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Review on IOT based Home Automation

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ABSTRACT: This proposed project presents complete design of Home Automation with low cost and wireless system. It specifically focuses on the development of IOT (Internet of Things) based home automation systems that are capable of controlling various components with the Internet or automatically programmed to operate from environmental conditions. We used Node MCU, popular open source IOT platform, to perform the process of automation. Different components of the system will use different transmission modes that will be implemented by user to convey device control through the node MCU to actual device. The main control system applies wireless technology to provide remote access from smart phones.

KEYWORDS: Home Automation, IOT (Internet of Thing), Node MCU, Blynk.

I. INTRODUCTION

Internet of Things (IOT) is a concept where devices are assigned an IP address and that IP address makes that device identifiable on the Internet. The ability to transfer data with the help of a network does not require human-to-human or human-to-computer interaction. Basically, it started as the internet of computers. Research studies predict an explosive growth in the number of things or we say devices that will be connected to the Internet. Recent developments in technology allow the use of wireless controlling environments such as Bluetooth and Wi-Fi that have enabled the ability of various devices to connect to each other. Using a WIFI shield to act as a micro web server for the Arduino that eliminates the need for a wired connection between the Arduino board and the computer reduces costs and enables it to act as a stand-alone device. The Wi-Fi Shield requires a connection to the Internet from a wireless router or wireless hotspot and will act as a gateway for the Arduino to communicate with the Internet. Keeping this in mind, internet based home automation systems are designed for remote control and status monitoring of home appliance

II. LITERATURE SURVAY

There are many researchers related to home automation platform using IoT devices. Along with this research has been done on various studies of applications of Maharashtra, IOT of Things. In the future, the Internet of Things (IOT) is all over us.

Ahmed ElShafee (2012)

This paper presents a design and prototype statement of a new home automation system that uses WiFi technology as the network infrastructure. He explained that the essential goals and objectives of a home automation system for a part are constructive. The system design and architecture is discussed and the prototype presents the homeplaton control problem and the remote monitor is implemented. Lastly, their system is available to professional users.

Vinay sagar K (2015)

This system can be used to control various low cost devices and allow value expansion. the house Automation devices using Internet of Things have been experimentally proven to work satisfactorily and controlled remotely over the Internet.



III. PROPOSED SYSTEM DEVELOPMENT

The project is composed of several components and they are: Node MCU (ESP8266), Relay module, Li ion Battery (5v), Bulb.

- **WIFI NodeMCU-**
NodeMCU (Node Microcontroller Unit) is an open-source software and hardware development environment built around an inexpensive system-on-a-chip (SoC) called the ESP8266. Designed and manufactured by Espressif Systems, the ESP8266 contains the essential components of a computer: CPU, RAM, networking (WiFi), and even a modern operating system and SDK. This makes it an excellent choice for all kinds of Internet of Things (IoT) projects.



Fig. Node MCU (ESP8266)

- **Relay Module-**
A relay is an electromechanical device that uses an electric current to open or close the contacts of a switch. A single-channel relay module is much more than just a simple relay, it contains components that facilitate switching and connection and acts as an indicator to show whether the module is powered and whether the relay is active.



Fig. Relay module

- **Li Ion Battery or 5v Supply-**
In this proposed project Node MCU and Relay module need 5v DC supply. Lithium batteries feature a primary cell construction. This means they are single-use—or non-rechargeable. On the other hand, ion batteries feature a secondary cell construction.



Fig. Li ion Battery



- Bulb-
Bulb is an electrical device. With the help of IOT, Node MCU and Relay module we can control or monitor Bulb or other home Appliances remotely.



Fig. Bulb

IV. WORKING OF SYSTEM

NodeMCU is very popular in home automation. Its WiFi capability and Arduino IDE support make it easy for IoT applications. It is very small and has many digital I/O pins, serial communication and I2C communication. The NodeMCU has a micro USB port for programming using your existing mobile cable (no additional programmer required). There is a successor called ESP32 development board which has more analog pins and digital pins. You can use any one of them for this project as per your requirement. Here we will use NodeMCU.

Blynk is a mobile application that has its own server to process user requests. It is an open source application and anyone can use it to control devices in their home automation, monitor sensor data and receive notifications through certain trigger actions.

With the help of Blynk app we have to load the code in NodeMCU. After successfully uploading the code to the NodeMCU board, you can start controlling home appliances using the Blynk app. All you need to do is click on the On/Off button on the Android app.

