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Integrating Physical World with Digital World using WhatsApp Chatbot

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ABSTRACT: Home Automation is expected to improve living standards with evolution of Internet of Things (IoT). It is used for controlling lights, ceiling fans and other alternative electrical appliances containing Internet-Of-Things.IoT refers to the devices or things connected to the Internet.In IoT based home automation system is implemented using Node MCU that can be controlled using the WhatsAppchatbot.User can access to the devices anytime by connecting to the network and control them using WhatsAppchatbot. The WhatsAppchatbot allows user to control the home appliances through any internet enabled device such as smart phone or laptop.

This project presents the overall design of home automation system using WhatsApp chatbot with low cost and wireless system. Home automation aims helping people to use the home appliances built and freely autonomous environment in house. The aim of this project is the full security and controlling the appliances using wireless communication as Wi-Fi. We design this system with the implementation of related hardware and software.We used Node MCU, is a popular open source IoT platform, to execute the process of home automation. We are using MQTT cloud-based communication. That would add to the practicality of the project by enabling unrestricted accesses of the appliances to the user irrespective distance factor. The home automation system improves the standard living at home.

KEYWORDS: -IoT, Home automation, home security, Python programming, Smart Phones, Relay Board, Wi-Fi Built-inNode MCU, WhatsAppChatbot**.**

I.INTRODUCTION

Internet of Things (IOT) is a concept where each device is assigned to an IP address. Basically, itstarted as the "Internet of Computers." Research studies have forecast an explosive growth in the number of "things". The resulting network is called the "Internet of Things (IOT). Home Automation is like a perfect solution for the current situation where we want every small task to happen with a click of a button. Our project is a small attempt towards an efficient and affordable home automation which specifically focuses on the switching on and off of electrical appliances like lights, ceiling fans and other alternative electrical appliances of a house.Home automation can include controlling aspects of our house remotely through your smart phone (via WhatsApp chatbot).The home automation is nothing butinterconnection of physical devices embedded with software and sensors. Where we can turn lights on or offthrough our mobile phones.

Home Automation with WhatsApp Chatbot - Our project intends to allow users to control electric home appliances, over internet using Internet of Things (IoT). Thus, increasing the efficiency and ease of use. We intend to make efficient use of IoT to provide a congruent zone for a two-way conversation between the system and the user.Through WhatsApp chatbot we fire a command and get the desired output.to make it simple also developed where we can ON and OFF light and other alternative electrical appliances through this WhatsApp chatbot. To make it user friendly WhatsApp chatbot is developed. The WhatsApp chatbot is making a world even better and smart and it will be very easy for the users to communicate. It is changing the use for other small devices. It will be more convenient for the users to use a chatbot rather than using a traditional handheld device. chatbot is replacing the

customer care. Using machine learning and Artificial Intelligence (AI) is making chatbots smarter and take intelligent decisions. The Procedure is must because the user gets their devices from different brand, only with the help of protocol functions the devices can be communicated with other devices.

Here, we have used Node MCU as the main module of the system, it is a low-cost microcontroller which consists of an open firmware for which open prototyping board designs sourceare available. The name "Node MCU" combines "node" (micro-controller unit). and "MCU".The whole system is unique because of the use of the Internet of Things (IoT).Internet of Things (IoT) enables the feature of using the commands from anywhere in the world through chatbot. Therefore, it is possible and easy to operate home appliances from any part of the globe.

