



VOICE ASSISTANT USING PYTHON

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Abstract: Today there is huge Advancement in the Technical field which is increasing day by day. In early days there were only computer systems where we were able to perform only few tasks, but today new technologies like machine learning, artificial intelligence, deep learning, and few some others have made computer systems so advance that we can perform any type of task with them. In recent years, Artificial Intelligence (AI) have done remarkable progress and its Capability is increasing day by day. One of the application Area of AI is Natural Language Processing (NLP). Natural Language Processing (NLP) helps Humans to communicate with the computer system in their own Language. For example, Voice Assistant. Various voice assistants were developed and they are still being improved more for better performance to overcome struggling of humans to interact with their machine. we are trying to develop a voice assistant using python which will help user to perform any type of task without interaction with keyboard. The aim of this paper is to study how voice assistants behaves smartly and can be used to get everyday work done and also be used for educational purpose also.

Key words – Voice Assistant, Python.

I. INTRODUCTION

Upcoming trending technologies such as virtual reality, augmented reality, voice interaction, IOT etc are changing the way people engage with the world and transforming digital experiences. Voice control is one of important development of human-machine interaction, which was possible because of advancement in Artificial Intelligence. In current era, we are able to train our machine to do their tasks by themselves or to think like humans using technologies like Artificial Intelligence, Machine Learning, Neural Networks, etc. we can talk to our machines with the help of virtual assistants. In recent time great appearance of voice assistants such as Apple's Siri, Google's Assistant, Microsoft's Cortana and Amazon's Alexa have been noticed due to heavy use of smartphones. Voice assistants uses technologies like voice recognition, speech synthesis, and Natural Language Processing (NLP) to provide various services which help users to perform their task using their machine by just giving commands in voice format and also with the help of Voice Assistant there will be no need to write the commands again and again for performing particular task.

Virtual assistants are very useful for old generation people, people with disabilities or special cases, small children who don't know to operate machines or smart gadgets, by making them sure that their interaction with machine is not difficult anymore and also enable them to perform Multitasking.

1.1 Basics fundamental tasks performed by Voice assistants are as follows:

- Search on web
- Play a music or video
- Setting a reminder and alarm
- Run any program or application
- Getting weather updates
- Sending WhatsApp, email messages etc.

These are very few examples of tasks performed by voice assistants, we can do many more things according to our requirement. The capabilities and improvements of voice assistants are continuously developing day by day to provide better performance to users. We have used python modules and libraries for making our Desktop based voice assistant so that our personal voice assistant can run easily, smoothly on desktop.

The basic idea of our Project is that the user makes a request to voice assistant through the Microphone of the device to get their work done and then their command gets converted into text. Then the text request goes to processing gives text response along with work done by voice assistant. Along with basic day to day functionalities we are also trying to implement the concept of Face detection for security purpose in our voice assistant to make it more flexible and to it make it more personal. our program uses the least amount of system resources which minimizes the expensive system requirements also reduces threat to your system as it directly does not interact with servers.

1.2 Some Reasons why there is necessity of voice assistants:

There are lots of reason why this verbal voice command application is in need in real time situations. Some of them are given below.

➤ To enable a highly engaging user experience:

Voice assistance engages users like no other interface. Users can speak to the applications naturally to ask for whatever they'd like.

➤ To make application frustration free:

We have to touch, type and mouse in the existing machine system to getting our work done, which are makes user frustrated sometimes. By using voice assistant users can directly ask what they wanted to get done.

➤ To personalize your app experience for every user:

Voice assistants are actually able to respond for every user based on their locality, language and preferences.

➤ To Remove Language Barriers:

Voice Assistant technology are blended with Translation services which helps users to handle them in their own language without concerning about language barriers which allows them to interact more freely with voice assistant.

2. LITERATURE REVIEW:

In today's world we train our machine to think like humans and do their task by themselves and what human being can do are being replaced by machines. Based on this situation there comes concept of voice assistant capable of completing various task for the humans based on their voice. Specific commands given by the user to virtual assistant is capable of filtering out the command and return relevant information [1].

People in the whole world are transforming their digital experience using upcoming technologies like virtual reality, augmented reality, voice interaction etc. Voice control is emerging as new evolution in Human and Machine interaction where analog signal is converted by speech signal to digital wave. In Last few years huge increase in the use of smart phones led to the great use of voice assistant like Apple's Siri, Google's Assistant, Microsoft's Cortana and Amazon's Alexa etc. Voice assistants are built using technologies like voice recognition, speech synthesis, and Natural Language Processing (NLP) to provide indefinite applications to the users to make their life easy and comfortable.

