

SMART CLASSROOM

ISSN 2395-1621

Aditi Deelip Khodave, Pallavi Pandurang Lokare, Harshada Ramesh Kumbhar,
Prof. Mousami Vanjale



aditikhodave99@gmail.com
pallavi.lokare1@gmail.com
kumbharharshada13@gmail.com
mousamivanjale@gmail.com

Electronics & Telecommunication AISSMS IOIT Pune.

ABSTRACT

Most of the colleges and universities use traditional methods for attendance monitoring system i.e. call the roll number of students and mark it on paper or take the signature of students on the attendance sheet. These methods are wastage of time and paper. In most of the college's wastage of electricity is observed, as students and faculty members are habituated towards leaving the classroom without switching off the lights, fans, projectors etc. This leads to unnecessary consumption of energy for organization and paying huge amount of bill from their budget. To overcome such problems "Automatic Attendance Monitoring System" using Fingerprint Module has been designed. This system also includes "Automatic Lightening and Control" using Arduino and Temperature and Humidity sensor. This system will control lightening in particular area of classroom based on presence of a person. Advantage of this project is that it consumes less time and assures accurate attendance monitoring without any faults. The motive to conserve electricity will get fulfilled in this project. This project can be easily installed in any institute to make the classrooms smart and efficient.

Keywords— Fingerprint module, Attendance monitoring, classroom, DHT11, Automatic lightening control, RTC.

ARTICLE INFO

Article History

Received: 8th March 2020

Received in revised form :

8th March 2020

Accepted: 10th March 2020

Published online :

11th March 2020

I. INTRODUCTION

Rapid development of automation technology make life of people very simple and easy. In today's world, all of them depend only on automatic system over manual system.

An IoT based smart classroom system mainly deals with automation of electronic appliances in a classroom and connect it to internet. As we live in the ever changing world, education remains surprisingly behind in the general rapid speed.

Smart classrooms are technology enhanced classrooms which enables to keep a record of students attendance. Smart class has a LCD display board to display the information of classroom and maintain interaction between authorities. The global question of conserving electricity and energy is well handled through smart classroom.

II LITERATURE REVIEW

In order to consume energy effectively, relay that monitors the electrical lightening and running of the fans were proposed by authors in[1]. The experimental results showed that we can reduce our bill to the extent of 50% if the electrical appliances are switched OFF when not in use. The advantage of this system is the electrical appliances be switched on or off in a particular area in classroom based on the presence of students [1]. Attendance management system was developed using data acquisition, Raspberry pi, Web server and MySQL database. In this system energy consumption is less. Local server and Zigbee has been used for monitoring all devices, network and for updating websites with daily attendance record. This system is not only cheaper, efficient, having low power design, but also easy to use [2]. Smart classroom roll caller system with IOT architecture has been designed as RFID roll caller to scan RFID student cards and could response every lessons attendance to subsystems real time. Advantage of this design is that it decreases absent rate from 30% to 5%. Small Classroom roll caller system has some limitation

like the students card can be purposefully forgotten by students and teachers have to keep eye on them [3]. In [4] fingerprint recognition consists four stages firstly, the sensor which is used for enrolment and recognition to capture the biometric data. In second stage of preprocessing, enhancement technique was used to remove unwanted data and increase the clarity of structure. Thirdly, feature extraction stage input is taken from second stage to extract the fingerprint feature. The matching stage compares the acquired feature with template in the database. Fingerprint recognition is done by using FFT and Gabor Filters to enhance the fingerprint image captured using UART 4000 fingerprint reader. Fingerprint recognition is most successful method used for person identification. In [5] authors designed Automatic fingerprint identification system (AFIS). Design and development of portable classroom attendance system based on arduino and fingerprint biometric is completed by authors to avoid traditional pen and paper method [6]. A Smart classroom using wireless sensor networks for student time attendance system[7].

III. BLOCK DIAGRAM

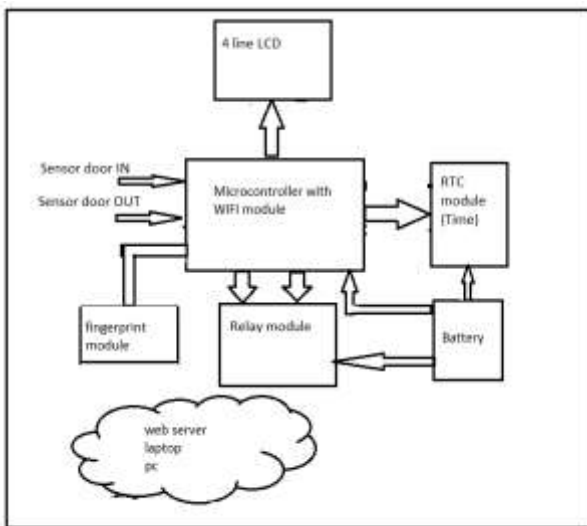


Fig.no.3.1 Block Diagram

Above Block Diagram shows connectivity of components used in this project. The Microcontroller controls the input from sensors. Date and Time will be displayed by using RTC module. Relay modules will control the function of lights and fans. Battery provides supply to the system.

