E-Election System

Parth Ranalkar[1], Aniket Dahibhate[2], Shubham Patil[3], Vedant Bhawalkar[4], Prof. Rashmi Kale[5]
Students, Department of Computer Engineering[1,2,3,4]
Guide, Department of Computer Engineering[5]
Smt Kashibai Navale of Engineering, Vadgaon Bk, Pune, Maharashtra, India

Abstract: *Fundamental right to vote or simply voting in elections forms the basis of democracy. The conduct of periodic, competitive, participatory, credible and non-violent elections is one of the main yardsticks used to determine the democratic condition of a country. These includes violent attack on the voters, result manipulations, vote buying, remoteness of polling canters etc. These are enough reasons that necessitates the design and construction of an electronic voting system that goes a long way in addressing most of these problems. The e-election system aims to eliminate the bottlenecks evident in the manual voting system such as the lengthy registration process, unnecessary transportation, election violence and ultimately the incredibility of the votes. This was achieved by developing a time effective registration platform which registers a voter and assigns a voter their voter's card immediately. The voter also gets to vote from their nearest safe and convenient polling unit and their votes is counted where it belongs. The results obtained from subsequent tests were very impressive in terms of time, security and accuracy as compared to the manual system. Such system with all these capabilities will go a long in ameliorating the aforementioned problems of the existing manual system of voting in the Indian electoral process.*

Keywords: Election System

I. INTRODUCTION

E-Election (Electronic Voting) as a term encompasses a broad range of voting systems that apply electronic elements in one or more steps of the electoral cycle.

There are many levels to e-voting in a broad sense which could be e-collation, e-verification, internet voting, remote online voting etc. Following the definition of a system as anything that takes an input and gives an output, an E-Election system is any system that can offers both electronic and online voting.

It could also incorporate e-registration, e-verification, e- collation, remote online voting and real-time result display. An E-Election system (EES) generally comprises the following for it to work efficiently:

An interactive voting user interface on an electronic device which provides a friendly environment for voters to authenticate and cast their votes, it also serves as a means of collection the individual votes and storing them in the local and central database.

An administrative dashboard for voters' registration, details update and elections coordination and monitoring. A database management system for the storage of election, voting and voters data. E-Election system serves to reduce the cumulative costs of running elections and increase voters participation in election as it offers voters an easy and convenient way to vote and most importantly, it is a panacea to the issue of long distances covered by voters to a specific destination for their votes to be counted. A great technological improvement is observed in election process mostly in the areas of result collation and transmission. Though the Independent National Electoral Commission INEC has not fully implemented the use of technologies for collation due to lack of legal framework [2]. But, most elections around the world use ICT in elections to some degree, at least to summarize and aggregate the votes. This electronic adaptation is the result of a long period of evolution during which not only the procedures but also the technological means for casting votes changed considerably.

II. LITERATURE REVIEW

"Online Voting System for India Based on AADHAAR ID" paper [1] by Himanshu Agarwal (2013). Through this research paper in a proposed system offers user/voter to vote from his allotted area. Voter also able to prefer his location from he/she can able to vote. The main motive is Proposed idea provide the feasibility to peoples to vote as people want.

"Biometrically secured electronic voting machine" paper [2] by Rahil Rizwan (2017) In this proposed system main focus is on to carry out the election digitally and provide technology-based security to it focus is on integrity of data and provide validation to it, so it can achieve whole election process effectively.

