A proposed design of E-Voting System with consuming of existing GSM infrastructure in the Aspects of Bangladesh

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Abstract: The foundation of a strong democracy is an informed and engaged citizenry. What is the better way to involve citizen or engaged citizen through the power of today's information and communication technology? Citizens around the world recognized and embrace the benefits of e-government service. Now government are initiating strategies that support e-democracy and doing so to engage more citizens in democracy process. This addresses the highly formal process of e-democracy in particular e-voting to offer governments and democratic base entities worldwide the infrastructures application and service necessary to implement and manage reliable, secure e-voting system. By integrating an electronic voting scheme with the mobile infrastructure. Using GSM base mobile technology, we are able to exploit existing secure mobile e-voting system. As like as Bangladesh is also a democratic country. Therefore, it is possible to apply this process.

Keywords: Electronic Vote, GSM mobile, Short Message Service, GSM MODEM (Huawei E220).

1. INTRODUCTION

In democratic societies, voting is an important tool to collect and reflect 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. Now a day the improvement or development of computer technology and cryptographic methods, electronic voting systems can be employed that replace the inefficient and most importantly error-prone human component. Voting system is the most important in democracy. As such it is critical to maintain the efficiency, reliability and security of the voting system. Traditional voting technology included hand count paper ballots. This paper base system has some problem:

- Unacceptable percentages of lost, stolen or miscounted ballots
- Voters lost through unclear or invalid ballots marks
- Limited accommodation for people with disabilities
- Unfair vote

For this reason, the development of technology information changes the view of the people voting system they vote. The mobile devices have been the most adopted means of communication both in the developed and the developing countries with its access more than all other electronic devices put together.
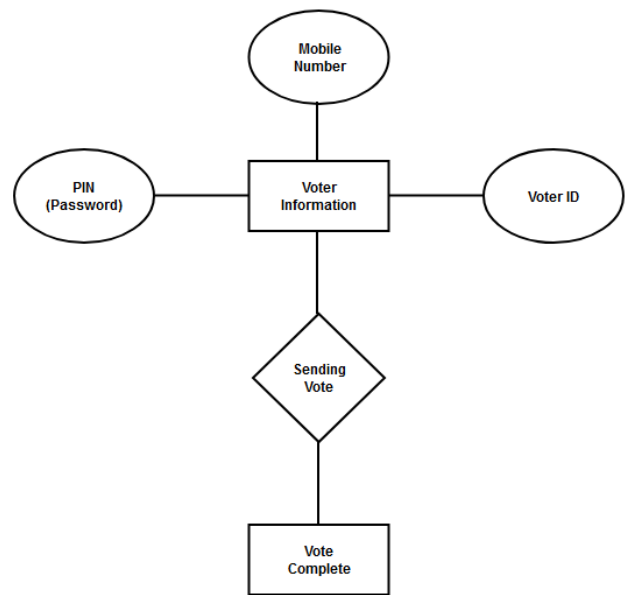
Figure-1: Voting System Relationship

- Ellipse Represent the voter identification
- Diamond Represent the send vote
- Rectangular Represent the information relationship

2. SECURITY REQUIREMENTS FOR SMS

Voting

- Voter Registration
- System Identification and Authentication

- Integrity of Information
- Service Protection

2.1 Voter Registration:

This phase represents the right To SMS voting service which granted only when SMS voting service registration are satisfied. This ensures that, the register voter has a legitimate right to vote as defined by law.

2.2 System Identification

This system will be granted to authorized agency and the mobile operators. The SMS voting system may be conditional depends upon the democracy process on behalf of government service providers.

2.3 Integrity of Information

To successful in the SMS voting system, it must be need to provide the information transmitted across the public networks with adequate protection from exploitation by accidental or deliberate modification, deletion or reply.

2.4 Service protection

In the SMS voting system, the application and the infrastructure network must be protected against the outside attacked during the voting time.

3. E- VOTING SYSTEM ARCHITECTURE
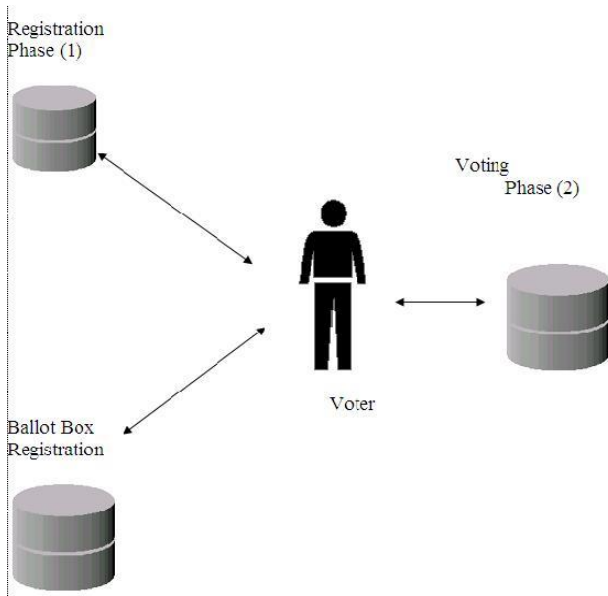
Figure-2: E-voting System Architecture

The proposal outlined here is a further development based on the algorithm proposed in. This proposed algorithm strictly separates registration and vote submission stage following the original requirements set by

3.1 Registration phase

The voter's credentials are checked and the voter receives a blindly signed election token, which is securely stored.

