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IOT Based Intelligent Home by Using Android App

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ABSTRACT: This proposed system having an idea or a concept for home automation using ESP 8266 with Blynk, Manual switch to control 4 relays with and without internet and monitor the real time feedback in the Blynk app. Automation of device has a wide scope for this generation as well as in forthcoming generation. In this mobile communication technology is playing a major role in the world of automation. This articles is fully based on low cost and reliable home control monitoring system for accessing and controlling devices and appliances remotely using Android based smart phone application. while using this technology the system improves the living standard at home, reduce human effort, energy efficient and time saving and thus make a smart home. And also it is very helpful for providing support to disable people and fulfill their needs in home and thus they leads a normal life. This propose system consists of Android mobile in using ESP 8266 with Blynk app, IR remote & Manual control relays. We are a using Wi-Fi technology to monitor the device because of its accuracy, high range and instant connectivity. This module controls the home appliances with a very ease of installation and it is user friendly.

I. INTRODUCTION

Home automation is become more beneficial because of its safety and security. Nowadays, home automation become more advance and precise to monitor all the home appliances. Home automation system become energy efficient and highly approachable smart home technique. It involves basic feature to maintain the user satisfaction and comfort. Home automation is a unique system that can control and communication between nearly all aspects of your house. Home automation is a term used to describe the working together of all household amenities and appliances. for example, a centrally microcontroller panel can have the capability to control everything from heating and overall electrical appliances.

Home automation can include controlling aspects of our home remotely through a computer or any mobile equipment, programming electronics devices to conditions or scenario or centralizing the control of a variety of appliances in our in to a single control center. It is essential that the different controllable appliances be interconnected and communication with each other. The main purpose of home automation is to control or monitor signals from different appliances or basic services. A smart phone can be used to control or monitor the home automation system.

II. PROPOSED WORK

This is IoT project, It's to make a simple ESP 8266 IoT smart home automation using Blynk to control 4 relays with and without the internet. With this ESP 8266 project, It can control 8 home appliances from the smartphone, IR remote, and manual switches. If there is no internet available still it can control the relay module from the IR remote and manual switches.

iii. Proposed system functions

In this project required following component for this ESP 8266 home automation system and smart relay module PCB.

- ESP 8266 DEV KIT V1
- 8-channel 5v SPDT relay module
- Switches or Push Buttons

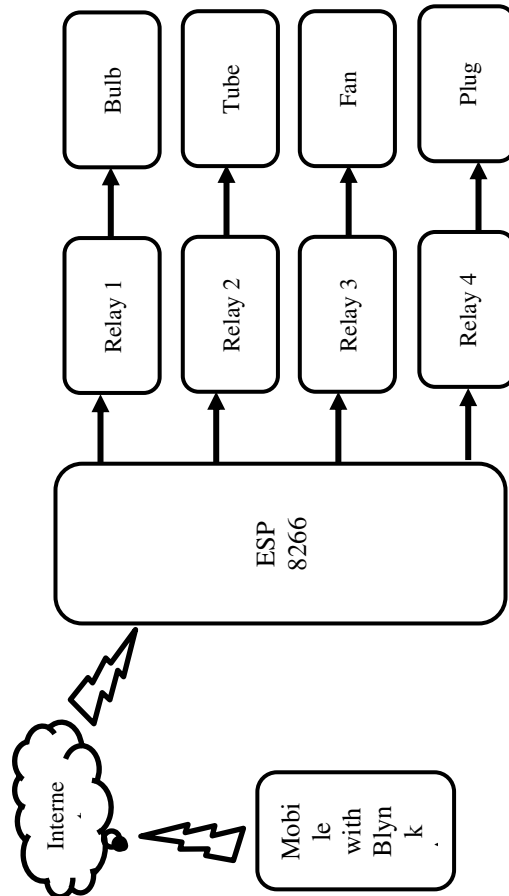
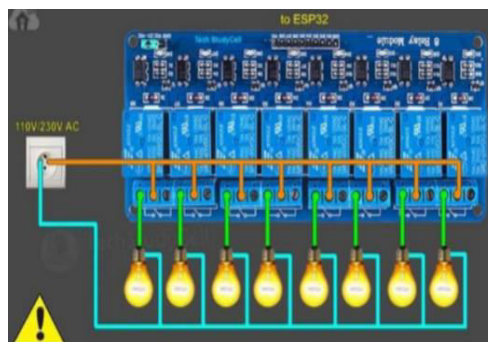


Fig. 1. Block Diagram of proposed system

Connect Home Appliances with Relay Module:



- Connect the home appliances with the relay module as per the circuit diagram.
- Take proper safety precaution, while working with high voltage.
- Now, turn on the 5V DC supply and 110V/220V AC supply.

