of choice in order to successfully vote. After the vote is taken, the system updates its database associated with the voter's biometric information indicating the voting status, which means that voter has already casted the vote thereby ensuring that if the same voter comes again to vote, the updated database will help the system easily to determine the voting status and decide whether or not to allow voting for that particular voter. Once the vote is accepted successfully, the database of the nominated candidates with votes gets updated and the system resets itself to the starting point, thereby completing one cycle.

2.4 NON-FUNCTIONAL REQUIREMENTS

- **Usability Requirement**: The system shall allow the users to access the system with no special training. The system user friendly.
- **Availability Requirement**: The system is available 100% for the user. The system shall be operational when made active for the voting process and the other processes that follow.
- **Accuracy**: The system should accurately provide real time information taking into consideration various issues. The system shall provide 100% access reliability to the authenticated election commission officials.
- **Performance Requirement**: Optimum performance from the whole system is expected so as to handle the enormous amount of data that should be dealt with.
- **Security Requirement**: System will use a secured database and the system will have varied authenticated users and each user has different types of constraints. Only admins have the rights to update database information of the registered electors who are eligible to vote.
- **Reliability Requirement**: The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect data.

2.5 HARDWARE and SOFTWARE REQUIREMENTS

HARDWARE REQUIREMENTS

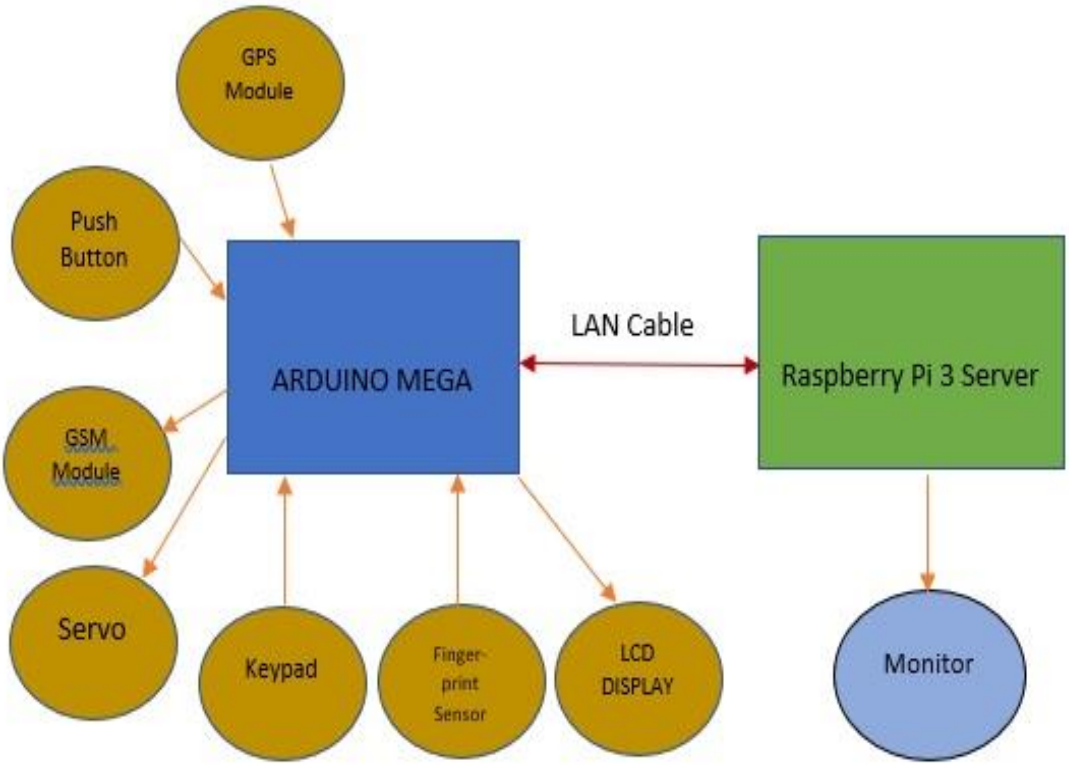
1. Arduino MEGA,
2. Generic Keypad,
3. Adafruit Fingerprint sensor,
4. 9g Servo Motor,
5. 16×2 LCD Display with I2C Adapter,
6. ENC28J60 Ethernet Module,
7. Raspberry Pi 3 Model B+ as Server,
8. Neo-6M GPS Module,
9. SIM900A GSM GPRS Module with RS232 Interface SMA,
10. DS3231 Clock Module,
11. LM2596 DC-DC Buck Converter Adjustable Step-Down Power Supply Module,
12. TP-Link TL-WR841N 300Mbps Wireless Router,
13. Generic 5V Buzzer, LEDs, Push Buttons,
14. 3x RJ45 LAN Cables.

SOFTWARE REQUIREMENTS

OPERATING SYSTEM	: Platform Independent (Windows, Linux,above android 6)
LANGUAGE	: PHP, HTML5, JavaScript, NodeJS, CSS
FRAMEWORK	: Laravel, Bootstrap
LOCAL DATABASE	:MySQL

3. SYSTEM DESIGN

3.1 BLOCK DIAGRAM:



Here is the block diagram of the project in which the following components are used –Arduino MEGA, Keypad, Fingerprint sensor,Servo Motor,LCD display with I2C,Ethernet Module, Raspberry Pi 3 B+ as Server, GPS & GSM Module.

The voting machine comes with two level security process. Firstly, the user has to provide their 12-digit valid Aadhaar number when the machine says "READY", the machine checks whether that Aadhaar number is registered or not in the Aadhar database in the server. If not found in the database, it will not grant access to the Finger-print Sensor, otherwise the finger-print sensor gets activated and then it asks the user to put their fingers so that it can check whether the fingerprint is matching or not with that registered Aadhaar number in the database. The user is allowed to cast his vote if match is found and a confirmation message is sent via the GSM module. Arduino Mega is the main microcontroller that has been used for all the co-ordination among the sensors. There is a GPS module which is constantly recording the data rather the geographical location of the voting machine and it is sending that data to Arduino so that if the voting machine gets displaced from its main location, the entire machine will be locked and an alarm will be triggered. The project comes with a server section connected via LAN Cable to a Raspberry Pi 3 making it more secure from de-auth and brute-force based attacks over WLAN where the Raspberry Pi 3 is the main Server for the Aadhar Database, fingerprints and the registry of votes. The Server is running PHP Laravel in its backend featuring an UI with login feature

for the counting officer, after logging in the admin gets the dashboard where he can view the Aadhar Database, the vote count and a pie chart based on the distribution of the total votes.

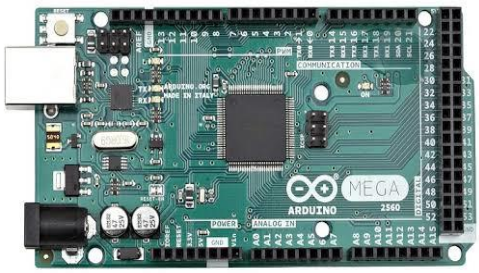
3.2 Process:

This voting process is quite similar to our regular voting system. First the user enters the Aadhar card number on the touch screen display, and then this number is checked in database of the central system. If it did not match then the voter is considered as invalid voter and the process gets aborted. If it is matched then further it asks the voter to scan his/her fingerprint on fingerprint scanner. This template of fingerprint is then matched with the template stored in the database. If the entered fingerprint is matched then the status of the voter is checked i.e. whether he/she has already voted or not. Now as the voter is valid, he/she can cast his vote. After this the vote count and status of the voter is updated in the database and a request is sent to database to disable the voter so as to avoid the false votes.

After the panel is closed, no more vote will be taken from the same voter, even if the original voter didn't cast vote physically, the message that is sent to his/her phone will serve as proof with a reference ID, this is to ensure safety and precaution.

3.3 COMPONENT FUNCTIONALITY AND DEVICE HARDWARE:

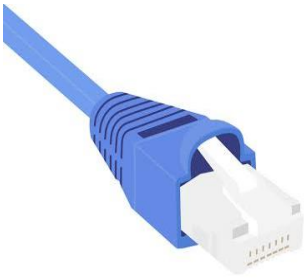
1. **Arduino Mega:**The Arduino Mega 2560 is a microcontroller board based on the Atmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It serves as the controlling unit in this system with the preloaded program required for the specifiedpurpose.

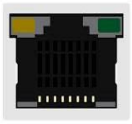


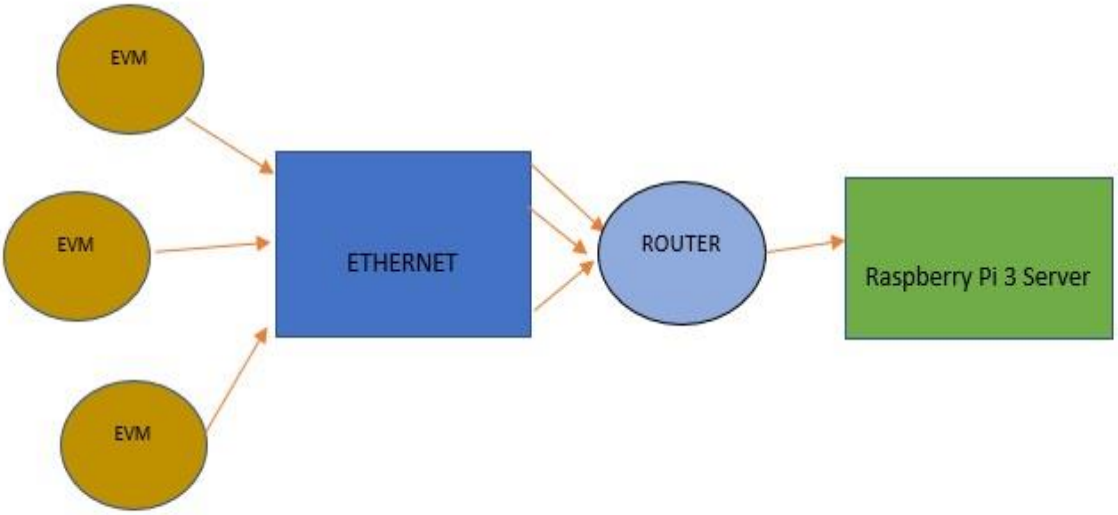
2. **Raspberry Pi 3 B+:**The **Raspberry Pi** is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote teaching of the basic computer science in schools. In this project it serves as the main server. It provides the access to the database by the machine. But one sector will have only one server. The advantage of using Raspberry as the server is its portability to all areas like rural places where mobilization of

conventional servers is an issue. Raspberry pi server will easily solve that problem.

