Intelligent Polling System Using Mobile Internet Technology

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Abstract

An online-voting, Electronic voting systems, also known as Classroom communication systems (CCS), Personal Response Systems (PRS) or Audience Response Systems (ARS) use Mobile handsets as transmitter if the person is within the range of receiver or uses Internet connected Mobile Equipment (ME) to reply from anywhere. To minimize the disadvantages of conventional e-voting, we propose a method in which a voter, who has E-certificate issued in advance, uses its own GSM Mobile phone without a special registration for a vote. In this paper, a polling scheme using mobile internet technology is presented as most basic application of GSM based Personal Response System, which allows a voter to cast his/her vote in simple and most convenient way without the limit of time and location. By integrating an electronic voting scheme with the pre-install GSM infrastructure.

Index Terms— *Personal Response System (PRS), Online-voting, GSM Technology, Mobile Equipment (ME), Confidentiality, Real Time Response(RTR).*

I. INTRODUCTION

In democratic countries, voting is an important tool to collect and re-act civilian's opinions. Conventionally, voting is conducted in centralized or distributed places called voting booths. Civilians go to their nearby voting booths and cast their votes under the supervision of authorized parties. Once the election has finished, The votes are then counted manually. With the rapid development of computer technology and cryptography methods, electronic voting systems can be employed that replace the incident and most importantly error-prone human Component. To increase the efficiency & accuracy of voting procedures, computerized voting systems were developed to help collecting and counting the votes. These include Lever Voting Machines, Punched Cards for Voting, Optical Mark-Sense Scanners and Direct Recording Electronic (DRE) polling systems.

The term "online -voting" is defined as any voting method where the voter's intention is expressed or collected by electronic means. E-Voting has been performed recently in some nations and regions. In an e-voting by touch screen, a voter directly selects candidates or the vote content appeared on a screen as the finger. This voting with fast counting time has also a problem that voters have to go to the polling station. In the meantime, an Online-voting using internet has no inconvenience that voters should visit the polling booth.

However, this voting can be perform just in the environment with internet accessible computer.

Due to so many reasons, voters may be unable to attend voting booths physically, but need to vote remotely, for example, from home or while traveling abroad. Hence, there is great demand for remote voting procedures that are easy, real time, transparent, and, most importantly, secure.

In this paper, we tried to improve mobility and address security problems of remote voting procedures and systems. We here present an electronic voting scheme using Internet Technology. With more than one billion users, the GSM authentication infrastructure is the most widely deployed authentication mechanism by so far. We make use of this well-designed Internet authentication infrastructure to improve mobility and security of mobile voting procedures.

An online-voting system that allows a voter to be identified using a wireless certificate without additionally registering when a user votes using his/her mobile terminal such as a cellular phone or Computer/laptop device. We also present a method that ensures the identity of voter and the confidentiality of vote content absolutely secure. By our mobile voting system, a voter can cast his/her vote more easily and conveniently than the existing e-voting using internet technology, within the scheduled time period from anywhere even when a voter is not able to access internet on a voting day. Our

proposal can be applied not only to presidential election but also to any votes such as a national assembly election or a local election or Lok Sabha Election.

Here is the Percentage of Voting From 1952 to 2014 of Lok sabha Election:

Election Year	% of Voting
2014	63.05%
2009	66.38%
2004	57.65%
1999	59.99%
1998	61.97%
1991	56.93%
1989	61.15%
1984	63.56%
1980	56.92%
1977	60.49%
1971	55.29%
1967	61.33%
1962	62.09%
1952	61.02%

Table:1- % voting in LokSabha Election

Here we can see that average voting rate is approximately 50 to 60 percentages.

Consider the case if any one I.e. registered voter in his/her home state that is UttarPradesh, If he/she need to register him/her self in Bangalore he/she need to prove that he/she is a resident there. However, he/she lives as a paying guest; So he/she has no proof of residence, so registering him/her self in Bangalore is not an option. Importantly he/she is not acquainted with the political scenario there and so even if he/she had an opportunity to vote he/she would not know whom to vote for, except make a choice along party lines, that too the national ones only, most of the people from outside the State hardly know the regional parties. So in such case, he/she would be able to make the best choice if he/she was to vote in UttarPradesh.

