system. The processing of IoT device in register and count votes with prevention of electoral frauds with blockchain approach is described.

The explanation of proposed block diagram and the process involved in user section such as registration, logging in, OTP and face authentication kind of verification, voting and viewing result is presented; admin section portal verification with managing voter data with result of it are defining in this section. The effectiveness of selected classifier algorithm to

perform face authentication is explained well. The face authentication with posting their voting and viewing result of every party is reviewed in section IV. The system is concluded with its advantages and requirement of this technology in future is represented in section V.

II. RELATED WORKS

The authors of [8] proposed a novel database-based recording system with a high level of integrity. This could be used in the event of a malpractice attempt. The Advanced Encryption Standard (AES) is utilised to encrypt this data. It is six times faster than the standard triple DES algorithm. The voters and administrators are granted public and private keys under this scheme. Voting has taken place as a result

of this procedure. Every new idea should address a human need in some way. There is a pressing need to increase the use of innovations. Few individuals nowadays have lost faith

in their administrators. As a result, the new unique voting method must have a high level of accuracy and confidence in order to reintroduce individuals to the voting system [7]. For improved security, Shalini Jindal et al. developed a block chain-based e-voting system in [9]. They looked at a variety of block chain-based e-voting methods. The authors have looked at a variety of criteria to increase the security of block chain. In [10], R.Osgood examined the different challenges and flaws with the traditional voting system. The author looked at many sorts of voting machines. Finally, the author came to the conclusion that

Electronic Voting Machines (EVMs) are vulnerable in a variety of ways. As a result, he highlighted why a block chain-based voting mechanism is required. After reviewing numerous voting system implementations,

the author developed a new secure and efficient

approach. The Electronic Voting System is made up of several processes, such as casting votes and then tabulating the results. Nowadays, a wide range of voting applications is available. One of the most extensively used voting systems is the Direct Recording Electronic System with Internet Voting. Three devices are required to implement this system. The total system implementation includes touch screen

machines, punch key machines, and wheel machines. This type is really easy and user pleasant one. However, it has a number of security concerns, which are discussed.

Dipali Pawar et.al [11] utilized blockchain based E voting system. Thus system subjects to avoid fake voting and provides a framework for verification. The decentralised system allows user to change their votes within in a given time period. In [12], Francesco Fusco suggested a voting system so called crypto voting system or e-voting system. For security purpose block chain technology is utilized. This system integrates phase and event of voting system. Event involves setting up of the system, sharing of credentials, register vote, ballot paper collection, vote count, result announcement and

several other processes. The recommended system tries to trace and audit this process without any intermediate person. In [13], Sikha Bagui et al. presented several data mining strategies for examining likely voting trends in

the US House of Representatives. The authors also demonstrated how findings might be interpreted based on various parameters. They used http://clerk.house.gov to gather raw data. Attribute selection, association rule mining, decision tree analysis, and interpretation of interesting outcomes were all part of their research. Y. Subba Reddy and P. Govindarajulu [14] addressed machine learning approaches in [8], which will help to explain the evolution of contemporary vote recommendation systems. In order to overcome the constraints of the current system, the authors offered new user-centric preferences. It will also contribute to

increased recommendation system reliability and

dependability. By computing weight for user views and rating, this new method can be embedded. In [15], Dinesh Kumar et al. introduced a novel upgraded ensemble classification algorithm that uses a new voting strategy to merge several classifiers. After

applying several classifiers and selecting the best classifiers, the final ensemble is created. Association and ensemble principles are used to improve the performance of ensemble classifiers.

In [16], Gopala Krishnan et al. developed a new

enhanced reweight mechanism in ensemble, which they claim will produce better results than single classifiers. In the initial iteration, use single classifiers such as decision trees and nave Bayes. After the first iteration, determine the number of correctly classified and misclassified cases in each class. Now, based on the previous iteration's findings, calculate fresh weights. Finally, in subsequent iterations, learn deep

networks based on the ensemble. From above observation, a clear view about e-voting system has obtained. To resolve drawbacks in several

other systems and to improvise the security protocols the proposed method is designed. This proposed system could replace the use of EVM and difficulties in it.

