To Predict a Novel and Efficient Online Voting System to be used in current voting scenarios for effortless conducting of voting in democratic system

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Abstract: With a population of more than 1 billion, India is the world's biggest democratic country. Hence, voting is considered a bridge between the government and the governed in a country of such large economy. The voting systems, where focus is maintained on the paper based voting processes, consists of many loopholes in the management and security of the voting process. Hence, the introduction of the Online Voting Systems can greatly solve many problems and speed up the election system, increasing the speed, intelligibility, accessibility and transparency in the voting process**.** This system is more reliable for the voting process as the system will provide the desired comfort for voting process along with the security factor to the voters. The system easily bypasses the current lengthy process of voting which makes the voter spend un-necessary money and extra time for the process. This paper focuses on the various aspects in which the online voting system improves the voting process over the paper based voting while taking into account the existing optimization techniques and enhancing the security and accessibility of the existing voting paradigm.

I. INTRODUCTION

One basic feature of democracy that cuts across all divides of people is the act of election. Democracy thus encourages individual freedom according to the rule of law, so that people may behave and express themselves as they choose. This not only gives people a chance to choose their leaders, but also to freely express their views on issues. With the passage of time, voting, which was mainly manual, has been influenced by Information Technology, with debates arising about the relevance or not, of computerized/online voting [2][3]. Nevertheless, it is impossible to completely rule out the need for technology and electronic voting, with the growing number of eligible voters and manual ballot papers involved [1][4]. The project is to develop an Online Voting System (OVS) based on the latest optimization techniques to implement a more secure and authenticated application for voting.

OVS is a Direct Recording Electronic Voting System which provides a platform for simplifying the electoral process for all institutions that employ voting in decision-making. OVS has several security requirements like access control, as well as user authentication incorporated into its design structure, making it not only secure and reliable, but also resilient. OVS also provides for user-friendly graphical interfaces and tools which make voting easy and enjoyable, because it equipped with security measures that range from the application design to implementation, management and monitoring.

Depending on the particular implementation, e-voting may use standalone electronic voting machines (also called EVM) or computers connected to the Internet. It may encompass a range of Internet services, from basic transmission of tabulated results to full-function online voting through common connectable household devices [5]. The electronic voting machines are intended both to reduce errors and to speed the counting process. Advantages of EVM over the traditional ballot paper/ballot box system include eliminating the possibility of invalid and doubtful votes which, in many cases, are the root causes of controversies and election petitions, making the process of counting of votes much faster than the conventional system, reducing to a great extent the quantity of paper used thus saving a large number of trees making the process eco-friendly [6].

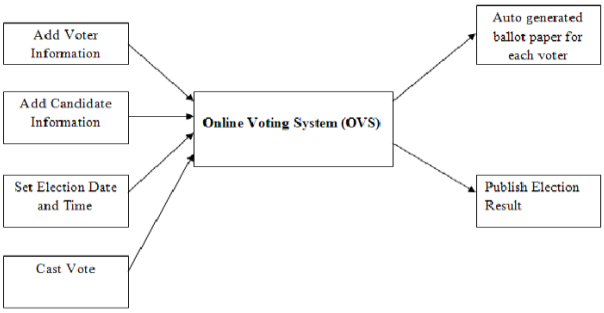

Fig.1 The Online Voting System Paradigm (OVS)

This voting system works in the manner as explained in Fig.

1. The OVS consists of the voter information and candidate information. The OVS sets the date for election and when the voter casts a vote, the election result is calculated and published [7].

II. LITERATURE REVIEW

Recently used Indian voting system is an electronic voting system. The voter availability not being compulsory creates a drawback for the voting system. So online voting system is the solution for this drawback voter can be voting the candidate for everywhere from specified Election Day and date [8]. Jambhulakar, Chakole and Pradhi [9] proposed a novel security for online voting system by using multiple encryption schemes. Provide security for cast vote when it is submitted from voting poll to voting server. Multiple encryptions to avoid DOS attack. Security provide submissive as well as active interloper. This system is to take a judgment of certain issues. This paper use cryptography concepts to take pros of digital signature. Encrypting the send forth vote to client server then send to voting server with the help of net. After sending encrypted vote then server side decrypt the vote before counting.

On server side decryption of that vote is done before counting. We require two keys for this purpose one for encryption on voter system, which should be publicly known and second key for decryption of encrypted vote before counting on voting server, this key must be private. So for this purpose we need a pair of asymmetric keys.