Metro & Mega cities have millions of people, from all parts of the country, a most of them are a floating population like above case , working in one state but with no political id entity. Therefore, there is requirement of remote voting system to increase the voting rate.

1.1 ADVANTAGES OF SMS BASED GSM VOTING COMPARE TO CONVENTIONAL POLLING SYSTEM

1. Cost Effective:
Instead of having thousands of polling stations scattered all over the country which will involve enormous logistics to is deployed , the only 'polling stations' will be one counting center per service provider where the election polling software system, this makes it easier to monitor.

B. Participation and voting options Increases:
As One can vote from home or offices, no need of public holiday to enable people to vote. Participation will be higher because people do not have to leave their home and stand in long endless queues. Participation will generally be greater than ever before. Many people do not vote just because of the stress involved in leaving home to reach to polling Booth .

C .Minimised Risk:
The road travel risk such as road traffic accidents and late arrival of electoral resources due to unforeseen delays during deployment of polling stations will be avoided.

D. Reduced time Consumption:

As it is electronic in nature, the results of the Polling will be come up immediately after voting with the GSM sms voting.

E. Greater speed and accuracy placing and tallying votes:
Possibility of dummy voting will be very low as compared with the ballot box system. The reasons are:
1) Every political office candidate will be allocated a number. eg. NCP candidate: sms to 1005, BJP: sms to 2604, Congress: sms to 4009 etc.

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2) An electronic voters' database (which is a primary requirement for the GSM sms system) will be used to control the rigging. Every voter will also register with unique GSM phone number, which he would use for voting during the elections.

3) To give vote, voters will type their registration number as a sms message eg. 00030611 and send it to the number of their candidate of choice. To confirm the vote, the voter will receive an acknowledge message from the Counting Station that their votes have been received. As a part of the voting receipt.

4) During registration voters, those who don't have mobile phones can register with designated handsets to be provided by service providers or use numbers of well known friends. Once a number is used, it cannot be changed until after the voting result declared.

5) Possibility of multiple voting is not possible since voter registration number must match with the GSM number used for voting.

F. Provide Equal Opportunity:

Best of all, As this system will provide an equal opportunity for all the political parties, this process will guarantee that a new generation of political leaders will emerge at last.

II. BACKGROUND

In this section, we review the security features of GSM Module used to built Internet Infrastructure in particular the authentication function.

2.1 SECURITYPROVIDED IN GSM MODULE

Global System for Mobile Communication is commonly known as GSM. It is a digital wireless network standard widely used in European and Asian countries. It provides a common set of compatible services and capabilities to all GSM mobile users. The services and security features to subscribers are subscriber identity confidentiality, subscriber identity authentication, user data security-confidentiality on physical connections, connection less user data confidentiality and signaling information element confidentiality. They are summarized as follows:

A. Subscriber Identity Confidentiality:

It is the property that the subscriber's real identity remains confidential by protecting his International Mobile Subscriber Identity (IMSI), which is an internal subscriber identity used only by the network, and using only temporary identities for network visited.

B. Subscriber Identity Authentication:

It is the property that ensures that the mobile subscriber who is accessing the network or using the service is the one authorized. This feature is to protect the network against unauthorized use.

C. Confidentiality of DATA:

Due to this property the user information and signaling data is not disclosed to unauthorized individuals, entities or processes. This Property is to ensure the privacy of the user information.

In our proposed GSM mobile Polling scheme, communication between the mobile equipment and the GSM network uses standard GSM Internet technology. Hence GSM security features are applied here.

III. GSM BASED INTELLIGENT POLLING SYSTEM
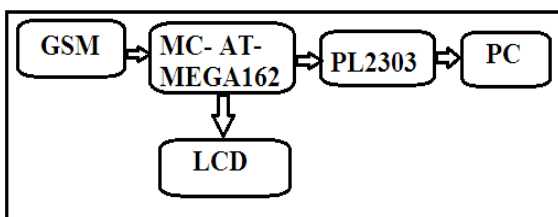
Fig. 1 Block Diagram of Intelligent Polling System Using Internet Technology

Fig. 1 shows the Block Diagram of Intelligent Polling System Using Internet Technology. It contains GSM Modem M10, a 16 bit Microcontroller ATMEGA162, which having two serial port one for GSM Modem and other for PC, Prolific PL2303, which is used for Communication & Interface between USART based serial port of microcontroller& USB port of computer. And a 16×2 Character LCD is used to display message.