A Machine Learning Based Strategy for Election Result Prediction" paper [3] by Meng-Hsiu Tsai(2019) This paper presents a machine learning based strategy to analyse Twitter data for predicting the overall results of many local elections. The results suggest the predicted results are close to the actual election outcome this will helps to predicts the results of the election and helpful in declaring the results.
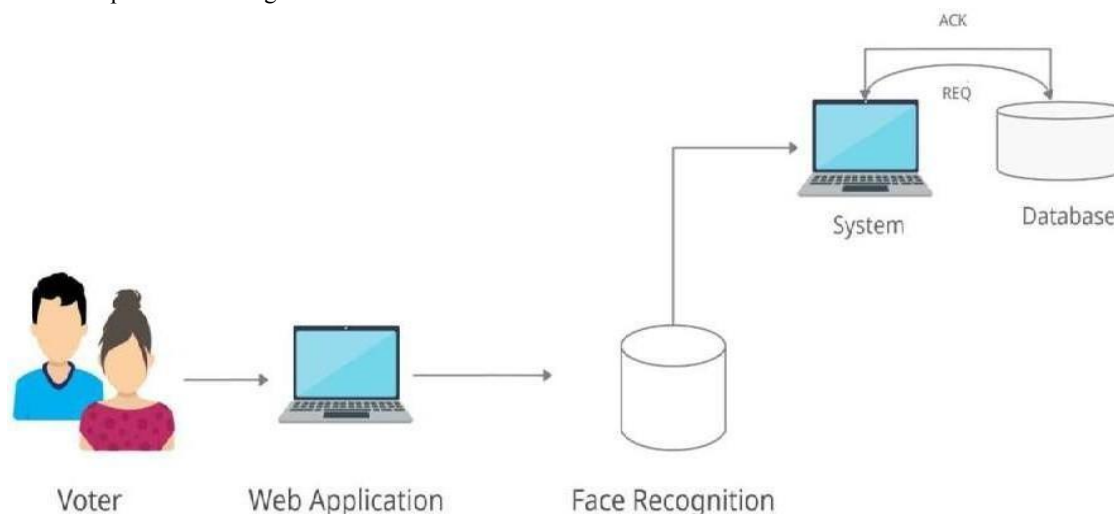

Figure: System Architecture

III. REQUIREMENT ANALYSIS

A software requirements specification blueprint of what are needs and critical requirements of program to be worked on. Towards the final stage of requirements engineering a good SRS is commissioned for final output. SRS consists of various requirements. All these requirements make SRS more concise, structured, verifiable and traceable. Following illustration will clarify all requirements used in SRS document to make it comprehensive.

3.1 Project Scope

This project work is mainly designed to enable the portability in voting process that is vote from anywhere and to allow voters to cast their votes easily and comfortably to promote a more credible election which is efficient and less costly. The dynamic nature of the elections application interface and database structure allows for different organizations set up and conduct basic elections too. Its online interface enables real-time election monitoring and result collation. Since the collection and sending of votes to the database requires an internet access which may not be readily available in some urban area would seem a limiting factor, though the local database and the printed vote can be used for counting until network is restored.

Use case document depicts what are prime functions of an application and how user will interact with system. By using clear use case diagrams one can understand overall process flow of any application which is crucial part of any system under observation.

Use case diagrams interconnect various parameters on basis of their functionality, thus improving business integration with real-life problems and working on it to produce working solution comprehensively. The presented details in such diagrams are varying and depend upon type of project and also based on whether diagram is depicts whole system or part of system.

IV. DETAIL OF MODULES

One of the progressive implementations of SDLC is incremental-iterative model. It aims to create structure of program while continuously incorporating new and updated modules to it by making it more functional and adhering to requirements.

While grasping the iterative method, generally method of increment is often used to introduce new improved functionality to same system progressively. It explains the need of newly incorporated modules which are part of SDLC itself. Throughout SDLC iterative model keeps up upgrading as new modules are integrated.

Analysis model is a technical representation of the system. It acts as a link between system description and design model. Analysis modelling predated design modelling. Analysis modelling transforms behaviour and functions in to multilevel designs. Which are further bifurcated into different levels. Elements of the analysis model are as follows :

1. Scenario based elements - Represents the system user point of view.
2. Class based elements - It defines the object, attributes and relationship.

Behavioural elements - Shows state of the current system and changes due to external events.

By integration of OOP with iterative model, a strong arch-type is created which further helped in code reuse, code maintainability and rigorous testing. All these parameters decide project success within stipulated time frame. Deliverables were successfully achieved without any major hiccups. Analysis model which was generated in design phase of project remained consistent throughout the process, this indicates robustness of model generated in early stages.

