



BIOMETRIC SYSTEM BASED VOTING MACHINE BY USING AT89C51 MICROCONTROLLER

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ABSTRACT

The project is aimed to form AN unattended Electronic mechanical device, with no controls needed from the polling officer. it'll be wont to solid votes for multiple elections going down at the same time. Every valid citizen is supplied with a novel citizen ID and a pass code by the election committee to be unbroken firmly, that is employed for the citizen identification and validation throughout polling, there's no restriction on the amount of candidates standing for a selected election. it'll tally the votes and even have the power of recording of actual votes exploitation period clock for time stamping of the votes, which is able to solely be browse accessible. **Keyword:** SCADA, GUI window, GPRS.

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1. INTRODUCTION:

we tend to area unit fascinated by the very fact that the World's Largest Democracy implements elections electronically, whereas on the contrary it's discouraged by the western countries even currently. {when we tend to|once we| after we} did a comprehensive we visited following facts that don't seem to be an area of Indian EVM's driving as motivation for America to implement them in our style.

1. Election Transparency: all the processes of

handling and enumeration ballots to be utterly receptive public read. Nothing to be hidden or secret – except, of course, every individual's choice decisions.

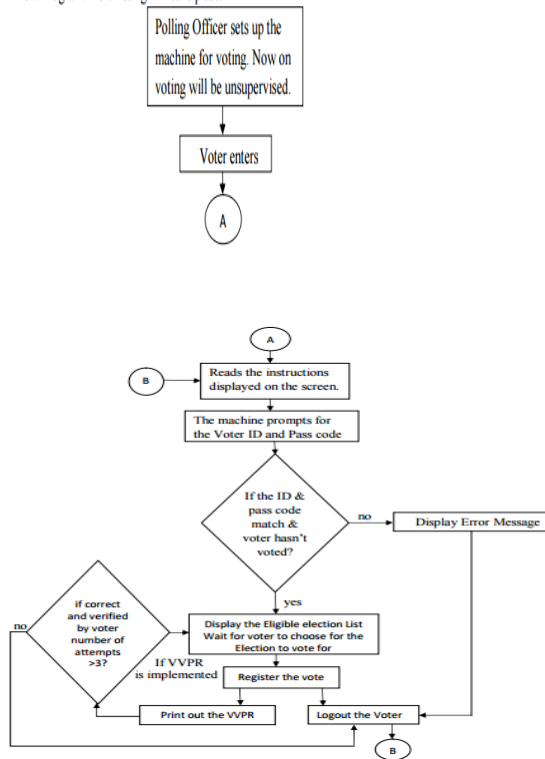
2. Trust of the citizen within the EVM registering the vote : we tend to commit to implement citizen verifiable paper record (vvpr) to that citizen will hunt instantly and choose on whether or not the vote he casted is registered properly within the system increasing the responsibility of the system. we've got created a module that interfaces with the citizen and directs to the procedure of choice.

The liquid show unit provides the citizen friendly interface guiding through the procedure of choice. The computer keyboard is employed to enter the main points and different actions to be taken by the citizen, that area unit integrated with the show unit [1]. we tend to learnt lots several aspects of style halfcularly} American state card interfacing is that the most attention-grabbing part. additionally the merchandise may be used for many styles of elections not barely the State or Assembly Elections, discussed in later sections.

2. Design Approach
Product Design

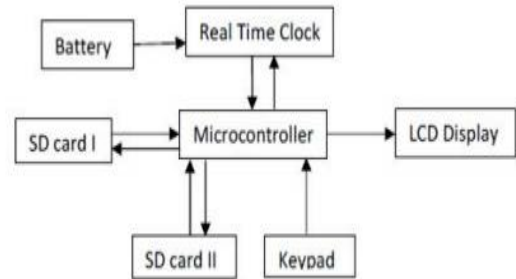


Flow Diagram: How voting will take place:



3. HARDWARE DESIGN

The hardware required for this design mainly needs to interface various blocks with each other in synchronization. These are as follows:



3.1 Memory Storage Components

We need a memory that is simple and quick in browse write and simply detachable from the system whenever needed, with none changes to the interior electronic equipment. Memory demand is additionally high, because it stores an oversized information of the voters and alternative details. Therefore, we have a tendency to set to travel for SD Cards. There square measure 2 SD cards within the projected machine:

Card I: it's a browse Write Card that may have knowledge from the commission, serially transferred to the cardboard by the PC:

- **citizen Details:** citizen ID, Pass code, Election Eligibility.
 - **Candidate Details:** Candidate Name, Party, ID, votes casted in favor, (image just in case of graphics display).
- Read Only: citizen details section --R/W: No. of votes casted within the favour of a selected candidate are updated throughout ballot.

