Smart Wireless Voting System using Smart Card

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Abstract— The paper proposes the need of real-time electronic voting system in election due to increase in illegal activities in voting system as this process is done through ATM machine that proposes authenticated data processing using RFID (Radio Frequency Identification). It's a sense of smart card. After authentication, data will be processed wirelessly towards server. The whole system hardware will be small in size, low power consumption, strong scalability, stable operation, convenient program maintenance and upgradation. GSM module is used in this paper. The detail will be stored in the database, the data storage part is based on the capacity of storage device or server capacity. The miniature and portable system which makes voting system durable. The structure which we have design of Smart wireless authenticating voting system will considerably save the amount of manpower, sources and time with speed and accuracy. Thus, the proposed wireless authenticating voting system is more durable and reliable.
Key words: Smart Card, Smart Wireless Voting System

I. INTRODUCTION

We can vote using smart card through the RFID and we can use GSM module for message transmission. The Radio Frequency Identification number with the person detail is stored in the controller. The data storage part is based on the capacity of storage device or server capacity. The miniature and portable system which makes voting system durable. Electronic voting system has many characteristics as the high precision, high speed, etc. In this machine the database can be stored in the Smart Card. So this paper studies wireless electronic voting machine of the high real-time requirement by PIC microcontroller hardware platform which combined with wireless transceiver .The structure which we have design of Smart wireless authenticating voting system will considerably save the amount of manpower, sources and time with speed and accuracy. Thus, the proposed wireless authenticating voting system is more durable, reliable and fast as compared to our existing electronic voting machine. At the end of the election polling is considered as important part for counting votes. This system makes the voting system easy and secured.

II. HARDWARE MODULE

A. Design Requirements

The design requirement of wireless authenticating voting machine, compiled together with the domain experts, is given here.

- The system should be able to detect vote of individual person authenticate in any location only once. It should also measure the poll of voting easily and report the data in real-time.
- The individual vote should be authenticating using Indian standard identity.

- Each control unit should be located in every area with easy voting facility.
- Each control unit should last for many days, such as long battery life and without any physical maintenance.
- The system should be inexpensive and easy to install. This provides incentive to the system.
- The system should be portable and handling should be sophisticated for voting.

B. System Frame Work

Hardware system consists of control unit & server unit. The control unit mainly composes by Alarm, controller or processor & data transmission module. For storing the Radio Frequency Identification tag it will scan 2 times for authenticating person. Each RFID get converted in appropriate unique code of sequence or encrypted code and signal transmitted through wireless. The controller verifies with database through wireless for convenient voting [2]-[3]. The overall structure shown as in both framework diagram shows the schematic diagram of Wireless Authenticating Voting Machine. Framework of control unit as shown in Fig. 1 and Framework of server unit as shown in Fig. 2
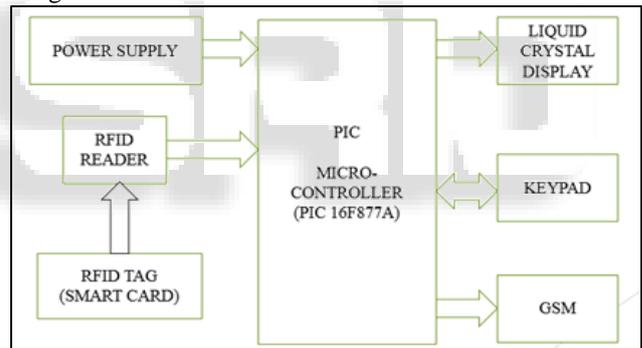

Fig. 1: Block diagram of system
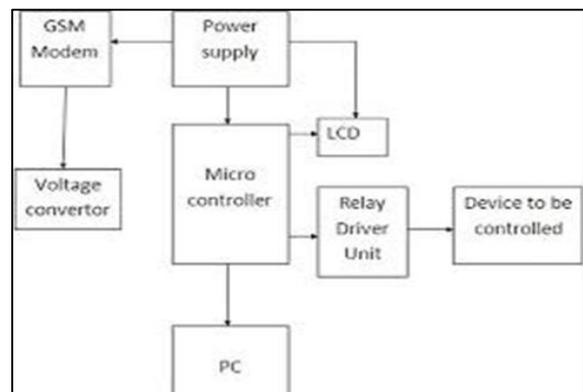
C. PIC Microcontroller

Fig. 2: Block diagram of Controller

PIC microcontroller is the first RISC based microcontroller fabricated in CMOS (complimentary metal oxide semiconductor) that uses separate bus for instruction and data allowing simultaneous access of program and data memory. Microcontroller is a general purpose device, which

integrates a number of the components of a microprocessor system on to single chip. It has inbuilt CPU, memory and peripherals to make it as a mini computer. Microcontrollers are

- Smaller in size
- Consumes less power
- Inexpensive

D. GSM Modem

GSM MODEM is a class of wireless MODEM devices that are designed for communication of a mobile with the GSM and GPRS network. It requires a Subscriber Identity Module (SIM) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification. A GSM/GPRS MODEM can perform the following operations:

- Receive, send or delete messages in a SIM.
- Read, add, search phonebook entries of the SIM.
- Make, Receive, or reject a voice call.

