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WIRELESS SMART CLASS ROOM USING EMBEDDED TECHNOLOGY

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Abstract

Smart Classroom facilitates collaborative learning among college students. Students in such an environment form small groups to solve a specific problem or develop a group project. In a Smart Classroom, each student has a situation-aware PDA. Students' PDAs dynamically form mobile ad hoc networks for group meetings. Each PDA monitors its situation (locations of PDAs, noise, light, and mobility) and uses situation to trigger communication activity among the students and the instructor for group discussion and automatic distribution of presentation materials. We have developed a Reconfigurable Context-Sensitive. The smart classroom will be used for a senior group software engineering project course as an illustrative example. Here wireless smart class room which deals with sensors which senses high Frequency signals**.**

Keywords: Smart Classroom, collaborative learning, computing, situation-awareness, and Reconfigurable Context-Sensitive Middleware (RCSM).

1. INTRODUCTION:

In the past, instructors could easily witness students passing notes, reading a magazine, or simply day dreaming during class. Now, laptops and other portable computing devices can create a barrier between the instructor and student, which can shield the student's activity behind a veil of technology. Is the student taking careful notes? Searching web sites relevant to the class discussion? Accessing the University's course management system? It can be difficult for an instructor to distinguish these activities from virtual chatting with friends, updating a Facebook status, or shopping online. The literature survey which was survived by under following In 2013, Smart universities and smart class room by Jeffrey p.Bakken it states that White board with digital pen by Digital system in Central universities. In 2012, Smart class room roll caller With IOT system by Ching hisang, it includes Mechanism by IOT Architecture with Roll collar system in Christian universities. In 2014, New computing paradigm and a vision of a next wave in ICT by S.E.Bibri it takes Not in real form with Not in real Form Over the years, technology has been used to improve the quality of instruction. However, effective use of technology to enhance the quality of teaching is a very challenging problem. Technology can be used to improve the quality of teaching in many ways. For example, it can improve the interactions between the instructor and the students, or in-group collaboration among the students.

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Very oftenly used sensors are used in before project. The sensors which senses and identifies low frequency signals. By using the sensors like IR PIR and element Buzzer which is used to sense low frequency signals. Sensors are separately used but now it is combined to give in a single application.

2. PROPOSED SYSTEM:

2.1.Block Diagram:

Here sensors and elements which is used to detect both low frequency and high frequency signals between herts to giga herts.it gives more fast response. It consists of many blocks in which the ARM is interfaced and the 12v dc supply is given to the microcontroller. The 230v ac is step down and rectified by rectifier then converts in to 12v dc.

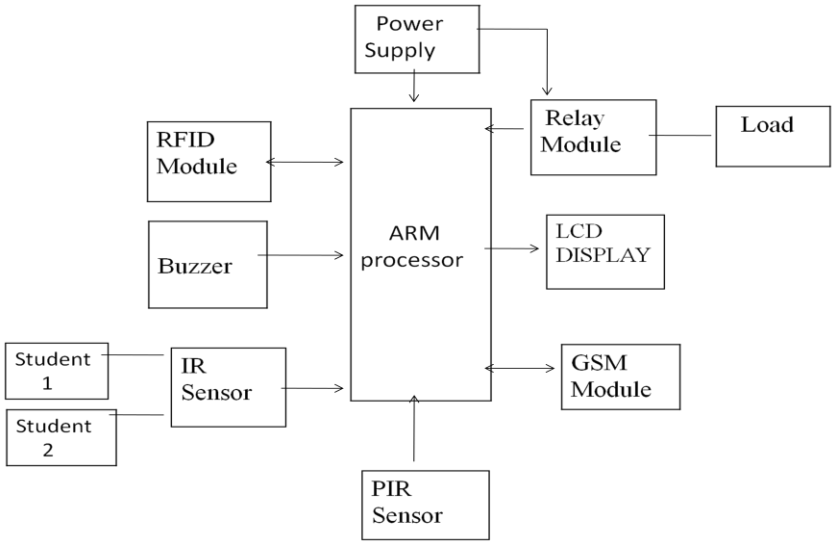

Fig.1. block diagram.

