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Rfid Based Attendance System

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Abstract: The security system is basically an embedded one. Embedded stands for hardware controller by software. Here a software using microcontroller controls all the hardware components. The microcontroller plays an important role in the system. The main objective of the system is to uniquely identify and to make security for a person. This requires a unique product, which has the capability of distinguishing different person. This is possible by the new technology called RFID. The main parts of the RFID system are RFID tag and RFID reader. In this system the RFID reader and RFID tag used are operating at 125 KHz. The microcontroller internal memory is used for storing the details. This report provides a clear picture of hardware and software used in the system. It also provides an overall view with detailed discussion of the operation of the system.

Index Terms- RFID Tag,, RFID Reader, Arduino, LCD, EEPROM, BMI.

I. INTRODUCTION

Main concept behind radio frequency based attendance system is to take the attendance. RFID card has to be show in front of RFID reader, and then the attendance of the person is noted down in the microcontroller memory. RFID based attendance system is one of the solutions to address the problem of student security by increasing the system efficiency instead of photo ID card, it also helps to take the attendance of the workers at their working place. its ability to uniquely identify each person based on their RFID tag type of id card make the process of allowing security access easier ,faster and secure as compare to traditional method. The card holder only needs to place their card on the reader and they will be allowed to enter the command if any invalid card is shown then the buzzer is turned on.

II. OBJECTIVE

Overcome the old attendance system which the attendance has to be taken manually. Design a database that supports such asystem that has been mentioned earlier. Develop a smart attendance system that be implemented in BMI(Biomedical Instrumentation) classes, laboratory and etc by combining the software with the proposed hardware.

III. EXISTING SYSTEM

Barcode has been used in student identity card for attendance purpose. It is a visual representation of data that is scanned and interpreted for information. At the same time, the conventional method of taking attendance in every lecturer / lab by calling names / roll numbers or signing on paper is very time consuming, unsecured, inefficient, difficult and monotonous for faculty. Their valuable time is wasted in taking attendance. Therefore many times proper attendance is not taken by the faculty. Also proxy attendance is always a problem in most of the campuses. Government & statutory bodies are also insisting Institutions for full proof attendance system.

IV. PROPOSED SYSTEM

In the proposed system, the student automation system project has been developed as an important application in order to maintain the attendance automatically using RFID. Our proposed system consists mainly 20X4 LCD, RFID reader, RFID tag, Arduino uno buzzer & momentum switches. Initially LCD Display unit showing five options to start the process.

These are 1 : Enrollment, 2 : Attendance, 3 : Deleting All Records & 4 : Results. So in our proposed model firstly we have to enroll the students or we can link the database to its adhaar database and then we can start the making attendance. In enrollment firstly student/employee information are save to the database.

After then student can make the attendance. We have used EPROM memory of device to save the attendance of the candidate. We Block diagram of our proposed system is in fig.1.

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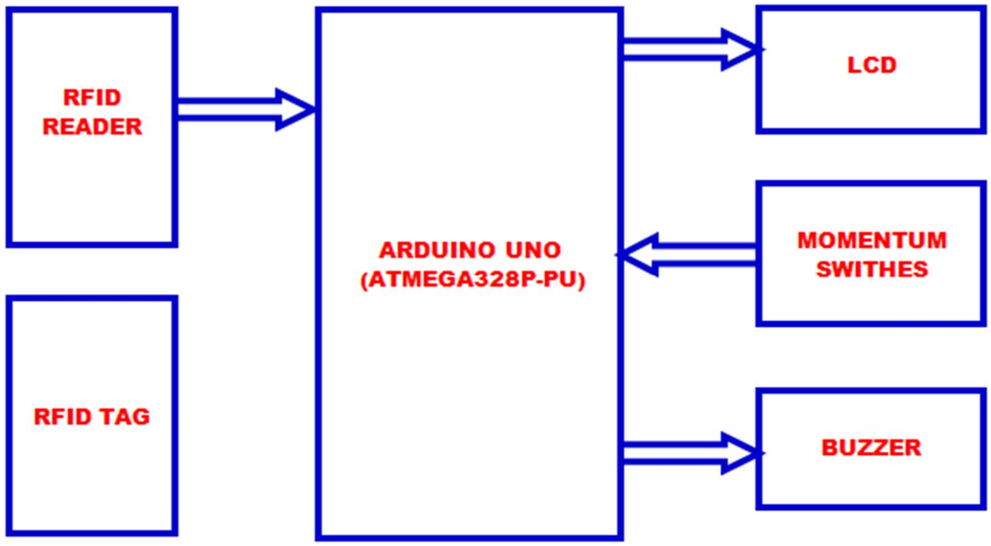