III. PROBLEM IDENTIFICATION

The convention al method of voting is done with Blockchain and IoT based hardware setup. The use of IoT device is to register and collect the vote. IoT hardware setup is either legitimate or malicious. If a system is observed as malicious, the possibility of adding that system with blockchain is more difficult. The major drawback of IoT system is security and privacy. Receiving the necessary details of voters and storing it in a local storage system is the difficult task for election commission; the cost expensive system may require additional maintenance; a technically well knowledge person is essential for computing and connecting hardware with software network and makes the hardware to react with software system. In case any failure occurs in the hardware portion, there is impossible to perform essential functions with software section alone.

IV. METHODOLOGY

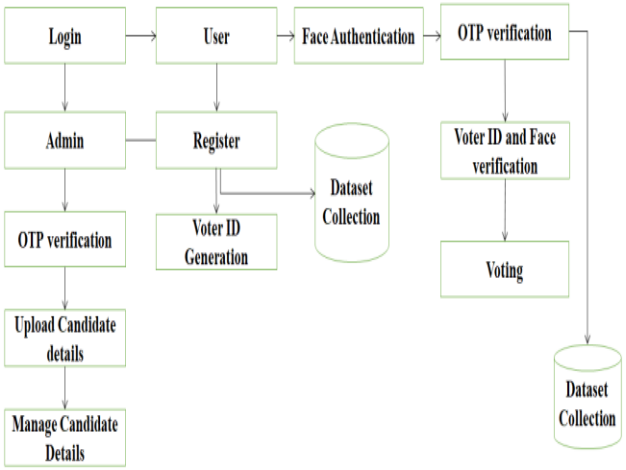


Figure 1 Overall architectural diagram of proposed system

The generalized structure of proposed bock diagram is shown in figure 1. The proposed system has tow-level of verification for voters and a level of verification for admin officers (i.e. Election commission officer). Before voting, the user need to verify their registered mobile number and after that face verification is

important to further processing of voting. To perform face recognition, the proposed system utilized LPB cascade classifier algorithm with CNN approach. For admin, OTP level verification is enough. Normally, a person with age above 18 can have the eligibility to vote. For them the registration process is must. In general, the proposed system collects the data of a user who is trying to register their name for voting. The user is allowed to logging in when the

registration process is over. The following user section and admission section describes how the work is process is going to be carried out till voting and admin section describes the process involved in it.

User section:

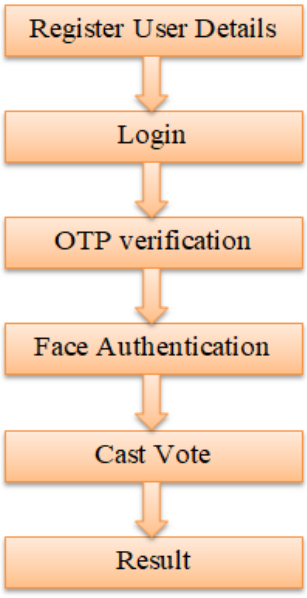


Figure 2 represents flow analysis of user section

Then process involved in user section is given in the format of flow chart which was visualized in figure 2. The registration for voting as per the age limit is the first and foremost step of this process. the In registration portal, the user needs to specify name with initial, permanent address as per Adhar card, E-mail id, and password, date of birth, Adhar card number, gender and temporary address. Once these details are entered the system verifies it and makes your

registration successful. Afterwards, it allows user to logging in. Once the data is collected, the collected information's are stored for further reference. If any images are uploaded by a user, the framework resized into acceptable form and performs gray scale conversion. After completing several steps the noise present in uploaded images are removed and stores that

information. The login portal asks user to put their registered mail id with password. Following login, the next step is verification. The user needs to verify registered mobile number by entering the OTP received during verification. If this check is completed, it will direct user to know details of upcoming election.

The information about party who is going to participate in their region is available in that section. After knowing information about it, the user can move on to voting. In this phase, face recognition is must. Once the facial image of a voter is captured, the system performs comparison of that image with preexisting data available in dataset and identification of

authorised person is done. For image recognition, the Machine learning (ML) algorithm such as LBP and CNN are used. The process is done by taking features extracted by LBP when the image undergoes feature extraction; by utilizing the extracted features, the CNN classifier

algorithm performs face recognition. For improving the understanding of classifier approach, these two algorithms are inter-combined.

LBP:

LBP is an operator utilized to define the texture features of images [17]. The feature extraction using LBP is shown in figure 3. The advantages of it are rotation and gray invariance. The feature extractor can get LBP coding at every pixel point and original LBP operator is extracted from images. Normally LBP patterns are not utilized as feature vector for classification; but LBP histogram features are used as feature vector for classification and recognition. The applications of LBP are texture classification, face recognition.

