

GSM Based Voting Machine Using SMS

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Abstract

Electronic voting systems have the potential to improve traditional voting procedures by providing added convenience and flexibility to the voter. GSM (Global System for Mobile communications) is the most widely used mobile networking standard. In this project, 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. This embedded project provides a facility to store the details of the registered voters. Each registered voter can cast his vote only once. The voter readily gets to know the status of his vote as he receives an appropriate acknowledgement message for every message he sends. Thus such an SMS based voting system so developed can be used for conducting any sort of opinion polls.

Keywords— Global System for Mobile Communications (GSM), SMS, GSM infrastructure, Opinion poles.

Introduction

Voting is a vital part of the democratic process. As such, the efficiency, reliability, and security of the Technologies involved are critical.

Traditional voting technologies include hand-counted paper ballots. These paper-based systems can result in a number of problems, including: Unacceptable percentages of lost, stolen, or miscounted ballots, Votes lost through unclear or invalid ballot marks, Limited accommodations for people with disabilities today, the development and widespread use of information technologies is changing the way people view voting processes and, ultimately, the way they vote. At the forefront of these new technologies is poll-site direct recording electronic (DRE) voting and remote Internet-based voting. In democratic societies, voting is an important toll to Collect and reflect people's opinions.

Traditionally, voting is conducted in centralized or distributed places called voting booth Voters go to voting booths and cast their votes under the supervision of authorized parities. 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.

Security Features In Gsm

GSM 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 confidentiality on physical connections, connectionless user data confidentiality and signaling information element confidentiality. They are summarized as follows: Subscriber identity confidentiality is the property that the subscriber's real identity remains secret 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 visited networks. Subscriber identity authentication is the property that ensures that the mobile subscriber who is accessing the network or using the service is the one claimed. In our proposed GSM mobile voting scheme, communication between the mobile equipment and the GSM network uses standard GSM technology. Hence GSM security features apply. Among which, the subscriber identity authentication feature is particularly used in the protocol. A random challenge RAND is issued when a mobile subscriber tries to access a visited network. The Authentication Centre (AC) computes a response SRES from RAND using an algorithm A3 under the control of a subscriber authentication key K_i , where the key K_i is unique to the subscriber, and is stored in the Subscriber Identity Module (SIM) on the Mobile Equipment (ME), as well as the Home Location Register (HLR). The ME also

computes a response SRES from RAND as well. Then the value SRES computed by the ME is signaled to the visited network, where it is compared with the value SRES computed by the AC. The access of the subscriber will be accepted or denied depending upon the result of comparing the two values. If the two values of SRES are the same, the mobile subscriber has been authenticated, and the connection is allowed to proceed. If the values are different, then access is denied.

System Architecture

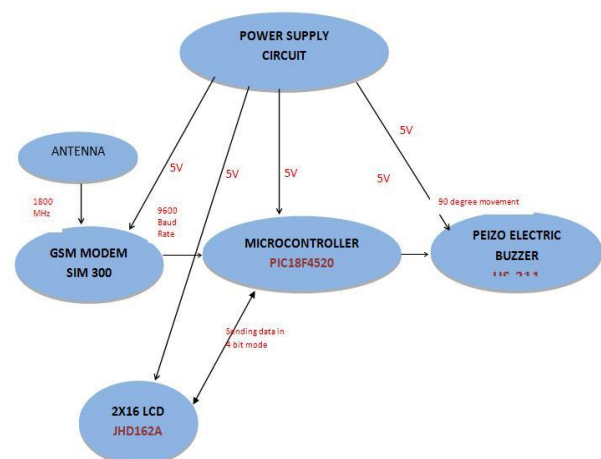


Fig 1: Block Diagram of GSM Based Voting System using SMS

Hardware Description

A. GSM MODEM SIM 300A

This GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. Advantage of using this modem will be that you can use its RS232 port to communicate and

develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily. The modem can either be connected to PC serial port directly or to any microcontroller. It can be used to send and receive SMS or make/receive voice calls. It can also be used in GPRS mode to connect to internet and do many applications for data logging and control. In GPRS mode you can also connect to any remote FTP server and upload files for data logging. This GSM modem is a highly flexible plug and play quad band GSM modem for direct and easy integration to RS232 applications. Supports features like Voice, SMS, Data/Fax, GPRS and integrated TCP/IP.

