

## **Review of Dynamic Digital Assistant Using Raspberry Pi**

Komal P. Nikure<sup>1</sup>, Prof. Ashish Manusmare<sup>2</sup>

<sup>1</sup>Department of Electronics & communication, Ballarpur Institute of Technology Ballarpur, India

<sup>2</sup>Department of Electronics & Communication, Ballarpur Institute of Technology Ballarpur, India

Corresponding Author: Komal P. Nikure

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**Abstract:** One of the goals of ‘‘ Dynamic Digital Assistant ‘‘ is boon for everyone in this new era of 21<sup>st</sup> century. It has develop for new technology where we can ask question to smart speaker and can interact with IVAs as people do with human. This new technology attracted almost world wide in many ways like smart phone, laptop , computer etc. The purpose of this paper is to interacting between smart speaker and user through the voice command and voice instruction using Raspberry Pi. In this system the two digital assistant operate on a single raspberry pi. Basically python language is used in this system. The main object of this system is to provide the voice information to the user. By using the Google assistant or Alexa through the USB speaker or USB microphone in real time mode. In this paper we can operate or control some home automation system by giving voice command to the system. Electric bulb or other electronic device can handled.

**Keywords:** USB Speaker , USB microphone , Raspberry Pi , Router , ESP8266 , Relay , IoT.

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### **I. Introduction**

A voice command system means a system in which voice process as input decodes & understands the meaning of that input it. and generate the real voice output. Voice system is very easy to understand for human being. In this recent year everyone want to their work easy in short time so for that they referred to this voice commands system for fulfill their work or complete their work. Voice command is basically used to operate any device to perform any task or write any data or information without having to used a mouse keyboards. Now, a days voice commands is done on a computer with the help of ASR(automatic speech recognition)software program .

Similarly, this system also available in smart device like smart phone. In this century voice command is developed day by day in communication technology. Since it is rapidly growing to process sound and voice than to process written text. Hence the voice system is omnipresent in computer system. Voice system is portable system so we can easily travel from one place to another. In this voice system we can use another language. also for voice commands basically English is referred because it is easy to understand to everyone. Now a day some electronic device like simple speaker, mic are reduce day by day and it replace with smart speaker .The smart speaker such as google assistant, alexa voice system. And it increase human interaction with the smart speaker. Basically, the smart speakers needs or use wireless technology such as internet, router, by using this technology communication is possible between smart speaker and user.

This digital assistant became popular in world wide. some smart device like to referred this digital assistant. The main work of this paper is to communication between smart speaker & user through the voice commands by using the raspberry pi. Also it will work for home automation system for controlling or operating some smart device. The main benefit of this digital assistant in home automation is to decrease the effort of using smart phone and developing the need of smart phone. In other words user can save their time and spent time with family with dynamic digital assistant. Disabilities people also have access to use the digital assistant.

### **II. Literature Review**

This paper present the survey on virtual assistant: google assistant, siri ,cortanana, alexa .This technology focus in world wide like smart phone, laptop, computer, etc. The aim of this paper is to test voice recognition and contextual understanding between user and human interaction. For completes this aim they analyses on the voice recognition and human interaction.To recognize the voice, it was necessary to know that the Virtual Assistant regularly understood the words that the users were referring to. The idea giving a feedback or estimation. In this survey, users tried to identify voices in gadgets and various differentiations along with them Changing the volume of the sounds of the base. According to the reports, Google and Siri understood

better. Google Assistant is good to understand the natural language, Alexa sounds and music are good, Alex is not easy with basic questions, Core is not basic. This was the first issue of human interaction that survey found that the hand-free connection to the neglected user was a real use case. In these special circumstances, the disruption ability was a huge obstacle. When they were given requests that they were asked to select or select an option by dragging the touch screen using the sermon on the outside of the intelligent virtual assistive screen or by using the discourse. It essentially intervened without handling the hands of the IVA and was particularly thought to be revolutionary in the situation, for example, driving. keeping the discourse as basic information and need to link all the activities through the connection so that there should be a need for the future of the IPA, with the specific guarantee that the Hands Free Association is completely complete, and that activities do not interfere with the process of collaboration [1].

This paper includes voice activated smart home design and implementation. The aim of this paper is to design and implement a quality home assistant that can be controlled by voice and text commands. Sound commands are captured by the Amazon Voice Service, also known as alexia, is processed via Amazon Developer Console. Before reaching the control terminal, Alexa skills and Ngrok services can access and manage these services via raspberry pi user Amazon Developer Console [2].

