



Automation of Lights in College Classroom and Lab using Google Assistant

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ABSTRACT

Automation has seen a rapid increase in its application areas not just restricting its use to industries or high scale applications but also extended its scope to a wider area like using homes, schools, colleges, offices etc. this proposed work deals with controlling of electrical devices using Google Assistant which is a free application for android mobile users. As the world has seen a great rise in number of android users, it led to our motivation of designing a system module which can allow mobile users to control electrical devices switching mechanism. Modern homes are getting more perspicacious with the advancements in engineering and technology. Physical operation of wall switches placed in different corners of the house is not convenient especially for the elderly and physically incapacitated members present in the domicile. World's population is senescent, considering the incrementing percentage of older persons virtually in every nation of the world as a result of advanced health care technologies. A Habitation Automation System (HAS) uses sundry sensors and components for controlling and monitoring the domicile environment. Several papers on Home Automation System have utilized Verbalization apperception, Bluetooth, GSM, DTMF and a number of other ways of operation of the system. In this paper we present a Automation System using Google Assistant where controlling can be done by utilizing the concept of to drive a number of Electrical Appliances (EAs) by interfacing with a relay driver.

Keywords : Google Assistant, automation, relay , GSM, DTMF, Electrical Appliances

I. INTRODUCTION

Human-machine interaction (HMI) has become, the more authentic in day-to-day life due to the, we have received tremendous amendment in the technology, but still power consumption is one of the immensely colossal issue all over the world. As per report, the Information and Communication Technologies (ICT) alone utilizes 4.7% of the world's electricity, which may liable to be incremented to 10% as per report [3]. India, share about the 17% of the world population has constrained energy resources and apportion roughly 0.6%, 0.4% and 7%, for world gas, oil and coal reserves respectively [4]. However, in India, the

electricity consumption due to ICT utilization has incremented from 24 TWh to 31 TWh in the last five years. This has resulted in electricity consumption of roughly 6.5% in 2015 [7]. Thus, preserving of the potency is the main concern, which is the rudimental aim of this project. To preserve the puissance consumption, we have proposed a novel approach, energy efficient home automation system utilizing IoT.

II. Literature Review

Intellective home automation systems
 As demand for electricity is incrementing day-by-day, consequently, perspicacious abode is the upcoming

area of research to provide the remote access for controlling the domicile appliance utilizing IoT [10]. IoT predicated application has additionally provided the boom for old aged people and the person having some scarcely incapacitation [11], . This sanctions the utilizer to control the home automation contrivance such as fan, bulb etc., without even making any physical connection. Research conducted on home automation system is reported in [9]. Most of the antecedent system predicated on these techniques is either predicated on DTMF or Bluetooth system. The rudimentary quandary with DTMF predicated home automation require dedicated PSTN channel for communication between main supply units and controlling contrivance. On the other hand, Bluetooth is utilizable for short range communication that requires the operating appliance in their range. Home automation utilizing MQTT is presented in [28] for sending/receiving data from the sensor. For this Raspberry pi is utilized as a gateway for accessing the data from the sensor which are habituated to quantify the temperature and sultriness of the room. Another home automation system is presented in [11] which are predicated on Raspberry pi and utilizer can control their domicile appliance utilizing the web-predicated interface. In home automation utilizing mobile is reported in which system is designed utilizing ZigBee. IoT has provided the applications to turn non-perspicacious contrivance into perspicacious contrivance, which sanction users to access these contrivances through the Internet. It converts the habitation into astute home and provides a more robust method of controlling the home appliance. Additionally, the security can be integrated with the avail of installed camera in the abode, which can be traced through the Internet. Thus, utilizer can monitor their domicile and can turn ON/OFF their appliances which will definitely going to preserve both the electricity and electric bills.

III. PROPOSED WORK

The proposed work aims to remove the complexities and disadvantages associated to previous works in automation and intend to design a better suited module for implementation in college lab and classroom which can help to ease out the task of teachers and students. It is also helpful for implementation at homes and offices.

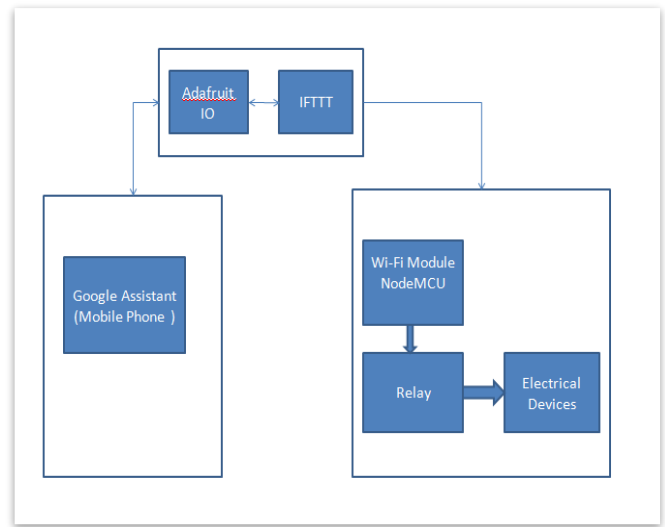


Fig 1. Block diagram of system

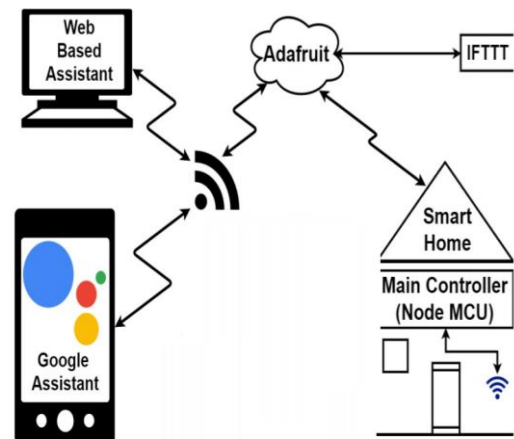


Fig 2. basic diagram of system

The project is divided into three sections i) User control section, ii) Programming and logic interfacing section, iii) Hardware Module for controlling section.

i) User Control section

Google Assistant should be installed in user's android mobile. It is a free application that can be installed from playstore. It takes input commands from user in form of voice which helps to remove out the task of typing or clicking. It is very helpful for senior citizens and physically challenged people also.



