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Intelligent Assistant for Controlling Iot Devices

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Abstract:*We square measure in twenty first century, wherever everything is automized from home to industrial space. Devices automation reduces the human efforts and it additionally saves energy and time. it's additionally used for security purposed. With the event of latest technologies, that square measure able to connect with one another through network, the web of things (IoT), raised its quality. IoT (Internet of Things) may be a network of interconnected devices, designed to gather and exchange information which may then flip it into data, eventually into knowledge. IoT may be a region wherever digital world converges with physical world. This paper describes the implementation ANd configuration of an intelligent assistant for a domestic also as industrial controller. The project uses Blynk application that employs the combination of cloud networking and wireless communication by providing the user with remote numerous of varied of assorted electrical appliances and senses various information equivalent to humidness, temperature, moisture, gas, etc. and supply the specified information on blynk. during this paper we tend to focus our attention on the combination of Intelligent informal code Agents or Chatbots with IoT. Chatbots square measure being adopted in larger numbers thanks to major strides in development of platforms and frameworks. The novelty of this paper lies within the specific integration of Chatbots within the IoT state of affairs. we tend to analyzed the shortcomings of existing IoT systems and advance ways in which to tackle them by incorporating chatbots.*

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I. Introduction

In the twenty first century, we would like to be connected with something anytime and anyplace, that is already happening in varied places round the world. The core part of this hyper connected society is IoT, that is additionally remarked as Machine to Machine (M2M) communication or net of Everything (IoE).

Internet of things (IoT) could be a idea that describes a network of interconnected devices that has advanced capabilities to move with devices and conjointly with mortals and its close physical world to perform a spread of tasks. during this context, the utilization of sensors on IoT devices ensures a seamless affiliation between the devices and also the physical world. Indeed, trendy IoT devices associate with a good vary of sensors (e.g., measuring instrument, gyroscope, microphone, lightweight device, etc.) that change additional economical and easy applications. victimization these sensors, IoT devices will sense any changes in their close and take necessary actions to enhance any current task with efficiency. the flexibility to sense changes within the physical world have created IoT devices ready to create autonomous selections, whereas, economical communication between the devices and also the physical world have created the IoT devices very talked-about in varied application areas: from personal attention to home appliances, from huge industrial applications to good cities.

The entire IoT system consists of Sensors (temperature, light, motion, etc.), Actuators (displays, sound, motors, etc.), Computation (programs and logic), and Communication interfaces (wired or wireless). The scope of the project is to interaction with IoT through internet Application Programming Interfaces (API) and specially machine-readable text Transfer Protocol (HTTP) primarily based realistic State Transfer (REST) Architectures. a preferred approach of internet of Things has been illustrated in Fig one during this project Blynk application is additionally uses that employs the combination of cloud networking and wireless communication by providing the user with device of varied IOT device.

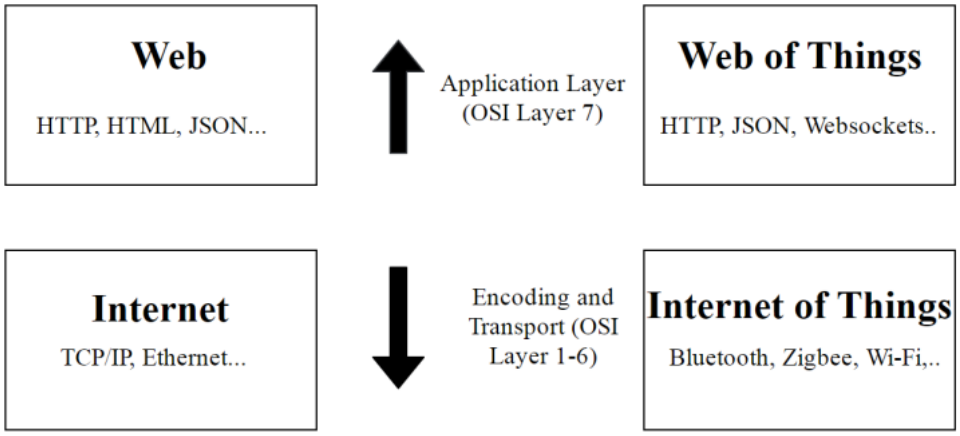

Fig. 1. Web of Things

This additionally paper proposes the employment of Intelligent colloquial Agents. we have a tendency to discuss with these as merely Chatbots (also referred to as Chatterbots or bots in general). apparently, there square measure several definitions for Chatbots in shut relation with package Agents (SA), Virtual Agents (VA) or Intelligent Personal Assistants (IPA) in literature and these have usually been utilized in conjunction with one another. The term "Agents" itself has several definitions however among the earliest and most well-known uses of the term is [10] - "A self-contained, interactive and concurrently-executing object, possessing internal state and communication capability." primarily based on this, ideas cherish Virtual Agents and Intelligent Personal Assistants (IPA) have return up, that uses tongue process, still as speech recognition techniques. for instance, Apple Siri, Amazon Alexa, Microsoft Cortana and Google Assistant.

