A REVIEW ON AI IMPLEMENTED VIRTUAL ASSISTANT

Er. Pratibha Dubey

Department of Electronics & Communication Engineering

Shri Ramswaroop Memorial College of Engineering and Management, Lucknow, India

Abhishek Maurya

Department of Electronics & Communication Engineering

Shri Ramswaroop Memorial College of Engineering and Management, Lucknow, India

Gaurav Kumar

Department of Electronics & Communication Engineering

Shri Ramswaroop Memorial College of Engineering and Management, Lucknow, India

Harsh Pratap Singh

Department of Electronics & Communication Engineering

Shri Ramswaroop Memorial College of Engineering and Management, Lucknow, India

Abstract: Our everyday life has become smarter and more practical. We already know some voice services like Cortana. Now, our voice assistant system can act like an auto chrome, it can open social network websites in your web browser, tell you the time and ask youto be informed on Wikipedia. This project works by inputting voice and rendering voice. Outputs and displays text on the screen. Our flagship voice assistant program makes people smarter and gets results faster with computers. Speech Assistant picks up voice input with a microphone and translates the voice into understandable computer language to provide the necessary solutions and custom responses. This service connects to the World Wide Web and provides the results requested by the user. Natural language processing algorithms allow computer systems to communicate using natural language in a variety of ways.

Index Terms – machine learning, artificial intelligence, python, pyqt5.

I. INTRODUCTION

A virtual assistant is used to start a computer such as a laptop or personal computer on your own set of instruction. Basically, a virtual assistant is a program that uses natural language and commands given by

human voice to perform desired tasks for the user. A virtual assistant is used to perform typical tasks such as displaying the date and time, managing emails, opening applications, interacting with humans etc. at your command. Nowadays, a virtual assistant is very useful and helpful for a person. It makes human life easier such as controlling a PC or laptop using just voice commands. A virtual assistant is very time efficient and précised. Usage of virtual assistant makes other life easy. Internet connection is a must since virtual assistants are usually server programs. To create a virtual assistant for your computer, go from the basics of python. Virtual assistants are task oriented. Virtual assistants are software that understand verbal and non-verbal (written) commands and perform tasks specified by users/clients. There are several voice assistants in the market such as Cortana by Microsoft, Siri by Apple, Google Assistant

by Google, Alexa by Amazon. Considering these assistants, we have also created desktop based virtual assistant for Windows [1]. For this project the programming language that we have used is Python because it offers a good library support. This software utilizes the system microphone which detects command given by user and a speaker as an output device to provide voice output. This process is a combination of several different technologies such as voice recognition, voice analysis and language processing. When the user gives the personal virtual assistant a command for a specific task, the command is translated from audio to digital signals.

In today's world, technology has made our daily lives more intelligent and interconnected. We are already familiar with voice assistants such as Google and Siri, which can perform various tasks and provide us with useful information simply by responding to our voice commands.

The proposed project utilizes voice input and output to provide instant and calculated results, making it an intelligent voice assistant. The main program of the voice assistant takes input through a microphone, which can be either a Bluetooth or a wired microphone. The input is then translated into a language that the computer can understand, allowing the assistant to provide desired solutions and answers to user queries. The assistant displays the output as text on the screen and delivers it through voice, making it accessible to users with different communication preferences. [4].

II. REVIEW OF SOME PREVIOUS WORK

Isha S. Dubey, Jyotsna S. Verma and Arundhati Mehendale, "An Assistive System for Visually Impaired using RaspberryPi" (05, May 2019). In this paper, the authors explain the design and implementation of this personal home assistant in the same device that has access to the Internet and can control home devices. The author explained that the device focuses on controlling devices using voice recognition and artificial intelligence using Google APIs. Intelligent virtual assistant using raspberry pi.

