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Advanced Voting Machine with Secutiry Features

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***Abstract*—**Voting is most pivotal process of democratic society through which people determine its government. Governments around the world are increasingly considering the replacement of traditional paper-based voting schemes with electronic voting systems. Here we are designing a fully secured voting machine using smart card. The voter's identification is done by a 'Smart Memory Card' which contain the voters ID. As soon as the voter inserts the card in the smart card reader, the microcontroller will check and then allow the voter to vote. The microcontroller will also check for duplicate voting. If duplicate card is detected buzzer is turned ON and voting is locked. The microcontroller will count the votes and store in its internal memory. When the result button is pressed, the microcontroller will display the voting result on LCD. If any malpractice/Booth capturing is observed then the administrator can press the reset button which will lock the voting machine and further voting is suspended.

Keywords*-Smart Card, Fake Voting, Voters ID, Smart Card Reader, Microcontroller*

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I. INTRODUCTION

A formal expression of opinion or choice, either positive o r negative, made by an individual or body of individuals is termed as Voting. The means by which such expression is made, as a ballot, ticket, etc.

In India, the method of voting by far has being traditional which involves manual authentication voter. But after all traditional voting system has its own limitations as far as authenticity of voter identity is concerned. To avoid all this, use of smart cards is the answer to such problem up to a creditable extent and easy on implementation. A smart card is a plastic card about the size of a credit card, with an embedded microchip that can be loaded with data, used for telephone calling, electronic cash payments, and other applications, and then periodically refreshed for additional use.

This paper thus explains a system which will smoothen the performance and ease of voting process.

A. Information of the system:

An electronic voting machine is a voting system in which election data is recorded, stored and processed as digital information. The voter's identification is done by a 'Smart Memory Card' which contain the voters ID. As soon as the voter inserts the card, the microcontroller will check for duplicate voting. If duplicate card is detected buzzer turns ON and voting is locked.

B. Overview of the target for the final system:

Advanced voting machine can be used during elections for voting instead of general Electronic Voting Machine (EVM). If any malpractice/Booth capturing is observed at the time of voting then the administrator can press the reset button which will lock the voting machine and further voting is suspended.

C. Summary of the system functionality:

Advanced voting machine makes vote results available, almost immediately. It maintains a high level of security to avoid voter frauds or fake voting. It also prevents the situation whereby a person votes more than once. Advanced voting machine has greater speed and higher accuracy as compared to general electronic voting machine.

D. Overview of the report:

Advanced voting machine with security features is designed with the help of microcontroller, smart card, smart card reader, switches and buzzer, LCD display. Smart card contains the voter's identity. Only with the help of smart card the voter can vote and that too only once.

E. Specifications of the system:

- Functionality provided by the system: Advanced voting machine provides the following functions:
  - It is cost effective.
  - Low power consumption is required.
  - Avoids invalid voting.
  - Less manpower is required
- System interfaces, inputs and outputs: Advanced voting machine is designed with the help of microcontroller 89S52, smart card, smart card reader, switches, buzzer and LCD display. Smart card is inserted in the smart card reader is input to the voting machine. After insertion of the smart card in smart card reader the message displays on the LCD screen due to which the voter can vote.
- Expected outcomes: As the smart card is inserted in the smart card reader by the voter the message is displayed on the LCD display to caste the vote. As the voter castes his vote result is stored in the memory of the microcontroller. When the result switch is pressed result is displayed on the LCD display. If fake voting is observed the reset switch is pressed which will lock the voting machine and further voting is suspended.

II. HARDWARE DESCRIPTION

A. *Liquid Crystal Display (LCD):*

Liquid Crystal Display which is commonly known as LCD is an Alphanumeric Display. It means that it can display Alphabets, Numbers as well as special symbols. Thus LCD is a user friendly display device which can be used for displaying various messages. Here 16 x 2 Alphanumeric Display is used which means that on this display two lines with maximum 16 characters in one line can be displayed.

The LCD display panel is used to display status messages and error messages. LCD is used in a project to visualize the output of the application. We have used 16x2 LCD which indicates 16 columns and 2 rows. So, we can write 16 characters in each line. So, total 32 characters we can display on 16x2 LCD. LCD can also used in a project to check the output of different modules interfaced with the microcontroller.

