

Real Time Student Tracking System Using RFID Tags and IOT Enabled Device

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Abstract- *In schools, colleges and institutions there exist a problem of irregularity of students which affects the overall academic performance of students. Currently, in some institutions the attendance is taking by calling in registers which is very time consuming and tedious. So, in this paper we are present the RFID and GSM based attendance monitoring system. The main goal of this project is to automate the process of attendance of the students, using active RFID tags. Each student is assigned with his/her specific RFID tag. The serial number of each tag is associated with each tag is associated with each student's database. The active RFID readers are capable of detecting the tags within a predefine parameter. This project is to simplify attendance recorder system by using radio frequency identification (RFID) technology, within the RFID kit , the system will be developed by using C++ technology and database support.*

Indexed Terms- *RFID, Student monitoring, tracking, IOT*

I. INTRODUCTION

RFID (Radio Frequency Identification) technology is mostly used in industry and academic institutes. It saves time and money. A seamless transfer of data between device and its reader is achieved with smart card and RFID technology provide this contact-less ID system solution. The aim of this paper is to improve attendance data management by this SMOSA was developed to ease the university management team to monitor the each student presence it has two task attendance system and tracking system. SMSOA are selected based on range, frequency which are good for the project environment and component.

II. LITERATURE REVIEW

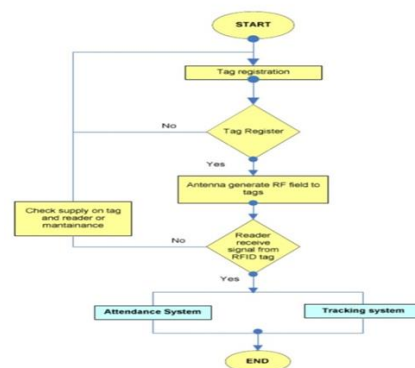
In 2016 Hamad Alqahtani and Hasan Al-sakram in there reference paper toward safe communication: using internet of thing made a smart student tracking device. Device implements radio frequency identification internet of things and GPS system to aware parents about there children. Joseph Dedy Irawan and Emmalia Adriantantri Akh Farid on there reference paper RFID and IOT for attendance monitoring system explain about how to use RFID in student attendance monitoring by using IOT and cloud technology it will be real time monitoring system can be seen by any time and from any were in 2014 T. saimounika and K. kishore take an attempt to address problem of continues attendance of lectures in collages by his Reference paper which name is Real Time Location System using RFID for Internet of things

Reference Paper	Author	Description
<ul style="list-style-type: none"> Towards Safe Commuting: Using Internet of Things for Building Smart Student Tracking System 	<ul style="list-style-type: none"> Hamad Alqahtai Hasan Al Sakran 	<ul style="list-style-type: none"> The system model implements various technologies like Radio Frequency Identification (RFID), Internet of Things (IOT) and GPS in order to notify parents and instructors about all of students' activities.
<ul style="list-style-type: none"> RFID and IOT for Attendance Monitoring System 	<ul style="list-style-type: none"> Joseph Dedy Irawan Emmalia Adriantantri Akh Farid 	<ul style="list-style-type: none"> Use of RFID in educational fields like student attendance monitoring system, by using Internet of Things (IoT) and Cloud technology, it will produce a real time attendance monitoring system that will be available to various parties, such as lecturer, campus administration and parents.
<ul style="list-style-type: none"> Real Time Locating System using RFID for Internet of Things 	<ul style="list-style-type: none"> Saimounika K.Kishore 	<ul style="list-style-type: none"> An attempt has been made to tackle the problem of attendance of lectures in developing countries and to find the location of students using RFID technology.

III. WORK FLOW

First RFID tag should give to each student then RFID tag is set to ON and the tag must be placed in a reading range. And after that antenna will send radio frequency to the tag. Each student wears an active RFID card tag with unique ID. When they enter the campus gate, nearby reader detect that ID tag immediately and upload information to server/system. The hardware components utilized are mounted on PCB which are of sufficient parameters compared to large scale automation. By implementing this project we can change the traditional pattern and existing method of maintaining records of attendance which was done manually. Every record is maintained automatically with an ease. It also creates a state of safeness from the parent's point of view that their children's safely reached the college or school premise.

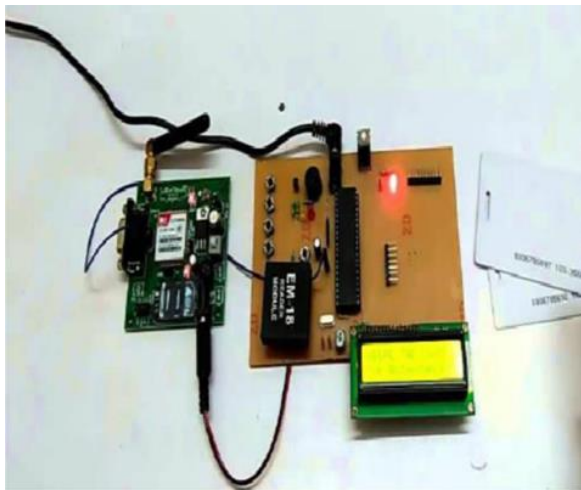
Then RFID will be detected the reader receives signals from the tags which are given to the students and save the record to the databases and while we want data we can search in the database.



Work Flow Diagram

The database will have each student information including tag id, student name, email address, phone number and address .And the information will always get update has student move.

