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Digitized Election Voting System : An innovative approach

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Abstract - *Election is a vital part of any democratic Republic Nation which allows the population of the nation to elect candidates based on their proficiencies and calibre to fulfil their duties. The proposed candidate should be efficient enough in carrying out their duties for which they are elected by the people of the nation. Often Election is a countrywide event in which maximum people take part as it decides the next 5 years of the nation's progress. In India back in the 20th Century voting was done via the Ballot box system which was the traditional method of voting during elections. But this system was transformed to EVM's (Electronic Voting Machines) in the 21st Century due to malpractices in the voting system using the Ballot Box. The use of EVM's has not been completely successful in eradicating the false voting and malpractices which has led to numerous conspiracy theories which has questioned the credibility of the Entire Electoral System. To vote is the constitutional right of every eligible person in the nation which should be transparent and should be free from the illegal activities that have raised questions on the system over the years. Hence a system which is highly optimized to tackle such malpractices should be adapted by the Election Commission to implement the Voting System. (Abstract)*

Key Words: **Voting System, Election, EVM, Election Commission, Democracy, UID, Fingerprint Scanning, Digital Voting. (key words)**

1. INTRODUCTION

India being one of the most populous country is also the largest democracy in the world. Hence the election plays a vital role in developing and strengthening the democracy of the country. Various government bodies and departments have to put lot of efforts in making sure that the elections are conducted smoothly and with maximum transparency. But every time some or the other controversy arises due to which the election system is termed as rigged. This puts a negative impact on the voters as they lose confidence in voting and hence they lose their right to elect a deserving candidate. Issues such as enrolment in voter's database, fake voting, disallowing voters to cast vote have been some of the problems that are faced by the Election Commission of the India. Thus it has become a major challenge for the Election Commission that they have to overcome to ensure a transparent and smooth voting process so that it restores the trust and faith in the disgruntled people.

Since 1947 India has seen almost 20-23 elections held which has lead to a significant change in the development of the nation. From Ballot box voting to use of EVM (Electronic Voting Machine) India has been the most advanced nation to adapt technology based voting system in the world. Of-course over the time supplementary processes to the voting system such as enrolment, Voter Identification etc have also progressively improved. With the advancement of technology affecting every walks of life and revolutionizing every sector, it has still to impact the Electoral system in the world. Many countries still prefer the traditional Ballot box voting and on the other hand many including India has adopted the Electronic Voting Machines (EVM). The System being technically advanced is still complex when it comes to Voters enrolments, publishing of the voter's identification card or for the fact publishing the name in the voter's list. This process can be simplified if integrated with the UID or AADHAR information. Since AADHAR card has been provided or registered by more than 90% of the population the eligible voters don't need to go through the hassle of registering their names by submitting their ID and Address proof. Due to the complex voter's registration many people don't take that extra effort to actually register themselves. Integrating with AADHAR can solve a lot of such small problems pertaining to the registration, publishing the list of voters, etc.

2. PROPOSED SYSTEM

The system will have certain modules based on its functionalities in Mobile Application are as follows:

1.1 User Registration

This module will register voters based on their AADHAR identification thus reducing the hassle of registering new voters since all the necessary details required for registering voters are already available in the Database for UID.

1.2 User Login

Once the voter has been registered he/she can login with their UID and verifying their finger print. The fingerprint will be verified via the fingerprint sensors in the Mobile Device.

1.3 Verification via Aadhar

Once the Fingerprint is fed to the system the same is verified from the Database and then if the fingerprint is verified, the screen moves ahead to the Ward specific to the user's Address.

1.4 Filtering the ward on bases of the address

The address of the user is fetched from the database and based on the same the candidates contesting the elections are displayed. The voter can click on each candidate's profile and know about their election agendas, history and portfolio.

1.5 Casting vote

Once the voter decides on the candidate to whom he/she would cast their vote, he/she can select their respective ward and then cast their ward. The verification of their ID will be done with their fingerprint and AADHAR ID. This verification will ensure that no voter can cast their vote twice.

With the help of Mobile Voting system, it will allow the voter to cast their vote from anywhere. The need of visiting the Poll Booth is not necessary. It will allow many first time voters to cast their vote without worrying about registering themselves. The youth miss out on voting just because the not so complex process of registering themselves for voter's ID Card. Many do not take that extra effort to register themselves and hence give away their right to cast the vote.

3. POLLING BOOTH SYSTEM

As there will be voting done via Mobile Devices there will also be polling booth set up for others who do not have access to such mobile devices with finger print sensors. These booths will be set up with devices such as interactive screen Kiosks which will allow the voters to provide their AADHAR ID and then scanning their finger to verify their ownership of the UID number used by them. The system will also capture the photo of the user while casting vote to ensure the person is same whose UID has been used. This image recognition module will be integrated in the kiosk software which will allow the system to detect if there is any malpractice in casting of the vote.

