MICROCONTROLLER AND ITS

APPLICATION

Electronic Voting Machine
(EVM)

Software & hardware Model Report

ABSTRACT

The project is aimed at designing an Electronic Voting Machine (EVM). It is an electronic device used for recording votes. It retains all the characteristics of voting by ballot papers, while making polling a lot more convenient. EVM's run on normal battery and they do not require electricity. It consists of two units, a control unit, and the balloting unit. Once the voter enters the vote, the balloting unit displays the vote to the voter, records it in its memory. EVM is used to improve ways to manage the cost and schedule concerns and to plan ahead for future impacts that may result from the current situation. Basically, EVM is a process to help measure performance in cost, schedule, and technical areas and to help the manager better identify project risks.

INTRODUCTION

Electronic voting machine has now days become an effective tool for voting. It ensures flawless voting and thus has become more widespread. It ensures people about their vote being secured. It avoids any kind of malpractice and invalid votes. Also such kind of system becomes more economical as consequent expenditure incurred on manpower is saved. It is also convenient on the part of voter, as he has to just press one key whichever belongs to his candidates. Voting machines are the total combination of mechanical, electromechanical, or electronic equipment (including software, firmware, and documentation required to program control, and support equipment), that is used to define ballots; to cast and count votes; to report or display election results; and to maintain and produce any audit trail information. The first voting machines were mechanical but it is increasingly more common to use electronic voting machines. A voting system includes the practices and associated documentation used to identify system components and versions of such components; to test the system during its development and maintenance; to maintain records of system errors or defects; to determine specific changes made after initial certification; and to make available any materials to the voter (such as notices, instructions, forms, or paper ballots).

The project aims to recreate an EVM for 4 parties where people can cast their votes. The voting is simple and all that has to be done is push or press a button. Once the button is pressed, their vote is successfully recorded and the next person can vote without any difficulty.

We have heard and seen in the news nowadays about the different ways tampering can be done with electronic voting machines. The projects aims to eradicate those ways and make sure the votes are effectively and efficiently counted and the winner is found right and square.

PROBLEM STATEMENT

Back in time in villages people used to vote with, ballot paper. But there was a problem, as this voting system was easily tampered. So, through this project we aim to come up with a modern solution of electronic voting machine in line with the rules of the democracy and these results can then be sent to a google spreadsheet where the numbers can be further analyzed and stored for security and verification purposes.

THEORY:

The AT89S52 comes from the popular 8051 family Microcontrollers. It is an 8-bit CMOS microcontroller with 8K as Flash memory and 256 bytes of RAM. It has 20 I/O pins comprising of 4 ports and on chip oscillator to generate the crystal frequency. It can be programmed with software like Arduino, Keil uVision. The PIN 1-8 acts as PORT 1 and PIN 10-17 as PORT 3 on one side of the microcontroller whereas as PIN 21-28 acting as PORT 2 along with PIN 32-39 as PORT 0 on other side of the microcontroller. The PIN 18 and 19 are used to generate the required crystal frequency. The PIN 9 is used to Reset the microcontroller with PIN 20 acting as ground. Power supply(V_{cc}) is provided through PIN 40. The other pins are PIN 29- PSEN, PIN 30-ALE and PIN 31- EA.

The LCD is used to display the votes and the messages that would be sent from the microcontroller upon pushing the buttons/switches.In the software simulation this electronic voting machine is designed for four candidates whereas in the hardware the voting is done between two parties. The input to the 16×2 LCD is processed with the help of six push buttons which in turn is connected to the microcontroller AT89S52 that processes various operations to the LCD. Votes are castes using the 4 buttons which are made active high and are connected to Pins 2-5 (P1.1 – P1.4) respectively of the microcontroller. The data pins of the LCD (pins 7-14) are connected to the output port P2 of the microcontroller, V_{SS} is connected to ground, V_{DD} is connected to 5V, V_{EE} is connected to ground for controlling brightness, RS is connected to P3.0, RW is connected to P3.7 and E is connected to P2.0.

We have demonstrated our EVM machine in two possible ways :

1- using hardware
2- using software.