3. **Ethernet:** Ethernet is the most popular physical layer LAN technology in use today. It defines the number of conductors that are required for a connection, the performance thresholds that can be expected, and provides the framework for data transmission. A standard Ethernet network can transmit data at a rate up to 100 Megabits per second (100 Mbps).
   The Ethernet provides the medium to connect more than one Voting Machine through its ports to the single router that connects all of them to the single server in one sector.

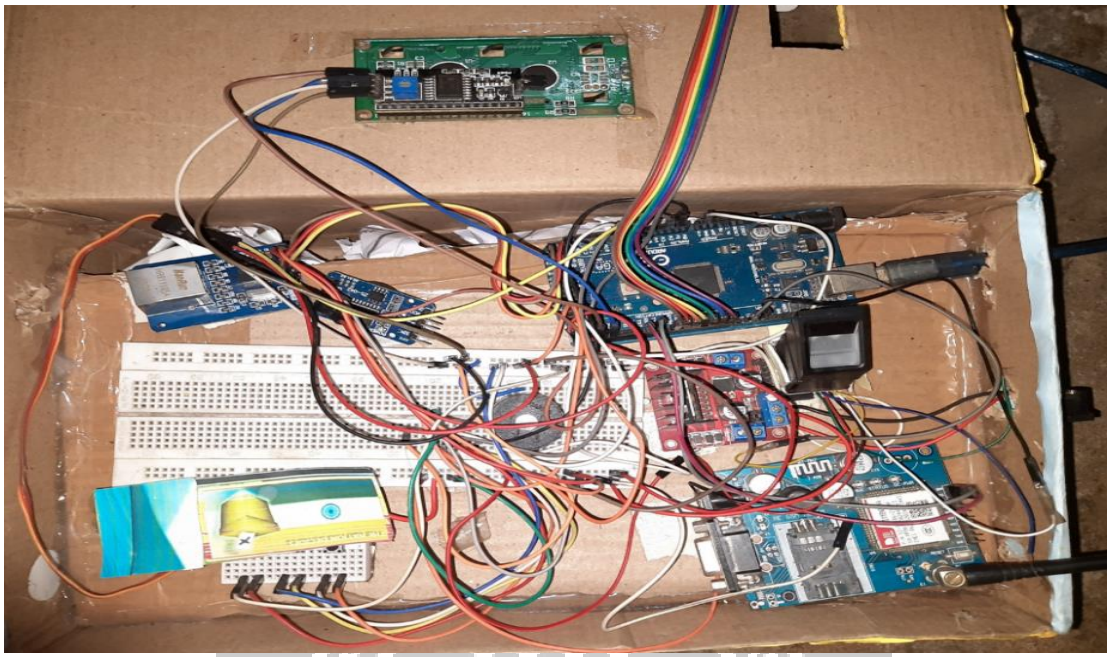






As shown by the above connection blocks, more than one voting machines will be connected on a LAN with the Raspberry Pi server, while the router serves merely as a network switch in the setup. As tyhis is connected to the local network so due to respect to the rural areas and there is not possible always internet connection in everywhere, so this machine will run on local server not required any type of internet connection. Hre for local server we use Ethernet port to running this machine. By many to one connection here many EVM machine will connect to one local server and operate on to it.

ASSEMBLY OF THE COMPONENTS (INTERNAL CIRCUIT)



EXTERNAL PORTION:

THE DEVICE SETUP:

Here, the **Wi-Fi router** is not used for internet connection, but has been used as a **network switch**in order to connect the Raspberry Pi Server and the Voting device to a Local Area Network (LAN). The Router has a default gateway: 192.168.0.1, a default gateway is the intermediary between the local subnet to other subnets.

What is a Network Switch?

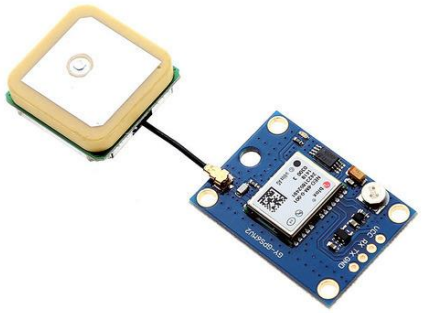
A network switch connects devices together on a single computer network called the Local Area Network (LAN). It uses MAC addresses to forward data to the correct destination. It is a layer2 device operating at the data link layer and uses packet switching to receive, process and forward data. A network switch is incapable of sharing an internet connection.

Using the Router as a Network Switch:

A router performs Network Address Translations (NAT) allowing all devices on a subnetwork to share same public IP address. When the router is used as a Network Switch, the devices are connected to its

ethernet port through the ethernet cable, the WAN port of the router is not used, because internet is not required in this scenario. The router's DHCP server allows it to assign IP addresses to the devices connected to it. As all the devices are connected to the router, they come under the same subnet mask. A **subnet mask**hides the network part of a system's IP address and leaves only the host part as the machine identifier. Systems within the same subnet can communicate directly with each other. The router has a subnet mask value: 255.255.255.0 Thus, many such voting machines can be connected to the LAN with the single server in the same room with the help of this network switch.

Here the device and the Raspberry Pi server is connected by that network switch. The raspberry deploys the web application server through its port 8080. Through the LAN, the device pings the server and the connection are established. Only then, the setup becomes functional. The voting device's MAC is bound with the server and if there is a mismatch of the MAC, the server will shut down. This implies that, any random voting machine cannot be connected to the same setup to jeopardize the security of the entire election process. This totally ensures a high level of security in that regard.



GPS MODULE: This NEO-6M module is used in the setup to add another layer od security. The particular co-ordinates of the voting center will be tracked through the GPS module. In any case of irregularity or shift in the coordinates above a specific range will immediately cause a mismatch of coordinates with the server database and the internal program will automatically deactivate that particular voting machine, whose GPS is in concern. But other voting machines connected to the same server will continue to work fine. This ensures that no one can hijack any voting machine from the room in order to cast false votes, there adding a more security to the entire process of election. Thus, GPS module plays a crucial role in adding up to the security of the entire system.

GSM MODULESIM900A is used for the purpose of communicating specific message with phone number. This is another emphasis on adding to the security of the voting process. When the Adhar and biometric data of the registered voter is matched with the database, before accepting the vote, the device will send a prompt message to the voter to the registered phone number obtained from the database. The GSM enables the system to carry on that task and ensure that the original voter always gets aware of such a voting attempt if in any unwanted case, that was not the real voter in person.

DS3231 CLOCK MODULE: The DS3231 is a low-cost, highly accurate Real Time Clock which can maintain hours, minutes and seconds, as well as, day, month and year information. Also, it has automatic compensation for leap-years and for months with fewer than 31 days. The module can work on either 3.3 or 5 V which makes it suitable for many development

platforms or microcontrollers. The battery input is 3V and a typical CR2032 3V battery can power the module and maintain the information for more than a year. The module uses the I2C Communication Protocol which makes the connection to the Arduino Board very easy. This module is used to keep matching the device time with that of the database.

3.4 SETTING UP THE RASPBERRY PI SERVER

Why have a Raspberry been used as a web server, rather than using service providers specialized in web hosting?

First, from an economic point of view, web hosting services are not free and that have to be paid every month/year. Unlike the Raspberry where a connection is just needed.In addition, by choosing Raspberry, there is the possibility to modify the services like as wanted (examples: the size of the disk, the hosting of Database, etc.), which is generally not the case with specialized hosts, which often sell shared hosting with low configuration capacity.However, to support more users, a Raspberry Pi 3, the Raspberry type B + (1GB of RAM) is used.The other advantage is the portability of the raspberry pi server to remote and rural places for election purpose. The question that now arises is, how to make a web server on Raspberry Pi?

What is Apache?

First, Apache will be installed, which is the web server.When speaking of a web server, people often think about the machine, but this term also refers to the software that allows the machine to analyze user requests (in http form), and to return the file corresponding to the request (Or an error if the file isn't found, or the query incorrectly formulated). As part of Apache, it is software, which is the concern.At the moment, Apache is the most used web server, with about 60% market share. Apache has its own license, used by many other projects. In addition, the massive use of Apache (which has become the standard for web servers), coupled with its high popularity, has led to a tremendous abundance of documentation, courses, and other books dealing with its use, and its security.Whether it is for the Raspberry Pi and Raspbian, or for a more general-purpose machine, Apache is therefore a safe choice.

Apache installation

Before installing the server, it must be made sure to have an up-to-date machine. To do this administrator rights must be possessed, either because of the sudo command.

sudo apt update

sudo apt upgrade

Once the Raspberry Pi is up to date, the Apache server is installed.

sudo apt install apache2

By the way, advantage is taken of it to give rights to the apache file that can be easily managed in the sites. To do this, the following commands are run:

sudo chown -R pi:www-data /var/www/html/

sudo chmod -R 770 /var/www/html/

Checking if Apache is working

Once the installation completed, that Apache can be tested if it is working properly, by going to the Raspberry address.To do this, it's necessary to try to access to the Raspberry from port 80 (this port not being opened from the outside, it will have to do since the Raspberry itself). By simply opening the Raspberry web browser, and going to "http://127.0.0.1". A page loads with a message like "It works! "And plenty of other text.If there is not already a GUI on the Raspbian, or SSH is used to connect to the Raspberry, the following command can be used:

wget -O check_apache.html http://127.0.0.1

This command will save the HTML code of the page in the file "check_apache.html" in the current directory.
So only the file with the command have to be read:

cat ./check_apache.html

If marked at a location in the code "It works!", then that Apache is working.

Apache uses the directory "/var/www/html" as the root for the site. This means that when Raspberry is called on port 80 (http), Apache looks for the file in "/var/www/html".

For example, if the address "http://127.0.0.1/example", is called, Apache will look for the "example" file in the "/var/www/html" directory.

To add new files, sites, etc., it is needed to add them to this directory.

Now Raspberry can be used to make a site in HTML, CSS and JavaScript, internally.

However, to quickly allow interactions between the site and the user: For example, to allow the user to register, etc. For PHP is needed.

PHP installation on Raspberry Pi

What is PHP?

First of all, PHP is an interpreted language. And as in the case of servers, the acronym PHP can have several meanings. In fact, when someone talks about PHP, they talk about either the language or the interpreter.

