

Towards Designing Multi Agent Mobile and Internet Based Voting System

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Abstract

Voting systems are essential in most democratic societies. The voting process is very difficult and consuming time and effort process. One of the major problems of voting is the security process. The E-voting system is process to use mobile multi agents system which can be less time consuming and more accurate due to Agent role through encryption/decryption which reduce the risk of casting vote in trouble environment. the vote will be received by the agent which will be encrypted and sent to mobile data base, and similar action is carried out in the Internet agent who will carry out similar process in a similar manner. Voting data is collected in three different sources which eventually collected in master data base after decrypting all votes. the counting agent counts the votes and classify votes for each perspective owner.

Keywords: Agent, SMS, Mobile, Vote, Encryption.

1. Introduction

Voting and elections are essential for any modern democratic societies. Unlike any other event, the result of Voting and elections are essential for any modern democratic societies. Unlike any other event, the result of elections can have many effects on societies and their economic and financial everyday life. Some elections have seen a gradual decline in the overall percentage of the electorate exercising their right to vote. This is worrying problem from a democratic point of view in that, if the reasons of the decline are left not fixed, the mandate of those elected to hold the positions might eventually be questionable. Moreover, it is interesting to note here that traditional/manual voting systems are slow, complex, inaccurate and inefficient. To fix these drawbacks, Governments have proposed a number of possible methods for re-engaging the electorate in the voting process. One of these methods is the study of the way in which the elections are being conducted. These methods include the use of electronic voting (e-Voting) as a new and modernized way to carry out the election process. e-Voting extends polling hours (anytime voting) and enables casting of votes from any place (anywhere voting) using different electronic means (any device voting) such as mobile devices and Internet-based voting. In this technological age, it is imperative to explore and encourage greater use

of information technology (IT) in most forms of service delivery. The ability to cast a vote through a multitude of choices such as web and mobile technologies is instantly attractive. Such facilities should also overcome constraints associated with the current voting process and engage more young voters. There is no doubt that remote electronic voting offers a convenience that would be appreciated by many people. E-voting enables citizens to participate electronically in democracy and provides them with more information about candidates and the election they are being asked to participate in. This paper details the requirements, design and implementation of a generic e-Voting System, where voters can cast their votes anytime, anywhere and using a number of electronic devices including network system, Web and mobile phones. A set of requirements that an e-Voting system must satisfy, and The architecture of an e-voting system that satisfies the stated requirements is to be developed and the implementation of a prototype for the e-Voting system. The relation between those devices is connected using a number of designed multi-agent system where a number of tasks allocated for each agent in fully coordinated system. Voters are casting their vote though one of devices used where the system will go through a number of operations until the voting procedure ends.

This document is set in 10-point Times New Roman. If absolutely necessary, we suggest the use of condensed line spacing rather than smaller point sizes. Some technical formatting software print mathematical formulas in italic type, with subscripts and superscripts in a slightly smaller font size. This is acceptable.

2. Agent

An agent is a software entity that shows several degrees of autonomy, since it has to take decisions and to carry out jobs without the direct participation of the user. Often an agent is an active object, i.e., an object with autonomous computational capability; in this case, the programmers can exploit the characteristics of the object-oriented programming paradigm. There are currently two main areas that use the term agent in the computer science research. The former one regards distributed systems,

and uses mobile agent to mean an autonomous software entity with the capability of roaming among nodes in a network a mobile agent can move from host to host to find the needed resources. The latter area relates to artificial intelligence, where intelligent agent means a software entity that can take even complex decisions on behalf of the user. Obviously, the two terms are not exclusive, since they define two orthogonal characteristics, which can be considered in order to build agents that are both mobile and intelligent.[1] former one regards distributed systems, and uses mobile agent to mean an autonomous software entity with the capability of roaming among nodes in a network a mobile agent can move from host to host to find the needed resources. The latter area relates to artificial intelligence, where intelligent agent means a software entity that can take even complex decisions on behalf of the user. Obviously, the two terms are not exclusive, since they define two orthogonal characteristics, which can be considered in order to build agents that are both mobile and intelligent.[1]