Voice assistants have several interesting services for their users such as:

- Answer to questions asked by users.
- Play music from streaming music services and Playing YouTube videos.
- Set timers or alarms.
- Send WhatsApp, email messages.
- Provide information about the weather.
- Control other smart devices (lights, locks, thermostats, vacuum cleaners, switches).

The capabilities of voice assistants are continuously extending according to the users need [2].

According to Deepak Shende, Ria Umabiya, the AIVA (Microsoft, Google Assistant from Google, and the recently appeared intelligent assistant under the name "AIVA" 2018) aimed at developing a voice-controlled personal assistant which is doing many things such as to search the Internet. It has some new features like posting comments on the social media websites such as Facebook, Twitter, etc. By just few simple commands. You can also know the weather around you and can get the climate conditions in your region [3].

Tulshan explained that because of continuous typing there may be possibility of injuries to the fingers of the user. To avoid such problems, we need to design a system in which we can get our work done through our voice commands. The voice will be recognized by the system and that recognized words will be synthesized and if they are appropriate or makes some sense then that will be printed on screen and after this again by recognizing the specific keywords the program will be compiled and executed [4].

Dr. Kshama V. Kulhalli presented that survey between the top most voice assistants like Google assistant, Apple's Siri and Microsoft's Cortana. Through this survey it was concluded that Google assistant answers most accurate than others. They could understand the variations in the voice very easily [5].

3. TECHNOLOGIES USED:

- **Python:**
 - Python is an interpreted high-level general-purpose programming language.
 - The version python 3.6.0 is used in the development of voice assistance project.
- **PyCharm:**
 - PyCharm is the most popular IDE for Python
 - It includes great features such as excellent code completion and inspection with advanced debugger and support for web programming and various frameworks.

4. METHODOLOGY:

4.1 Existing System

In existing system, the audio command is taken as input through microphone of the device. The next task of voice assistant will be to analyze audio command and give appropriate output to the user.

The working process of existing system is shown below:

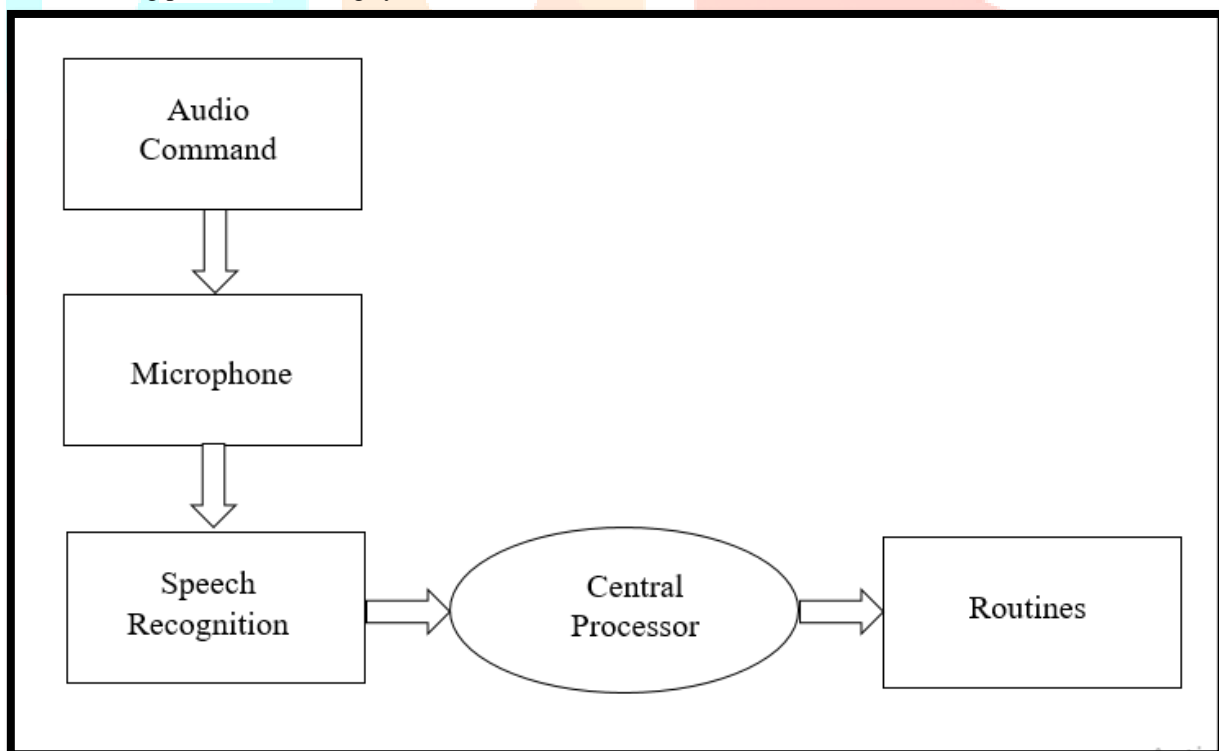


fig. processing in existing system

4.2 Data flow diagram (DFD):

DFD is graphical representation of system which give detail information about data flow between input and output. As level increases it elaborates detail information about data flow.

4.2.1 DFD (level 0):

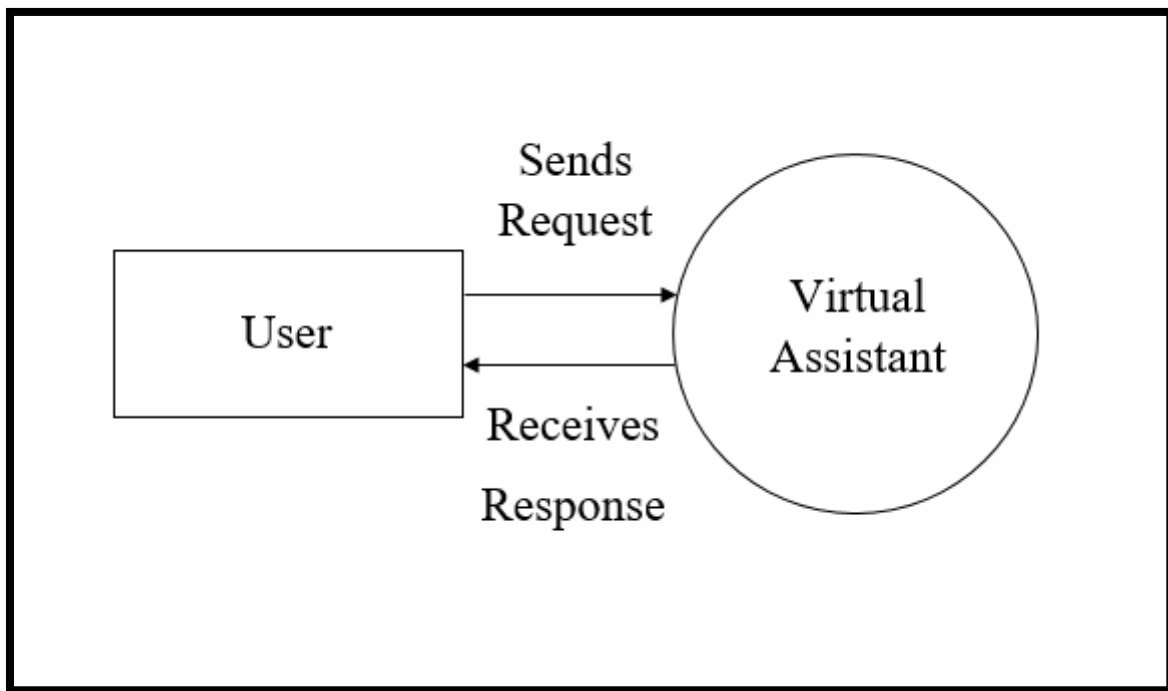


fig. data flow diagram (level 0)

