Wireless Room Sensing and Controlling using Google Assistant

N. Anusa, R. Anitha, V. Bharathi, K. Rajkumar

Abstract: ***There are many safety structures in the world to screen our home, office, schools, institutes and industries. However, our merchandise are mindful of the surroundings and refer to phrases such as temperature, gas, humidity, pace and sound. For our cell telephones (anywhere in the world). It additionally serves as a safety device by way of monitoring motion in that room or warehouse. The primary phase of the product is the manage machine with some digital blocks (controls, actuators, software program and ADAFRUIT). Control block runs the system, wi-fi block ensures verbal exchange and the records transfer, actuator aspect is treated through the manipulate block. Sensors decide primary facts about the environment, such as temperature, humidity, and gas. Control block helps wi-fi sensors and relays. The important phase of the machine is ESP8266 NodeMCU. The device communicates with the PC, smartphone, internet browser, etc. In addition, the interface of the gadget ought to be as easy and effortless to study as it can be used through the aged and disabled. Control the gadget the usage of Android apps or Google Assistant. Android apps are used to speak with the Firebase database and replace its values. This approves you to manage a variety of sensors and electrical gadgets in the house.***

Index Terms: ***NodeMCU, Adafruit, Google Assistant, IFTT, MQT, Android OS and Wi-Fi.***

I. INTRODUCTION

This challenge goals to boost a voice-controlled clever domestic the usage of a WI-FI and IOT, which is being remotely managed by means of any Android OS Smartphone. Home automation will become essential, as it offers the consumer relief and a trouble-free machine for the use of domestic devices. A computerized domestic is an IOT gadget that permits customers to manipulate fundamental domestic duties and aspects mechanically the usage of cell units and computer systems at some stage in voice over the internet. An computerized domestic is regularly referred to as an stylish home. With the boom of Automation technology, existence is getting easier and less complicated in all slants .In contemporary world, Automatic structures are being chosen over the guide system.

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The hasty increase in the range of customers of the net over the previous decade has made the Internet a section of life.[6] In disparity Wireless structures can be of superb assist for automation systems. With the growth of wi-fi applied sciences such as Wi-Fi, cloud networks in the current past, wi-fi structures are used each day and everywhere.[9] It additionally controls the electric powered home equipment like fan, light, air-conditioner, etc. In that room or warehouse through “Google Assistant” from wherever in the world.

A. Objective Of The Product

The principle of this project is to monitor the parameters of a transformer using different sensors. The sensors used in this project include moisture level, gas sensors, humidity sensors, and temperature sensors. This product's ultimate aim is to make smart IOT based security system that sensing, monitoring, and controlling the environment through Google Assistant.

II. LITERATURE SURVEY

Ms. Poonam [1] discussed Bluetooth-based home automation systems are connected to the Arduino BT board at the input-output port using home relays.
Mr. Yusuf Sharif [5] GSM technology is discussed and there is a fascination with GSM-based home automation research. SMS-based home automation, GPRS-based home automation and dual-tone multi-frequency (DTMF) based home automation, these are the options we have mainly considered for communication in GSM.
Mr.N. Srikanth et al. [6] Describes the technology used by mobile or computer to automatically control basic home control and performance over the Internet from anywhere in the world, making the robotic home sometimes smart. Called home. It is about saving electricity and manpower. A planned system is a distributed house
The automation system consists of a server, a Wi-Fi module, and a sensor. The server controls and monitors various sensors and can be easily configured to handle more hardware interface modules (sensors).

III. PROBLEM STATEMENT

In our days, people are looking at ways and means to improve their lifestyle using existing methods. Any new feature or hope device that promises to improve their lifestyle is grabbed by patrons. Such additional facilities and equipment will be added; There are simple and appropriate methods and ways to manage and operate these devices. It becomes almost impossible to monitor running devices and their performance.

IV. PROPOSED SYSTEM

The proposed system is a more home automation system using a server, cloud, and sensors. Servers are used to track and control various devices and to save values in the cloud. In this system, the IO.ADAFRUIT cloud is used to store the values of various sensors. Google Assistant is used for a generous supply of IFTTT (if it is not). IFTTT acts as a broker among them. The detailed process is explained in the flow chart, as shown in Figure 5.1. The illustrated diagram (Figure 5.4) shows the sensing and monitoring process of the entire circuit.

