

BIOMETRIC GSM VOTING SYSTEM

Mrs. S.M.Shinde^{#1}, Mrs. Priti Subramaniam^{#2}

(Associate professor of E&C Dept.S.S.G.B.C.O.E.T.,Bhusawal)

(Assistant professor of CSE Dept.S.S.G.B.C.O.E.T.,Bhusawal)

Abstract : Electronic voting (also known as e-voting) is a term encompassing several different types of voting, embracing both electronic means of casting a vote and electronic means of counting votes. Electronic voting technology can include punch cards, optical scan voting systems and specialized voting kiosks (including self-contained Direct-recording electronic (DRE) voting systems). It can also involve transmission of ballots and votes via telephones, private computer networks, or the Internet. Electronic voting systems may offer advantages compared to other voting techniques. An electronic voting system can be involved in any one of a number of steps in the setup, distributing, voting, collecting, and counting of ballots, and thus may or may not introduce advantages into any of these steps. The main aim of this project is develop a Electronic Voting Machine with maximum security facilities.

Index Terms— Electronic voting, e-voting, Direct-recording electronic, private computer networks, biometric gsm voting etc (*key words*)

I. INTRODUCTION.

Biometric voting has been a very controversial topic ever since the presidential elections in the U.S. in 2000. Many security flaws were found. The standards for the implementation of Biometric voting systems were shown to be too weak and many (scientific) experts expressed their negative opinions on biometric voting. Nevertheless, efforts are still made to introduce Bio-metric in countries that use traditional paper ballots. Biometric voting is an election method in which the votes are cast or collected electronically. A computer system whose main element is an software component that maps the voting procedure electronically is called an biometric voting system. A direct recording electronic (DRE) machine is a special case of such a system as it implements all steps in the voting process, from registration and ballot casting to counting.

Introduction

There are two different forms of voting: distance and presence voting. In presence voting, a voter can cast his or her vote in a polling station under the supervision of the election's administration. Examples for presence voting are conventional elections in polling stations or voting with biometric voting machines. In distance voting, the voter acts without the supervision of the electoral commission and casts his or her vote from a place other than a polling booth, such as casting absentee ballots via mail or internet voting.

In the presidential election, the election of member of the national assembly, the head of local government election, and others, a voter can cast vote after going to the designated polling place and checking his identity. This makes man directly to count the ballots and counting of votes to be long. Especially, this voting is a reason to reduce voting rate since voters always should go to the polling place. In an e-voting by touch screen, mobile system and internet, a voter directly selects candidates or the vote content appeared on a screen as the finger. In the meantime, an e-voting using internet has no inconvenience that voters should visit the voting booth. However, this voting is executed just in the environment with internet accessible computer. In this paper, we proposes an e-voting system that allows a voter to be identified using a wireless certificate without additionally registering when a user votes using his mobile terminal such as a cellular phone or a PDA. We also present a method that ensures the anonymity of voter and the confidentiality of vote content. By our mobile voting system, a voter can cast his vote more easily and conveniently than the existing e-voting using internet, within the scheduled time period 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. Our goal is not to design a cryptographically provable protocol but to illustrate e-voting model and to describe a voting process.

In democratic societies, voting is an important tool to collect and react people's opinions. Traditionally, voting is conducted in centralized or distributed places called voting booths. Voters go to voting booths and cast their votes under the supervision of authorized parties. The votes are then counted manually once the election has finished. With the rapid development of computer technology and cryptographic methods, electronic voting systems can be employed that replace the incident and most importantly error-prone human component. To increase the efficiency and 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) voting systems. For a variety of reasons, voters may be unable to attend voting booths physically, but need to vote remotely, for example, from home or while travelling abroad. Hence, there is great demand for remote voting procedures that are easy, transparent, and, most importantly, secure. Today, the most common way for remote voting is postal voting, where

voters cast their votes by post. However, it lacks proper authentication and involves a time-consuming procedure. Internet voting was introduced to provide more flexibility. Because of the inherited security vulnerabilities of the Internet and computerized systems in general, Internet voting incurred a wide range of criticism. However, to date many pilot projects in different countries and research groups have been carried out. The Secure Electronic Registration and Voting Experiment (SERVE), an Internet-based voting system built by Accenture and its subcontractors for the U.S. Department of Defense's Federal Voting Assistance Program (FVAP), is the most well-known of this kind. In this paper, we endeavor to improve mobility and address security problems of remote voting procedures and systems. We present an electronic voting scheme using GSM. With more than one billion users, the GSM authentication infrastructure [1] is the most widely deployed authentication mechanism by far. We make use of this well-designed GSM authentication infrastructure to improve mobility and security of mobile voting procedures. The cryptographic protocol of our GSM mobile voting scheme is based on the earlier work of Fujioka et al. In our proposed scheme, voters are authenticated by their GSM mobile operators, and the votes are sent using GSM wireless communication. Voters and their votes cannot be linked and votes remain secret until the final counting. The Fujioka et al. applies a public-key based signature scheme for every single voter. By employing the GSM authentication infrastructure instead, we avoid using a public-key based solution and employ a full-edged scheme for every single voter. Hence the public-key infrastructure overhead is largely reduced.