Deepak Shende, Ria Umahiya, Monika Raghorte, Aishwarya Bhisikar and Anup Bhange, "AI Based Voice Assistant Using Python" (February 2019). This text discusses the operational principles of voice assistants, as well as their drawbacks and constraints. It also details a technique for developing a local voice assistant that does not rely on cloud services, which could increase the device's practicality in the future. Natural language recognition technology is an important area of artificial intelligence, and further exploration could lead to novel methods of human-machine interaction, where the machine can learn to comprehend, adjust to, and communicate with human speech naturally.

Aditya Sinha, Gargi Garg, Gourav Rajwani and Shimona Tayal, "Intelligent Personal Assistant" (April 2017). Aditya Sinha introduced a virtual voice intelligent assistant for visually impaired users. The process is as follows: the input voice is first passed through speech recognition and then speech synthesis is performed. The content is extracted and then the response is provided to the user. The project utilizes the Java Sphinx library to analyze speech and MaryTTS for text-to-speech conversion. Additionally, neural networks are employed to enhance task performance by utilizing their learning capability. Rishabh Shah developed a chatbot using natural language processing (NLP). The present document showcases educational systems that rely on natural learning acquisition during the learning process. This system addresses the issue of educational unavailability. This system involves sentence tokenization and subsequent query extraction based on an N-gram splitting algorithm. This metadata is searched in its knowledge base and if a match is found, the information is retrieved and passed to the user. The Sirius application, which was designed by Johann Hauswald, is a database application that accepts input in the form of speech and images. The software prioritizes the design space for server architectures, and it makes use of specialized hardware such as FPGAs, CPLDs, and GPUs. The system includes several new modules, including ASR, IMM, and QA, which have been designed to enhance its capabilities.

Ankit Pandey, Vaibhav Vashist, Prateek Tiwari, Sunil Sikka and Priyanka Makkar, "Smart Voice based Virtual Personal Assistants with Artificial Intelligence" (June 2020). Developed a voice assistant that allows users to perform any task in the system without using a keyboard, reducing the number of input devices. The elderly, the visually and physically impaired, children and others benefit from virtual assistants because working with machines is no longer a challenge. Even blind people who cannot see a computer can interact with it simply by talking to it.

Emad S. Othman, "Voice Controlled Personal Assistant Using Raspberry Pi" (November 2017). The objective of this paper is to demonstrate the deployment of a voice control system that functions as an intelligent personal assistant (IPA) capable of executing various tasks or services for individuals. The tasks or services offered by the system are reliant on user inputs, location awareness, and the ability to retrieve data from different online sources. Such sources include weather and traffic reports, news updates, stock prices, user schedules, retail costs, notification scheduling, local traffic updates, travel assistance, event scheduling, and notifications from social applications. Furthermore, users can ask the system questions, employ its machine learning capabilities, or extract information from Wikipedia, among other things.

Abhay Dekate, Chaitanya Kulkarni and Rohan Killedar, "Study of Voice Controlled Personal Assistant Device" (December 2016). A highly advanced personal assistant with exceptional deductive abilities and the capability to engage with the surroundings using only one of the materialistic forms of human interaction - the human voice. The associated hardware captures the audio requests through a microphone and then processes the requests, enabling the device to provide responses to the individual through the built-in speaker module. For example, if you ask the device "what's the weather like?" or "how's the traffic?" using its built-in skills, the device will look up the weather and traffic conditions and then return the answer to the customer via a connected speaker.

Deny Nancy, Sumithra Praveen, Anushria Sai, M. Ganga and R.S. Abisree, "Voice Assistant Application for a college website" (April 2019). The Voice Assistant web application provides a hands-free environment for answering quick questions or looking up college information or urgent information about a specific website. Thus, our web application would be useful for new users as well as people with hectic schedules. Our web application improves the status quo by increasing user satisfaction and convenience.