B. *AT89S52 Oscillator and Clock (Crystal)*

The heart of 89C51 is the circuitry that generates the clock pulses by which all internal operations are synchronized. Pins XTAL1 and XTAL2 are provided for connecting a resonant network to form an oscillator. Here crystal frequency is the basic internal clock frequency of the microcontroller.

C. *Smart Cards*

A smart card is a device that includes an embedded integrated circuit that can be either a secure microcontroller or equivalent intelligence with internal memory or a memory chip alone. The card connects to a reader with direct physical contact or with a remote contactless radio frequency interface. With an embedded microcontroller, smart cards have the unique ability to store large amounts of data, carry out their own on-card functions and interact intelligently with a smart card reader. Smart card technology conforms to international standards and is available in a variety of form factors, including plastic cards, key fobs, watches, subscriber identification modules used in GSM mobile phones, and USB-based tokens.

In 1968 and 1969 Helmut Grottrup and Jurgen Dethloff jointly filed patents for the automated chip card. Roland Moreno patented the memory card concept in 1974. An important patent for smart cards with a microprocessor and memory as used today was filed by Jurgen Dethloff in 1976 and granted as USP 4105156 in 1978. In 1977, Michel Ugon from Honeywell Bull invented the first microprocessor smart card. In 1978, Bull patented the SPOM (self-programmable one-chip microcomputer) that defines the necessary architecture to program the chip. Three years later, Motorola used this patent in its "CP8". At that time, Bull had 1,200 patents related to smart cards. In 2001, Bull sold its CP8 division together with its patents to Schlumberger, who subsequently combined its own internal smart card department and CP8 to create Axalto. In 2006, Axalto and Gemplus, at the time the world's top two smart card manufacturers, merged and became Gemalto. In 2008 Dexa Systems spun off from Schlumberger and acquired Enterprise Security Services business, which included the smart card solutions division responsible for deploying the first large scale public key infrastructure (PKI) based smart card management systems.

Smart cards have been advertised as suitable for personal identification tasks, because they are engineered to be tamper resistant. The chip usually implements some cryptographic. There are, however, several methods for recovering some of the algorithm's internal state.

Differential power analysis involves measuring the precise time and electric current required for certain encryption or decryption operations. This can deduce the on-chip private key used by public key algorithms such as RSA. Some implementations of symmetric ciphers can be vulnerable to timing or power attacks as well.

Smart cards can be physically disassembled by using acid, abrasives, solvents, or some other technique to obtain unrestricted access to the on-board microprocessor. Although such techniques may involve a risk of permanent damage to the chip, they permit much more detailed information (e.g. photomicrographs of encryption hardware) to be extracted.

III. HARDWARE DESIGN

A. *Working of Circuit*

Supply Section of this circuit consists of an IC 7805. The output of the IC 7805 is +5 volts, which is used for all other digital applications Maintaining the Integrity of the Specifications

The voting machine consists of six keys, which are connected to six separate pins of microcontroller 89S52.

The display section uses the port 0 of microcontroller. This port is in open drain configuration and as a result, pull up resistors should be provided for its normal operation.

A Buzzer is used to indicate whether a voter has exercised his vote correctly and also for recognizing any malpractice during the whole process. This buzzer is connected to pin no. 21 of microcontroller 89S52.

The details related to the voter and indicating whether a voter has cast his vote or not is stored in microcontroller 89S52.

IV. RESULT ANALYSIS

A. *Key features*

The following are the key features of advanced voting machine:

- Avoids invalid voting.
- Make vote results available, almost immediately.
- Less manpower required.
- Time conscious, as less time required for voting and counting.
- Saves transportation cost due to its compact size.
- Maintain a high level of security to avoid voter frauds or fake voting.
- Prevent the situation whereby a person votes more than once.
- Greater speed and higher Accuracy.
- Quick response time
- Fully automate system

B. Future Scope

The advanced voting machine can also be further modified by:-

- Introducing Audio output to make it user friendly for illiterate voters and also for blind people.
- Retina scanning can also be developed

C. Result Analysis

Advanced voting machine overcomes all the drawbacks of ordinary voting machine. It provides additional security. Its main advantage is that due to smart card technology this system completely reduces the chances of invalid votes. The system can be manufactured simply and is cheap. Advanced voting machine requires low power consumption. It also requires less manpower. It requires less time for voting and counting and avoids invalid voting. Advanced voting machine is very much convenient for the voter's to vote.