II. Literature Review

The first journal entitle 'Smart Home-Control and observance System mistreatment good Phone' that was written by Rajeev Piyare and Seong Ro Lee from Department of data physical science Engineering, Mokpo National University. They wrote a couple of low price home system mistreatment associate embedded micro-web server, with IP property for accessing and dominant devices and appliances remotely mistreatment golem primarily based appreciate good phone app. each of the specialists enforced the net of Things to the smartphone or devices which will access the network and communicate with one another. The planned system doesn't need a passionate server with reference to similar systems to watch and management the house appliances with over simply the change operate. each of the man of science conjointly wrote that once a Wi-Fi affiliation isn't out there, mobile cellular networks appreciate 3G or 4G also can be wont to access the systems [12].

The second journal entitled 'Bluetooth Remote Home Automation System mistreatment golem Application' analysis by M.H Leong from Universiti Teknikal Asian nation Melaka, Malaysia. it's written concerning the style of Home Automation System (HAS) with low price and wireless management. this method is style to help and supply support so as to fulfil the wants of aged and disabled in home. the most system implements wireless Bluetooth technology that is to produce remote access from PC/Laptop or good phone. the planning remains the present electrical switches and provides a lot of safety management over electrical appliances switches. The switches standing is synchronic all told system whereby each computer program indicates the important time existing switches standing. The system supposed to manage electrical appliances and devices in house with comparatively low price style, user friendly interface and easy installation [5].

Next journal entitled 'Internet primarily based Home Automation' analysis by Kumar Manu from Moradabad Institute of Technology, Moradabad, India. it's writtenabout the utilization of Arduino Uno with the assistance of relay. during this project the used of LAN defend so as to produce interface between user and therefore the network. The man of science explicit that Arduino isn't a standalone device however a platform which incorporates Arduino board and IDE development atmosphere. The project offers users a straightforward & effective of dominant varied home appliances from a far off location let's say while not physically being gift reception Powerful microcontrollers square measure used as elements of most home and workplace appliances [13].

Then, journal entitle 'Home Automation Systems – A study' analysis Satish Palaniappan and Naveen Hariharan from school of Engineering, Pakistani monetary unit University, Chennal, India. They pen a study of Home Automation by mistreatment varied of technique appreciate GSM, Bluetooth, Raspberry Pi and Zigbee. the aim of this journal is to survey and compared all of the systems and appearance at their varied feature and

downsides. The comparison state square measure in details let's say they providing the circuit and graph for every of the tactic [14].

Finally, journal entitle 'Energy economical good Home Automation System' by Abhay Kumar and Neha Tiwari from Suresh Gyan Vihar University, Jipur , Rajasthan . They wrote a couple of good home which may avoid the wastage of electrical once individuals forget to modify off their home appliances. Their good home project consists of 3 elements that square measure network, dominant device and residential automation. The voltage uses of sure electrical appliances is being management by server laptop and programming within 16F877A PIC [15].

III. Methodology

IOT devices design and specifications rely upon the sort of hardware and package used**.**