II. OBJECTIVES

Electronic voting system [2] is the system that automates and simplifies the process of election. It is based on the computers or portable computerized devices. This paper firstly discusses about the generic requirements and specific user-oriented requirements for electronic voting systems. Then it introduces a set of essential components for building up electronic voting systems. Moreover, it presents the design analysis, which is based on analyzing various existing electronic voting systems, and usability and security are the key issues to be discussed in this section. The analysis shows that these systems worked well, but still have several problems. Suggestions about what need to be improved are provided in the end. Electronic voting (E-voting) [3] using an internet has been recently performed in some nations and regions. There is no spatial restriction which a voter directly has to visit the polling place, but an e-voting using an internet has to go together the computer in which the internet connection is possible. Also, this voting requires an access code for the e-voting through the beforehand report of a voter. To minimize these disadvantages, we propose a method in which a voter, who has the wireless certificate issued in advance, uses its own cellular phone for an

e-voting without the special registration for a vote. Our proposal allows a voter to cast his vote in a simple and convenient way without the limit of time and location, thereby increasing the voting rate, and also ensuring confidentiality and anonymity. Electronic voting systems have the potential to improve traditional voting procedures by providing added convenience and flexibility to the voter. Numerous electronic voting schemes have been proposed in the past, but most of them have failed to provide voter authentication in an efficient and transparent way. On the other hand, GSM (Global System for Mobile communications) is the most widely used mobile networking standard. There are more than one billion GSM users worldwide that represent a large user potential, not just for mobile telephony, but also for other mobile applications that exploit the mature GSM infrastructure. In this paper, an electronic voting scheme using GSM mobile technology is presented. By integrating an electronic voting scheme with the GSM infrastructure, we are able to exploit existing GSM authentication mechanisms and provide enhanced voter authentication and mobility while maintaining voter privacy.

III. ORGANIZATION

Electronic voting system organization Figure 1 shows the architectural view of a generic e-voting system. There are some essential components in a generic electronic voting system and each of these components will be detailed in this section. There are many different devices for users to access an electronic voting system. Those devices include desktops or laptops with wired internet connections, WIFI or WAP enabled mobile devices such as personal digital assistant and smartphones, and normal cell phones. The user interface technologies of those devices are presented in the following text. With the development of the high technologies, PC and apple computers are becoming more and more powerful, and they are normally characterized by huge memory resources (L1 cache and L2 cache), powerful processors, and high resolution of the display. The new generation internet browsers with, for example, Macromedia flash player, are capable to display most of powerful graphic user interface language such as HTML and XHTML associated with JavaScript, AJAX technologies. There is a prototype called HTTP between web browser and web server to ensure data exchange over the wired Internet.

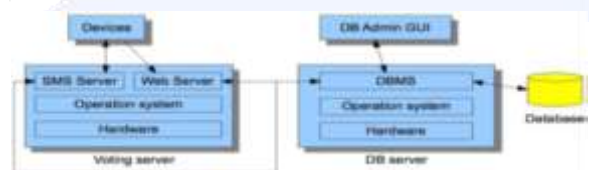


Figure 1: An architectural view of a generic Biometric voting

Portable devices are characterized by small memory resources, limited processors, and limited web browsers. A thin-

client application solution should be the primary consideration for designing a mobile device –based e-voting systems. In addition, a markup language called Wireless Markup Language (WML), which is based on XHTML, is utilized by browsers built in the PDA or Smartphone as a specification for the user interface. For those portable devices such as PDA, smartphones, figure1 depicts that they connected to the voting server over wireless network. Since the limited bandwidth of network, these devices use wireless application prototype framework (WAP). A gateway is accommodated to connect to the web server and transfer WAP to the standard HTTP.

A. Cell phones

Figure1 shows that cell phones utilize the Short Message Service (SMS) technology to connect with voting server. SMS is probably the most popular way to communicate among users. The low cost is one of the most attractive features for SMS based voting system. However, the obvious drawback is that it is hard to build up a highly interactive user interface or dialog between the cell phones and voting servers.

