Online Voting System

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Abstract: *The project "Online Voting System" aims to simplify voting in any type of election. In India, presently voting is done either using ballot paper or with EVM machines. In the traditional Voting approach, Individuals are required to visit voting stations and cast their votes. People from various locations who don't have their voting cards are unable to cast their votes. Also, the user's validation is poor and inappropriate. Further, the conventional voting system involves a lot of manual work which is a time-consuming process. Therefore, to overcome the drawbacks in the existing system this particular system was proposed to mark our work much easier and to reduce wastage of time. This work deals with design, building and testing a online voting system that facilitates user (the person who is eligible for voting), candidate (Candidate are the users who are going to stand in elections for their respective party), Election Commission Officer (Election Commission Officer who will verify whether registered user and candidates are authentic or not) to participate in online voting. This voting system is highly secured and has a very simple, user-friendly, and reliable design. The proposed application is developed and tested to work on Ethernet and allow online voting. The user can register by giving his personal details and the image of his face which gets stored in the database presented at the central side. After the voting date is fixed and the user gets pop up notifications on his\her android phone via GCM (Google Cloud Messaging). After that the users open the application then the face authentication is done at server side using the OTP. If the user is a valid user, then OTP is sent to the user's mail address the user accesses the voting form using their OTP, casts their vote, clicks the submit button, and then logs out.*

Keywords: Online voting system, Voter authentication, Biometric identification, security, AADHAAR ID based online election

I. INTRODUCTION

The traditional voting methods are very time consuming and are more prone to human errors. The new approach addresses the drawbacks of the traditional procedures and also improves the performance of voting systems using Android application. The proposed system eliminates the trouble of voters having to go to voting booths and cast their votes. Whenever scheduled date notification via short message is received on the user's android device, the user can cast their vote from anywhere between the scheduled time. The proposed model will authenticate voters in a highly efficient manner because in order to cast a vote, the user must be registered. With the help of a Smartphone camera, a proposed model takes a picture of the user's face; if the current face is matched then the authentication is successful; otherwise, the user will be unable to cast a vote. This new voting approach allows every voter to use their right to vote from anywhere in the country. We provide a detailed description of the functional and performance characteristics of the online voting system. Voters can cast their ballots in a highly secure manner from anywhere in the nation without traveling to the voting stations. As a result, more people vote, this not only boosts the percentage of voters but also makes voting safe and reduces the threat of violence.

The existing manual Voting system consumes much time as voters have to spend a long time at a polling station to vote for the right candidate and have to go through the complex process. The election officials must first confirm that the voter is eligible to cast a vote in that particular booth, and then only they check the voter ID information that is listed on the booths' voter list. The voter will be able to cast their ballot in that booth once that information is available. All the work is done by paper ballot so it is very difficult to locate a particular candidate, some voters even cast their votes for all candidates. To overcome all these problems, we have implemented a web application which is much reliable, enables voting from anywhere and reduces the time and complexity for the voting process. The objective of this system

is a replacement of the traditional system that is in existence. In this system the voter username and password will be sent through SMS. The voter cast their vote and entered the confirmation OTP sent their mobile number. Database maintained by this system usually contains the Voters information, Candidate information and the final Result of total votes. Purpose of voting is to provide voters the right to precise their choice over specific issues, laws, citizen initiatives, constitutional amendments, recalls and/or on their government and political representatives. It has always been an onerous task for the election commission to conduct free and fair polls in our country, the largest democracy in the world. A lot of cash has been spent on this to make sure that the elections are rampage free. But, now-a-days it's become very common for a few forces to enjoy rigging which can eventually cause a result contrary to the particular verdict given by the people. In order to provide inexpensive solutions to the above, this project will be implemented with a biometric system.

II. LITERATURE SURVEY

This software is being developed for use by everyone with a simple and self-explanatory GUI. This is software that can be used by people to vote in an election. All the user must do is login and click on his favourable candidates to register his vote. The development and testing is done on Ethernet. While the online voting system has been an active area of research in recent years, the use of insecure Internet, well documented cases of incorrect implementations have been reported recently. These challenges are to be resolved so that the public should cast their vote in a secure and convenient way. Proposed online voting system is a voting system by which any Voter can use his/her voting rights from anywhere in the country [1].

A lot of practices are made to introduce the variations in electronic and online voting systems where different techniques and methodologies are used. Some of them guarantee confidentiality and security to the system to some extent, still the voting information and process need to be controlled and managed with advanced systems that will ensure and guarantee the security and privacy of voters and voter's information [2].

The Android phones take the image from the user and send it to the web service. The web service stores the image in the database. The web service executes the face detection algorithm which checks for Face validation [3].