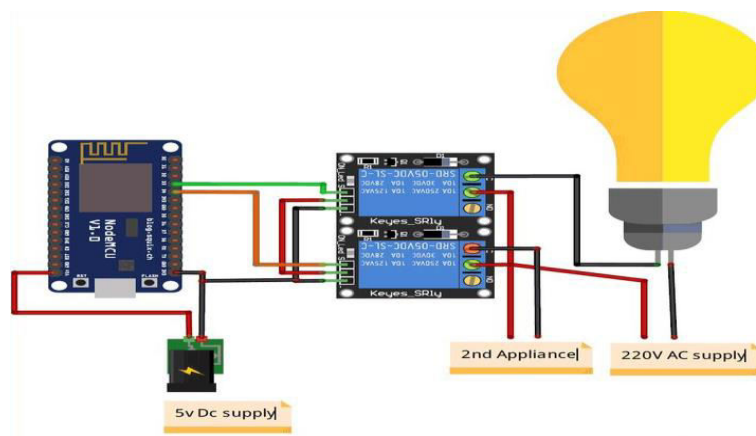


Fig. Circuit diagram



V. APPLICATION

There are some known applications of Home Automation and they are presented below:

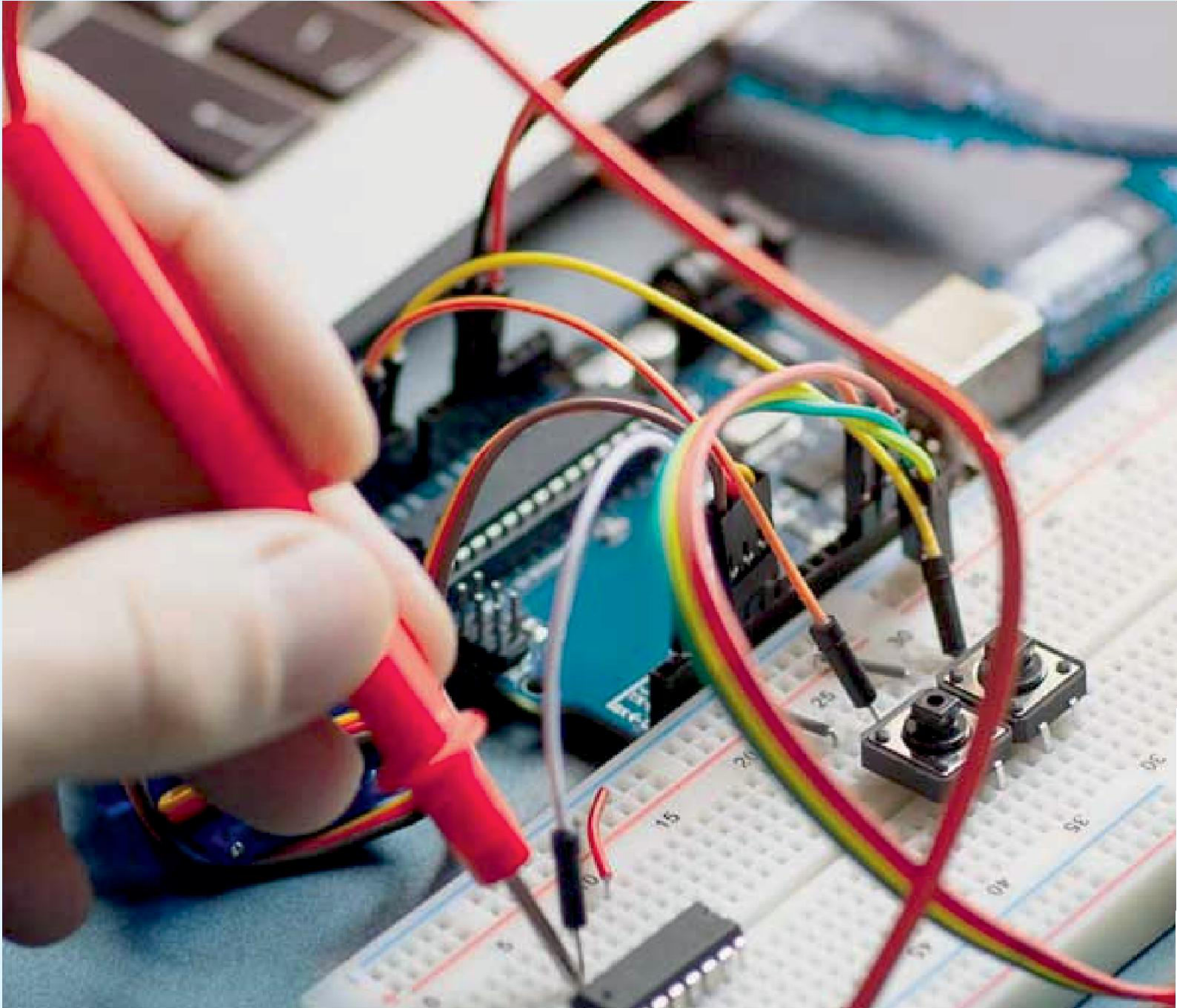
- (a) It can be used Automatic regulation of home appliances.
- (b) It can be for Home air quality and water quality monitoring.
- (c) Also use for regulate home electrical and electronic devices like windows, refrigerators, fans, lights, fire alarms.

VI. CONCLUSION

Using IOT based Home Automation we can control or monitor the home appliances. A smart home integrates various electrical devices in the home and automates them with no or minimal user intervention. Keeps a smart home Tracks and guides the various environmental variables present Equipment to work according to the needs of the user.

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