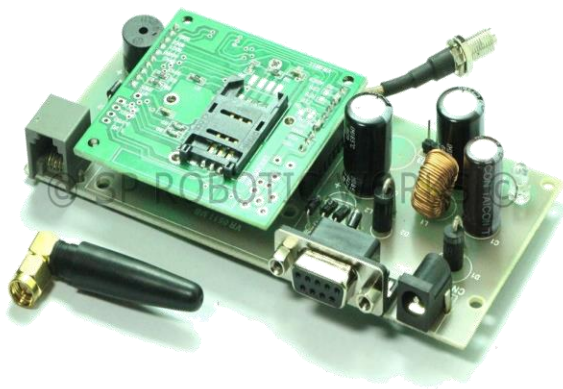


Fig 2:- GSM Module

B. LCD (Liquid crystal display)

The JHD162A dot-matrix liquid crystal display controller and driver LSI displays alphanumeric, Japanese kana characters, and symbols. It can be configured to drive a dot-matrix liquid crystal display under the control of a 4- or 8-bit microprocessor. Since all the functions such as display RAM, character

generator, and liquid crystal driver, required for driving a dot-matrix liquid crystal display are internally provided on one chip, a minimal system can be interfaced with this controller/driver.



Fig 3:-LCD

C. Micro Controller Pic18f4520

Circumstances that we find ourselves in today in the field of microcontrollers had their beginnings in the development of technology of integrated circuits. This development has made it possible to store hundreds of thousands of transistors into one chip. That was a prerequisite for production of microprocessors, and the first computers were made by adding external peripherals such as memory, input-output lines, timers and other. Further increasing of the volume of the package resulted in creation of integrated circuits.



Fig 4:- Microcontroller PIC18F4520

D. Transformer

Transformers convert AC electricity from one voltage to another with little loss of power. Transformers work only with AC and this is one of the reasons why mains electricity is AC. Step-up transformers increase voltage, step-down transformers reduce voltage. Most power supplies use a step-down transformer to reduce the dangerously high mains voltage (230V in UK) to a safer low voltage.



Fig 5:- Transformer

PLAB development tools for the PIC16F877A Microcontroller Architecture support every level of software developer from the professional applications engineer to the student just learning about embedded software development. The Keil 8051 Development Tools are designed to solve the complex problems facing embedded software developers.

Pcb Layout

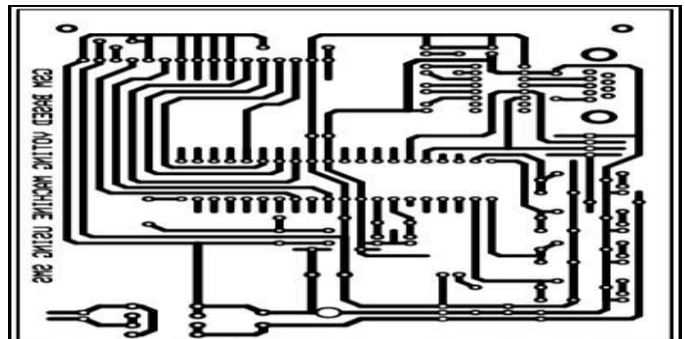


Fig 6:- Hardware Simulation on PCB

Conclusion

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 a 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. To improve mobility, address security problems of remote voting procedures and systems. We present an electronic voting using GSM. With more than one billion users, the GSM authentication infrastructure is the most widely deployed authentication mechanism by far.

Future Scope

Next we will try to connect the different circuits and obtain the programming commands for sending and receiving of the sms and its feedback. Our challenges include:

Connecting the GSM handset with microcontroller IC. Interfacing the handset with FORTRAN or C programming. Using the DB 09 connector with the serial COM port of the computer.

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