3. DESCRIPTION:

3.1Power Supply:

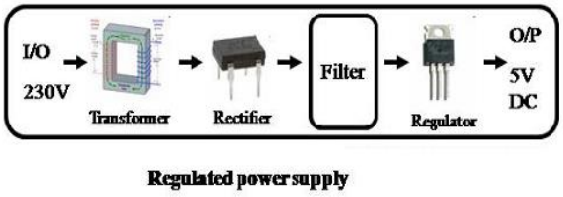

Fig.2. power supply.

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Alternating current (AC) is used for power line transmission and for high power devices like appliances and lights. The characteristics of AC make it ideal for transmission over long lines and for delivering large amounts of power for relatively unregulated uses, such as generating heat and light. Lower power appliances and devices require the closely regulated control of direct current power (DC). As a normal house is supplied with AC, it must be converted to DC for many uses. Use these tips to learn how to make an AC DC converter. By giving 12v supply to the ARM processor then connects to all the components that requires electricity.

3.2 IR Sensors:

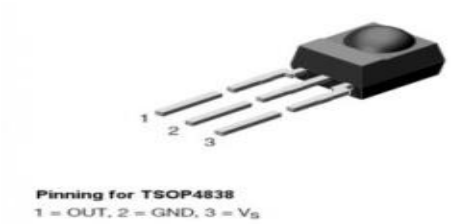

Fig.3.IR Sensor.

An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting and/or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion.

- IR has anode and cathode.
- High output power.
- Ideal for remote control applications.

3.3 PIR Sensor:

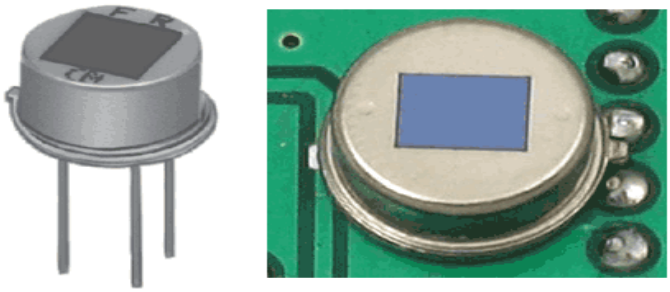

Fig.4. PIR sensor.

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The PIR (Passive-Infrared) sensor functions in the same way as an outdoor light with a motion detector and reacts to movements made by objects that radiate heat (people and animals). The switching threshold can be set from between 0% and 100%.The computer compensates for any temperature-related dependencies and other product-life-related drifts. To do so, the computer sends an inquiry to the sensor approx. 15 times a second and compares this information to its resting signal. Up to 10 meters at an angle of ± 15 degrees. The PIR sensor requires neither visible nor infrared light to operate properly.

3.4 RFID Reader:

Fig.5. RFID.

RFID tag is a small device which stores and sends data to reader. They are categorized in two types – **active tag and passive tag**. Active tags are those which contain an internal battery and do not require power from the reader. Typically active tags have a longer distance range than passive tags. Passive tags are smaller and lighter in size than the active tags. They do not contain an internal battery and thus depend on RFID reader for operating power and certainly have a low range limited up to few meters.

3.5 GSM Module:

Mobile services based on GSM technology were first launched in Finland in 1991. Today, more than 690 mobile networks provide GSM services across 213 countries and GSM represents 82.4% of all global mobile connections. Mobile services based on GSM technology were first launched in Finland in 1991. Today, more than 690 mobile networks provide GSM services across 213 countries and GSM represents 82.4% of all global mobile connections. According to GSM World, there are now more than 2 billion GSM mobile phone users worldwide. GSM World references China as "the largest single GSM market, with more than 370 million users, followed by Russia with 145 million, India with 83 million and the USA with 78 million users."Since many GSM network operators have roaming agreements with foreign operators, users can often continue to use their mobile phones when they travel to other countries. SIM cards (Subscriber Identity Module) holding home network access configurations may be switched to those will reducing roaming costs while experiencing no reductions in service.