This paper present voice enabled home automation using Amazon echo. Home Automation enabled current paper with Amazon Paper using Amazon Echo. In this field, the research focuses on how to create a robust, economical system with the latest developments available, and smart non-smart and large-scale applications. Amazon Power N is used. And to provide smart features for the smart phone, Raspberry Pi3 is used as a hardware component. They describe different components of their product and work effectively to switch their systems and shut down applications [3].

We discussed a smart home system will be needed in the near future, with continually improved Google homepage and Amazon Echo. This paper introduces the design and implementation of a low-cost Voice Active Smart Home system that can be combined with many basic subsystems and individual needs can be met. With Alexa Skills Kits and Raspberry Pi, each device can be controlled anywhere without having to interact directly with them. It is full with the possibility of developing simple and user-friendly Alexa Skills Kit and Amazon Web Services. Future tasks for upgrading Smart Home systems can be done to accommodate large numbers of users [4].

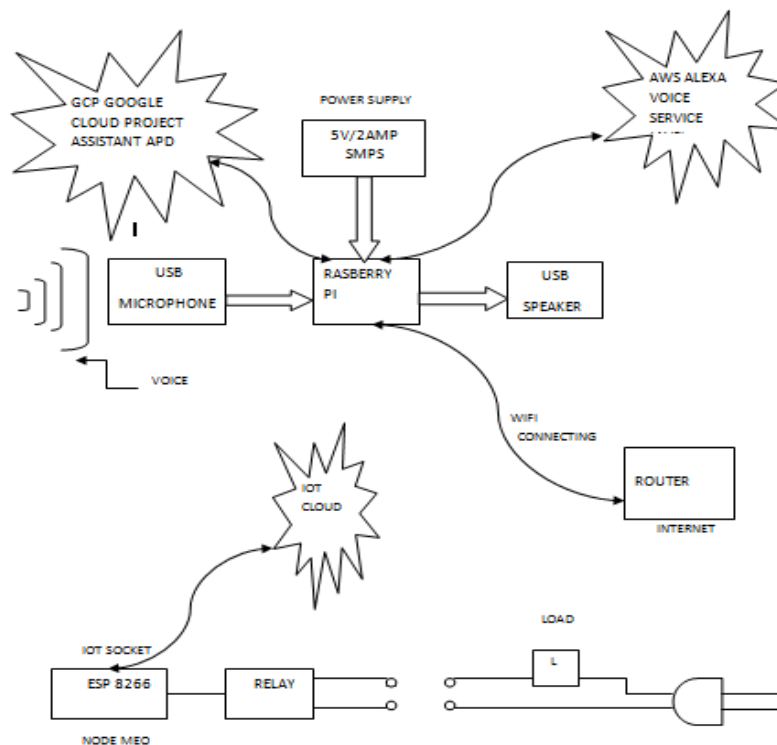
This paper present intelligent assistant for controlling IoT device. The propose of this paper is to design and development of intelligent assistant control system by using bylnk app. This paper describes the implementation and configuration of intelligent assistants for domestic use as a combination of cloud networking and industrial controllers. This project uses BNE application which uses cloud networking and wireless communication connectors so that the user has a variety of telephones, mixed electrical applications and sensors, various information, humidity, temperature, moisture ,gas equivalent [5].

This paper present the voice controlled personal assistant using raspberry pi. The purpose of this paper can serve many as the purpose of implementing the voice command system as an intelligent personal assistant. In this system the user started the system and used the microphone to send it to the input. Then users receive input and the computer is given it for further processing, then the input volume is conveyed to the text converter, which converts the audio input text output from the computer and after that the keywords of that content are analyzed and searched, the text searches the text to match the system word, and once the keyword is matched then it give required output. This output is in text format and then converted to speech output using speech converter which uses optical character recognition system [6].

This article present the next generation of virtual assistant (Microsoft cortana, apple siri , amazon alexa and google home).The goals of this paper is the realization of natural dialogue between the human and machine for this purpose multimodal is used. Multimodal dialogue system which process toe or more combination of user input modes such as image ,video ,touch, head and body movement in order to design next generation of VPAS model. This system can support to wide range of application such as business enterprises, education, government, healthcare. In this paper, the Amazon Voice Service, also called Alexa is not it Voice recognition work only in this smart phone , but the brains of millions of tools Amazon Eco - Smart Home Device has developed Amazon uses the proposed Smart Home System Amazon Because of its voice recognition system and the value of proto typing, voice services .We have a general understanding of personal assistants. A person (or agent) who is able to provide specific help in the context of given time and given action [7].

After the various study and literature survey, communication system is one of the active sectors Companies use to design and improve their new system. According to CMM Research, 2030, millions of people using "voice" to interact with the machine and to voice-play Smart phones will become part and portions of smart phones Specs, Home Centers, Kitchen Appliances, TVs, Game Console [8].