The procedure to operate the machine remains same in both the methods.

When we begin our voting machine, the LCD displays a message "Welcome, press button 1 to start". On pressing the first button, it gives direction on how to cast the vote and which button needs to be pressed next. The voter would then be able to cast the vote by pressing the respective button and once he makes his choice the LCD then displays “Thank you”. The subsequent voter can then caste his respective

vote by pressing the Button 1 again and following the same procedure. Once the voting is completed the results can be displayed on the LCD screen on pressing the last button.

The first button initializes the voting system when pressed, followed by the buttons to vote for their respective candidates. The last button ends the voting and displays the poll results on LCD screen along with the final count for each party. At the end, the LCD displays the winning party by displaying "Respective party wins". But if there arises a tie between the parties the LCD also displays message "Clash between Party 1 and Party 2."

COMPONENTS AND SOFTWARE USED:

1. 8051 microcontroller- AT89S52
2. USB ISP Programmer
3. 16x2 LCD
4. Push Buttons
5. Connecting wires
6. Breadboard
7. NodeMcu
8. Proteus software
9. ProgISP software

Push Button

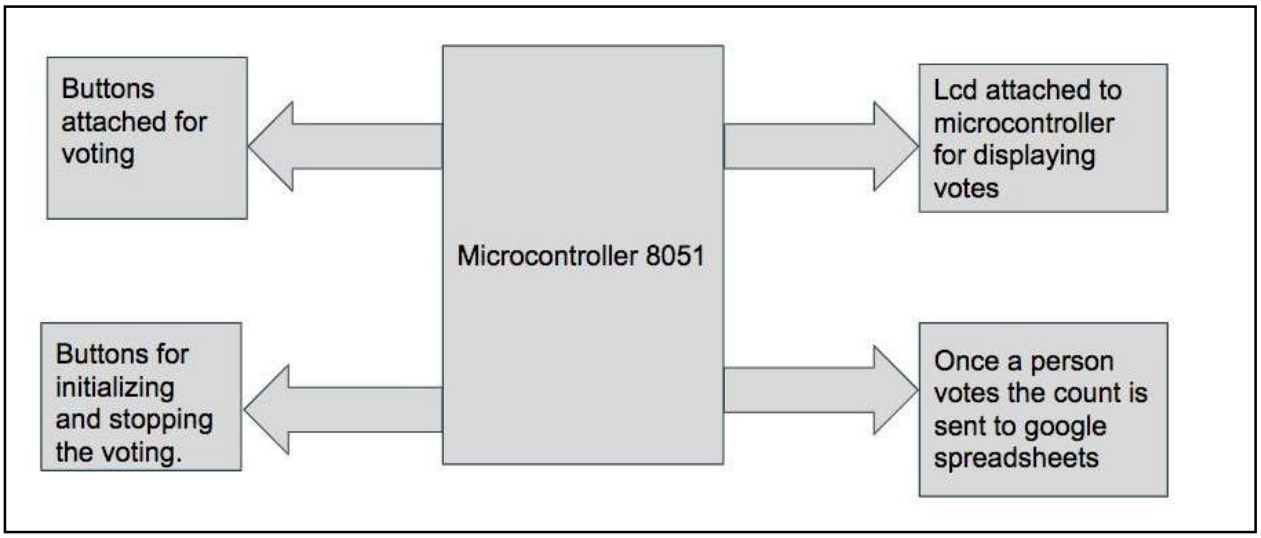
`

16x2 LCD

USB ISP Programmer

AT89S52 microcontroller

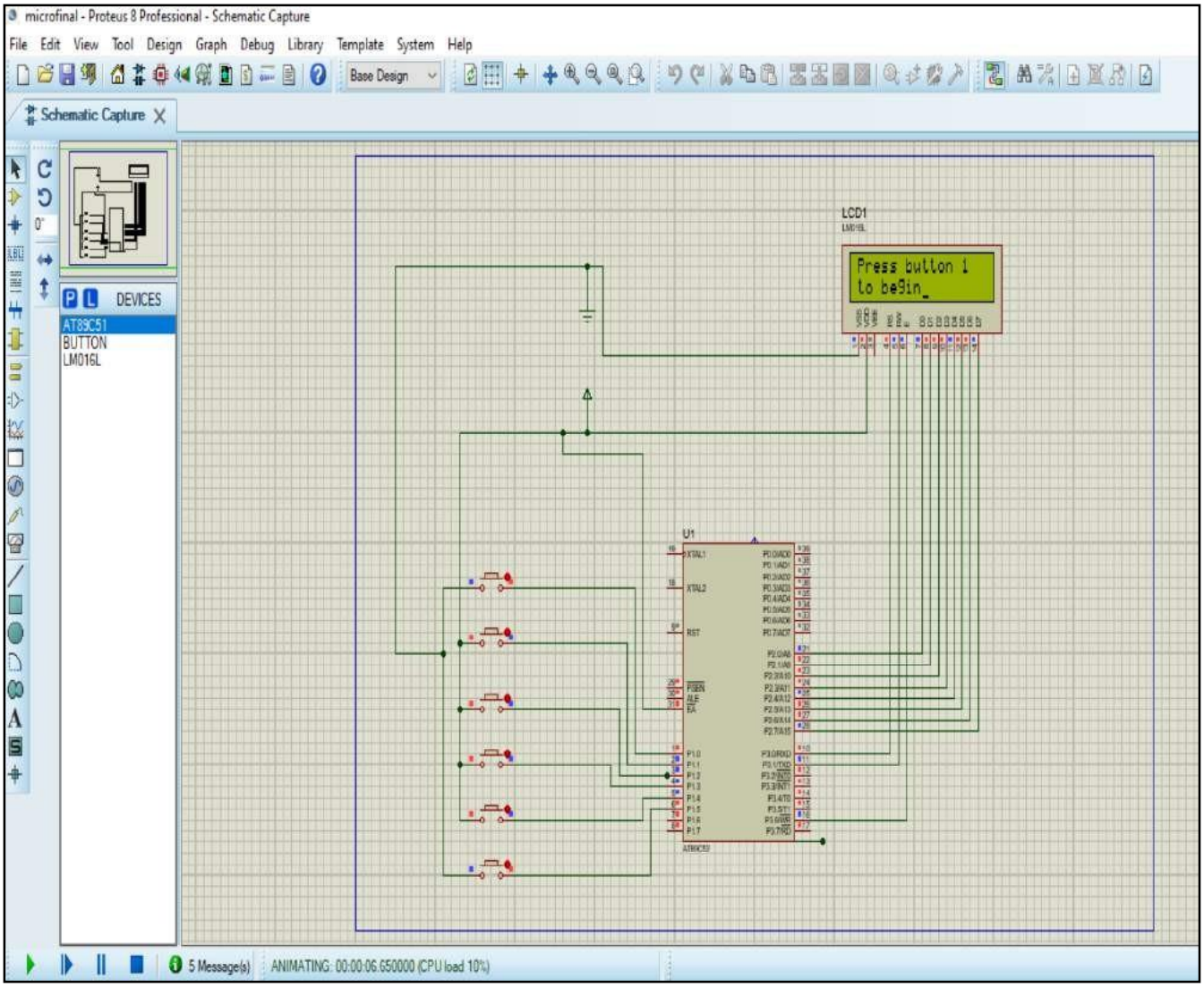
BLOCK DIAGRAM



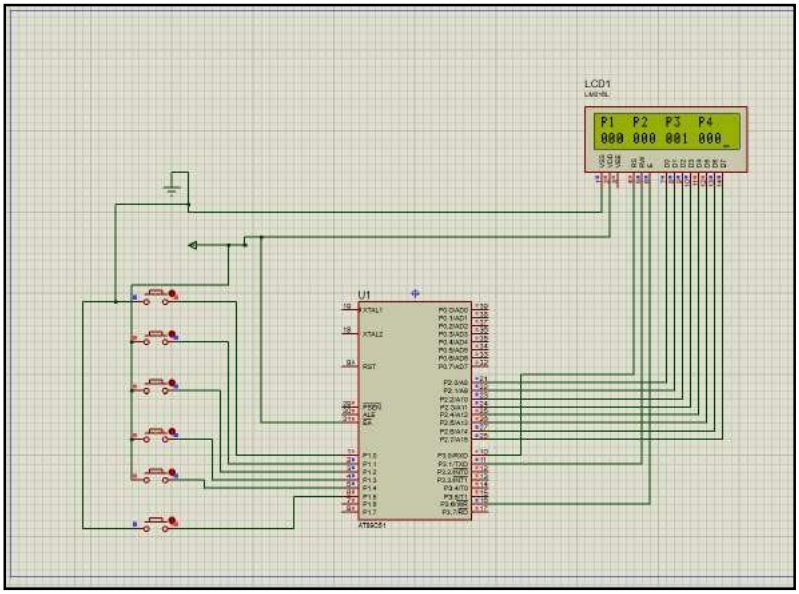
The block diagram of an Electronic Voting Machine is illustrated above.