II.LITERATURE REVIEW

This paper illustrates a methodology to provide a low-cost Home Automation System (HAS) using Wireless Fidelity (Wi-Fi). This crystallizes the concept of internetworking of smart devices. A Wi-Fi based Wireless Sensor Network (WSN) is designed for the purpose of monitoring and controlling environmental, safety and electrical parameters of a smart interconnected home.[1] For the accessibility of the suite of devices in the home over a remote network is facilitated by the IP Addressing methods in the IOT.[2] For providing efficient power supply and 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.[3]This multimodal system can also use alternatively Google Assistant along with a web-based application to control the smart home, WhatsApp chatbot. The smart home is implemented with main controller unit that needs to be connected with the 24-hour available Wi-Fi network.[4] Failure in any type of power or connection will lead to failure of the system. Research work on this topic shows that the there is huge future scope for working on this topic. 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.[5] The smart home consists two modules.[5] Home automation that consists; fan light and door controller, and security module that consists; smoke sensor motion sensor and camera module.[5]

III.EXISTING SYSTEM

The resulting home automation system contains of adapters that enable present non- smart devices to be automatic. An operator can control these adapters with an Android application, either directly connected to the network of adapters, or through the Internet with the help of a gateway connected in the network.

IV.PROPOSED ARCHITECTURE

The android OS provides the flexibility of using the open source. Android Phone acts as a client and data are sent via python programming. The WhatsApp chatbot takes command from user in different modes. In this system WhatsApp chatbot used to send signal to Node MCU and Wi-Fi module connected to Node MCU gives this signal to Wi-Fi for controlling appliances using relay board.

1) WhatsApp chatbot in smart phone sends the signal to the Wi-Fi module which is connected to same network. WhatsApp chatbot has all the different message for each appliance.

2) Wi-Fi module receives the signal from the WhatsApp chatbot and give this signal to the Node MCU for processing.

3) We use Node MCU as controller to control all the appliances. Relay board and Wi-Fi module is connected to Node MCU. Each command is processed by Node MCU and control the relay for switching on/off the appliances.

4) Relay board use as electrical switches, for performing on/off operation. Power supply is provided through the relay board to the appliances.

5) Finally, user can access the WhatsApp chatbot in smart phone and give command to Wi-Fi module which is connected to Node MCU which can control the all appliances.

V. BLOCK DIAGRAM

It is a block diagram of our home automation project. In this basically shown that the project how works actually. We are operating our system through WhatsApp chatbot. We need network connection and here you can see the 4 relay boards, we are connecting that all to node MCU. And we need internet for it and with the help of MQQT cloud we connect all this wireless. And you can see the outlets.
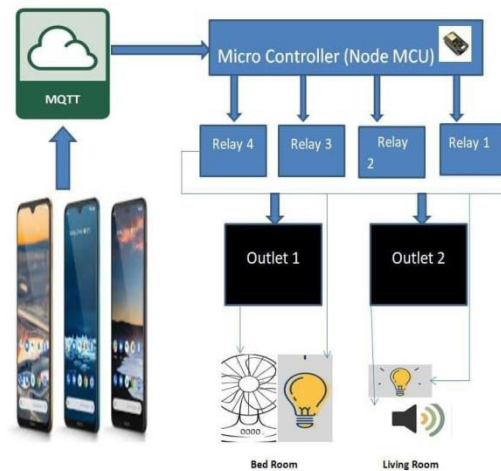

Fig. Block Diagram

1. **MQTT: -** MQTT stands for Message Queuing Telemetry Transport. It is used as the underlying protocol in communication most home automation systems.
2. **Micro Controller (Node MCU): -** Node MCU is an open firmware for which open prototyping board designs source are available. The name "Node MCU" combines "node" and "MCU"(micro-controller unit).
3. **Relay:** - A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals.
4. **WhatsApp chatbot:** - Chatbots are simply WhatsApp accounts operated by software – not people – and they will often have AI features. They can do anything – teach, play, search, broadcast, remind, connect, integrate with other services, or even pass commands to the Internet of Things. Chatbots are third-party applications that run inside WhatsApp. Users can interact with chatbots by sending them messages, commands, and inline requests. You control your chatbots using HTTPS requests to our Chatbot API.
5. **Python NLTK library: -** Natural Language Toolkit is a free, open-source and leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning and wrappers for industrial-strength NLP libraries.

