ISSN No. 0976-5697

Volume 7, No. 7, Nov-Dec 2016

International Journal of Advanced Research in Computer Science

RESEARCH PAPER

Available Online at www.ijarcs.info

Remote Voting system in India: A futuristic Approach (Based on analysis of existing online voting system)

Anooja A
Assistant Professor (CS), Department of Computer Science, IM&CS, NIMS University, Jaipur, India
Sourabh Munjal
Assistant Professor (Management), Department of Management, IM&CS, NIMS University, Jaipur, India

Abstract: Some Countries are casting votes over the Internet. Online voting system can be a best alternative for election and they must provide the security as paper based elections. This Research deals with designing and building an online voting system. This online voting system is highly secured and its design is very simple ease of use and also reliable. It built and manages voting and election details as all the voters must login by inserting their verified user id and password then they can choose their desired candidate to cast vote. Citizens living abroad cannot vote because of physical absence in voting station but this voting system will also lead to increasing the voting percentage of abroad voters. My research focuses on security analysis of its previous uses and technological risks and will also review the existing technology of remote online voting and assess the security risks.

Keywords: OVS, Database, Voting, Security, Integrity.

INTRODUCTION

The online voting system is for the citizens from all over India--

- The database of the Voter's information and details
- Voter Id Card
- Calculation of total casted votes
- Checking information by the voter
- Store accurate information
- The data transfers to Election Commission.

Through OVS people can vote through internet with/without going polling booth with securely and efficiently. Online registration process will start before the one month of election for avoiding the rush and Unique Identification Digit is basic requirement. Blocking feature for un-authenticate access through UID and registered mobile number. Voters can give vote from anywhere but not more than once.

Scope:

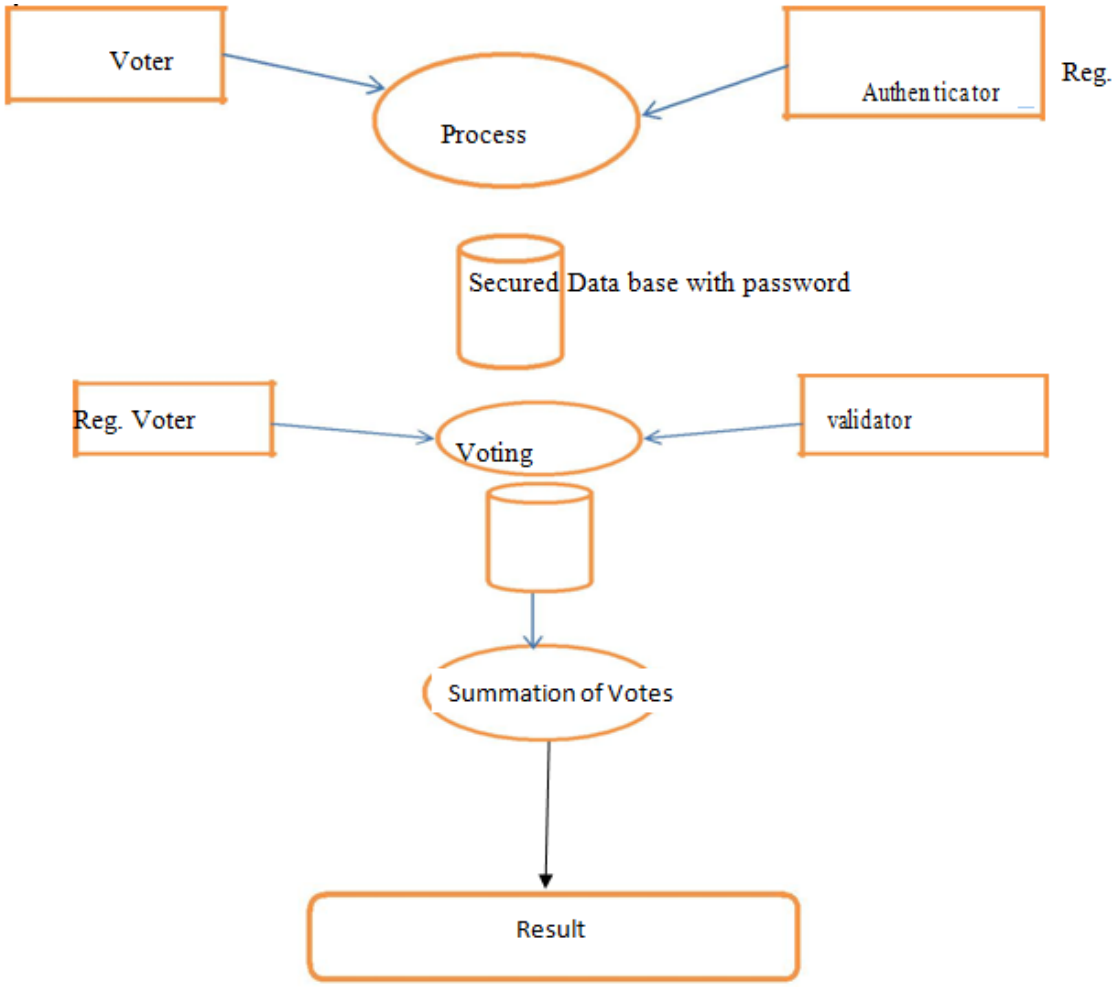
A Scope survey shows general election polling system failed because voters queuing outside polling stations, handicapped people struggling for their right to vote. Indian missions do not have enough resources and time to organize voting and to mail paper ballots abroad and get them back in time for counting, hence they are promoting Online voting. **Authenticity and integrity are two critical issues with stored data new improved Online voting system immune to tampering**. Various techniques are used to ensure the authenticity and integrity of data and protecting the storage infrastructure from physical attacks, and back up data to geographically different locations. For variety of data, including voter data, these measures are insufficient. Tamper-resistant storage systems are storage systems having practical solutions for high reliability that data has not changed.

