

# SMART ATTENDANCE SYSTEM USING RFID

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## ABSTRACT

Most of the institutional authorities are troubled with the cumbersome method of maintaining manual attendance of their employees. The manual process of signing on a paper is prolonged and insecure. An efficient attendance monitoring system needs to be enforced at such places. Radio Frequency Identification (RFID) based attendance system provides us with a solution that caters to issues like proxy attendance. This paper describes the design of an RFID based attendance monitoring system which uniquely identifies each employee/student based on their RFID tag which is attached to their ID card. This makes the mechanism of recording the attendance effortless, quicker and protected as compared to conventional method. This system is designed to be used at different educational institutions, corporate offices, government offices etc. The proposed system consists of both hardware and software components based on IoT Technology. The hardware component consists of RC522 RFID card reader and RFID tags/cards. The software used here is database for storing the record of the students. The employees or students just need to place their RFID card or tag on the reader and their attendance will be recorded for the day. Also, the attendance recorded will be more accurate as the system is synced with a real-time clock

**Keywords: RFID, RC522.**

## 1. INTRODUCTION

Attendance has important role in every organization. Attendance in many of the Institute, college and schools are on paper. When we consider the attendance that is based pen paper, the chances of getting error are high. This technology can solve the problem and the papers can be avoided in this process. The attendance management system can track who is at school, without using the traditional method of recording attendance. The system is designed to help keep track of employees' attendance. It is possible to track the attendance of students at their dorms using this system. Radio waves are used to transmit data from an RFID tag, which is connected to a reader system. This help us to know and monitor the objects. RFID is a technology that uses electromagnetic coupling in the radio freq region of the electromagnetic spectrum to know the objects. This entity could be a person, an animal, or any other object. RFID chips contain a radio transmitter that produces a coded identification number when it comes into contact with a reader device. To help identify products, tiny type is included on some of them. The tag has an electronic chip inside it which stores information. RFID

tags have a tiny transmitter that transmits an encoded radio signal to query the tag. The receiver, which is tiny too, receives the message and replies with the tag's identification. Some RFID tags don't need batteries, because they have a chip inside that works automatically. The tag relies on the radio signal that the reader sends out, rather than needing to draw its power from a separate source. RFID technology helps to separate different tags that are in the field of view of the RFID reader. This is part of the machine plan for RFID. RFID can be used for different purposes, such as tracking items, tracking people, and tracking information. For tracking and manage inventory, assets, people, and other things, tags can be attached to any object. It can be attached to things like automobiles, laptops, books, cell phones, etc. A specific organization which uses an automated IoT system called an RFID attendance device to track the attendance of registered members. The RFID attendance device offers a business, affordability, comfort, and the efficiency associated with RFID technology. Each student used a RFID cards, and the reader record each time they enter. Each card contains an electronic product code (EPC), a distinctive identification type.

## 2. LITERATURE SURVEY

Based on concerns from educational institutions concerning erratic student attendance, this paper provides a novel paradigm for RFID-based student attendance tracking. The general academic performance of a student might be impacted by school absences. It takes a lot of effort and is ineffective to record attendance using paper attribution or signatures. One of the answers to the issue is an RFID-based IoT-based attendance system. Two of his most well-liked styles of technical investigation are present in the proposed work. His RFID and the Internet of Things [1].

A project known as the RFID-based automated attendance system is currently being implemented. The software for the attendance system was developed in VB using Microsoft Access. NET. Each student also has a student ID card and an RFID tag. A serial connection is used to link the RFID reader and computer, and it is kept active for this connection. There is an RFID reader on the door to the auditorium. The RFID reader scans the RFID tag every time a student enters the auditorium to capture all of the student's data. in the database via serial connection to maintain the system. In contrast to conventional systems, the administrator of this system can quickly retrieve data from the database and view all documents by using the software's user interface. [2].



We can use a lot of technology while retaining the traditional model in light of the current state of our educational system. At colleges and universities, professors used to manually enter students' names into attendance records. After recording attendance, instructors manually update the database. Speaking of technology, there are many tools available that can help make lectures less stressful, as I've found out. RFID usage serves as one example of this. Combining RFID and IOT (Internet of Things) allows you to automate the process and do away with lecture-based training. In this scenario, we plan to store data in the cloud for improved performance. IOT and the cloud allow access from anywhere at any time, increasing power and flexibility [3].

Students must be present in class. The lecturer or without the attendance procedure. A student's participation cannot be graded by the teacher. However, the current procedure still involves manually taking attendance on paper. The first issue is the excessive paper use, and the second issue is that it is challenging for the administration to summarize student attendance data. The administration must review a large number of attendance records, which is why. As a result, a system for tracking student attendance is required that can gather information quickly, effectively, and accurately. By gathering data, analyzing the system, designing the system, and putting it into practice, this student attendance system is accomplished. Android and PHP programming languages were used to create this system. [4].

IBEACON technology is also used by the system to identify classrooms. The purpose of this study is to create IBEACON-based applications for students that will notify them of class schedules and have an attendance system. This should increase the effectiveness of the attendance process and make it simpler for professors and the central administration to keep track of attendance. [5].

implementation of a web-based attendance system based on RFID. The system tracks student attendance and reads particular students using RFID tags and readers. As soon as the reader establishes a connection with her Arduino microcontroller, it uses the Arduino shield to send the RFID reader response to her web server. Finally, you can use PHP and MySQL to store student attendance data on your web server. The system administrator has access to all student files through this particular web-based service. You can see student data on the LCD display as well. [6].

## 2.2 Finding from Literature Survey

From this, we developed a number of benefits. This project's problems were covered in great detail in a previous paper. From the literature review mentioned above, we learned about various parameters, including a smart attendance system that uses web-based, Arduino, IOT, and RFID cards. We discovered some errors in this project, and to fix them, we added an excel sheet and an RFID card.