Here, when talking about installing PHP, it means that the interpreter will be installed, in order to use the language.

PHP (the language this time) is mainly used to make a site dynamic, that is to say that the user sends information to the server which returns the modified results according to this information. Conversely, a static site doesn't adapt to information provided by a user. It's saved as a file once and for all, and will always deliver the same content.

PHP is free, and maintained by the PHP Foundation, as well as Zend Enterprise, and various other companies (it should be noted that Zend is also the author of the famous Zend PHP framework, widely used and recognized in the world of" business).

It's one of the most widely used programming languages, and it is even the most used for web programming, with about 79% market share.

Again, all the skills one can acquire, on the language, or on the installation and configuration of the interpreter, will always be useful.

How to install PHP?

Again, use the administrator will be used to install PHP with the command line: -

sudo apt install php php-mbstring

Control if PHP is working

To know if PHP is working properly, it's not very complicated, and the method is quite similar to the one used for Apache.

The file "index.html" in the directory "/var/www/html" is first deleted:

sudo rm /var/www/html/index.html

Then an "index.php" file in this directory is created, with this command line

echo "<?php phpinfo ();?>" > /var/www/html/index.php

From there, the operation is the same as for the Apache check.

By trying to access the page now, the result comes as described and visualized by the below image and if an interface is not there, the same method as before is used, to look for the words "PHP Version").

PHP Version 5.4.4-14+deb7u7	

System	Linux ajaniserveur 3.2.0-4-amd64 #1 SMP Debian 3.2.54-2 x86_64
Build Date	Dec 12 2013 08:42:50
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php5/apache2
Loaded Configuration File	/etc/php5/apache2/php.ini
Scan this dir for additional .ini files	/etc/php5/apache2/conf.d
Additional .ini files parsed	/etc/php5/apache2/conf.d/10-pdo.ini, /etc/php5/apache2/conf.d/20-gd.ini, /etc/php5/apache2/conf.d/20-mysql.ini, /etc/php5/apache2/conf.d/20-mysqli.ini, /etc/php5/apache2/conf.d/20-pdo_mysql.ini
PHP API	20100412
PHP Extension	20100525
Zend Extension	220100525
Zend Extension Build	API220100525,NTS

Table generated by the *phpinfo* command on a raspberry.

A MySQL database for the server is used.

Why MySQL?

Now after setting up PHP, information for use in your sites is required to be stored. Here the question of storage is very crucial. For this purpose, databases are most often used.

Therefore, a DBMS (Database Management System), namely MySQL is set up.

MySQL is a free, powerful, massively used DBMS (about 56% market share of free DBMS).

How to install MySQL

To do this mariadb-server and php-mysql (which will serve as a link between php and mysql) is installed.

sudo apt install mariadb-server php-mysql

Verify that MySQL is working correctly

To check the operation of MySQL, this time only the command line is used. To do this, simply getting it connected via the command:

sudo mysql --user=root

The default mysql root user will not be deleted and new mysql root user be created, because the default one can only be used with Linux root account, and so not available for the webserver and php scripts.

To do so, after connecting to MySQL, those commands are simply run. (here the actual password is not written, which can be substituted at the right place):

DROP USER 'root'@'localhost';

CREATE USER 'root'@'localhost' IDENTIFIED BY 'password';

*GRANT ALL PRIVILEGES ON *.* TO 'root'@'localhost' WITH GRANT OPTION;*

So now there is a web server, connected to PHP and MySQL. In this way, it has to be done.

(On the next connections, it will be possible to connect to mysql without using sudo, with the command mysql --user=root --password=yourmysqlpassword).

Add PHPMyAdmin

The installation of PHPMyAdmin is absolutely not necessary. In this installation, it will not take care about any special security settings.

The PHPMyAdmin installation is pretty quick and easy, by simply using the packet manager with this command:

sudo apt install phpmyadmin

PHPMyAdmin installation program will ask a few questions. About the dbconfig-common part, it must be chosen to not use it (as database is already configured). About the server to configure PHPMyAdmin for, Apache is chosen. And the root password is the one that has been set for MySQL.

Mysql extension is also enabled using the undermentionedcommand:

sudo phpenmod mysqli

sudo /etc/init.d/apache2 restart

To Check that PHPMyAdmin is working properly

To check that PHPMyAdmin works, simply it is tried to access, using the address of Raspberry followed by /phpmyadmin. For example, locally it will be http://127.0.0.1/phpmyadmin

If still an error occurs, it could be because PHPMyAdmin has moved to another directory. In this case, the below command is tried:

sudo ln -s /usr/share/phpmyadmin /var/www/html/phpmyadmin

Now,PHPMyAdmin canbe accessed from Raspberry Pi's browser, with the url: http://127.0.0.1/

phpmyadmin

3.5 The PHP-Laravel Framework

Introduction:

Laravel is an MVC framework with bundles, migrations, and Artisan CLI. Laravel offers a robust set of tools and an application architecture that incorporates many of the best features of frameworks like CodeIgniter, Yii, ASP.NET MVC, Ruby on Rails, Sinatra, and others.
Laravel is an Open Source framework. It has a very rich set of features which will boost the speed of Web Development. If you familiar with Core PHP and Advanced PHP, Laravel will make your task easier. It will save a lot time if you are planning to develop a website from scratch. Not only that, the website built in Laravel is also secure. It prevents the various attacks that can take place on websites.

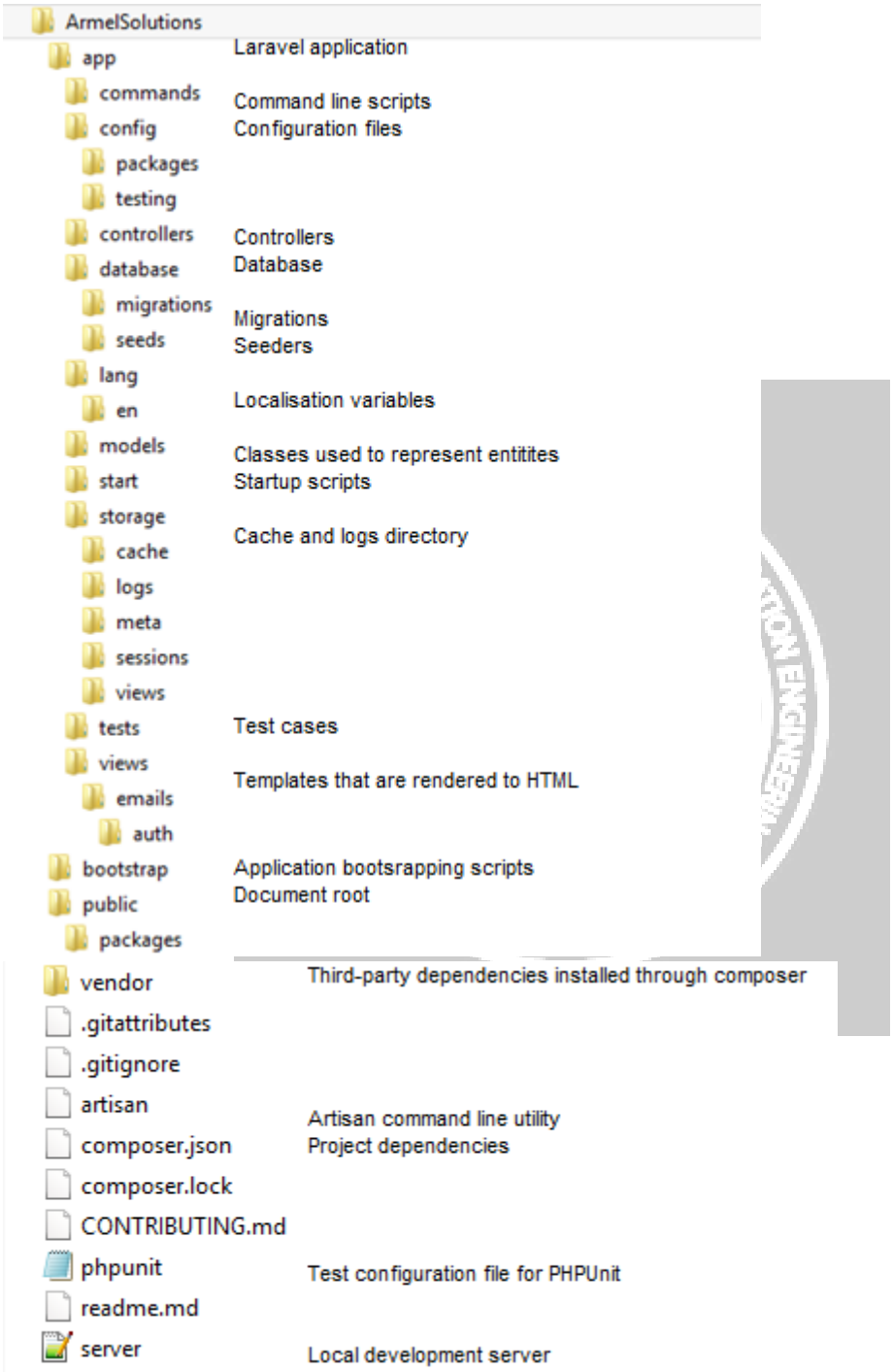
Architecture:

Laravel is a web application framework that tries to ease the development process by simplifying repetitive tasks used in most of today's web applications, including but not limited to routing, authentication, caching and sessions.

Since it manages to do all essential tasks ranging from web serving and database management right to HTML generation, Laravel is called a full stack framework. This vertically integrated web development environment is meant to offer an improved and smooth workflow for the developer.

Unlike other vertically integrated environments, Laravel is unique in its way of prioritizing convention over configuration. In fact, while many PHP frameworks demand a heavy-duty XML configuration before starting the actual project, Laravel needs only a few lines of PHP code to be edited and it becomes ready to use. Avoiding or using a minimum amount of configuration files gives all Laravel web applications a similar code structure which is very characteristic and identifiable. This might be considered at first glance as serious constraint on how a developer might wish to organize the structure of her/his own web application. However, these constraints make it actually a lot easier to build web-applications.