This kiosk will consist of multiple screens which will have details about all the candidates contesting the election and then choosing the candidate and casting their vote. There use of indelible ink won't be required because the verification of the of the voter will be done with the help of biometric identification. Biometric Identification is unique to every voter and hence will act as an authentication to nullify any malpractices that could occur with forging voter's identity. This setup does not need a separate premises arranged specially for Elections. It can be done in small room such as ATM centres. The access to the machine will be provided when the voter will scan their finger on the entry gate, once the finger has been scanned, the voter will get access to the machine. The voter has to use the same finger in order to cast their vote thus providing enhanced security and minimizing any malpractices.

4. INITIAL HYPOTHESIS

According to the survey done, from more than 150 people from different localities like urban, suburban and rural areas with different age groups, genders and qualifications, following were the results of the hypothesis:

Almost all of them were eligible to cast their vote, but few of them were not a registered voter. On asking the reason why they haven't registered for voting, we received a fairly common answer i.e. the complex self-registration process. If this process was eliminated and instead the voters were allowed to vote based on their AADHAR ID may be we would have more number of voters than the country would have ever seen. In order to do so we need a proper system in place that could verify the ownership of UID and the authenticity of the UID from the database so the person cannot use falsified AADHAR ID to cast any wrongful votes.

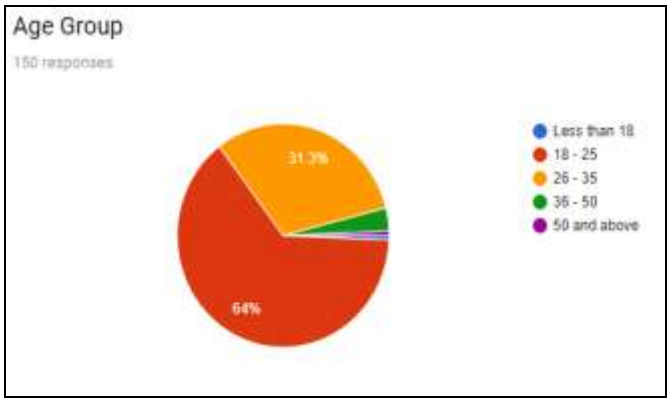

Fig 1 : Graphical representation of the age group of people who have done the survey.

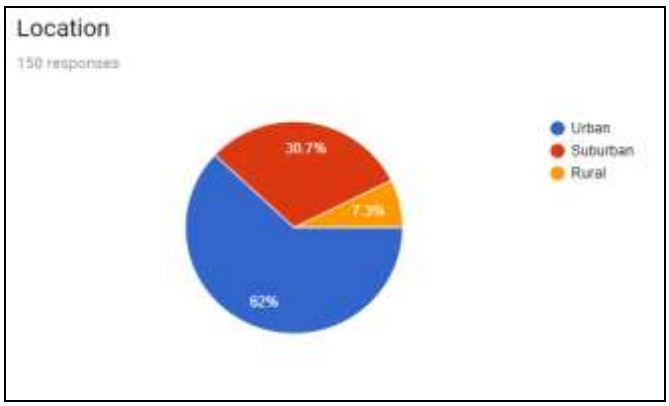

Fig 2 : Graphical representation of people residing in different localities

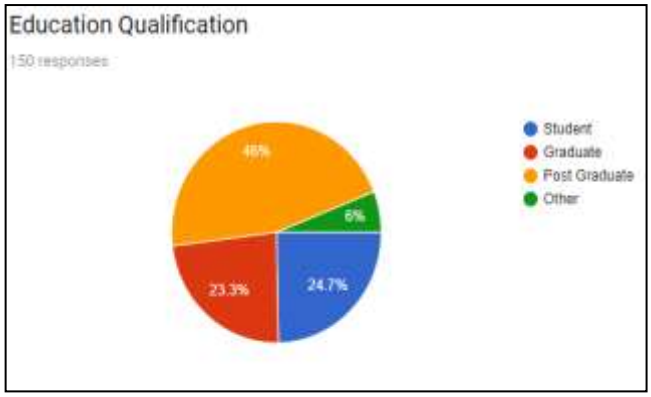

Fig 3 : Graphical representation of people with diverse educational qualifications.

The above figures shows the responses recorded from people belonging to different age groups, location and educational qualification.

The following pie charts show the number of people who are eligible to vote and who are not registered to vote.