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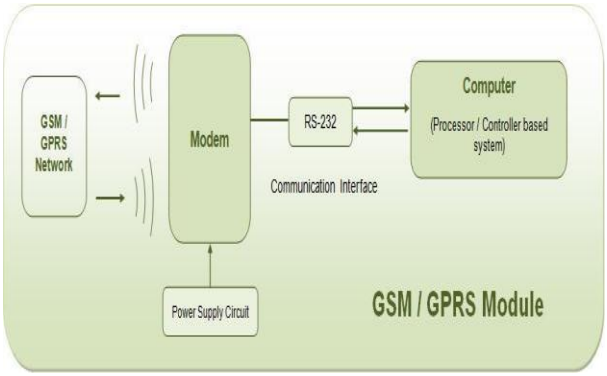

Fig.6. GSM MODULE.

3.6 BUZZER:

Fig.7. Buzzer.

A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signaling device. A Piezo electric buzzer can be driven by an oscillating electronic circuit or other audio signal source. A click, beep or ring can indicate that a button has been pressed.

Types of Buzzers

There are several different kinds of buzzers. At Future Electronics we stock many of the most common types categorized by Type, Sound Level, Frequency, Rated Voltage, Dimension and Packaging Type. The parametric filters on our website can help refine your search results depending on the required specifications The most common sizes for Sound Level are 80 dB, 85 dB, 90 dB and 95 dB. We also carry buzzers with Sound Level up to 105 dB. There are several types available including Electro-Acoustic Electromagnetic.

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3.7 LCD Display:

Fig.8. LCD Display

This is the first interfacing example for the parallel port. We will star with something simple. This example does not use the Bi-directional feature found on newer ports, thus it should work with most, if no all Parallel Ports. It however does not show the use of the status port as an input. So what are we interfacing? A 16 Character, 2 Line LCD Module to the Parallel Port. These LCD Modules are very common these days, and are quite simple to work with, as all the logic required running them is on board.

4. DATA TRANSFER:

4.1 SERIAL COMMUNICATION:

4.1.1 MAX 232:

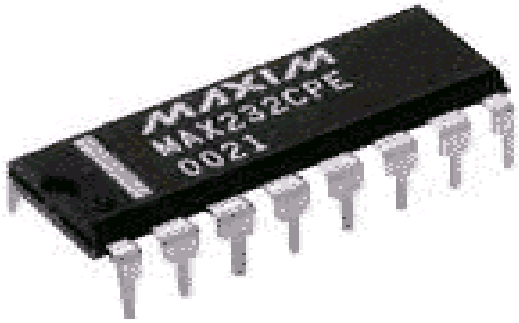

Fig.9. MAX 232

The MAX232 from Maxim was the first IC which in one package contains the necessary drivers (two) and receivers (also two), to adapt the RS-232 signal voltage levels to TTL logic. It became popular, because it just needs one voltage (+5V) and generates the necessary RS-232 voltage levels (approx. -10V and +10V) internally. This greatly simplified the design of circuitry. Circuitry designers no longer need to design and build a power supply with three voltages (e.g. -12V, +5V, and +12V), but could just provide one +5V power supply, e.g. with the help of a simple 78x05 voltage regulator.

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Serial RS-232 (V.24) communication works with voltages (between -15V ... -3V are used to transmit a binary '1' and +3V ... +15V to transmit a binary '0') which are not compatible with today's computer logic voltages. On the other hand, classic TTL computer logic operates between 0V ... +5V (roughly 0V ... +0.8V referred to as *low* for binary '0', +2V ... +5V for *high* binary '1'). Modern low-power logic operates in the range of 0V ... +3.3V or even lower.

5. CIRCUIT DIAGRAM:

Here ARM which is interfaced with many elements such as RFID Module, IR sensors, PIR sensor, Light and fan. The arm processor with the help of pins it connected to the respected element as shown in circuit diagram. The respected supply is +12v DC given to the processor to work all the components with respected works. The crytal oscillator generates the clock puse for respected frequency.