V. FLOW DIAGRAM

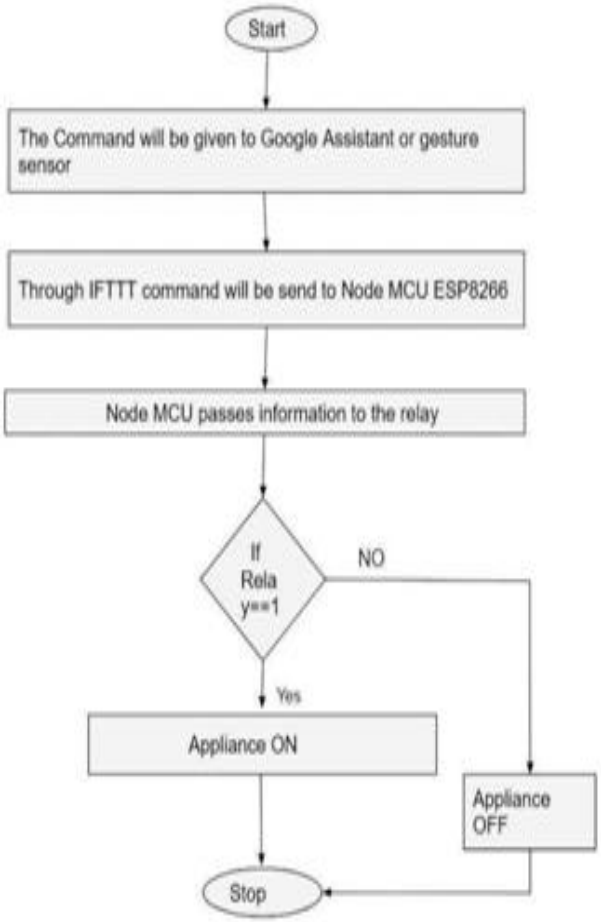

Figure 5.1 - Flow Diagram

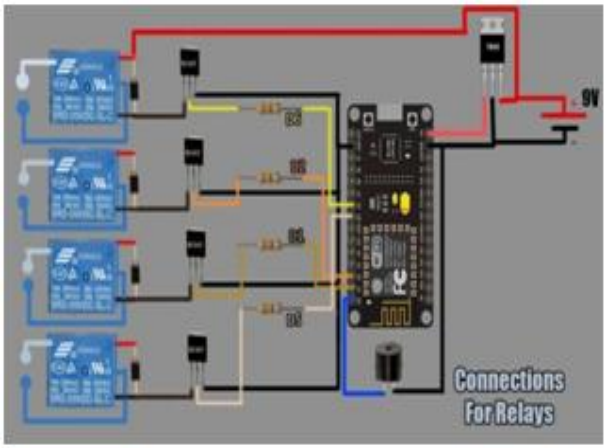

Figure 5.2 – Connection for relays

In the project, a 5-volt relay is used to change appliances. It has a current of 7Amps. The transistor is used to change the relay and a diode is connected in parallel to the Rio, but in reverse bias, it is used to limit the reverse current.