Fig 3. Logo of Google Assistant

ii) Programming and logic interfacing section

a. Adafri io : It is an open source platform which enables to provide an interfacing platform between google assistant voice based commands and IFTTT logic. As it is a third part service, we need to make an account with same email-id as that of google account

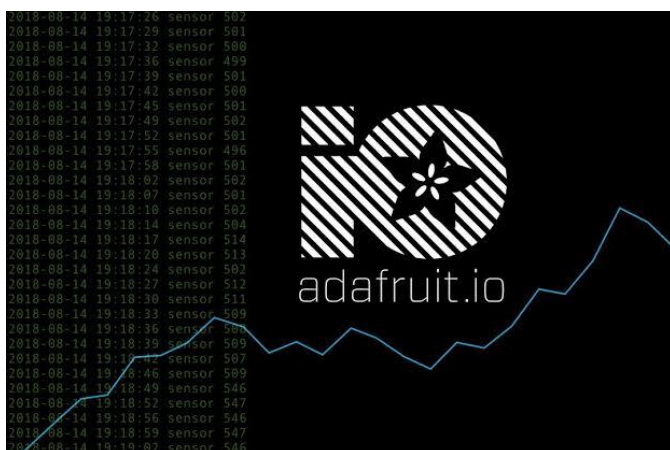


Fig 4. Adafri logo

b. IFTTT

It is a logic generation third part service which helps to annotate the voice commands and configure with Adafri io to switch on and off through dashboard.



Fig 5. IFTTT logo

iii) Hardware Module for controlling section.

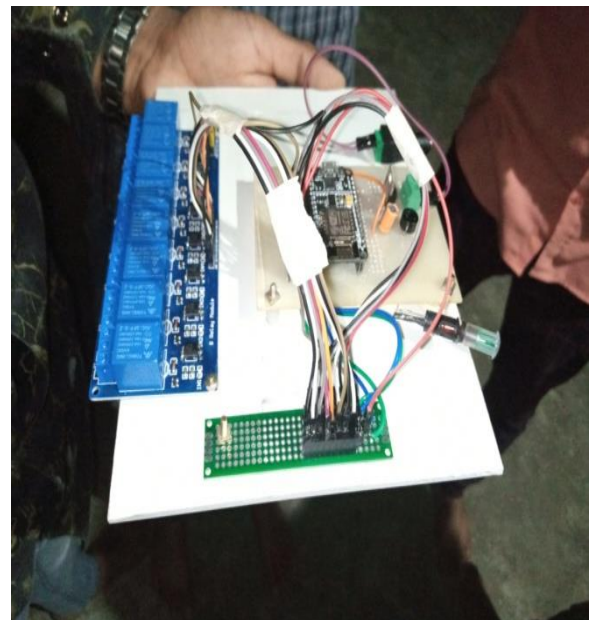


Fig 6. Designed Hardware Module

a. NodeMCU

Controller used is nodemcu which has built-in wifi module to connect with the Google Assistant commands and provide switching commands as output to the relay module.



Fig 7. NodeMcu

b. Relay Module

It is a electromechanical device which senses input signal and then does the work of switching.



Fig 8 - channel relay module

c. Power Supply

Nodemcu is powered by an adaptor which helps to power up the entire circuit

d. Load

The load which has to be switched ON/ OFF has to be connected with the relay using common, NO, NC terminals. In this project 8 channel relay is used which represents 8 loads can be connected with this module.

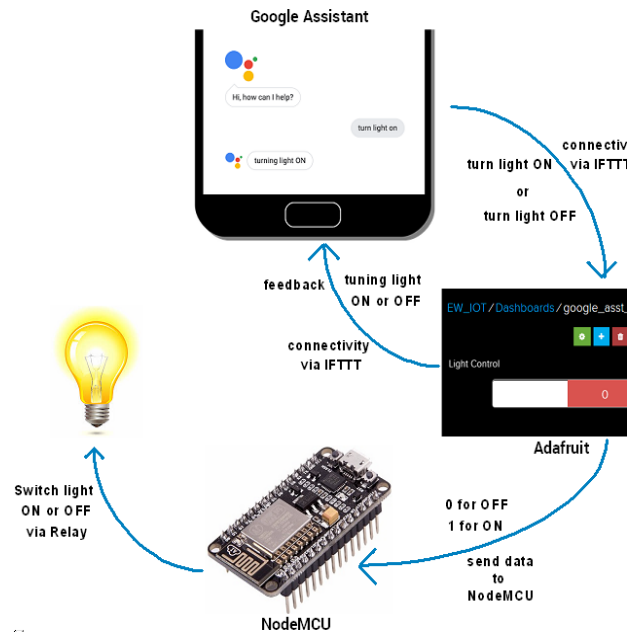


Fig 9. Hardware Module with load connected

IV. CONCLUSION

The system designed here facilitates the automation process which helps to switch on and off the devices connected to it. The project designed here has a practical implementation in college rooms and lab which does not confine its applications. This module can be used in offices, schools, homes and the best part of project is that it can be used from an part of the world and at an moment of time. Also the hardware module is economically feasible.

V. REFERENCES

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