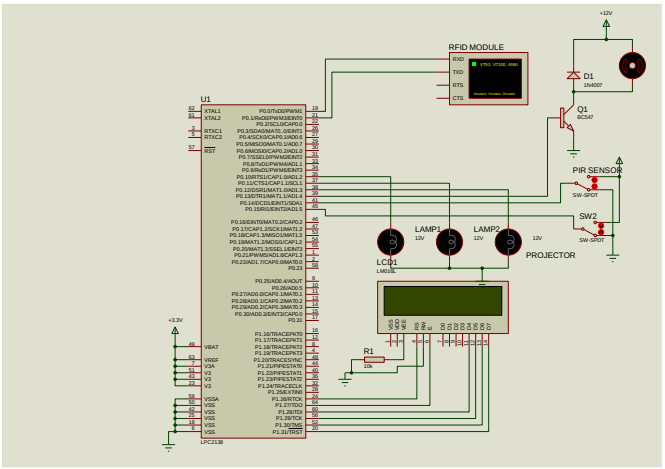

Fig.10. circuit diagram.

ARM:

PIN DIAGRAM

The LPC2141/2/4/6/8 microcontrollers are based on a 32/16 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combines the microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/2/4/6/8 are ideal for applications where miniaturization is a key requirement, such as

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access control and point-of-sale. A blend of serial communications interfaces ranging from a USB 2.0 Full Speed device, multiple UARTs, SPI, SSP to I2Cs, and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers particularly suitable for industrial control and medical systems.

Fig.11. Pin Diagram.

Fig.12. ARM7TDMI

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6. WORKING:

MAJOR FEATURES:

1. Entry and Exit Display

Here entry and exit is taken by IR(Infra Red) Sensor. If the student enters our smart class room then, the radiation are passed on the student while entering by sensing the heat produced by student and the radiation reflects batch then the count is increased or incremented simultaneously and the output displays in LCD.

2. Human Detection

This was found by PIR(Passive Infra Red) sensor. Here if the student enters in to the class room then the load will be automatically ON or OFF where the student present. If the count is increased above 2 then the projector also automatically ON/OFF. The load which indicates here is light, fan and so on.

3. A Record of Student Attendance:

RFID(Radio Frequency Identification) is used here for attendance purpose inside the class room for students. Students must wear the tag in that the BAR CODE is generated already and we have to fix the RFID Identifier inside the class room. By that if students enter in to the class room it senses by barcode and takes the attendance automatically then displays in LCD with the students name.

4. Information Passing:

Here GSM(Global Servicee Message) which here used for circular passing.If the higher authority wants to pass any information regarding the circulam then they sends the short message by GSM so that it also displays by LCD inside of our smart class room.

5. Electricity Saving

Buzzer which is used for overall power saving mode. It indicates us by long term alert sound. If the overall load is OFF inside the class room after the class timing over then the buzzer will sound or gives alert so that we can shutdown the main. If not it won't sound by this we can save power.

APPLICATION:

This project which helps us to understand our class more simple and it is more interactive between faculties and students. It is tension free and time saving application used in class rooms.

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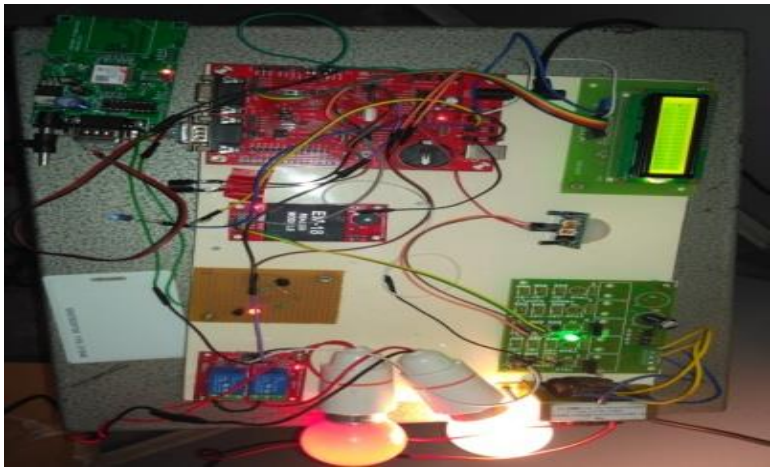

Fig.13. HardwareOutput

CONCLUSION:

In recent year in use of distance education system in all kinds of education have been increasing. One of the tools for distance education system is probably for smart class room simulatanous smart class room environments. It is therefore, important to increase the effectiveness of smart classroom to enhance the learning environment in distance education.

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