All the new Laravel projects come out of the box equipped with a full directory tree and also many placeholder files resulting in a structure permitting a quick start of the actual development process. This structure is nevertheless fully customizable. Herein the following figure is shown what such a structure looks like:


ArmelSolutions
app
Laravel application
commands
Command line scripts
config
Configuration files
packages
testing
controllers
Controllers
database
Database
migrations
Migrations
seeds
Seeders
lang
Localisation variables
en
models
Classes used to represent entitites
start
Startup scripts
storage
Cache and logs directory
cache
logs
meta
sessions
views
tests
Test cases
views
Templates that are rendered to HTML
emails
auth
bootstrap
Application bootsrapping scripts
public
Document root
packages
vendor
Third-party dependencies installed through composer
.gitattributes
.gitignore
artisan
Artisan command line utility
composer.json
Project dependencies
composer.lock
CONTRIBUTING.md
phpunit
Test configuration file for PHPUnit
readme.md
server
Local development server

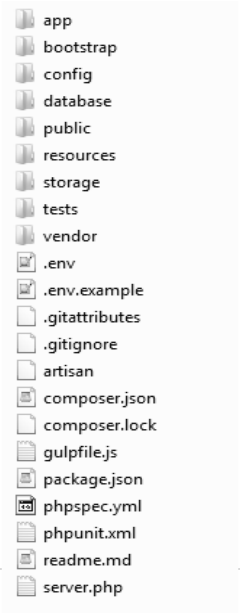
Laravel – Features:

Laravel offers the following key features:

- Modularity
- Testability
- Routing
- Configuration management
- Query builder and ORM (**O**bject **R**elational **M**apper)
- Schema builder, migrations, and seeding
- Template engine
- E-mailing
- Authentication
- Redis
- Queues
- Event and command bus

Laravel – Application Structure

The Root Directory:



- **app:** This directory contains the core code of the application.
- **bootstrap:** This directory contains the application bootstrapping script.
- **config:**This directory contains configuration files of application.
- **database:** This folder contains your database migration and seeds.
- **public:**This is the application's document root. It starts the Laravel application. It also contains the assets of the application like JavaScript, CSS, Images etc.
- **resources:** This directory contains raw assets such as the LESS & Sass files, localization and language files, and Templates that are rendered as HTML.
- **storage:** This directory contains App storage, like file uploads etc. Framework storage (cache), and application-generated logs.
- **test:** This directory contains various test cases.
- **vendor:** This directory contains composer dependencies.

3.6 The Setup of Voter Registration Form with Laravel

To Add registration_forms/create route and RegistrationFormsController@create method

To display a form, a GET request is sent to registration_forms/create. The associated controller method would be something like RegistrationFormsController@create.
Here a route is needed for theregistration_forms/create and a method is needed in the controller for RegistrationFormsController@create. In the following way, the setup is done:

routes/web.php

```
<?php

Route::get('registration_forms', 'RegistrationFormsController@index');

Route::get('registration_forms/{id}', 'RegistrationFormsController@show');

Route::get('registration_forms/create', 'RegistrationFormsController@create');
```

app/Http/Controllers/RegistrationFormsController.php

```
<?php
namespace App\Http\Controllers;
use Illuminate\Http\Request;
use App\Voter;
class RegistrationFormsController extends Controller
{
public function index()
{
$registration_forms = Voter::all();
return view('registration_forms.index', ['registration_forms' => $registration_forms]);
}
public function show(Voter $id)
{
return view('registration_forms.show', ['Voter' => $id]);
}
public function create()
{
return 'it works';
```

}
}

To Test out the route:

With the new route and new controller method in place, it is needed to test that route in the browser. When *http://54.dev/registration_forms/create* is visited, a problem is noticed.

Sorry, the page you are looking for could not be found.

2/2
NotFoundHttpException in Handler.php line 131:No query results for model [App\Voter].

It turns out the order of routes matters in the routes file. It is a process of checking for matching routes from the top down, and as soon as a match is found, the route is processed. With the way routes file is structured now, by visiting here as provided in the link*http://54.dev/registration_forms/create*,actuallythe *Route::get('registration_forms/{id}', 'RegistrationFormsController@show')* is triggered; route and this is not desired. Rearranging the routes file leads to solve the matter:

```
<?php

Route::get('registration_forms', 'RegistrationFormsController@index');


Route::get('registration_forms/create', 'RegistrationFormsController@create');


Route::get('registration_forms/{id}', 'RegistrationFormsController@show');
```

On visiting the route now, 'it works' is obtained and so the route and controller method are working. With this sorted out, the create() method is updated to render a view file to see the form.

```
public function create()
{
   return view('registration_forms.create');
}
```

Create a new view of create.blade.php and add a Form

Within resources/views/registration_forms to go ahead and add a view file named create.blade.php. A form that allows to fill out the Name, DOB, Voter Adhar Number, as well as **upload an image** for the Voter and email and contact information.

resources/views/registration_forms/create.blade.php

```
@extends('layouts.master')


@section('content')


<h2>Add a Voter</h2>
<form method="post" action="/registration_forms" enctype="multipart/form-data">
{{ csrf_field() }}
  <div class="form-group row">
  <label for="Voterimageid" class="col-sm-3 col-form-label">Voter Image</label>
  <div class="col-sm-9">
  <input name="image" type="file" id="Voterimageid" class="custom-file-input">
  <span style="margin-left: 15px; width: 480px;" class="custom-file-control"></span>
  </div>
</div>
<div class="form-group row">
  <label for="nameid" class="col-sm-3 col-form-label">Name</label>
  <div class="col-sm-9">
  <input name="name" type="text" class="form-control" id="nameid" placeholder="Name">
  </div>
</div>
<div class="form-group row">
  <label for="birthdate" class="col-sm-3 col-form-label">DOB</label>
  <div class="col-sm-9">
  <input name="birthdate" type="text" class="form-control" id="birthdate"
                placeholder="DOB">
  </div>
</div>
<div class="form-group row">
  <label for="adharid" class="col-sm-3 col-form-label">Adhar Number</label>
  <div class="col-sm-9">
  <input name="adharid" type="text" class="form-control" id="adharid"
                placeholder="Adhar Number">
  </div>
</div>
<div class="form-group row">
  <label for="emailid" class="col-sm-3 col-form-label">Email ID</label>
  <div class="col-sm-9">
```

```
    <input name="emailid" type="text" class="form-control" id="emailid"
                placeholder="Email ID">
    </div>
  </div>
  <div class="form-group row">
    <label for="phone" class="col-sm-3 col-form-label">Phone Number</label>
    <div class="col-sm-9">
    <input name="phone" type="text" class="form-control" id="phone"
                placeholder="Phone Number">
    </div>
  </div>
  <div class="form-group row">
    <div class="offset-sm-3 col-sm-9">
    <button type="submit" class="btn btn-primary">Submit Voter</button>
    </div>
  </div>
  </form>
  @endsection
```

Visiting *http://54.dev/registration_forms/create* , then a form for submitting a new Voter is shown.

Some important points about the new form.

- The **method** attribute must be set to *post*: Every form is going to have an attribute named **method**. This specifies *the type of HTTP request* one will make with the form. When trying to add an item to the server, one must use a **POST** request.
- The **action** attribute is set to */registration_forms*: The other attribute that must be payed attention to in forms is the **action** attribute. This guides where to send the post request. In keeping with convention, a post request is made to /registration_forms
- The **enctype** attribute is set to *multipart/form-data*: Since the ability to upload an image is included, it is needed to set the **enctype** attribute to multipart/form-data.
- **csrf_field** is required: To protect against cross site request forgery, this field must be included just after the opening form tag. If this is not included, token mismatch errors will occur.
- each input has a unique **name**: Input tags in forms must have a **name** attribute with a unique value set. This is how to identify which data corresponds to which input when processing in Laravel or PHP on the server side.
- button **type** of *submit*: In order to submit the form, a button with it's **type** attribute set to submit is needed.

Add post /registration_forms route and RegistrationFormsController@store method

In order to actually process the data entered into the form, the associated route and controller method is needed to do so. The routes file can be updated like this.

```
<?php


Route::get('registration_forms', 'RegistrationFormsController@index');


Route::get('registration_forms/create', 'RegistrationFormsController@create');
Route::get('registration_forms/{id}', 'RegistrationFormsController@show');


Route::post('registration_forms', 'RegistrationFormsController@store');
```

Getting data from the form submission

To inspect what happens when each field is filled and submitted, the store() method is populated on the RegistrationFormsController like this for a quick second:

```
use App\Voter;


class RegistrationFormsController extends Controller
{
    public function index()
    {
        $registration_forms = Voter::all();
        return view('registration_forms.index', ['registration_forms' => $registration_forms]);
    }


    public function show(Voter $id)
    {
```

```
        return view('registration_forms.show', ['Voter' => $id]);
    }

    public function create()
    {
        return view('registration_forms.create');
    }

    public function store()
    {

var_dump(request('image'));
var_dump(request('nameid'));
 var_dump(request('birthdate'));
        var_dump(request('adharid'));
var_dump(request('emailid'));
var_dump(request('phone'));

    }
}
```

By clicking the submit, the required data gets where it should.

To be able to save the **nameid**, **birthdate**, **adharid**, **emailed, phone** and **image** path to the database. In the current registration_forms table, there are fields for the name, birthdate, adharid, emailed, phone, but nothing for the image path. It is required to adjust the migration file and re run the migrations. The following line is added to the original migration file.

```
<?php

use Illuminate\Support\Facades\Schema;
```

```
use Illuminate\Database\Schema\Blueprint;
use Illuminate\Database\Migrations\Migration;

class CreateRegistration_formsTable extends Migration
{
    /**
     * Run the migrations.
     *
     * @return void
     */
    public function up()
    {
        Schema::create('registration_forms', function (Blueprint $table) {
            $table->increments('id');
            $table->string('image');
            $table->string('nameid');
            $table->integer('birthdate');
            $table->integer('adharid');
            $table->string('emailid');
            $table->integer('phone');
            $table->timestamps();
        });
    }

    /**
     * Reverse the migrations.
     *
     * @return void
```

```
     */
    public function down()
    {
        Schema::dropIfExists('registration_forms');
    }
}
```

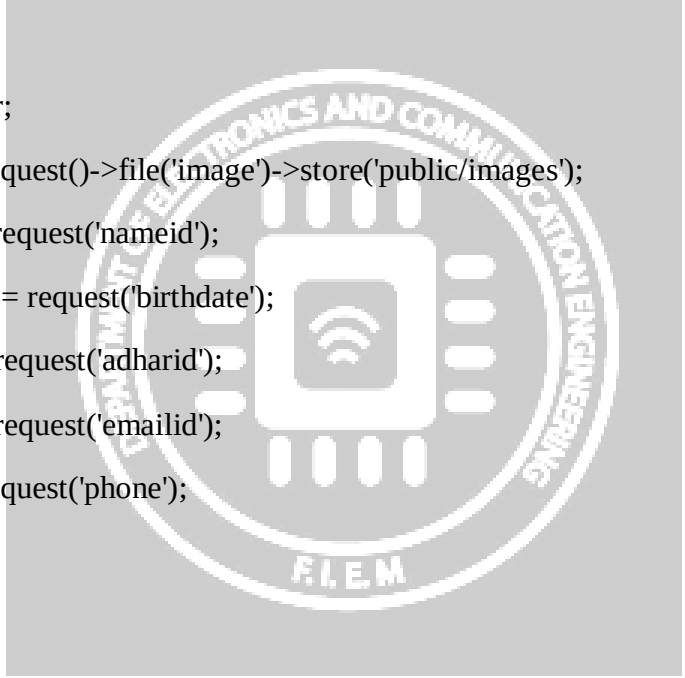
Then *php artisan migrate:refresh*, is run, which will reset and re-run all migrations.