The first part of it is the buttons. There are 4 buttons attached for voting and these are the switches that represent each party. Next, there are 2 buttons for stopping and starting the voting process. Once the start button is pressed, the voting process would be initialized. Once the stop button is pressed, the voting process would end and the results would be displayed on the LCD. While the people cast their votes, the count will be sent to google spreadsheets with the help of an ESP8266 Wifi module. The data in the spreadsheets can be accessed only by the authorized people given permission to view the data.

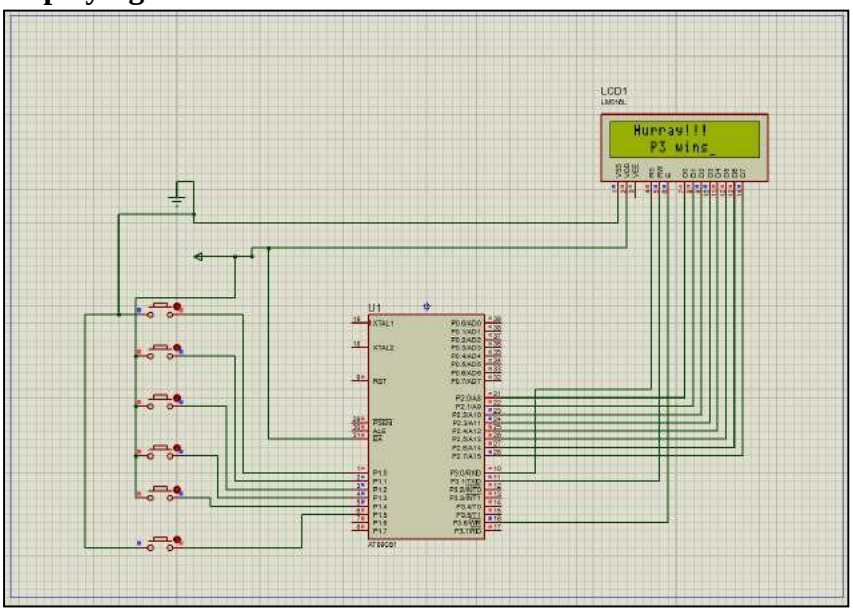
PROTEUS SIMULATION AND EXP RESULTS:



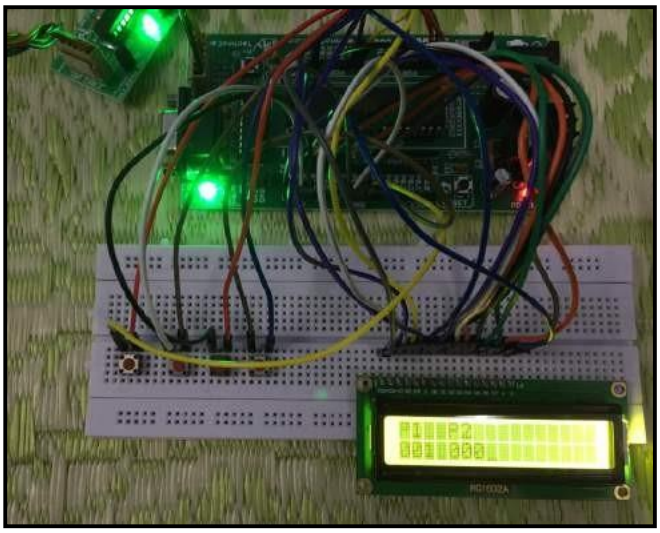
On voting for Party 3:

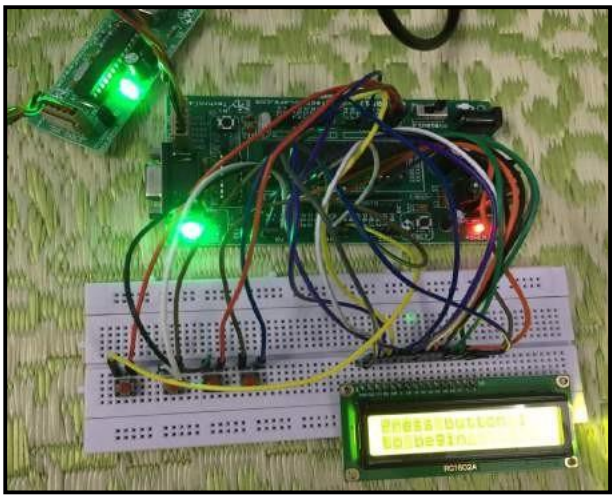


Displaying final results:



HARDWARE:





SENDING DATA TO GOOGLE SHEET:

10/17/2020	23:02:21	0	0	
10/17/2020	23:02:23	0	1.91	
10/17/2020	23:11:36	0	0	
10/17/2020	23:11:39	0	1.91	
10/18/2020	0:00:35	0	0	
10/18/2020	0:00:38	0	1.91	
10/18/2020	0:00:50	0	0	
10/18/2020	0:00:53	0	1.91	
10/18/2020	0:01:06	0	0	
10/18/2020	0:01:08	0	1.91	
10/18/2020	0:01:21	0	0	
10/18/2020	0:01:23	0	1.91	
10/18/2020	0:01:36	0	0	
10/18/2020	0:01:38	0	1.91	
10/18/2020	0:01:51	0	0	
10/18/2020	0:01:54	0	1.91	
10/18/2020	0:02:06	0	0	
10/18/2020	0:02:09	0	1.91	
10/18/2020	0:02:21	0	0	
10/18/2020	0:02:24	0	1.91	
10/18/2020	0:02:38	0	0	
10/18/2020	0:02:41	0	1.91	
10/18/2020	0:02:54	0	0	
10/18/2020	0:02:56	0	1.91	
10/18/2020	0:03:09	0	0	
10/18/2020	0:03:12	0	1.91	
10/18/2020	0:03:27	0	0	

RESULTS

With the use of 8051 microcontroller, concept of EVM was successfully implemented, using both hardware as well as software. Software simulation was done on PROTEUS and hardware implementation was done using various components mentioned above. The number of votes per party were sent to Google Sheets where the results can be analyzed and visualized later. Thus the proper working of EVM was demonstrated and explained through both hardware as well as software.

ADVANTAGES AND DISADVANTAGES

Like any other machine even our machine also has certain advantages and disadvantages associated with it. They are as follows:

ADVANTAGES:

1- EVM is an economical machine.
2- It requires less manpower and less time for voting and counting.
3- It saves the transportation cost, It avoids invalid voting.

DISADVANTAGES:

1- EVM'S are vulnerable to malicious activities.
2- Physically disabled people have complained that touch base screens are not efficient enough to capture votes.
3- Can be tampered easily by changing any one portion of the code.

CONCLUSION:

The AT89S52 microcontroller which has an architecture comparative to 8051 was used to demonstrate the EVM. People can cast their votes to 2 different parties using the software and hardware circuit demonstrated. Based on the votes given, the number of votes for a particular party are counted and in the end the results are displayed on LCD. After successful casting of votes the final results were displayed on LCD.