

A REVIEW PAPER ON: IOT Based Library Light Management System

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ABSTRACT - The idea behind this system is to give an easy and user-friendly IOT based library light management system to the users and in order to effectively use the time and energy of the staff and students, it is also important to maintain an organized way to library management. IOT Based Smart Library Lighting Management System has efficiently reduces man power to manually ON/OFF lights and can effectively work by sensing human heat by using PIR sensor. IOT Based Smart Library Lighting System is one of the best electricity saving method and can save electricity efficiently. IOT Based Smart Library Lighting System is very good for the various Library. IOT Based Smart Library Lighting system will only light ON when a person is searching a book in the bookshelf. IOT Based Smart Library Lighting system is smart because it is using sensors such as PIR Sensor and LDR sensor. In this project it uses LED, PIR sensor, LDR Sensor, Arduino UNO, Breadboard, and wires for connections.

Key words: Internet of Things (IOT), Temperature sensor, Arduino UNO, Relay, LED, Library, PIR motion sensor, Energy consumption, energy wastage.

1. INTRODUCTION

Internet of Things is a developing technology that has the potential to and will create the better world we have all been dreaming about. Traditional lighting systems are used in libraries in universities and colleges, and they require a switch to adjust the lights. This will cause unnecessary waste of electricity. As a result, this study suggests a system that uses Internet of Things (IoT) technology to automatically manage the lighting in the library to encourage efficient energy use. The system makes use of an Arduino and a motion sensor to track human movement and regulate the lighting in different regions of the library. This solution enables organizations to manage lighting in libraries more efficiently and improve energy efficiency. Using this technique makes the organization more convenient and environmentally beneficial. The IOT-based smart lighting system for libraries has effectively reduced the amount of effort needed to manually turn on and off the lights and can function by detecting body heat using a PIR sensor. One of the best effective methods to save electricity is with an IOT-based smart library lighting system. IOT

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2. LITERATURE REVIEW

A literature review creates a "landscape" for the reader, giving her or he a full understanding of the developments in the IOT based library management system. This landscape informs the reader that the author has indeed assimilated all previous, significant works in the field into her or his research.

[1] Chitra Batumalai, Xin Rou Kong, Malathy Batumalay "Smart Lighting System for Library Using IoT Technology" (INTI JOURNAL _June 2019). This paper is about a smart lighting system for library using iot technology is an automatic and intelligent lighting control system that is managed lights for particular areas in the library. This system helps organizations to understand lighting in libraries more efficiently and enhance energy efficiency. Using this approach makes the organization more convenient and environmentally friendly.

[2] Anurag Yadav.N. Gayathri "IoT with Motion Sensor Application for Smart Learning Environment" (May 2020)" In this study, we discovered that intelligent classrooms with motion sensors are a significant advancement that will likely be important in the future. This project is best for controlling the extra and unnecessary use of energy. IOT has a very high demanding scope in today's era. IOT is making things smarter like a smart home, smart cities. Thus, electrical energy is lost during the undesirable period. PIR sensors and LDR are used to automatically control this to solve. PIR senses the humans inside the classroom and only turns ON when there is some person inside the classroom and save the electrical energy.

[3] Francis Jesmar P. Montalbo, Erwin L. Enriquez, In this paper we have studied that the demand for IoT is considerably increasing in day today life and increasing the

interaction through the internet. It is possible to save time and effort by using devices like cell phones, laptop computers, or even wireless sensors to perform everyday tasks. An IoT system allows the exchange of data through a big network and provide a connection of wireless devices.

3. INFORMATION OF ARDUINO, PIR SENSOR, AND RELAY

The circuit for the proposed system consists of Arduino UNO, PIR Sensor, Relay and LED. Figure 5.1, the Arduino UNO is a microcontroller board using the ATmega328 as the microcontroller. This microcontroller is developed with some basic parts that can ease in utilization. These basic parts are 14 digital I/O pins, 6 analog inputs, 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. The most common ways to connect the microcontroller with computer using the USB cable. Besides that, it tends to be power up with a battery or the AC-to DC adapter. The PIR sensor is implemented in the system is shown in figure 5.2 The figure shows the image of the PIR sensor and the function of module pin outs, controls, and indicators. The VCC, Gnd and Out are connected to the Arduino UNO board to detect objects. This connection enables the Power LED to sense objects. If there is an object within the range of the IR Emitter LED, the PIR Emitter LED will send the rays from the object body surface to the PIR Receiver. At the same time, the obstacle LED would be on.



