STUDENT MONITORING SYSTEM USING RFID TECHNOLOGY

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Abstract: In the present roll call system, the technique of taking attendance is typically completed manually, because the numbers of college students are growing within the training institutes, the problem with taking attendance manually calls for human effort to report and preserve the attendance of the students. Consequently human mistakes are common in this process. Maximum instructional establishments are involved approximately scholar's attendance and their usual typical overall performance, the purpose of this system is to develop a software program for the academic institutes which is easy and handy for the handling the administrations of the employer. The tool has the potential to be imparting a clean way for instructional institutions to interact with students and their respective parents/guardians. One manner to talk with a whole campus can be finished via messaging device, which empowers colleges and universities. With the help of SMS textual content messaging you could ship text indicators within the campus or outside the campus in order that verbal exchange may be completed with the university participants, university students and similarly to their parents instantly. The system helps parents to keep eye on their child's overall performance. Also Lecturer can easily communicate with their students in case of emergency.

I. INTRODUCTION

In today's age, it is very difficult for the parents to keep themselves updated about their children education, as they are facing the scarcity of time. Because of their busy schedule they can't visit institution regularly. And also they can't surf the institution website to check the progress and performance of their children. Along with this, the institutions also facing the problems to keep monitor and record the students overall performance, this is because of tremendously increasing the number of students in educational institutes. The purpose of this system is to overcome the above mentioned problem. Many educational institutions are more concerned about their student irregular attendance, as it directly reflects on their overall academic performance. Taking attendance by calling student names or signing on paper is very time consuming and insecure hence it is inefficient. The RFID based attendance system is the solution for this problem. This system can be used to take the attendance of students in schools, colleges and universities. It has the ability to identify each person/student uniquely based on RFID tags. The RFID architecture is mainly consists of two parts 1) RFID tag and 2) RFID reader. RFID (Radio-Frequency-Identification) is a technology used to detect presence an object using radio signals.

There are two types of tags are available in the market and those are

01. ACTIVE TAGS
02. PASSIVE TAGS

The passive tags won't be having any battery, to transmit the data which is present inside a small circuit, it draws power from the reader. Reader sends out electromagnetic waves that induce current in the tags antenna. Active tags are the one which have transmitter and their own power source. The battery is used to run microchip circuitry present in the tags and broadcast the signal to the reader. A tag can typically hold the data from 2kilobytes to 8kb

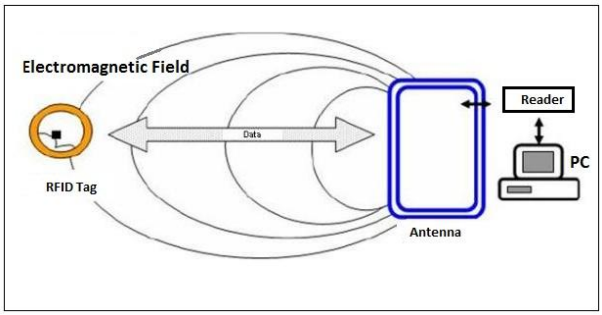


Figure: RFID system components

RFID (Radio frequency identification) is widely used to automatically identify and track the objects or items with the help of tags. It is one of the growing technologies in today's age, in 2014 the world RFID market was worth US $8.89 billion dollars and 2026 the market value is expected to rise up to US $18.68 billion dollars. The communication between tags and reader is done by the electromagnetic field which is generated by the RFID reader. Tags are the one which contains use full information in it. RFID is mainly used for automatically identify the object and for data capture (AIDC). The stored data is collected and fed to the computer/mobile directly without human involvement. Tags give unique identification code for each object or item and to identify each tag, it should be scanned with the help of reader.

Other part of system is SMS/text messaging alert. Feature of SMS/text messaging are

- Sending message to desired number
- Managing group
- Sending message to desired contacts and numbers
- Cost effective
- Internet is not required

PROJECT PURPOSE

- To maintain database of the students which collects student attendance
- To maintain database of students which aids student's academic performance
- To send SMS alerts to the parents/guardians of a

particular student in the scenario of the student failing in particular subject
- Allow access of student/staff details via mobile device
- Provides freedom for the staff to communicate with their students in case of dismiss of class.