VI. REQUIREMENT SPECIFICATION

Hardware

1) Node MCU (ESP8266)
2) PCB
3) 4 Channel Relay Board

Software

1) WhatsApp
2) Cloud
3) Python Programming

VII. ADVANTAGES

1. Managing all of our home electric appliances from one place to another place. The convenience factor here is enormous.

2. Increased safety Smart fire detectors, carbon monoxide monitors, pressure sensors, and other home automation security features can help protect your home from disaster.

3. Improved appliance functionality.

4. Remote access control your home from mobile devices, including your laptop, tablet, or smartphone.

5. Energy efficiency home automation allows you to be more mindful of your power usage.

VIII. APPICATIONS

1. Controlled smart home appliances.

2. Enhanced safety and security at home.

3. Al-driven digital experiences.

4. Water and air quality control and monitoring

5. Lawn/Gardening management

6. Better Infotainment delivery

7. Smart Switches

8. Smart energy meters

IX. RESULT AND OUTPUT

The testing and result analysis includes the following Two interfaces: -

1] Chatbot Interface

2] Working Model Interface

The system is currently customized for three appliances: Tube light, Bulb, Fan.
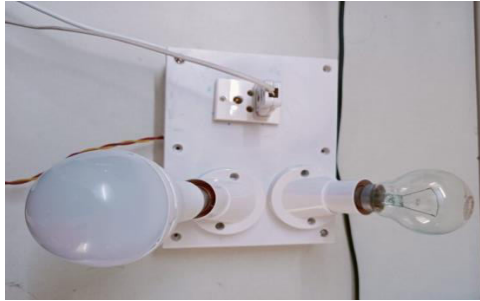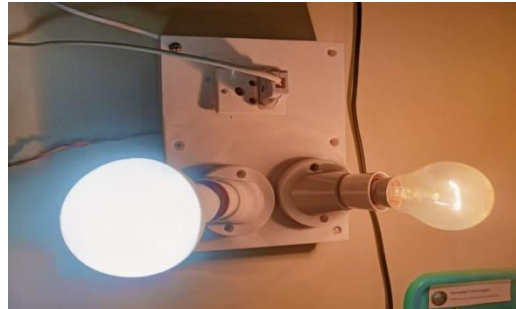

Fig. Project Module

Fig. Running Status of Project Module

The following image show the Switching ON/OFF of appliances using Chatbot.

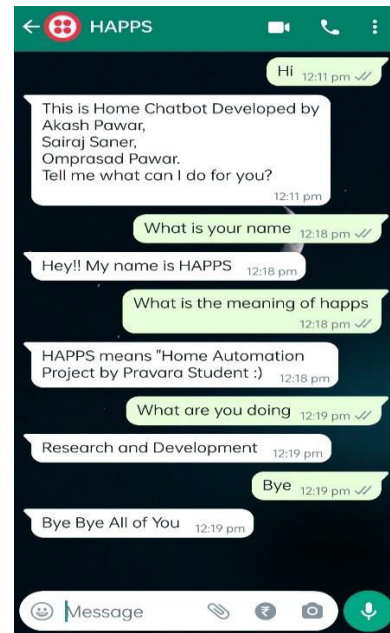Small talk response in the Chatbot: -

Fig. Chatbot Interface

Fig. Responses when the user intends to

have a small talk with the bot

X.CONCLUSION

As mentioned above in the proposed system the paper conclude that the proposed system is very useful for the smart home automation. In this paper, aWhatsApp chatbot based smart home system that can be controlled remotely upon user authentication is proposed and implemented. The WhatsAppchatbot allows user to control the home appliances through any internet enabled device such as smart phone or laptop. Home automation system provide interface between various types of home and electrical appliances like lights, fans, etc.After analysing other existing systems, we propose the novel technique for better human interaction and for provided that better consumption of android. This system is basically usefull for reducing power consumption which is sustainable for humans and eco-friendly environment. By using home automation system, we can manage cost, flexible and energy efficient smart homes. Main purpose of home automation system to provide ease to people to control different home appliances with the help of the WhatsApp chatbot present in their smart phones and to save electricity, time and money.

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