

# SMART CLASSROOM ROBOT

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**Abstract:-** Basically, the internet has become a daily necessity to utmost the effective participants in which we interact and communicate among ourselves by switching data and information sensed about the environment and atmosphere. Hence in this project smart classroom robot is implemented. The entire system is controlled by the ARM controller. RFID Scanner will scan the card whenever student scans the card and it displays on the LCD display. Whenever students enter the room, then sanitizer will spray on student hands. When room exceeds the threshold level then temperature sensor is detected and automatically switches on the fan. Next LDR sensor is detected when light radiation is low and switches on the light and if light radiation is high then it will switches on the light. Hence this project gives effective outcome.

**KEYWORDS:** Robot, ARM controller, RFID scanner, Temperature sensor, LDR sensor, Sanitizer.

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## I INTRODUCTION

As we enter the 21st century, the interaction between humans and computer is breaking the old barriers and entering a new realm. Today's homes require sophistication control in its different gadgets which are basically electronic appliances. This has revolutionized the area of home automation with respect to an increased level of affordability and simplicity through the integration of home appliances with smart phone and tablet connectivity.

Smart phones are already feature-perfect and can be made to communicate to any other devices in an ad hoc network with a connectivity options like Bluetooth and WiFi. In the highly technology driven world of today's computer and cell phones have become a part of our lifestyles. Computers are no longer tool to manage data and neither cell phone is just communication tool.

Classrooms are the most basic components of an educational institution. From the elementary school to the medical colleges or Engineering universities, classroom is the most important infrastructure of an educational institute. A classroom is a learning space, a room in which classes are held. Classrooms are found in educational institutions of all kinds, from preschools to universities, and may also be found in other places where education or training is provided, such as corporations and religious and humanitarian organizations. In this age of massive digitalization of our country, classrooms are the most needed structures to be digitalized.

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corporations and religious and humanitarian organizations. In this age of massive digitalization of our country, classrooms are the most needed structures to be digitalized. If this happens, this would be the biggest evolution of our road to Vision 2021. In this project smart classroom robot is implemented.

## II. LITERATURE SURVEY

**Vishal Kolambkar, Tejas Patil, Sagar Anute, Prof. Rasika Shintre [1],**

The internet has become a daily necessity to utmost of the effective participants in which we interact and communicate among ourselves by switching data and information sensed about the environment and atmosphere. From this IoT they relate autonomously to the real-world events and offer us with services with or without direct human interference. Automation of the surrounding environment of a modern human being allows increasing his work efficiency and comfort.

An automation system is a precisely planned change in a physical or administrative task utilizing a new process, method, or machine that increases productivity, quality, and profit while providing methodological control and analysis. There has been a significant development in the area of an individual's routine tasks and those can be automated. Automation gives an individual the ability to remotely or automatically control things around the home using the mobile application.

**Prof. Rohini Temkar, Mohanish Gupte, Siddhesh Kalgaonkar, [2]**

Much of the time is wasted while entering the classroom in queue, picking up their own materials, sit up and down while answering to questions and it makes very much difficult for teachers to handle huge number of students without any technology. On an average, an American student spends about 1025 hours each year just for following instructions given to him/her.

Connected devices and emerging trending technologies will help teachers to focus on student’s learning needs rather than wasting time for managing large group procedures because of which they cannot give enough time for developing some extra qualities in students. Connected devices would definitely help teachers to transform classroom experience. This paper consists of some practical scenarios of about how I.O.T can be implemented for a better classroom experience and how teachers can focus on student’s skills and which will help to save the time of both.

**Faisal Md. Tanvir Islam [3]**

“Smart Classroom” is a classroom where energy can be saved by using renewable energy. In this class classroom solar panel has been used to supply the power to the entire classroom. Students have to punch their RFID card to get access into their classroom. Fans and lights will be automatically turned on and off. When the class will start it will be automatically turned on and when it will end it will be automatically turned off. Now a days parents are very much concerned about their children whether they are attending the class or not. That is why this classroom has additional feature, if any student will miss the class an automatic message will be sent to their parent’s phone number. Gate will be locked until the class ends and teacher will have a special id that can be used in any emergency cases.

**Rabie A. Ramadan[4]**

Recently, Radio Frequency Identification (RFID) technology has been widely used in many applications including health care and automatic toll stations. However, there are many issues and problems in using such technology in smart environments where different devices are required to cooperate with each other. In this paper, we present our experience in developing an intelligent classroom (Iclass) for the benefit of the sensor network community.

