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AADHAAR ENABLED ELECTRONIC VOTING MECHANISM

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Abstract

Aadhaar based identification systems are gaining momentum and it is used in several authentication mechanisms. In many democratic countries, the electoral system is still in its juvenile stage and operating in a manual mechanism which consumes huge resources for every voting. In this work, we propose a mechanism which uses Aadhaar based identification to enable a voter to vote. The connection between the voting machine and Aadhaar database is fully secured and encrypted. To avoid intentional hacking, the whole system is computerized and does not require human intervention.

Keywords : Aadhaar card, Vote, Security, Manual intervention.

I. Introduction

Voting is a basic right of every citizen in any country which allows them to choose their leader [VII]. It is a method of expressing people's choice regarding specific issues, constitutional amendments and deciding their political representative who will lead them [II].

At present in India, the election procedure takes place in polling booths by using electronic voting machines. In this system, the voter has to pitch his vote by once pressing the blue button against the candidate and symbol of his choice [I]. But the main issue with this system would be the security risks. In addition to human error, there may be the possibility of hacking and even system failure [IX]. Thus, to overcome the issues faced in e-voting we proposed Electronic Voting Mechanisms using Aadhaar cards.

The main motive of this work is to establish a secure electronic voting mechanism by using Aadhaar card. Nowadays Aadhaar card is very essential and used for all the government's transactions/schemes because it has a unique identification number and it is also much more secure [V].In this system, a database is developed in which all the information about the people is stored in a personal Computer. The main function of this paper is enlistment and matching. During election, when the voter scans his Aadhaar, the formerly stored Aadhaar card details will be shown from the database and verifies whether the information of the person is matched or not. If the details are matched that means the person is eligible to cast a vote. Thus, this system includes secure voting by allowing the chance of voting only once so that the repetition of votes can also be reduced. After the completion of the voting process the number of votes casted till that particular time can also be displayed. Hence, if this system is used in an efficient manner, the elections would be held in an easier way and would be free from rigging.

II. Traditional System for Voting

In India, paper-based voting came into real world before the invention of electronic voting machines for the purpose of voting. In this paper-based voting system, voting is done by using ballot paper in the polling booth [VI]. People choose their favourite candidate by stamping the ballot paper with their favourite candidate name and symbol with a rubber stamp. Then the voter holds the paper and inserts it into a ballot box [III]. After the process of voting is finished votes are counted and the decisions are taken according to the majority of voting. This voting process is very hard to gather all the votes. Mistakes may happen while counting the number of votes. There may be a chance of adding fake votes and it is also a time taking process [X].

III. Existing System for Voting

To overcome the problems faced by the paper-based voting system the electronic voting machine (EVM) is implemented by the Election Commission to make the voting process easier. EVM consists of mainly two units, control unit and ballot unit which are connected by a 5m cable [IV]. On Election Day the control unit is carried by the polling representative while the balloting unit is kept within the voting compartment for the voters to cast their votes. When the person needs to cast his vote, his name is checked in the voters list [VIII]. After verifying the person's identity, the polling representative will press the button which will allow the voter to cast his vote, if not he/she is not allowed to cast the vote. Then the person casts his vote by pressing the button against his favourite candidate on the electronic machine [XI]. This process takes a huge time and is also not secure. The biggest problem of EVM is hacking. This hacking could be done by using physical tampering or remote. By using electronic voting machines there is also a chance of voting multiple times which leads to fraud voting/rigging [II]. So, to avoid rigging in elections, we proposed an Aadhaar based electronic voting mechanism.

IV. Proposed System for Voting

In this system Aadhaar card is proposed for voting during elections. Aadhaar card is a unique identification card used by an Indian citizen. As Aadhaar card consists of a unique identification number and a Quick Response (QR) code which is different for every individual, it is much secured compared to the existing system [V]. We can prevent rigging to the maximum extent by using the proposed method of voting. People can cast their vote by scanning the QR code which is present on the Aadhaar card in the polling booth. Generally, QR code consists of information related to the person who is going to pitch his vote. Once the person casts his vote he cannot vote again, through this fake votes and repetition of votes can be reduced. The proposed voting system is shown in Fig.1.

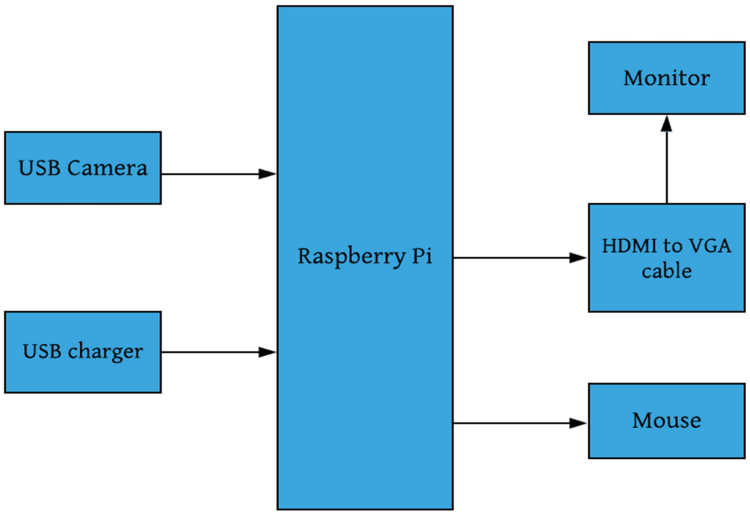

Fig. 1: Block diagram of proposed voting system

A. Hardware Requirements

Raspberry Pi 3B

Monitor

Keyboard

USB Camera

USB Charger

HDMI to VGA cable

B. Software Requirements

Raspbian OS

Python IDE

Open CV

C. Hardware Description

Raspberry Pi:

