

SMART HOME SANCTUARY

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ABSTRACT

Automation is a trending era in the 21st century making it play an important role in our daily lives. The main attraction of any automated system in reducing human labor, effort, time and errors due to human negligence. In this pandemic, sanitization is playing an important role. Using hand sanitizer reduces microbial counts and kills germs that would affect the family members with flu and other viruses. In order to keep the family healthy and thriving environment it is critical that family members to use sanitizer. Our paper presents a novel solution by attaching automatic sanitizer dispenser attached to wall at entrance of home. Along with automatic sanitizer our paper also presents a microcontroller based voice controlled home automation system using smart phones. We know that smart phones have become a necessity for every person on this planet. This system will enable users to have control over every appliance in his/her home with their voice. All that the user needs is an smart phone, and a control circuit. The system is implemented using Natural language voice commands are given to the Google Assistant and with the help of IFTTT (If This Then That) application and the Blynk application, turning the device connected to the respective relay On or OFF as per the users request to the Google Assistant. The microcontroller used is NodeMCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet).

Keywords: Home Automation, IFTTT (If This Than That) Application, Blynk Application, Internet Of Things (Iot), Google Assistant, Voice Control, Smartphone.

I. INTRODUCTION

Hand sanitizer (in any case called hand clean, hand sanitizer, hand rub) is a liquid, gel or foam regularly used to kill by a wide margin most diseases/minute creatures/microorganisms on the hands In numerous settings, hand washing with cleaning agent and water is all around preferred. Hand sanitizer is less reasonable at killing specific kinds of germs, and not in the slightest degree like hand washing, it can't really wipe out destructive engineered substances. People may erroneously clear irregular sanitizer before it has dried, and some are less fruitful because their alcohol obsessions are unreasonably low. Alcohol based hand sanitizer that is at any rate 60% (v/v) alcohol in water (unequivocally, ethanol) is proposed by the United States Centers for Disease Control and Prevention (CDC), anyway if cleaning agent and water are not available. The CDC proposes the going with propels while using an alcohol based hand sanitizer:

1. Apply thing to the palm of one hand.
2. Rub hands together.
3. Rub the thing over all surfaces of hands and fingers until hands are dry.
4. Do not go near fire or gas burner or any burning-through article during use of hand sanitizer.

As customized hand sanitizer is joined at the section of the home when one walks around can use the sanitizer without reaching it as this helps in getting less affected by the diseases and besides helps with keeping the family secured. In the wake of sanitizing our hands we go into home as it is the place where one prefers or needs to be following a long tiring day. People get back home exhausted after a long continuing on day. Some are too depleted that they feel that its hard to move once they land on their affection seat, lounge chair or bed. So any little contraption/development that would help them switch theirs lights on or off, or play their #1 music, etc on a go with their voice with the aide of their high level cell phones would make their home more pleasant.

Smart home advancement insinuates a set-up of devices, machines or systems that tap into a run of the mill association and that you can deal with uninhibitedly through a regulator or voice control. For example, you can have your home's indoor controller , sound speakers, TVs, lights, security, locks and devices all related with the splendid home association.

These you can deal with from your GA(Google Assistant), contact screen device and, appreciation to continuous movements in talk affirmation development, your voice. Never again is voice-controlled home motorization a thing of science fiction. The advancement for voice-controlled home motorization is accessible to you more than ever already.

Exactly when you acclaim presence with current development like voice home computerization, you are streamlining your home just as your life too. With how clamoring by far most's lives are today, everyone should be truly useful.

This paper proposes such canny system. It uses IR Obstacle sensor , the Google Assistant, the IFTTT [1] application, the Blynk [2] application and the NodeMCU [3] microcontroller as the huge parts close by an exchange board including 4/8 exchanges close by ULN 2803 IC. Standard language voice is used to give requests to the Google Assistant [4]. The total of the parts are related over the web using Wi-Fi which puts this structure under the IoT [5].

