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Research Article

Implementation of Attendance System based on RFID and GSM with respect to Power Saving Concept

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Abstract

The paper describes the development of student's attendance system based on RFID followed by power saving concept. The existing system includes manual attendance which is very time consuming and at the same include lots of paper work. The drawback of this system is that the student can make proxy or may do the sign of other student mistakenly or intentionally. Our system includes attendance of students by swiping the RFID card. This system is easily accessible by both faculty and students. The faculty can easily keep the record of the student. This system also includes sending the overall attendance of the student to their respective parents, so that they can also be aware about their child sincerity. Keeping in mind the importance of Power saving, we undertook this along with attendance system. As technology is getting advanced people nowadays have become more depended on it and have become lazy. They want everything to get automized. Based on such factors power saving concept was developed.

Keywords: *Radio frequency identification (RFID), passive tags, GSM module, SMS, LCD display, control buttons, sensors, relays, controller.*

1. Introduction

Earlier the presence of students was marked by writing presence next to their enrollment number and that was considered to be much tedious task. Then we moved onto the method of magnetic strip card which was affected by stray magnetic field. So these are the past scenario which takes too much time to execute and power saving is not at all undertaken.

Now this project will undertake the presence of students to be marked in a most efficient and effective way, and it will be delivered via GSM modem to their respective parents. And to cope up with the present scenario we must consider power saving concept which will be undertaken by this project.

The attendance system is basically an embedded one where hardware is fully controlled with the help of software. Now power saving is completely linked to it. The microcontroller is considered to be the heart of the system. The main objective is to mark attendance of the student. This requires a unique product, which has the capability of distinguishing different person. This is possible by the new emerging technology RFID (Radio Frequency Identification). The main parts of an RFID system are RFID Tag (with unique ID number) and RFID reader (for reading the RFID tag).

To start with the process, there is an IC present in RFID card and magnetic field will be generated by RFID card reader. Whenever we will show any RFID card to RFID card reader it will start matching the frequency of both, for every card we issue a special ID number. Once the frequency will be matched the data which will be there on that particular RFID card no. will be displayed on LCD. Parallel to this power saving concept will also work. After marking the attendance the student will enter the class and will sit on their respective places. Now the idea of power saving will be executed. The electric appliances of only that particular area will be lighted where the student's presence will be sensed and rest all will be off.

2. System Block Diagram

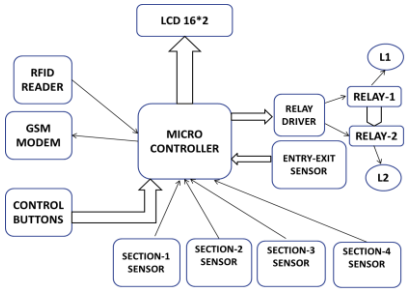

Fig.1 Block Diagram

Block 1. RFID READER- Low-cost method for reading passive RFID transponder tags with 9600 bps serial interface at RS232 level.

Block 2.GSM Modem-SMS notifications is given to parents via GSM Modem.

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Block3.LCD 16*2-Students name along with their attendance are been displayed.
Block 4. Microcontroller-AT89C52 is an 8-bit microcontroller and belongs to Atmel's 8051 family. All the data's of students are stored in it.
Block 5. Control buttons- Using this, the teacher will mark the attendance of that particular student whose card has been read and attendance will be marked and parallel will be send to the respective parents after each lecture with the help of GSM Modem.
Block 6. Sensors-
(1). It will sense the entry and exit of the students.
(2). It will sense the position of students.
Block 7. Relay driver-It will act as a switch. The area in which the students are seated, only those particular electric appliances will be on and rest all will be off with the help of relay.

3. System Model Flow Graph

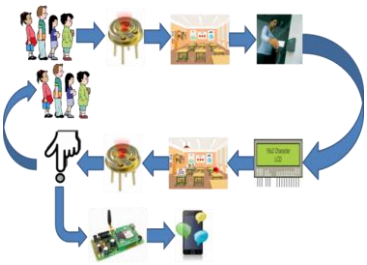

Fig.2 Flow Graph

Description

Voluntarily ring the bell control button will be pressed. This will be an indication for the students that first lecture is going to be started. Meanwhile students will enter the class by scanning their card through RFID card reader. Now the Prof. will press start the lecture control button.

After a particular period of time the Prof. will press you are late control button after which no attendance will be marked though student will enter the class. Now sensors will sense the student presence and as per that electric appliances will be turned ON and OFF through relay driver. End of the lecture will be indicated by the Prof. by pressing end of the lecture control button. At the end of the day the number of lectures attended by the students will be sent to their respective parents through GSM.

Table 1 Comparison between RFID, Biomatrix and megstrip

Name	Description	Advantages	Disadvantages
RFID	RFID chips embedded in all students card	Fast, efficient, availability, cost effective	Card may be given to friend for scanning
Biomatrix	Finger print or retina scanner	Absolute positive identification	Very expensive, slow
Megstrip	The magnetic strip on all student cards	Availability	Slow, wear and tear, old technology, card may be given to friend for scanning

4. Future Scope

Instead of RFID further modification can be done either by using Biomatrix and face detection. This concept undertakes the human presence for security purpose which can be further made more secure.

In power saving we are making a prototype where we are using IR sensors which can be modified and instead of model can be applicable in entire classroom by using humidity sensors. This concept can be further applicable in organization, classroom, offices, banks, etc.

5. Result

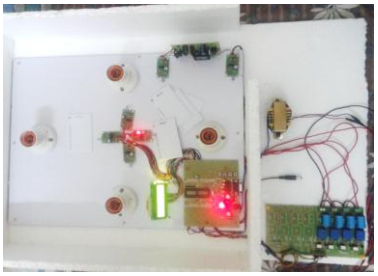

Fig.3 Working Result

6. Flow Chart

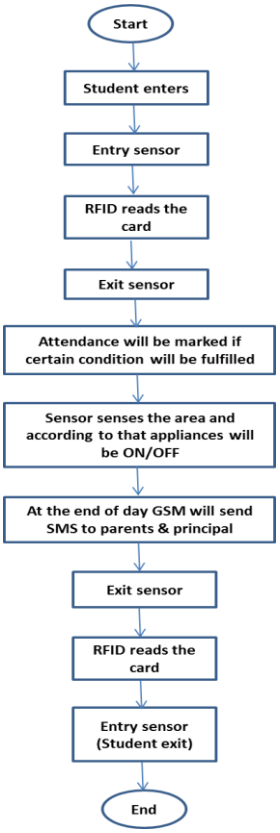

Fig.4 Flow of the project

Conclusion

A smart classroom attendance system is introduced in this project. As an important part of campus management system, the system can intelligently complete examining students' attendance. In addition, the system can automatically collect data information in real time, automatically analyze and process the collected data, report this data using visual interface, and thus intelligently implement SMS notification at the same time.

The project is helpful to remove all the outdated methods for marking attendance and takes into account a newly smarter method which undertakes certain advantages like

1) Reduces paper work.
2) Power saving concept will also be achieved.
3) System is economic with respect to college.

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