

Voice Assisted Home Automation

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Abstract – Presently technological evolution is a great platform providing a pool of opportunities. Since technology is evolving so rapidly that we need things that will provide us a little ease in our day to day hectic life. Home automation has become important because it gives the user a convenient and easy method to use home appliances. This paper aims to help people with special needs or physical disabilities or medical conditions to control any device via Bluetooth technology using voice commands based on inbuilt personal assistants. The mobile device can recognize voice command, convert it into the desired text, and communicates using Bluetooth with the micro-controller. The software consists of a micro C language programmable micro-controller. The system is cost-efficient with huge scope in various fields.

Keywords: Automation, IOT, Bluetooth (HC-05), Tasked, Arduino UNO.

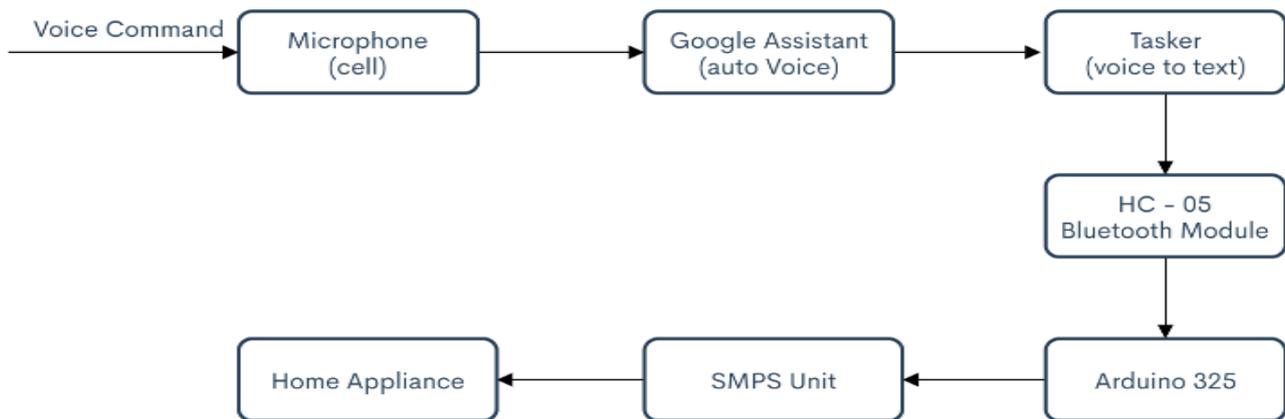
I. INTRODUCTION

In the present time, the world is getting more and more advance as new technology is penetrating deeper into our lives and in our homes as well. The home automation system is becoming very popular around the world. In today's era, one of the major growing industries is home automation because of the way, our lifestyle is changing, and getting evolved and getting dependent on things based on technology, which provide aid and reduces effort. This system is specially designed to provide ease and comfort to physically disabled, blind people, and old citizens, also for a luxurious lifestyle because installing this particular system can eliminate switchboards and can be a change in the design of homes. The aim of this project is to provide service to the old and disabled in a way that they can operate home appliances using their voice commands. The aim of this project is to provide assistance, comfort, and ease at low cost with easy maintenance, there are various running projects on smart homes.