4.2.1 DFD (level 1):

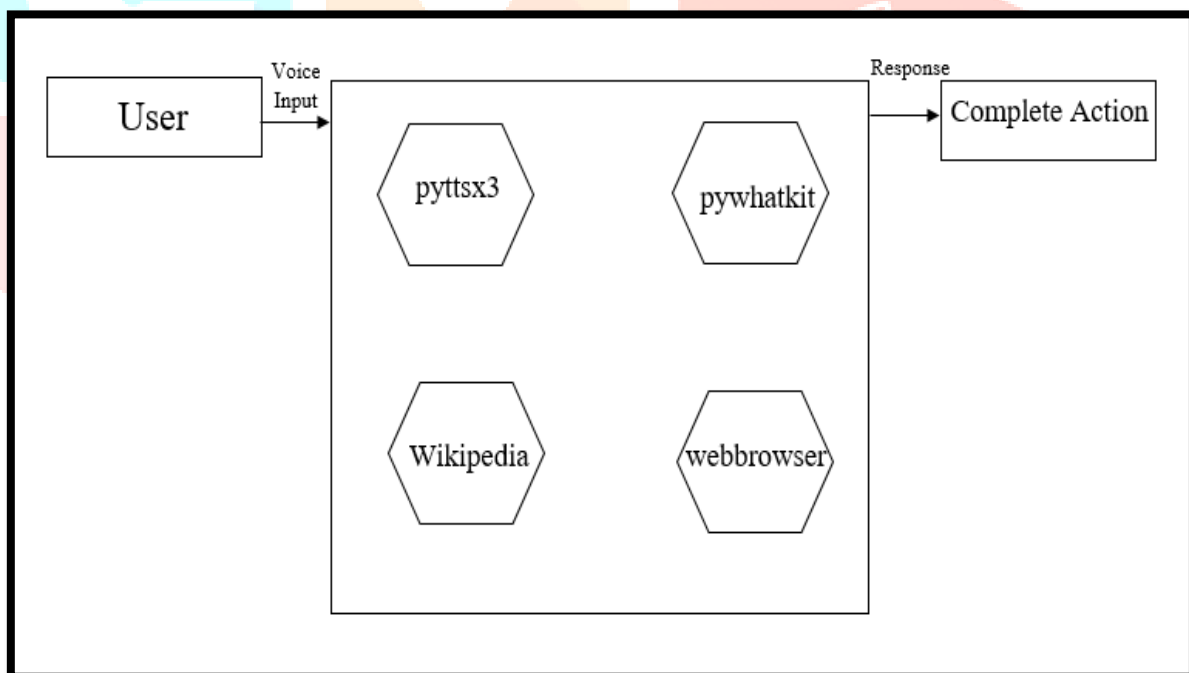


fig. data flow diagram (level 1)

4.3 Packages used:

➤ *Speech Recognition:*

Speech Recognition library is used for listening to the words spoken by the users that is taken as input from microphone as a source and then process it for finding out its meaning and convert them into text format. This library allows machine system to understand the human language.

➤ **Pytsx3:**

Pytsx3 stands for Python text to speech library is used for making our voice assistant talk to us. It supports common text to speech engines which is like a tool that converts text into speech and makes voice assistant able to talk to its user. We can make it talking in both male and female voices according to requirement.

➤ **Wikipedia:**

We need to use Wikipedia library so that we can get information from Wikipedia on any topic or we can also ask for solution to our query or simply we can perform Wikipedia search for any topic using this library. This Library in python needs Internet connection for fetching results and it will provide results to user in text as well as voice format.

➤ **Datetime:**

This is an essential module to support the functionality of Date and time. Whenever user wants to know the current date and time or the user wants to schedule a task at a certain time then this module will be helpful to them.

➤ **PyAutoGUI:**

PyAutoGUL is a Python Package which has control over the mouse and the keyboard it is able to simulate the mouse cursor moves as well as clicks the button press. With the help of particular 2-D coordinate we can click on exact location on screen.

➤ **PyWhatkit:**

PyWhatKit is a Python Library which has number of features like Sending messages, images through WhatsApp, playing YouTube videos, converting image to ASCII, sending emails etc.

➤ **Keyboard:**

Keyboard is library in Python which provides user the full control over the Keyboard. Especially the 'press ()' and 'write ()' function helps for controlling keyboard keys as well as writing messages on screen.

➤ **SpeedTest:**

Speedtest library is essential to test internet bandwidth. It helps to evaluate the uploading as well as downloading speed of Internet. All the result that we get are in Megabits.

➤ **OS:**

OS (Operating System) module in Python is used for interacting with operating system. Particularly we are using the 'Start file ()' to open any application that are installed in our system.

These are some of the modules used for making voice assistant that can perform very common features.

5. CONCLUSION:

In this Paper we have discussed uses, methodology as well as implementation details of the personal Desktop based voice assistant using Python which is built using open-source software PyCharm as an implementation tool. This Project will be helpful for people of all generations as well as to people with some disabilities or people with some special cases. The personal voice assistant will be easy to use and will reduce the manual human efforts for performing various tasks. The functionality of the current voice assistant system is limited to working on Desktop based and working online (required to have internet connection to perform tasks) only. The voice assistant system is modular in nature so that addition of new features is possible without disturbing current system functionalities.

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