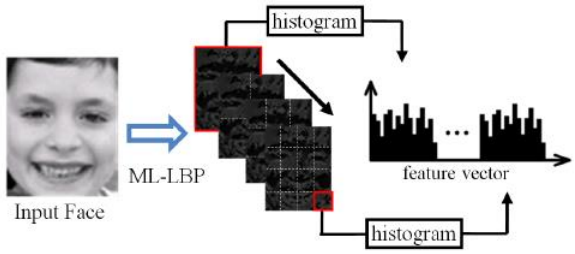


Figure 3 Histogram feature extraction using LBP

Normally LBP emerge as generic texture descriptor. The operator labelling every pixel of an image by thresholding a 3 × 3 neighborhood with the center pixel values and output is obtained in the form of binary numbers. The binary results are obtained by reading the values from clockwise, from top left neighbor. The pixel position is given in the format of (x, y), LBP is said to be aligned set of binary

comparison of pixel intensity of the central pixel and surrounding pixels [18]. The resultant decimal labelled value of the 8-bit word is written as:

LBP (x, y) =∑ 0 .s (ln(x, y)-lc(x, y))

Where lc represents grey value of center pixel (x,y) to grey value of 8 surrounding pixel, and function s(k) .The LBP functions with 8 neighbors of a pixel by utilizing center pixel as thershold.

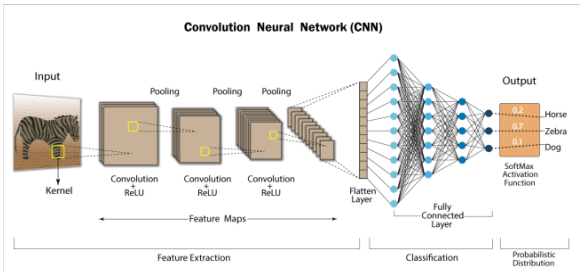


Figure 4 Classification of an image using CNN

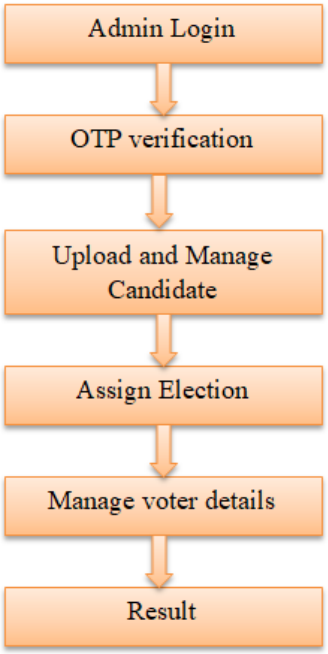
CNN is the more popular algorithm in deep learning and real time arithmetic circuits [19-23]. The recent advancement in CNN expands its growth of usage in various portions of ML techniques and giving better result than other neural networks. Normally CNN is utilized to simplify the complexity in selected data pre-treatment. The weight sharing network methodology looks like a biological neural

network and it minimizes the network model's

difficulty and decreasing the weight count. The

advantage of CNN is that the visibility of neural

network is more when intake is ultidimensional and enabling it to network by eliminating the need of data reconstruction and complications in traditional classifier algorithms [20]. In many cases, CNN utilizes convoluted layer linked to the sampling layer and finally convolutional layer. The convolutional layer is employed to extract essential features and then the features are merged to get abstract features; at the end of this stage image object properties are available.



Admin section:

Figure 5 flow analysis of admin section

The work flow of admin is depicted in figure 9. The administrator is in charge of keeping an eye on the entire system. The login id and password for the first admin are standard.

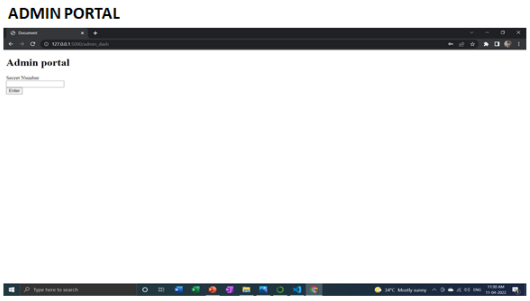


Figure 6 Admin portal

Admin can update the details of candidate who is going to participate in election as per booth. The user list must be in a csv file with user details such as part name, email, and area. Admin will compete with this information, and the file will be uploaded from data. The registered user can also be monitored by the

administrator. Elections on upcoming dates can also be assigned by the administrator.

