

# RFID Based Attendance Management System

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**Abstract-** Security in the hostel is one of the most persistent problems that organization needs to address. Now-a day's security is a prime concern in every human beings life. To maintain daily in-out record is complicated and time consuming system for the hostel management. The numbers of existing systems are based on RFID monitoring and making students attendance at school but having limitation. To avoid this entire problem hostel in/out management and monitoring system is proposed. The system makes automatically monitor entry/exit of student from hostel and gives alert SMS to student parents for high safety. In this system each and every student has to store their finger print data base, unique RFID card No. and photograph with their parents' mobile number. Face recognition is known to be the most natural ones, since that uses to identify students in hostel. RFID identification also provides better performance. The system is based on the ARM 11 microcontroller, Finger print scanner, Camera, GSM module, RFID reader and passive RFID tag. Microcontroller ARM 11 is heart of system which will process the functioning of total system. In present system In/Out management and monitoring of student in hostel is done by using RFID technology, Face Recognition system. Alert student parents by sending SMS using GSM module. This system is working without human interface. The goal of our system is to provide security to hostel students and alert their parents about their in/out timing in the hostel. Parents get the sense of security by knowing the current information about in and out of their child in hostel. Nowadays, attend system in schools and colleges is generally based on paper. So sometimes this process causes errors and also takes more time. So this project uses RFID technology to make a note of every student entering into the hostel and also to calculate the time resides in the class. In this proposed system, every student is allotted with an RFID tag. The process of attendance can be done by placing the card near the RFID reader. This article discusses about what is RFID technology and attendance system using RFID with an example project.

**Keywords-** RFID, Lecture, Attendance, Passive tag, Reader

## I. INTRODUCTION

The emergence of electronic paradigm for learning compared to traditional method and availability of almost all information on the information superhighway(Internet),

nowadays have caused students to be less motivated to come to the lecture rooms than ever before. Laziness on the part of students, nonchalance to school work, extra social activities that have no importance in aiding the objectives of the institution and a lot more, may prevent students from attending lectures.

These strategies are however time consuming, stressful and laborious because the valuable lecture time that could otherwise been used for lectures is dedicated to student attendance taking [1] and sometimes not accurate. In addition to all these challenges, the attendances are recorded manually by the tutor and therefore are prone to personal errors. There arises a need for a more efficient and effective method of solving this problem. A technology that can solve this problem and even do more is the RFID technology. RFID is an automated identification and data collection technology, that ensures more accurate and timely data entry.

At their simplest, RFID systems use tiny chips called —tags that contain and transmit some piece of identifying information to an RFID reader, a device that in turn can interface with computers [2]. The ability of RFID systems to deliver precise and accurate data about tagged items will improve efficiency and bring other benefits to business community and consumers alike in the not distant future [3]. In this paper, we present an RFID based Automated Student in-out system.

## II. RELATED WORKS

A number of related works exist in literature, application of RFID Technology to different areas and specifically to the area of academic attendance monitoring problem.

In [4], authors designed and implemented a model of a secured and portable embedded reader system to read the biometric data from the electronic passport. The authors attempted to solve problems of reliability, security and privacy in E-passports by authenticating holder online using Global System of Mobile Communications (GSM) network. The GSM network is the main interface between identification centre and the e-passport reader. The communication data is protected between server and e-passport reader by using AES

to encrypt data for protection while transferring through GSM network.

Author in [5] reviewed the current research application of RFID to different areas with emphasis on application for supply chain management and developed a taxonomic framework to classify literature which enables swift and easy content analysis to help identify areas for future research.

Authors in [6] reviewed the use of RFID in an integrated-circuit(IC) packaging house to resolve inventory transaction issues. His study suggests that RFID contributes significant improvements to the water receiving process and the inventory transaction process that reduce labour cost and man-made errors.

In [7], an automated attendance management system was implemented both in electronic and mobile platform using stationary matrix AR 400 RFID reader with four circulatory polarized antennae and Symbol MC9000-G handheld RFID reader respectively. In the electronic platform, the attendance management system

### III. PROPOSED METHODOLOGY

The proposed system mainly consists of RFID tag and RFID reader and the overall process is controlled by the microcontroller. RFID reader is used to detect the tag. These tags have provided to students with particular ID. As soon as the student with valid RFID card comes near to the RFID detector, detector will sense the card and collect the necessary information present in the card.

