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RFID Attendence using RC522

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Abstract: ***We have made an RFID RC522 Based Attendance System Using Arduino. MFRC522 RFID Reader is a very easy to use yet effective module. It is an RFID module and is used for scanning RFID cards This system could be used to mark attendance for people in education or employment. Its ability to identify every person using their RFID tag type of ID card makes the process of marking the attendance more convenient, quicker and secure as compared to any other conventional method. Students or employees only need to place their Identification on the reader and their attendance will be marked instantly. With RTC capability, the process of marking attendance will be more precise as the time for the attendance marked will be stored. The system can be connected to the computer through the USB port and store the attendance in an organized database as per requirements.***

Keywords: RFID, SD-CARD, MODULE, RTC, LCD, RFID CARD

I. INTRODUCTION

RFID Full form is Radio Frequency Identification. It is a self identification technology used for storing data on to RFID Tags without any physical contact. Designed system mainly consists of RFID Tags, Readers, Middleware and a Backend database. In old fashioned methods, lots of complications exists which includes loss of attendance book, false attendance. If the attendance book is lost by the teacher then the notorious students get an opportunity to mark fake attendance because the teacher has to create whole new attendance .RFID Tags are made by the EPC global Tag Data Standard. In managing the attendance of the student in the university, the use of RFID technology enables the management get rid of manual attendance record and take a step forward in future technology because everything is going to be stored online. This technology is money friendly and decreases work challenges in dealing with the attendance logs. RFID will assist and accelerate these trivial techniques -and also lower the time required in a few different zones such as parking, Bus ticketing system and others. This system can be used to retrieve staff and student records from centralized data base hence therefore reducing human error. This system is also user friendly. This type of technology is going to be the future.

II. SYSTEM OVERVIEW

The system consists of Arduino uno,sd card module, rtc module, Rfid MRFC522 Module, lcd,red and green, led,buzzer.

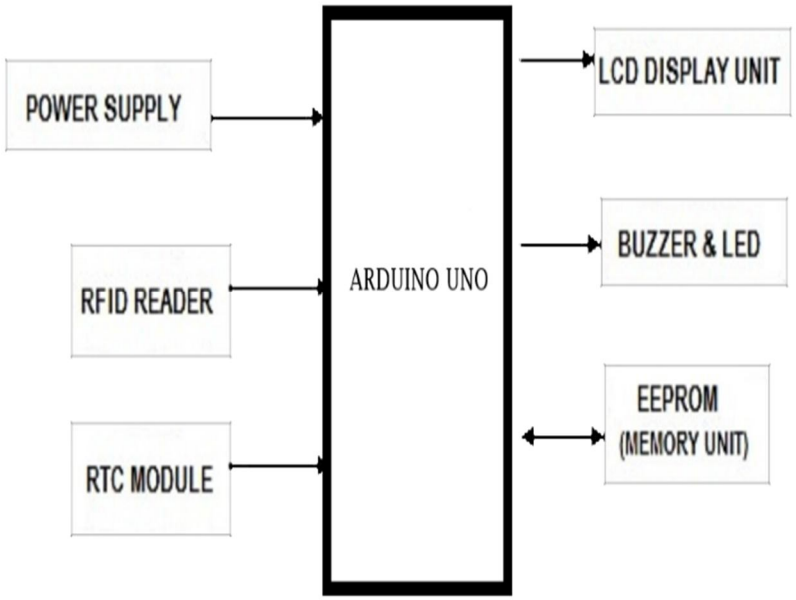


Fig 1.Block diagram

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III. COMPONENTS

A. Arduino Uno

The Arduino is having 28 pins for making the input and output from the Arduino board. These pins are very much helpful for some useful work for example it can be used to take some sensor values from the sensors and make the decision based on the programming we have done on it. The board is having an ATMEGA microcontroller which is like a heart of the board.

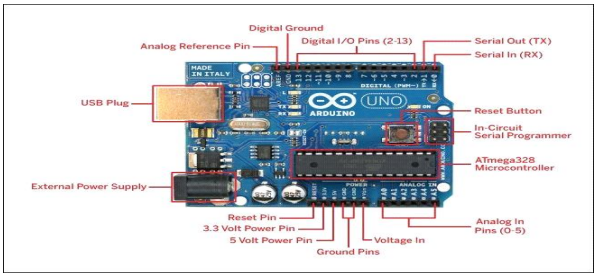


Fig.2 Arduino Uno

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by boot loader
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

Table.1 Arduino Uno

B. RFID(MFRC522) Module

Radio Frequency Identification (RFID) is a generic term for technologies that use radio waves to automatically identify people or objects from a distance of several inches to hundreds of feet.Rfid has high rading speed.Rfid offers advantage over the traditional barcode system. This is an Automatic identification (Auto-ID) technology by which any object can be identified automatically.These standards works on selected frequency bands (e.g. 860 – 915 MHz for UHF or 13.56 MHz for HF)[1].