IV. SYSTEM ARCHITECTURE

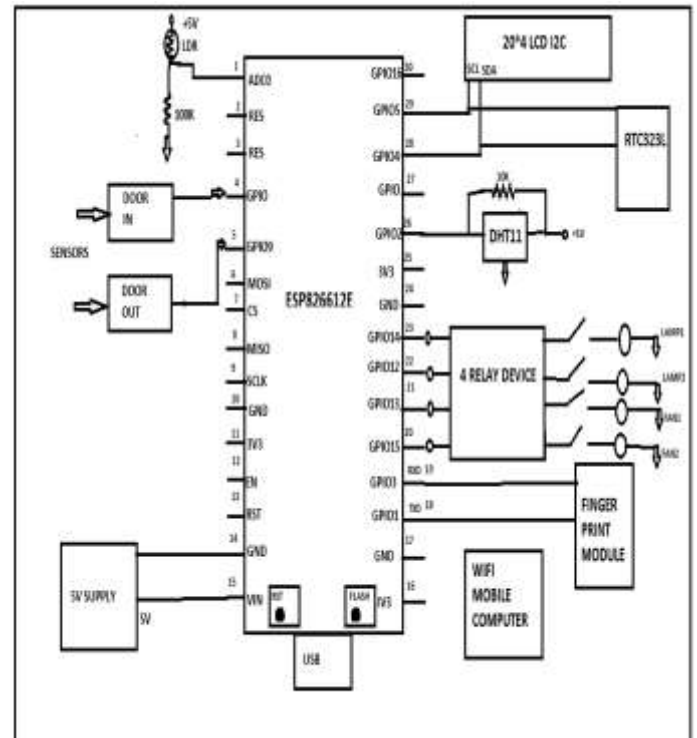


Fig.no.3.2 Circuit Diagram

Above diagram shows the circuit connection of smart classroom. Components includes are as follows:

ESP8266- Microcontroller ESP8266 offers a complete and self content WiFi networking solutions. ESP8266 has on board processing and storage capabilities allow it to be integrated with sensors and other applications through its GPIOs. [8]



Fig.no.3.3 ESP8266

DHT11 sensor -DHT11 sensor is use to sense the humidity and temperature in classroom. DHT11 can interface with any microcontroller like Arduino, Raspberry pi, etc. It is low cost humidity and temperature. [9]



Fig.no. 3.4 DHT11

Relay Module- Relay is an electrically operated switch that can be turn on or off, letting the current go through or not and can be control with low voltages like 5 volts provided by arduino pins.



Fig.no.3.5 Relay module

20*4 LCD- Liquid Crystal Display are use to display the required monitoring data of the class.



Fig.no.3.6 LCD

Fingerprint module -Finger print sensor R307 consists of optical fingerprint sensor, high speed DSP processor, simple structure. Sensing circuit standby current is very low, less than 5uA.



Fig.no.3.7 Fingerprint module

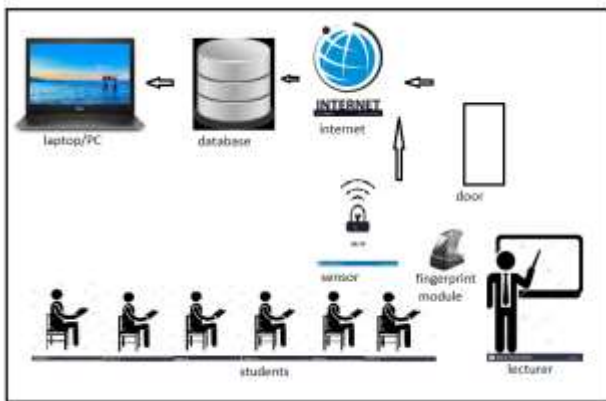


Fig.no.3.8. Overview of smart classroom .

V. RESULTS



Fig.no.4.1 Result.



Fig.no.4.2 Result

VII.CONCLUSION

This paper proposes an Automatic lights and fans control, Automatic attendance management system, which can reduce the bill and wastage of paper and time. This method also improves the efficiency of attendance management system. The system uses arduino connected to microcontroller to achieve the objective of our project. Attendance is counted by fingerprint module and this attendance will be displayed on lcd which is connected near the door. Lights, fans are also controlled by number of students present in classroom.

REFERENCES

[1] Suresh.S and H.N.S Anusha, “Automatic lightning and control system”, 2016 IEEE.
 [2] Shailendra, Manjot Singh, “Attendance Monitoring system” International Conference on Electronics and Communication Systems. pp.418-422, 2015.
 [3] Ching Hisang Chang “ Smart Classroom roll caller system with IoT Architechture”, 2011 second international conference on innovation in bio- inspired computer and application , pp.356-360, doi:10.1109/IBICA.2011.94
 [4] Vivek H Mahale, Pravin Yannawar, A.T. Gaikwad, “Overview of fingerprint recognition system”, International conference on Electrical, Electronics and optimization Technique(ICEEOT)-2016 IEEE.
 [5] Mariko Nakano, Hector Perez, “Fingerprint Recognition” International conference on internet monitoring and protraction(ICIMP)-2007,IEEE.
 [6] Hasmah Mansor, Mira Kartiwi, “Design and development of portable classroom attendance system based on arduino and fingerprint biometric” International Islamic University, Malaysia research endowment fund EDWB14-135-1020.
 [7] Fawaz Alassery, “A smart classroom of wireless sensor networks for student time attendance system” Integrated STEM Education conference (ISEC)-2019 IEEE.
 [8] <http://bbs.espressif.com/2015>
 [9] www.droboticonline.com