IOSR Journal of Engineering (IOSR JEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 60-63

A Study Of Student Monitoring System Through RFID

Chetan Dilip Bhonde[1], Ms. Bhagyashree Ambulkar[2]
[1] *Student of Department of Computer Science, GHRIIT, Nagpur, Maharashtra, India*
[2] *Asst. Professor, Department of Computer Science, GHRIIT, Nagpur, Maharashtra, India*

Abstract:*The idea behind this paper is to track the student in school campus and record the place where the student visited. The proposed system requires the RFID tag which will be embedded in the identity card of students. System also requires RFID readers which will be installed at various places in school campus and also in classes. When student comes in the range of reader then location can be found which will sends that location to server. The RFID card Reader reads the Student identity. The Interface software is responsible to record the location of the student in the server. The system generates the reports of location of the students. It is application which is completely automated and parents can see the location of their child through application.*
Keywords:*Security, Smart Monitoring, Smart Reader*

I. Introduction

The people are using smart technology to do the daily chores. To track the student in the school is likely difficult task. The proposed system will track the student and give records of location of student visited in school campus. The school timetable includes all the classes for studying, playing and other activities. Parents need to know that what the child is doing in school campus. It is really very important for child that he/she will do all other activities including study. This will help the child to grow up physically and mentally. Parents send their child to school for study and other activities like playing, singing, painting, etc. The parents really want that their child should good in studies and other activities also. By this intention the parent send their child to good schools and paid high amount for fees. So, the parents need to know that their child is really doing all the activities along with study. But in some schools it will not happened, to avoid this proposed system will act.
The system will track the places where the student is visited. The RFID tag which is embedded in the student Identity card will let you know that where the student is available. The RFID reader is placed in many locations in the school campus like doors of each classroom, the entry point of school, exit point of school, door of the activity room, entrance washrooms, door of the staff room, door of sports room, entrance on ground, etc. As soon as the student is in range of RFID reader the interface software collects the identity of the student and with time and place of RFID reader is sent to the server. From server the parent can see the information of the child through the application. The record of data will help parents to examine the schedule of the student. The parent can also verify that all the activities are going or not in school. At the entrance of the student in school interface software will generate an alert to the parent that the student entered into the school and at the time of leaving the school also.

1.1. The Rfid Tag

The RFID tag is basically is a kind of a memory device that can transmit the information when scanned by the reader. The memory consists of bits, and the transmission and receiving of data has a communication channel. The tag can be an electronic circuit with its own power supply i.e. active device or a very low power integrated circuit i.e. passive device which taps energy from the scanner to transmit its content. In a tag, the transmission power is very low and is measured in millionths of watt i.e. microwatt. Tag can be passive, semi-passive or active. Tag can be based on memory type and based on the transmission channel. Passive RFID tags have no internal energy source; energy supplied to the antenna by the incoming radio frequency waves persuade enough energy for the CMOS integrated circuit in the tag to get activated and transmits a response. The semi passive tag is likely similar to passive tag, but has an addition of small power source (battery). This battery powers the integrated circuit constantly of the tag and the need for an aerial to tap energy from the incoming signal is removed. Active tags have their own internal energy source which supplies energy to the integrated circuit producing the outgoing signal. They are more reliable due to their ability to conduct a session with the reader. As a result of their on-board energy source, they can transmit at a higher power level than passive tags, allowing them to be of more effect in RF challenged environments at longer distances. They can transmit signal over a greater distance and their random access memory (RAM) gives them the ability to store up to 32,000 bytes of data. A battery can live up to almost 10 years and have practical ranges of hundreds of meters. Types of tags that were used in the RFID system are clamshell card, ISO card and also soft label.

1.2 THE RFID READER

The RFID reader sends a pulse of radio waves to the tags and ready for its response. The tag detects this pulse and sends back a response; the tag ID number and possibly other information as well. The RFID reader can be classified based on the design and technology used or based on the fixation of the device. The read only RFID reader reads data from tags, usually a microcontroller based unit with a wound output coil, peak detector hardware, comparators and firmware which are designed to transmit energy to tags detecting their backscattering modulation, different types for different protocols and standards existing. The read/write reader reads data from/to tags. While in stationary reader, the device is attached in a fixed way.

RFID is a member of a group of technologies referred to as Automatic Identification and Data Capture (AIDC). AIDC methods automatically identify objects, collect data about them, and enter those data directly into computer systems with little or no human intervention. RFID methods utilize radio waves to accomplish this. At a simple level, RFID systems consist of three components: an RFID tag or smart label, an antenna, and an RFID reader. RFID tags contain an antenna and an integrated circuit, which is used to transmit data to the RFID reader (also called an interrogator). The reader then converts the radio waves to a more usable form of data. Data collected from the tags is processed and then transferred through a communications interface to a host computer system, where the data can be stored in a database and analyzed at a later time.

