IOT - SMART SWITCH

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ABSTRACT

It is a low cost and flexible home control and environmental monitoring system. It employs an embedded micro – web server in NODE MCU microcontroller, with IP connectivity for accessing and controlling devices and appliances remotely. These devices can be controlled through a web application or via Bluetooth Android based Smart phone app. The proposed system does not require a dedicated server PC with respect to similar systems and offers a novel communication protocol to monitor and control the home environment with more than just the switching functionality. To demonstrate the feasibility and effectiveness of this system, devices such as light switches, power plug, temperature sensor, gas sensor and motion sensors have been integrated with the proposed home control system. Therefore this system has been successfully designed and implemented in real time.

The Internet of Things (IoT) refers to a system of interrelated, internet-connected objects that are able to collect and transfer data over a wireless network .It used to be controlled by websites and smart phone applications remotely, also, to control tools and instruments by codes and algorithms structures for artificial intelligence issues. In case we want to create advanced systems using different algorithms, Wi-Fi or Ethernet connection is connected to our tools, equipment, and devices controlling them by smart phone applications or internet websites. A smart home to operate lamps or other home-use devices, it can be used as a security system or an industrial-use system, for example, to open or close the main building gate, to operate full automatic industrial machine, or even to control internet and communication ports using IoT technology. A huge industrial facilities or governmental institutions have much of lamps. Employees sometimes forget to turn them off in the end of the day. This research suggests a solution that can save energy by letting the security to control lighting of the building with his smart home by Blynk application. The lamps can be controlled by switches distributed in the

building and Blynk application at the same time with a certain electrical installation. This research presents a simple prototype of smart home, or the easy way and low cost to control loads by Wi-Fi connection generally.

INTRODUCTION

Here introduce the paper, A load controlled by computer systems has many advantages compared with manual controlled loads. Nowadays there are many programs and applications help to control things better using codes or python algorithms in artificial intelligence projects. In order to save energy and make loads monitored easily, this research suggests smart home project based on IoT technology. This smart home is an Internet of Things (IoT) project that controls loads with internet connection via Wireless Fidelity WIFI connection. A smart phone connected to internet with Blynk application as a control panel, and NodeMCU microcontroller kit in other side as a controller that receives control commands via WIFI signal. NodeMCU kit is built with ESP8266 WIFI receiver that able to process and analyze WIFI signal to input the microcontroller. The WIFI receiver and microcontroller are built in one kit to be used as IoT project. It"s called NodeMCU. To connect the system to the Internet, needs a WiFi receiver. In my case I used ESP8266 that is connected as built-in in the NodeMCU board that contains a firmware runs with the ESP8266. The firmware is a low-level control computer software.

LITERATURE SURVEY

The expeditiously growing internet has opened new horizons for development in various fields. The home automation industry has seen a brisk growth in the last few years. It has become a topic of interest of many people around the globe. Vishwateja Mudiam Reddy & Naresh Vinay in their paper "Internet of Things Enabled Smart Switch"[1] designed a system which integrates the cloud and web app. With the help of flip-flops, logic gates and a processor, the switches could be controlled. The proposed model was intended for reducing the cost of these systems which was the main barrier in the wide adaptation of this technology. Khusvinder Gill & Shuang-Hua Yang[2] created a common home gateway for ZigBee and Wi-Fi. This enabled remote control using a simple user interface. The system was cost effective and had good security inside the house. Salma and Dr. Radcliffe[3] with an aim of increasing the popularity and reach of home

automation designed a system that used the Novel Network Protocol. It gave the option of controlling the commercial devices through a mobile or laptop. An additional network device was used for remote access instead of a microcontroller. A flexible and simple system with an ability to integrate with very fewer efforts for off the shelf products was created by Carelin and I. Jacob Raglend[4]. The system used ZigBee for home controlling and GSM for remote access. It did not provide any GUI and also it was prone to security threats as anyone could access the system. Rozita Teymourzadeh, Salah Addin Ahmed[5] designed a GSM based system for home automation. Using the GSM protocol, it became possible to access the system by using the Short Message System (SMS). The system also gave feedback to the user about the current state of any desired object.

