

# Home Appliances Control using IOT & Google Assistant



P. Sabitha, Satyam Sharma, Sakshi Sinha, Arpit Srivastava

**Abstract:** *Internet of Things (IoT) builds up the possibility of remotely imparting and watching genuine items (things) through the Internet. When it goes to our home, this idea can be suitably consolidated to make it more intelligent and mechanize. This IoT venture centers around building a keen remote home computerization framework that can be utilized by utilizing a similar arrangement of sensors. The influence acquired by preferring this framework over comparable sorts of existing frameworks is that we can control every single electronic gadget utilizing Arduino and Wi-Fi that can work utilizing a cell phone. This framework is intended to diminish human endeavors with the goal that you can work the gadget from any edge of your room.*

**Keywords:** - *Arduino, GSM Module, Bluetooth Module, Google Assistant, Relay Module, Smart Home, Speech Recognition.*

## I. INTRODUCTION

At present, home robotization is getting basic to improve our living conditions. The solace and convenience of machines is the thing that home robotization offers. Home mechanization offers a modern lifestyle where an individual can control their whole home utilizing a cell phone, from turning on a TV to locking/opening entryways; It additionally offers an effective utilization of vitality. Yet, getting or procuring said introduced framework will cost a ton of cash and that is the fundamental motivation behind why home computerization has not gotten such a lot of interest and consideration, which adds to the multifaceted nature of introducing and arranging it. In this way, it is basic for it to be savvy and simple to arrange, on the off chance that this is allowed to individuals, at that point they will procure it in their homes, workplaces, and schools.

Manuscript received on February 10, 2020.

Revised Manuscript received on February 20, 2020.

Manuscript published on March 30, 2020.

\* Correspondence Author

**Ms. C. Ashwini\***, Assistant Professor, Computer Science And Engineering Department, in SRM Institute of Science And Technology, Ramapuram, Chennai India.

**Satyam Sharma**, Pre-Final Year Student of B.Tech, Computer Science And Engineering in SRM Institute of Science And Technology, Ramapuram, Chennai India.

**Arpit Srivastava**, Pre-Final Year Student of B.Tech, Computer Science And Engineering in SRM Institute of Science And Technology, Ramapuram, Chennai India.

**Sakshi Sinha**, Pre-Final Year Student of B.Tech Computer Science And Engineering in SRM Institute of Science And Technology, Ramapuram, Chennai India.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](http://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

At the end of the day, an alteration of the home mechanization framework is required so as to diminish the cost of applying it to homes. Furthermore, home mechanization offers simplicity of psyche and body for the incapacitated or potentially old in their homes with only a single tick to do what they need, as demonstrated previously. This venture is improving the savvy home's innovative aptitudes at the following degree of progress for reasons of security and time.

The possibility of the task is not quite the same as other home mechanization frameworks since it joins the GSM-based home computerization framework and the IoT-based home robotization framework. The slight bit of progress right now utilize the Google Assistant as a controller for savvy gadgets inside the house. The programming language for the specific connection is worked on utilizing C and C++. It incorporates the design of Adafruit.io followed by the arrangement of the IFTT account and the connection with the Google Assistant application. At last, equipment tests are performed to confirm the

acknowledgment of voice control. This thought encourages incapacitated individuals to perform day by day needs exercises through their voices. A home control and observing framework dependent on the Internet of Things (IoT) innovation. It is planned and actualized using an implicit small-scale web server, control gadgets, cell phone, and a product application. The framework engineering comprises of three sections: residential condition, household door, and remote condition. An insightful home computerization framework executed using the Global System for Mobile Communication (GSM). The equipment design of the framework comprises of GSM modem, PIC16F887 microcontroller and cell phone. The framework utilized a GSM modem to control electrical gadgets through a SMS demand. The PIC16F887 microcontroller associates with a GSM modem and is utilized to peruse and decipher the got SMS to execute the particular order. The apparatuses are associated with the PIC16F887 microcontroller through transfers. RS232 is utilized for sequential correspondence between the GSM modem and the PIC16F887 microcontroller. The thought is conveyed forward by these engineering and circuit game plans.

## II. HARDWARE AND SOFTWARE REQUIREMENTS

### A. Hardware Requirements

The following are the necessary apparatus that are used to control 4 different loads:

- Arduino Uno with ATmega328P Microcontroller
- HC-05 Bluetooth Module
- 5 V Relay X2

- Smartphone or tablet (Bluetooth enabled)
- BC547NPN TransistorX4
- 1N4007 DiodeX2
- 1KΩ ResistorX8
- Connecting wires
- 12V Power supply

## A.1. Arduino Uno

It is a microcontroller board dependent on ATmega328P. It involves the 14 advanced information/yield ports of which 6 ports can be upgraded as PWM yields and 6 ports streamlined as simple sources of info. There is a 16MHz gem oscillator mounted on the microcontroller board. There is additionally a USB association, a force connector and an ICSP header alongside a reset button. Arduino Uno includes all the basic prerequisites to help the microcontroller. It very well may be handily associated with a PC with the assistance of a USB link or it tends to be fueled with an AC to DC connector or a battery to make it work. Try not to utilize the USB FDI chip to sequential controller. Your ATmega8U2 workers customized for USB to sequential change.