To Store The Voter In The Database

With the registration_forms table now updated to include a path for an image file, this is ready to store a Voter in the database. This is how the store() method can be updated to do that.

```
<?php

namespace App\Http\Controllers;

use Illuminate\Http\Request;
use App\Voter;

class RegistrationFormsController extends Controller
{
    public function index()
    {
        $registration_forms = Voter::all();
        return view('registration_forms.index', ['registration_forms' => $registration_forms]);
    }

    public function show(Voter $id)
    {
```

```
        return view('registration_forms.show', ['Voter' => $id]);
    }

    public function create()
    {
        return view('registration_forms.create');
    }

    public function store()
    {
        $Voter = new Voter;
        $Voter->image = request()->file('image')->store('public/images');
        $Voter->nameid = request('nameid');
        $Voter->birth_date = request('birthdate');
        $Voter->adharid = request('adharid');
        $Voter->emailid = request('emailid');
        $Voter->phone = request('phone');
        $Voter->save();
    }
}
```



What happens in this store() method is pretty straight forward. The request() helper function is used to access the data desired from the form. The line: *$Voter->image = request()->file('image')->store('public/images');* There are two things happening at once here. Laravel is accepting the file from the form submission, and storing it in the application at *storage/app/public/images*. At the same time, the path for the image is stored in $Voter->image so the image source is fetched when needed to be displayed later on.

3.7 DATABASE DESIGN

A database management system (DBMS) is a software package designed to define, manipulate, retrieve and manage data in a database. A DBMS generally manipulates the data itself, the data format, field names, record structure and file structure. It also defines rules to validate and manipulate this data.

A DBMS relieves users of framing programs for data maintenance. Fourth-generation query languages, such as SQL, are used along with the DBMS package to interact with a database.

Some other DBMS examples include:

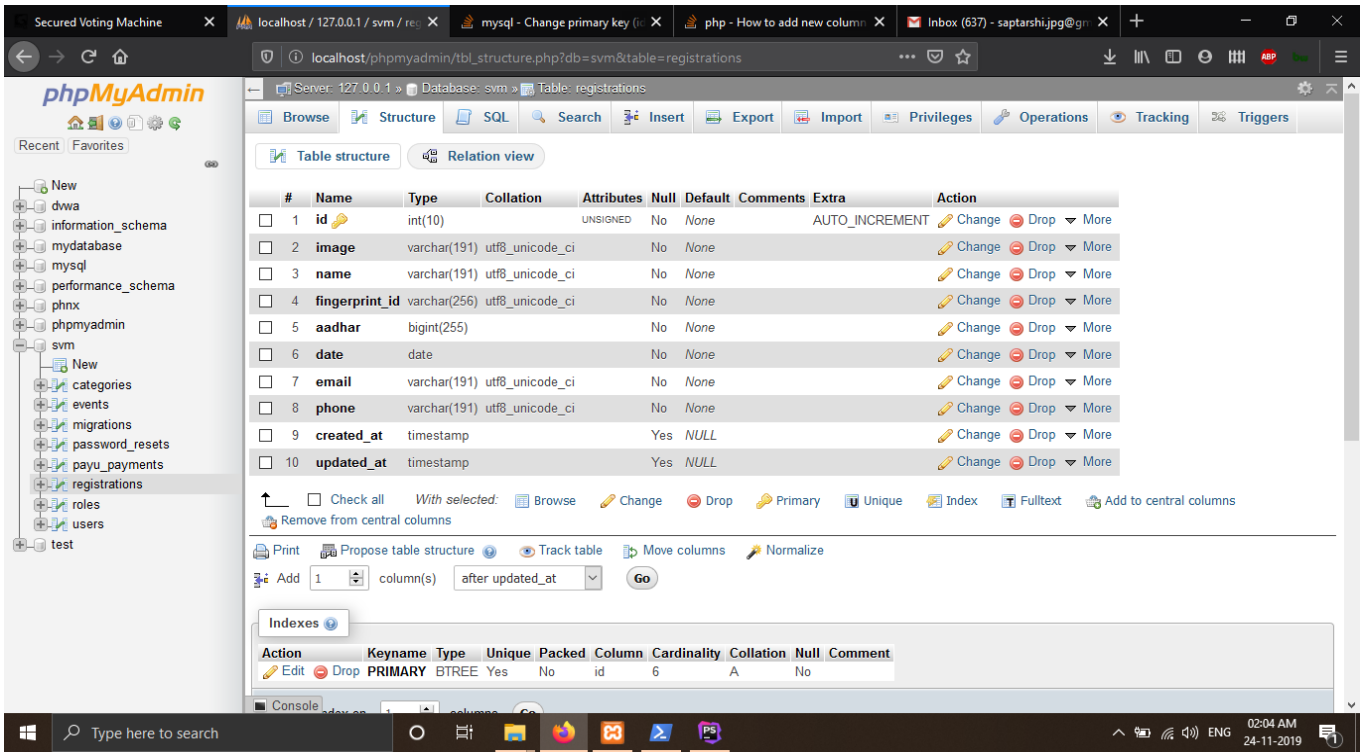
- MySQL
- SQL Server
- Oracle
- dBASE
- FoxPro

A database management system receives instruction from a database administrator (DBA) and accordingly instructs the system to make the necessary changes. These commands can be to load, retrieve or modify existing data from the system. A DBMS always provides data independence. Any change in storage mechanism and formats are performed without modifying the entire application. There are four main types of database organization:

- Relational Database: Data is organized as logically independent tables. Relationships among tables are shown through shared data. The data in one table may reference similar data in other tables, which maintains the integrity of the links among them. This feature is referred to as referential integrity – an important concept in a relational database system. Operations such as "select" and "join" can be performed on these tables. This is the most widely used system of database organization.
- Flat Database: Data is organized in a single kind of record with a fixed number of fields. This database type encounters more errors due to the repetitive nature of data.
- Object-Oriented Database: Data is organized with similarity to object-oriented programming concepts. An object consists of data and methods, while classes group objects having similar data and methods.
- Hierarchical Database: Data is organized with hierarchical relationships. It becomes a complex network if the one-to-many relationship is violated.

In this project we are using or implementing this database system for creating or maintaining the backend of the Hardware System like maintaining the AADHAR database of the Voters and maintaining the Candidate Details.

AADHAR DATABASE contains the required fields like Unique ID, Photo, Name, Fingerprint_ID, AADHAR No., Email ID, Linked Mobile No. etc. The details of all the registered voters are given in this table which is matched when a voter comes and gives the vote. The sample design of creating the database is given below.



In the similar way we have registered the candidate details too in the database so that whenever a voter gives the vote, the counter for that respective candidate increases by 1. This Databases are useful and specially designed for the ADMIN who can login to the website of the project to get all the details there

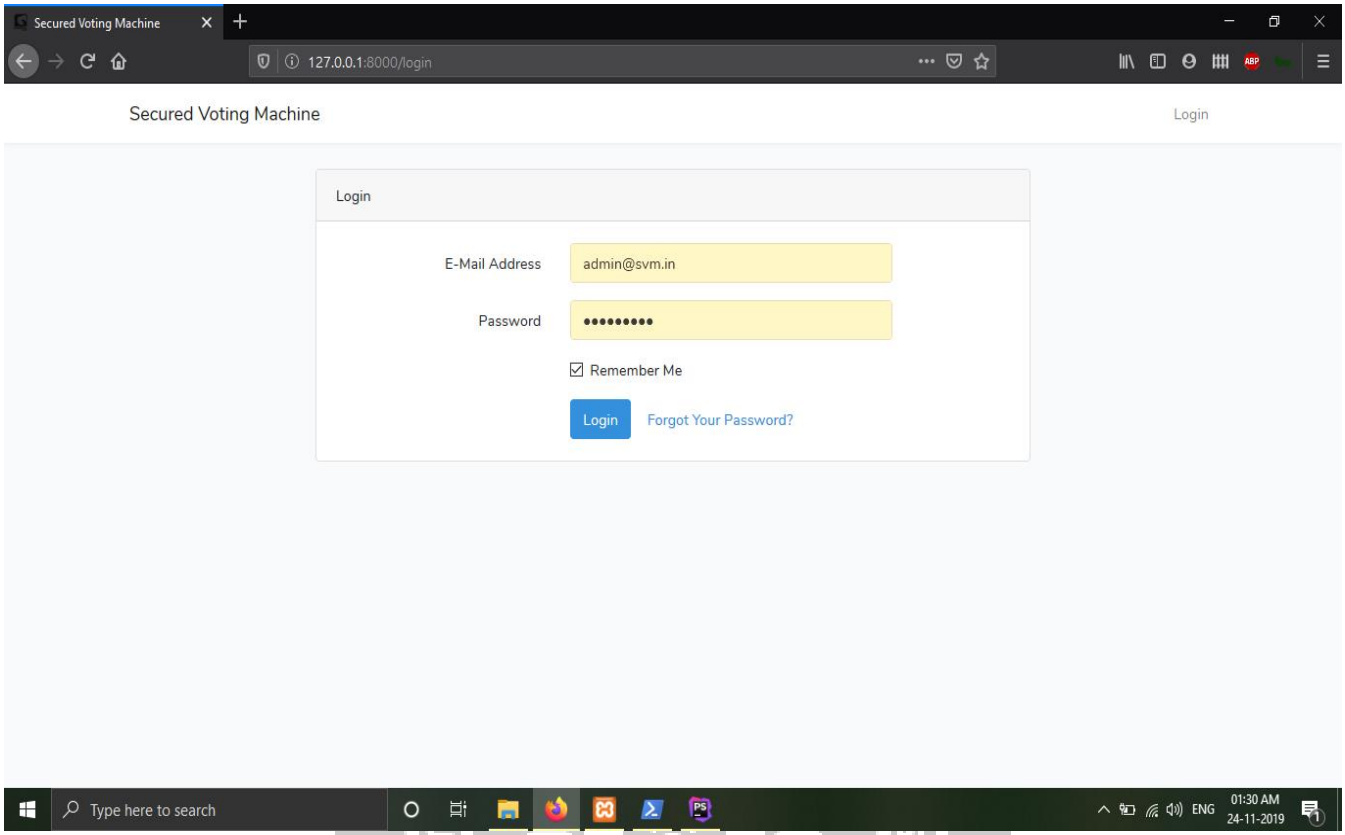
as well as the subsequent results of the votes given. Only the admin of the website can see those details. It is highly restricted and password protected website which is not accessible to anyone.

