

# Student Attendance System Using RFID

R. Nivetha<sup>1\*</sup>, M. Kavipriya<sup>2</sup>, R. Pavithra<sup>3</sup>, C. Jeyanthi<sup>4</sup>, V. Santhana Lakshmi<sup>5</sup>

<sup>1,2,3,4</sup>Student, Dept. of Computer Science (PG), PSGR Krishnammal College for Women, Coimbatore, India

<sup>5</sup>Assistant Professor, Department of Computer Science (PG), PSGR Krishnammal College for Women, Coimbatore, India

\*Corresponding author: nivetharavikumar630@gmail.com

**Abstract:** In an educational system, attendance is considered as an important criterion to assess the performance of the student. A student is expected to perform well if he is regular to college. The traditional method of marking the student's attendance is by calling the student one by one. This method consumes more time. In this technological era, everything is automatized. In this paper we propose a system to monitor and record the attendance of the system using RFID and Arduino. Every student will be given unique RFID. When the students scans RFID card in front of RFID card reader, the attendance is automatically marked by reading the RFID tag in the card. It is then stored in Microsoft Excel file. Utilizing RFID technology for marking attendance is extremely well effective and saves the time of both the teacher and the student.

**Keywords:** Arduino, Microsoft Excel, RFID, RFID reader, RFID tags.

## 1. Introduction

Recording of student attendance in the class is one of the routine work performed in institutions and schools. Even though multiple new technology arises, the traditional method which is the paper based method are widely used by people for marking the attendance. This method is inefficient since it consumes much of the class time and also the record must be maintained for the future reference. In paper-based record the data entered will be faded and the condition of the paper will not remain as same as while recording. While entering data manually there is a chance for typographical error. The same problem arises when the paper-based data is transferred into the electronic form for calculating the total attendance of the student. To overcome the issue, institutions and schools began to use the new technology. Student attendance data are usually used as one of the numerous factors that affect the final grade of the student. Besides that, it is used for the analysis and prediction of student achievements in individual subject and individual study program level. There is a possibility for the students to make changes in the attendance. There is no security for the data. Anybody can access.

In this project, Radio Frequency Identification (RFID) is used for tracking and identification of the objects in the particular zone. RFID is an electronic device which has a small reader and RFID tags. This device is used to transmit the information of the students between the reader and RFID tag.

The tag contains 2k bytes of data. The operating frequency ranges of these devices include low, mid and high range. The high frequency range is 2.4KHz to 2.5KHz. The paper is arranged as follows. In the next section, we present literature survey, an overview of the system and its main components.

## 2. Literature Survey

Md. Kaviul Hossain [1] proposes RFID based paper. this paper, it proposes RFID based which allows fast transaction and can makes issue, return of books for library management system. In this tags or transponders, the vital components of RFID which are the electronic chips consisting of a microcircuit and antenna coil that communicate with a reader by means of a oftenness signal, smart labels/tags are designed for lasting to lifetime of the item it identifies and also performs the EAS (Electronic Article Surveillance) function to detect the thefts. They conclude that RFID within the library makes things quick like book borrowing, monitoring, books searching processes and thus free staff to try to do more user service tasks. To urge the simplest performance, RFID readers and RFID tags to be used must be of excellent quality. The efficient performance of the technology also depends upon the data to be written in this tag. The appliance can result in significant savings in aborning costs, enhance customer service, lower book theft and it provide a continuing record update of latest collections of books.

Rupali sawant and et. al [2] proposes a concept of RFID based smart shopping cart in the field of retail merchandise. Our shopping experience is often marred by the long checkout lines. The bar code is replaced by smart labels which are known as radio frequency identification (RFID) tag. The idea they proposed is to give assistance in shopping by reduction in time spent, eliminating the daily hassle of locating the right product and standing in long lines. They conclude that, the model they had developed has easy access in shopping experience to reduce their time and energy of the consumers. The challenges and drawbacks are resolved to make the proposed system more robust, also the RFID have a wide scope in supply chain management, their proposed system has the potential to improve the basic retail experience to great extent.

With the above technology we propose the RFID based students attendance system which are facing many problems by following the traditional methods like taking attendance by

calling the student's name and marking present/absent in paper and the other method is getting student's signature in paper which consumes lot of time. In this paper, we have used the adaptability of RFID for the student course attendance system in implementing functional and automatic by simply swiping or moving their ID cards. This system can also be used by storing the attendance in the cloud and can be analysed

In this paper [3], LANDMARC – locating objects inside building using RFID technology which is a location sensing prototype system. It has an improved locating the objects using reference tags concept.

### 3. System Overview

The system consists of RFID tag, RFID Reader, Arduino UNO, PLX-DAQ tool, LCD, buzzer, LED. In figure 1, When the RFID tag is placed near the RFID Reader, it reads the Card ID and checks whether the card is authorized or not. If it is authorized, It marks the in-time and name of the student. The buzzer gives an Alarm sound when the card is not authorized. The data read from the RFID reader by Arduino UNO is given to PLX-DAQ tool. This tool is used to fetch the data from the sensor and display in fields of the Spread Sheets which is very useful in analyzing the data.

Here RFID Reader RC522 is used and the RFID card respective to the reader is taken.

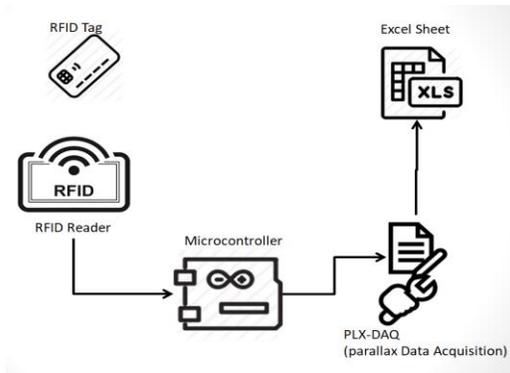


Fig. 1. Diagram

### 4. Methodology

#### A. Components used

##### 1) RFID reader



Fig. 2. RFID Reader [4]

tags and RFID reader use wireless communication between them. In this kind of communication RFID Reader does not need any line of sight with the tags. The reader is able to find the RFID tag even if there is an obstacle between them. RFID Reader is shown in figure 2.

##### 2) RFID cards

There are two main kinds of RFID cards, Passive and Active. Passive RFID tags are used in this system. We can use normal RFID cards which are of the size of credit card as shown in Figure-3. These cards are like credit or debit cards which are white in color that can be used as ID card also.



Fig. 3. RFID Tag [5]

##### 3) Arduino UNO

Microcontroller stores the attendance of the student in the microcontroller memory. Main goal of RFID based attendance system is to record the attendance of the student. In this project, Arduino UNO microcontroller is used which is based on 8-bit ATmega328P Microcontroller. Figure 4 shows the microcontroller Arduino UNO. It is the main component of project. Microcontroller does the following functions:

1. Displaying on LCD.
2. Input is read from RFID reader.
3. The data or RFID card ID is compared with the data stored in microcontroller memory.
4. If the tag does not match, the buzzer gives an alarm sound.
5. If the tag is available in the memory, in time of the student is stored.
6. The data is sent to the computer and the attendance of the student is marked.



Fig. 4. Microcontroller (Arduino UNO) [6]

##### 4) Buzzer

Buzzer is a sound creating device. Buzzer is used for demonstration purpose. Buzzer will be turned on with alarm sound for invalid card access and it gives beep sound for valid card access. Figure 5 shows the Buzzer.

Full form of RFID is Radio Frequency Identification. RFID



Fig. 5. Buzzer [7]

5) LED

Green LED and Red LED id is used to differentiate the authorized and unauthorized user. Figure-6 shows the Red and Green LED lights.



Fig. 6. LED [8]

6) LCD I2C

Liquid crystal display (Figure 7) is also used to display the Name, Time in and Time out of the authorized students and to display error message for unauthorized access.

Table 1  
Pin Connections

RFID – RC522	Arduino UNO
SDA	Pin 10
SCK	Pin 13
MOSI	Pin 11
MISO	Pin 12
IRQ	
GND	GND
RST	Pin9
3.3v	3.3v
Buzzer	Pin 5
Red led	Pin 8
Green Led	Pin A1
<b>I2C LCD</b>	
SDA	A4
SCL	A5
GND	GND
VCC	5V



Fig. 7. I2C LCD [9]

B. Software Used

1) Arduino

Arduino is a company which provides an open-source hardware and software. Arduino also provides projects and a user community. It makes designs and manufactures

microcontroller kits for constructing digital devices.

2) PLX-DAQ( ) tool

PLX-DAQ is a tool which the add-in for Microsoft Excel. It can have upto 26 channels data from microcontrollers and the numbers are dropped into as they arrive. PLX-DAQ is used to analyse the data collected in the columns, real-time equipment monitoring and also analyse the data from sensors.

C. Working

Student Attendance system is used to mark the attendance of students by recording the in time and out time of the students. It is included in colleges, school for students to find the login, and logout time of students. RFID cards come in the size of credit card which is in white color. As given in Figure-1, student will be given RFID card and RFID reader will be placed on the door or the entry gate of school or college. Whenever students want to enter in the school/college, he/she has to show the RFID card to the reader, student has to take the RFID card near to the RFID reader. RFID Reader will mark the attendance by fetching the RFID card number and swiped in time. And in the same method, the exit time of the student is recorded. Table-1 shows the Pin connection of the system.

5. Outcome/Result

The attendance of the students is displayed in Excel sheet. As give in the figure 9, Excel file has details such as Student name, Register Number, Date (date of attendance), Card ID (unique id of RFID tag), Time IN, Time OUT.

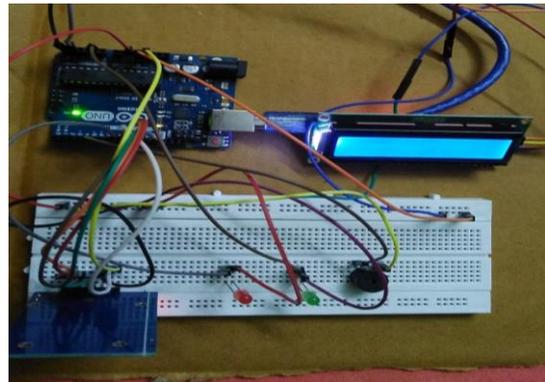
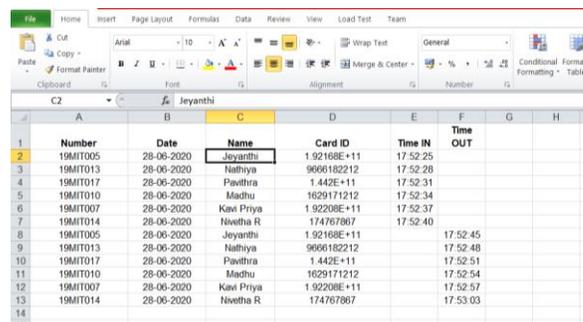


Fig. 8. Result



Number	Date	Name	Card ID	Time IN	Time OUT
1	19MIT005	28-06-2020	Jeyanthi	1.92168E+11	17:52:25
2	19MIT013	28-06-2020	Nathya	9696182212	17:52:28
3	19MIT017	28-06-2020	Pavithra	1.442E+11	17:52:31
4	19MIT010	28-06-2020	Madhu	1629171212	17:52:34
5	19MIT007	28-06-2020	Kavi Priya	1.92208E+11	17:52:37
6	19MIT014	28-06-2020	Nivetha R	174767867	17:52:40
7	19MIT005	28-06-2020	Jeyanthi	1.92168E+11	17:52:45
8	19MIT013	28-06-2020	Nathya	9696182212	17:52:48
9	19MIT017	28-06-2020	Pavithra	1.442E+11	17:52:51
10	19MIT010	28-06-2020	Madhu	1629171212	17:52:54
11	19MIT007	28-06-2020	Kavi Priya	1.92208E+11	17:52:57
12	19MIT014	28-06-2020	Nivetha R	174767867	17:53:03

Fig. 9. Result

## 6. Conclusion

In this paper attempt has been made to mark the attendance of the students using RFID technology. It monitors the student's attendance thereby the time is saved for teacher. More sophisticated applications will use the capability of RFID to receive, store and forward data to a remote sink source as the RFID technology evolves. we have used the adaptability of RFID for the student course attendance system in implementing functional and automatic system by simply swiping or moving their ID cards. It is obvious that the use of biometrics could improve some aspects of using this kind of system. This system can be further improved by storing the attendance in the cloud and intimation can be sent to the parents about the presence and absence of the student.

## References

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