### III. Proposed Work



**Fig:** Block diagram of dynamic digital assistant using raspberry pi

Initially, when the user starts the system, he uses a USB microphone to send the input voice signal. In this system user speak into the microphone then it will takes input voice from the user and it is fed to the raspberry pi for processing then the raspberry pi will fed that input signal to the Google assistant through the raspberry pi . After receiving input voice the Google assistant will contact with cloud server .Cloud server will collect the data from all input devices that the system uses to collect the data from USB microphone then input from the user it constructs queries to cloud servers and knowledge source in order to perform given task. After that raspberry pi receive that input voice signal from google cloud server and then convert it to text then it sends the text to the application in cloud servers to analyze the text & returning the result in USB speaker.

Similarly, Alexa will also be working as google assistant .In this system voice input takes from USB microphone to alexa . after receiving the voice input from the microphone alexa contact with cloud server for performing given task and require output will give in USB speaker. In this system raspberry pi require 5v/2amp SMPS. here raspberry pi is interfacing with the router through the Wi-Fi or internet system .Router is used for forwarding the data packets or information between the networks or within a network or to another network. In this system some other device also use such as esp8266, IoT socket , relay , IoT cloud .The esp826 is the controller used for controlling this system . Smart socket is used to connect with other smart device. Relay is used for on or off the system. by using this device we will operate home automation system.

### IV. Conclusion

This proposal introduces the design of Dynamic Digital Assistants, a new VPA system that is designed to communicate with humans in a consistent structure. This assistant systems have used to speech and other methods used in communication, input and output channels. Plus, a dynamic digital assistant system will be used to enhance communication between users and raspberry pi through some technologies. This system can be used in various activities like education assistance, medical assistance, robotics and vehicle, disability system,

home automation and safety access control. Voice In addition, it creates a way for connected homes using Internet of Things, Voice Command System, and Computer Vision.

### References

- [1]. Amrita s. Tulshan and Sudhir Namdeorao Dhage “Survey on Virtual Assistant : google Assistant,Siri,Cortana,Alexa”. © Springer Nature Singapore Pte Ltd. 2019 S. M. Thampi et al. (Eds.): SIRS 2018, CCIS 968, pp. 190–201, 2019. [https://doi.org/10.1007/978-981-13-5758-9\\_17](https://doi.org/10.1007/978-981-13-5758-9_17)
- [2]. Chan Zhen Yue and Shum Pig, “Voice activated Smart home design and implementation”. 2<sup>nd</sup> international 2017 conference on frontiers of sensor technology 978-1-5090-4860-1/17/\$31.00 ©2017 IEEE
- [3]. Achal S Kaundinva,Nikhil S P Atreyas,Smrithi Srinivas,Vidhya Kehav,Naveen Kumar “Voice enabled home automation using Amazon echo” “International Research Journal of Engineering and Technology (IRJET)Volume:04Issue:08August-2017”.e-ISSN:2395-0056 p-ISSN:2395-0072
- [4]. G.Ashwini,M.Nithish Reddy, R.Paramesh,P.AKHIL “An intelligent virtual assistant using raspberry pi ”
- [5]. Nidhi Singh Intelligent Assistant for Controlling Iot Devices *IOSR Journal of Electrical and Electronics Engineering (IOSR-JEEE) e-ISSN: 2278-1676,p-ISSN: 2320-3331, Volume 13, Issue 4 Ver. 1 (Jul. – Aug. 2018), PP 30-35*
- [6]. Ass. Prof. Emad S. Othman “Voice Controlled Personal Assistant Using Raspberry Pi” International Journal of Scientific & Engineering Research Volume 8, Issue 11, November-2017 ISSN 2229-5518
- [7]. Veton Kepuska and Gamel Bohouta “ Next generation of virtual personal assistant (Microsoft cortana) Apple siri , Amazon alexa and Google home”. 978-1-5386-4649-6/18/\$31.00 ©2018 IEEE
- [8]. Emad S. Othman, “ Voice Controlled Personal Assistant Using Raspberry Pi” International Journal of Scientific & Engineering Research Volume 8, Issue 11, November-2017 ISSN 2229-5518
- [9]. Amazon. Amazon Lex is a service for building conversational interfaces. <https://aws.amazon.com>.
- [10]. Google: Google Assistant. <https://assisatnt.google.com>
- [11]. Gong, L.: San Francisco, CA (US) United States US 2003.01671.67A1 (12) Patent Application Publication c (10) Pub. No.: US 2003/0167167 A1 Gong (43) Pub. Date: 4 September 2003 for Intelligent Virtual Assistant Sarikaya, R.: The technology behind personal digital assistants. IEEE Signal Process. Mag. 34, 67–81 (2017).

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