IMPLEMENTATION

The home automation circuit is built around ESP8266, Blynk Android App, and 2-channel relay board. The hardware set up should be according to the circuit diagram. AC mains appliances (Bulbs) will be connected to relays which are controlled by the ESP8266.Once Arduino IDE is installed on the computer, connect the board with the computer using the USB cable. Now open the Arduino IDE and choose the correct board by selecting Tools>Boards>NodeMCU1.0 (ESP-12E Module), and choose the correct Port by selecting Tools>Port. To get it started with the NodeMCU board and blink the built-in LED, load the example code by selecting Files>Examples>Basics>Blink. Once the example code is loaded into your IDE, click on the „upload" button given on the top bar. Once the upload is finished, you should see the built-in LED of the board blinking. User has to install and configure the Blynk App as per the above instructions. NodeMCU to 2- Channel Relay Board Connect D0 pin of NodeMCU to input pin of Relay board, Connect D1 pin of NodeMCU to input pin of Relay board. Connect 3.3V of NodeMCU to Vcc pin of Relay board, Connect GND pin of NodeMCU to GND pin of Relay board. We are including ESP8266 WiFi library which provides ESP8266 specific WiFi routines and we are calling it to connect to the network. BlynkSimpleEsp8266 library establishes the communication between Blynk App and ESP8266.

ADVANTAGES

• Can operate from any place with networking

• Easy to operate

• Less Hardware devices

• Less complexity

• High accuracy

APPLICATION

• Smart home

• Smart city

• Smart grids

• Industrial internet

• Connected car

• Agriculture fields

CONCLUSION

In our planned model a high proportion of accuracy has been achieved through implementation. This method is capable of dominating the house appliances supported the user desired mode. All the modes work with sensible accuracy that was found throughout implementation. Users solely ought to choose modes from their smartphones and our system can do the remainder of controlling the appliances. This planned project is extremely reliable. Therefore it is aforesaid that this system has higher accuracy with nice potency. This system has immense opportunities to upgrade within the future. As mentioned

earlier this is often the primary generation of home automation. It might be upgraded to the second generation by storing and analyzing knowledge on the cloud servers. Then victimization machine learning algorithms, we have a tendency to even ought not to select modes from smartphones. Rather it'd be ready to switch modes with its own computer science.

FUTURE SCOPE

Smart Homes

In the coming years, fully automated smart homes will surely become a reality as the home automation is developing rapidly. Due to good user convenience, smart homes are appealing a wide range of people all over the globe. The User can check for the electricity usage, the condition of his devices and get notification accordingly

Smart Cities

With increasing automation and IoT, devices can communicate with each other. This will help in building new and smarter cities. Cities that would be free form pollution, traffic accidents, etc. problems.

Agriculture

The proposed system can be used in Agriculture as well. The various devices used in fields can be operated from any remote location.

RESULT
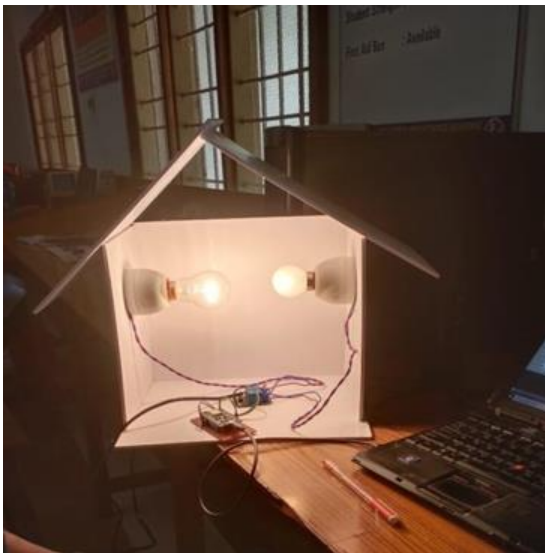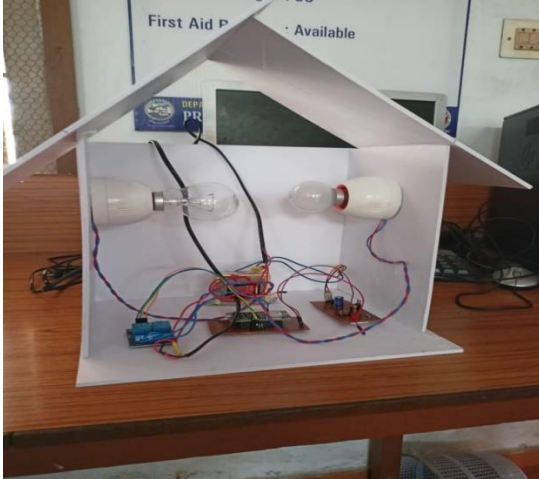
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