B. The election database system

The election database system that contains all data representing elections, voters, candidates, and the schema that is used to present the associated constraints to avoid data redundancy. For instance, the constraints of database for a national-wide presidential election voting system could be described as a voter must be registered as a citizen of that country, a voter must be above 18 years old, a candidate must be a citizen of that country, and a candidate must not be a president before. The database is managed by a database management system (DBMS).

The web server and web pages The web server stores the different web pages and the codes to interact with database and voters. There are two kinds of web pages: static and dynamic. The data content of static web pages cannot be changed through its existence. However, the content of dynamic pages can be changed based on voters' input. The dynamic web pages can be implemented by couple technologies such as PHP, ASP.NET or JSP. The GSM/GPRS Modem comes with a serial interface through which the modem can be controlled using AT command interface. An antenna and a power adapter are provided. The basic segregation of working of the modem is as under

- Voice calls
- SMS
- GSM Data calls
- GPRS

Applications suitable for GSM/GPRS mode

If your application needs one or more of the following features, GSM will be more cost-effective than other communication systems.

C. Short Data Size:

You data size per transaction should be small like 1-3 lines. e.g. banking transaction data, sales/purchase data, consignment tracking data, updates. These small but important transaction data can be sent through SMS messaging which cost even less than a local telephone call or sometimes free of cost worldwide. Hence with negligible cost you are able to send critical information to your head office located anywhere in the world from multiple points. You can also transfer faxes, large data through GSM but this will be as or more costly compared to landline networks.

D. Multiple remote data collection points:

If you have multiple data collections points situated all over your city, state, country or worldwide you will benefit the most. The data can be sent from multiple points like your branch offices, business associates, warehouses, and agents with devices like GSM modems connected to PCs, GSM electronic terminals and Mobile phones. Many a times some places like warehouses may be situated at remote location may not have landline or internet but you will have GSM network still available easily

E. High uptime:

If your business require high uptime and availability GSM is best suitable for you as GSM mobile networks have high uptime compared to landline, internet and other communication mediums. Also in situations where you expect that someone may sabotage your communication systems by cutting wires or taping landlines, you can depend on GSM wireless communication.

F. Large transaction volumes:

GSM SMS messaging can handle large number of transaction in a very short time. You can receive large number SMS messages on your server like e-mails without internet connectivity. E-mails normally get delayed a lot but SMS messages are almost instantaneous for instant transactions. Consider situation like shop owners doing credit card transaction with GSM technology instead of conventional landlines. time you find local transaction servers busy as these servers use multiple telephone lines to take care of multiple transactions, whereas one GSM connection is enough to handle hundreds of transaction. Mobility, Quick installation: GSM technology allows mobility, GSM terminals, modems can be just picked and installed at other location unlike telephone lines. Also you can be mobile with GSM terminals and can also communicate with server using your mobile phone. You can just purchase the GSM hardware like modems, terminals and mobile handsets, insert SIM cards, configure software and your are ready for GSM communication.

IV. CONCLUSION

It is concluded that it is really hard to make an electronic voting system to satisfy all the voters. Many user requirements and justified security concerns by academic communities make

V. FUTURE SCOPE

a tough job for those developers developing electronic voting system. There is no perfect solution for the security issues that most of e-voting systems encounter with at the moment, and some problems are not even technically solvable. Hence, making e-voting to be free and open source could be a new way to explore further. This proposal enables a voter to cast his vote using a mobile phone or PDA or computer without additionally registering himself for voting in advance and going to a polling place. Also, proxy vote or double voting is not possible. Any entities except for an e-voting device can't know the voting result. In this paper, we are not focusing on encryption algorithm applied for two entities. Its concern to present e-voting system using a mobile terminal and to explain its process. As a next work, it is needed to design a concrete cryptographic protocol to guarantee the anonymity and the confidentiality of a voter. Although there are a lot of electronic voting mechanism using multiparty protocol and anonymous communication, more reviews are required in the aspect of efficiency and secrecy.

We proposed a GSM mobile voting scheme, where the GSM authentication infrastructure is used to provide voter authentication and improve voter mobility. Authentication is always a difficult requirement to fulfill for remote voting schemes, most of which apply a public-key based signature scheme for voter authentication. In our scheme, by using the existing GSM authentication infrastructure, the public-key overhead is largely reduced. Our scheme also enhances the security and provides more mobility and convenience to voters. Where the voters' privacy is protected by applying a blind signature scheme. In this paper, we presented the basic structure and protocol of our GSM based mobile voting system. However, further work is needed to address the importance we place in the trust on the AC, and we are therefore investigating options for enhancing and extending the GSM mobile voting scheme. In future work, we will discuss end-user device (ME) and application security.