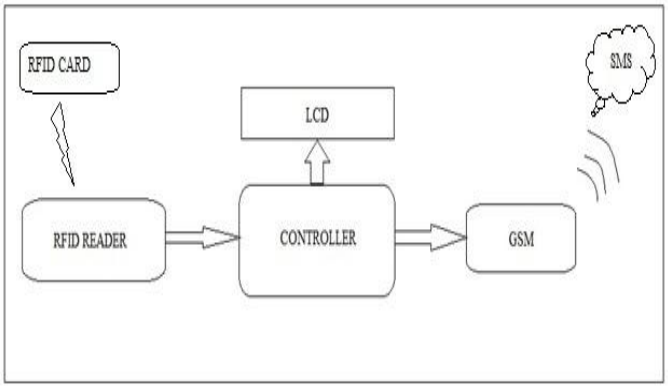
II. METHODOLOGY

The student monitoring system is divided into two parts that is hardware and software. The hardware part consists of RFID reader and controller along with GSM module. The RFID tags are going to provide unique ID for each student or for the lecturers. The RFID reader will read the RFID tags in order to take the attendance of particular students. The received data is sent to 89C51 microcontroller. The controller has the capability to store bulk of data and it is transmitted to GSM module. The array of collected data is broadcasted serially through GSM to the registered mobile. The software part of the module is developed by using Java and ADT tool which is used to develop application in smart phones. It has the capability to read the incoming data and compare it with the database and particular student attendance will be marked. It also provides easy way for the lecturers to enter marks of students, and instant communication can be done in case of emergency.

III. SYSTEM DESIGN

A. HARDWARE DESIGN

The student monitoring system consists of automated attendance system for every college students and professor. While coming into the class room both the students and professor should mark their attendance using their RFID cards. This unique code from card is forwarded to a mobile device, after processing it through the microcontroller. If a pupil is absent for particular class then notification could be dispatched to his/her parents via SMS. The design of the system is shown in the figure. RFID is used to take the attendance of the students. Students have to scan their card to the reader. The reader is going to read the unique code from the card and sends it to the P89V51RD2 microcontroller which is based on 8051. The controller takes input from RFID reader, processes it and sends it to the both GSM module and LCD display in order to display the read data. Here we can also use the arduino microcontroller but we are using P89V51RD2 controller.



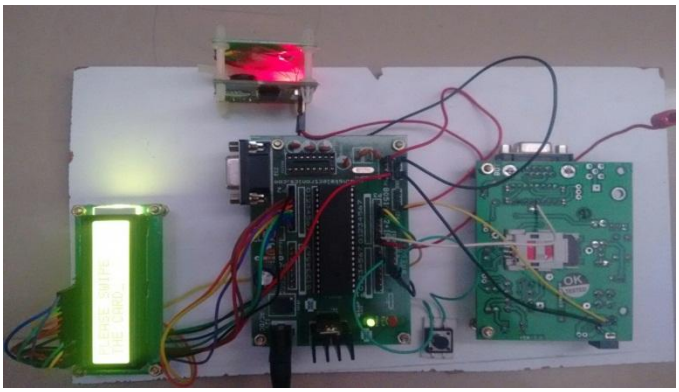


Figure: Hardware of the system

The hardware of the system is shown in the above figure. The system consists of P89V51RD2, an 8051 based microcontroller, RFID reader, GSM SIM module and LCD display. The central part of system is microcontroller. The P89V51RD2 are 80C51 microcontroller provides ability for the user to choose between the clock rates, either six clock per machine cycle or 12 clocks per machine cycle which is called as X2 mode of operation. The X2 mode of operation is used to achieve twice the throughput at the same clock frequency. The P89V51RD2 are 8051 microcontroller with 64KB Flash and 1024B of data RAM. The flash programming memory supports both serial ISP and parallel programming. Advantages of parallel programming mode is, it offers long programming at high speed, by increasing speed one can reduce time to market and programming cost. And serial ISP allows a device to be reprogrammed in the end product. GSM stands for Global System for Mobile Communications which is most popular standard for mobile communication system. GSM is used by more than 1.5 billion people over 121 countries. It is considered as the second generation (2G) digital cellular mobile phone system, it is the replacement for analog cellular network (1G). SIM300 is a tri-band GSM/GPRS engine, it works on three frequencies, EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz it also supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4. GSM supports data transfer rate of up to 9.6 Kbps, allowing the transmission of basic data service such as SMS.