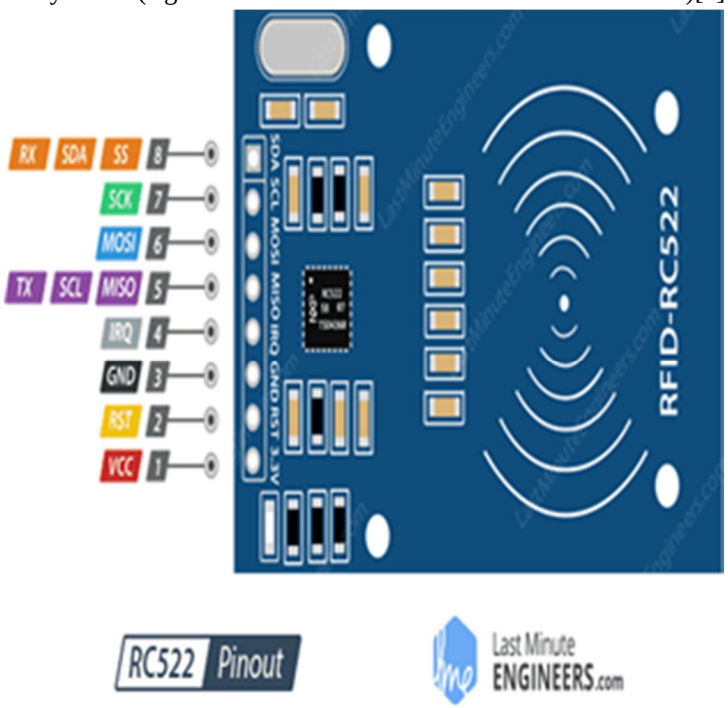


Fig.3 RFID Module

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1) A RC522-Specifications

Operating Current	13-26mA / DC 3.3V
Idle Current	10-13mA / DC 3.3V
Sleep Current	< 80uA
Peak Current	< 30mA
Operating Frequency	13.56MHz
Supported card types	mifare1 S50, mifare1 S70 MIFARE Ultralight, mifare Pro, MIFARE DESFire
Environmental Operating Temperature	-20 - 80 degrees Celsius
Environmental Storage Temperature	-40 - 85 degrees Celsius
Relative humidity	relative humidity 5% - 95%
Reader Distance	≥ 50mm / 1.95" (mifare 1)
Module Size	40mm × 60mm
Module interface	SPI
Data transfer rate	Maximum 10Mbit/s

Table.2 RC522

C. Sd Card Module

The micro- SD Card Module is a simple solution for transferring data to and from a standard SD card.It's major application in this proposed system to store the data from attendance logs.This Module allows you to add mass storage. This module has SPI interface which is compatible with any sd card and it use 5V or 3.3V power supply which is compatible with Arduino UNO/Mega..

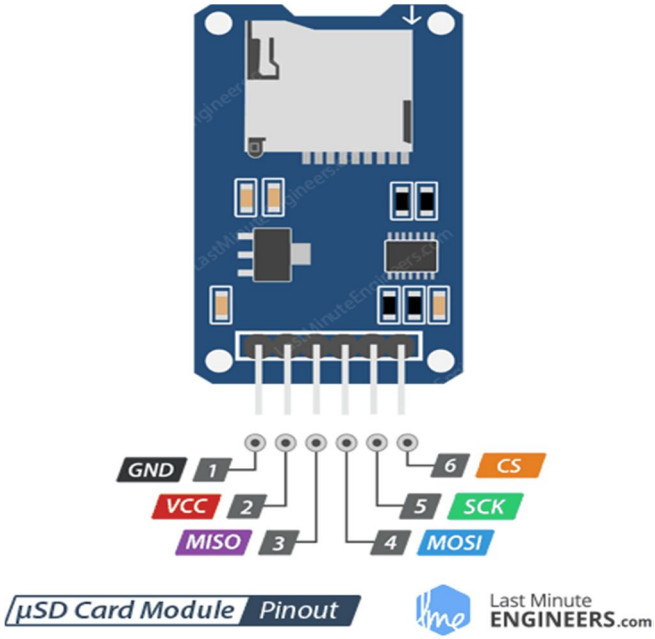


Fig 4.Sd card Module

1) A Specifications

Working Voltage	5V/3.3V
Interface	SPI
Compatible	MicroSD

Table 3. Sd card Module

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D. ARTC Module

Rtc Module as the name recommends are clock modules. They are simply used to remember date and time which can be useful for some systems. It doesn't need external power supply. The system have their own battery setup. We have used ds3231 in this project

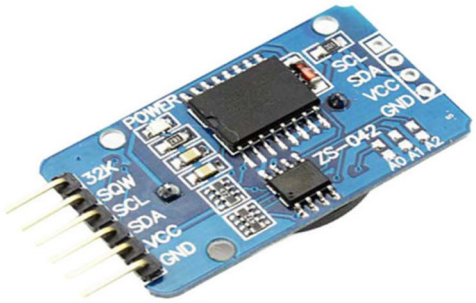


Fig 5.RTC Module

1) A Specifications

Operating voltage of DS3231 MODULE	2.3V – 5.5V
Maximum voltage at SDA , SCL	VCC + 0.3V
Operating temperature	-45°C to +80°C

Table 4.RTC Module

E. LCD16X2

Simple LCD display device which is available in the market its 16X2 display where one can able to view the 16 characters in each line and having a maximum of 2 lines. LCD's comes in thinner and lighter when compared to LED and cathode ray tube. It has major application in the field of science and engineering on electronic devices. LCD's provides excellent contrasts. LCD consists of some microwatts for display in comparison to some mill watts for LEDs

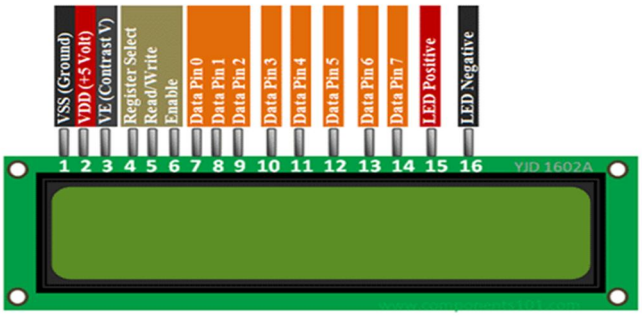


Fig 6.Lcd

ITEM	SYMBOL	LEVEL	FUNCTIONS
1	VSS	0V	Power Ground
2	VDD	+5V	Power supply for logic
3	V0	—	Contrast adjust
4	RS	H/L	H:data L:command
5	R/W	H/L	H:read L:write
6	E	H.H→L	Enable signal
7-14	DB0-DB7	H/L	Data Bus
15	LEDA	+5V	Power supply for LED Backlight
16	LEDK	0V	

Table 5.Lcd

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1) A Specifications

Display Format	16x2 Dots LCD
Outline Dimension	85(W)x30(H)x12(T)mm
Visual Area	64.5×16.0mm
Active Area	55.45(W)x10.75(H)mm
Character Size	2.95x5.15mm
Diagonal Size	2.6“
Dot (Pixel) Size	0.55X0.60mm
IC Package	COB LCD
IC or Equivalent	SPLC780C/HS44780/KS0066 or Equivalent
Interface	6800 8-bit/4-bit Parallel
Interface	parallel
Display Type	STN/FSTN
Sunlight Readable	No
Touch Panel Optional	No
Contrast Ratio(Typ)	No
Viewing Direction	6: 00
LED Backlight Color	Blue /Yellow Green /Gray
Appearance	White on Blue/Black on Yellow Green/White on Gray
Power Supply(Typ)	3.3V/5V
Backlight Current (Typ)	15mA
Operating Temp	-20°C~70°C
Storage Temperature	-30°C~80°C
If accept customized	Yes
RoHS Compliance	Yes

Table 6.Lcd

F. Piezo Electric buzzer

A piezo buzzer is a sound producing device. It is cheap material which can be useful many a times. They contain piezo crystal, it is a special material, which is going to change shape when voltage is going to be applied to it.



Fig 7. Buzzer

1) A Specifications

Rated Voltage	6V DC
Operating Voltage	4-8V DC
Rated current	<30mA
Sound Type	Continuous Beep
Resonant Frequency	~2300 Hz.

Table 7.Buzzer

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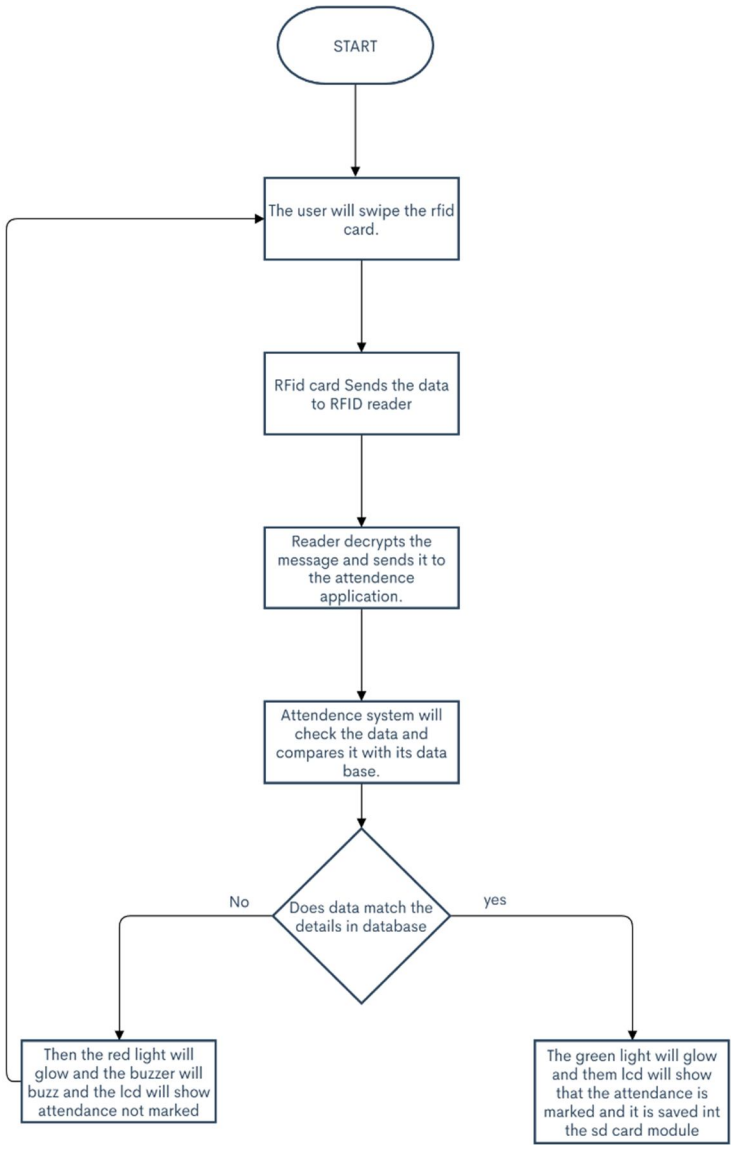
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IV. WORKING

The working principle of RFID based attendance system is so much simple. The student or employee or any other user who is implementing this system just has to swipe the rfid card in front of the RFID scanner. The scanner will then acquire the unique serial number embedded on the tag .This information will the be verified and stored in the attached sd card module. LCD will show if the attendance of the user has been marked. The rtc module will provide the accurate date and time for when the user has logged in.All this information will then be presented in an organized manner with use of excel sheet.

V. OVERFLOW OF THE SYSTEM

In first case the user will have to swipe the card.The rfid card will send the data to rfid reader. The rifd reader will decrypt the message. The attendance system will check the data with the data present in the system. If the data is matched then the attendance will be marked and the green light will glow. If the data does not match then the red light will glow and the buzzer will buzz and the lcd will that attendance is not marked.



VI. FUTURE SCOPE

Further improvement can be undertaken on this project for better enhancement. A camera can be added to this system which will add more protection to it.No fake attendance can be marked in the class. More over if want more security the we can add fingerprint module to this system which is a foolproof system.

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VII. OUTCOME/RESULT

As you can see the first thing which you can see is that the lcd will tell you to swipe the card.After swiping the card you will either get a message if the attendance is marked and the data will stored in the following manner shown in the table result below or it will show that the attendance is not marked and the red led will glow and the buzzer will buzz for 5 sec.

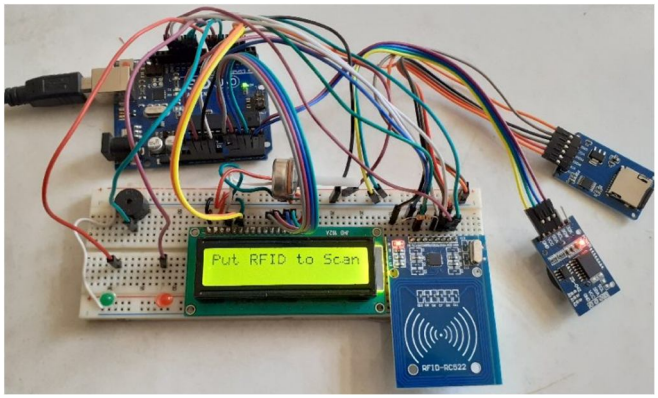


Fig 8. Result

A	B	C	D
Date	Time	Name	Number
2/3/2020	12:41:59 PM	omkar	123456
2/3/2020	12:42:06 PM	prajwal	789101

Table 8. Result

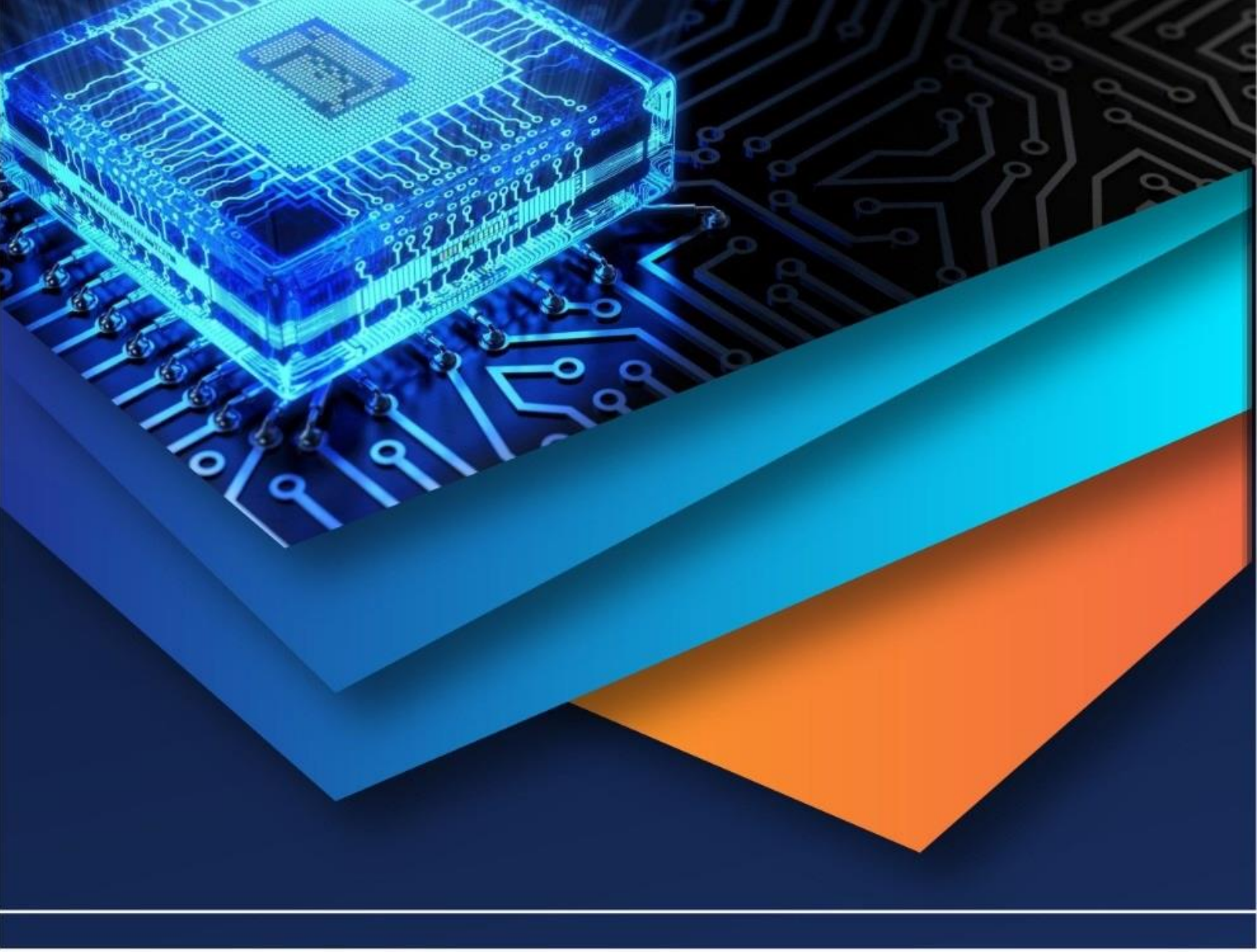
VIII. CONCLUSION

The proposed system of managing attendance using RFID technology will improve the process of manual attendance, in universities and schools and colleges it can also be use full in work environments The plus point of this system is that it is cost friendly and any university can implement it in a large scale. Thus, by implementing the proposed system we can get the actual attendance of the class.

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