II. METHODOLOGY

Structure plan and execution consolidates two essential classes :

- a) Hardware : Hardware insinuates indisputable parts and real contraptions that are crucial for taking care of and executing (or running) the item. They fill in as a transport structure for the plan of rules given by an item.
- b) Software : Software insinuates a combination of tasks, documentation, codes, rules, etc that engages customers to help out PC systems. Writing computer programs is conventionally a program that is principal for PCs to perform unequivocal endeavors. They are subtle in nature and can't be really seen as hardware portions. Hardware is also called as 'Control unit' which contains microcontroller NodeMCU and Relay Board(either 4 or 8 channel). To design customized hand sanitizer IR Obstacle sensor is used to recognize the hands. In programming Blynk application runs with help of web which goes probably as medium among microcontroller and passes on the best messages.

The basic block diagram of Home automation is given below :

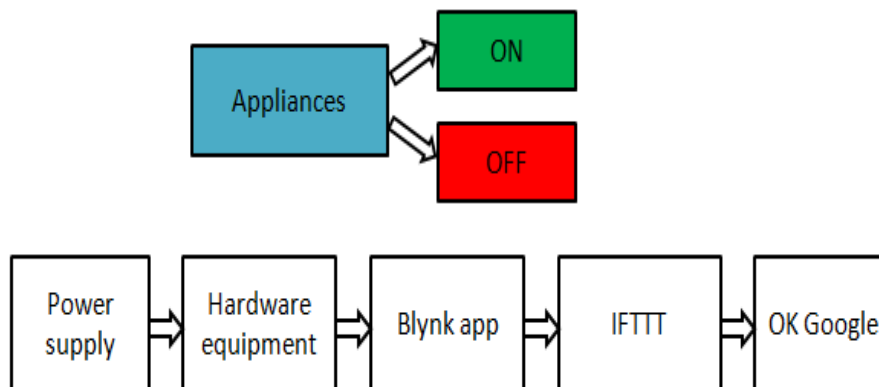


Figure 1- Basic Block diagram of Home automation

NodeMCU's mechanized yield pins are related with the Relay pins of the Relay board. Finally, each Relay is related with a mechanical assembly.

Execution includes some key components :

- a) **NodeMCU(ESP8266)** : NodeMCU is an open-source Lua based firmware and progression board especially centered around for IoT based Applications. It fuses firmware that abrupt spikes popular for the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which relies upon the ESP-12 module.

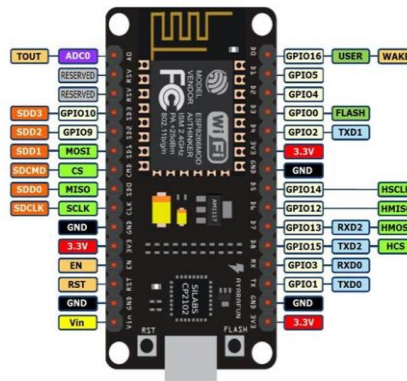


Figure 2- NodeMCU(ESP8266) Development Board

Figure 3- NodeMCU(ESP8266) pinout

NodeMCU specifications and features :

- Microcontroller: Tensilica Xtensa LX106, 32-cycle RISC processor
- Working voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL subject to CP2102 is consolidated introduced, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit keenly inside your IoT projects

b) Relay Board : The four-direct hand-off module contains four 5V exchanges and the related trading and separating portions, which makes interfacing with a microcontroller or sensor straightforward with least fragments and affiliations. The contacts on each move are resolved for 250VAC and 30VDC and 10A for every circumstance, as separate on the body of the exchanges.