B. SOFTWARE DESIGN

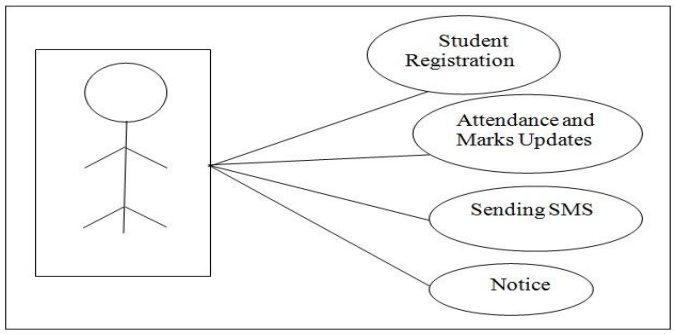


Figure: Software parts

Software part of the system contains of creating an application in the mobile phone so that it can be easy for the lecturer to keep updating students about their attendance,

marks and notice. And at the same time it should be use full for the student parents/guardians to manage and to know their respective child overall performance.

Student Registration: All the students need to be register themselves in the system which is present with the lecturer. Usually in colleges and universities this process is carried out by writing all the student information on the paper. The disadvantage, by writing all the information of the students on the paperis one needs to maintain all the information in well-organized way so that when it is required it can be collected and used easily. To overcome this problem, registration is done in the mobile app only, so when it is required it can be accessed easily by the particular lecturer.

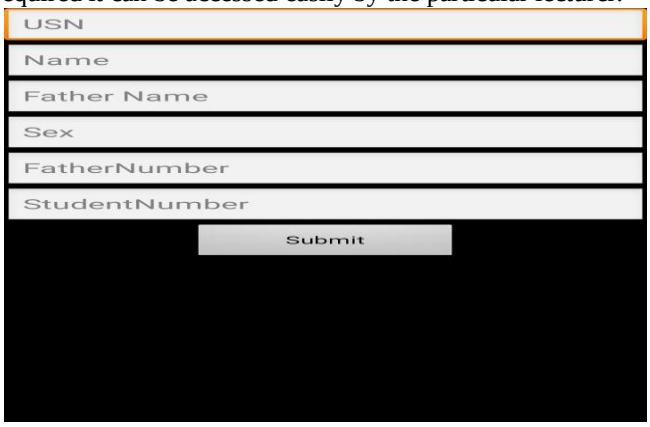


Figure: registration page.

Attendance and Marks update: The second part of the system is taking the attendance of the students and maintaining it. The read data from RFID reader is transmitted to the mobile app with the help of GSM module. The unique code of each student is received at the mobile side where app is created. The app has the ability to read those data and compare it with the database of the app where all the student information is stored.

Figure: Student attendance screen

Sending messages: The app will also provide the ability to send information about student attendance and marks to their respective parents. For this, parent/guardian has to send a request message to the lecturer mobile where app is installed. In this system user need to send SMS like "marks" followed by the student USN number. With response to this, app will generate an automated message which consists of student overall performance like student attendance, along with the marks.

Notice: The advantage of using this system is, broadcasting notice to the each and every individual student at the same time which helps lecturers to convey any important message to their students easily. And also it helps students to get to know about the class schedules.

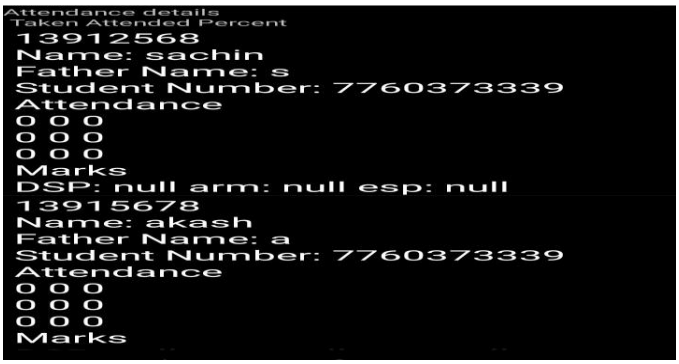


Figure: student information display screen.

IV. CONCLUSION

The student monitoring system is going to change how educational institute interacts with their students and also with the respective parents. The system provides, parents to keep an eye on their child attendance and marks. When student is absent for the class an instant message will be sent to their respective parent number. In case of emergency, lecturer can easily find student's parents number from database where students are registered. It also provides capability to lecturers to communicate with their students in case of sending any sort of important message instantly.

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