



# A Survey on: Home Automation through Voice Recognition Application and Messaging on Social Sites

Ajay Mane<sup>1</sup>, Nilam Thopate<sup>2</sup>, Puja Pawar<sup>3</sup>, Mohini Kanse<sup>4</sup>  
BE Student<sup>1,2,3,4</sup>

Department of Computer Engineering  
SEC, Someshwar Nagar, Baramati, Pune, Maharashtra, India

## Abstract:

People are using smart phones and social networks for every aspect of their lives. This system develops a scalable platform in which the user could monitor and control their home wirelessly. A proposed system for home automation with the help of Raspberry pi using Internet of Things (IoT). In this system the controlling of devices are done in two methods. In the first method user can control devices through Android Voice Application and in second method by using Social Network like Facebook. Raspberry Pi is used as the board controller to connected the appliances through input and output port. The communication between the smartphone and the Raspberry Pi board is wireless.

**Keywords:** Voice control app, Internet of things, Raspberry pi, Smart home, Facebook Bot Server.

## I. INTRODUCTION

Home automation system can be referred as a system which replaces human interactions by controls. This used connecting Relay and Internet of Thing (IoT). Devices uses internet to connect to each other and operate further. Internet of Thing is a dust that turns the automated home into the smart home. Internet of thing allows object to be controlled and sensed. Home automation is used for connecting various electrical devices in our home or office. These automation systems are designed or manufactured according to need of customer. Using home automation we can control devices remotely i.e. we can control lights, A.C, room temperature etc. Home automation systems are used for power saving. Home automation system requires computers which are large as well as heavy to carry around

### a) Raspberry-Pi

In our project we are using Raspberry Pi which works as a card size computer and remove the overhead of carrying heavy size tools from one place to another place. Various automation systems come according to the type of connection and future usage. We are using home automation using Wireless Browser base using Raspberry-Pi with the help of internet. We are using raspberry-pi because it's a simple circuit, easy to operate and it offers privacy because at a side single user can view or use the circuit.

### Technical Specification:

- Broadcom BCM2837 64 bit quad core processor power single board computer at 1.2 GHz.
- 1 GB RAM.
- BCM 43143 Wi-Fi on board.
- Bluetooth Low Energy on board.
- 40 extended GPIO.
- 4\* USB 2 ports.
- 4 pole Stereo output and composite video port.
- Full size HDMI.
- CSI camera port.

- DSI display board.
- Micro SD port.

### B) Voice Application:

Voice recognition application takes an audio stream as input and convert it into a text format. The voice recognition process having a front end and a back end.

### Convert Audio Input

The front end processes the audio stream, isolating segments of sound that are probably speech and converting them into a series of numeric values that characterize the vocal sounds in the signal.

### Match Input to Speech Models

In back end the output produced by the front end and searches across three databases: an acoustic model, a lexicon and a language model

## II. LITERATURE SURVEY

1] Home Automation System with Android Application.

**Authors:** - Mohd.Nor Azni

**Description:** This system allows the user to control home appliances through Android application with the help of Raspberry Pi.

2] A Bluetooth Based Sophisticated Home Automation.

**Authors:** - Sukhen Das.

**Description:** This system represents a reliable, compact & low cost smart home automation system. This system utilizes Bluetooth module for fast and reliable communication in between the remote user and home devices. But this system has one drawback is in Bluetooth range limit.

3] Low cost Arduino/Android-based Energy-Efficient Home Automation System with Smart Task Scheduling.

**Authors:** - Kim Baraka

**Description:** This system combines both wired & wireless technologies for Home Automation.

4] A Smart Home Automation Technique with Raspberry Pi using IOT

**Authors:** - Vamsikrishna patchava

**Description:** This system reduces most of the human interactions, by supporting this system using Internet of Things (IoT).

5] Home and Building Automation through Social Networks.

**Authors:** - Luis C,Basaca-Preciado.

**Description:-** The main purpose of this system to Automate the some task in the office and home.

### III. TECHNIQUES

#### a] Internet of Things :

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique Id and also provide ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Virtualized networks, cloud computing and the data center will play a vital role in making the Internet of Things a success. The vision for IoT is that millions of devices will be connected to each other and the Internet allowing people to communicate with machines, and machines to communicate with other machines. The data from all those devices will be critical to existing data center infrastructure because it will represent a massive increase in the amount of data and connected nodes to the network. The cloud will play a key role in IoT because it can connect many of these devices, some of which will have very low intelligence or functionality. Data analytics will be vital because all the data collected from these devices will lead to the development of smarter applications for industrial and consumer businesses.

#### ➤ Cloud:

The cloud is a term referring to accessing computer, information technology (IT), and software applications through a network connection, often by accessing data centers using wide area networking (WAN) or Internet connectivity. The cloud is used to store large amount data which can be accessed from any place through internet.

#### Types of Cloud:

##### 1)Public Cloud :

In public cloud Service providers use the internet to make resources, such as applications and storage, available to the general public, or on a 'public cloud. There are some limitations of the public cloud may not be the right fit for every organization.

##### 2)Private Cloud:

Private clouds are data center architectures owned by a single company that provides flexibility, scalability, provisioning, automation and monitoring. The goal of a private cloud is not sell "as-a-service" offerings to external customers but instead to gain the benefits of cloud architecture without giving up the control of maintaining your own data center.