Shridharan [10] implemented three models such as, Authentication model, franchise excising model, distributed database and central server model. In authentication model voter with smart card and voter identification number and also gives the biometric information this all information is used in future election voting process. After verification and validation voting interface means candidate name and sign are displayed, this is verified by vote casting database, and then votes are counted and declared the result. In this system security and traceability also ensures to auditing the vote and voter information.

Himanshu Agarwal and G.N.Pandey [11] proposed aadhar id based online voting system for Indian election is proposed for the first time in this paper. The proposed model has a greater security in the sense that voter high security password is confirmed before the vote is accepted in the main database of Election Commission of India. The additional feature of the model is that the voter can confirm if his/her vote has gone to correct candidate/party. In this model a person can also vote from outside of his/her allotted constituency or from his/her preferred location. In the proposed system the tallying of the votes will be done automatically, thus saving a huge time and enabling Election Commissioner of India to announce the result within a very short period.

K. P. Kaliyamurthie1, R. Udayakumar, D. Parameswari and S. N. Mugunthan [12] The aim of this paper is to people who have citizenship of India and whose age is above 18 years and of any sex can give their vote through online without going to any physical polling station. Election Commission Officer (Election Commission Officer who will verify whether registered user and candidates are authentic or not) to participate in online voting. This online voting system is highly secured, and its design is very simple, ease of use and also reliable. The proposed software is developed and tested to work on Ethernet and allows online voting. It also creates and manages voting and an election detail as all the users must login by user name and password and click on his favorable candidates to register vote. This will increase the voting percentage in India. By applying high security it will reduce false votes.

Gianluca Dini [13] this proposed system is based on replication and tolerates both benign and fully arbitrary failures of servers. If enough servers are correct, service availability and security are ensured despite the presence of faulty servers and any number of faulty voters. A voter that suffers a crash failure can vote after recovery. The proposed service satisfies common voting requirements including voter eligibility and privacy, and tally accuracy. In addition, the service satisfies a further important requirement, namely tally verifiability without any intervention of voters.

III. OBJECTIVES OF STUDY

The various objectives of this system are:

1. Study about current research for optimization of existing voting paradigm.
2. Enhancement of security of the existing voting system by implementing current research oriented techniques.
3. Enhancing the voting system accessibility for different users.
4. To develop a secure user interaction system to be used for voting system.

IV. SCOPE OF STUDY

In a democracy, the electorate expresses its will through the election of representatives. These elected representatives operate the country, on behalf of the politic body. In order for the representatives to appropriately represent and implement the demands of the people, the elections in which they are elected must be held fairly and results computed accurately.

Observing the history we deduce that Polling Systems based on hand rising had just a problem with security (elections were not anonymous). Instead a Paper- based Polling System has at least three problems (discussed below). The paradigm shift from hand- based polling system to paper- based polling system is caused due to population growth whereas, now, time and safety are so important that it has driven a new paradigm shift from paper to electronic. There is no defendable reason to stick with paper polling system, but there are many security reasons to encourage the use a new electronic polling system in order to draw up polling systems to digital era.

In India's current paper polling system, there are some other troubles as well apart from low turnout of votes, by looking at those problems, it is necessary to build a system which could solve those problems and speed up the election system [14].

1. **Speed**: Hand counting votes is time consuming especially in most populated countries like India, where many candidates are for same position and voter has to cast vote for many races.

2. **Intelligibility**: When a system based on pens, stamps, punch cards or ballot papers is used for voting in a paper- based polling system, the result can be ambiguous.

3. **Accessibility**: Disabled or duty- bound people do not have an easy access to the poll booth, but an easily touchable system will help them to cast their vote.

4. **Transparency**: Chances of manipulation of the results from influencing authorities will almost be finished.

V. PROPOSED SYSTEM

The proposed e-Voting system is expected to exhibit certain features and quality attributes [15][16][17] listed below:

1. Methodology of Working:

Physical ballots can be lost or destroyed before tabulation [18]. So, the complete process of working of the voting system shall be systematic. The data shall be properly stored and maintained in the database server, which will help in faster retrieval of records upon need. Also it will make the storing of information process efficient and faster.

2. System Efficiency:

The accuracy shall be maintained in the proposed system and the level of the accuracy shall be high. All operations done correctly shall be again verified to ensure accuracy of the system working process. This will lead to maintain the accuracy quality factor.

3. Improved Authentication:

The system shall be highly reliable due to the reasons stated above. The reasons above make sure that the system becomes authentic and very much efficient. The proper storage of necessary data and information is the main reason behind the increase in the reliability of the system. The system shall be made sure of resisting any sort of system failures so that there is no loss of data collected from the voters.