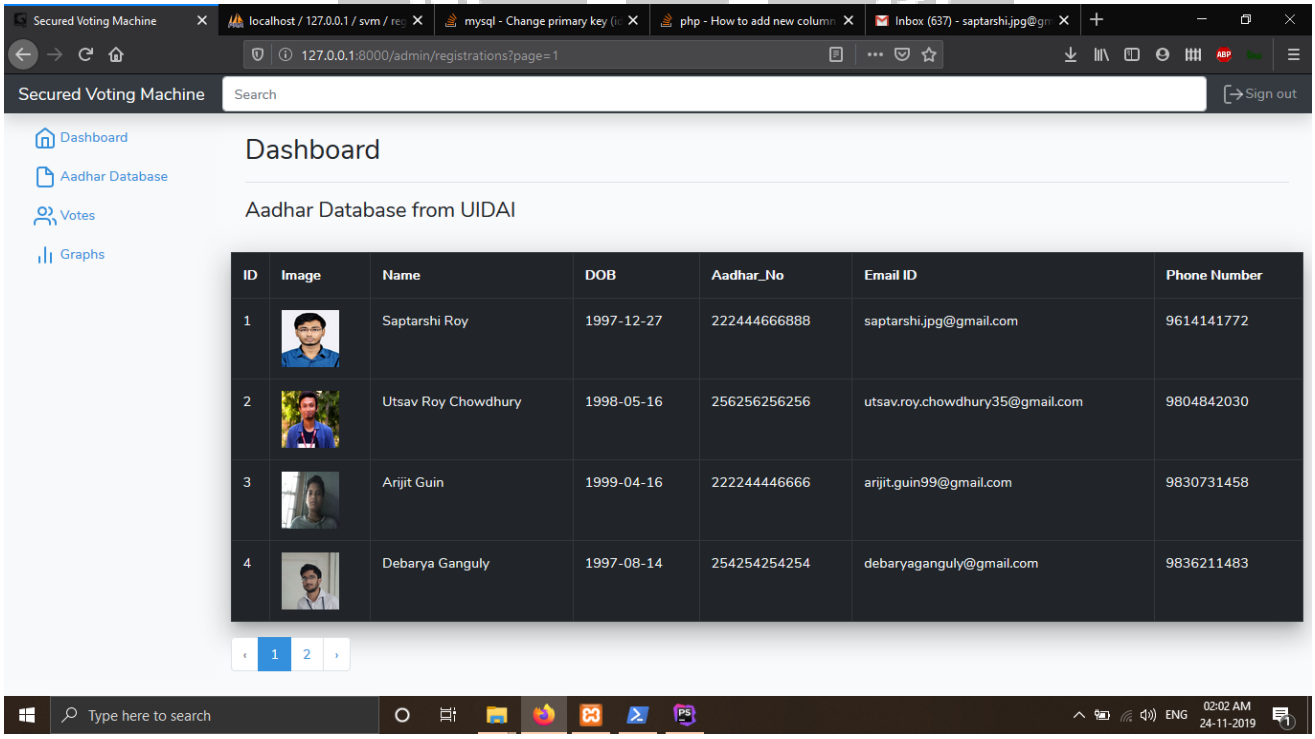
3.8 WEBSITE DESIGN

Web design is the process of creating websites. It encompasses several different aspects, including webpage layout, content production, and graphic design. While the terms web design and web development are often used interchangeably, web design is technically a subset of the broader category of web development

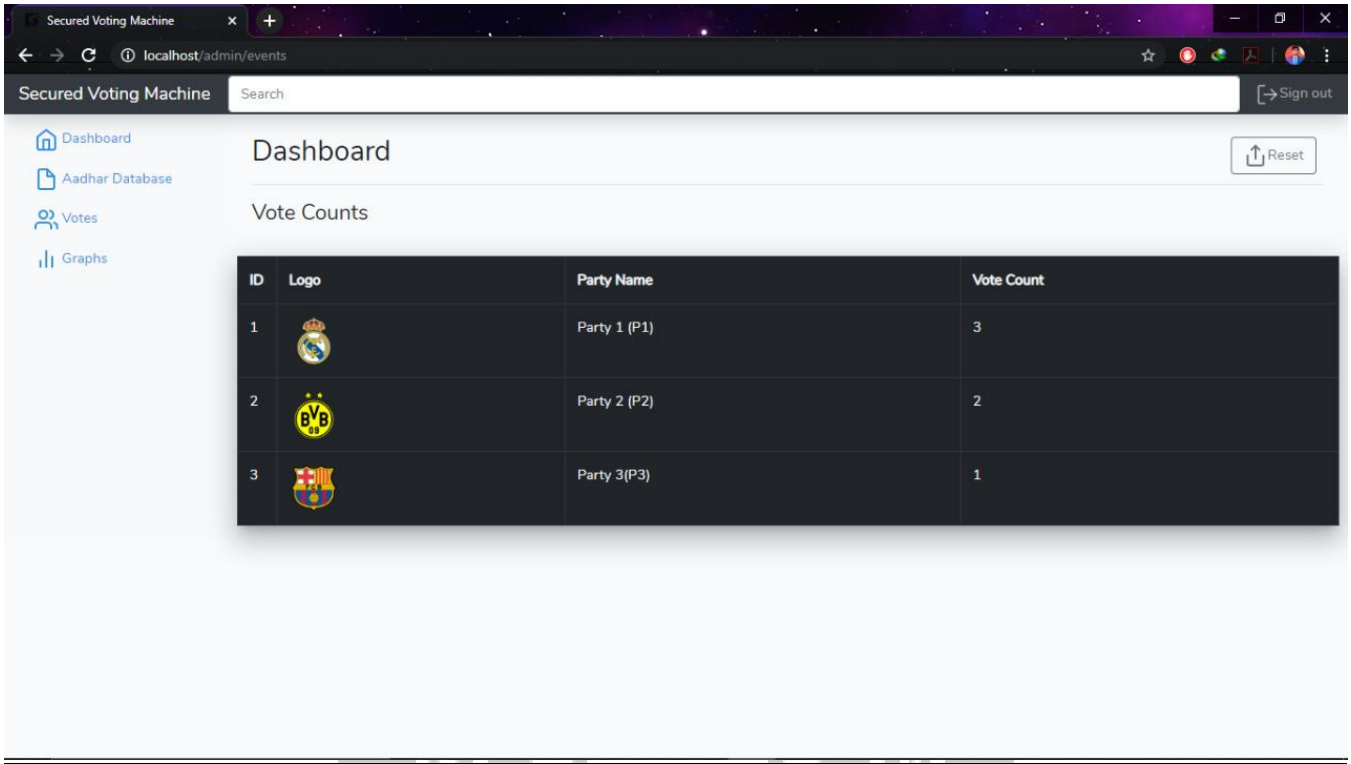
Below is the picture of the outlook or the first page of the website which has a Login Tab for the ADMIN to login to the website of this Smart Voting System. At the top Right Corner of the page we have a red box marked, that is the Login tab. If we click it, the login Portal is opened next.

After ADMIN logins to the portal he/she can see the dashboard containing the details like AADHAR Database, Vote Count and Pie Chart of the respective vote counts. All the tabs are on the left side of the page. Whenever the ADMIN clicks it, the respective part gets opened.