#### ➤ Microcontroller

A microcontroller is a small computer on a single integrated circuit. In new terminology, it is similar to, but less sophisticated than, a system on a chip or SoC. An SoC may include a microcontroller as one of its components. A microcontroller contains one or more CPUs (processor cores) along with memory and programmable input/output

peripherals. Program memory in the form of Ferroelectric RAM, NOR flash is also often included on chip, as well as a small amount of RAM. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications consisting of various discrete chips. Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/ output devices, microcontrollers make it economical to digitally control even more devices and processes. Mixed signal microcontrollers are common, integrating analog components needed to control non-digital electronic systems.

### IV. PROPOSED SYSTEM

Today use of social network through smartphones is very high. Count of smartphone users is exploding in more numbers and yet extra hardware is required to control the home automation system. To make home automation system more accessible and robust we have come up with this idea.

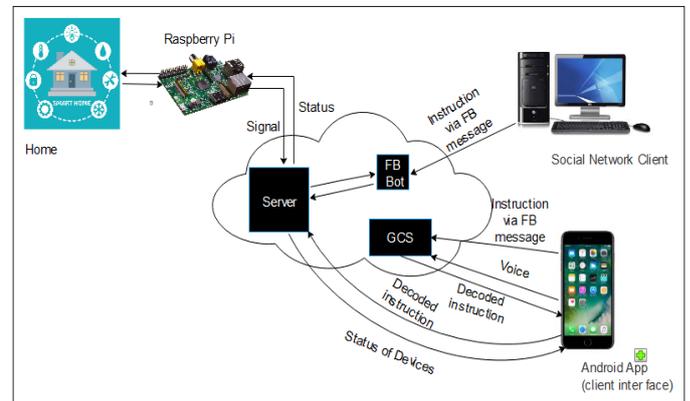


Figure.1. System Architecture

In the given architecture following are main components:

#### 1. Android Mobile Application (Gleam):

This is the mobile application used in the project to register the user with our system. Once registered he can log in to the app and start using our app. Inside our app user can see all the appliances connected to his controlling device. He can also control the permission of certain users to access the devices of which he is the administrator. He can see the status of all devices which he is accessible to and can control them either using GUI switches or voice command. Gleam uses Facebook Or Auth login system. Thus fetching user's credentials from Facebook. It then lookup for the same user in our database and fetches the information about users appliances and controlling device from our server. Switch GUI is a direct interface to control appliances. It is just like pressing virtual switches. Voice control is the easier way to control appliances. Just launch the app and hit voice command button and speak the command. Gleam will recognize command given and execute the instruction accordingly. We use Google cloud API to extract a contextual instruction from voice instruction.

#### 2. Facebook Bot Server:

This is a server connected to Facebook messaging system. It imitates a user who is continuously online on Facebook listening to other user's request. Once a user requests

something to our Messenger Bot it reads the request, identifies a user, validates appliance id in the request, verifies appliance id, processes the request and forwards it to the main server. The main server then executes the request of the user. Thus using Facebook any user can control his home automation system from anywhere and any device without dedicated hardware.

#### **Server:**

This is the main server which processes the APIs of mobile app Glean and Controller device. It processes all requests coming from either the mobile app or the Facebook chatbot or Google assistant. It always keeps listening to request and once the request is available it verifies and validates user and appliance pointed in the request. The server is directly connected to the central database and thus is our central control unit. Processed request is sent to controlling device which is directly connected to the server and thus executing the request.

#### **Controlling Device (Raspberry Pi):**

This device is fitted inside the house of the user. This device is directly connected to the main server. And it is connected to appliances using relays which acts as digital switches. Thus using controlling device we can control appliances giving request to the server. The Raspberry Pi is a compact and smart computer system that has been developed to provide low-cost computer. Raspberry-Pi does not contain any storage facility, it contain a micro SD card slot.

#### **Google Cloud Speech APIs:**

It authorize developers to convert audio to text by applying powerful neural network models in an easy to use API. The API recognizes over 110 languages and variants, to support your global user base. You can transcribe the text of users dictating to an application's microphone, enable command-and-control through voice, or transcribe audio files, among many other use cases. Recognize audio uploaded in the request, and integrate with your audio storage on Google Cloud Storage, by using the same technology Google uses to power its own products. Once audio is converted to textual info it can be used to build a request. This request can then be sent to the main server to process and execute. This system makes home automation easy to control and access without any extra device.

#### **Google Assistant:**

We can also control our system using Google assistant on Android smartphones without even launching our android application. Google assistant takes the request of the user and recognizes the app for which request is sent. Assistant then directly forwards request to our main server using Google Action APIs without launching our Android application.

## **V. CONCLUSION AND FUTURE WORK**

#### **Conclusion:**

This system successfully designed a system that communicates with a mobile device such as a Smartphone or laptop via Raspberry Pi to control light switches ,fans and A.C. In this system, we can control our home automation system just using

social networks like Facebook or voice command on android device or google assistance on android device.

## **VI. FUTURE SCOPE:**

Making homes even smarter is future scope for the home automation systems. Our homes can be interfaced with sensors such as motion sensors, fire detector sensor, gas leakage and temperature sensors which can provide automatic toggling of devices by analysis certain conditions. Energy can be conserved by turning on or off the light according to the environmental changes. Home automation technique can be easily converted into or used as security system for our homes. The future scope will extend these systems to work on a larger scale environments such as offices and factories and also we detect the fire.

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