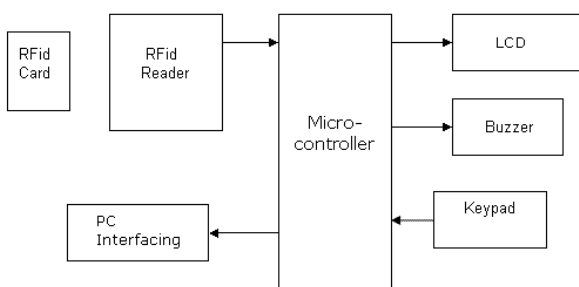


Figure 1. RFID based Automated Student in-out system

The information is transmitted wired using reader. The received information is then updated in the respective student's profile on the application. Microcontroller is used for controlling the events. In PCB (Printed Circuit Board) design, power supply requires Zener diode which generates dc supply. This supply is sends to entire device.

The major part of this system is LCD, RFID reader, Tag and microcontroller. Microcontroller is the heart of this system. The proposed block diagram of RFID based Automated Student in-out system is as shown in fig. 1. It has shown the main blocks that are being used in the system

### Module Description

#### Database

This module is used to store the following details into the database, there are

- Staff details
- Student and their RFID information's
- Token prices
- Student fees information
- And student request for leave

These details are manage by the admin of the application. Because of admin only have the full rights to create, change and delete the record.

**Staff Details:** This module is used to store the staff information with staff username and password for their login purpose. Staff only can accept or reject the student request for leave or outing purpose. So staff must can login into the application.

**Student and RFID:** This module have the information about each and every student and their RFID number with face recognition. Purpose of this module is create the above mentioned information.

**Token prices:** Purpose of this module is create and store the student fees for food, amount per token, total available token and total token for each and every students, these details are attached with student RFID number.

**Fees Details:** This module is used to store the student fees for token. Token prices module is work based on this module. Admin can update the fees structure and increase the number for token is available for each and every students.

**Leave request:** This module is used to the student send the leave and outing request and also used to staff for accept and reject the student's request. Student can use the RFID for leave purpose if staff is accept the request.

**Login:** Login is the important module in this project. Once the admin submit their details the information are accepted and the admin can login with their username and password for

manage our records. Only the registered admin can do the database operations. In this module it checks whether the authorized persons is accessing and it does not allow other users to access.

The following members can use the application with the login authentication,

- Admin
- Staff
- Student

**Check In – Out:** This module is used to maintain the in and out time for the following purposes,

1. Emergency
2. Outing
3. Leave

This process is also used to calculate the attendance for each students. Attendance calculation is done by automatically when the student is using the RFID tag on the application in each time. This process is show the student presented days by month wise.

**Emergency check in:** This type of check-in student can use any time in the hostel without getting the permission from staff or third person. This type of check in and check out do not disturbed the student attendance.

**Outing:** This type of check-In student can't login without staff permission. This module also affects the student attendance. This module have the minimum time space, that is student only get the minimum time space for outing otherwise attendance for the particular student has been decreased.

**Leave:** This type of module is used to maintain and check in and check out time for leave purpose. This process also student can't take the leave without staff permission. This module also affects the student attendance. This process is used to calculate the number of days present.

**Token:** This module is used to the launch purpose. When the student use the RFID for launch purpose then the result is showing "how many tokens are available to that student". These details calculated form the data's which are stored by the admin using Database module.

**Token generation:** This module is used to create the token for each student that the token values are attached with the students RFID value. This process is based on student's fees and amount per token.

**Token Updating:** This module is used to update the token for particular student. When the student pays the fees amount, token available token will be increased based on student payment and amount per token.

**Request:** This module is used to send the request to the concern staff for following details,

1. Outing
2. Leave

Student can only use for these details when the request is accepted by the staff. At the time of acceptance student get the SMS for the staff via this application.

**Day's calculation:** This module is used to calculate the number of days presented for each student. This calculation is based on their leave days and outing time. Outing time is based on minimum time space. When the student exceed the outing time form the minimum time space, remaining time will be calculated as absent.

#### IV. CONCLUSION

The developed Student in-out time calculation using Radio Frequency identification technology will significantly improve the current manual process of student attendance recording and tracking system, especially in a university or school environment. The system promotes a semi-automated approach in capturing the student attendance, i.e. By having the students to flash their student cards to the RFID reader. However, some further improvements can be made on this RFID in order to increase its reliability and effectiveness.

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