Fig.1 Proposed system block diagram

V. MODULE / COMPONENT DESCRIPTION

A. Arduino Uno

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. Each of the 14 digital pins and 6 Analog pins on the Uno can be used as an input or output, using pinMode(),digitalWrite(), and digitalRead() functions. They operate at 5 volts. Each pin can provide or receive 20 mA as recommended operating condition and has an internal pull-up resistor (disconnected by default) of 20-50k ohm. A maximum of 40mA is the value that must not be exceeded on any I/O pin to avoid permanent damage to the microcontroller.The Uno has 6 analog inputs, labeled A0 through A5, each of which provide 10 bits of resolution (i.e. 1024 different values).

Serial Pins 0 (Rx) and 1 (Tx): Rx and Tx pins are used to receive and transmit TTL serial data. They are connected with the corresponding ATmega328P USB to TTL serial chip. PWM Pins 3, 5, 6, 9 and 11: These pins provide an 8-bit PWM output by using analogWrite() function. SPI Pins 10 (SS), 11 (MOSI), 12 (MISO) and 13 (SCK): These pins are used for SPI communication.

B. 20x4 LCD DISPLAY UNIT

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. Here, in this project we are going to use a monochromatic 20x4 alphanumeric LCD. 20x4 means that 20 characters can be displayed in each of the 4 rows of the 20x4 LCD, thus a total of 80 characters can be displayed at any instance of time[9]. LCD accepts two types of signals, one is data, and another is control. These signals are recognized by the LCD module from status of the RS pin. Now data can be read also from the LCD display, by pulling the R/W pin high. As soon as the E pin is pulsed, LCD display reads data at the falling edge of the pulse and executes it, same for the case of transmission. LCD display takes a time of 39-43μS to place a character or execute a command. Except for clearing display and to seek cursor to home position it takes 1.53ms to 1.64ms. Any attempt to send any data before this interval may lead to failure to read data or execution of the current data in some devices. Some devices compensate the speed by storing the incoming data to some temporary registers. LCD displays have two RAMs, naming DDRAM and CGRAM. DDRAM registers in which position which character in the ASCII chart would be displayed. Each byte of DDRAM represents each unique position on the LCD display. The LCD controller reads the information from the DDRAM and displays it on the LCD screen. CGRAM allows user to define their custom characters. For that purpose, address space for first 16 ASCII characters are reserved for users. After CGRAM has been setup to display characters, user can easily display their custom characters on the LCD screen[10]. Display data RAM (DDRAM) stores display data represented in 8-bit character codes. Its extended capacity is 80 X 8 bits, or 80 characters. The area in display data RAM (DDRAM) that is not used for display can be used as general data RAM. The character generator ROM generates 5 x 8 dot or 5 x 10 dot character patterns from 8-bit character codes. It can generate 208 5 x 8 dot character patterns and 32 5 x 10 dot character patterns. CGRAM area is used to create custom characters in LCD. In the character generator RAM, the user can rewrite character patterns by program. For 5 x 8 dots, eight character patterns can be written, and for 5 x 10 dots, four character patterns can be written.