IV. OPERATION OF INTERNET TECHNOLOGY BASED INTELLIGENT POLLING SYSTEM (IPS)

Fig.2 shows the GSM Module for Internet Technology as a part of Receiver, which receives votes from each voter in terms of messages (SMS). Each voter has unique mobile id (Mobile No.), like a voter id, that identify the voter's identity. Election committee provides mobile id.. The voter who uses their mobile to caste their votes through Internet Technology. For this purpose the information of candidates are predefined to voter's modem, it also has own number that is known to every voter. When voter caste their votes on the Election Day, for this purpose voter send an SMS to GSM, which contains voter's mobile id and the candidate's id which he/she wants to vote. GSM modem will receive the votes, which is coming from voters' mobile equipment (ME).

Fig.2 shows the Internet(GSM) Receiver Module

V. HOW DOES GSM BASED IPS WORKS???

Fig. 3 shows the flow chart of Internet based IPS system which works as follows: For example, a voter has id 045 he cast the vote for a candidate which serial id is 04 than
he will send a message to GSM modem that is (045 04 919981360643).
GSM modem will send received message to the microcontroller I.e. MC-AT-MEGA162. This Microcontroller will keep the database
For all valid voters id. Microcontrollers receive the message from a GSM modem and compare the voter id of the received message from its own database. On the basis of comparison it gives following conclusion:
1. 'This is valid voter id'- if this is valid voter id than it checks that the any votes from this id is received.
2. 'Voting is already done' - if votes from the same id is received by microcontroller than that is discarded by microcontroller and send acknowledge massage returns to voters mobile.
3. 'unsuccessful voting'
If this is invalid voter id than microcontroller discard the vote, and send acknowledge message , return to voters mobile.
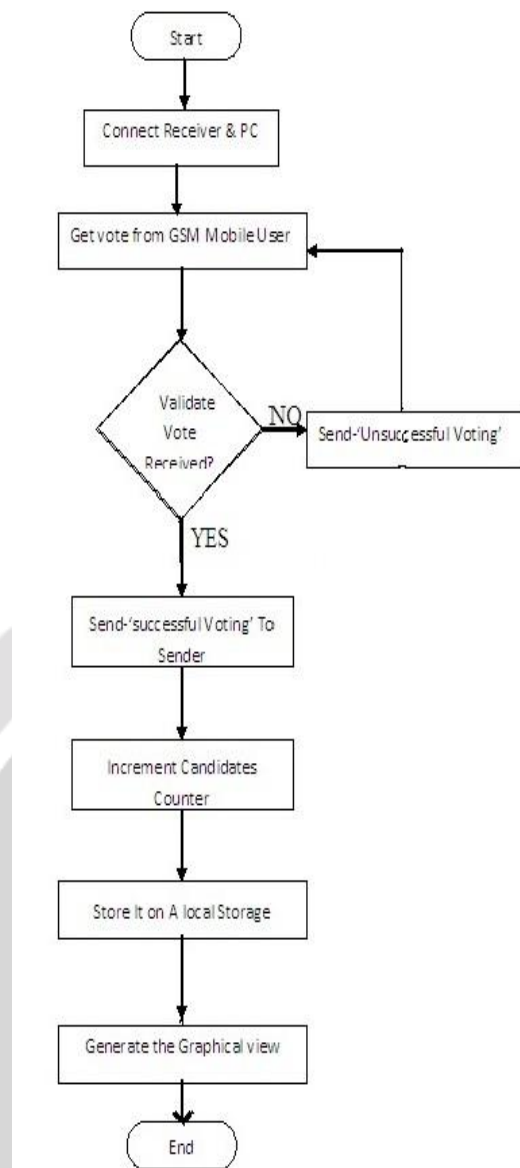
Fig.3 Flow chart of IPS using Internet Technology