We will also address how the voters obtain the voting application and solutions to provide the integrity of the voting application running on the ME. The Trusted Platform Module and smart card solutions will be considered. Even the best election observation cannot solve the transparency problems with Electronic voting by using internet and GSM described above. However, good election observation can review system design and, perhaps, undertake extensive technical validation of a prototype terminal. Such efforts may be important if election results are contested, but they are unlikely to be determinative. The procurement of ballot boxes or ballots from a given supplier in a given election does not bind the electoral authority to the same supplier for future elections. this technology, however, is not "mix-and-match." Procurement from a given supplier binds the electoral authority's future decisions, perhaps becoming a point of unhappiness if the donor reduces its commitment over time.

It proposed a internet and GSM mobile voting scheme, where the GSM and the internet authentication infrastructure is used to provide voter authentication and improve voter mobility. Authentication is always a difficult requirement to fulfill for remote voting schemes, most of which apply a public-key based signature scheme for voter authentication. In this scheme, by using the existing GSM and internet authentication infrastructure, the public-key overhead is largely reduced. This scheme also enhances the security and provides more mobility and convenience to voters. Where the voters' privacy is protected by applying a blind signature scheme. In this paper, I presented the basic structure and protocol of our GSM and internet based mobile voting system. However, further work is needed to address the importance place in the trust on the AC, and this are therefore investigating options for enhancing and extending the GSM and internet mobile voting scheme. In future work, it will discuss end-user device (ME) and application security. It will also address how the voters obtain the voting application and solutions to provide the integrity of the voting application running on the ME. The Trusted Platform Module and smart card solutions will be considered.

First of all, in 2003, 60% of France citizens prefer internet voting to paper voting. This indicates that more and more people intend to vote though their own electronic devices. Secondly, the usability study run by professors from the University of Maryland indicates that Audio-only mode of Diebold machine has some problems such as the keypad mapping is inconsistent and delays make the audio quality pretty bad. The idea of Designing Audio-only system is fantastic for the people with disabilities but technically developers should improve the audio quality for the Diebold machine. Thirdly, there is no significant solution for the people with disabilities using online voting system. Since the internet voting system will get more and more popular, the accessibility of system still needs to be improved. Fourthly, the electronic voting systems should try to be free and open source to users. Last but not least, some internet voting systems such as ADDER does not offer to a voter a method for physically verifying if this voter actually submitted the vote by him/herself or this was her/his actual choice. Hence, solving this complex problem will be challenging

VI. APPLICATION

The application for this electronic voting system by using GSM mobile technology and internet is only for casting vote.

- ✓ This makes vote counting and result tabulation faster and more accurate. Although any election can be conducted using hand counted paper ballots, these two categories of elections can require time-consuming, costly, and error-prone hand counts.
- ✓ The introduction of electronic voting would motivate the younger generation to take an interest

in voting, as they are more likely to vote in this way.

- ✓ This technology combats common Indian electoral fraud problems, such as capturing polling places or stealing ballot boxes.
- ✓ Equally, mention that some people cannot be bothered to go to a polling station particularly if it is far away, and that this is when alternatives such as an electronic voting are most important.
- ✓ Many complain that the presence of candidates and canvassers at polling stations is irritating and too much of an attempt to influence voters' choice. This will not happen in electronic voting system.
- ✓ This voting system will bring the voter to vote from any places other than his or her home town for example a military person can cast his vote, a student who is studying far from his place can cast vote.
- ✓ Accuracy of counting is one of the main advantage of this system.
- ✓ It reduces figures by making spoiled ballots impossible and unintentionally blank ballots difficult.
- ✓ Proxy vote or double voting is not possible. 4.5 Limitations:
- ✓ Illustrate that the idea of a polling station is familiar and proven to work, as well as being simple and easy to understand.
- ✓ Electronic voting is still much more in the trial stage than postal voting, and has not been tested so extensively. It is also said to be more problematic.
- ✓ It is argued that many voters find electronic voting confusing or too much of a change.
- ✓ These technologies also allow for more sophisticated voter interfaces, potentially resolving many voter access problems for
- ✓ those with disabilities or those using minority languages. Visual interfaces may also be useful for illiterate voters, but this presumption has not been rigorously tested in environments with little computer literacy.
- ✓ Any computer program can have an undetected, unintentional error (a "bug"). Any computer program can be changed by malicious programming ("hacked") in a way that is undetectable after the fact. This is true of all manufacturers and, in fact, of all computer software.
- ✓ The cost and complexity may well make E-voting prohibitively expensive, especially for relatively simple elections. The cost for the equipment of voting is high this give a main problem to those remote people who have not even a mobile equipment

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