Automatic Attendance Marking and Parent Alerting System Using RFID And GSM

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Abstract-**This paper presents the design and construction of automatic attendance marking and parent alerting system, in order to create an ideal environment for teaching in classes. In this model every student and lecturer shall be having a unique RFID card. As a student comes near the class door it opens only if his RFID matches with the database and once he entered the class the door closes. This process continues until the professor enters the class, once he enters the class the door is locked and the list of absent students is created. SMS shall be sent to the respective parents of the absentee students through the GSM module present in the model. During this process though the RFID of the student is matched he is not allowed to enter the class as he is late or any other student inside the class is allowed to leave the class. The class door opens only when the professor brings his RFID tag near the class door indicating the completion of class and the same procedure continues for every class.**

Keywords:- RFID, GSM, LPC2148 microcontroller

I. INTRODUCTION

A Classroom is a place where individuals gather for the purpose of learning and studying. The classroom may be of a primary school, an elementary school, a college or a university - but the purpose remains the same. It should be in a way where students can comfortably spend their time, getting the most of their study and where teachers can be at comfort too to provide the sublime education.

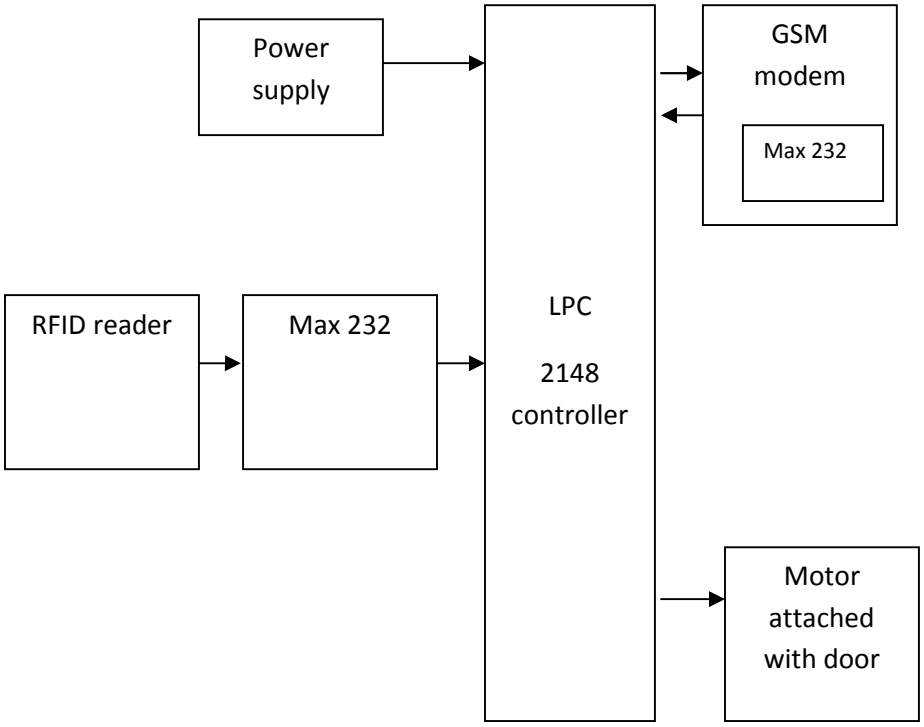
In order to get the most of the learning process, there are certain standards that a classroom should meet. A classroom should be made like a place where students get the urge to grow and develop themselves professionally and mentally. They should be comfortable, at fully ease and should be provided with a chance to study under a highly disciplined and well-facilitated place. It increases their efficiencies exponentially and moreover, a good classroom also does facilitate the teacher in various ways.

An ideal environment for teaching in classes can be created by following certain aspects like: automatically closing the door so as to prevent the noises from the outside to enter the class, preventing the late comers in entering the class as it might cause distractions to the students already present in the class, automatic attendance marking in order to save time, not allowing the students to leave the class without the permission of the faculty when the class is going on, sending a message to respective parents of the absent students regarding the absence of their ward.

Up until now, class attendance records have been maintained manually by having students sign next to their names on printed class lists during class. This method is out-dated, time-consuming and a distraction for both student and professor. Another way of marking the attendance is through biometric system though it is highly secure it requires a huge data base to store and map the finger prints of each student and it takes time as each and every student has to go through the biometric scanning one at a time unlike RFID reader which can sense the tag from a distance of about 2 to 3 inches and relatively takes less time in comparing the number with the database.

Our proposed model which uses RFID tags for every student and professor and GSM module to send messages to the parents of the absent students satisfies all the aspects required to create an ideal environment for teaching in the classes.

II. DESIGN AND CONSTRUCTION



A. RFID MODULE:

The RFID system consists of Reader module and tags. Generally the tags are classified into two classes, Active tags and Passive tags. Active tags require a power source i.e., they are either connected to a powered infrastructure or use energy stored in an integrated battery, a tag's lifetime is limited by the stored energy. The batteries make the cost, size, and lifetime of active tags impractical for the retail trade. Passive RFID is of interest because the tags don't require batteries or maintenance. The tags also have an indefinite operational life and are small enough to fit into a practical adhesive label. A passive tag consists of three parts: an antenna, a semiconductor chip attached to the antenna and some form of encapsulation. The tag reader is responsible for powering and communicating with a tag. The tag antenna captures energy and transfers the tag's ID. The RFID module used in our case is shown in Fig 1.