If vote received by voter' Mobile id is first time than it checks the candidate id and increment the counter for valid candidate, for whom he votes. And send this vote to the personal computer. Microcontroller will send acknowledge massage 'successful voting' return back to voters mobile id.
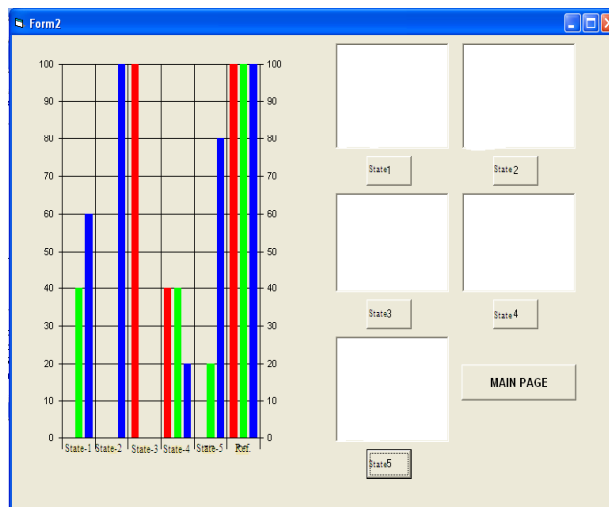
VI. RESULT OF SIMULATION IN VISUAL BASIC

   The below Fig-4 shows the form 1 created in visual basic. Here after entering the port no, the file for three candidates are created .As voters vote from their GSM Mobile Equipment (ME), for validate votes counter of that particular candidate will be increase by 1. Then by pressing the graph we can get the result of all three candidates as in form 2 as shown in Fig-5.

As shown in Fig. 5 shows the Graph of five State after voting with GSM-Internet Technology having Three Candidates. Here, the response shows the (%) parentage   voting done in favour of all three candidates, for five different states. The Result of five State indicates that 100% votting is achieved with GSM Internet Technology,
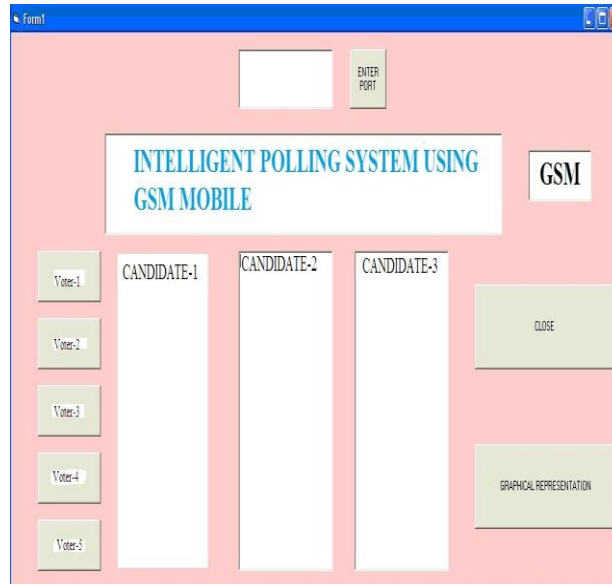
Figure 4 Form1 created in Visual Basic

where voters may have cast their voting through Mobile terminal or via Desktop/Laptop terminal. which is shown in graphical manner.And this five states result is compared with reference to100% in last column.

Fig.5 Simulation result in visual basic

VII. CONCLUSION & FUTUREWORK

This paper shows in detail the motivation, design and implementation of a proposed online-voting technique using Internet Technology- GSM Mobile System as a most basic application of GSM Based Personal Response System, where valid and eligible voters can cast their votes anytime, anywhere by using a GSM Mobile Equipment (ME). Our proposal enables a voter to cast his/her vote using a Internet Technology-ME(Mobile Equipment) without additionally registering himself/herself for voting in advance and going to a polling place as a real time votting. Here the GSM Mobile service provider authentication infrastructure is used to provide voter authentication and improve voter mobility. As we know that authentication is always a difficult requirement to fulfill for remote voting schemes, most of which apply a public-key based signature scheme for voter's authentication. In our proposed technology , we are using the existing GSM authentication infrastructure. Our Technology also enhances the security and provides more mobility and convenience to all voters. Where the voters' privacy is protected. In addition, proxy voting or double voting is not possible in this technology. Any entities except for an e-voting device cannot know the voting result. However, future work is required to address the importance that we place in the trust on the Authentication Center (AC). In further work, we will discuss more on end-user device (ME) and application security. In this paper, our concern is to present online-voting system using a Mobile Equipment (ME) and to explain its process as a basic application of Internet Technology- GSM based Personal Response System. In which voter does not need to go to voting booth to cast their votes.

ACKNOLEDGEMENT

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