4. Reducing Redundancy in the System:

Utmost care is taken in this proposer voting system that no information is duplicated or manipulated in the storage or otherwise. This would make sure of the economic use of storage space and consistency in the existing data and newly fed data. A single unique voter would not be able to cast a vote more than once. This makes sure that there is no duplication of votes.

5. Usage of Remote Systems for Voting:

This feature is the heart of the system. This is the feature that enables a voter to vote securely from anywhere without moving to a voting machine. The voter can cast a vote by either using the website through a personal computer or a laptop else the voter can also use the android application that runs on the android powered smart phone. A voter can have exactly one login instance irrespective platform i.e. android app or from website.

6. Privacy of Voter Identity:

In the proposed system, no person would ever come to know whom a voter voted to. Each voter will have his own authentication user id and a password. The complete data from android device to web server shall be encrypted resulting in the greater security of the complete system.

7. Usage of User Interface in an Interactive Way:

The user interface of the system shall be completely user friendly and very interactive. The interface shall be so interactive and easy to use that the system will have a very high factor of usability quality attribute. This will make sure that a new user shall be able to handle the system very easily and get used it in no time. Usability shall be maintained throughout the system, be it the website. The voter is encouraged by the ease of the new voting process. It will increase the participation in elections.

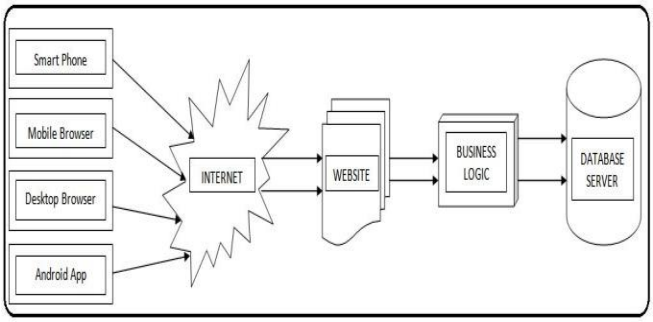

Fig. 2 Block Diagram Of (3-Tier) Architecture Of The Proposed System

As the Fig. 2 depicts, the system will consist of a website which can be accessed through any web browsers on both the desktop computers, laptops and the smart phones. The website can be accessed only if there is an active internet connection. All the business logic is saved in the business tier. Basically the architecture used is a 3 -tier architecture. There is a separate data layer which forms the 3rd tier of the system. It contains the database information and data is stored and retrieved from this database as and when needed. There shall be the following pages in the system:-

a. Login / Registration Page
b. Display Candidates Page
c. Vote Page
d. Acknowledgement Page
e. Results Page
f. Help Page
g. Contact Us Page

The pages listed above are common for both the website and the android application. The navigation throughout the

pages shall be very quick so that the session timer would not become a problem [19].

Session Timeout shall be designed to run in the system that will make sure that there is no misuse of the account, in case the authentic voter has left it open. As soon as the voter logs into the account, the timer shall be enabled and the session expiry countdown shall be running behind. If casting of vote is not recorded in time then the respective user may once again log in to the account using the authentic credentials and the same process repeats.

Help section is provided in the system that will make sure that the voters are comfortable in understanding the process and the help section shall be made available even when the election windows are closed. Results page shall also be made available once the voting window closes after the voting process so that all the registered candidates shall be able to see the results of the elections in the portal itself. The results shall be announced or published on the website within a couple of hours as the vote counting system is computerized and hence there shall be no chance of occurrence of any kind of mistakes in the results.

The system includes a One Time Password type of PIN number [20] system that makes sure that the voting process generates the one time password which is sent to the voter before finally casting a vote. This makes sure that there is no misuse or manipulation in the voting process and there are no compromises at all.

VI. CONCLUSION

This paper has successfully made an introduction to a new and efficient design of electronic voting application for the process of voting using the web-based platform. This system is more reliable for the voting process as the system will provide the desired comfort for voting process along with the security factor to the voters. The system easily bypasses the current lengthy process of voting which makes the voter spend un-necessary money and extra time for the process. It can efficiently handle the post-voting procedures like accuracy in counting the votes, generating proper and accurate results of the elections, displaying the results within a couple of hours post the election process and to make sure there is no compromise in the system. One Time Password feature makes sure that there is no misuse of the system during the process of voting and hence the system is highly reliable.

VII. FUTURE SCOPE

As one of the most hotly contested debates in information technology policy, e-voting has generated an immense amount of interest in the discussion of technology, security, legitimacy, turnout, and numerous other topics related to voting policy in this country and around the world. E-voting has spurred many projects, websites, weblogs, and other organizational structures filled with a wealth of information about e-voting. Electronic voting proves to be a promising alternative to paper ballots where we can provide a more optimized and secure system for the voting processes.

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