The MODEM needs AT commands, for interacting with processor or controller, which are communicated through serial communication. These commands are sent by the controller/processor. The MODEM sends back a result after it receives a command. Different AT commands supported by the MODEM can be sent by the processor/controller/computer to interact with the GSM and GPRS cellular network.

E. GSM Module

A GSM/GPRS module assembles a GSM/GPRS modem with standard communication interfaces like RS-232 (Serial Port), USB etc., so that it can be easily interfaced with a computer or a microprocessor / microcontroller based system. The power supply circuit is also built in the module that can be activated by using a suitable adaptor. For sending message, a GSM Module named SIMCOM_300 with RS232, power supply, buzzer and audio interface are used. This can be connected to PC by using a USB to Serial Adaptor. Terminal programs such as Real term are used to send & receive data. The interface between GSM Module and microcontroller can also be done directly with the help of wired communication.

F. RFID Reader

The RFID reader reads EM4100 family transponder tags that are brought in proximity to the reader and output unique tag identification number through RS232 serial port @9600 bps. The reader output 12 byte including one start, stop byte and 10 unique data byte. The start byte and stop byte are used to easily identify that the correct string has been received from the RFID reader. The middle ten bytes are the actual tag's unique ID. Vertical and horizontal parity checking has been done in card reading algorithm to ensure data integrity. One status LED is provided to indicate card detection. RFID (radio frequency identification) systems use data strings stored inside RFID tags or transponders) to uniquely identify people or objects when they are scanned by an RFID reader. These types of systems are found in many applications such as passport protection, inventory control systems, and secured access control systems, navigation, inventory tracking and payment systems.

Because passive tags require a strong RF field to operate, their effective range is limited to an area in close proximity to the RFID reader.

G. Product Features

- Reading Distance 10-15CM of the reader (Depend card shape)
- 125kHz read frequency
- 9600 baud RS232 serial interface
- Bread Board compatible
- Low power Requirement 7-9V @ 100mA
- Small Size
- No components at PCB bottom side
- Status LED for card detection

Fig. 3: RFID Tag

This is a basic VLF RFID tag used for sensing the present objects. These tags come with a unique 32-bit ID and are not re-programmable.

H. RFID Clamshell Card Features

- EM4001 ISO based RFID IC
- 125kHz Carrier
- 2kbps ASK
- Manchester encoding
- 32-bit unique ID
- 64bit data stream [Header + ID + Data + Parity]
- Dimensions: 54 x 85.5 x 1.8m

I. Power Supply and Regulator

The ac voltage, typically 220V rms is connected to a transformer, which steps ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

J. Display

The Liquid Crystal Display (LCD) is used for the displaying the output. LCDs are available to display arbitrary images or fixed images with low information content, which can be displayed or hidden, such as preset words, digits. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

III. SOFTWARE MODULE

A. MP Lab

MPLAB IDE is a software program that is used to develop applications for Microchip microcontrollers and digital signal controllers. This development tool is called an Integrated Development Environment, or IDE, because it provides a single integrated "environment" to develop code for embedded microcontrollers. This chapter describes the development of an embedded system and briefly explains how MPLAB X IDE from Microchip is used in the process.

MPLAB compilers from Microchip provide fully integrated, optimized code for PIC MCUs and dsPIC DSCs, along with compilers from micro Engineering Labs, CCS and SDCC, they are invoked by the MPLAB X IDE project manager to compile code that is automatically loaded into the target debugger for instant testing and verification.

B. Proteus 8

Proteus is one of the most famous simulation software. It can be used to simulate almost every circuit on electrical fields. It is easy to use because of the Graphical User Interface (GUI) that is very similar to the real Prototype board. Moreover, it can be used to design Print Circuit Board (PCB). Proteus has features to generate both analog and digital results. It used in analog and digital schematic designs.

ISIS has been created and evolved over twelve years research and development and has been proven by thousands of users worldwide. The first time ever it is possible to draw a complete circuit for a micro-controller based system and then test it interactively, all from within the same piece of software. Meanwhile, ISIS retains a host of features aimed at the PCB designer, so that the same design can be exported for production with ARES or other PCB layout software.

IV. CONCLUSION

The system design clearly describes the overall system architecture & a wireless voting system tasks to achieve the target of voting system with more securable and the process is done fastly with more accuracy through Wireless transmission which can overcome many practical difficulties, compared to traditional voting system. Communication system is faster, accurate, low-cost, flexible, real-time, safety, and indeed provides a better choice for the voting system. This machine will be practically implemented in a few years, with recent development in technology, a RFID reader is less expensive and not complicated to use on daily basis. Thus voting percentage will increase. By this project paper, we can make our voting system easy and also with more security at the same time with more accuracy.

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