2.1 Mobile Agent

We imagine a mobile agent to be a software entity endowed with the following properties:

1. **Autonomy:** As is the case for real world agents such as travel agents, software agents should work with some degree of independence from their creator. They should be able to make at least some decisions without the need to consult a central authority.
2. **Mobility:** In the case of mobile agents we insist that they have the ability to move from node to node in a distributed system. When such an agent moves it is assumed that it encapsulates some or all of its state to move with it. Beyond the above, a number of researchers include the following attributes in their definition of a mobile agent Interactivity. Obviously an agent must be able to interact with its environment, to make queries of nodes it visits, to report its findings, etc. But in many (possibly most) applications we imagine that more than one agent is present and the agents themselves are able to interact. Again in most instances this is likely to be cooperative behavior but competitive behavior is also possible. The exact form of this interaction depends upon the system but usually involves some sort of communication either by means of message passing or shared memory.
3. **Intelligence:** The usefulness of an agent increases significantly with its ability to adapt to new situations, to learn from previous experience and to

model correctly the intentions of the user who created it as well as those of the agents it encounters. It is our goal to develop a flexible framework in which systems exhibiting any subset of the above properties can be analyzed.[2].Again in most instances this is likely to be cooperative behavior but competitive behavior is also possible. The exact form of this interaction depends upon the system but usually involves some sort of communication either by means of message passing or shared memory.

2.2. Electronic voting

Electronic voting 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. 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 inefficient 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.

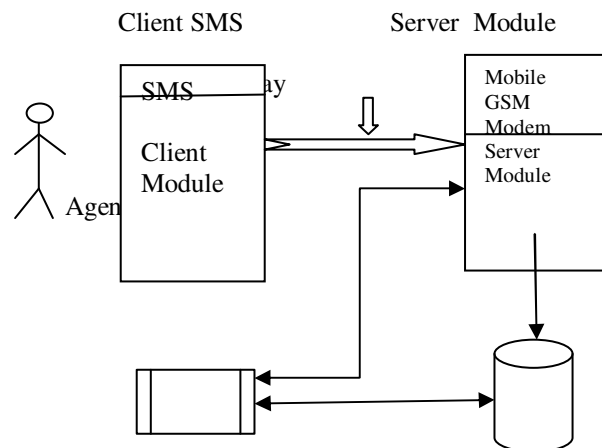


Fig. 1 SMS Gateway Modules

Voting and elections are essential ingredients of modern democratic societies. Unlike any other transactional event, the result of elections can have many effects on societies and their economic and financial wellbeing.

Recent elections have seen a gradual decline in the overall percentage of the electorate exercising their right to vote. This is worrying from a democratic point of view in that, if the reasons of the decline are left unchecked, the mandate

of those elected to hold the positions might eventually be questionable. Moreover, it is interesting to note here that traditional/manual voting systems are slow, complex, inaccurate and inefficient. To counter these drawbacks, Governments have proposed a number of possible methods for re-engaging the electorate in the voting process. One of these methods is the modernization of the way in which the elections are being conducted.[3].

2.3. Aim of the study

These methods include the use of electronic voting (e-Voting) as a new and modernized way to carry out the election process. e-Voting extends polling hours (anytime voting) and enables casting of votes from any place (anywhere voting) using different electronic means (any device voting) such as mobile devices and Internet-based voting. In this technological age, it is imperative to explore and encourage greater use of information technology (IT) in most forms of service delivery. The ability to cast a vote through a multitude of choices such as web and mobile technologies is instantly attractive. Such facilities should also overcome constraints associated with the current voting process and engage more young voters. There is no doubt that remote electronic voting offers a convenience that would be appreciated by many people. E-voting enables citizens to participate electronically in democracy and provides them with more information about candidates and the election they are being asked to participate in.