Table.1: Pin configuration of 20x4 LCD display

Pin Number	Symbol	Function
1	VSS	Ground Terminal
2	VCC	Positive Supply
3	VDD	Contrast adjustment
4	RS	Register Select; 0→Instruction Register, 1→Data Register
5	R/W	Read/write Signal; 1→Read, 0→ Write
6	E	Enable; Falling edge
7	DB0	Bi-directional data bus, data transfer is performed once, thru DB0 to DB7, in the case of interface data length is 8-bits; and twice, through DB4 to DB7 in the case of interface data length is 4-bits. Upper four bits first then lower four bits.
8	DB1	
9	DB2	
10	DB3	
11	DB4	
12	DB5	
13	DB6	
14	DB7	
15	LED-(K)	Back light LED cathode terminal
16	LED+(A)	Back Light LED anode terminal

Busy Flag is an status indicator flag for LCD. When we send a command or data to the LCD for processing, this flag is set (i.e BF =1) and as soon as the instruction is executed successfully this flag is cleared (BF = 0). This is helpful in producing and exact ammount of delay. for the LCD processing. To read Busy Flag, the condition RS = 0 and R/W = 1 must be met and The MSB of the LCD data bus (D7) act as busy flag. When BF = 1 means LCD is busy and will not accept next command or data and BF = 0 means LCD is ready for the next command or data to process. There are two 8-bit registers in HD44780 controller Instruction and Data register. Instruction register corresponds to the register where you send commands to LCD e.g LCD shift command, LCD clear, LCD address etc. and Data register is used for storing data which is to be displayed on LCD. when send the enable signal of the LCD is asserted, the data on the pins is latched in to the data register and data is then moved automatically to the DDRAM and hence is displayed on the LCD[11].

Table.2: Frequently used commands and instructions for LCD

Sl. No	Instruction	Hex Code
1	Function Set: 8-bit, 1 Line, 5x7 Dots	0x30
2	Function Set: 8-bit, 2 Line, 5x7 Dots	0x38
3	Function Set: 4-bit, 1 Line, 5x7 Dots	0x20
4	Function Set: 4-bit, 2 Line, 5x7 Dots	0x28
5	Entry Mode	0x06
6	Display off Cursor off (clearing display without clearing DDRAM content)	0x08
7	Display on Cursor on	0x0E
8	Display on Cursor off	0x0C
9	Display on Cursor blinking	0x0F

10	Shift entire display left	0x18
11	Shift entire display right	0x1C
12	Move cursor left by one character	0x10
13	Move cursor right by one character	0x14
14	Clear Display (also clear DDRAM content)	0x01
15	Set DDRAM address or cursor position on display	0x80 + address*
16	Set CGRAM address or set pointer to CGRAM location	0x40 + address**

C. Rfid Reader

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically-stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader [6]. RFID belongs to a group of technologies referred to as Automatic Identification and Data Capture (AIDC). AIDC methods automatically identify objects, collect data about them, and enter those data directly into computer systems with little or no human intervention. RFID methods utilize radio waves to accomplish this. At a simple level, RFID systems consist of three components: an RFID tag or smart label, an RFID reader, and an antenna. RFID tags contain an integrated circuit and an antenna, which are used to transmit data to the RFID reader (also called an interrogator). The reader then converts the radio waves to a more usable form of data. Information collected from the tags is then transferred through a communications interface to a host computer system, where the data can be stored in a database and analyzed at a later time[7]. There are two types of RFID systems. **(1)** Active RFID system: These are systems where the tag has its own power source like any external power supply unit or a battery. The only constraint being the life time of the power devices. These systems can be used for larger distances and to track high value goods like vehicles. **(2)** Passive RFID system: These are systems where the tag gets power through the transfer of power from a reader antenna to the tag antenna. They are used for short range transmission[8].

D. Buzzer

A buzzer is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. A buzzer is a small yet efficient component to add sound features to our system[4]. It is very small and compact 2-pin structure. This is a simple buzzer which when powered will make a continuous Beeeeeeppp.... sound.