V. PROPOSED ALGORITHM

- OpenCV :- OpenCV is the open source library for the computer vision, machine learning and image processing. By using it one can process images and videos to identify object and faces.
- Numpy :- Numpy is a general-purpose array-processing package.

5.1 Algorithm

1. Use cv2.VideoCapture(0) to get a video capture object for the camera.
2. Set up an infinite while loop and use the read() method to read the frames using the above created object.cv2.imwrite() use to write image to specified dataset path.
3. Use of CascadeClassifier to detect object in image.
4. Then to load the image and convert it into gray- scale.cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

The image has stored in BGR channel for image recognition we need to convert it to gray channel because gray channel is easy to process and is computationally less intensive.

5. Use of detectMultiScale this will help to find features and locations of image.

It returns the four values by detecting the feature of face, and draws rectangle around face using this values.

VI. DEVELOPMENT OF GUI

It plays an important role by supporting the strategic plan for concerned device. An ideal system implementation plan transmutes system into further smaller sub-systems and draws out strategic plan in stepwise manner. From here we can assign individuals to specific tasks in ordered manner to execute steps. Since strategic planning is massively implemented on higher levels, it helps in drawing out best plan. Thus, the implementation plan tracks SDLC, identifying out how the best execution of strategic plan till the end of its life-cycle.

VI. OTHERS SPECIFICATIONS

6.1 Improved Convenience for Voters

1. Easier vote marking and casting as the voting experience helps to avoid errors, in particular when over-voting, under-voting or making incorrect selections.
2. Vote remotely from home or other locations using internet voting.

6.2 Improved Accessibility

1. People with disabilities are able to vote.
2. Online voting allows people who are unable to reach the polling places to vote.

6.3 Fraud Prevention

1. e-Voting reduces the chances of accidental or intentional variations in vote counts by reducing poll worker direct

interaction with ballots or counts.

2. e-Voting and online voting reduce voter errors and the chances of voter fraud, increasing electoral integrity.

6.4 Reduced Costs

1. Switching to online voting can reduce your organization's costs significantly. It saves you the price of printing and mailing thousands of ballots if you typically opt for mail in ballots. If in-person voting is the norm for your organization, the transition can eliminate the costs of renting a polling location and the printing of all materials used that day.

6.5 Limitations

1. Problems with access to the Internet through the digital divide based on socio economic variables and between rural and urban areas.
2. Vulnerability to hacking.
3. Issue of voter education: time and money must be invested to ensure public is aware that electronic / Internet voting is an option.

VIII. CONCLUSION

We have developed a web site to Provide the facility of vote from anywhere. This E Election system will manage the Voter's information by which voter can login and use their voting rights. The system will incorporate all features of voting system. It provides the tools for maintaining voter's vote to every party and it count total number of votes of every party.

There is a DATABASE which is maintained by the ELECTION COMMISION OF INDIA in which all the names of voter with complete information is stored.

In this user who is above 18 year's register his/her information on the database and when he/she want to vote he/she has to login by his id and password and can vote to any party only single time. Voting detail store in database and the result is displayed by calculation. By online voting system percentage of voting is increases. It decreases the cost and time of voting process. It is very easy to use and it is varying less time consuming. It is very easy to debug.

Finally, because of iterative-incremental model it has been possible to keep up with project development and keep track of objectives and requirements. Use of OOP concepts has formed skeleton of this project. This project has wide future scope which has been discusses earlier. Few improvements over the time can transmute this project into a commercial venture. With efficient use of available resources and predetermined goal plan this project has been concluded as a success.

REFERENCES

[1]. Tadayoshi Kohno, Adam Stubblefield, Aviel D. Rubin, Dan S. Wallach,"Analysis of an Electronic Voting System", Johns Hopkins University Information Security Institute Technical Report, TR- 2003-19, July 23 2003

[2]. David L. Dill, Bruce Schneier, and Barbara Simons, "Voting and technology: Who gets to count your vote?", Communications of the ACM, vol. 46(8), Aug. 2003, pp. 29- 31.