III   PROPOSED SYSTEM METHODOLOGY

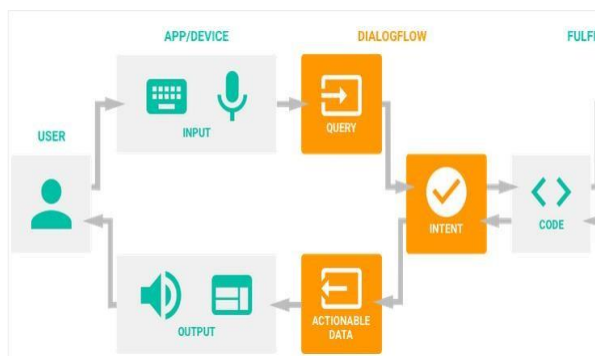How does a Virtual Assistant works ?

Fig. 1: - Methodology Diagram.

When a user requests a personal assistant to perform a task by asking a question, the audio signal in natural language is converted into digital data or an executable command that the software can analyze. Then this data is compared with the software data to find the appropriate answer. The virtual assistant is used to start machines on your own commands. To develop a virtual assistant, developers can use various Python installer packages such as speech recognition, gTTS, pipwin, etc. These packages help in building voice recognition capabilities, converting text to speech, and managing Python packages on Windows, among other functionalities. Basically, natural language processing is used to map the commands entered by the user. Voice or audio commands are converted into text by application peripheral interface for further processing [5]. According to the diagram above, users first give a command to interaction entities such as laptop, PC, these interaction entities listen to the command and recognize it. For the next analysis process, compare this command with the cloud in which we already store the data. When a request is received, the system first matches it with the cloud data to determine whether it has a match or not. If there is a match, the system executes the corresponding function or logic associated with the request. Once the backend process is completed, the system generates an output in both text and voice format as a response to the request.

The planned system is expected to perform the following functions:

a) The system will continue to be attentive to voice commands, and the duration of the listening period can be adjusted to meet the user's needs.

b) In situations where the system cannot retrieve information from the user input, it will prompt the user for additional attempts until the user specifies a specific number of retries.

c) The system can incorporate both male and female voices, as per the user's preference.

d) The current version of the system includes several features, such as playing music, sending and receiving emails and texts, searching Wikipedia, launching web browsers, among others.

In summary, the above functions are expected to be included in the system, with the aim of providing users with a more convenient and personalized experience

Step By Step flow: -

- **STEP 1: -** Listening
- **STEP 2: -** Recognizing
- **STEP 3: -** The command
        Example: - open YouTube
- **STEP 4: -** YouTube App Opens
- **STEP 5: -** Repeat step1 until exits.

IV METHODOLOGY RELATED TO THE PROJECT.

Working flow step by step: -
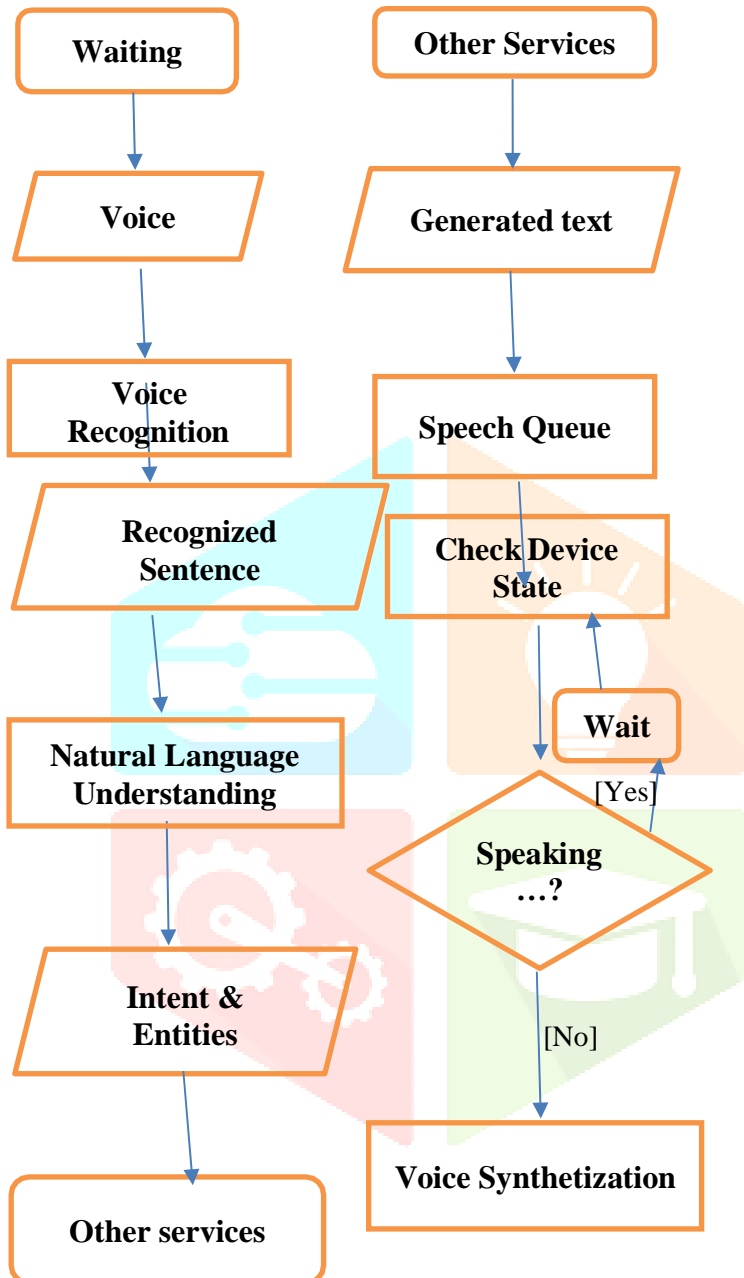
V GUI INTRODUCED