II. Survey

Many related works exist in literature, application of RFID Technology to different areas and specifically to the area of RFID monitoring problem. Author in [10] evaluates the research application of RFID to distinct areas with importance on application for supply chain management and developed a heterotypic framework to classify literature which enables fast and easy content analysis to help identify areas for future research. Authors in [8] reviewed the use of RFID in an integrated circuit (IC) packaging house to resolve the issues in inventory transaction. His study proposed that RFID presents significant advancement to the water receiving process and the inventory transaction process that reduce labor cost and man-made errors. In the electronic platform, the attendance management system depicts a simple client, i.e. antennae placed at classroom entrance /server i.e. privileged student database system. Students can see their names as they entered class on the digital screen and they are assured that their presence has been entered in the instructor's database. However, one principal drawback about this system is the RFID tag read rates reduce to a very great extent as it comes closer to electronic devices. Authors in [6] also explored and proposed biometric system using fingerprint identification for attendance automation of employees in an organization. Consequently, authors in [7] proposed student wolf pack club tracking system to simplify and speed up the process of student wolf pack club ticket distribution for athletic event. Our proposition emphasizes a simple, reliable and cost effective model for student monitoring management that uses existing student ID card chip as the RFID passive tag with additional short message services to parents as weekly summary.

An RFID system uses the electromagnetic spectrum like cell phones or WiFi networks; they are comparatively easy to jam using energy at the right frequency. Although this would only be a disruption for consumers, it could be tragic in other environments where RFID is increasingly used. Collision in the reader occurs when the signals from two or more readers overlap. The tag is not capable to respond to simultaneous queries. Systems must be carefully set up to avoid this problem; many systems use an anti-collision protocol (also called a singulation protocol. Anti-collision protocols can be used to the tags to take turns in transmitting to a reader. Tag collision occurs when many tags are nearby in a small amount of area; but since the read time of Reader is quite high, it is easier for vendors to develop systems that guard the tags respond one at a time. RFID tags are difficult to for consumers to detach; some are very small in size (less than a half-millimeter square and as thin as a sheet of paper) - others may be invisible or implant inside a product where consumers cannot see them. New technologies allow RFID tags to be printed right on a product and very hard to detach one implanted. Since the tags can be read without swiping or obviously scanned (as is the case with barcodes or magnetic strips) anyone with an RFID tag reader can read the tag without your knowledge.

III. Architecture

The development of Student Monitoring System Using RFID is divided into two main parts; the hardware and software. The hardware part consists of the RFID reader, RFID tags and the host computer. The software part is the host system application can be designed using any programming language incorporated with database. Administrator can login into the system and check necessary information in the application, which keeps a log of the ID, time and date of every student that enters the different places in the school premises. Administrator also can make separate accounts for the parents to see the report of their child. It can also register new student using the tag ID of each tag. The complete system (see Figure 1) is placed at the entrance door of the each room. A RFID tag is given to each student (which is embedded into their ID cards) and this is scanned

at the entrance of the each room by the reader. The RFID contains a special code that is scanned by the reader. On every scan by the student, the name, matriculation number of the student, the grade to be taken and the date are been captured by host computer interface.

