Comparative Study, Design and Implementation of Global Wireless E-Voting System for Improving Ballet Paper Voting System

Vikrambhai R. Makwana[1]

[1]Computer Science Department, C.U. Shah University, Wadhwan, Gujarat, India

Abstract: India is world's largest democracy. Fundamental right to vote or simply voting in election forms the basis of Indian democracy. The present electronic voting machine is not intelligent that is it cannot determine the person came for the voting is eligible or not. Electronic voting is now being performed using World Wide Web in many countries of the word due to this advancement a voter need not to visit the polling place. As we are seeing much better growth in technology but we don't see that its level is being properly utilized in the voting system. The present voting system is highly unsecured and it's not efficient in utilizing the current technology i.e., It can't determine that the person who come for voting is eligible or not, it just depends on the voting in-charge officer in the booth. Here there is also a possibility to boost the vote number as the vote count lies within the piece of equipment and if the in-charge officer is corrupted, he has the chance to do it, even while transporting the machines to the strong room. Hence we can't rely on it any more. In the projected system, i.e., "Global wireless e-voting system", machine is made smart that it can find out whether the voter is qualified for voting or not with the help of scanning the eye pattern of the voter and also the vote count is not maintained in the machine itself .Vote count is made to be stored in a remote server by converting them into radio waves. Hence there won't be any scope of escalating the vote count. Even the machine fails; there won't be any problem to the votes that are casted as they are saved in the server. By this we can reduce many problems regarding the present EVM's.

Keywords: Technology, Secured, Efficient, Retina Pattern, Remote Server Etc.

I. INTRODUCTION

The elections system has superlative weight age. Electronic voting systems for electorates have been in use since the 1960s when punched card systems debuted. India is a Secular, Socialist, Democratic Republic and the largest democracy in the World. Having a constitutional democracy with a parliamentary system of government, and at the centre of the system lays a obligation to hold standard, free and fair elections. People now days need more comfort and they need things to be done so easily. They don't want to go to their respective constituency to cast their vote. They want everything to be done without troubling their comfort. This is also one of the reasons for low polling percentages. Hence with the help of current technology, we can meet their meet their requirements by allowing them to cast their vote in hands with their mobile phone. By this we can also increase the voting strength. To provide solution to all these hurdles we propose "Global Wireless E-Voting System".

II. EVM SYSTEM AND CONVENTIONAL SYSTEM

A. Ballot Voting System

We used to have a Ballot voting system in the past and it is also being followed in some of the very few places at present. People were provided with a ballot paper containing the list of candidates, their respective party names and symbols. All the voters had to do was to put a swastika symbol of the candidate whom they want to elect. It had many disadvantages .This system was not a secured one. It was also not a cost effective one.

Fig-1: Ballot Box

B. Electronic Voting Machine

Now the present system is the Electronic Voting Machine (EVM). This system contains a balloting unit and a control unit. With the help of balloting we can cast our vote by pressing the symbol which lies besides the name of the candidate. Control unit stores all the votes in itself. After the completion of the voting the control unit is detached from the balloting unit. After that nobody can cast their vote and also any one can't increase the vote count. Booth in-charge officer is the one who checks the eligibility of the person who comes to vote and send them towards the machine to cast the vote. The voter has to press the button near the symbol of the candidate whom they want to elect. For getting the result, there will be a button called Result. If we press those buttons we can get the results of the election. Works are going on to introduce "Voter verified paper audit trial". In this the voter will also be given a printed paper containing the details of the vote that he has casted. Government of India has experimented this kind of voting in many places like Chennai central, Bangalore south and Mizoram.
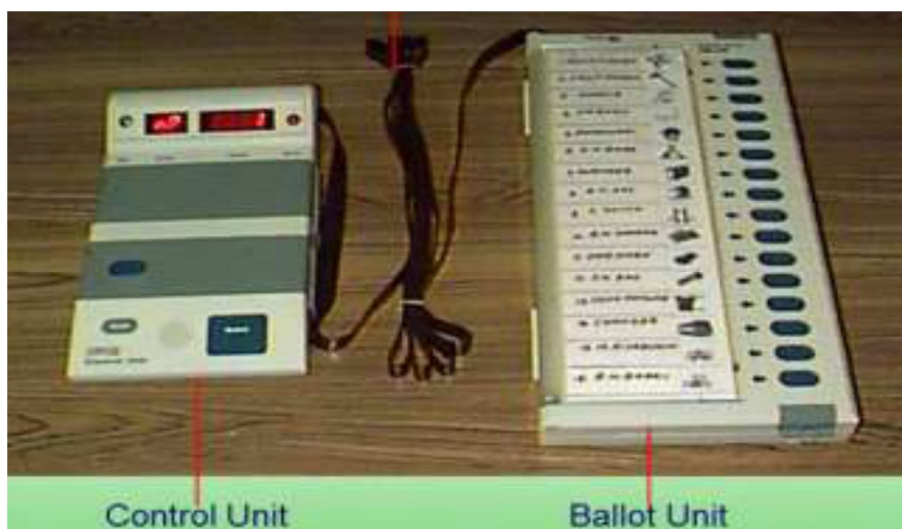