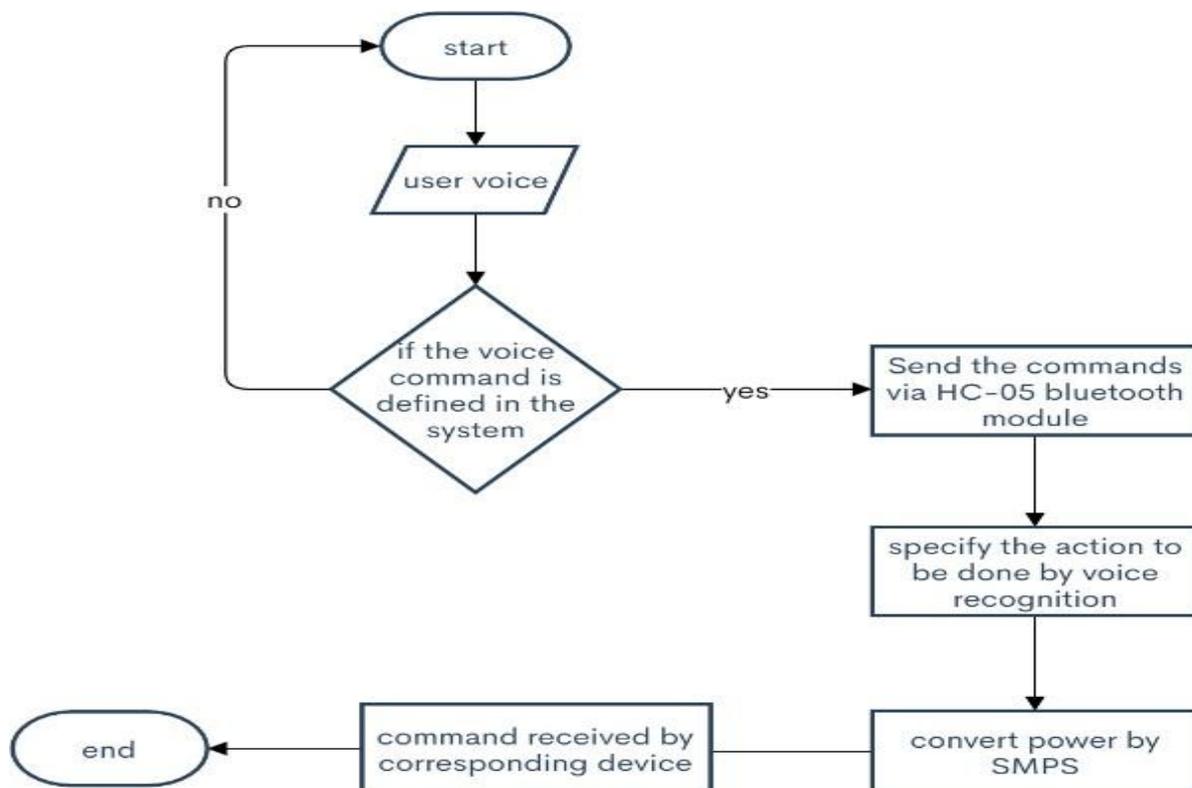
II. LITERATURE SURVEY

In, the proposed format to use Smartphone's to alter all software in the person domestic with the aid in their voice the usage of an Arduino micro-controller. The gadget component includes an Arduino Uno micro-controller, which changed into won't to manner the speech commands from the user and manages the switching of gadgets. The Arduino and cell phone are related to the useful resource of using Bluetooth programs; moreover, the system can use a giant Wi-Fi generation to percentage statistics. In the course of this machine, the Voice reputation package was modified into wont to understand the speech command. In, suggested a task to work mild and fan relying on ATMEGA-328P and Android OS speech popularity. This painting is a trade and appropriate way to operating devices supported sound and consequently, it enables humans with specific must exercise their lives just like the average. In the proposed layout to work domestic appliances using voice command and IR controller. The proposed System could figure with and without Internet Connectivity. It named as Personal Assistant with Voice Recognition Intelligence, which takes the user input in sort of voice or text and processes it and returns the output in various forms like action to be performed or the search result is dictated to the end-user. Also, this proposed system can change the way of interactions between a user and therefore the mobile devices. The system is being designed in such a way that all the services provided by the mobile devices are accessible by the top user on the user's voice commands. This project in the current scenario features a major significance, as installing this in hospitals, during this global pandemic can be a huge help, doctors and nurses can operate appliances employing a small freed from cost application in their smart phones, and a hardware cost-efficient found out.

This design deals with operating the entire range of electronic appliances. All the appliances aside from lights and fans can only be turned on and off, whereas the brightness and speed of lights and fans are often regulated using our voice commands. All the people in the Bluetooth range can connect their phones, having applications installed, and may operate the appliances using Auto voice service provided by goggle assistance with no physical movement. The proposed system is the combination of software and hardware manipulations which ends up in two sections receiving unit and the transmitting unit.



Block diagram of voice controlled Bluetooth based micro-controller.



Block diagram of voice controlled Bluetooth based micro-controller.

III. COMPONENTS REQUIRED

A. TASKER

It is an Android/iOS application that intercepts the voice commands given to goggle assistant, converts the voice input into digital inputs, and transmits over Bluetooth to the system within a fraction of seconds. It is often easily customized according to the user. There is a pre-designed task profile which can be imported to the appliance and used.

B. ARDUINO328

The Arduino Uno micro-controller is based on real-time emulation and embedded trace support. It supports embedded high-speed non volatile storage because of its low power consumption and tiny size, it's good to use where size could also be a key requirement for access control and point-of-sale applications. It's suitable for gateways and protocol converters in

communication, soft modem, voice recognition, low-resolution imaging, and provides high processing power and massive buffer size.

C. HC-05

It is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. It can be used in a Master or Slave configuration.

D. SMPS

It is a switched mode power supply which is customized as per the need of this project. It helps in modulating the power supply which is essential for dimming and regulating purposes. It involves majorly three components – a full wave rectifier, a triac and some opto-couplers.

FULL WAVE RECTIFIER

We obtain a double phased rectified wave with the help of a full wave rectifier. A full wave rectifier converts both halves of each cycle (as shown in figure 1.) of an alternating wave (AC signal) into pulsating DC signal. Thus it provides every half of the wave to the opto-coupler instead of every other half.

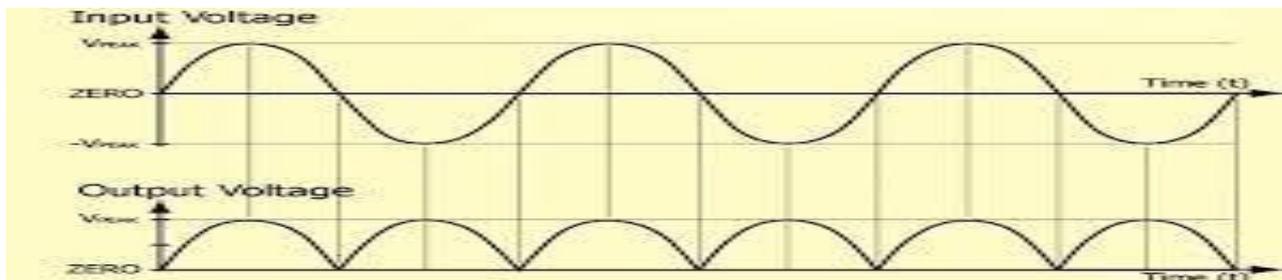


Figure 1: Full wave rectifier TRIAC.