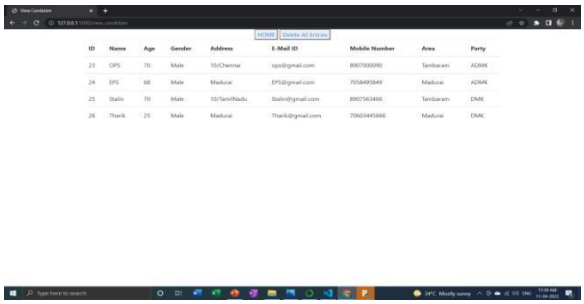


Figure 7 Entire details of parties participating in Election

IV. RESULT AND DISCUSSION

The details about election are known and the user whois going to vote is shown in webpage with details.

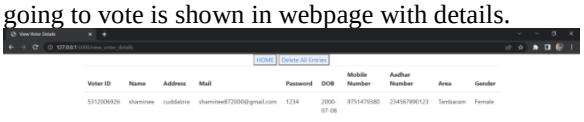
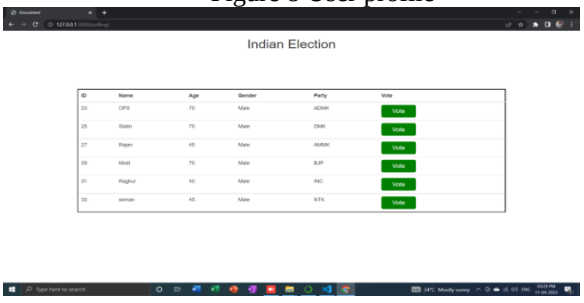


Figure 8 User profile

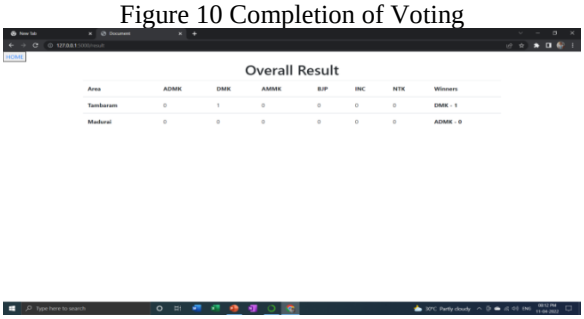


After recognising face of voter, the web page allows entering voting and it is shown in figure 10.

Figure 9 Voting section

Once the voting is done, the webpage will instruct as like figure 10.

Figure 10 Completion of Voting



The user can know the result of their favourite party leaders. It will show where the places elections are is conducted and who won the post.

Figure 11 Election Result

V. CONCLUSION

The majority of India's cities are primarily responsible for Smart Voting. It should be seen as the most pressing concern for the vast majority of us. Existing voting techniques need a lot of manual labour and manpower, and converting voting to online require a secure voting system to cast voters' votes. The

technology of Machine Learning is used to recognise a person's face and determine whether or not a voter is authorised. In the future, we will include cloud storage system to prevent unauthorised users to change or do some modifications in dataset. The use of cloud storage system with SQL attack prevention in voting systems will help to provide a secure and cost-effective election while also protecting the privacy of voters.

REFERENCE

[1] Nilam Choudhary, Shikhar Agarwal, Geerija Lavania, “Smart Voting System through Facial Recognition” IJSRCSE, Vol.7, Issue.2, pp.7- 10, April (2019)

[2] Swetha M S, Shreejwol Disti, Dr. Thungamani M, Raman Shah, “Smart Voting System Support through Face Recognition” IJIRST –| Volume 5 | Issue 11 | April 2019