Fig 1.RFID MODULE

B. GSM MODEM:

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM uses TDMA and sends the digitized signal (voice or data) in different time slots. A GSM modem is a wireless modem that works with a GSM wireless network. GSM modem sends and receive the data through the radio waves. The GSM modem requires a SIM from the wireless carrier in order to operate. The GSM modem is connected to the microcontroller using UART and is operated by the AT commands sent from the microcontroller to the modem. The GSM modem used in our case is shown in figure.

Fig 2.GSM MODEM

C. GEAR MOTOR:

Gear motor is the normal dc motor attached with the gear system. This produces high torque at a relative low speed. This motor shaft is attached with a door. The dc motor is connected to the microcontroller by the driver.

Fig 3 GEAR motor

D. LPC 2148 microcontroller:

LPC 2148 microcontroller consists of arm 7 microprocessor. The microcontroller programming is done using embedded c programming language. LPC 2148 microcontroller has an operating speed of max 30 MHz, voltage 3.3V. The RFID reader reads the data from the tag and sends it to the microcontroller via UART (max232-rs232-max232).the GSM modem is connected to the microcontroller with the help of another UART.

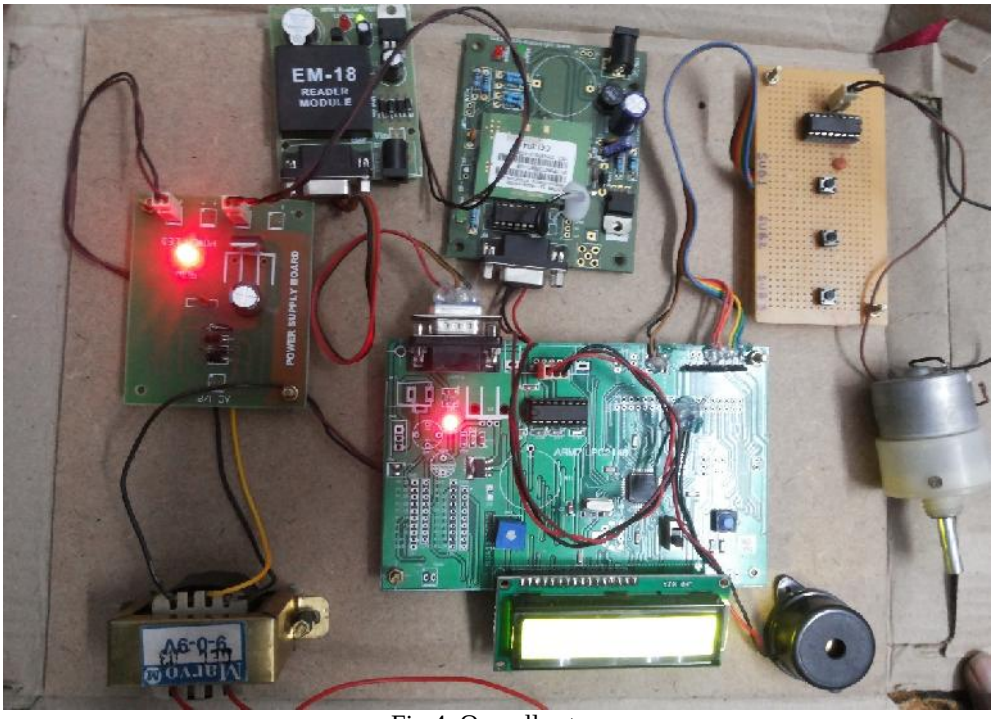


Fig 4. Overall setup

III. FUNCTIONS

The project is assumed to have 3 classes with 15 students and 3 faculties. The 15 students is distributed into 3 batches each of 10 students. Any one of the 3 classes is selected. Whenever the student shows his RFID card the data on the card is displayed on the lcd and the door of the class opens, if the RFID card matches with the database, student enters the class and the door closes. This repeats till the faculty enters by showing the corresponding RFID card, once the faculty entered the class the door is locked and no student is allowed to come in or to go out. The system checks the absentees and sends the message to the parents, class admin using the GSM modem. The parents are alerted that their son/daughter is absent for the selected class and the class admin will mark the absentees on the attendance sheet. This system can be implemented at each and every gate of the college so that we can know the status of the student.

IV. RESULTS AND DISCUSSION

The proposed system satisfies all the requirements needed to create an ideal environment inside the class. The RFID tag which can be used as the identity card has the student details and this variable data is displayed and is sent through the short message service to the parents and class admin. This system works fine with three faculty and 15 students and can be extended to any number of students. This small system which can be easily implemented at a low cost can be used even in the schools of the small villages wherever GSM is installed, there is no need of the computer or the internet facility.

V. CONCLUSION

Our proposed model works not only for the ideal case consisting of fixed number of students with fixed number of classes it can also works fine with variable number of students in variable number of classes that is a given student need not have to be registered in all the classes likewise a class need not have to contain all the students registered in it. With only limited and minimum number of modules it is easy to fix and use.

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