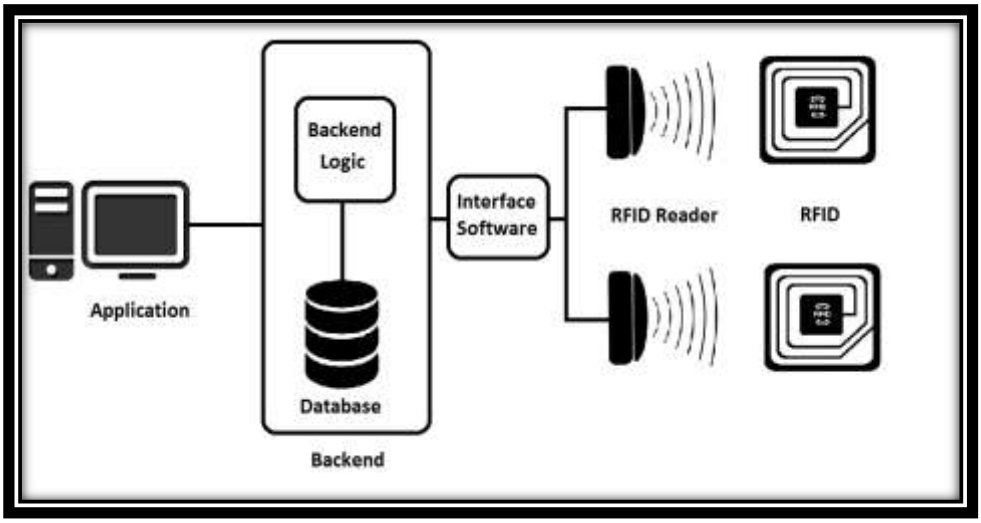

Figure1. Overview of Student Monitoring System Using RFID

IV. Results

The RFID system is integrated with graphic user interface on the host system. The system consists of login form, admin form, database form, main menu form, class record form, and admin registration form and database record form interface using USB UART serial communication with the RFID reader. The system performs two main functions which are class attendance system and students are spending time at which place of school at what time. The alert is also sent after student entered in the school and after student leaves the school. The proposed system will also help the school management to analyze the student is properly doing classes or not.

1. Graphical User Interface

The graphical user interface and it consists of the database system used to store all the student details, date and time. There are several tables built in database to store the RFID based automatic attendance system's information.

2. Login Window Form

The login window can be built with tightened security which allows only authenticated person to access this system. The administrator needs to create his user name and password to log in this system. Therefore, the administrator needs to key in the correct username and password to access this system and can quit this system by clicking the exit button to turn off the system. The administrator can make selection either to login to the admin page or create user page.

3. Main Window Form

When the administrator login to the software, he can register students, edit, and update or delete student's information at any time. From this form, he can register new Lecturers and edit, update or delete their respective information. He also has rights to set time of each lectures and breaks in the college.

4. Edit Lecture Time Table

Clicking this button, Lecture Time Table form is opened where the user can change the time schedule of the school.

V. Conclusion

The proposed system will also help parents that they will know what the child is doing right now in the school. The parent will also get alerts that the student is reached with the school and after the child left the school the parent will get also alert. This alert will help the parent that at what time the student will reach at home. If the student leaves from the school and did not reach the home then the parents will take the necessary action to track the student. And the parent will also know how many hours the child spent the time in doing

classes regarding the academic study and extracurricular activities. Today the attendance in schools and classes are done manually .The proposed system, i.e. student tracking and attendance management system using RFID technology will improve the process of manual attendance, especially in an organization or school environment. So we have come up with a system which would mark the attendance of the student as well as track them in and around campus. This system gives automated approach to maintain the student attendance. In proposing system it is necessary to be issued RFID tag to each and every student in the school. The students have to swap their RFID cards to the RFID reader. By using this system we will track the particular student and check whether he/she is bunking his/her classes or he/she is roaming in the campus while the classes is going on. The purpose of developing this system is to track the student using RFID tag which will be provided to the student. It is very useful for the teacher as they can easily monitor their student's attendance and manage the attendance of them. Because of this system the frequency of student bunking the classes is reduced and Parents also assure about their son/daughter. So this system is very useful for schools.

References

[1]. N. Amiyana and M. Alias, "Attendance and Access Control System Using RFID System", (2011).

[2]. C. E. Geoffrey, "Automatic Access Control System using Student's Identification Card based on RFID Technology", Unpublished Thesis Faculty of Electrical Engineering, University of Teknologi Malaysia, (2012).

[3]. M. P. V. Mojares, G. A. T. Litan and J. G. Mojares, iNotified: An SMS and RFID-Based Notification System of Lipa City Colleges", Journal of Applied Global Research, vol. 6, no. 18, (2013).

[4]. B. M. Stephen, E. S. Sanjay and R. W. John, "RFID Technology and Applications", Cambridge University Press, (2008).

[5]. https://www.rfidjournal.com/.

[6]. Maltoni D, D. Maio, A. K. Jain, S. Prabhaker (2003),"Handbook of Fingerprint Recognition", Springer, New York, Pp 13-20.

[7]. Victor S, Jonathan M, Reece J, and Lemire J (2003),"Student Wolfpack Club Tracking System", North Carolina State University. USA.

[8]. Liu C.M and Chen L.S (2009), "Applications of RFID technology for improving production efficiency in an Integrated-circuit packaging house," International Journal of Production Research, vol 47, no. 8, pp. 2203- 2216.

[9]. RFID SensNet Lab (2005), A white paper on automatic Attendance System. Texas A & M University, Texas, USA. [10] Nambiar A.N. (2009)," A supply chain perspective of RFID Systems", World Academy of Science, Engineering and Technology Journal, Volume 6, pp15.

[10]. H. Lehpamer, "RFID Design and Principles", Artech House, Inc., (2008).

[11]. RumanaAnjum, VijayaKamble "Student Tracking and Attendance Monitoring System Using RFID", 2017 IJSRCSEIT | Volume 2 | Issue 2 | ISSN : 2456-3307