Card II:

it'll have the sealed vote details, precisely as they're casted by the voters. knowledge already written are freeze, to stay details intact and non-modifiable at any purpose of your time. This card is employed in case of any legal issues concerning the pair of the expected and actual results, or if some malpractice is suspected within the tallying method.

3.2 Microcontroller

It will manage the interfacing between varied blocks as shown higher than within the machine. it's the ballot software package programmed in it. we've chosen the Atmega thirty two for our style. it's a serial interface, 2 wire link interface, that square measure needed for SD Card and RTC interfacing severally. Our system needs a uC with low procedure speed, since they happen solely at the time votes square measure casted which too aren't prolonged, creating United States select Atmega-32. Initially, we have a tendency to use Atmega16, however attributable to larger RAM needs of the software package we have a tendency to emotional onto Atmega32. We have left several pins of uC unused, this is often for more use of those port pins to implement future works like biological unit, printer etc. conjointly on constant line we have a

tendency to shifted from 8 bit to 4 bit alphanumeric display interfacing.

3.3 OUTPUT SHOW UNIT:

alphanumeric display this is often the output unit of the machine. citizen Interface are provided here. It displays all the relevant details concerning the present election and citizen will act consequently and examine the choices out here. we've enforced it on the 16X2 show presently since the show things weren't complicated as we have a tendency to didn't have image for a candidate in gift machine.

3.4 Input Unit:

input device this is often the input unit of the machine that takes varied directions from the voters, whereas ballot and conjointly in configuring of the EVM before elections. The citizen enters the main points asked for identification via citizen ID and pass code, and moves more on to the method of ballot. citizen ID & Pass code are within the style of numbers therefore on take away any problems connected languages, and cultures. alternative four keys are as: arrow keys, enter key. this can be nominative on the hardware

3.5 period Clock (RTC):

it's used for time stamping of votes on the SD Card II. It promptly provides current time and

date whenever required. Battery is required for Real clock in order that in spite of breakdown the clock runs conjointly there'll less burden on the facility provide. however we have a tendency to propose to implement in next stage of our style.

4. SOFTWARE

package style :The software package are programmed within the microcontroller. this can verify however casted votes square measure handled by the system. The interfacing between varied blocks is additionally integrated with this. Conjointly there'll be some secret writing for the citizen ID numbers which can be written on the Paper Record that we've projected as extension. The software package is being enforced in four steps (4.1-4.4).

4.1 Validation of citizen :

Voter is valid by checking the entered parole from the corresponding citizenid's passcode entered in voter.txt file.

4.2 Checking the standing of vote Checking the citizen status:

It 1st checks if the citizen has voted for central elections by checking out the voterID within the file centl.txt. If no, he's asked to vote. If yes, we have a tendency to check if user is eligible for state election happening. If

the citizen isn't eligible, he's logged out. If eligible, similar procedure as of central election is meted out.

4.3 Vote Registration

The list of candidates standing for election into consideration is displayed together with the candidateID and also the citizen is asked for the candidate he want to vote for. The corresponding count in ccand.txt gets incremented by one, thereby giving the count of votes received by a selected candidate. Same procedure is followed for state elections still.

4.4 Time stamping of vote

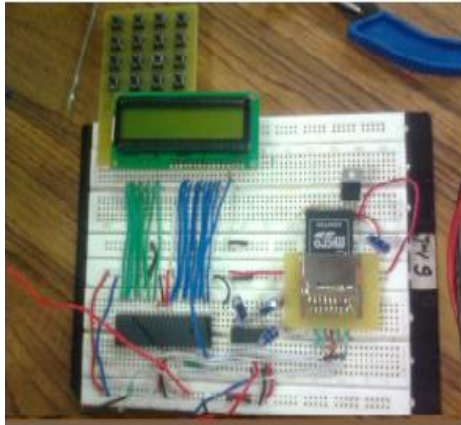
Time stamping of vote is finished to avoid phoney ballot and track them. The vote casted by a citizen gets registered at mini SD, within the file centl.txt. Details of the vote casted square measure given in description of centl.txt file