3.2 Voting phase

The voter uses the election token to obtain a ballot sheet and casts her vote. Figures depict the proposal, in addition to the notation that was used in the last section, the voter's Trust Center T will also be used for the voting protocol.

4. SYSTEM REQUIREMENTS

Table-1: System Requirements

	Windows 2008	Win-Dows 2003	Windows 2000	Windows 7	Windows Vista	Win-Dows XP
CPU	1 GHz 32-bit (x86) or 1.4 GHz (x64)	P550 or higher	P133 or higher	1 GHz 32-bit (x86) or 64-bit (x64)	P233 or higher	
Memory	512 MB	256 MB or more	128MB Or more	512 MB	512 MB	128 MB Or More
Service Pack	Not required	Not required	SP1 or higher	Not required	Not required	Not required
Available disk space	50 MB	50 MB	50 MB	50 MB	50 MB	50 MB
Internet Explorer	n/a	IE5.5 SP2 or Higher	IE5.5 SP2 or higher	n/a	n/a	IE5.5 SP2 or higher

The ActiveXperts SMS Messaging Server service only runs on a Windows workstation or server platforms, and must meet either of the following requirements:

5. CONCEPTS OF E-VOTING

5.1 Free elections

The citizen must be able to use her/his Voting rights without being coerced and without undue Influence of a third party. The vote must reach the election authority without the chance of manipulation.

5.2 Secret voting

No person must know the vote of another person, counting of votes must be delayed until a sufficient number of votes ensures that no conclusions as to the vote of the individual voter can be drawn.

5.3 Equal voting rights

Each vote must have the same weight. No vote must become invalid by predictable technical problems or must be lost on its way to the voting authority. Also, the right to vote must not be made dependent on factors other than those enumerated in the Law (e.g., a criminal conviction).

5.4 Audibility

The whole voting process must be transparent and reproducible.

5.5 Reliability

The whole voting system should work robustly (i.e. so that no votes are lost), even if failures occur like loss of Internet communication or malfunctioning voting machines.

5.6 Flexibility

The system should be configurable for many different election scenarios (like different ballot question formats or multiple languages etc.) and on a technical level compatible with multiple operation system platforms as well.

5.7 Uniqueness

No voter should be able to vote more than once.

5.8 Integrity

Votes as such should not be modifiable, forged or deleted without detection and the possibility to repair the manipulation.

5.9 Convenience

Election systems should not require extra skills to be usable and without unreasonable need for equipment.

6. METHODOLOGY

The aim of this project is to develop an interactive voting system with which users can Participate using their mobile phone. The system shall be made up of the following three components:

1. Mobile client application
2. Server application
3. Database back-end and web-based administration tool.

In this project we use Microsoft Access for developed our database and Visual studio.Net 2008. For SMS sending and receiving we choose Active Xperts SMS software. Visual basic are mainly used for showing the result and also work as the connecting media between the data base and the Active Xperts SMS software.

After developing database and carefully install software, it will be connected with a GSM modem. It will be noted that, uses windows and software must be authenticated. All
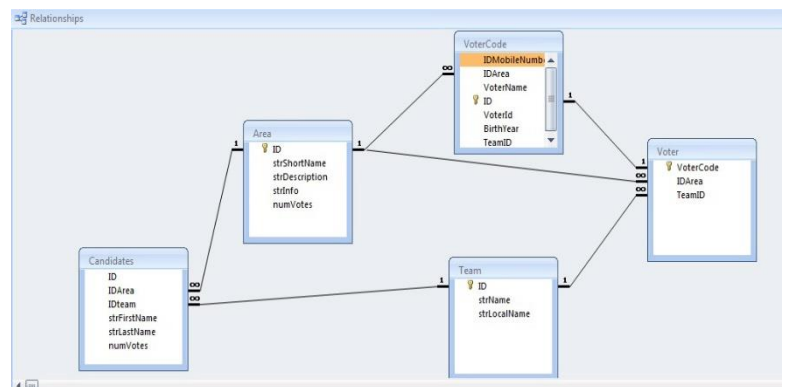
essential

Figure-3: Relationship diagram with Voter, Candidate & Team.

work with related system set up must be completed before starting the voting event. From related other works our project is obviously much better. To establish this project, it is needed less time than others. Because here we use very easier Microsoft access database. Database will be included

candidates' information beside the voters. Voters own mobile number, birth date and he/she is which areas? All are included the database. In the other side, candidate have a AreaID, that he from which areas, also include a TeamID (which is known as PartyID) that he stands election under that Team/Party. There has a wonderful relationship according to working process. After installing the software with authentication, go to the new project from the menu bar. With an attractive project name include the database there. Then connect the GSM Modem where include a SIM card. According to database relationship and voting process create a trigger. Without trigger the project cannot run & successful, because trigger indicates the whole working process and according to trigger it will work. Voting time duration, relationship maintain etc. all are included in this trigger. Total voting system design are completed by following steps:

- Make an access database with relationship (voters, candidates, party or team all information will include this database)
- Install SMS gateway software, open new project in ActiveXperts messaging server from menu bar and give an attractive project name.
- Create a trigger according voting system and following database relationship.
- Connect gsm modem with ActiveXperts software.
- Test database connection.
- After ending all primary work see the monitor from menu bar in the ActiveXperts messaging server.
- Before starting the service must be completed the output design using microsoft.net framework.
- Start your service & send message according the voting system.
- Show the result in your output design.

6.1 Voting

- Steps of voting can be followed:
- Go to your mobile SMS write option.
- Write your details (according to voting format).
- The format is <VOTERCODE>space<AREA>space<TEAM/PARTY ID> send ('0000')

- For example, <45-235-ED-87> <130601> <1100>

- If vote is successful, then a reply is return back in voter's mobile number. Which is…'successful, thank you for voting'.
- If vote is not successful, then also a reply is return back in voters' mobile number, reply is- 'unsuccessful, try again'
- If try again for third time with invalid way or try to corrupt, then also a reply is return back in voters' mobile number, reply is- 'you are corrupted' besides this also a reply will go to the legal service number.
- Finished.

['0000' will be a specific or unique number, in where all voters send their vote.]

6.2 Counting

When voting period is over, automatically voting will stop and server engine will off. After ending the period, the result is ready in database against each candidate. Also, can see the output design page who is the man of the day?

7. IMPLEMENTATION

To implement this voting system should use ActiveXperts software, in project trigger can be use VB language a GSM modem with connect this software and for developing database use Microsoft access database.

8. SERVER

Here the server is also the Activexperts messaging server with connect a GSM modem and visual studio (Microsoft.net framework) for developing output design.

9. NETWORK COVERAGE

For network coverage, which service or which providers sim we use in GSM modem, that coverage the network, which is possible for that or the limit of the providers. In this case the most powerful and wide coverage network is Grameenphone for Bangladesh prospectus. So, we choose this provider. Already it across the 300lakhs of its users.

10. TRIGGER & OUTPUT DESIGN

Before starting the service, you must be completed the trigger option and output design. Trigger is the main part of this service; it can be called the programming part. The whole process will work which system or how? All are be denoted in there, also voting period time limit. In which way you create trigger it works same way. Also, you must set up the output design, where you can see the final result.
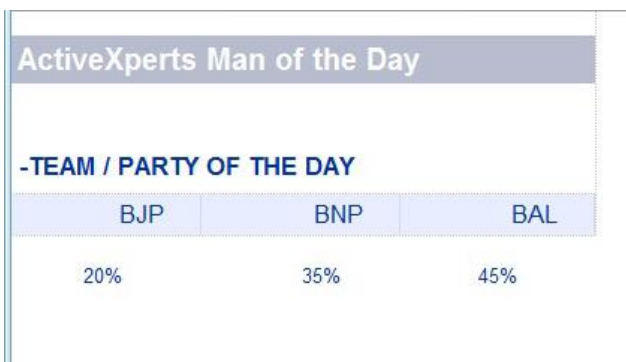
11. RESULT & DISCUSSION

All candidates name will show in output designing page. After ending voting period, the result will show this page with total vote corresponding their name. The output design with voting result for an area can be the following figure. (In figure, Abdul, Anowar, Farid. These are the name of candidates)

ActiveXperts Man of the Day

-UTTARA(Dhaka-01)

Abdul	Anowar	Farid
100	150	200

Figure-4: Voting Result for an Area

When voting result collection of every area and candidate will complete, the final voting result can be the following figure with the base of team or party (in figure, BJP, BNP, BAL, are the symbolic name of team or party.)

ActiveXperts Man of the Day

-TEAM / PARTY OF THE DAY

BJP	BNP	BAL
20%	35%	45%

Figure-5: The Final Voting Result

11.1 Conclusion & future Works

In this proposed mobile voting system, the system has developed for help the people to cast their vote easily and accurately its reemission the problem of the conventional voting system. The proposed system confirms that, the system has capable to completion the election fairly and give the result quickly which may reduce the corruption. Our developed mobile voting system is fully secure and reliable and time reduceable. The participation rate of voting is expected to increase because voters do not have to line-up in a long time, even it would satisfy people for high security system. For future improvements that can be made on the system as follows:

Day by day internet users are increase rapidly. People are going to be highly interested & attracted with internet.so e-voting or internet voting system can be made up. People complete their vote with internet by using computer or wap supported mobile phone.

Security of the system can be greatly improved if biometric authentication system such as fingerprint or face is employed. However, this type of authentication system needs extra hardware.

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