Figure 1

## A.2. HC-05 Bluetooth

The module of the HC-05 module appeared in Fig. 2 is fundamentally a Bluetooth SPP module that is anything but difficult to utilize and is worked for a straightforward remote sequential association setup [13]. The Bluetooth sequential port module is completely outfitted with Bluetooth adaptation 2.0 and upgraded information pace of 3Mbps adjustment with full 2.4GHz baseband radio handset.



Figure 2

## A.3. Relays module

A transfer is an electro specialized switch which is utilized to control the circuit with the assistance of low force electrical signs and fundamentally works as indicated by the guideline of the actuators. Actuators are those gadgets that convert one type of vitality into another. In transfers, the electrical sign is utilized to work the mechanical switch.



Figure 3

## B. Software Requirement

- Android application
- Arduino 1.6.9 compiler
- Proteus7

## III. RELATED EFFORT

We took the reference from the several journal papers where; we found some related effort that are follows. Pair of the paper presents the Dwelling Interactive Interface, a GUI project providing the dwellers of a Pounding Home with an instrument for controlling appliances, comfort metrics and systems which is published under IEEE. Smart Phone as a Controlling Device for Smart Home using Speech Recognition describe about controlling the home appliances with voice recognition present in IEEE. IoT smart home concept describe about the sensor activity and data analysis, the household can respond autonomously to situations in the home and warn users against possible anomalies and deficiencies. The IoT concept of a smart home described in this document uses wireless low energy IoT elements with a simple installation and implementation of sensors to create a smart home without the need to rebuild a home. Seemly Home security frameworks Using IOT depict Paper manages the security framework which has been intended for the old, truly tested/impaired individuals and little kids in home.

Planning and Implementation of a WiFi Based Home Automation System tells about Paper presents plan and model usage of new home robotization framework that utilizes WiFi innovation as a system foundation interfacing its parts. Home Automation Using Internet of Thing depict about home computerization utilizing advanced mobile phone and PC. The Iot gadgets controls and screens the electronic electrical and the mechanical frameworks utilized in different kinds of structures. We took the references from the above sources with the goal that we can actualize our venture by giving the new strategy in the above notice frameworks.

## IV. PROPOSED STRUCTURE

The idea behind this is to control home devices with voice is that, nowadays people have smartphones with them all the time. So it makes them to use these to control home appliances. Using the application, you can control all the appliances like TV, fans, light etc. You can give the command to switch on or off the devices (like light, fan etc) and also manipulate them like fan speed, light intensity. Commands are sent via a voice to Arduino. So there is no need for you to get up to switch on or switch off the device while watching a movie or doing some important work. In this system we are using the google assistant where we can use to operate from any corner of the world by simply saying "OK GOOGLE" "provide the system connection through the GSM module.

In this structure first the voice has been recognised by using acoustic-phonetic speech parameter. So that after the request has been processed through the Arduino system when set of commands has been coded in order to provide the support to the system.

After that the relay module has been worked where the multiple device is connected and work accordingly .so using that user will no need to take care of their home appliances as basically this structure focused on the disabled person that are in kindly need so no need to get up and switch the light and fan off/on it provide the support to the individual .we are using the database to store the data of currently using units to check the consumption of the electricity. So that user will know about the usage.

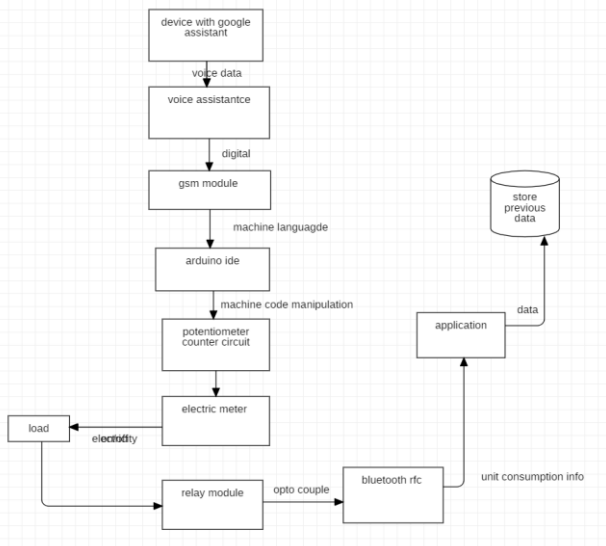


Figure 4: Architecture diagram

## V. IMPLEMENTATION

The proposed system is designed in such a way to reduce the human effort. The user does not need to provide the more effort than saying OK GOOGLE do this. The system used two main components: one is hardware component and the other one is a software component that is used for communicating with the module. Arduino is the main component, as it works as an intermediate module (interface device) between hardware and software. This project worked by using google assistant in which speech has been recognize by using acoustic-phonetic parameter by with it translate the analog into text so that it moves to the Arduino where certain commands has been provided to work with and operate, then it will pass through the electric meter which operate the load and relay module is used to connect multiple device so that it has the control over all the system. GSM module is used to establish a connection with Arduino so that it will read all the instruction and process the request. The data of electricity consumption has been updated in a database which provide the all information of the power consumption which java based application is being developed to check the data. All the operation has been take place using the voice in which google own API has been used that provide us the functional behavior to work with the IOT based device in which internet connection is required as we are using GSM to connect with Arduino.