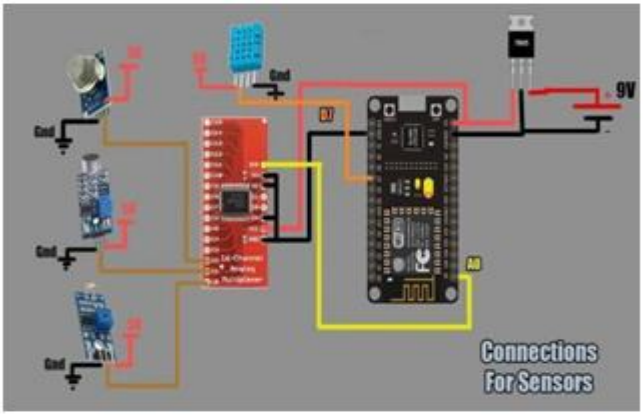

Figure 5.3 - Connections for sensors

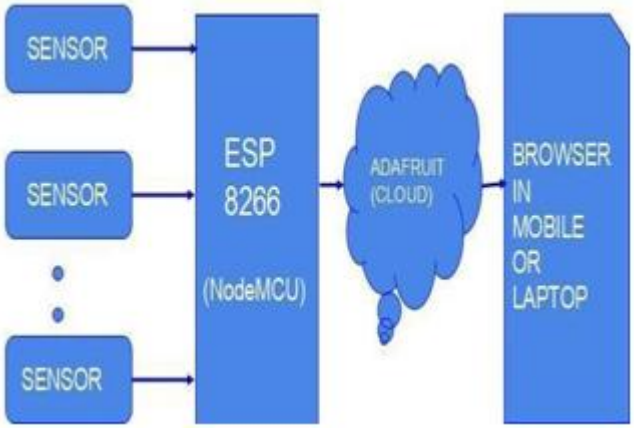

Figure 5.4 – Sensing and Monitoring

In practice, what does the sensor expect its sensitivity to be based solely on the quantity to be measured and therefore the output input function only? However, measurements don't seem to be found under ideal conditions, and any sensor has some sort of interference and internal disturbances, like temperature effects, static pressure effects,magnetic interference effects[2]. Another aspect to recollect is that the static behavior that directly affects the sensor performance, including accuracy, precision, and so on..

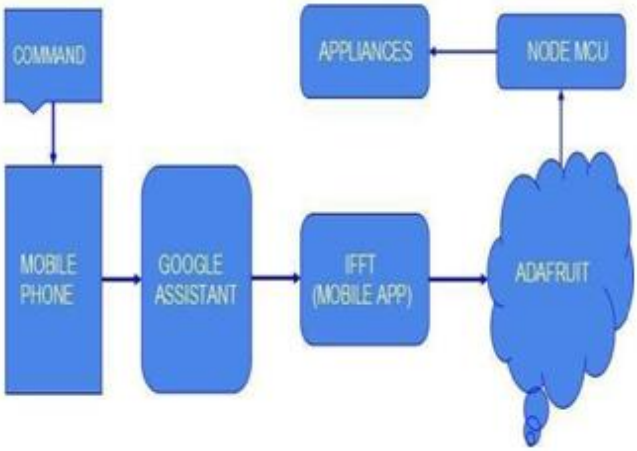

Figure 5.5 – Block Diagram for Controlling Appliances

VI. EXPLAINED ILLUSTRATION

This development is supported by two online platforms, IFTTT and Adafruit MQTT. IFTTT means if it is; This is a huge platform on which we can combine the two services by

creating an applet. In this we need to display a condition and a function. Action is taken whenever a specific condition is met. Connections for sensors and relays are shown in Figures 5.2 and 5.3. The MQTT broker may be a general broker operating within a range of Wi-Fi routers, or it may be a cloud-based broker operating from anywhere in the world[3]. With the help of IFTTT, I integrate Google Assistant and Adafruit MQTT.[10] The applet I made is somewhat similar to, "Google Assistant sends data to fan 1 of the AdFruit MQTT broker if you hear the fan launching." So this is a kind of applet that I created using IFTTT, which adds to my mix. Google Assistant and Adafruit MQTT. How does Adafruit MQTT work now?[5] In fact, the MQTT Broker Client operates in a publication-membership mode in which patrons subscribe to the broker's item. Any information change in that aspect will be connected to all devices. For the same thing in that broker.

A. Hardware Components

- ESP8266 12E Development Board(Node MCU)
- x 5V Relays
- x 330-ohm Resistors
- Channel 16 Channel Analog Multiplex Module
- IR PIR Motion Sensor
- • MQ35 sensor
- • Light sensor
- • DHT11 temperature and humidity sensor
- 80 7805 Regulator IC
- V 9 V Power Adapter
- X 4 x 2 pin PCB mount screw terminal

B. Software Implementation

To erect a home automation application, three special platforms are used.

