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TITLE: INNOVATIVE CLASSROOM MANAGEMENT SYSTEM

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Abstract

Modern day classrooms are equipped with electronic devices that have supporting software to improve and facilitate teaching methods. However, it is often seen that significant class time is wasted on taking attendance, manual control of the appliances and manual display of data on the notice board. Therefore, to overcome these problems a feasible system is created that will help to maintain a proper record of student's attendance, controlling the appliances as well as digitally displaying data on the notice board. Thus, the system will facilitate the smooth running of classes with minimum time loss.

This classroom management system has the main objectives of attendance management using RFID (Radio frequency Identification) with notification to HOD sir about the attendance and RFID will have an unique identity and security for a person, controlling the appliances inside the classrooms via PIR sensor and displaying the messages or notices on the wireless noticeboard by using GSM technology as it will surely be easy and also will reduce the manpower which is required in traditional notice board system.

This classroom management system has three main objectives

- *Attendance management system using RFID (Radio frequency identification).*
- *Controlling appliances using PIR sensor.*
- *Wireless notice board using GSM.*

1. INTRODUCTION

In last few decades, automation is has made its way in almost every field including industries, offices and even schools. Automation allows things to be done in much more reliably and effectively as it avoids human errors. Automation of anything usually means making a system which interacts with environment and control or process the output without any interference of any human. Innovative classroom is a system which provides efficient use of resources in classroom. It provides automated attendance system and appliance control, interface for displaying notifications, computer interface, and assist in many other time consuming works. Out of such large set of features, in our project we have implemented RFID based attendance system and appliance control system. Maintaining attendance is very important in all the institutes for checking the performance of students. Every institute has its own method in this regards. Some are taking attendance manually using old paper or file based approach and some have adopted methods of automatic attendance using some Biometric based .Communication devices such as mobile handsets and related wireless innovations have become

ubiquitous. Multiple domains in the field of Communication and Embedded devices are being increasingly explored. The use of cell phones has rapidly increased nowadays. Developments in communication technologies have led to the growth of dense networks. As a means of communication, notice boards are widely trendy with its applications ranging from schools, colleges, hospitals to major organizations. Notice boards effectively tackle the global problem of deforestation by conveying messages at large without the use of paper. Such innovative measures will go a long way in adapting the damage to the environment. GSM technology aims in reducing the complexity for sending a message by incorporating SMS (Short Message Service) technology. This technology can be used in public areas such as hospitals, schools, multiplexes and buildings to improve the security system and also to spread awareness in an emergency.

conditions like intrusion, temperature rise, etc. through miscall or SMS

2. LITERATURE SURVEY

2.1Java based home automation system

In [1], the design is based on a standalone embedded system board integrated into a PC based server at home. The home appliances are connected to the input and output ports of the embedded system board and their status are passed to the server. The monitoring and control software engine is based on the combination of java server pages. Java beans, and interactive C. the home appliances can be monitored and controlled locally via the embedded system board, or remotely through a web browser from anywhere in the world provided that an internet connection is available.

2.2GSM based home automation system

This system proposed design and implementation of remote control system by means of GSM cellular communication network [4]. The design integrates the device to be controlled, the microcontroller, and the GSM module so that it can be used for a wide range of applications. Detailed description and implementation of each design element are presented. To verify the principle operation of the MZM design, two home applications are experimentally tested using PC-based environment.

2.3Microcontroller based home automation system

With advancement of technology things are becoming simpler and easier for us. Automatic systems are being preferred over manual system. This unit talks about the basic definitions needed to understand the system better and further defines the technical criteria to be implemented as a part of this system. Automation is the use of control systems and information technologies to reduce the need for human work in the production of goods and services.

2.4Cell Phone based home automation system

In this system, development of two remote monitoring systems using cell Phone with a major focus on cost reduction to allow wider utilization even in undeveloped and developing countries are discussed. The first system has relatively simple features and designed with objective of keeping very low operational cost using novel concept of missed calls. The second system incorporates additional security features like image capture and transmission for intrusion detection. Based on commands received from user cell phone and present sensor conditions, microcontroller system send signals through its ports to switch on/off appliances like AC, lights, fan, siren, etc. The sensors used in the system are microphone, temperature sensor and Passive infrared (PIR) intrusion detector sensors. The system informs user about any abnormal