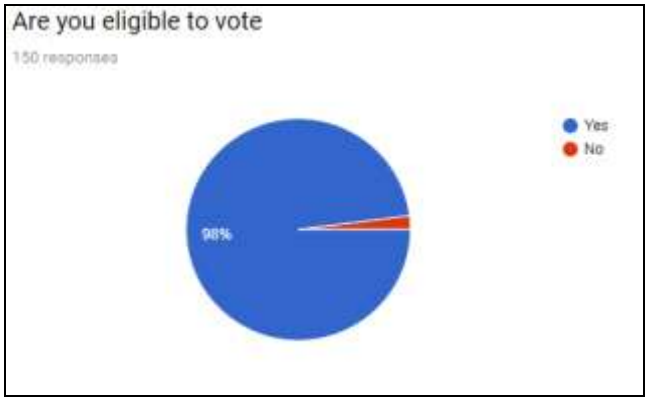

Fig 4 : Graphical representation of people who are eligible for voting.

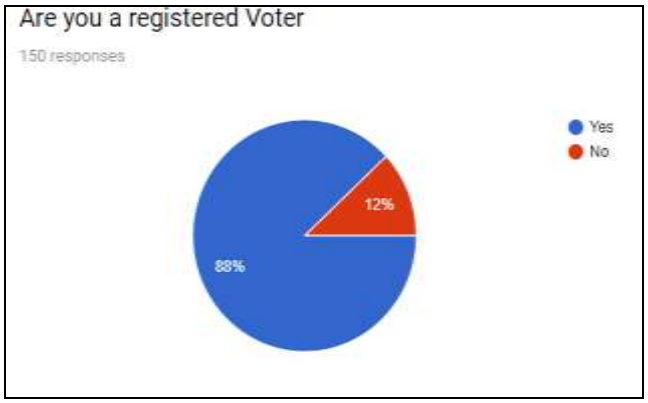

Fig 5 : Graphical representation of people who are registered voters.

In the above pie chart, it shows that out of 150 people 88% of the people are registered voter and 12% viz. 18 people are not registered to vote. Even though they are eligible to vote they haven't registered themselves for VOTER's ID.

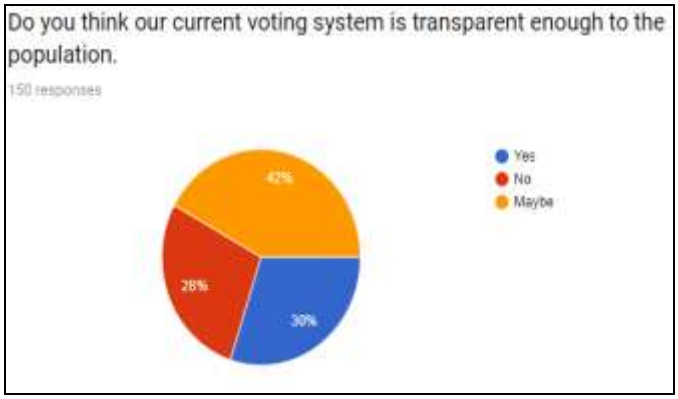

Fig 6 : Graphical representation of people who believe whether our current system is transparent enough.

Above pie chart shows the percentage of people who think that our voting system is transparent enough or not. 30% feel that it is transparent enough whereas 42% think that maybe our Election Commission isn't transparent enough with their voting system. 28% of the people think that there can be more to the existing system than it is currently.

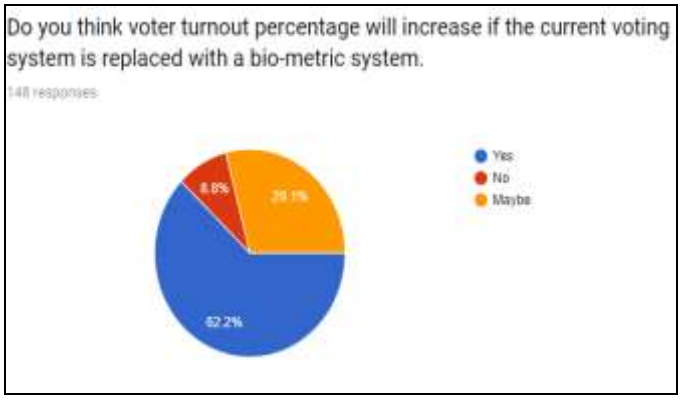

Fig 7 : Graphical representation of people who believe that voter turnout would increase if the current system is replaced with an enhanced bio-metric system.