ESP8266 CONTROL RELAY WITH BLYNK APP –

If the ESP8266 is connected with Wi-Fi, then we could control the relay module with Blynk App. We could control, monitor the current status of the relays from anywhere in the world from the Blynk App. When the internet comes

back, the ESP32 will fetch the previous state of the switches from the Blynk IoT server and accordingly turn on and off the relays.

CONTROL RELAYS WITH SWITCHES OR PUSH BUTTONS –

We could also manually control the appliances from the switches. If the ESP8266 connected with Wi-Fi then it will send real-time feedback to the Blynk server.

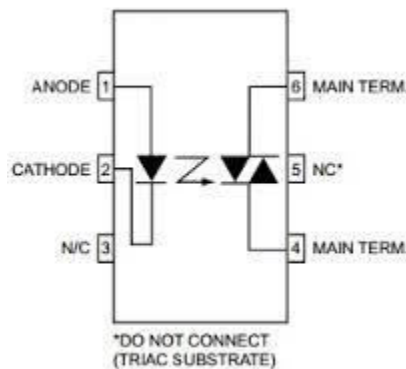
MAX 232:

We are using MAX 232 for serial communication with the components that are Wi-Fi module. MAX232 is used to provide TTL to the components as per the requirement. GSM needs TTL so it is connected to Arduino through MAX232. Some Wi-Fi module doesn't require TTL because it's already build in it and some may require based on its working.

Wi-Fi MODULE (ESP8266):

Wi-Fi stands for Wireless Fidelity. We are using Wi-Fi which acts as heart for IoT. Through Wi-Fi the consumer can set changes in threshold value, he can ON and OFF the electric use. Time to time the readings of units and cost are displayed on blynk app. Consumer can accesses the Arduino board and smart switch with help of Wi-Fi.

DRIVER CIRCUIT (moc3071):



- └ It is a 6 pin device known as opto coupler or opto isolator.
- └ In our project we are using this opto coupler to cut off the AC load.
- └ It is connected to the SSR to cut off the AC load.

SWITCHING DEVICE:

In our system we are using SSR as switching device even though we can use RELAY because SSR is highly advantageous. We are using switching device to switch the energy meter. For ON and OFF purpose of meter we are using switching block. SSR stands for SOLID STATE RELAY.

Why SSR instead of RELAY?

- └ Both are used as AC switching device, but if switching speed is high than SSR is suitable, if switching speed is slow than RELAY is used.
- └ Relay life decreases as number of usage time increases, but in SSR there is no change.
- └ For driving RELAY, current or power required is more comparatively to SSR.
- └ For switching SSR requires 15amp, whereas RELAY needs (30amp,50amp,90amp) as per requirement.

III. LITERATURE SURVEY

Smart Energy Efficient Home Automation System using IOT”, by Satyendra K. Vishwakarma, Prashant Upadhyaya, Babita Kumari, Arun Kumar Mishra.

This paper presents a step-by-step procedure of a smart home automation controller. It uses IOT to convert home appliances to smart and intelligent devices, with the help of design control. An energy efficient system is designed that

accesses the smart home remotely using IOT connectivity. The proposed system mainly requires, Node MCU as the microcontroller unit, IFTTT to interpret voice commands, Adafruit a library that supports MQTT acts as an MQTT broker and Arduino IDE to code the microcontroller. This multimodal system uses Google Assistant along with a web based application to control the smart home. The smart home is implemented with main controller unit that is connected with the 24-hour available Wi-Fi network. To ensure, that the Wi-Fi connection do not turn off, the main controller is programmed to establish automatic connection with the available network and connected to the auto power backup.