Advanced voting machine has greater speed and high accuracy. With the help of smart card technology fake voting or voter fraud is reduced. In case if fake voting is detected the buzzer is turned ON and the voting machine is locked. Advanced voting machine is also very much useful at the time of riots, malpractices and also booth capturing. Hence advanced voting machine is very much convenient.

D. Conclusion

The project examines the lessons learned for using smart cards in the context of e-voting from both existing real-world applications and scientific proposals. We first reviewed e-voting schemes in which smart cards were used to identify and authenticate voters as well as to sign votes. The sample of smart cards included both national EID cards and special purpose smart cards. It also concludes that e-voting should rely on established smart cards that voters are familiar with, that do not impose additional costs, thus preventing fake voting.

As an overall conclusion to these lessons learned, we recommend that states that do not (yet) plan to introduce electronic voting take our considerations into account for their smart card design because the proper functionality of smart card can dramatically improve the security of any e-voting system.

Furthermore, we direct future attention to the question of needed and offered functionality of smart cards, specifically in the field of e-voting.

REFERENCES

[1] The 8051 Microcontroller Architecture, Programming and Application by Kenneth J. Ayala, Penram International Publications.
[2] The 8051 Microcontroller and Embedded Systems by Muhammad Ali Mazidi, Pearson Publications.
[3] http://www.atmel.com
[4] http://www.smartcardbasics.com
[5] Jurlind Budurushi, Stephan Neumann and Melanie Volkamer, "Smart Cards in Electronic Voting: Lessons Learned from Applications in Legally-Binding Elections and Approaches Proposed in Scientific Papers"