- Google Assistant
- Adafruit IO
- IFTTT

C. Google Assistant

Google Assistant depends on language processing, which is that the technique of turning speech into sounds, words, and thoughts. Google recorded the speech for the first time. Recordings are despatched to Google's servers for extra environment friendly analysis, as there may be lots computational energy for the interpretation of sounds. Google breaks down what's stated in several sounds[7] A database can then be accustomed see which phrases are closest to the combination of man or woman phonemes. It identifies the key to grasp duties and finishing associated tasks. as an example, if Google Assistant appears at phrases like "weather" or "temperature," it opens the climate app. Google's servers ship the information returned to the system and so the Google Assistant can speak. If Google Assistant wishes to say something, it goes thru the equal system described above, however in reverse order.[5]

D. Adafruit IO

Adafruit.io is a cloud carrier that approves customers to join with the aid of the Internet, and it is chiefly aimed at storing and retrieving facts and more[11]. It shows records from the air-quality sensor as nicely as the temperature-humidity sensor, and a button can be inserted .

E. IFTTT - If This Then That

IFTTT, if so, is a easy web-based provider referred to as applet for growing a collection of easy conditional statements. Applet is a trade in internet offerings such as Gmail, Facebook, Telegram, Instagram or Pinterest. Here, IFTTT is used to use Google Assistant provider and Adafruit provider in the chain. So, Google makes use of Google's Helper to flip on or off the light, to manage the domestic lighting[12]. IFTTT can then interpret the message and ship it to the feed created with the aid of Adafruit's dashboard.

F. Steps Of Implementation

- To Create an account on the IFTTT platform.
- Post the IFTTT carrier for your project.
- IF Have IFTTT understanding in your project.
- Create an applet.
- Test whether the applet is working or not.

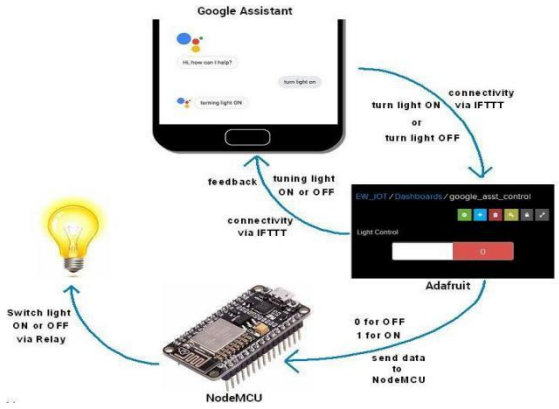

Figure 6.1 – Working principle

I use Google Assistant on my smartphone and grant voice instructions in the form of "OK Google, turn LED on" applet generated in IFTTT, which receives instructions and sends data '1' to the AdaFruit feed[3]. It launches the event on the Adafruit Console, which is constantly monitored via the microcontroller (where the node MCU). This microcontroller acts in accordance to information modifications in the Adafruit Dashboard. This process is shown graphically in ***Figure 6.1.***

G. Message Queue Telemetry Transport

MQTT is a messaging transport protocol. This protocol is broadly used for machine-to-machine contact on the floor of IoT due to the fact its later facets are lightweight, open and convenient to install. Therefore these elements are fashions for IoT cause due to the fact we want to categorical the nation of the desktop from one computing device to another. It essentially consists of a dealer and various clients, the place consumers can be regarded as our clever phones, sensors, etc., and all speak with the server, recognized as a broker. In this protocol, every customer ought to be related to any tackle of the broker, known as a Subject to MQTT. Within a single broker, there can be more than one matters and customers can subscribe to a couple of objects of the identical broker. As mentioned, implementations are executed in Google Assistant and Adafruit and the connections are whole and are shown in the Figures 7.1, 7.2 and 7.3.