Since first ever election the voter percentage in India have always been below satisfactory level, there could be many reasons behind it but to tackle that reason many approaches can be taken one of which I suggest is using bio-metric system which can reduce the malpractices and also enable users to cast their vote at the ease of their own. Using handheld devices such as mobile phones which have finger print scanners will allow the voter to register themselves and cast their vote without having to visit the polling booth hence increasing the vote count. Today's youth believes in digital transformation and having the ability to cast vote from their

mobile phones will make them accept the system and be a part of it. It will also encourage them to take part in the political festival our nation celebrates every 5 years.

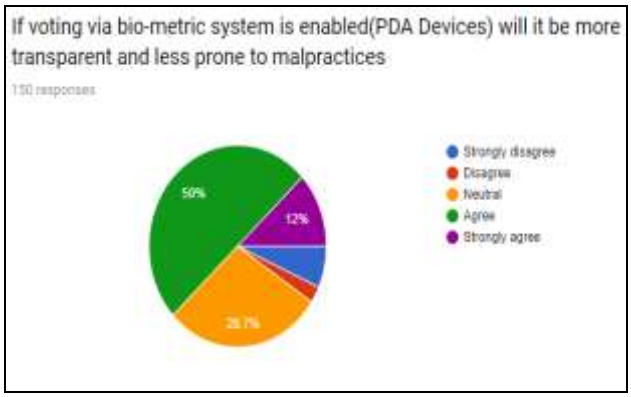

Fig 8 : Graphical representation of people who believe bringing in biometric system will lead to less malpractices and rigging in elections.

Since the major percentage of people surveyed were between the age of 18 – 30 they feel that if the elections will be held with them having the freedom to vote from anywhere this would lead to less malpractices and more transparency as the security and transparency is greater on digital platforms.

The security is the biggest concern here because as the digital platform provides great flexibility and freedom of use it also is prone to much vulnerability of cyber-attacks. To make sure the system is air tight there has to be different security protocols and encryption enabled in order ensure that the voting is carried out in as transparent as possible and as secure as possible system.

5. WORKING OF THE SYSTEM

The database of the system which will mostly comprise of the AADHAR data will be constructed on block-chain technology so that it is less prone to cyber-attacks. The mobile applications supporting both iOS and Android devices will be accessible to the common people from the respective app stores, and these applications will allow the existing voters and new voters to register themselves and cast their vote. From a single device only one person can cast their vote whose fingerprint has been saved in the device. The fingerprint has to be saved in full and not partial so as to verify with the one save in the database. Failing to provide the complete fingerprint will disallow the voter to cast their vote. The mechanism of verifying thrice will determine if the voter is disbarred from voting due to faulty inputs/tries.

This will be enforced to detect anomalies in voting and system usage, whether any sort of tampering with the system is under progress. 256 bit AES encryption will be enforced when the data from application will be transferred to the back end just like how it is while making online payments. The connection will be real-time connection to ensure the data is passed only when the system is connected to the internet.

The setup on polling booths will also have an application which will be built on the same lines as the mobile application it will just have different resolution as per the kiosks; these systems will have an added security feature of allowing the same person who used their finger to access the door of the room. The person's finger print will be recorded and then re-verified while the person scans again to cast their vote. If the fingerprints do not match, then the vote will not be recorded and the person will be asked to try again. In a scenario where the person fails to verify their fingerprint three times then they will be disbarred from voting. Such a setup can be placed even in rural areas where the use of modern handheld devices is not so common and chances of tampering with the system are high.

6. CONCLUSIONS AND FUTURE SCOPE

If the current voting system is developed using the digital platform it will not only simplify the voter registration process but will also increase the number of voters this nation has ever recorded. People want transparency and the current systems (EVM, VVPAT) are not fully tamper proof to provide credible results to the population. The need of bio-metric enabled system can be a possible solution to a tamper proof election in our nation.

The system is still vulnerable to the outside threats but if proper security and authentication are maintained then any digital system can be made difficult to impenetrate.

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BIOGRAPHIES

Mr. Siddharth Jain has received MCA degree from Mumbai University in the year 2019 and BSc. Degree in Information Technology in 2013. Currently he is working as Managing Partner at Tech Simians, an IT Services Firm located in Mumbai catering to development and designing of Web apps, Mobile Apps, and more. He likes to spend most of his time reading about new technologies and how to implement them to make the change in people's lives.

Ms. Harshali Patil received the B.Sc. (Computer Science) and M.Sc. (Computer Science) degree from North Maharashtra University, Jalgaon, in 1996, 1998 respectively. She secured first rank in order of merit in B.Sc. and Second rank in M.Sc. Computer Science. She is currently pursuing Ph.D degree in Computer Science from University of Mumbai. She is having 17 years of teaching experience. She is member of CSI, IEEE Mumbai branch and life member of IWSA. Her area of interest is Database Management Systems, Soft Computing and Networking. She has published research papers in national and international conferences and journals.