“IOT Based Smart Security and Home Automation”, by Shardha Somani, Parikshit Solunke, Shaunak Oke, Parth Medhi, Prof. P. P. Laturkar.

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 Smartphone into a remote 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 contains a photo 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 alarm in 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.

“A Dynamic Distributed Energy Management Algorithm of Home Sensor Network for Home Automation System”, by Tui-Yi Yang, Chu-Sing Yang, Tien-Wen Sung.

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 topologies.

“Enhance Smart Home Automation System based on Internet of Things”, by Tushar Churiasia and Prashant Kumar Jain.

This paper proposes a system that develops a model to reduce the computation overhead in existing smart home solutions that uses various encryption technologies like AES, ECHD, hybrid, etc. these solutions use intermediate gateway for connecting various sensor devices. The proposed model provides a method for automation with sensor based learning. The system uses temperature sensor for development but other sensors can also be used as per requirement. These smart home devices with sensors can configure themselves autonomously and can operate without human intervention. This work minimizes encryption decryption and focuses on authentication and automation of smart home devices with learning. The system bypasses local gateway mentioned in existing system to provide better security for smart home devices and sensor data and save computation overhead. The real time broker cloud is directly connected with smart home and manages all incoming and outgoing request between users and devices. The main purpose to use real time broker cloud is save time of cryptographic operations.

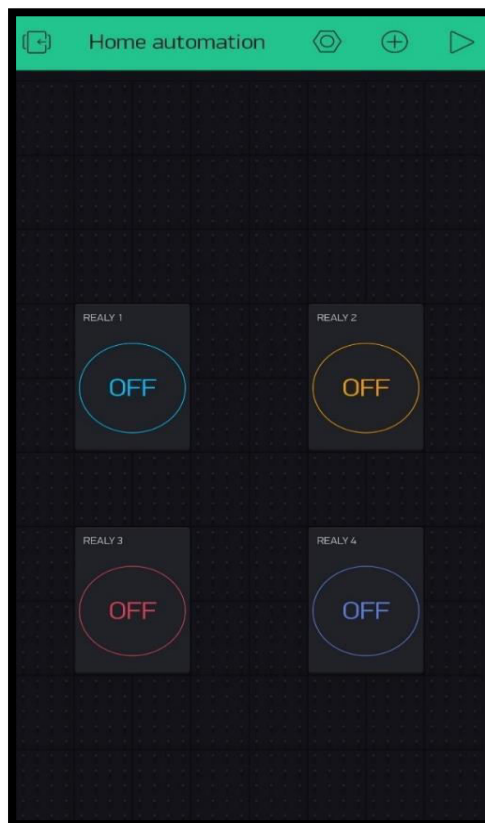
“Visual Machine Intelligence for Home Automation”, by Suraj, Ish Kool, Dharmendra Kumar, Shovan Barman.

The paper present a vision-based machine intelligence system to sense on/off state of common home appliance. The proposed method of sensing the state of appliances results on a novel home automation system. The accessibility of the suite of devices in the home over a remote network is facilitated by the IP Addressing methods in the IOT. This project uses two boards viz. Raspberry Pi and Intel Galileo Gen 2. The communication between the User devices, Raspberry Pi and the Intel Galileo boards happens over a wireless network. The UDP protocol is deployed to facilitate the wireless communication of the nodes present in the home automation network. A Pi Cam and a USB Logitech camera attached to the rotating shaft of two different servo motor capture snapshots that are passed as inputs to the Machine Learning based models trained using dlib-C++ to detect the state of the operation of the appliances. The proposed method uses visual modality to automate the appliances, as privacy concerns may emerge while using the images from some specific places, as a counter to this issue, an SPDT switch is added to the Raspberry Pi which when turned off ensures that even

if the images are taken from the webcams, they are just passed as inputs to the machine learning models and are not displayed on the website when the users access the website on the server address obtained from Raspberry Pi.

IV. RESULT

The result section will include the result of present system is follows,



V. CONCLUSION

In this proposed work, an internet based smart home system that can be controlled upon user authentication. is proposed and implemented. The home automation using iot has experimentally proven to work by connecting effortless appliances to it. The designed system instigates a process according to the user's. requirements. The android based smart home app communicates with ESP8266 with Blynk app and manual control relays.

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