In addition, we show how RFID technology can be utilized in Intelligent Classroom environment. We explore some of the issues and problems that we faced during the implementation of RFID in the Iclass. Moreover, we elaborate on some of the open problems that are beneficial to the students’ education system in different levels..

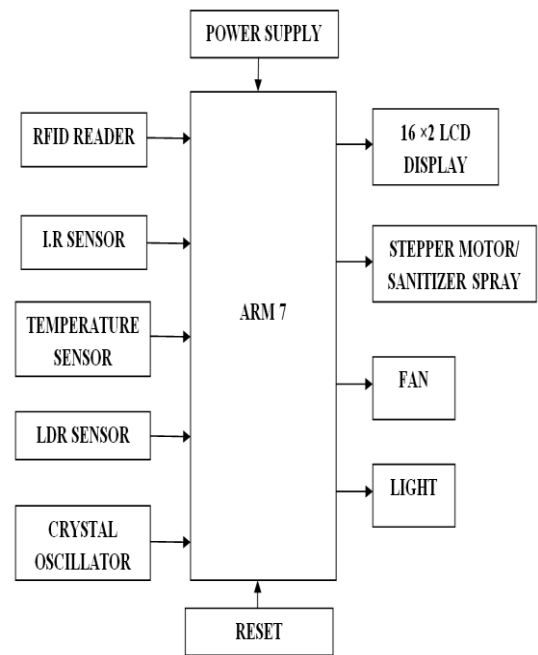
**Mohd Helmy Abd Wahab Herdawatie Abdul Kadir Muhammad Nurfahmi Mohd Yusof Rahmat Sanudin Mohd Razali Tomari [5]**

The rapid growth of Information and Communication Technology field has made medium of information retrieval more advanced and complex. As the RFID has gained a lot of attention nowadays, the use of RFID in a wide range application has been successfully developed. Thus, this paper

describes a brief introduction to application of attendance system and reviews some application of attendance system and techniques of data retrieval such as smart card, biometrics, barcode and RFID itself. This ongoing research would be applicable in collecting student attendance in classroom using active RFID technology.

### III. PROPOSED SYSTEM

The below figure (1) shows the block diagram of proposed system. The entire system is controlled by the ARM controller. RFID Scanner will scan the card whenever student scans the card and it displays on the LCD display. Whenever students enter the room, then sanitizer will spray on student hands. When room exceeds the threshold level then temperature sensor is detected and automatically switches on the fan. Next LDR sensor is detected when light radiation is low and switches on the light and if light radiation is high then it will switches on the light.



**Fig. 1: BLOCK DIAGRAM OF PROPOSED WORK**

#### A. LCD DISPLAY

LCD is used to display the data. 16x2 is the LCD i.e. is used which contains 16 characters in 1 line, total 2 lines are there. It requires +5V to operate. It is connected to port 2 of microcontroller. It acts as an output to microcontroller. It uses ASCII values to display the character.

#### B. ARM

The LPC2148 microcontrollers are focused around a 16-bit or 32-bit ARM7TDMI-S CPU with constant imitating and implanted follow help, which consolidate microcontroller with inserted high velocity streak memory extending from 32 kb to

512 kb. A 128-bit wide memory interface and one of a kind quickening agent building design empower 32-bit code execution at the most extreme clock rate. For discriminating code size applications, the option 16-bit Thumb mode decreases code by more than 30 percent with negligible execution punishment.

Because of their little size and low power utilization, LPC2148 are perfect for applications where scaling down is a key pre-requisite, for example, access control and purpose of offer. Serial interchanges interfaces running from a USB 2.0 Full-speed gadget, various UARTS, SPI, SSP to I2c-transport and onchip SRAM of 8 kilo Bytes up to 40 Kilo Bytes, make these gadgets extremely appropriate for correspondence entryways and convention converters, delicate modems, voice distinguishment and low end imaging, giving both extensive cradle size and high transforming force. Different 32-bit clocks, single or double 10-bit ADC(s), 10-bit DAC, PWM channels and 45 quick GPIO lines with up to nine edge or level touchy outside intrude on pins make these microcontrollers suitable for mechanical control and restorative frameworks.

### C. CRYSTAL OSCILLATOR

An oscillator gives a wellspring of tedious A.C. motion over its yield terminals without requiring any contribution (aside from a D.C. supply). The flag produced by the oscillator is more often than that of steady sufficiency. The wave shape and sufficiency are controlled by the plan of the oscillator circuit and decision of segment esteems. The recurrence of the yield wave might be fixed or variable, contingent upon the oscillator structure.