VII. RESULTS AND SCREENSHOTS

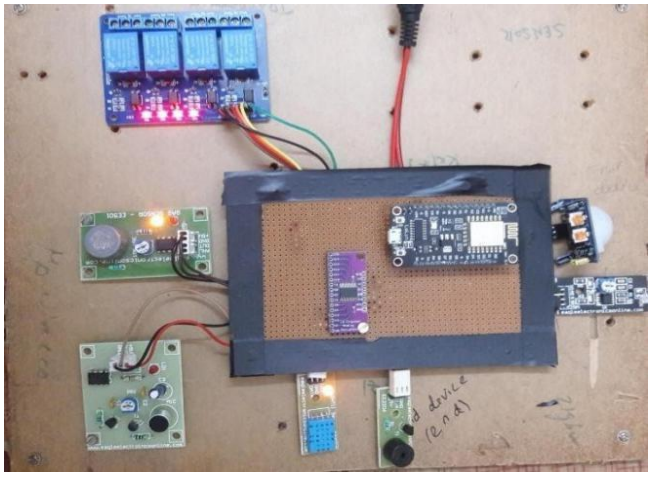

Figure 7.1 – Hardware Connections

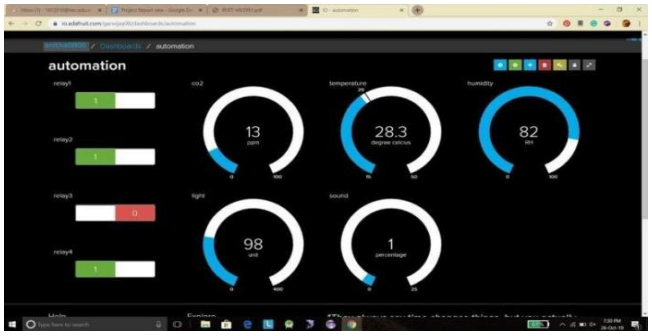

Figure7.2 – Implementation on AdaFruit

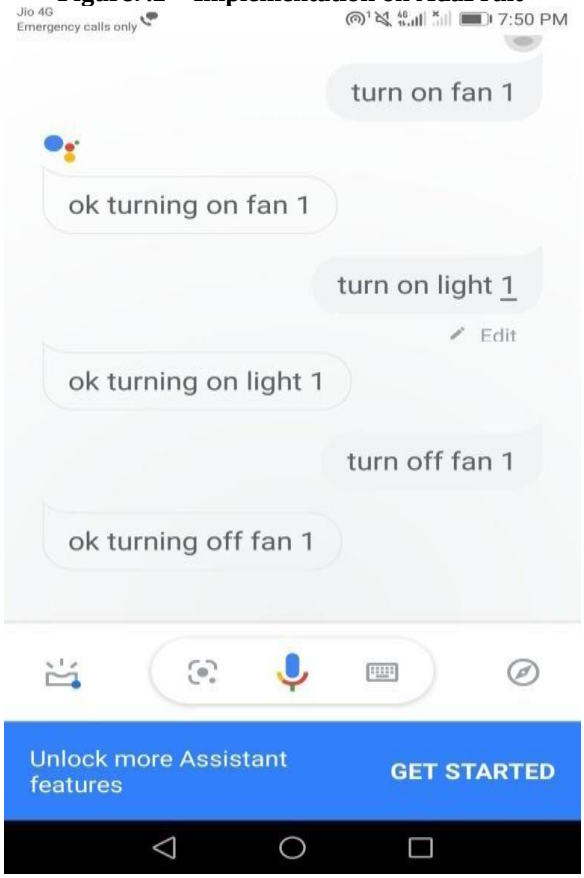

Figure 7.3 – Implementation on Google Assistant

VIII. CONCLUSION

Wireless manage is that the foremost basic desires of all humans among the globe. But sadly, the science has now not been altogether used as a result of giant quantities of statistics and voice communication costs. Generally, most wireless-controlled robots use RF modules. automated gadgets that use cyber web of Things ar almost valid to perform with the assistance of simple devices, and thus the units ar properly disarmed for the length of voice commands. Our growth visual display unit units detector records like temperature and wetness, however turns the fragile on or off each and every time somebody desires it. this protects detector statistics among the cloud. This helps the patron to mirror on thought on and manipulate the stipulations of quite selection parameters at domestic somewhere among the globe. The diagram device approaches pro re nata, as an example, turning on the fragile once we tend to offer commands. It helps the person to induce an overview of selection parameters reception, whenever and anywhere. AN occasional priced and bendy domestic automation machine is projected and dispensed the usage of a node MCU microcontroller. Overall, the node MCU is convenient to apprehend and its cryptography is easy. By implementing this type of system, we tend to square measure ready to conclude that electricity conservation are going to be done. With the assist of this technique, we tend to square measure ready to expand the effectiveness of the instrumentality. we tend to square measure ready to even have entire manipulate over far-fetched appliances. it will increase human remedy and it reduces human efforts.

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