The app has an easy-to-use interface "Login Screen" for voters where they can login with their Google account ids. Each voter's data is stored in a database containing their essential information such as Google account id, name, college roll number and a voting status which stores whether the voter has voted or not. After login, voters have access to the voting interface "Voting Screen" that allows them to select candidates for the given positions and submit their voting data securely. Once a voter submits his/her response, then re-submission will not be permissible. The complete voting procedure is under System Admin's control. Admin has to sign-in with the predefined Gmail id. After successful sign in, admin gets access to "Admin Screen" where options of enabling/disabling of voting lines and viewing results are available [4].

Secured Smart Voting System using Aadhaar is an App based Biometric online voting system, which determines whether a particular person is eligible for casting vote by authenticating his/her finger print. Voter details are retrieved from the Aadhaar Database and verified. Details about the casted vote are updated to the respective Database. They Have used Android Studio- It is the most popular, official and open-source platform for creating applications for all android Platforms and also used My-SQL It is a popular Software for Relational Database management systems and most importantly Aadhaar API-It enables identification of Aadhaar holders using biometric. This system provides the best possible solution to problems associated with the Indian voting system [5].

This system consists of an android application for voting. This application contains a block of voter ID for log-in of voters. Also, an android application contains a camera feature for taking the face image of the user for face detection and recognition. Local server use for AOVSAD system is an XAMPP server. XAMPP Server is the part of AOVSAD system where process of face verification takes place. OTP is used to verify the true voter for avoiding the fake votes. We have designed an Android application which has to be used as a GUI for voting systems. We have used OTP as an authentication in the application [6].

This is an automated system. It will be a secure system because users can vote only once as the database will not accept more than one vote per user as all the details of the eligible people will be stored in the database. The Online Voting

Platform offers clever tickets, brilliant Agenda highlights, vote counting, classification and revealing. These capacities are programmed and don't be doled Out to faculty in-house [7].

System consists of three phases namely, Registration phase, voting phase and Tallying phase, This System Has been designed to overcome significant drawbacks in the current voting scheme. They have proposed an internet based voting system that claims to have several advantages like reduced cost, less overhead, great voter's turnout [8].

It mainly focuses on the voting system. That will enhance the voting more secure and authenticated in Future. System is a multi-purpose Platform independent system which can be used by any Organization and government to conduct the elections. Will work on any operating system be It android or IOS using the QR code and OTP (one Time password functionality embedded in them) [9].

A unique Aadhaar identity is the center point of our proposed model. It leads to the easier verification of both voters and candidates. This Aadhaar Identity number is unique for every citizen or voter of India. This Aadhaar Identity number has been introduced by the government of India and this also recognizes the constituency of the voter. But the registration of the voter should be completed only after the verification of all documents by the field officer. The officer also verifies the Aadhaar Identity Number from the main Aadhaar card database. After completing verification, the registration of the voter should be complete and the voter will get an auto generated e- mail which has all the information of the voter with the system generated password. The Voter can use this password for login and he/she can also change the system generated an old password. Voters can also set the verification keys to ensure security. There should be restricted use of only virtual/on screen keyboard to type password or to change password. Main purpose of using a virtual/on screen keyboard is to stop capturing passwords, if a voter changes his/her password from some public place. [10].

From the time it takes to the current technological development, there are online voting systems. That was clarified in this document. Develop voting plans to make more efficient voting services available with ICT resources than traditional paper-based voting methods. Voters regard themselves as consumers and it is expected that the government will make the voting business more convenient. In the past decade, various forms of electronic voting, especially as additional methods of voting for remote voting, political parties, candidates, the electoral administration, and most importantly to improve the efficiency and promise of the democratic process to the. The electorate has attracted considerable attention [11].

Remote systems that allow voters to vote from any computer connected to the internet - typically at home or at work. As well as via PCs, home internet voting could be through digital TV or even mobile phones or games machines. Remote internet voting might be used to replace poll site voting entirely, or it might be used only for absentee balloting. The dramatic impact of the internet has led to discussions about the relation between e-democracy and online voting. Some early enthusiasts declared that the internet could replace representative democracy, enabling everyone to vote on everything and anything at the push of a button [6]. Such visions oversimplify the democratic process. Others have argued that e-voting could reduce costs and increase turnout by making voting more convenient [12].

Clarifying the research objectives is the most crucial aspect when conducting a review. Generally, in this study, the objective is to study usability issues in e-voting of different researchers. The specific objectives are as follows: 1. To study the metrics used by researchers to evaluate the e-voting systems; 2. To study and evaluate the e-voting devices and interfaces used in e-voting systems to enhance security and reduce errors; and 3. To determine how the e-voting organisms can assure the refuge of the voters. Mobile devices, like mobile phones, have been used in some elections as an e-voting device. It replaces the polling stations. Study by depicts that incomparing mobile voting systems and non-mobile voting systems, the mobile voting system is slower than the non-mobile devices [13].