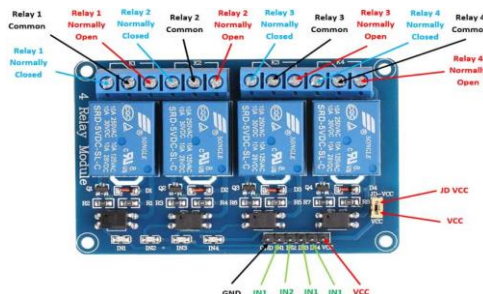
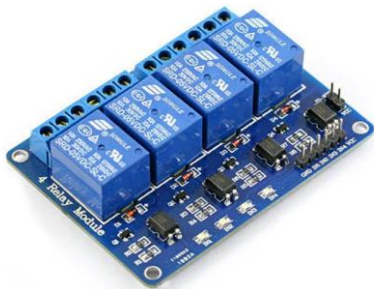


Figure 4- 5V four channel relay module

Figure 5- 5V four channel relay module pinout

Relay Specifications and features :

- Supply voltage – 3.75V to 6V
- Trigger current – 5mA
- Current when the exchange is dynamic - ~70mA (single), ~300mA (every one of the four)
- Relay most noteworthy contact voltage – 250VAC, 30VDC
- Relay most noteworthy current – 10A

c) Infrared obstacle avoidance sensor: The infrared-infrared obstacle avoidance sensor module has a pair of infrared emitting tubes and receiving tubes. Once the transmitted light wave is reflected, the reflected IR wave will be captured by the collector tube. The locally available comparator hardware processes the

operation, and the green control light is on. The module includes a 3 wire interface with VCC, GND and an OUTPUT nail to its tail. It turns out great with 3v3 to 5V levels. Upon obstruction/reflectance, the yield pin gives out an advanced sign (a low-level sign). The distance scope of sensor is nearly 2cm to 80cm.



Figure 6- IR Obstacle sensor

The proposed framework comprises of programming applications Blynk application and IFTTT application.

a) Blynk Application : Blynk is a Platform with IOS and Android applications to control Arduino, Raspberry Pi and the preferences over the Internet. It's a computerized dashboard where you can assemble a realistic interface for your venture by essentially relocating gadgets. With Blynk, you can handle a LED or an engine from your cell phone with in a real sense zero programming.

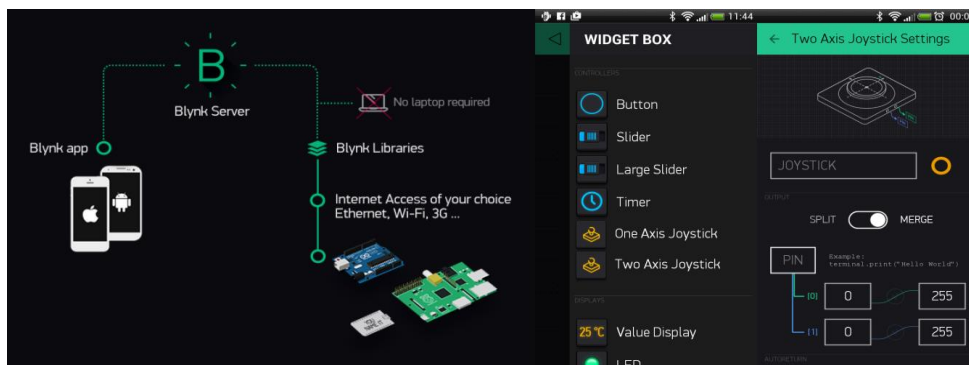


Figure 7- Functioning and Interface of Blynk Application

b) IFTTT Application : IFTTT gets its name from the programming restrictive explanation "assuming this, that. What the organization gives is a product stage that associates applications, gadgets and administrations from various engineers to trigger at least one computerizations including those applications, gadgets and administrations. The robotizations are cultivated by means of applets — which are similar to macros that associate numerous applications to run mechanized undertakings. You can kill on or an applet utilizing IFTTT's site or versatile applications (or potentially the portable applications' IFTTT gadgets). You can likewise make your own applets or make varieties of existing ones by means of IFTTT's easy to use, direct interface.