Fig-2: EVM System

C. Disadvantages of the Present System

After voting if any technical problems or damage occurs with the machines it may leads to the reflection. The machine is not able to recognize the eligibility of a candidate, so the corrupted officers may misguide the people. The corrupted officers may increase the count of the voting. During transportation of the machines the in charge person can change the status of machines and even may destroy. Moreover this system is expensive as we need officers, secured place for counting and for election to be carried out. It needs nearly 5 million man power to conduct voting in India. The voter can't vote from the place where he is. He has to go to his respective constituency to cast his vote.

III.   PROPOSED SYSTEM

In the Global wireless e-voting machine, the votes being casted will be stored in another remote secured server. An electronic system is used to enable the voter to vote and this vote will be transferred to the remote secured system by converting it into the radio waves. Unlike the previous systems, our system is capable of checking the legibility of the person who comes to voting through scanning his retina pattern. Even if the machine gets damaged the count of voting will not be lost and we can vote from anywhere. A person will be able to vote from mobile system or even through the internet only if he has retina scanner.

A. Detailed Diagram of the Election Process

The voting machine is actually a device which generates the different voltages for different votes these voltages are fed to the (ADC) which is then converted to digital bits then can be converted to radio waves.

B. Interface Device

This is an electronic device which converts the input digital signals such as (retina pattern votes and secure bits) to radio waves.
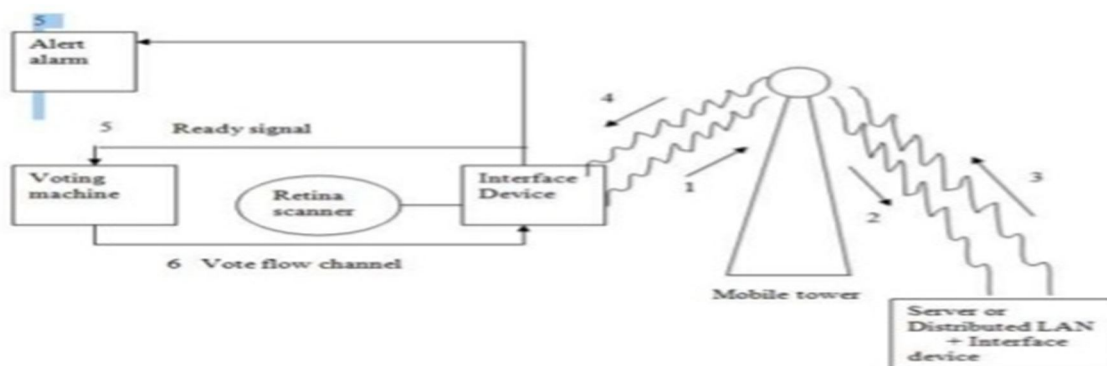
Fig-3: Interface Device

Explanation of diagram
1) Radio waves are being transmitted to the mobile tower. Those waves consist of scanned retina pattern and the vote.
2) Radio waves are being transmitted from the mobile tower to the remote server.
3) Positive or negative acknowledgement is being transmitted from the server to mobile tower.
4) Positive or negative acknowledgement is being transmitted from mobile tower to Interface device.
5) Ready signal will be generated if the retina is scanned appropriately to voting machine. If not so, negative signal will be generated then alert alarm will be activated.
6) Acknowledged vote is prepared to rivulet to the interface device.

C. Eye Retina Scanning
The eye retina machine be a simple web cam or device which can capture the images effectively. The capture image will be represented in the form of a matrix where each pixel represents 24-bit (RGB,8+8+8 format).