This app also ensures that the option is anonymous, when they log in each user is assigned a single and random id, which cannot have any ties to any user details, so there is no point in specifying that the user voted for that candidate. The focus is more on knowledge visual illustrations, and no free links are used, the interface is made as easy as possible with only basic functionality. The Steps to use the device are: 1) Scan your fingerprint and the application can match it with the info at the server. If the match is booming, the user is mechanically switched to succeeding Voting window. 2) The ballot screen has all the logos and names of candidates standing for the post, the user simply must press the vote link next to his/her favorite candidate. If any user does not want to select any candidate for any reason, then he/she may

directly log out exploiting the logout possibility. 3) Auto-logout feature takes care of the remainder once a vote has been placed and the main login screen is restored [14].

A lot of practices are made to introduce the variations in electronic and online voting systems where different techniques and methodologies are used. Some of them guarantees the confidentiality and security to the system at some extent, still the voting information and process need to be control and manage with advanced systems that will ensures and guarantees the security and privacy of voters and voter's information.[15]

A new platform for secure votes and voting is the online voting system. Online voting systems are a web-based voting system, which transmits votes via a web browser over the internet. Voters from all over the world are eligible to vote online. Security issues arising from online voting are as follows: In general applications, password protection is high and phishing attacks are not the focus of the application. Website users are not protected efficiently from phishing. The key proposal for ensuring a secure online polling protocol to meet privacy, anonymity, eligibility, equity, verification, and unique online voting safety requirements. To achieve reliability, eligibility, transparency, accuracy, and uniqueness of the e-vote system, two millionaires couples have created secure online voting for identities based on cryptographic algorithms. A secure, end-to-end verifiable, Identity-based blind signature Internet voting system: IEEE, newspapers, 2020. This document has amended early vote, elliptical curve cryptography, verifiable end-to-end digital signature, Internet vote system. Batch venerability. Functional digital signature used by the BLS short signature system to protect voting against any changes anonymously to issue a blank ballot to voters. Future of voting: Specifications and feasibility study of verifiable Internet vote from end to end [16].

This software is being developed for use by everyone with a simple and self-explanatory GUI. This is software that can be used by people to vote in an election. All the user must do is login and click on his favorable candidates to register his vote. The development and testing is done on Ethernet. While the online voting system has been an active area of research in recent years, the use of insecure Internet, well documented cases of incorrect implementations have been reported recently. These challenges are to be resolved so that the public should cast their vote in a secure and convenient way. Proposed online voting system is a voting system by which any Voter can use his/her voting rights from anywhere in the country. Online voting system contains: a) Voter's information in the database. b) Voter's Names with ID and password. c) Voter's vote in a database. d) Calculation of the total number of votes. Various operational works proposed in the system are: Recording information of the Voter in the database. Checking of information filled by voters. Discard the false information. Each information is sent to the election commission [17].

To make the voting process very easy and efficient wireless and web technologies are used. The online- voting system has the possibility of a secure, easy and safe way to capture and count the votes in the election. The author in online voting system based on Aadhaar id uses Aadhaar id as key of authentication, system is efficient in terms of time and provides security the system is great improvement over traditional system but the main problem resides in this system is that of authentication, the authentication technique used is not that efficient as biometric is not used. The paper Secure Authentication for Online Voting System" presents non traceability and integrity of the votes, smart card has been used to avoid multiple votes casted by users; biometric is being used for authenticating voters. The author has introduced smart cards for biometric identification and voter id cards to be used at the time of casting vote. They are using smart cards and voter id cards at the time of election which is not feasible as anything can happen to those cards thus relying completely upon cards is not a good idea. And the use of various cards makes the system costly now each and every voter needs to have these additional cards. Also, it may take a reasonable amount of time to generate so many cards [18].

All voting system generated priory though have met various features, which a voting system may consists but the main problem one could find in this system is that little "online" word, despite all techniques they have used to make the system robust there is always a chance of malpractice when your system is online. In an online voting system powered by biometric security the author has used personal identification number, thumb impression and secret key altogether for authentication of the voter. Techniques such as cover image creation, secret key expansion have been used for securely sending data to servers and then further authenticating voters. This system is quite robust; it takes care of authentication as well as security of voter's data stored in the server. The main problem with such systems is that despite using various security techniques they won't be able to manage such a huge amount of data that they may encounter during election periods their system is online and they may face congestion during casting votes [19].

To offer an online election system, it was necessary to study the current computerized voting system or voting machines working in different countries. Many developed countries USA, Australia has already adopted an online Election system [20].

III. PROPOSED SYSTEM

Here we are proposing an android application for the voting process that is an Online Voting System through SMS. The online voting system will manage the voter's details, Candidate details. The main feature of the project includes voter information and candidate information; voters can login and use his/her voting rights. The system can manage the information data very efficiently. The proposed system is more reliable, faster, accurate and easy to handle compared to existing manual systems. It helps to computerize everything and reducing the errors as compare to manual voting system

This proposed system consists of 3 main modules, which are listed below.

