

Wireless Light Control System

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ABSTRACT

The objective of the project is to provide automatic control and fault detection on home appliances. The lighting system which targets the energy and automatic operation on economical affordable for the and immediate information response about the home appliances fault. Moreover, errors which occur due to manual operation can also eliminate. The home appliances switched ON/OFF through an Internet of Things (IoT). The house light system is checking the weather for house switches ON/OFF condition. The weather is light or dark are sense through a LDR sensor, If the weather is light, the system will OFF. If the weather is dark, the light system will ON. After the light on the light condition also check through LDR sensor for light glow or not glow status. If light is not glowing, the sensor sends the value to light system. The house light system will generate message and send SMS to ward member and ward serviceman mobile number through GSM. At the same time the sensor values are stored in cloud server. We can access the light system data in cloud anywhere and anytime.

COMPONNATS : Power Supply, Load(bulb 220v), Connecting wire, Vero Board, SmartPhone, 8 Channal Relay(5v), AC712 current sensor, Mobile Google assistance.

1. INTRODUCTION

The house light system is the one of the largest energy expenses for a city. A smart home appliances system can reduce the corporation lighting costs. Recently however with the increasing importance for saving power and proper maintenance are leading to develop a latest techniques and technologies which permit significant power savings and larger respect for the environment and more effective management. In this system gives the solution to those problems. An automatic light system using sensors and wireless modules for implement a system. The LDR(light dependent resistor) sensing the environment. The system can identify the light or dark environment using LDR. The environment is dark the system allows to ON the lights. The environment is light the system allows to OFF the lights. Same this LDR operation is used to find the light fault detection. The GSM module is used to send the SMS to the users for the light faulty condition. At the same time we can access the light system status from the cloud system environment through a Wi-Fi module. So, we can access the light status in anywhere and anytime. Sensors feature a wireless transmitter that sends signals through the air to receivers embedded in gateways or repeater modules, which sends signals to a server, which then communicates back to the controller to adjust the status of the luminaire. Switches typically send signals directly to the luminaire controller. .During setup, all devices are discovered and added to a programmable network, where they're grouped and given assignments. Setup methods vary by manufacturer and include pushbutton programming, bar code scanning, mobile app setup, graphical database generation and others. For devices to communicate, they must be in range of each other to ensure reliable signal transmission. The devices are configured within a topology to ensure reliable signal pathways. And they must be designed to interoperate using the same protocol (communication method).

Otherwise, the system may be sized to two devices communicating within range up to autonomous pre-programmed room-based systems all the way up to building-wide networks programmable to controlled lighting via gateways and sending operating data back to a central server.

Objectives:-

Lighting applications represents 19% of the world's energy use and 6% of all greenhouse emissions.^[4] In the United States, 65 percent of energy consumption is used by commercial and industrial sectors, and 22 percent of this is used for lighting.

Smart lighting enables households and users to remotely control cooling, heating, lighting and appliances, minimizing unnecessary light and energy use. This ability saves energy and provides a level of comfort and convenience. From outside the traditional lighting industry, the future success of lighting will require involvement of a number of stakeholders and stakeholder communities. The concept of smart lighting also involves utilizing natural light from the sun to reduce the use of man-made lighting, and the simple concept of people turning off lighting when they leave a room

2. LITERTURE SURVEY

This paper focuses on a system that provides features of Home Automation relying on IOT to operate easily, in addition to that it includes a camera module and provides home security. The android application basically converts smart phone into are mote for all home appliances. Security is achieved with motion sensors if movement is sensed at the entrance of the house; a notification is sent that contain sapho to of house entrance in real time . This notification will be received by the owner of the house via internet such that app can trigger a notification. So owner can raise an alarmin case of any intrusion or he/she can toggle the appliances like opening the door if the person is a guest. The system uses Raspberry Pi, a small sized computer which acts as server for the system. The smart home consist two modules. Home automation that consists; fan light and door controller, and security module that consists; smoke sensor motion sensor and camera module.

This paper proposes an optimization of home power consumption based on PLC (Power Line Communication) for an easy to access home energy consumption. This also proposes a Zigbee and PLC based renewable energy gateway to monitor the energy generation of renewable energies. ACS and DDEM algorithm are proposed for the design of an intelligent distribution of power management system to make sure ongoing power supply of home networks. To provide efficient power management the power supply models of home sensor network are classified groups viz. main supply only, main supply and backup battery, rechargeable battery power and non-rechargeable battery power. Devices with particular features are assigned to these groups. It targets to establish real time processing scheme to address variable sensor network to pologies.

3. CONSTRUCTION AND WORKING

IOT applications have turned reactive medical based system into proactive wellness based system. IOT focuses on creating systems rather than equipment. IOT creates a future of medicine and healthcare which exploits a highly integrated network of sophisticated medical devices. The integration of all elements provides more accuracy, more attention to detail, faster reactions to events, and constant improvement while reducing the typical overhead of medical research and organizations.