## 3. PROPOSED SYSTEM

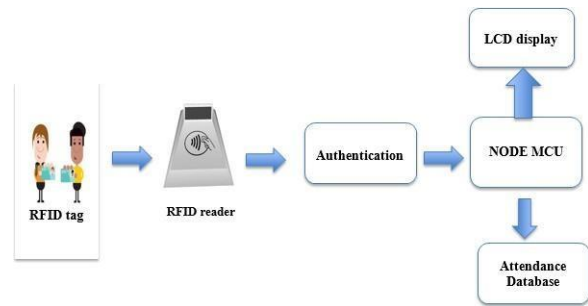


Fig 1. Block Diagram Of Proposed System

## 3.1 Working

The RFID system in this project consists of an antenna and a tag, a tiny silicon chip. The MFRC522 module, which is attached to the Node MCU, can read this tag. A single chip called a microcontroller contains a processor, IO ports, data memory, etc. all on one board. Here, Node MCU is used as the controller. In this project, we're using RFID to design a smart attendance system. A set of RFID card data is first stored in our system. Any number of RFID data can be stored; our system has multiple RFID tag numbers stored. The ID card system cannot read the data from an unregistered student and does not store it in the database. Student RFID ID cards must first be registered in our system. The system is able to gather and save their information in our database. The RFID reader scans the RFID tag after that, sending the results to the Node MCU for verification. If the scan card is valid, it will mark the attendance and display the message. Otherwise, it will check to see if the card is genuine. If a student marks attendance after the allotted time, it will be recorded as a late attendance. This information is kept on an excel spreadsheet and shows the latecomers and current students.

## 4. HARDWARE AND SOFTWARE REQUIREMENTS

- NODE MCU
- RFID Reader (MFRC522)
- RFID tag
- LED Display(16\*2)
- Arduino IDE

**5. BLOCK Diagram**

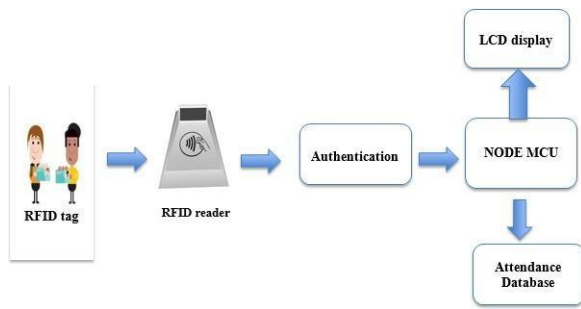


Fig 2. Block Diagram

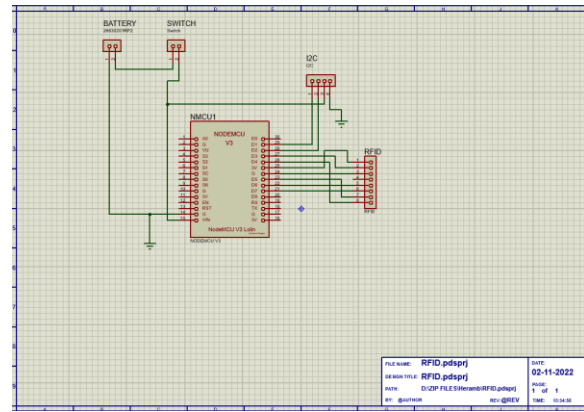


Fig 4. Circuit Diagram

**5.1 FLOW CHART**

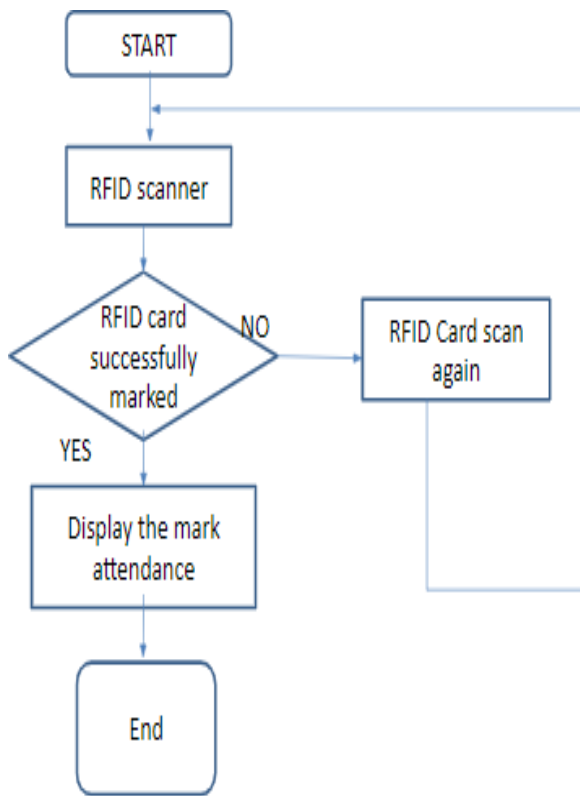


Fig 3. Flow Chart

**6. SIMULATION RESULT**

The simulation of the circuit is done with the Node MCU. When an RFID Tag is placed on the RFID reader the data is ready by the Reader and transferred to the NODEMCU. And it will display message on the LCD screen. The teacher can check attendance details on the excel sheet.



Fig 1. Actual Working Of Proposed System

**7. ADVANTAGES**

1. An improved identification is given by the system.
2. Identifies candidates swiftly and quickly.
3. The System is less time-consuming, less expensive, simple to use, and difficult to adulterate. Modest.
4. Schools, colleges, and universities are examples of organizations that can accurately assess the consistency of their students, teachers, and staff members while preventing proxy marking and error.

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