PyQt5 is a user-friendly tool for creating Graphical User Interfaces (GUIs). There are two ways you can create the GUI:

   (i)   Hard coding

   (ii)   Using the designer tool

Here we make use of the designer tool.

VI LANGUAGE USED

The IDE used in this project is VS Code. All the python files were created in VS Code and all the necessary packages were easily installable in this IDE. For this project following modules and libraries were used i.e., pyttsx3, SpeechRecognition, Datetime, Wikipedia, Smtplib, pywhatkit, pyjokes, pyPDF2, pyautogui, pyQt etc. We have created a live GUI for interacting with the Assistant as it gives a design and interesting look while having the conversation.

VS Code: -

Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

Visual Studio Code is **a streamlined code editor with support for development operations like debugging, task running, and version control**. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE. Visual Studio Code is **a free coding editor that helps you start coding quickly**. Use it to code in any programming language, without switching editors.

VII   CONCLUSION

In this article, we have discussed the creation of a Personal Virtual Assistant for Windows using Python. The main benefit of virtual assistants is their ability to make people's lives easier by providing convenient and useful services. The flexibility to contract only for the services needed is another advantage of virtual assistants. Popular examples of virtual assistants include Alexa, Cortana, Siri, and Google Assistant. Using Python, we can create a virtual assistant for all Windows versions that can efficiently manage and organize schedules. Virtual personal assistants are often more reliable than human assistants because they are more portable, available 24/7, and have a high level of loyalty. Our virtual assistant will be capable of suggesting and providing instructions and will be able to learn more about the user over time. With this level of functionality, we can expect the virtual assistant to become an indispensable tool for users

VIII   AUTHOR CONTRIBUTION

All Authors contributed significantly to the conceptualization and design, data acquisition, analysis, and interpretation of data; were involved in authoring the manuscript or critically editing it for essential intellectual content; and gave final approval of the version to be published. Each author has contributed enough to the project to accept public accountability for portions of the text. The final manuscript was read and approved by all writers.

IX. DECLARATIONS

- **Conflict of interest:**

  The authors declare that there is no conflict of interestregarding the publication of this paper.

- **Compliance With Ethical Standards:**

  The authors declare that all procedures followed were inaccordance with the ethical standards.

- **Consent to participate:**

  All the authors declare their consent to participate in thisresearch article.

- **Consent for publications:**

  All authors declare their consent for publication

  of thearticle on acceptance.

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