All the module & components finally assemble together & microcontroller code for this was developed finally & then finally we have reach to our goal of this project. Real hardware of our proposed system is shown in fig.2

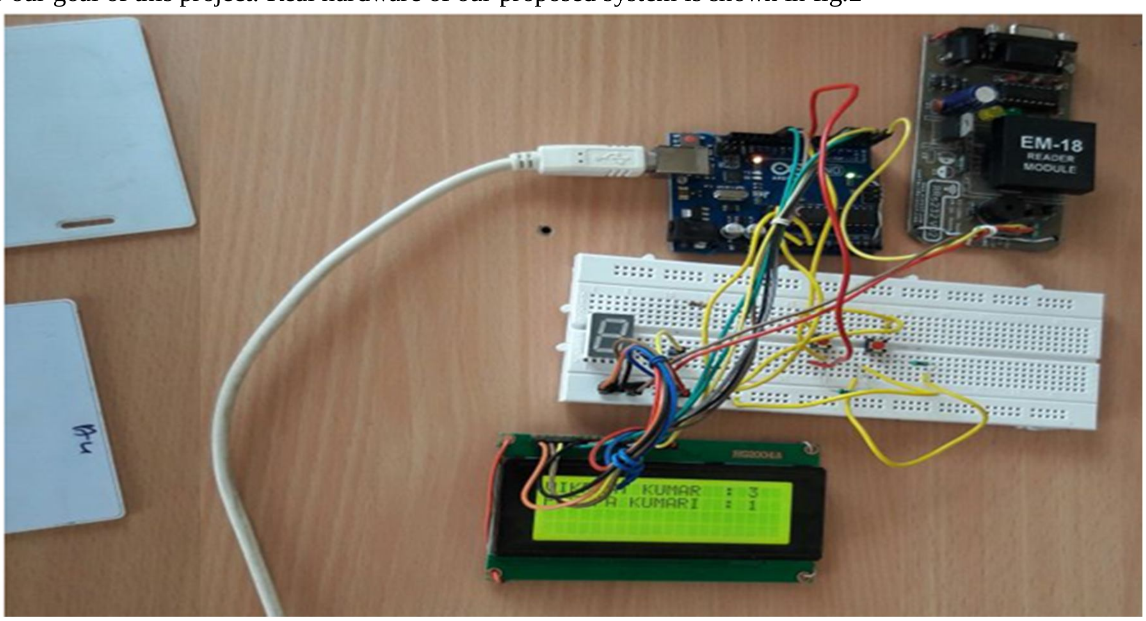

Fig.2 Real hardware of proposed system

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In coding part we have used following header file(1) #include <LiquidCrystal.h> & (2)#include <EEPROM.h>
Program to find the character code stored in RFID tag [which will be shown in Serial monitor of computer] are as follows

```
char datal = 0;
String s="";
int x=0;
void setup()
{
  Serial.begin(9600);
}
void loop()
{
    while(Serial.available() > 0)
    {
       datal=Serial.read();  s=s+datal;  Serial.print(s);  x++;
    }
   if(x==12)
    {
       x=0;  Serial.println("");
    }
      s=""; datal=0;
}
```

VI. CONCLUSION /FUTURE SCOPE

The objective to build a RFID based attendance system was successfully achieved. In terms of performance and efficiency, this project has provided a convenient method of attendance marking compared to traditional method of attendance system. By using database, the data is more organized. This system is also a user friendly system as data manipulation are retrieval can be done via the interface, making it a universal attendance system. Thus, it can be implemented in either an academic institution or in organizations.

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REFERENCES

[1] www.wikipedia.org
[2] www.semanticscholar.org
[3] https://www.tutorialspoint.com/arduino/arduino_board_description.htm
[4] https://components101.com/buzzer-pinout-working-datasheet
[5] http://wilsonhurd.com/images/pdfs/MembraneSwitchesDesignGuidelines.pdf
[6] https://en.wikipedia.org/wiki/Radio-frequency_identification
[7] http://www.abr.com/what-is-rfid-how-does-rfid-work
[8] https://www.elprocus.com/rfid-basic-introduction-simple-application
[9] http://www.instructables.com/id/Interfacing-20x4-LCD-with-Arduino
[10] http://www.circuitstoday.com/a-note-on-character-lcd-displays
[11] http://www.8051projects.net/lcd-interfacing/basics.php