1. **ADMINISTRATIVE MODULE:** Online Voting is a voting system by which any Voter can use his\her voting rights from anywhere in India. Online voting for association contains-: Voter's information in database. Voter's Names with ID. Voter's vote in a database. Calculation of total number of votes Various operational works that are done in the system are: Recording information of the Voter in Voter database. Checking of information filled by voters. Discard the false information. Each information is maintained by the admin.

2. **NOMINEE CANDIDATE MODULE:** The Nominee details will be updated by the admin for the post of board of director and manager. The candidate will submit their own details and the admin maintains all of the background details of the particular nominee and uploads their information in the correct procedure. In order to, the user or voter can view the nominee details.

3. **USER/VOTER MODULE:** The user after their registration only can login for voting. The user will view nominee details with their image before they can vote. After knowing the nominee details the user can login for voting. They should vote for the board of directors and the manager in the association. The count will be taken for each voting. After voting the particular person/user cannot logon to vote again
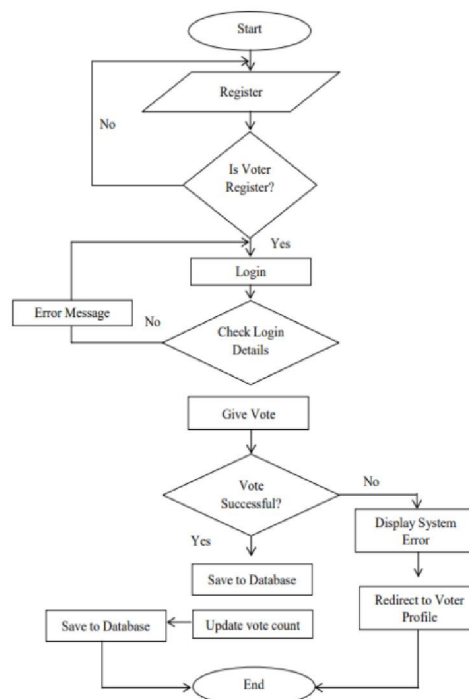
IV. METHODOLOGY

Fig. 1. Flowchart of the system

The system development followed the Waterfall software development life-cycle to develop a complete system and test it. Requirements of the proposed system were gathered from various literature reviews on the online voting system. The designs of data, workflows, user interface flow of events were determined by analysing data requirements and end-user workflow. Features expected by administrative users and voters were implemented in Android platform respectively. Various libraries for implementing hash algorithms were used. Finally, sample data were used to conduct experiments and end-user testing.
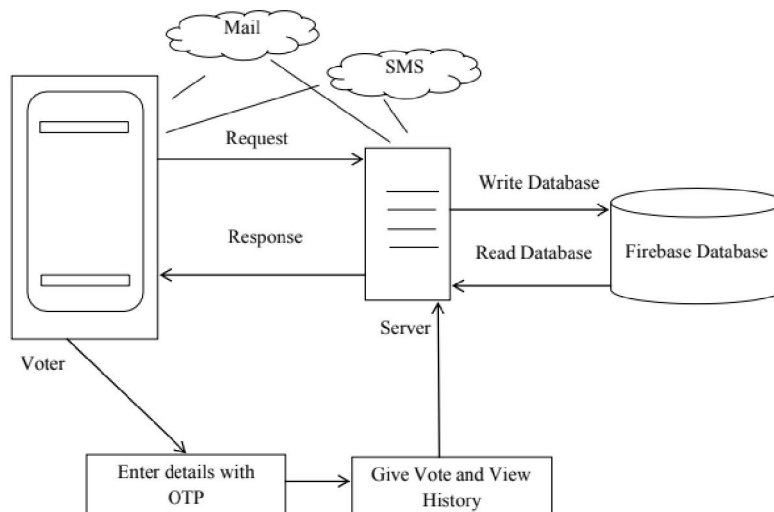

Fig. 2. Architecture of the System

V. CONCLUSION

In conclusion, online voting systems represent a promising solution for enhancing the accessibility and convenience of the electoral process. The online voting systems can bring about significant advancements in the way elections are conducted. These systems have the potential to increase voter turnout, provide more accessibility to voters, and reduce the costs associated with traditional voting methods. Furthermore, the online voting system can enhance the transparency and accountability of the election process, as it allows for easy verification and audit of the voting results. However, it is important to ensure that such systems are designed and implemented in a way that guarantees the integrity and confidentiality of the vote and maintains public trust in the democratic process. With the right measures in place, online voting systems have the potential to revolutionize the way we conduct elections and ensure that every citizen's voice is heard.

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