### D. POWER SUPPLY

A power supply is an electrical gadget that provisions electric capacity to an electrical burden. The essential capacity of a power supply is to change over electric flow from a source to the right voltage, flow, and recurrence to control the heap. Subsequently, control supplies are in some cases alluded to as electric power converters. Some power supplies are isolated independent bits of hardware, while others are incorporated with the heap apparatuses that they control. Instances of the last incorporate power supplies found in personal computers and gadgets.

### E. IR SENSOR

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it and that is called as a passive IR sensor.

### F. LDR SENSOR

The light dependent resistor (LDR) is a sensor whose resistance decreases when light impinges on it. This kind of sensor is commonly used in light sensor circuits in open areas, to control

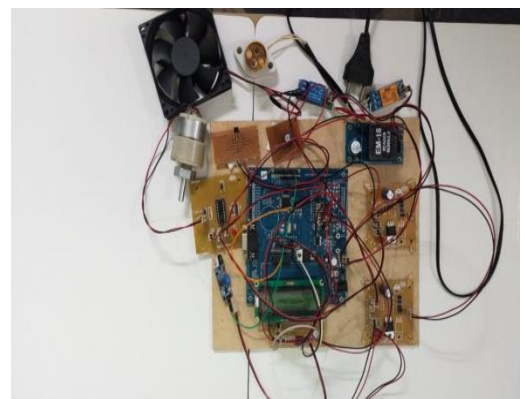
street lamps for example. Another possible use is in spectroscopic apparatus. In this kind of apparatus, continuous light or pulsed light can be used. Continuous light is used in common spectroscopic apparatus.

### G.TEMPERATURE SENSOR

**LM35** is an analog, linear temperature sensor whose output voltage varies linearly with change in temperature. LM35 is three terminal linear temperature sensors from National semiconductors. It can measure temperature from **-55 degree Celsius to +150 degree Celsius**. The voltage output of the LM35 increases 10mV per degree Celsius rise in temperature. LM35 can be operated from a 5V supply and the stand by current is less than 60uA.

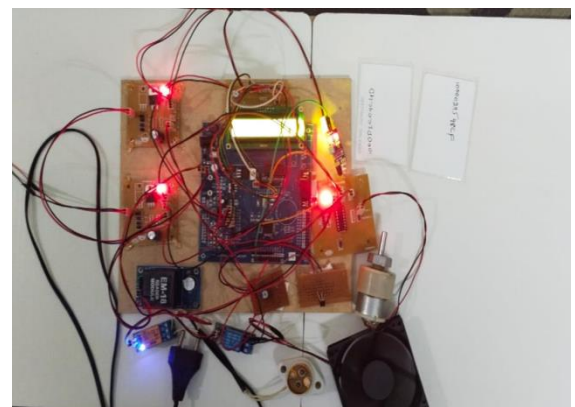
## IV. RESULTS

The below figure (2) shows the hardware kit of proposed system. In this RFID reader, LDR Sensor, Temperature Sensor, LCD Display, I.R sensor, Stepper motor.



**Fig. 2: HARDWARE KIT**

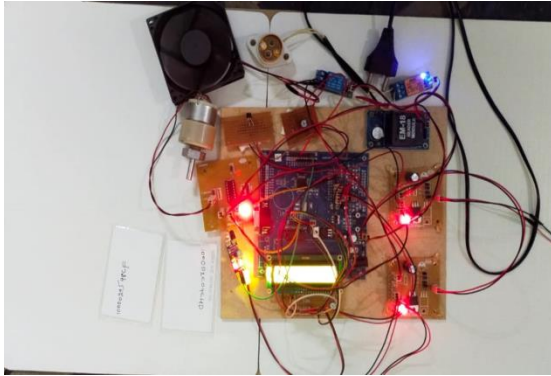
The below figure (3) shows the project output-1 of proposed system. RFID Scanner will scan the card whenever student scans the card and it displays on the LCD display. Whenever students enter the room, then sanitizer will spray on student hands.





**Fig. 3: PROJECT OUTPUT-1**

The below figure (4) shows the project output-2 of proposed system When room exceeds the threshold level then temperature sensor is detected and automatically switches on the fan. Next LDR sensor is detected when light radiation is low and switches on the light and if light radiation is high then it will switches on the light



**Fig. 4: PROJECT OUTPUT-1**

## V. CONCLUSION

Hence in this project smart classroom robot was implemented. Smart classroom will be user friendly and very much cost effective. Earlier Classroom teaching is a common method that currently applying by most the academic institution including in school and colleges. The conventional method by having manually signed the attendance in a sheet of paper then passed around the classroom while lecturer conducts the teaching in the classroom is wide implements nowadays. To overcome this issues smart classroom robot is implemented.

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