Fig-4: Eye Retina Scanning

D. Working of the Whole System
In the global wireless e-voting system there will be two possibilities of voting.
Voter can cast his vote with his mobile device, wherever he wants. But the mobile device should have internet connection and also a retina scanner.
Whenever voters enter to voting booth then he will be instructed to directly look at retina scanning machine at this time the machine scans the retina. Once retina scanning properly confirmed then it sent signal to the voting machine as to accept the vote it will be powered on .then voter is made to vote. Now the whole data including the retina pattern is sent to interfacing device which is convert into radio waves of mobile frequency range and these radio waves are sent to mobile tower and then to the remote server, where the authentication and voters identification is stored into a secured database. The received data is first converted into digital format from the radio waves through the interface device kept the server side, and then retina pattern and vote separated. Next the retina pattern is matched against the existing database. If match is found then flag is check which indicates its voting status i.e. if the

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voter is not voted yet then positive ask is send to the mobile tower and then to the corresponding voting machine. This ask is recognized by the receiver kept at the voter side and machine is made to scan next retina pattern and vote, otherwise if–vet ask then alert alarm is made to ring.

IV. IMPLEMENTATION

There are several more issues that we have to consider along the Implementation such as

A. Security

The radio waves of a mobile frequency consist of Retina pattern and vote can be generated by means of external source. That's why we need to provide some set of security to avoid this problem. One of the idea to solve this problem is CDMA (which will be explained later) and another technique is inserting security bits at regular interval of time during the transmission of radio waves (Ex.2 msec) .At the server side after the given interval (2 msec) security bits are checked (ex 1001) . In case of positive confirmation we can accept as valid vote, otherwise simply rejected.

The length of the given string is 7. So let us generate the 7 random numbers .Let numbers is

1) 8 12 34 4 11 9 26 .

The ASCII values for KSHITIJ are

K S H I T I J

2) 75 83 72 73 84 73 74

Add corresponding A) and B) values as

8+75 12+83 34+72 4+73 11+84 9+73 26+74

83 95 106 77 95 82 100

The corresponding ASCII characters for these are

S _ j M _ R d

The corresponding characters for random values

! $ ( ) +

Finally encrypted data as

n! d # m % m (y +

The ultimate encrypted information is shaped in such a way that the unsystematic information at the even places and the remaining at odd places. This is done to make the decryption much uncomplicated. The encrypted data can be decrypted simply by taking away the characters at even position from odd position character. In this way the algorithm can be implemented.

B. Efficiency

The data which is sent from the voter (client) side, it is in the large amount, this delays a bit a voting system and the data that is received at server side is in the multiple access mode i.e. more than one client is sending the data. The votes which are being acknowledged at the server is in various access mode. This is because more than one person can cast their votes at the same time from various places. If we reduce the data size then this problem may reduce. We may also apply compression algorithms in order to overcome this problem. This will decrease the data transfer. Compression methods like jpeg, gif, png etc. may be used.

Concurrency problem in using the multiple servers can be reduced by using CDMA technique where the key values are orthogonal to each other i.e. $x1*x2=0$ and $x1*x1=1$ i.e. if anyone tries to decode the data with any other key the data will be missing as the data will be in the type $y1*x1$.If anyone try to decode with x2 then effect will be as $y1*x1*x2=0$. This will fade away the data. And if correct decoding key i.e., x1 is used then decoding will be $y1*x1*x1=y1$. This decrypts the information accurately. As per the scheming concurrency for multiple access the information from all the nodes is acknowledged as $x1*y1+x2*y2+x3*y3+x4*y4$. If anyone needs information respective to the second node then simply multiply the complete equation with x2. This will result y2 as $(x1*y1+x2*y2+x3*y3+x4*y4)*x2=y2$. It can be seen that numeral nodes are permitted to send the data, while the server will acknowledge all the information and which ever has to be unconcerned will be multiplied with respective key.

C. Geographical Problem

This is the problem regarding the area where technical facilities like mobile tower or Internet service is not present. There will be few areas where we can't find internet services and mobile tower facilities .In such areas people will have to face the difficulties in casting their vote. In order to the overcome their problem it can be made to translate the casted vote and the eye retina pattern of the

voter into electrical signals till the area where the appropriate facilities are found. Their vote should also be casted and therefore this can be done but the system through the mobiles itself even from there.

V.   FUTURE ENRICHMENTS

The project can be enhanced to work in mobiles through SMS. With this method we can increase the percentage of voting. But for its implementation security becomes a problem which has to be overcome with the proper secured methods. Here when the voter casts his vote we can provide the voter with a printed paper containing the details of the vote that he has casted. With this printed paper we can reduce the fraudulent actions that can takes place.

VI.   CONCLUSION

This process of voting can be done at any place. The machine which we will be going to use in this process will provide higher level of security, authentication, reliability, and corruption-free mechanism. By this we can get result within minute after a completion of voting. Minimum manpower Utilization, hence mechanism is error free.

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