

# iAssist – A Digital Life Assistant

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**Abstract-Physical interaction in order to provide commands or gain access to a computer system is now a history. Voice or speech stimulated systems are a part of modern Smartphone culture. We present iAssist, a digital life assistant that can be used to control lights and appliances, assist in cooking, notifying about breaking news, and many more. In our project we mainly use voice as communication means so the iAssist is basically a Speech recognition application. The concept of speech technology really encompasses two technologies: Synthesizer and recognizer. A speech synthesizer takes as input and produces an audio stream as output. A speech recognizer on the other hand does opposite. It takes an audio stream as input and thus turns it into text transcription. Our aim is to create more and more functionalities which can help human in assisting in their daily life and reduce their efforts.**

**Keywords:** *Node MCU, Home Automation, Internet of Things*

## I INTRODUCTION

This is a cost-effective system made from locally available components like NodeMCU chip, power supply module and relay modules which allows us to control the lighting system of our house.

This paper describes a smart home where lighting system of the house is monitored and controlled remotely and voice by establishing a remote server and by using an application based on C, C++.

The Internet of Things is connecting everyday objects intelligently to the Internet to enable communication between things and people, and between things themselves. The devices can be any physical objects like smart-phones, Internet TVs, sensors and actuators [1]. For the objects to collect and exchange data electronics, software, sensors and network connectivity are embedded into them. This technology has endless possibilities and infinite applications. Everyday devices are made smart and intuitive and by enabling them to share data intelligently they can be

used to improve peoples' lives. It can be used to provide better personal safety, monitor health, save time and make better use of our natural resources. IOT has made a huge impact in the way people live, work and communicate.

IoT has received much attention from scientists, industry and government all over the world for its potential in changing modern day living. IoT is envisioned as billions of sensors connected to the internet through wireless and other communication technologies. The sensors would generate large amount of data which needs to be analyzed, interpreted and utilized. Home Automation System uses the technology of Internet of Things for monitoring and controlling of the electrical and electronic appliances at home from any remote location by simply using a Smartphone. Implementation of a low cost, flexible home automation system is presented. It enhances the use of wireless communication which provides the user.

iAssist is a network of various chip and controllers integrated together to provide the user with remote control of various devices within their home. The sensors sense various changes, monitor them, store the data and display them for analysis and control. This helps us customize our home to fit every family's way of life.

## II OBJECTIVE AND METHODOLOGY

The main objective of the project is to simplify our life by providing service for complete home automation, virtual assistant and answering door in absence of the owner. The assistant will be designed for ease of interaction without expertise, and to be able to learn through past experiences and interactions.

- a. Methodology
  - i. Hardware Implementation

To make the system hardware we gone through below block diagram. The whole block diagram is divided into two sections, first is Server side and other one is client or user

side

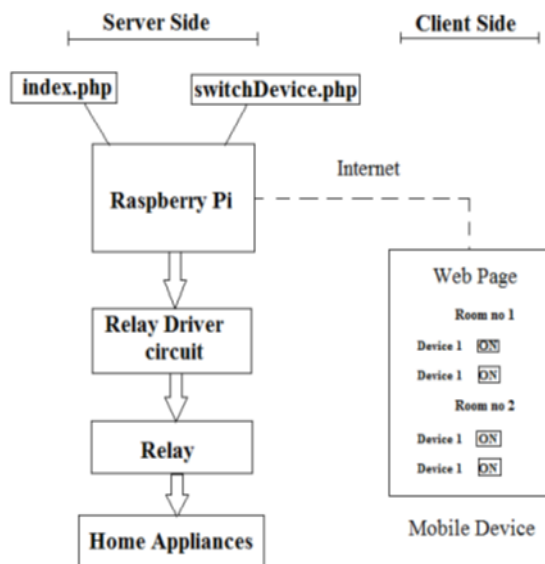


Fig 1:Hardware Implementation

Server side is totally installed on the IFTT. Server is created on the Raspberry pi with the help of LAMP (Linux, Apache, MySQL, PHP)<sup>[2]</sup>. Two PHP files are created and stored on the Server that we have created on the Raspberry pi. Raspberry pi is having 40 GPIO pins. These pins are used to control the home appliances. Relay are connected to the GPIO pins of the Raspberry pi through the Relay Driver Circuitry. Output of the GPIO pins is 3.3V. In order to drive Relay minimum 6V voltage is required so this can be obtained with the help of Relay driver circuitry. All home appliances are connected to the Relay.

Client side is nothing but a User side. Users need to use Mobile device to access the Raspberry pi through the internet. Once the user connects mobile device in network and after putting the IP address of the Raspberry pi in the browser of Mobile device will be able to see the web page which contains UI to control home appliances in each room. UI simply shows the number of rooms and home appliances present in each room. It also contains buttons to toggle the status of home appliances of each room. Number of home appliances can be controlled simultaneously.