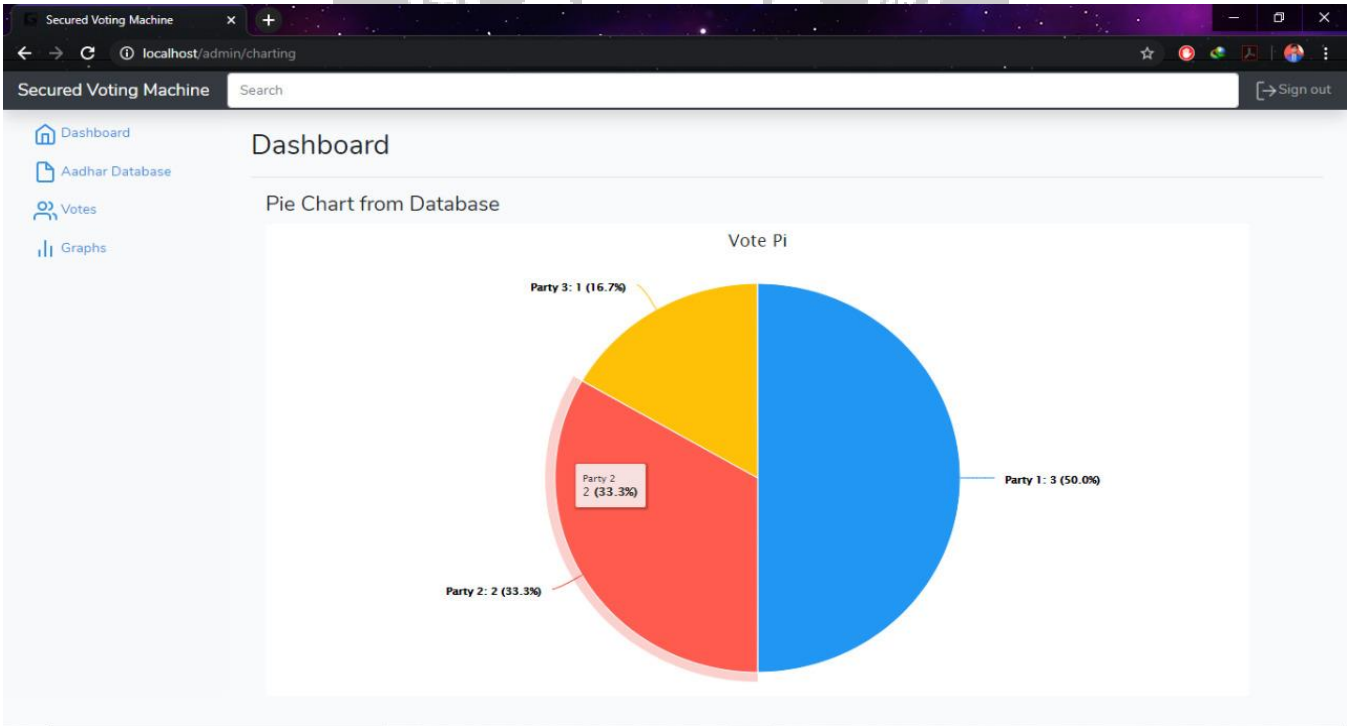




Above is the AADHAR DATABASE Details on the website



Above is the Vote Count details



Pie Chart of the Votes Given

4. SYSTEM SECURITY MEASURES

With the inclusion of biometric fingerprint sensor, each voter is entered into the system, after pressing the switch to vote a particular. In this process, there can be error in counting of votes or in some cases bring forth a system thatis secure,transparent, reliableaswellaseasyto useforthesystem.Secured Electronic Voting System Using the Concepts of Block chain that is the highly new concept to be design that specifically drop the errors involved in the manual counting process and the large time taken to holding the process and full completing the process A fingerprint authentication system is also added as an extra layer of security of this system.

For this purpose of smart digitalized system has to be occurred many different errors that is server-based errors, database based errors, system based errors and many others so for rectifying those errors have to design proper secured based system and identify and rectify these type of errors by the strong security of the system.

So, there are many types of security that is followed by database security, system security etc.

One of the most important technique of security is regression analysis.

4.1 DATABASE SECURITY

System security measure is meant to be provided to make the system reliable and secured from unauthorized user may create threats to the system. So, some security measures should be followed. Security levels in database level at system level have been used.

4.2 SYSTEM SECURITY

System security measures have been implemented with the help of maintaining the session throughout the whole system's use. Once the official has logged out then he/she will not be able to perform any task before signing back again.
A high level of authentic login is given to the system so this is a very tedious task to enter without authorization and authentication.

Moreover, the security measures have been already discussed in details in the previous sections of this report.

4.3 SECURITY IN LARAVEL 5

- **Storing Passwords:** Laravel provides a class called "**Hash**" class which provides secure Bcrypt hashing. The password can be hashed in the following way.

- **Authenticating Users:** The other main security features in Laravel is authenticating user and perform some action. Laravel has made this task easier and to do this we can use **Auth::attempt** method.
- **CSRF Protection/Cross-site request forgery (XSS):** Cross-site scripting (XSS) attacks happen when attackers are able to place client-side JavaScript code in a page viewed by other users. To avoid this kind of attack, you should never trust any user-submitted data or escape any dangerous characters.You should favour the double-brace syntax **({{ $value }})** in Blade templates, and only use the **{!! $value !!}** syntax, where you're certain the data is safe to display in its raw format.
- **Avoiding SQL injection:** SQL injection vulnerability exists when an application inserts arbitrary and unfiltered user input in an SQL query. By default, Laravel will protect you against this type of attack since both the query builder and Eloquent use.
- **Cookies – Secure by default:** Laravel makes it very easy to create, read, and expire cookies with its Cookie class. In Laravel all cookies are automatically signed and encrypted. This means that if they are tampered with, Laravel will automatically discard them. This also means that you will not be able to read them from the client side using JavaScript.
- **Forcing HTTPS when exchanging sensitive data:** HTTPS prevents attackers on the same network to intercept private information such as session variables, and log in as the victim.

4.4 REGRESSIONANALYSIS

Regression analysis is a form of predictive modelling technique which investigates the relationship between a **dependent** (target) and **independent variable (s)** (predictor). This technique is used for forecasting, time series modelling and finding the causal effect relationship between the variables. For example, relationship between rash driving and number of road accidents by a driver is best studied through regression.Regression analysis is an important tool for modelling and analyzing data. Here, we fit a curve / line to the data points, in such a manner that the differences between the distances of data points from the curve or line is minimized. I'll explain this in more details in coming sections.

Why do we use Regression Analysis?

There are multiple benefits of using regression analysis. They are as follows:

1. It indicates the significant relationships between dependent variable and independent variable.
2. It indicates the strength of impact of multiple independent variables on a dependent variable.

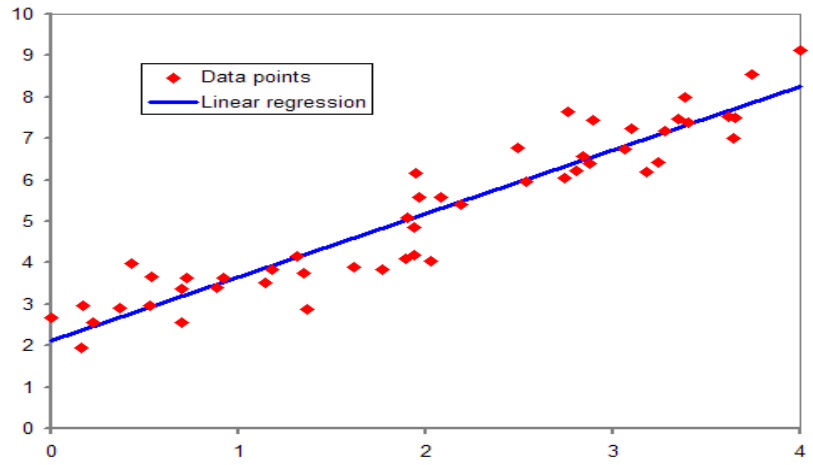
Regression analysis also allows us to compare the effects of variables measured on different scales, such as the effect of price changes and the number of promotional activities. These benefits help market researchers/data analysts/data scientists to eliminate and evaluate the best set of variables to be used for building predictive models.

Linear Regression

It is one of the most widely known modeling techniques. Linear regression is usually among the first few topics which people pick while learning predictive modeling. In this technique, the dependent variable is continuous, independent variable(s) can be continuous or discrete, and nature of regression line is linear.

Linear Regression establishes a relationship between one **dependent variable (Y)** and one or more **independent variables (X)** using a **best fit straight line** (also known as regression line).

It is represented by an equation **Y=a+b*X + e**, where a is intercept, b is slope of the line and e is error term. This equation can be used to predict the value of target variable based on given predictor variable(s).



The difference between simple linear regression and multiple linear regression is that, multiple linear regression has (>1) independent variables, whereas simple linear regression has only 1 independent variable. In the figure, the red points are the data points and the blue line is the predicted line for the training data. To get the predicted value, these data points are projected on to the line.

Uses of Regression analysis in System Security

Regression analysis is one of the main part of the machine learning to build a model, perfectly train the model with sample input and output and finally test the model with specific input and output, so after this preparing of model, it can be perfectly ready to predict the output, so it is one of the most important part of the data analysis.

The main two types of regression analysis those are mostly used are Linear Regression and Logistic Regression. Linear regression can be used when the nature of the predicting output is continuous and Logistic regression can be used to classify a data in a simplest way, it helps on boundary line

classification and for another type where the total space is divided for some small space to classify and predict the output that is called Decision Tree classification. For this

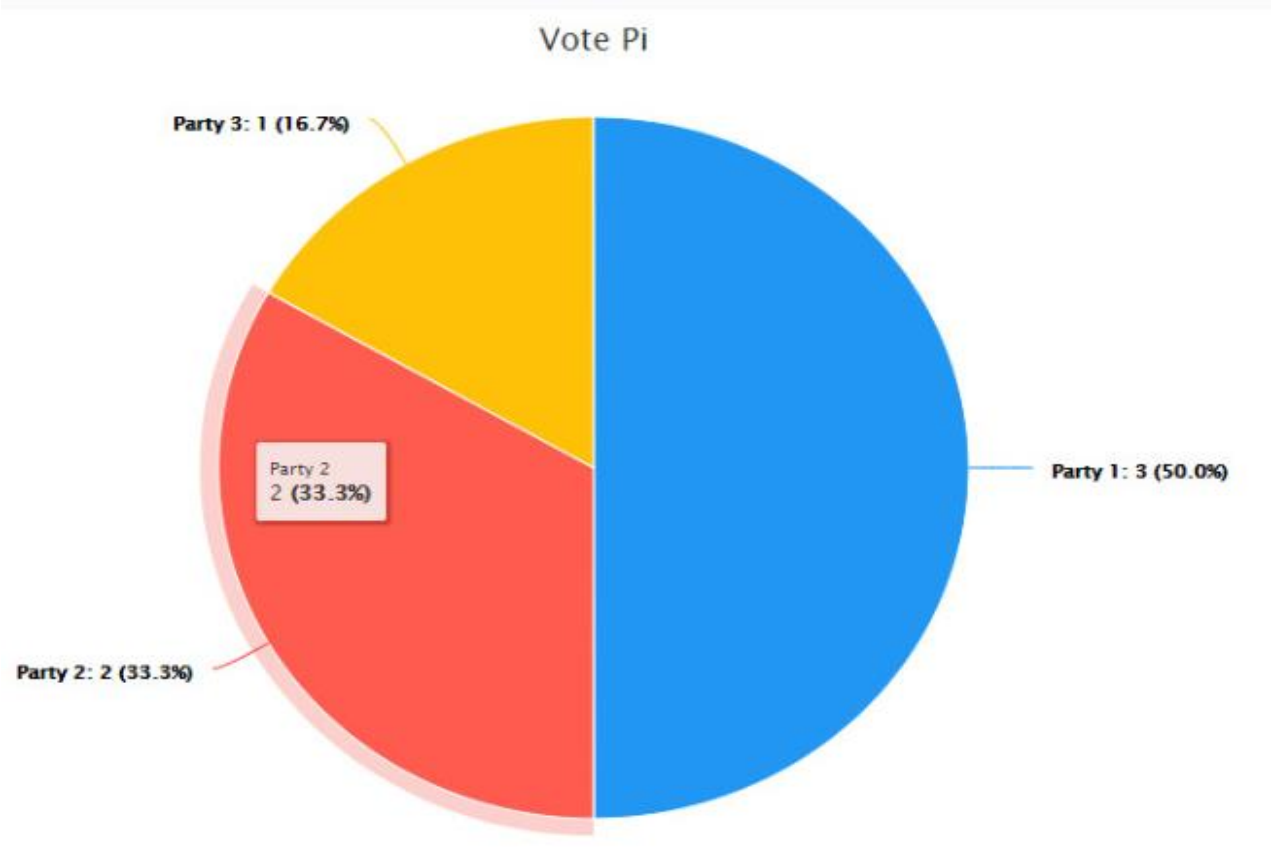
Calculating the standard deviation of the target variable using below formula.