3. BLOCK DIAGRAMS

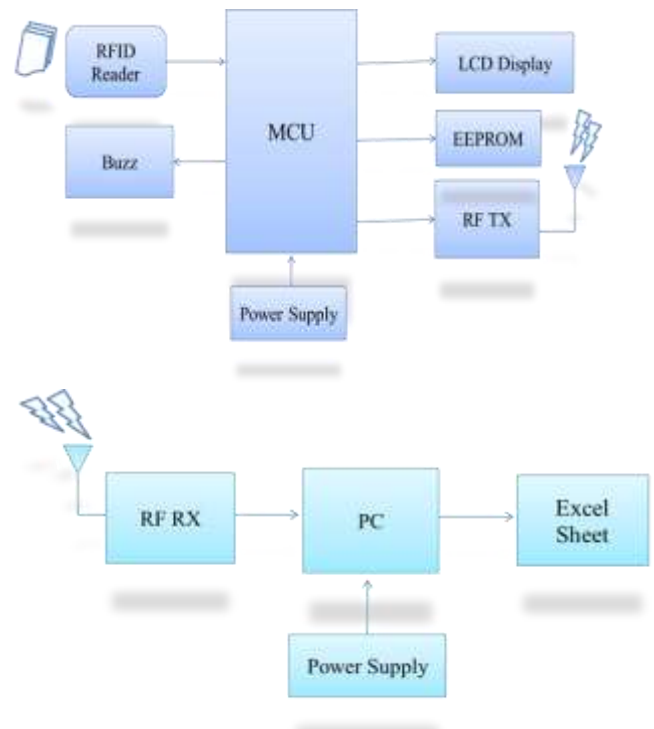


Fig 1: Block Diagram of Attendance System

The above block diagram shows RFID based attendance system the main element of this system is AVR microcontroller. The various blocks like RFID reader, RF transceiver, LCD display, EEPROM and Buzzer are connected to this microcontroller. For taking the attendance the RFID card is placed over the RFID reader, this card has a unique number it will match the information of the respective card with its database and once it is verified the card will be accepted and the student’s information will be displayed on the LCD display and simultaneously that information will be transmitted through RF Transmitter to departmental PC and further it will be stored in the Excel sheet. If there will be power failure the data will be stored in EEPROM. The buzzer is connected to indicate the entries and turning ON/OFF of the system.



Fig 2: Block Diagram of Appliance Control System

The next block diagram is of the appliance control system, it includes PIR sensor block, IC 555 block connected with load. Whenever any fluctuations are detected in the classroom the PIR sensor will sense that fluctuations and according the appliances (lights, fans etc.) will be turned ON and OFF for the specific period of time. For this IC 555 is working in monostable mode that means it will be having one stable state for a specific period of time

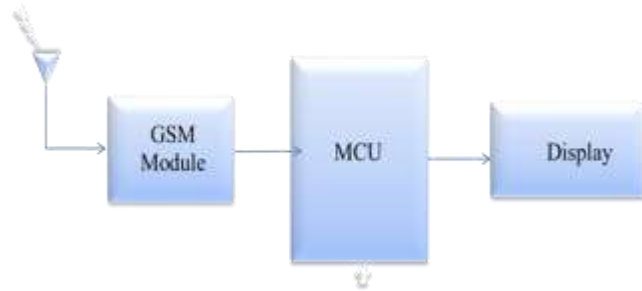


Fig 3: Block Diagram of Wireless Notice board System

The third system representing the block diagram of wireless notice board using GSM module (Global system for mobile communication) is illustrated. It includes AVR controller block, GSM module and LCD display. The SMS containing the notices will be sent through mobile unit to a specific number, then that notice will be received at the receiver antenna of GSM module. Once it is received the respective notice will be processed further through controller and hence displayed on LCD display.

4. HARDWARE REQUIREMENTS

4.1 ATMEGA-16 MICROCONTROLLER.



- ATmega16 is a high performance MC of Atmel Mega AVR family with low power consumption.
- Atmega16 has 16KB programmable flash memory, static RAM of 1KB and EPROM of 512 bytes.
- ATmega is a 40 pin microcontroller.
- There are 32 I/O lines which are divided into four 8-bit ports designed as PORTA, PORTB, and PORTC & PORTD.

- ATmega has various in-built peripherals like USART, ADC, Analog Comparator, SPI, JTAG.

4.2 RFID (RADIO FREQUENCY IDENTIFICATION)



- RFID is an acronym for “radio-frequency identification” and refers to a technology whereby digital data encoded in RFID tags or smart labels (defined below) are captured by a reader via radio waves.
- RFID is similar to barcoding in that data from a tag or label are captured by a device that stores the data in a database.
- We use RFID for attendance purpose.
- Its ability to uniquely identify each person based on their RFID tag type of ID card make the process of taking the attendance easier, faster and secure as compared to conventional method.
- Students or workers only need to place their ID card on the reader and their attendance will be taken immediately.

4.3 PIR SENSOR

- A passive infrared sensor (PIR) is an electronic sensor that detects a human being in classroom in our project & according to that light and fan automatically turns ON & OFF.
- The PIR sensor itself has two slots in it, each slot is made of a special material that is sensitive to IR.
- The lens used here is not really doing much and so we see that the two slots can 'see' out past some distance (basically the sensitivity of the sensor).



- When the sensor is idle, both slots detect the same amount of IR, the ambient amount radiated from the room or walls or outdoors.
- When a warm body like a human or animal passes, PIR sensor sense & according to it can work.
- When the warm body leaves the .sensing area, the reverse process happens.

4.4 GSM 800L

- Supply voltage: 3.8 - 4.2 V
- Current consumption:
Idle mode <7.0mA
- Module size: 25*23mm
- SIM card socket : micro SIM (bottom side)
- Supported frequencies: Quad band(850/950/1800/1900 MHz)
- Antenna connector: IPX
- Working temperature range: -40 to +85°C



5. ADVANTAGES

- Easy to maintain attendance records
- Higher authentication
- Provide computer interface.
- Better utilization of appliances
- Reduces paperwork and Saves time.
- Eliminate duplicate data entry.
- Keep attendance of students and staff as well.

6. CONCLUSION

- This project presents a model that has been proposed to meet the basic needs of classroom automation.

- An important advantage of this system is that it gives the system as a complete prototype to develop more such cost efficient systems that can be used in classrooms and college automation.
- In addition to this the future work can be focused on developing applications that can help in automating an entire department or a college.
- Future work should be along the lines of considering the validation of the attendance also by including an image detection technique which will further more authenticate the person.
- The same model also can be helped in making a home automation system which will be cost efficient.

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