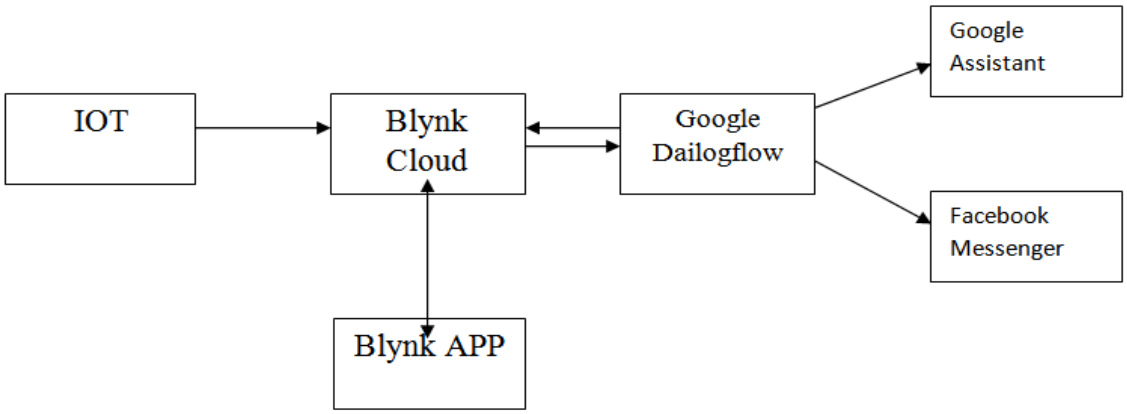

Fig 2: Process Of Project

The IOT device (having esp8266 PCB designed with numerous sensing element connected) is connected to Wi-fi or router in order that device is access with the assistance of web. By victimization the mechanical man software package the module is programmed so it's joined with bynk application by making a bylnk cloud network with the assistance of address code.The cloud may be a key enabler for the IoT. The IOT device is Wi-Fi enabled and remotely governable employing a mobile app or by browsing to your account on the remainder API web site. Futher, this IOT devices and bylnk application is joined by Google Dialogflow. By loading the information as per our demand in dialogflow, Chatbot is formed. Chatbots ar designed on IM platforms (such as Facebook traveller and Slack) that support multiple completely different chatbot applications.

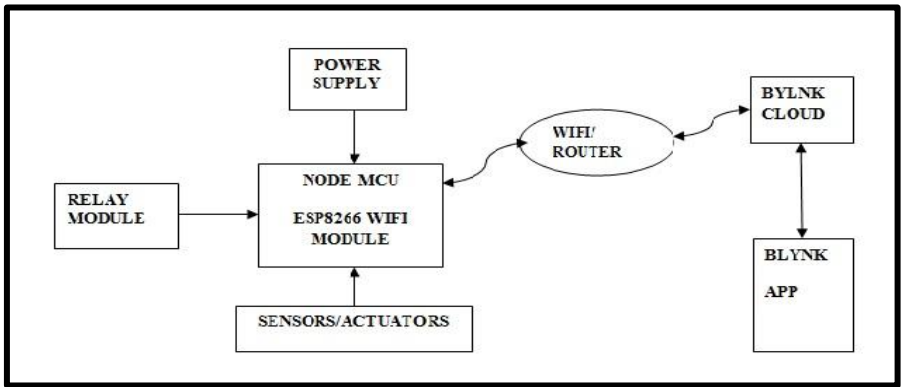

Figure 3: Diagram of each module

In figure 3,node MCU ESP8266 in built wifi moduleis connected with relay, various sensors and actuator, and with power supply. The 5 V power supply is provide to node mcu with the help of voltage regulator. The ESP8266 is a wifi module. The block diagram above shows the electrical systems that are controlled with IOT system by using wireless network. The devices are connected to the router in the house or using its own data connection (3G or 4G) network. Next, human will send information to switch ON the appliances in their home or building or industry through router and router will send the information to the

Arduino. After that, Arduino will analyse the data with helping of wifi serial transceiver module (ESP8266) to communicate with the relay circuits. Then, after the relay circuit received the data on which switch going to be ON, the data will send to the appliances. The important thing to be highlight is the iot device was connected wired with the relay circuit. Hence, the relay itself will communicate with the Arduino and the ESP 8266 module.

In this paper node mcu is used as the main component. As a C program has been coded into Arduino software, it will determine what types of electrical appliances that can be controlled. Web-server is running on using the wifi module ESP8266. This wifi module has capability to be used both either as a client or a server. Next, the communication between electrical appliances systems for example light or fan to the Espresso Lite v2.0 is started. Since Arduino serial module already supports a TCP/IP stack, so it focuses on implementing software to connect it to the remote users. During the configuration stage, the wifi module establishes connection with Local Area Network (LAN) using a static IP address. To optimize the process of connection, the static IP address that is used rather than acquiring an IP via Dynamic Host Configuration Protocol (DHCP). By doing so, the control systems that connected with Wi-Fi serial module can be control either using web based or application in smart phone

In this project four modules are present, the working of each module is different. Means each module perform different task as compare to other. The four different modules are given as