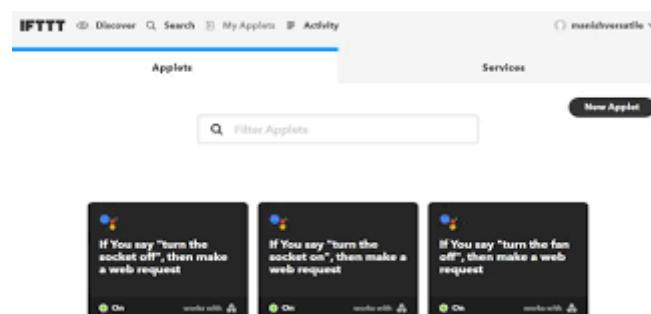


Figure 8- Screenshot of IFTTT Application

III. WORKING

The working of project starts when anyone enters the home. As the name of our project is SMART HOME SANCTUARY , "sanctuary" means providing safety to the one living in the home and people entering home. If anyone enters home first they have to sanitize themselves using automatic hand sanitizer attached at the entrance of home and then the one entering the home can control the home appliances without having contact with the appliances. They can directly rest and refresh themselves. This is how safety of family members is achieved and also makes our lives moving towards digitalization.

The automatic hand sanitizer circuit is shown below :

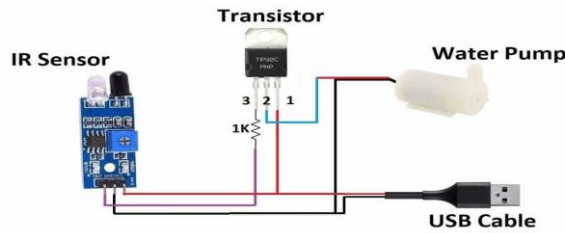


Figure 9- Circuit connections of automatic hand sanitizer

The voice controlled home automation design comprises of four steps :

1. Download and setup Blynk application.
2. Setting up Arduino IDE and Blynk libraries.
3. Hardware Assembly.
4. Configure IFTTT

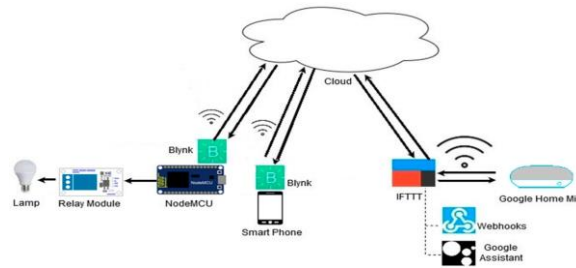


Figure 10- Working of voice controlled home automation

When the power supply is given to NodeMCU and Relay then if we give command to google assistant then it switches on the appliance when the IFTTT and Blynk are configured through cloud. This whole process works through internet connection. We control hardware using Blynk application and IFTTT gives the information to Blynk to on the specific appliance.

IV. RESULTS AND DISCUSSION

The proposed framework which contains programmed hand sanitizer connected at passageway of home and voice controlled home mechanization utilizing Google Assistant outcomes are given underneath :



Figure 11- Automatic hand sanitizer

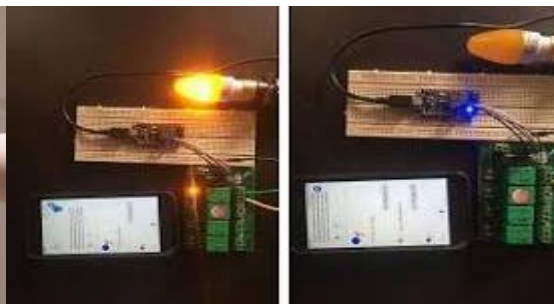


Figure 12- Light turning ON and OFF

V. CONCLUSION

The point of the paper was to propose a financially savvy keen home asylum as safe-haven implies securing the one living in home. This framework was planned as so that the one entering home initially need to clean their hands and afterward enter their home and can handle the machines utilizing voice as it is profoundly solid and productive in any event, for distinctively capable people who live in wheel seat can turn on the apparatuses without moving.

FUTURE SCOPE

The future degree for keen home safe-haven can be tremendous which builds productivity , control , and customization. Incorporation of home gadgets , keen spaces outside homes , improvement of shrewd machines , individual home conveyance , Advancement in medical services , and furthermore ensures individuals living in

home as they can disinfect their hands prior to entering home. Blynk application can be improved to make it quicker.

VI. REFERENCES

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