$$\textbf{Standard Deviation} = S = \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$$

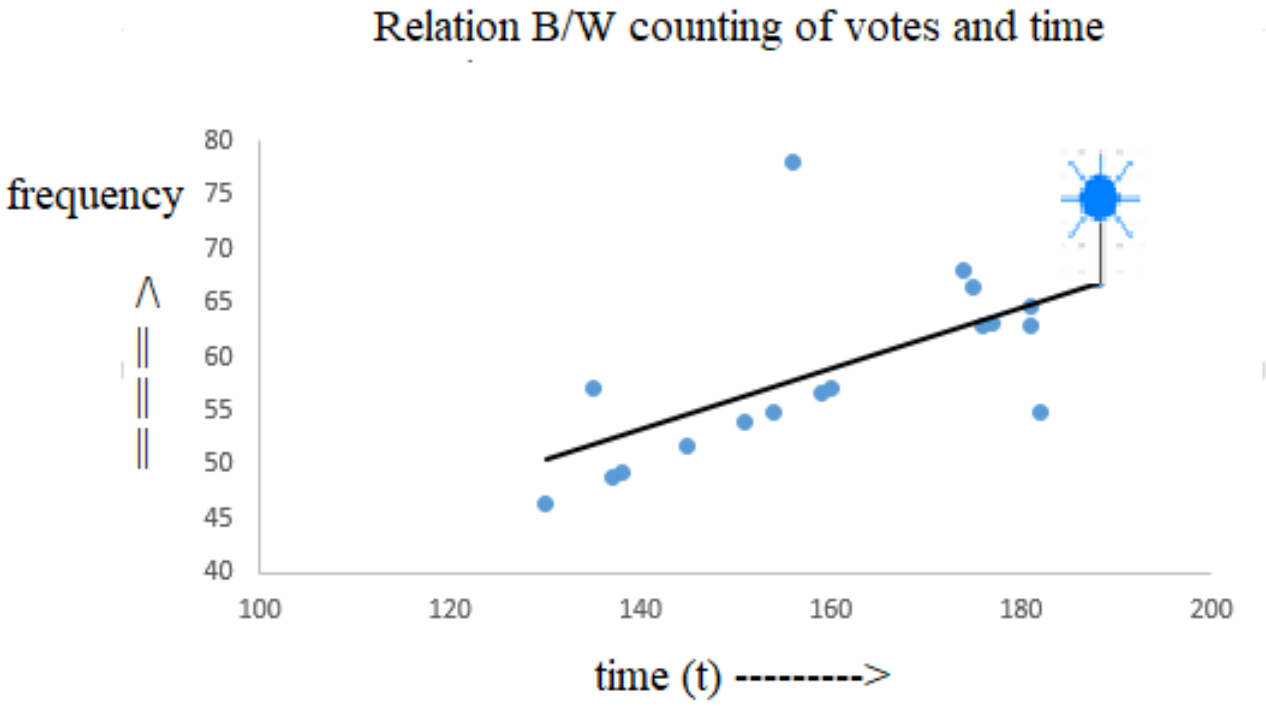
Splitting the dataset on different attributes and calculate the standard deviation for each branch (standard deviation for target and predictor). This value is subtracted from the standard deviation before the split. The result is the standard deviation reduction.

$$SDR(T,X) = S(T) - S(T,X)$$

Here in this project both type of regression analysis can be used. But here we use simply linear regression for the basis of data entry or submission of vote, to clarify this frequency the system automatically identifies the frequency of submission of vote for the particular time, by taking the responsibility of Admin to reach the police force at that time to control the situation.



Using multiple linear **regression analysis**, we can see that certain values precession input and output. Using multiple regression to investigate values predictive of **voters** in the system and maintain our voting **system**, immigration, and building a wall along the southern. From the showing pi chart on the database website the admin can understand the voting procedure and counting of votes and percentage of votes for the respective candidates at the particular time with clock timer due to the real time operating system. As because this system is ready to design for fully digitalized and reduce the main force to control and cover the voting procedure by whole day so for this reason here manual security is very less to communicate and maintain the whole voting process. All the security is enabled in built in the voting system to reduce the manual security. So here admin will show one linear graph besides this vote counting pie chart to continuous maintaining the frequency of submission of vote at a particular time of interval.So here for showing this graph and maintaining the strength of voting procedure that will be implemented on the voting system by this linear regression model to predict the output (vote count) of a particular input (particular time).



So here from this graph there is perfectly showing that how many numbers of votes are dropped at a particular time. Besides showing the pie chart this approximated graph will show from this graph admin can understand that when the frequency of votes is high so admin should take a manual security action for control this particular situation. So here to viewing this graph there is a target point, when the data that is counting of votes are reaches to this particular target point due to a particular time, at this situation graph will automatically blinking and buzzer message will be sent to the admin due to the real time clock. So, for facing this kind of situation admin will take an action as soon as possible for controlling this situation by the manual security.

5. PROJECT CODES

Some of the codes used in this project are given below:

FILE: Web.php

```
<?php

/*
|--------------------------------------------------------------------------
| Web Routes
|--------------------------------------------------------------------------
|
| Here is where you can register web routes for your application. These
| routes are loaded by the RouteServiceProvider within a group which
| contains the "web" middleware group. Now create something great!
|
*/
use App\Event;
Route::get('/', function () {
    return view('welcome');
});

Auth::routes();
Route::get('payment', ['as' => 'payment', 'uses' => 'PaymentController@payment']);
Route::get('payment/status', ['as' => 'payment.status', 'uses' => 'PaymentController@status']);
Route::get('/home', 'HomeController@index')->name('home');

Route::group(['as' => 'admin.', 'middleware' => ['auth', 'administrator'], 'prefix' => 'admin'], function(){
```

```
Route::get('dashboard', 'AdminController@dashboard')->name('dashboard');
Route::resource('events', 'EventController');
Route::resource('registrations', 'RegistrationController');
    Route::get('profiles', 'AdminController@profiles')->name('profiles');
    Route::get('exp', 'EventController@export');
    Route::get('reset', 'RegistrationController@reset');
    Route::get('charting', 'EventController@charting')->name('charts');
});
Route::post('/delete/{id}', 'EventController@destroy');
```

FILE: AdminController.php

```
<?php
namespace App\Http\Controllers;
use DB;
use App\User;
use Illuminate\Http\Request;
class AdminController extends Controller
{
    public function __construct()
    {
    }
    public function dashboard(){
        return view('admin.dashboard');
    }
    public function profiles(){
        $data = User::paginate(10);
        return view('admin.profiles.index', compact('data'));
    }
}
```

6. ADVANTAGES

- 2 Factor Authentications like Face ID or Biometric Fingerprint ID.
- Low implementation cost as only one server is needed for few polling booths in a sector.
- Fully offline and LAN based connections using Ethernet to the server using no WLAN, has no vulnerabilities to DDOS, DeAuth, Bruteforce, MITM etc.
- Machine will be locked if turned on out of its geolocation range.
- Machine will never work if rigging is attempted with fake servers by disconnecting the RJ45 as MAC Address is bound.

7. LIMITATIONS

- Aadhar linking to the Electoral Identity Card is necessary as the whole system is Aadhar based.
- Users must be able to put their Aadhar number in the panel.
- Aadhar image has to be updated before election for face detection.
- Very complex internal circuitry.
- If the machine has been tampered with, the machine will be locked and cannot be used further to collect votes until the manufacturer unlocks it.

8. FUTURE SCOPES

- Face Recognition can be added for extra layer of security. Face Recognition can be added for extra layer of security. A webcam would be placed to capture the image of those voters coming to cast their vote.
  Facial recognition is a category of biometric software which works by matching the facial features. We will be studying the implementation of various algorithms in the field of secure voting methodology. There are another extra levels of verification which will be use for the voters in our proposed system. The first is UID verification, second is for the voter card number, and the third level of verification includes the use of various algorithms for facial recognition.
  Here in our complete project there are already many level of high security. First id UIDAI number verification and then fingerprint verification which one will be valid on voter's ADHAR card then will be open the ballot panel to give the permission to voter and allow them to give their vote. So after these we are planning to develop our project with face recognition system and verify to the current database of Election commission.

- OTP based layer can also be added. OTP based layer can also be added.The one time password would be sent to their registered mobile no and after he/she successfully enters the no the evm machine will allow the voters to cast their votes. A one-time password (**OTP**), also known as one-time pin or dynamic password, is a password that is valid for only one login session or transaction, on a computer **system** or other digital device. So this one time password is a another level of strong security purpose for revoking the duplicity and proper identification of the particular voters with their mobile number.

- An Android app can be made for handling the queries and profile updates of the voters. An Android app can be made for handling the queries and profile updates of the voters.The app will aslo enable the user to lodge any complain against the authority.

9.CONCLUSION

This project report gives an in-detailed idea about the project and its objectives. The advantages as well as the limitations of the system and its impact on the environment and society, its utility and requirement in the human life and its features. The report focusses on all the aspects related to the project, starting from the brief idea of the election process to the use of technology, machinery and the designs. This Server Based Secured Voting Machine will surely give a technological remedy to the modern-day problems of corruption and rigging in the election procedures and will try to ensure free and fair elections with several layers of security.

Here, a smart and secured voting machine has been designed, which is basically avoiding all type of man force security and drop out all the kinds of ballot box, avoiding the counting of votes manually etc. Here the whole system is digitalized so at first starting from taking the respective votes from the voters to counting the votes, maintaining the security system all are done by the local server and finally the whole voting procedure will covered by the Ethernet local server so avoiding all type of man force to maintain this process and whole thing will be operated by only administrator to showing the graph and maintain this, so it is more simple and easy to be operated. From the deployment procedure, server setup, registration forms up to the database build-up, vote accepting procedure and the different layers of security – everything has been discussed in detail in this report thereby giving an in-depth idea about the project.

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