5. BLOCK WISE TESTING

5.1 Secure Digital Card

- **Protocol** – Interfaced with Atmega16 through the SPI peripheral. the cardboard is acting as slave and uC as master. SD card is interfaced with the atmega16 exploitation FAT32 filesystem. 2 pins square measure used as chip choose for choosing between the cards and therefore the communication is finished severally between them. Since 2 cards were used, MISO, MOSI and SCK pins of uC square measure multiplexed to each the cards. Communication is finished block wise at a

time and every block size is 512 bytes. The resistors at these pins square measure provided to match the present specifications of SDCard. SDCard runs on a provide voltage of two.7-3.6V,we've used a hard and fast transformer of three.3V(LM1117)



5.2KEYPAD

We have used the logic of scanning the rows and columns of the 4X4 matrix computer keyboard by propulsion rows low one by one then checking the corresponding column press for that low row. If a key therein row is presses then a column crossed therewith row are low, thence key detection was done. conjointly we have a tendency tointroduced a delay of 20us so as to see that actually a key was ironed and thence once more took the input for that key.

5.3 LCD INTERFACING

- 16X2 Hitachi HD44780 LCD is interfaced in four bit mode, that's we've

got used solely half dozen pins of uC: 4:information line (DB7-DB4) 2: management pins◇ RS(register select) and E(enable) we have a tendency to solelywrite information onto LCD. rather than 8bit mode 4bit was chosen since our application isn't high speed and delay sowing to the introduction of multiplexing information line doubly, doesn't have an effect on the system speed relating our demand. Its vital to notice down the sequence of directions to be followed, else the 4bit implementation won't provide correct results.

5.4 REAL clock CHIP USED:

Maxim DS 1307 Protocol: Serial interface victimisation Two-Wire interface victimisation Inter-Integrated Circuit(I 2C) multi-master serial bus. RTC interfaced with LCD. Specifications of communication: RTC • uC Frequency : 1MHz • Serial Clock Frequency (SCL): 28KHz (calculated from information sheet) . • Serial information Line: SDA presently RTC resets on every power clean up since there's no back battery placeinto the system.

6. CHECK RESULTS AND DISCUSSIONS

The blocks tested area unit running successfully: • Serial communication with the laptop from the uC is enforced with success (serial port used). This was performed in three steps- character by character mirroring, buffer transmission, modify the received

buffer then transmit. we have a tendency to discovered this transmission on the DSO further to verify whether or not the serial communication is functioning dead or not.

- MicroSD card interfaced with uC and following steps were dead. 1) one block was read/write/deleted from the cardboard. 2) Card was formatted in FAT32 then the files were read/write/deleted from the uC.

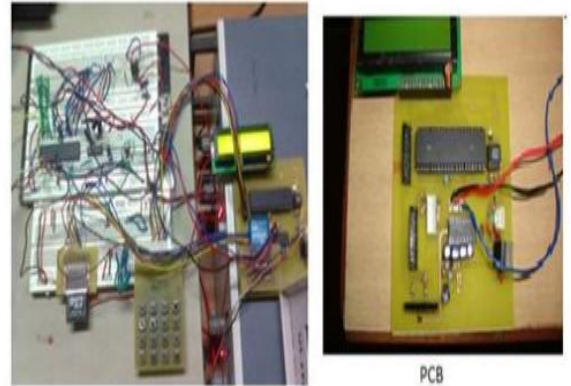
- LM317 was used 1st that may be a variable regulator owing to simple access. It did total for whereas we have a tendency to used only 1 card within the circuit. however on introduction of second card within the system, loading occurred and therefore the offer voltage of regulator wasn't at intervals the vary two.7-3.6, although it had been presupposed to be at three.3V(set voltage). owing to this, one microSD card was blown. Hence, to account for the large sensitivity of microSD, we have a tendency to affected on to LM1117, for victimisation this. These variations were removed by the mounted transformer LM1117.

- Before writing the EVM computer code, card to card communication was tested, as a requirement step.

- computer code problems :- "voter.txt" isn't taken by the avr compiler and thence this was passed character by character as 'v','o','t','e','r'.

- after we enforced the writing of information from one card to a different, via the uC, we have a tendency to encountered the matter of RAM flow. every block is of 512 bytes and that we needed 2 thereby resulting in >1K of RAM. This caused RAM overflow of Atmega16 and issues like main reset were encountered. thence we have a

tendency to switched to Atmega32, our final processor of the EVM



Bread Board Implementation of EVM

7. FUTURE PLANS

1. Facility to provide printer extension in the machine, so that voter can be sure of his vote casted after seeing it on a hard copy. This will help to track the malfunctioning of EVM and have a backup of votes in that case. Voter Verifiable Paper Record (VVPR): (if implemented) It will have following details on it:
 1. Candidate name for which voter voted

8. REFERENCES

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