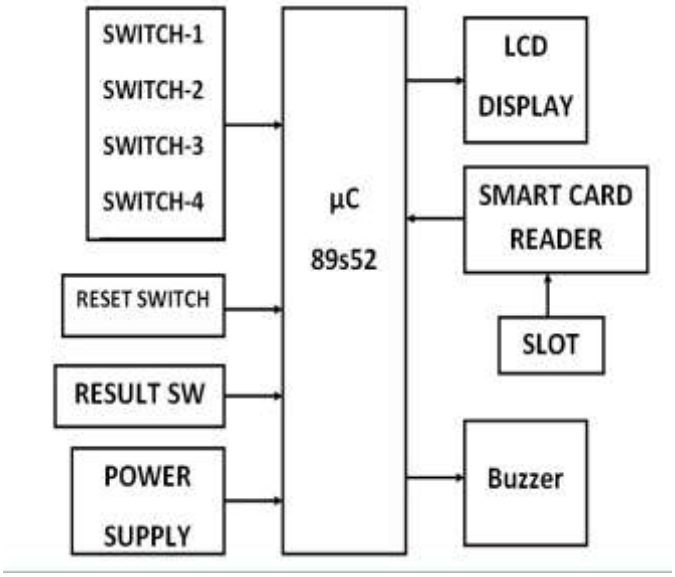

Figure 2. 1 Block Diagram

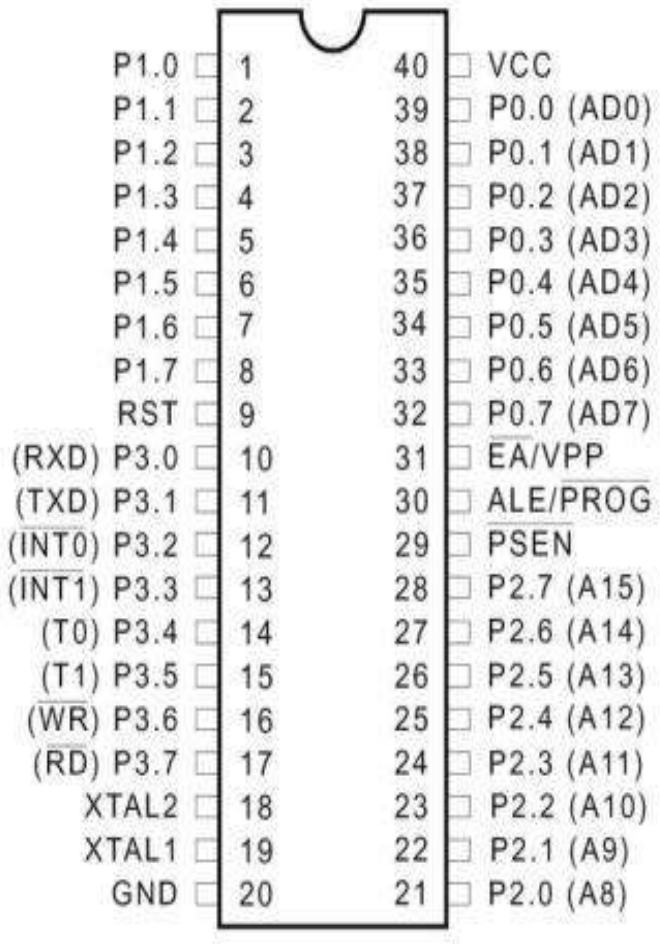

Figure 3. 1 89C52 Pin Diagram

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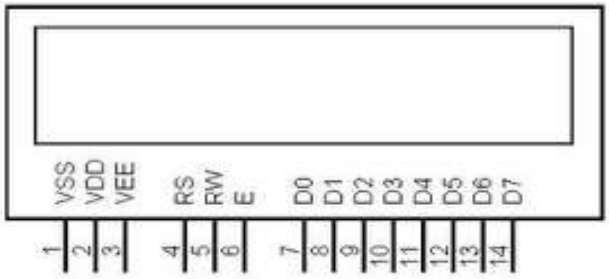

Figure 3. 2 Pin Diagram of 16*2 LCD

Pin No.	Symbol	Function
1	Vss	Ground
2	VDD	Power supply
3	Vo	Power Supply for LCD
4	RS	Select Display Data("H") or Instructions("L")
5	R/W	Read or Write Select Signal
6	E	Read/Write Enable Signal
7	DB0	
8	DB1	
9	DB2	
10	DB3	Display Data Signal
11	DB4	
12	DB5	
13	DB6	
14	DB7	
15	LED - (K)	Please also refer to 6.1 PCB drawing and description.
16	LED + (A)	Please also refer to 6.1 PCB drawing and description.

Figure 3. 3 Pin Description of 16*2 LCD

Figure 3. 4 Smart Card

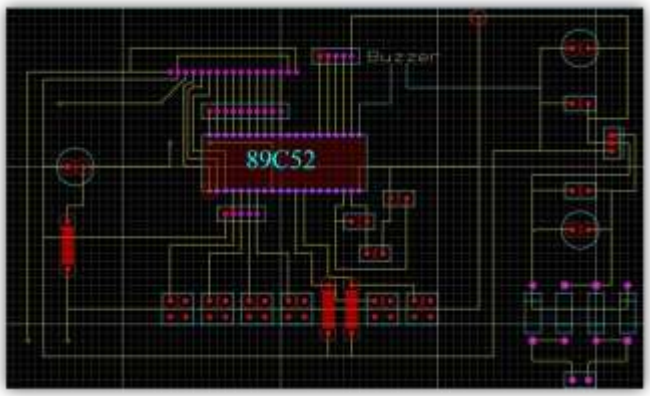

Figure 3. 5 PCB Layout

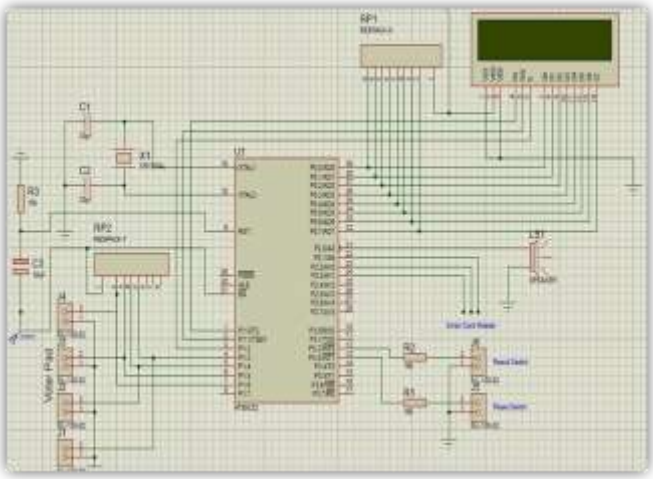

Figure 4. 1 Circuit Diagram