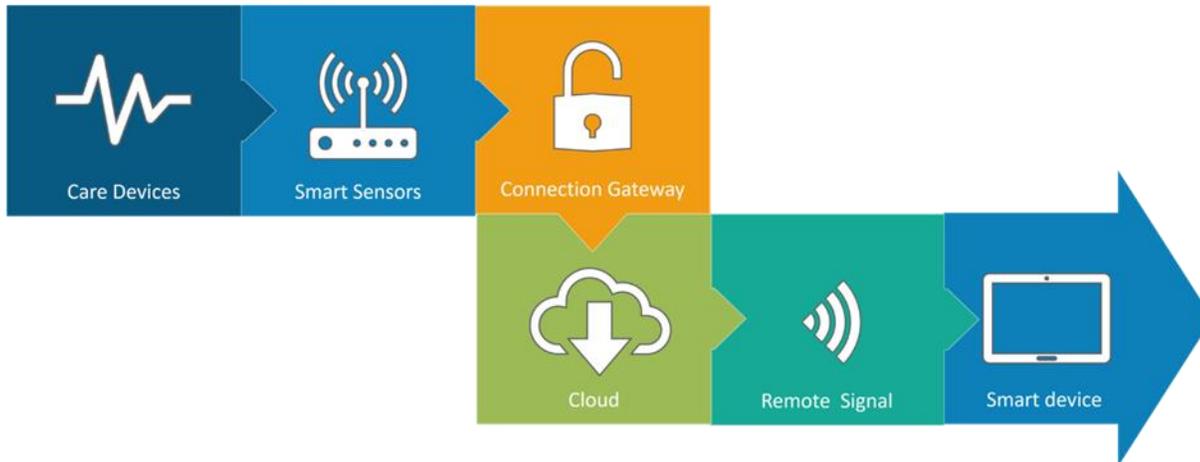
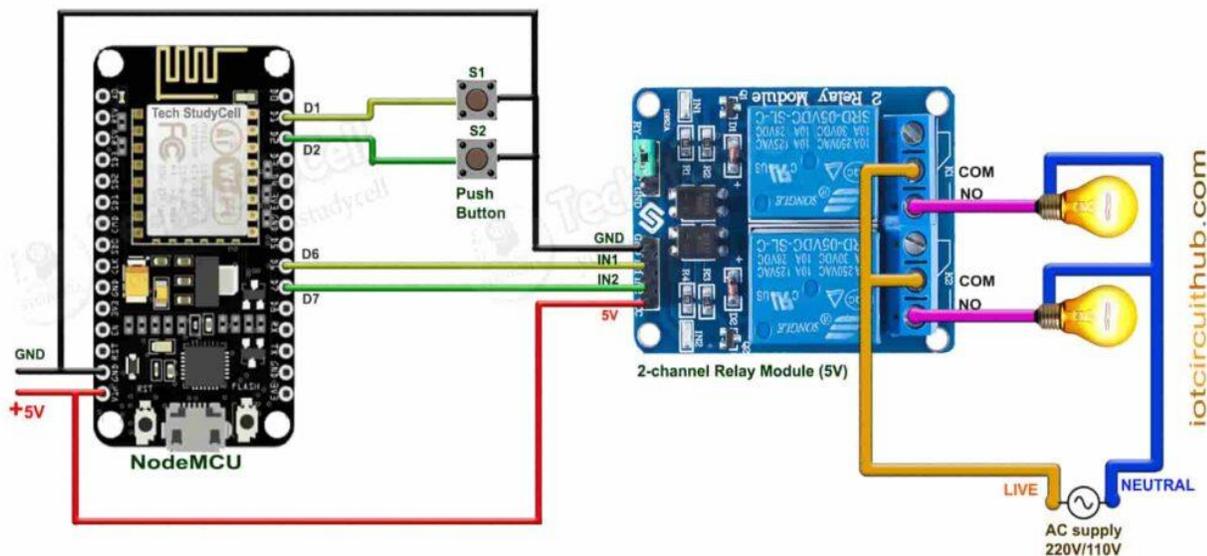