- Node MCU ESP-12 chip

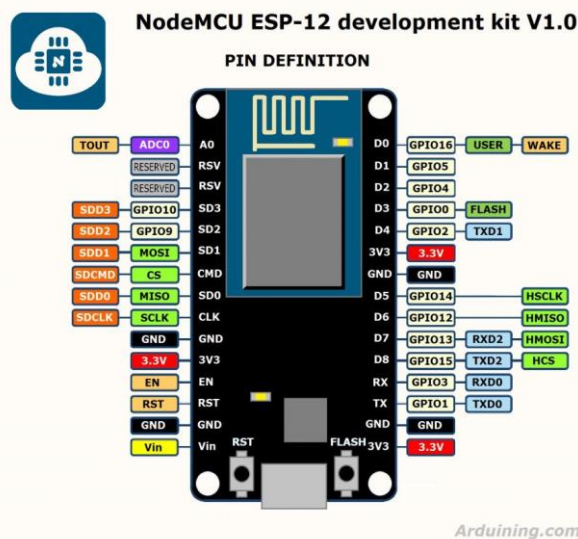


Fig 2: Node MCU ESP-12 chip

NodeMCU<sup>[5]</sup> is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language

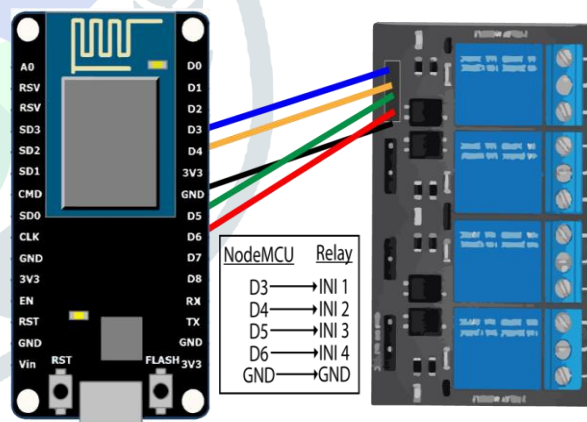
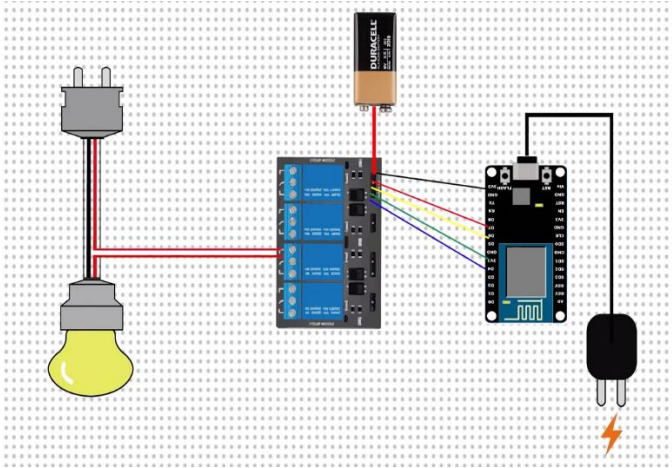


Fig 3: Hardware Assembly of home automation



voice commands over Google Assistant service connected over IFTTT.

### III EXISTING SYSTEM

Digital assistants make work via:

- Text (online chat), especially in an instant messaging app or other app
- Voice, for example with Amazon Alexa on the Amazon Echo device, or Siri on an iPhone
- By taking and/or uploading images, as in the case of Samsung Bixby on the Samsung Galaxy S8

Some virtual assistants are accessible via multiple methods, such as Google Assistant via chat on the Google Allo app and via voice on Google Home smart speakers.

Virtual assistants use natural language processing (NLP) to match user text or voice input to executable commands. Many continually learn using artificial intelligence techniques including machine learning.

To activate a virtual assistant using the voice, a wake word might be used. This is a word or groups of words such as "Alexa", "Hey Siri" or "OK Google".

Virtual assistants may be integrated into many types of platforms or, like Amazon Alexa, across several of them:

- Into devices like smart speakers such as Amazon Echo, Google Home and Apple HomePod
- In instant messaging apps on both smartphones and via the Web, e.g. Facebook's M (virtual assistant) on both Facebook and Facebook Messenger apps or via the Web
- Built into a mobile operating system (OS), as are Apple's Siri on iOS devices and BlackBerry Assistant on BlackBerry 10 devices, or into a desktop OS such as Cortana on Microsoft Windows OS
- Built into a smartphone independent of the OS, as is Bixby on the Samsung Galaxy S8 and Note 8[6].
- On other mobile apps such as Google Allo
- Within instant messaging platforms, assistants from specific organizations, such as Aeromexico's Aerobot on Facebook Messenger or Wechat Secretary on WeChat
- Within mobile apps from specific companies and other organizations, such as Dom from Domino's Pizza
- On smartwatches