Figure 5.1 Arduino UNO



Figure 5.2 PIR

Sensors Figure 5.1 Arduino UNO Figure 5.2 PIR sensor LED used in this smart lighting system to represent the light in the library is as per figure 5.3 Show the circuit diagram. In that circuit diagram shows the overall connection between Arduino Board, PIR Sensor, Relay and Light.

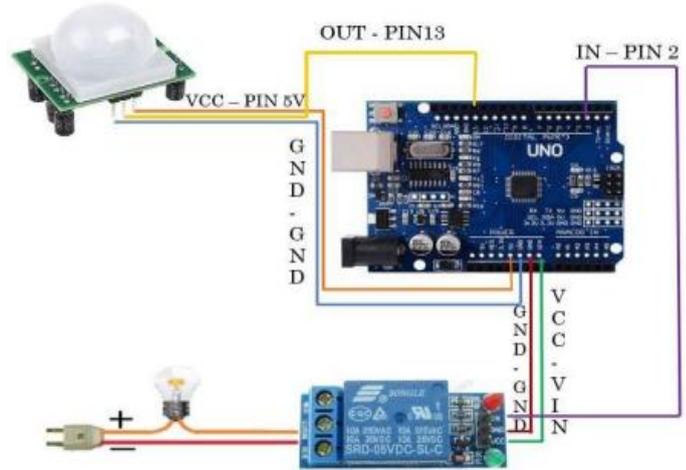


Figure 5.3 circuit Diagram

A Relay is an electromechanical device that can be used to make or break an electrical connection. It consists of a flexible moving mechanical part which can be controlled electronically through an electromagnet, basically, a relay is just like a mechanical switch but you can control it with an electronic signal instead of manually turning it on or off.



Figure 5.4 Relay

4. ADVANTAGES OF PROPOSED SYSTEM

Electricity energy conservation: - Due to the system's complete automation, unnecessary electricity or energy waste is prevented.

Library lights automatically turn off and on: - The IOT-Based Library Light Management System's Automatic Library Lighting can be used to automate the lighting in a room so that it turns on when someone comes and turns off when they depart.

Save money: - Unexpectedly frequently, people enter a room, turn on the light, and then forget to turn it off before leaving. Our power bill is reduced thanks to the occupancy sensors on the lights, which turn on when someone enters the building and switch off when no one is present. Unlike us, light sensors do not forget.

Easy to maintain and more reliable

5. COMMERCIAL USES

We are making decisions in this system based on human presence, but we can also interface LDR (Light Dependent Resistor) Sensor and Temperature sensor for better system operation and energy savings. This system can also be linked to a Bluetooth module, allowing us to control the entire system from the mobile phone. Our device's applications are listed below.

1. It can be used in businesses, colleges, and schools (Turn of lights and fans when no one is there).
2. It can also be installed at the front door of the house for home security purposes.
3. It can be utilized to create intelligent street lighting systems that effectively conserve energy.
4. It can also be used to create smart signal poles, which can help to reduce traffic and the amount of time it takes to manually clear the traffic.

6. CONCLUSIONS

Once this project is ready with all the functionality it is expected from the system that project should, whenever a person enters in library for searching a book in bookshelf the light in the top of bookshelf is automatically on and person take the book from bookshelf and leave the library the light is automatically off. The Smart Intelligent Library Lighting system helps in providing minimal power consumption in library. The low cost of maintenance and the decreased power usage in the modern world make it an important call at this hour.

7. FUTURE SCOPE

In the future, we will upgrade this system with a Bluetooth module. The user is automatically notified anytime a light bulb is blown, and they may easily replace the fuse bulb. For the purpose of adjusting the light intensity in accordance with the brightness intensity of the room, we can also add an LDR sensor to this system.

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