Proposed Methodology:

Internet voting framework will be developed and compared with the conventional voting system to find out the weaknesses, feasibility and to full-fill the requirements of voting. The Proposed voting system is open list voting where voters can cast votes to a desired political group or desired candidate. All system databases are password protected which only managed by system administrator he is responsible for storing authenticate voters and candidates. Administrator can view the voting results only after the completion of entire voting.

E R DIAGRAM:

An entity–relationship model (ER model) is a data model for describing the data or information aspects of process requirements and it being implemented in a database such as a relational database. The main components of ER models are entities and relationships between entities.



Importance of Proposed Research Investigation:

Every citizen has a right of the vote, and we have a moral obligation to ensure the integrity of our voting process. Online Voting proposed system enables a voter to cast their vote through online without going physically to booth and registering themselves for voting in advance, duplicate or fraud is not possible, fast to access, secure and accurate, easy to manage voting information, highly efficient and flexible. Hence, by this the casting vote percentage will increase. As the average percentage of voting is a less than 60%. Fraud vote can be easily done in the present system. There is a challenge electorate needs to be educated adequately on the use of online voting.

Citizens living abroad cannot vote because of physical absence in voting station but this voting system will also lead to increasing the voting percentage of abroad voters.

- Authorized Voting
- No one can vote more than once.
- Voting from anywhere
- Only voter should be able to know who he voted.
- Voter can make sure his/ her vote has been taken into account.
- Less cost

Review of the work related to the field of Research-already done on the subject -Present and Past Status

LITERATURE SURVEY:

1) Android Voting
2) SMS / Voice Voting
3) Online Voting

Android voting System:

- This application provides a new technique for voters. Voters can cast vote using android mobile phones. Android voting system is an easy and flexible way of casting votes anytime and from anywhere.

SMS/TEXT/Message/Voice Voting System:

- SMS voting is the easiest and fastest way without using any hardware and software to find out what public is thinking.
- Voters can votes by sending an SMS or call from their mobile phone.

- Nominee represented by codes or symbols.

Research Gaps identified in the proposed field of investigation -

Critical analysis or Pitfalls of online voting:

1. Authentication
2. Voting by others without the knowledge of the voter
3. Hacking and attacks
4. Payable internet service
5. Network Traffic and expensive
6. **Complexity of database**
7. Complex process

Current scenario of voters

Election Year	Registered voters	Votes polled	Voter turnout
1999	61.9 crore	37.1 crore	60.0 %
2004	67.1 crore	38.9 crore	58.0 %
2009	71.7 crore	41.7 crore	58.2 %
2014	81.4 crore	55.3 crore	66.4 %

Table No.1: Voter Status [1]

Current scenario of Internet Users:

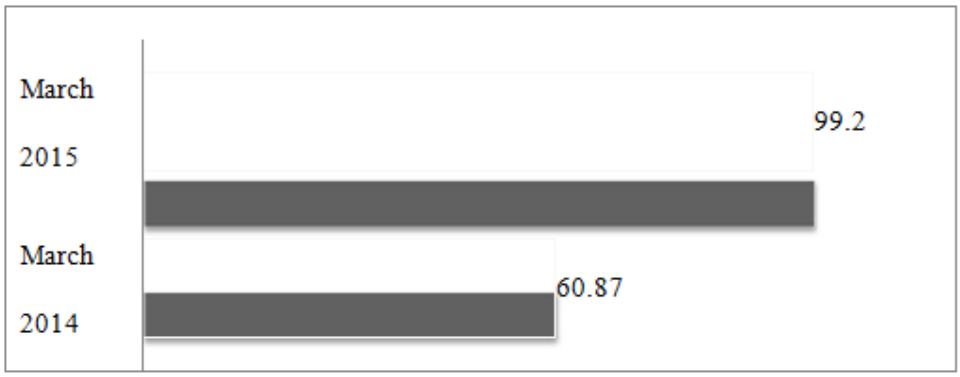


Chart No. 1 Broadband Users in India (million)[2]

GLOBAL PICTURE OF INTENET VOTING:

Internet voting firstly took place in United States 2000, 14 countries have now used Internet voting. Canada, Estonia, France and Switzerland four countries have been using Internet voting. Estonia offer Internet voting to the entire country.

Internet voting differs according to scope and functionality of country. Many of the changes seen in Internet voting systems aimed at improving the quality of elections delivered by these systems for electronic voting.

Following Countries using OVS- [3]

Estonia

- Rolled out e-voting in 2005 and by 2009 nearly a quarter of all votes cast were online
- Various ways of voter identification: ID Card with Pin Code, Digital ID, Mobile ID
- E-Voting for general elections, the model can be considered as one of the successful model and scalability of that model for large voter based needs to be analyzed.
- Estonia Voting System- Security provided through the use of open-source public key-private key encryption software (upgraded in 2011 to 2048-bit)

Switzerland

- First used it in Geneva in 2003, with Zurich and Neuchatel

Canada

- Uses online voting in municipal elections
- The town of Markham, in Ontario, has offered online ballots in local elections since 2003
- Overall turnout rose nearly 10% from 2006 to 2010

ONLINE VOTING IN INDIA:

Some programs like Digital India, National Optical Fibre Network etc. helps to grow internet users in India.

- Gujarat has already started providing online voting facility.
- Gujarat Election Commission is offering the option of online voting for all six municipal corporations: Ahmedabad, Vadodara, Surat, Rajkot, Bhavnagar and Jamnagar.

K. C. Kapoor Gives First-Ever Online Voting Platform

- Gujarat State Election Commission along with Tata Consultancy Services (TCS) introduced **Online Voting System (OVS)** for Gujarat State which can be used for Municipal Corporation / Municipality Election. [4]

2010 and 2015 SEC had made online voting option available for voters.

ONLINE VOTING SYSTEM GUJARAT WEAKNESSES:

- The response to the introduction of new polling system, very few people casted vote online.
- 20,000 people had applied for e voting registration in 2015, but for document verification only 1,310 voters completed the procedure
- Only 806 people voted online.
- SEC should make the procedure for online voting more simple and promote it among youths to popularize its use.
- **SEC was spent 15 cr. for data centre and database but still Voters will have to use the same verified hardware major weakness. [5]**

Critical Gap analysis of existing Online Voting system:

1) Security issue
2) Authenticate Voters
3) Encryption
4) Network Traffic
5) Less number of people voting
6) Fraud and Coercion (Someone votes on other behalf)
7) Voter Education

Reasons behind Gujarat online voting system (GOVS) use the same verified hardware for voting. [6,7] —

It is important that the public supports, have strong confidence and trust on electoral process and system whenever hackers can break into high-security websites entire computer networks with corrupted and reported results are not trustworthy. [8]

1. Low Internet Penetration in India
2. Even companies like Google and LinkedIn have been hacked before.
3. If any glitches, recounting is not possible.
4. Election process affected by network traffic.
5. Difficult to trace the fraud if committed.
6. Lack of privacy and secrecy.
7. Minuet mistake produce un accurate result.
8. Small coding mistake makes entire internet system fail.
9. Basic computer knowledge is really low in India.
10. You can never be perfectly anonymous on Internet (remember Prism scandal)

Estonia Internet Voting System:

I-voting system has crucial architectural drawbacks and gaps that potentially jeopardize the integrity of elections. My findings will illustrate the practical obstacles to Internet voting in the modern world through analysis of Estonia. Before adopting this system we have to know about major drawbacks.

We experimentally verified that these trusted components are vulnerable by two kinds of attacks. First is client- side attack in which for large numbers of individual voters an attacker can change vote. The second server-side attacks within the reach of a well-resourced state-level attacker or dishonest insider in which an attacker could change the wholesale results of the entire election by attacking the vote counting server.