Fig 5: Software Implementation

The programming is done over C/C++ language on the NodeMCU chip, where we have to functions start() and loop() to control the behaviour of the relay driver. The Blynk app installed or the Google Assistant is connected to the NodeMCU using IFTTT platform through which the instructions are sent to the relay driver to control the overall service. This is just the brief of how the whole process works. To understand in detail, we have a NodeMCU chip which has an inbuilt wifi module, to connect the internet, in order to control the circuit over the internet[4]. The NodeMCU chip is connected with a relay driver whose job is to control the circuit, based on the chip's instructions. To control the NodeMCU from the internet we have IFTTT website which basically acts a mediator between the hardware and the app. The app sends the instructions to the hardware through IFTTT webhooks service to control the circuit. The commands basically trigger an event which has a certain response. The same can be achieved through the

- In appliances, cars, and Android Wear clothing.
- Previous generations of virtual assistants often worked on websites, such as Alaska Airlines' Ask Jenn, or on interactive voice response (IVR) systems such as American Airlines' IVR by Nuance.

•Orange Djingo

Virtual assistants can provide a wide variety of services, and particularly those from Amazon Alexa and Google Assistant grow by the day. These include:

- Provide information such as weather, facts from e.g. Wikipedia or IMDB, set an alarm, make to-do lists and shopping lists
- Play music from streaming services such as Spotify and Pandora; play radio stations; read audiobooks
- Play videos, TV shows or movies on televisions, streaming from e.g. Netflix
- Conversational commerce, see below
- Complement and/or replace customer service by humans. One report estimated that an automated online assistant produced a 30% decrease in the work-load for a human-provided call center.

Conversational commerce-

Conversational commerce is e-commerce via various means of messaging, including via voice assistants but also live chat on e-commerce Web sites, live chat on messaging apps such as WeChat, Facebook Messenger and WhatsApp.

Third-party services-

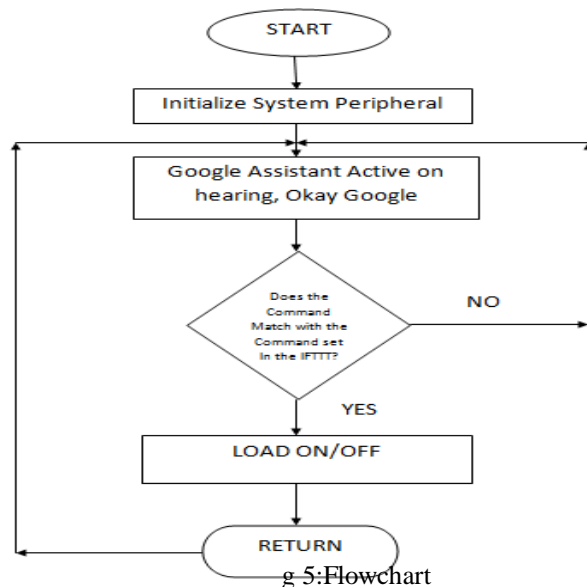
Amazon enables Alexa "Skills" and Google "Actions", essentially apps that run on the assistant platforms.

**IV DRAWBACKS ON EXISTING SYSTEM**

- No Person stays in home all the time
- Need to remember every guest who all visited before
- Difficult to remember all the information
- Need an efficient system for home automation rather than controlling manually
- Need of a system to answer door in the absence of the house owner

- Need of a cheap security system to provide security in the absence of the house owner

**V FLOWCHART**



**VI. SEQUENCE DIAGRAM**

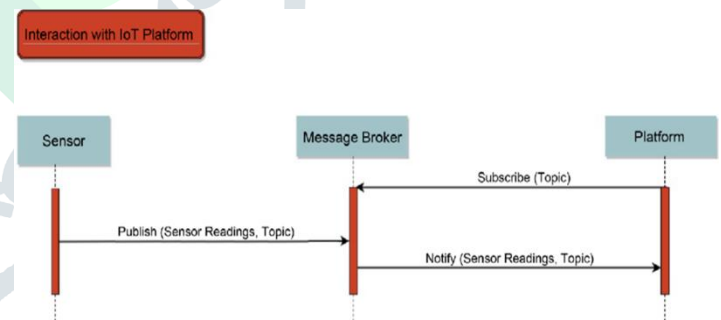


Fig 6:Sequence Diagram

**VII CONCLUSION**

The aim of this paper was to propose a cost-effective voice controlled (Google Assistant) home automation. Controlling general appliances found in one's home. The approach discussed in the paper was successful as GACHA's (Google Assistant Controlled Home Automation) design was successfully implemented. This system is highly reliable and efficient for the aged people and differently abled person on a wheel chair who cannot reach the switch for the switching ON/OFF the device and are dependent on others.

The future scope for GACHA can be huge. There are many factors to improve on to make GACHA more powerful, intelligent, scalable, and to become better overall for home automation. For example, controlling the speed of the fan, a greater number of devices can be integrated, like a coffee machine, air conditioner etc. To make the system respond more faster own private Blynk server can be made. Well, no system is ever perfect. It always has a scope for improvement. One just needs to put on a thinking cap and try and make the system better.

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