It is a latching device which works as a switch for AC circuit. The micro-controller opens the Triac for microseconds (figure 2.), it stays open until the current through it becomes sufficiently low (close to zero). Since the time for which the triac remains open is unpredictable, therefore leads to unpredictable dimming. So we need a reference point. We need to detect zero point crossing.

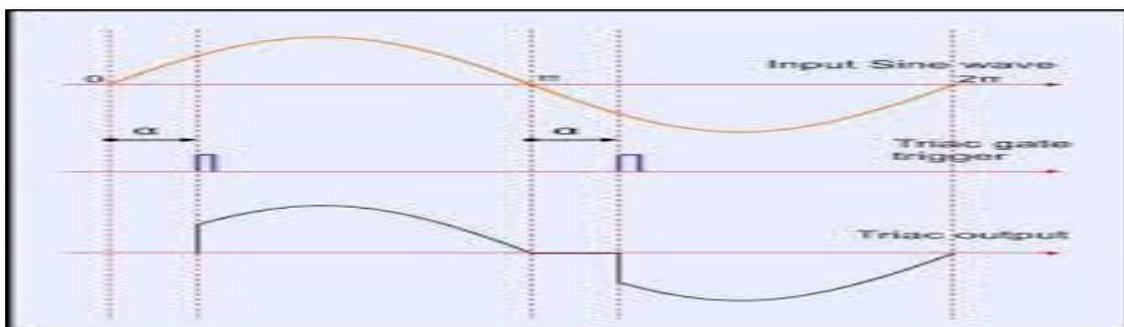


Figure 2: Triac opening for microseconds.

OPTO-COUPLER

It is a device that detects the zero crossings of a sinus wave and in turn, controls the Triac (figure 3.). It generates a signal every time the wave passes through zero. Because the sine wave is double phase rectified it doesn't matter whether the wave is going up or down, the opto-coupler will generate an interrupt every time it detects zero. This ensures a completely predictable dimming from 0% to 100%.

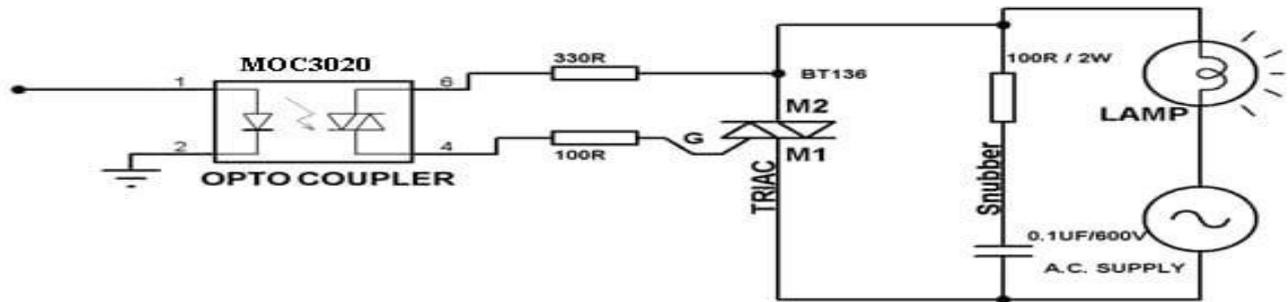


Figure 3: Opto-coupler signaling Triac.

IV. ANALYSIS

Our project uses Bluetooth technology for communication which is secured by a password so only the intended user can control it. Controlling home appliances is successfully achieved using this system. It is tried and tested successfully on a regular power supply and inverter power supply in case of a power cut. Every component of this system works on 12V power and hence power consumption of the system itself is fairly negligible. This system is efficiently regulating the power output for speed control and dimming. This project is tested on various android and iOS versions. The minimum requirement of the android version is android Kit Kat (v4.4) and above and for iOS it is iOS 10 and above. The android device should support goggle voice assistant for this system to work. Our project is capable of entertaining changes as per real-time usage Users can assign commands as per their needs and in the language of their choice. Names of appliances can be assigned as per the user's convenience.

V. CONCLUSION

The low-cost, efficient, highly effective, and real time voice-assisted home appliance operator is implemented and tested. Through this system elderly, patients, disabled and blind people can easily operate electronic appliances using their voice command. It can be concluded that this project work on developing a voice-assisted home automation system is successful. This system not only helps the disabled but had a huge impact on the luxury house project. Voice assistance reduces physical contact and can set a remark in the medical field. This system consists of an Arduino-Uno(C programmable) board, tasked application, SMPS. It is cost-effective has Low power consumption, it reduces risk and the parts are easily available in the market place.

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