GARDENING SYSTEM

The first module is related to gardening system. In garden area soil moisture sensor with water pump is implemented. When the moisture level of the soil is less than 40% than the water pump will automatically start the water inlet till the moisture level will be 70%

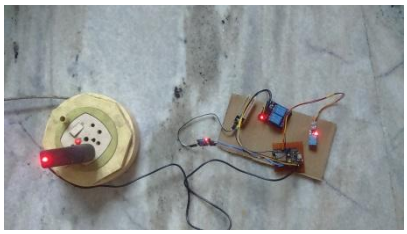

Figure 4: Module of Gardening system

RFID SECURITY SYSTEM

The second module is of RFID security system, in which using valid RFID cards lock is opened and closed. If the card is invalid then it will show notification of 'Alert' in bylnk app.

Figure 5: Module of RFID Security system

PARKING SYSTEM

In parking system IR sensor is used which detect the heat and motion by using that it identify the location of the car in the parking system. If car is present in the parking area then it will indicate that the parking space is occupied and if car is not present then it will indicate that the parking space is vacant.

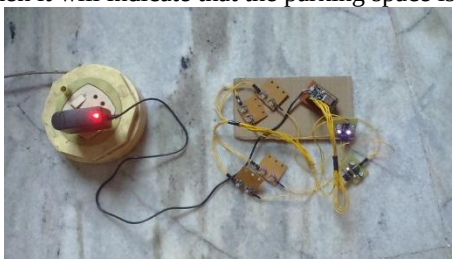

Figure 6: Module of parking system

MOOD LAMP

For mood lamp RGB strip is used. This RGB strip is control by RGB driver circuitas per our requirement we can change the color of the lamp through blynk app by moving finger on the zebra for desire color.

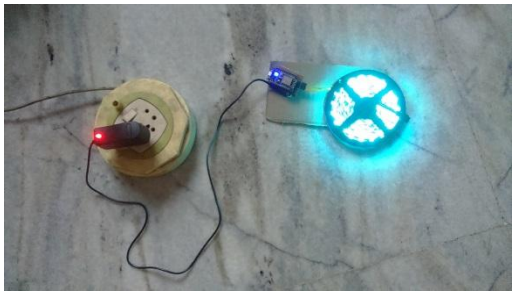

Figure 7: Mood Lamp Module

IV. Result And Discussion

In the Figure 5, the widget can be selected for switching ON/OFF and it should be set with the port number for example V1, V2, V3, ETC. Port number should be same with the port in the coding at arduino. From that it will send and read command that have been set. At the first time, it will follow the relay either in normally open or normally closed. All of it can be known from the widget that has been set in blynk apps.

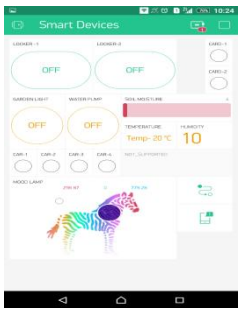

Fig 8: The Bylnk apps widget in switch off

The IOT device is also run by using chatbots through facebook messenger. The conversation of IOT chatbot by user is shown in figure 6

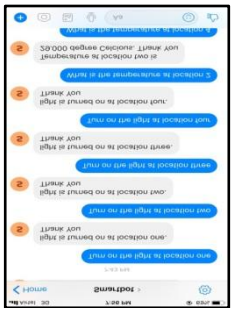

Fig 9: Sample of a IoT Chatbot-User conversation in facebook

In the above figure, when user command to 'turn on the tube light at gardening area' immediately the tube light at turned on in blynk app and device. Similarly,when it was commanded to change the color of mood lamp. Immediately the color of the mood lamp change as shown in the figure 7. In this way the user can command to perform various related functions of IOT devices.

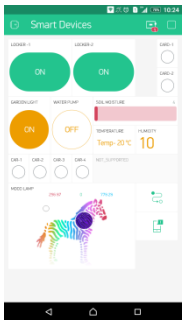

Figure 10: The Bylnk apps widget in switch on

V. Conclusion

This paper proposed the complete design and development of intelligent assistant control systems by using bylnk app. It considered successfully because all IOT devices can be controlled by using smartphone and chatbots. Development in the field of IoT has been phenomenal in recent times. Similarly, Chatbot systems are also becoming more intelligent and sophisticated as the days progress. By using this technologies a common device can be turned into an intelligent devices,with domestic control throughchatbots and IOT; thiscan be achieved with a low budget and resources available in the majority of houses around the world.

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