[3]. Sun Xuejun, Lu Haijun and Zhu Yuefei, "An Electronic Vote Protocol Without Authority", Computer Engineering, vol. 30, pp. 96-97, Jun. 2004.

[4]. Cao Gang and Shi Ronghua, "The Research and Design of an Anonymous Vote Protocol of Internet", Computer Engineering and Applications, vol. 40, pp. 156-157, Apr. 2004.

[5]. David Evans and Nathanael Paul, "Election security: Perception and reality", IEEE Security & Privacy, vol. 2(1), Jan. 2004, pp. 24-31.

[6]. Cao Gang and Shi Ronghua, "The Research and Design of an Anonymous Vote Protocol of Internet", Computer Engineering and Applications, vol. 40, pp. 156-157, Apr. 2004.

[7]. Sun Xuejun, Lu Haijun and Zhu Yuefei, "A Electronic Vote Protocol Without Authority", Computer Engineering, vol. 30, pp. 96-97, Jun. 2004.

[8]. Yao qian, Chen shun and Xieli, "A Digital Certificate-Based Electronic Voting Protocol", Computer Science, vol. 33, pp. 112-113, Jan. 2006.

[9]. R. Bhuvanapriya, S. Rozil Banu, P. Sivapriya and V. K. G. Kalaiselvi, "Smart voting", 2017 2nd International

Conference on Computing and Communications Technologies (ICCCT), pp. 143-147, 2017.

[10]. A Navya et al., "Electronic voting machine based on Blockchain technology and Aadhar verification", International Journal of Advance Research Ideas and Innovations in Technology, vol. 4, no. 2, 2018.

[11]. Rahul Rakhe et al., "E-Voting System using Blockchain Technology for Distributed Environment", International Journal of Innovative Research in Science Engineering and Technology, vol. 8, no. 5, May 2019.

[12]. Oleksandr Kurbatov, Pavel Kravchenko, Nikolay Poluyanenko, Oleksiy Shapoval, Tetiana Kuznetsova, "Using Ring Signatures For An Anonymous E-Voting System", Advanced Trends in Information Theory (ATIT) 2019 IEEE International Conference on, pp.187-190, 2019.

[13]. Tyagi Amit Kumar and Nair Meghna Manoj, "Internet of Everything (IoE) and Internet of Things (IoTs): Threat Analyses", Possible Opportunities for Future, vol. 15, no. 4, 2020.

[14]. Executive Summary of "Genesis and Spread of Maoist Violence and Appropriate State Strategy to Handle it", Bureau of Police Research and Development, Ministry of Home Affairs, New Delhipp.

[15]. A.K Tyagi, S U Aswathy and Ajith Abraham, "Integrating Blockchain Technology and Artificial Intelligence: Synergies Perspectives Challenges and Research Directions", Journal of Information Assurance and Security, 2020.

[16]. Ze Xu, Sanxing Cao, "Efficient Privacy- Preserving Electronic Voting Scheme Based on Blockchain", Smart Internet of Things (SmartIoT) 2020 IEEE International Conference on, pp. 190-196, 2020.

[17]. Suryaa Pranav Meduri, Saketh Kamatham, Sneha Subramanian, Anupama Meduri, Neha Diwan, "A Secure Network Monitored Balloting System", Inventive Computation Technologies (ICICT) 2021 6th International Conference on, pp. 31-35, 2021.

[18]. Alkesh Kothar, Pratik Hopal, Pratiksha More, Swamini Pimpale, Dr. J. B. Patil, "Biometric Authentication in E-Voting through RNN", International Journal of Scientific Research in Science and Technology, pp. 434, 2021.

[19]. Irina Dyachkova;Anton Rakitskiy Development of the Remote Anonimous Voting Systems and the Analysis of its Vulnerabilities 2021 Ural Symposium on Biomedical Engineering,

[20]. T Vairam; S Sarathambekai; R Balaji "Block chain based voting System in Local Network", 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS)