

## Internet Of Things Based Student Monitoring Mechanism Using RFID

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**Abstract:** *RFID is a nascent era, deeply rooted in its early trends in using Radar 1 as a weapon for enemy aircraft sometime in World War II. A large number of industries have taken advantage of the RFID era's advantages to improve sectors such as the military, sports activities, security, airlines, animal farms, healthcare, and other areas. In this proposed system, law students receive an RFID tag. Therefore, the stats saved on this card are called the identity/presence of the individual. Once the requester places the card in front of the RFID card reader, it reads the records and checks them against the stats stored inside the 8051-family microcontroller. If the stats match, it displays a message on the LCD screen to confirm identification. Input from this student; Otherwise, she delivers a message refusing to help. The student's attendance status can be retrieved from this system by pressing the Reputation button attached to the microcontroller. Thus, a lot of time is saved as all students' attendance is stored directly in the database.*

**Keywords:** *RFID, Internet of Things Based attendance system, Microcontroller.*

### I. INTRODUCTION

The Internet of Things (IoT) concept has attracted increasing interest these days from both academic and business circles. The Internet of Things is where devices (even animals or people) have accurate identifiers and the ability to automatically transmit records through a community without requiring human-computer interaction [1]. The Internet of Things is a

situation in which devices (even animals or humans) are equipped with accurate identifiers and the ability to automatically transmit data over a network without requiring human-computer interaction. RFID forms a fundamental building block of IoT, where RFID devices are micro-wi-fi chips that are used to identify devices by computer. Student attendance is a vital part

of daily instruction. Traditionally, teachers are given the task of calling out class names. Thus, this is time-consuming, and you also no longer have the flexibility to produce reports or logs. Researchers have proposed several technologies to get rid of the guided attendance procedure of signatures on papers, including barcode-based attendance systems, facial recognition, and fingerprint identification. However, these structures suffer from some obstacles and difficulties [2]. The most common method of tracking student attendance systems is by manually taking a list of names or recording them in the attendance sheet. For a classroom full of energy, both strategies are stressful. The name roll method quickly risks false attendance in a large class and takes longer to say the names of all the college students. Significant problems also arise with converting paper facts into an electronic form for students' electronic records to calculate total attendance in several grades (e.g., subject, exam program, school, or university). In addition to the above risks, the most significant common drawback is that these strategies require more equipment. A proposed device has been developed to address these risks. The main benefits of the proposed system are flexible use, no device costs, no time loss, and easy access [3]. Classroom attendance machine is mainly based on face reputation

generation, combined with the era of RFID. It effectively emphasized the identification of schoolchildren within the class. Real-time testing of the rule set fully meets the time attendance requirements within elegance, reduces the value of attendance in the classroom, and successfully solves signature troubles and other problems. For Internet server structures, the XAMPP program is used. XAMPP is the software that contains the complete Internet optimization environments for PHP, Apache, and MySQL. XAMPP is an accessible, open-source web server for optimizing web-based packages natively. SQL is a single-reason programming language that manipulates records in a relational database control system. The MySQL device in XAMPP is PHPMyAdmin. To maintain a real identity on the student ticket, MySQL is needed. In MySQL, four tables were created, including the employee table, the student table, the student attendance desk, and the student grades.

## **RFID TECHNOLOGY**

RFID is popular in Radio Frequency Identification; the current idea of the Internet of Things (IoT) era is similar to barcode devices but with a slightly more advanced concept. It works by using the mobile signal and receiving it through the antenna and the integrated circuit. It

contains components that are RFID tag and an RFID reader.

### **RFID Tag**

An RFID tag is a digital tag that exchanges data with an RFID reader via radio waves. Almost all RFID tags contain special elements, an antenna, and an integrated circuit (IC). The antenna is used to receive radio frequency waves, and the IC used to process and record recordings.

### **RFID Reader**

The RFID reader is a device to obtain records of RFID tags used for male or female music. RFID uses radio waves to transmit records from the tag to the reader.

### **WORKING MECHANISM**

The RFID tag receives the signal from the reader through the antenna and is charged. The loaded tag then sends the feedback back to the antenna. The antenna reads the data and sends it to the reader. Finally, the reader reads and follows the necessary commands.

## **II. LITERATURE SURVEY**

Kariapper et al. [4] This paper discusses the latest development and application of IoT attendance systems using RFID. This analysis found that RFID ushers in a completely new era of computerized assistive devices and provide much better

accuracy and performance than traditional paper-based systems. The hybrid version is necessary and must achieve greater security, reliability, lower price, and better device performance. This paper will use the RFID 4 Biometric frame machine with a sufficient number of RFID tag readers and fingerprint devices to verify the device's security and reliability. The web server should be replaced with PHP and MYSQL, which are cheaper, with better accuracy and overall performance overkill. This hybrid model can be applied and practiced efficiently in schools and better training institutions.

Madhu et al. [5] Nowadays, we have witnessed a sudden surge in the use of Radio Frequency Identification (RFID) systems in business technologies, fitness, agriculture, transportation, etc. Moreover, the Internet of Things is thriving in parallel. So, by using these, an effort has been made to solve attendance tracking and control problems. Attendance Management System is an IoT application with Raspberry Pi 3 and RFID technology to reduce feeding time with traditional daily attendance systems in colleges and institutions. Therefore, everything here, in turn, is automated. An effort has also been made to increase the android software (application) and help scholars to watch their presence everywhere and at any time.

B.M Sri Madhu et al. [6] Recently, we have seen a sudden increase in the use of Radio Frequency Identification (RFID) systems in business technology, healthcare, agriculture, transportation, etc. Moreover, the Internet of Things is thriving in parallel. So, by using these, an attempt is made to solve the problems of attendance tracking and control. Attendance Management System is an IoT application with Raspberry Pi 3 and RFID technology, a way to reduce feeding time with the help of traditional daily attendance devices in schools and organizations. Therefore, everything here, in turn, is automated. An attempt has also been made to develop an Android app (application) and help students to see their presence everywhere and at all times.

Turkane et al. [7] The online support method is helpful for workers who perform activities outside the workplace or people with multiple agendas. Recently, we have seen a sharp increase in the use of face-detection focus structures in business technology, fitness, agriculture, transportation, and many more. Moreover, the Internet of Things is thriving in parallel. Therefore, by using them, an effort has been made to solve the problems of attendance tracking and control. Online Attendance Management System is the implementation of the Internet of Things

through the Raspberry Pi and face detection approach to reduce the time it takes for a traditional device to record daily attendance in schools and organizations. This system describes assistance without human intervention. In this strategy, the camera is constantly inside the meeting room and will take the picture; the faces are detected, then it is diagnosed with the database, and at some point, the attendance is determined. So, everything here, in turn, becomes automated. An attempt has also been made to develop an Android app(s) and help students see their presence everywhere and at every time.

Mathew Turk et.al, [8] Here they built a near real-time computing device that could find and adjust a person's head, then stop the man or woman by comparing their facial features to those of known humans. The computational methodology adopted in this framework is motivated by every body structure and the idea of facts, as well as by the practical requirements of general performance and accuracy near real-time. This method treats the face popularity problem as a typical 2D reputation problem rather than a 3D geometry retrieval order, exploiting that such appearances are often rectilinear and thus likely to be represented by the tangible association of 2D brands. His

investigations show that the eigenfaces method can work very accurately, albeit with enormous "hard-to-grasp" separation charges, and is, therefore, probably suitable for these beams. The future scale of this project has become, in addition to facial recognition, the utilization of the investigation of faces to determine the sexual orientation of the subject and the interpretation of facial expressions.

### III. PROPOSED METHODOLOGY

#### Internet of Things (IoT)

The Internet of Things (IoT) is an intercom or network of several devices on the body, such as cars and apartments, integrated with sensors, software, electronic hardware, and connectivity that helps retrieve and alter records. It allows the discovery and management of objects through the available network infrastructure, integrating the physical environment and its elements with portable systems. It provides superior connectivity between devices and systems passing through device-to-device courtship.

The project method is that once the person entering has been read by PIR sensor 1, the RFID reader will be activated and receive only one card at a time until the other PIR sensor detects the character. This way, until the PIR 2 sensor detects that the character is moving in the class,

attendance will not be updated in the database. Here we used XAMPP to create the database in a PHP script for the Apache server. Attendance will be updated directly on this web page, and we have also designed a basic app (application) for Android through which students can check their attendance directly from the app on their mobile phones.

The proposed system has been explained with the help of following steps:

**Step 1:** Start the RFID Reader

**Step 2:** Initialize the LCD Screen

**Step 3:** Initialize UART (Universal AsynchronousReceiver/ Transmitter)

**Step 4:** Send scanned UID of RFID card data to Raspberry Pi Model

**Step 5:** Search and match the UID and extract therelevant student information

**Step 6:** Compare detected student id, date and timewith class time table and if match found then markthe presence.

We have widely used passive infrared sensors to solve the problem of a support agent. The first PIR sensor will first detect the movement of the man or woman by sensing their body heat and will give an output of 1. Once the PIR output is 1, the RFID reader is programmed so that the requester does not skip the second PIR,

and the RFID reader can study only one RFID tag. Now the student will only touch her card, not the one not there. Then the student will enter the lecture room, and the second PIR sensor will read out loud. Once the second PIR is high, the student can mark attendance for that single issue, and the growth will be calculated by 1. Similarly, if the second PIR reads first, then the first, it counts will go down through one, and the school will find out there is an agent because the numbers will vary. It can update Raspberry Pi records in the teacher's database without delay, and they don't want to do the hard work of getting benefits support. All teachers can have a username and password to log into the database. We used XAMPP (X: Cross-Platform (WINDOWS, LINUX, MAC OS) A: Apache M: My SQL P: PHP P: PEARL) to build the database on time.

We have also developed an ANDROID APP so that college students can view their daily attendance on their mobile phones, making it easier for you to take your regular attendance test. This android app contains details about the student, his call, USN, tracks recorded, group of classes attended, list and number of instructions taken, and eligibility reputation, which makes it easy for the student to keep a song for help reputation and thus live consciously. This is an open platform, and

any man or woman can look into it by simply entering the student's name and the position whose attendance you wish to understand.

### **Arduino Uno**

Arduino Uno is an open-source microcontroller board mainly based on the ATmega328P microcontroller developed by Arduino. The board is equipped with virtual and analog input/output (I/O) modules that can be connected to various expansion boards (nine displays) and other circuits. The board has 14 digital I/O pins (six suitable for PWM output) and six analog I/O pins and is programmable using the Arduino IDE (Integrated Development Environment) via a Type B USB cable. It can be powered through a USB cable or an external 9V battery, although it accepts voltages between 7 and 20V. It is also like Arduino Nano and Leonardo. Hardware reference design submitted under the Creative Common website. ShareAlike Attribution 2.5 AM License.

### **EM-18 RFID reader**

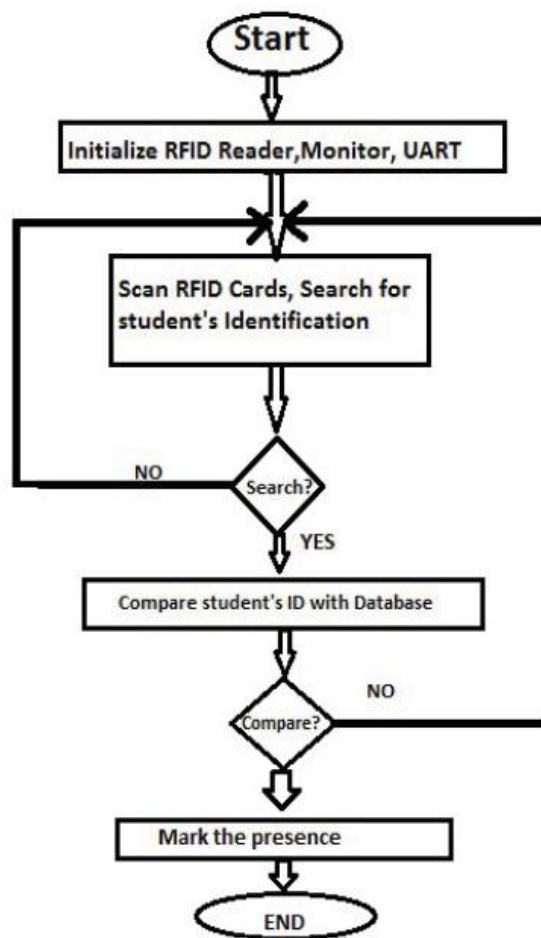
The EM-18 RFID reader module operating at 125 kHz is a cost-effective RFID-based solution. The reader module comes with an antenna on the chip and can be powered by a 5V power supply. Power on the module and connect the module's transmit pin to the microcontroller's receive pin. Show

your card within the scanning distance, and the card type will be discarded. Optionally, the unit can be configured for additional weight and output.

**PIN of DS3231 RTC module**

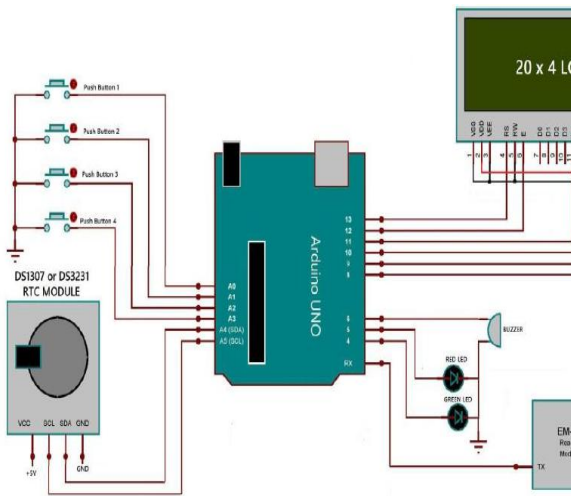
As mentioned above, DS3231 IC and 24C32 EEPROM IC are the two main components in a normal DS3231 RTC module board. Other than that, there are a few other components, such as a power LED, some resistors, capacitors, a battery holder, and pins to connect to the microcontroller. Figure 2 shows the components and pins on the RTC DS3231 module.

**SYSTEM FLOW**

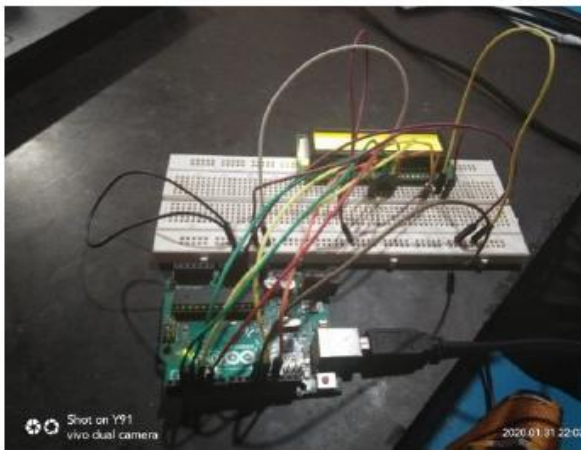


**Fig.1** Flow chart

The proposed attendance monitor uses the idea of IoT to record and obtain information on the server/cloud and make the user obtain it anytime and anywhere. For target assignments, we also like to provide college students access to their attendance, who will log in and view their attendance remotely. We can fully integrate the device with the mobile application so that all functions are from the cell phone itself. Also, we'd like to integrate this device with Canvas or Blackboard using an XML interface.



**Fig.2**Circuit connection of the project



**Fig.3**Experimental results

**IV. RESULTS AND DISCUSSIONS**

In this stage, we note some limitations and discuss our system's destination plans. For this prototype, due to laboratory limitations, we invited only five volunteers to participate in our experiments and evaluated the overall performance of the

device on this basis. However, detection accuracy may be affected by greatly increasing diversity in humans. This is because more human beings; are likely to have similar framework features, so it may require us to have more granular features. Moreover, real-time capability can also be a key consideration to further improve the robustness of our devices. The fourth figure indicates the circuit's test run and provides our task's real-time output.

**CONCLUSION**

Our goal is to increase easy, portable, and facility-friendly RFID-based assistance. The machine features a natural and environment-friendly response to monitoring student attendance on a large scale. The proposed attendance tracking system takes advantage of the Internet of Things to record and retrieve information on the server/cloud and make it available to the consumer anytime and anywhere. For future work, we'd also like to give students access to their attendance, so they can log in and prove their attendance remotely. We can fully integrate the device with the cell phone application so that all capacity is in the cell itself. Also, we'd like to integrate this system with Canvas or Blackboard using an XML interface.

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