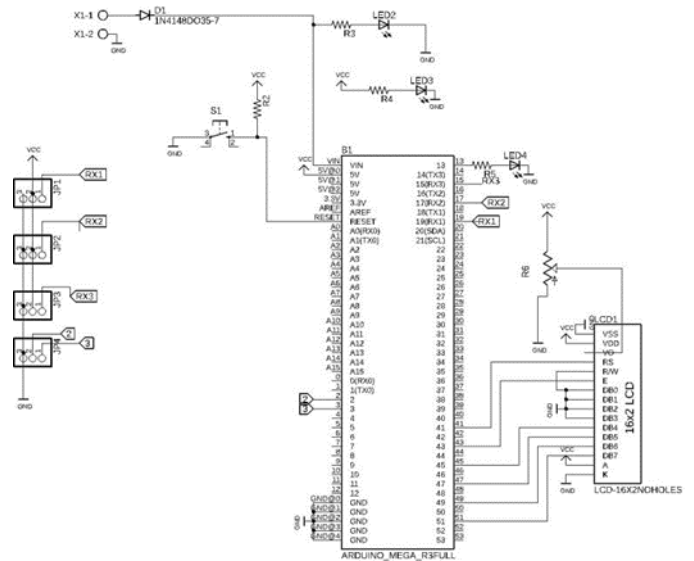
Criteria	Solution
Type of RFID Reader	Active
Reader	2.4GHZ ISM Band
Range	70 meters
Size of RFID tag	(31 X 21.5 X 7)mm without enclosure (40 X 40 x 15)mm
Life	Unlimited
Source of power supply	8-28 v DC/400mA
Type of software	Microsoft Visual Basic
Other typical application	Access Control, item level tracking , smart card
Networking	LAN



IV. METHODOLOGY

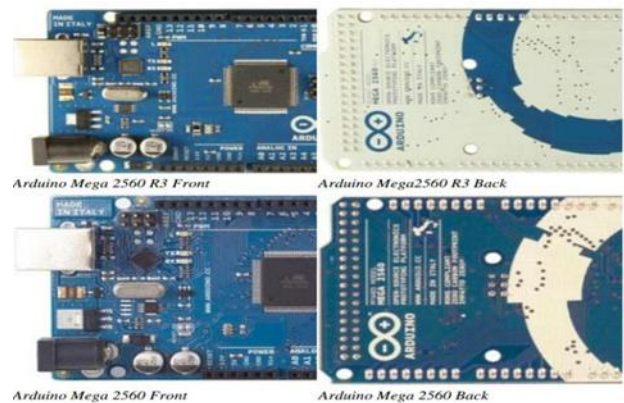
We are presenting this model to illustrate how this RFID system can be implemented. We are going to show this large scale automation on small scale with the help of breadboard circuit or Printed Circuit Board (PCB). On PCB we will attach components that are required to provide an example of an automation this components soldered on to PCB will function in such a way to illustrate RFID system. We use digital hardware circuit with RF reader interface and RF passive card for attendance system. The device uses Atmel high-density, non-volatile technology RF reader system is connected to the PC via COM port. We installed eagle software in the computer with database in access. Whenever we scan the card to any of reader then the hardware system gets the data of RF card with the help of 125 KHZ frequencies. Reader gets data and transfer this data and micro-controller immediate process this data and transfer this data to

the PC via COM port PC get this data and compare this data with database in access. In database we already register the passive card code number with ID number. For every card we assign a special ID number. In the database system we enter the IN/OUT for entry. If the student show his card before time then computer show present, but same card exit the premises before time then same database is store as absent. Every time when we scan the card to the RF reader, then display connected with the micro-controller will show its name. We register the new card entry with software anytime. IN/OUT timing of students for entry is also to be change in data.



V. COMPONENTS

- Arduino



The arduino mega 2560 which will be used is a micro-controller board based on the ATmega2560. It has 54

digital input, output pins, 16 analog inputs, 4 UART's, 16MHz crystal oscillator, a USB connection and a power jack. It has everything which need to control the microcontroller simple connected with USB cable.

• RFID Tag

RFID tag is a small object that can be attached to product. It has antennas that help to transmit radio signal and frequencies to and from transceivers. There is two type of RFID passive and active.

Criteria	Active	Passive
Tag Power Source	Internal to tag	Energy transferred from the reader via radio frequency.
Tag Battery	Yes	No
Availability of Tag Power	Continuous	Only within field of reader
Required Signal strength from reader to tag	Low	High
Available signal strength from tag to Reader	High	Low
Communication	Long range	Short or very short range

Active RFID depends on an internal power supply continuously to run the tag and its radio frequency. It allow low level signal to be received by the tag.

• RFID Reader

RFID reader has antenna which produce radio waves the tag responds by sending back its data. The thing which can affect is the distance at which tags can be read. And the where we are placed the tag on the object is have impact on RFID system read range.



• Scope of Project

RFID technology with IOT make a power full tool to record the student presence in the following ways.

- a. Activity like attendance and physical presence in class room, library, canteen etc.
- b. Details like boarding to school bus and reaching home can be traced with the help of this.
- c. We can see the location of particular student by monitoring dashboard where students are visited on this days.

CONCLUSION

In this student tracking system we focus on two main things. The first aim will be to build reliable system to access student data. And the second is to monitor students attendance percentages in each class.

REFERENCES

- [1] Chung_chih Lin; Ping-Yeh Lin; Po-Kuan Lu; Guan-Yu Hsieh; Wei-Lun Lee; Ren-Guey Lee, A Healthcare Integration System for Disease Assessment and Safety Monitoring of Dementia Patients, IEEE transactions on Information technology in biomedicine vol.12 no 5 2017.
- [2] Savi Technologies, Savi Technologies Active and Passive RFID and selecting the right active frequency Q.E.D system 2017.
- [3] D.M Kroenke, Database Concepts, Prentice Hall, Upper Saddle River, New Jersey 2018.