## VI. OUTCOMES AND DISCUSSIONS

When the command has been given through voice it takes 3-4 sec of time to processed which provide good accuracy as we

have improved the system by using google assistant. We can cope with this by training the system using code in Arduino.

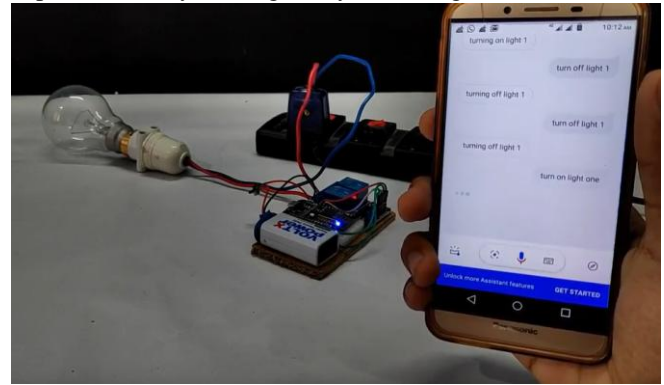


Figure 5: Processing request

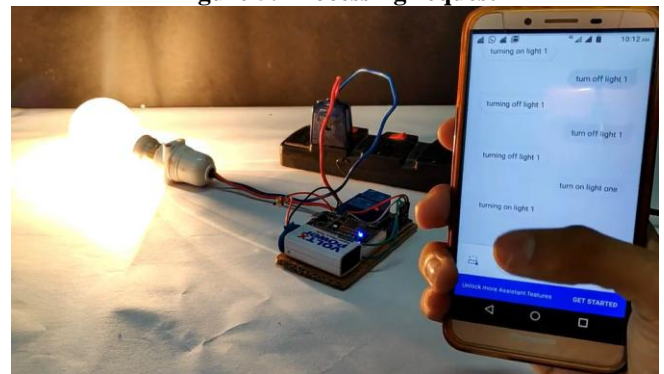


Figure 6: Request Processed

## VII. CONCLUSION AND FUTURE WORK

- Use to operate the home appliances.
- Can be operated from anywhere.
- Work using google assistant.
- Count the usage units.
- Based on Arduino and gsm module.
- System that can be operate wireless using device having google assistant
- To produce a effective system in low cost
- Elder and disable persons friendly system that will help them
- Can operate for security use by adding alarm system

## REFERENCES

1. J. Baby, n. Munshi, a. Malik, k. Dogra and r. Rajesh, "home automation using web application and speech recognition," 2017 international conference on microelectronic devices, circuits and systems (icmdcs), vellore, 2017, pp. 16.
2. N. Kawarazaki and t. Yoshidome, "remote control system of home electrical appliances using speech recognition," 2012 iee international conference on automation science and engineering (case), seoul, 2012, pp. 761-764.
3. M. B., H. H., F. S., Z. M., H. A. R. and N. S. M. K, "Homes Appliances Controlled Using Speech Recognition in Wireless Network Environment", 2009 International Conference on Computer Technology and Development, Kota Kinabalu, 2009, pp. 285- 288.
4. Muhammad Asadullah. Ahsan Raza, "An Overview of Home Automation System". Robotics and Artificial Intelligence (ICRAI), 2016 2nd International Conference on, At Rawalpindi, Pakistan, IEEE 2016.



5. Avishek Paul, Madhurima Panja, Monalisa Bage, Nairit Das, Rudrabrata Mitra Mazumder, Soumyarshi Ghosh, "Voice Recognition Based Wireless Room Automation System", 2016 International Conference on Intelligent Control Power and Instrumentation (ICICPI) IEEE.

## AUTHORS PROFILE



**Ms. C. Ashwini** , Assistant Professor, Computer Science And Engineering Department, in SRM Institute of Science And Technology, Ramapuram , Chennai



**Satyam Sharma** , Pre-Final Year Student of B.Tech ,Computer Science And Engineering in SRM Institute of Science And Technology , Ramapuram, Chennai



**Arpit Srivastava** , Pre-Final Year Student of B.Tech, Computer Science And Engineering in SRM Institute of Science And Technology, Ramapuram, Chennai



**Sakshi Sinha** , Pre-Final Year Student of B.Tech Computer Science And Engineering in SRM Institute of Science And Technology, Ramapuram , Chennai