[3] Vetrivendan Lakshmanan, Viswanathan Ramasamy, J Angelinblessy, "Smart Voting System Support through Face Recognition" IJERCSE, Vol 5, Issue 4, April 2018
[4] Nadar Rajkani Paulraj, G.Rajagopalan, M.Rajesh, S.V.Kiruthika, I.Jasmine, "Smart Voting Machine Based on Finger Prints and Face Recognition", NCIECC – 2017 (Volume 5 – Issue 09)
[5] Noha E. El-Sayad, Rabab Farouk Abdel Kader, Mahmoud Ibraheem Marie, "Face Recognition as an Authentication Technique in Electronic Voting" (IJACSA) Vol. 4 No. 6, 2013.
[6] Hongshuai Zhang, Zhiyi Qu, Liping Yuan, GangLi, "A Face Recognition Method Based on LBP Feature for CNN" 2017 IEEE G Bhavani, "Survey on Blockchain Based E□Voting Recording System Design", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 7, Issue 11, 2018.
[7] S. Shah, Q. Kanchwala, and H. Mi, "Block Chain Voting System", From Northeastern University, 2016.
[8] Shalini Jindal, Tarun Kumar Garg, Ajeet Singh, "A New Perceptive of E-Voting with Blockchain", International Journal of Engineering and Advanced Technology (IJEAT), ISSN: 2249 – 8958, Vol. 9, Issue 3, 2020.
[9] Osgood, "R. The Future of Democracy: Blockchain Voting", http:// www.cs.tuf ts.edu/co mp /116/ archive/fall2016/rosgood.pdf
[10] Dipali Pawar , Pooja Sarode , Shilpa Santpure , Poonam Thore, Pravin Nimbalkar, "Secure Voting System using Blockchain", International Journal of Engineering Research & Technology (IJERT) Volume 08, Issue 11 (November 2019)
[11] F. Fusco, M. I. Lunesu, F. E. Pani, and A. Pinna, "Crypto-voting , a Blockchain based e Voting System CryptoVoting , a blockchain based e-voting system", In Proceedings of the 10th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (IC3K 2018), Vol. 3, 2018.
[12] Sikha Bagui, Dustin Mink, and Patrick Cash, "Data Mining Techniques to Study Voting Patterns in the US", Data Science Journal, Vol. 6, 2007.14. Y. Subba Reddy and Prof. P. Govindarajulu, "A survey on data mining and machine learning techniques for internet voting and product/service selection", IJCSNS International Journal of Computer Science and Network Security, Vol. 7, No.9, 2017.
[13] T. Dinesh Kumar, E. Prabhakar, K. Nandhagopal, "An Enhanced Ensemble Classification Algorithm (EECA) for Airline Services Big Data Sentiment Analysis", Journal of Advanced Research in Dynamical & Control Systems, Volume 11, Issue 7, ISSN 1943-023X, Page No.1461-1467, August 2019.
[14] K. Gopalakrishnan, S. Thiruvenkatasamy, E. Prabhakar, R. Aarthi, "Night Vision Patrolling Rover Navigation System for Women's Safety Using Machine Learning", International Journal of Psychosocial Rehabilitation, Volume 23, Issue 4, ISSN 1475-7192, Page No. 1136-1148, 2019.
[15] IT. Ojala, M. Pietikainen, D. Harwood. A comparative study of texture measures with classification based on feature distributions [J].Patterncognition,1996,29(1):51-59.
[16] Patrik Kamencay, Miroslav Benco,Tomas Mizdos, Roman Radil, "A New Method for Face Recognition UsingConvolutional Neural Network" Digital Image Processing And Computer Graphics, VOLUME: 15 |NUMBER: 4 |2017.
[17] Arel, I,Rose D C, Karnowski T P., "Deepmachine learning-A new frontier in artificial intelligence research" Computational Intelligence Magazine, IEEE, 2010.
[18] F. H. C. Tivive and A. Bouzerdoum, "A New Class Of Convolutional Neural Networks (SICoNNets) And Their Application Of Face Detection," Proceedings of the International Joint Conference on Neural Networks, vol. 3, pp.2157-2162,2003.
[19] P. Anguraj and T. Krishnan, "Design and implementation of modified BCD digit multiplier for digit-by-digit decimal multiplier," Analog Integr. Circuits Signal Process., pp. 1–12, 2021.
[20] T. Krishnan, S. Saravanan, A. S. Pillai, and P. Anguraj, "Design of high-speed RCA based 2-D bypassing multiplier for fir filter," Mater. Today Proc., Jul. 2020, doi: 10.1016/j.matpr.2020.05.803.
[21] T. Krishnan, S. Saravanan, P. Anguraj, and A. S. Pillai, "Design and implementation of area efficient EAIC modulo adder," Mater. Today Proc., vol. 33, pp. 3751–3756, 2020.