According to Alex Halderman- “Estonia's Internet voting system is quite sophisticated, He explains: “The system was built by people who had intimate knowledge of security. They made large parts of the system open source, they documented their procedures and they have videos of almost every step of the process." [9]

INTEGRITY ISSUES:

1) Database cannot able to store the detail of multiple devices.
2) There is a Database stores voters and candidates which is maintained by the ELECTIONCOMMISI ON OF INDIA. Server unable for handling network traffic of huge voters using multiple devices for vote then database must be store for that much of data [10].
3) Due to Hacks or viruses attacks election result altered.
4) Technical difficulties, programming errors or server malfunctions
5) Hardware and Software Errors- Data stored on a storage device can be corrupted due to hardware or software malfunctioning
6) Malicious Intrusions-Although highly critical information is being stored electronically, and is accessed through several different interfaces. For example, in a distributed storage system, data can be accessed from remote locations through un-trusted network links if the data is not protected by encryption then a network eavesdropper can gain access to confidential data [11].
7) User Errors- an inadvertent deletion of a database file can cause a data corruption.
8) Distributed denial of service attacks (DDoS) can overload servers, preventing voters from registering [12].
9) Intruders could read personal information, submit

false information, or even change info on voters.

10) DDoS attacks can overload servers, preventing voting, especially if elections are held on a single day.
11) Attackers could potentially impersonate legitimate voters to cast false votes, or monitor network traffic to see how individuals voted.
12) Voters from abroad were not in the election database.

According to Mark Ryan (professor of cyber security at the University of Birmingham) online voting is very different from online banking, for example with banking you can verify a transaction, whereas voting is not checkable in the same way. Also, if there is a mistake in online banking, money can be returned later. If hacking was found to have occurred a week after an election "it's a bit of a disaster" - would the result have to be reversed? [13]

CONCLUSION

Without very strong security, online voting offers even more opportunities for intrusions and tampering than traditional systems. One of fundamental requirement of any country is enhancing and improving the voting system. Online voting solutions mainly advertise their convenience, efficiency and low cost, On the other hand, cryptographically secure voting schemes in the literature are generally complex and inefficient for a real-world implementation.

It will be very hard to maintain the offline voting system with growing population in 10-20 years from now.

REFERENCES

1. Internet voting system and digital India— Anooja A (International Journal of Emerging Trends & Technology in Computer Science (IJETTCS), Volume & Issue no: Volume 5, Issue 1, January - February 2016)
2. Digital India with E-Commerce Revolution in Rural India: Transform India Digitally and Economically— Anooja A (Engineering International, Volume 3, No 2 (2015)
3. Internet Voting-p ran, V. and Merloe, P. (2007) NDI Handbook: Monitoring Electronic Technologies in Electoral Processes, pp. 85–88.https://www.ndi.org/e-voting-guide/internet-voting
4. October 2012 ~ Gujarat News by Gujarat Voice | Ahmedabad http://www.gujaratvoice.com/2012_10_01_archive.html
5. Online voting system in system Gujarat India- e voting for Gujarat election adhttpantages/Information and Details-://www.nrigujarati.co.in/Topic/4159/1/online-voting-system-in-gujarat-india-e-voting-for-gujarat-election-information-advantages-details.html.
6. Modi Wave: Did voters really punish Congress in 2014?http://guruprasad.net/posts/modiwave- did-voters-really-punish-congress-in-2014/
7. After compulsory voting, Gujarat now offers the online option: http://indianexpress.com/article/india/india-others/after-compulsory-voting-gujarat-nowoffers- the-online-option.
8. October 2012 ~ Gujarat News by Gujarat Voice | Ahmedabadhttp://www.gujaratvoice.com/2012_10_01_archive.html.
9. Security Analysis of the Estonian Internet Voting System- Drew Springall (CCS'14, November 3–7, 2014, Scottsdale, Arizona, USA)- https://jhalderm.com/pub/papers/i**voting-ccs14**.pdf
10. A proposal for internet voting in Iraq www.ijarcsse.com/docs/papers/Volume_3/10.../V3I9-0281.pdf
11. Policy Mechanisms for Increasing Transparency in Electronic Voting by. Joseph Lorenzo Hall https://josephhall.org/papers/jhall-phd.pdf
12. The Security of Remote Online Voting - Daniel Rubin www.cs.virginia.edu/~evans/theses/rubin.pdf Election 2015: How feasible would it be to introduce online voting? http://www.bbc.com/news/magazine-32421086