Fig-Working of IOT enables care devices

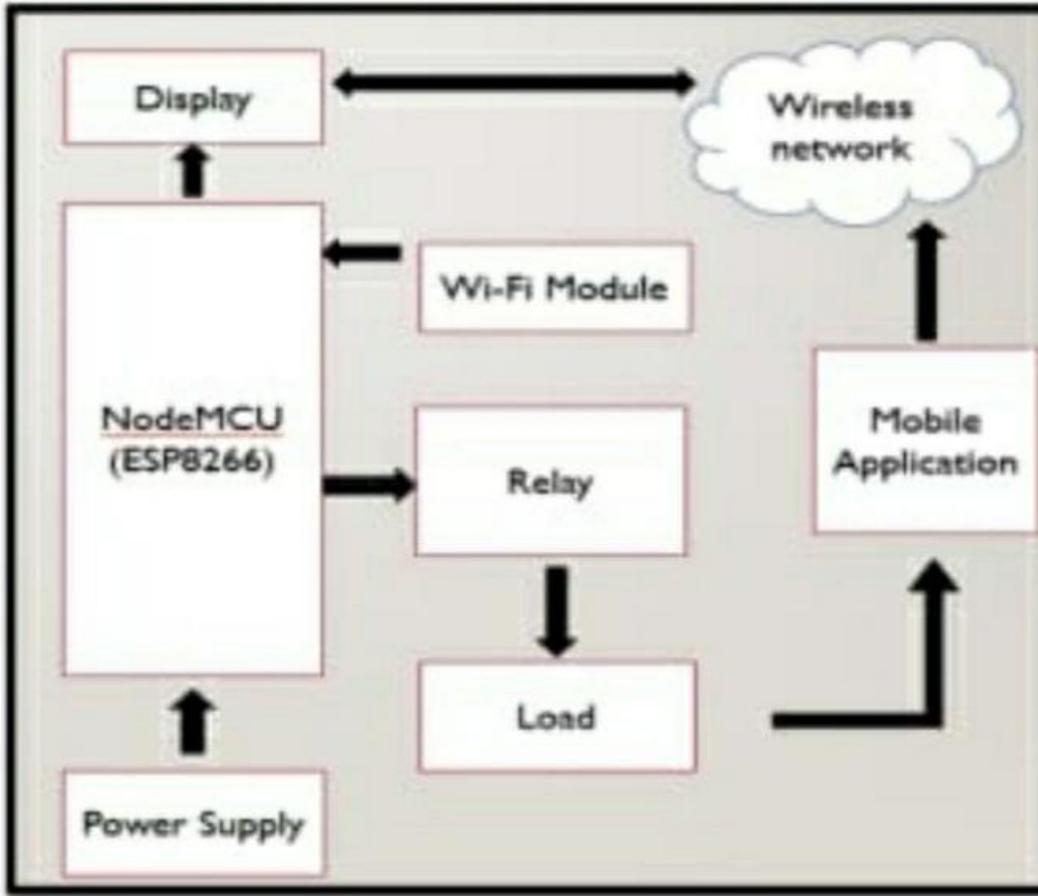
With the advancement in virtual assistants like Google Assistant and Alexa, Home automation and Voice controlled applications are becoming normal. Now, we ourselves have built many home automation projects, from simple Automatic Staircase Lights to IoT based web controlled Home Automation using Raspberry Pi. But this project here is different, the idea here is to create a practical Home automation board that can fit into our AC power units on our walls and stay concealed inside it. The board should not interrupt the normal working of our power unit switches, that is they should turn ON or OFF with manual switches as well. And without being said, it should also be able to control the same load with voice using google assistant and also set a timer so that any load can automatically turn ON or OFF during a preset time of the day.



NodeMCU control Relay Module



- NodeMCU is an open source firmware for which open source prototyping board designs are available. The name "NodeMCU" combines "node" and "MCU" (micro-controller unit). The term "NodeMCU" strictly speaking refers to the firmware rather than the associated development kits. Both the firmware and prototyping board designs are open source



Block diagram of proposed system

Advantages:

1. Increased security-the use of 128-bit Advanced Encryption Standard (AED) security boost the level of security offered by many wireless lighting technologies we have at comthe AES is so robust that the US Government gave a go-ahead for it to be used for the protection of classified information.
2. Scalability – wireless lighting technologies are ideal for multi-floor and multi-office installations since they support a wider range of gadgets ore a greater distance compared to wired ones. They are also easier to place in areas that are harder to access or where it’s more expensive to install wired lighting fixtures.
3. Convenience-wireless lighting control systems use mature technology with great reliability and robustness. Their installation is easy, and no training is required to learn how to operate them.

Disadvantages

1. A bad set-up can make them challenging to use – Because wireless lighting control systems differ from the traditional switches many people are used to, a bad design and installation can cause challenges in its use. At come install fully customised systems with bespoke engravings that can match your needs and requirements.
2. Require regular maintenance- even well installed and fully integrated wireless lighting control systems will have greater lifespan with good maintenance.

6. CONCLUSION

An automatic street light control and fault detection system with cloud storage in this paper, control the street light ON/OFF automatically depends on the environment situation and we can easily identify the light faults in this system easily and also the system sends alert message to the authorized person's mobile numbers. We can monitor the system anywhere and anytime via cloud storage system. This system is very useful to Municipal Corporation. In, Future we will find the sensor's faults and power supply faults in the system and also we will control the light power adjustment depends on the environment.

REFERENCES

1. Mr. Amey J.Manekar, Dr. Dr. R .V. Kshirsagar ” Design and Implementation of Automatic Street Light Controller for Energy Optimization Using FPGA”, International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 6, June 2016.
2. Chaitanya Amin, AshutoshNerkar, Paridhi Holani, Rahul Kaul ”GSM Based Autonomous Street Illumination System for Efficient Power Management” International Journal of Engineering Trends and TechnologyVolume4Issue1 - 2013
3. K.Y.Rajput, Gargeyee Khatav, Monica Pujari, Priyanka Yadav” Intelligent Street Lighting System Using Gsm” International Journal of Engineering Science Invention Volume 2 Issue 3 , March, 2013.
4. V.Sumathi, A.Krishna Sandeep, B.Tarun Kumar “Arm Based Street Lighting System with Fault Detection” International Journal of Engineering and Technology- Vol 5 No 5 Oct-Nov 2013.