Raspberry Pi is a small credit card sized single board computer that was established by the Raspberry Pi foundation from the UK. It can be used for performing various operations at a time, like a normal PC, and hence it is called 'Mini Computer'. Raspberry Pi comes in different models, we use model B in this system. Model B consists of an Ethernet port which helps to connect with the other devices and used to access the internet.

Monitor:

In this system Monitor is used to display the information and image of a person. The process of voting is also done with the help of a monitor.

Keyboard: Keyboard is used to enter the data of a person/voter in the database.

USB Camera:

USB Cameras are the imaging cameras that use USB 2.0 or 3.0 technologies to deport the image data. In this system USB Camera is used to scan the QR code which is on the Aadhaar card.

USB Charger:

It is a power adapter that generates the power supply of 5V DC required by the USB. This USB charger is linked to the raspberry pi board.

HDMI to VGA Cable:

High Definition Multimedia Interface (HDMI) is a cable that combines the transmission of digital audio and video signals between devices. This technology is used with devices such as projector, DVD players. A Video Graphics Array (VGA) cable is used to join up an analog PC monitor to a PC OR laptop which is capable of transmitting only video signals.

D. Software Description

Raspbian Operating System:

Raspbian is a primary operating system provided by the Raspberry Pi foundation for the family of Raspberry Pi single-board computers. It is effectively used for the raspberry Pi line's low-performance ARM CPUs. Raspbian is a version of Linux built specially for the raspberry pi which runs on python language.

Python IDE:

Python IDE (Integrated Development Environment) is a tool designed for software development. This allows writing and debugging the code in an easier way.

Open CV:

Computer Vision (CV) refers to a process by which we can understand how the images and videos are stored. Open CV is an open-source library used for computer vision, machine learning, and image processing. By using it, we can perform operations on images and videos to identify objects, faces and even handwriting of a person.

V. Result

The developed system is presented in fig. 2 and it is having more advantages compared with the traditional and other electronic systems in the points of flexibility, accuracy and is more secured. During elections, rigging has been a common problem across the country. The EVM may be able to tackle some situations to a particular extent, but the issues of mistakes while counting votes, multiple times of voting and mismatch of ballots is tackled in this system. In the proposed system each voter is provided with a unique identification card i.e., Aadhaar card. In this system a database is developed in which all the information about the person is stored and during elections when the person scans his Aadhaar the system checks whether the information is similar with the information stored in the data base. If matched that means the person is valid to cast a vote. Thus, by adopting this technology, voting can be more secure.

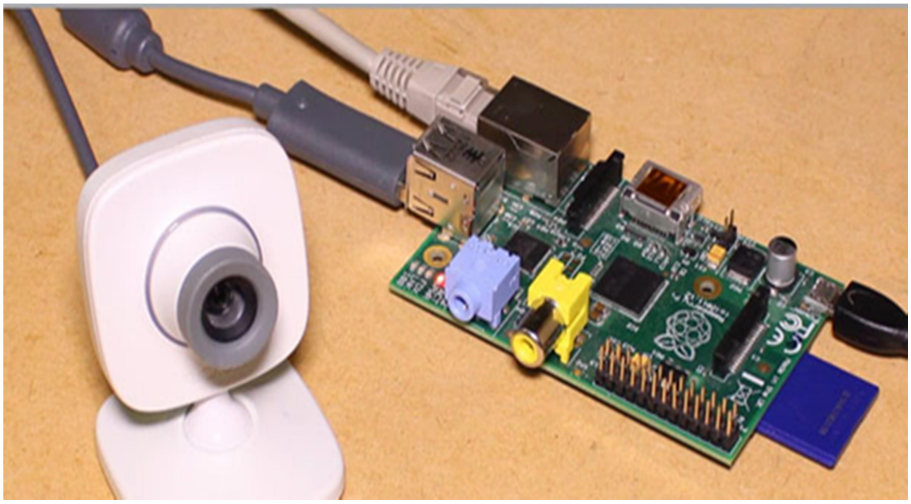

Fig. 2: Demonstration of proposed voting system

VI. Conclusion

This Aadhaar enabled electronic voting mechanism is mainly intended to develop advanced EVM which helps in free and fair way of conducting elections which are basics for the democratic country like India. The Aadhaar card detail makes a unique profile of the individual to keep up a key separation from false voting. So simply the qualified contenders can cast their votes. This endeavours in diminishing the man's work and enhances the security. This concludes that the Aadhaar based EVM will be useful

- To avoid election frauds.
- To reduce time consumption.
- To securely reserve the voters' information.

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