2.4. Voting Requirement

The basic normal can be divided into two parts the first part concern the voters being aware of the voting process and has the ability to use mobile and internet, And the availability of user interface for mobile as well as the internet which should be clear and accurate for the user to file in voter personal information . the use of both devises must indexed with the national number for the reason that each voter must hold a national number to be able to cast his/her vote. The second part dealing with hardware requirement which mainly consists mobile, internet, computer and computer wireless network connected to GSM system with gateway modem using SIM card to receive messages through SMS messages.

2.5. Agent task and Participation

Agent is an intelligent software which can participate in a number of tasks such as reading SMS, analyzing messages , and taking decisions which can be of an advice form for the voter which of no harm for the voter to follow for casting his/her vote. Storing data in database, analyzing data, and producing statistical reports in the form of tables

and graphs. Agent can be used to validate voter national number and make sense of data received to store or discard number as shown in fig(3).

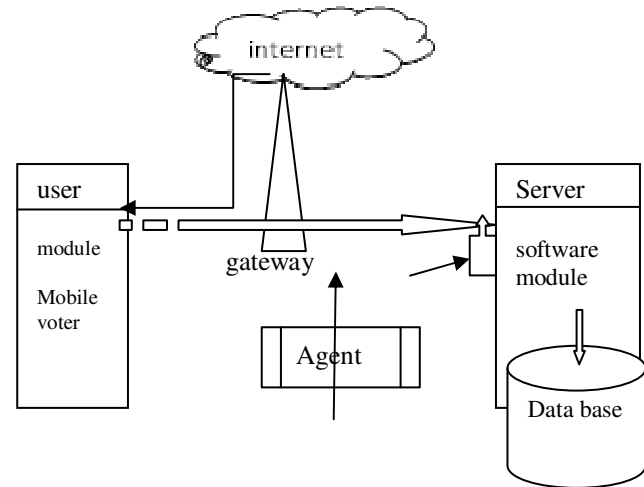


Fig 2. Conceptual voting system

2.6 Previous Work

A paper entitled " An Electronic Voting System Using GSM Mobile Technology -Yang Feng, Siaw-Lynn Ng and Scarlet Schwiderski-Grosche-Department of Mathematics Royal Holloway, University of London- 26 June 2006 "in this paper they was proposed a GSM mobile voting scheme, where the GSM authentication infrastructure is used to provide voter authentication and improve voter mobilitySubsection headings are numbered 1.1. Aaa, 1.2. Bbb, etc. in 12 pt. bold Times New Roman font with a 6pt line spacing following 2.6 Previous Work. A paper entitled " An Electronic Voting System Using GSM Mobile Technology -Yang Feng, Siaw-Lynn Ng and Scarlet Schwiderski-Grosche-Department of Mathematics Royal Holloway,

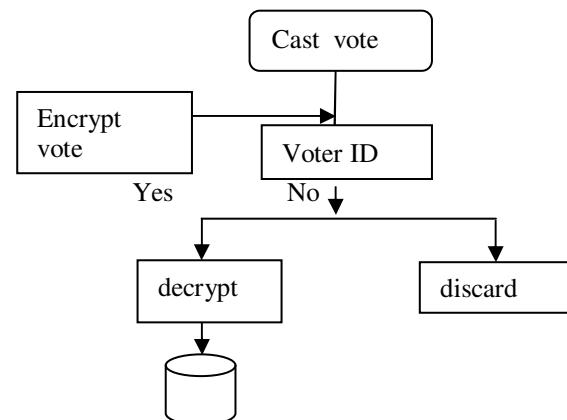


Fig 3. Encrypting decrypting vote

3. Conclusion

During the research work a number of problems were encountered the most important of these problems is voters awareness of the work don and voters education among older voters due to the lack of social education of using the application as a means to help casting vote . Also The distrust among some smaller areas which are not accustomed to using electronic means of casting vote . The application was very successful in send and receiving votes and building Database. Some of the problems raised were dealing with the forms security which needed some watermark to be embedded within the forms used. Some of he points which can be considered for future research wireless connection speed as well as connection security.

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