**INT404 Project**

**(Personal Assistant)**

**Section: K18LC G-2 Project Grp: 1**

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**Abstract**

Adoption of social network sites and use of smart phones with number of sensors in them has digitized user’s activities in real-time. Smart phone applications such as calendar, email, and notes contain lot of user information and provide a view into user’s activities, while sensors such as GPS sensor can be used to passively find information about the user. In addition to this user and device data, these devices have access to the Internet that can be leveraged to build powerful applications.

Personal assistant software (smart agent) can be used as an interface to the digital world to make the consumption of this information timely and efficient for the user’s specific tasks. Goal of the thesis is to design personal assistant software that understands the semantics of the task, can decompose the task into multiple tasks within the context of the user and plan these tasks for the user. It will be designed using semantic web technologies and knowledge databases to understand the relations between the tasks. Agent will be integrated with online web-services to harvest the data available on-line with the data available on the device and help the user to manage his or her tasks.

**Introduction**

An **intelligent virtual assistant** (**IVA**) or **intelligent personal assistant** (**IPA**) is a [software agent](https://en.wikipedia.org/wiki/Software_agent) that can perform tasks or services for an individual based on commands or questions. Sometimes the term "[chatbot](https://en.wikipedia.org/wiki/Chatbot)" is used to refer to virtual assistants generally or specifically accessed by [online chat](https://en.wikipedia.org/wiki/Online_chat). In some cases, online chat programs are exclusively for entertainment purposes. Some virtual assistants can interpret human speech and respond via synthesized voices. Users can ask their assistants questions, control home automation devices and media playback via voice, and manage other basic tasks such as email, to-do lists, and calendars with verbal (spoken?) commands.[[1]](https://en.wikipedia.org/wiki/Virtual_assistant#cite_note-1) A similar concept, however with differences, lays under the [dialogue systems](https://en.wikipedia.org/wiki/Dialogue_system)

**What Is a Voice Assistant?**

To call any technology that makes our lives easier by one name is almost impossible. There are a variety of terms that refer to agents that can perform tasks or services for an individual, and they are almost interchangeable — but not quite. They differ mainly based on how we interact with the technology, the app, or a combination of both.

Here are some basic definitions, similarities, and differences:

* **Intelligent Personal Assistant**: This is software that can assist people with basic tasks, usually using natural language. Intelligent personal assistants can go online and search for an answer to a user’s question. Either text or voice can trigger an action.
* **Automated Personal Assistant**: This term is synonymous with intelligent personal assistant.
* **Smart Assistant**: This term usually refers to the types of physical items that can provide various services by using smart speakers that listen for a wake word to become active and perform certain tasks. Amazon’s Echo, Google’s Home, and Apple’s Home Pod are types of smart assistants.
* **Virtual Digital Assistants**: These are automated software applications or platforms that assist the user by understanding natural language in either written or spoken form.
* **Chatbot**: Text is the main way to get assistance from a chatbot. Chatbots can simulate a conversation with a human user. Many companies use them in the customer service sector to answer basic questions and connect with a live person if necessary.
* **Voice Assistant**: The key here is voice. A voice assistant is a digital assistant that uses voice recognition, speech synthesis, and natural language processing (NLP) to provide a service through an application.

For the purpose of this discussion, the term voice assistant will be used interchangeably with the following related terms: intelligent personal assistant, automated personal assistant, smart assistant, and virtual digital assistant.

**The Uses of Voice Assistants**

Many devices we use every day utilize voice assistants. They’re on our smartphones and inside smart speakers in our homes. Many mobile apps and operating systems use them. Additionally, certain technology in cars, as well as in retail, education, healthcare, and telecommunications environments, can be operated by voices.

**METHODOLOGY**

**A.) System Architecture The overall system design consists of following phases:**

(a) Data collection in the form of speech.

(b) Voice analysis and conversion to text

(c) Data storage and processing

(d) Generating speech from the processed text output

**B) System Components (In form of functions):**

I)Speak: This function asks as for our command in form of voice

ii)Wish me: When we command the program “Wish me” it will reply as with the suitable wish for that time i.e. good morning, evening, night, etc.

iii)Take Command: we have several more command like open code editor, open google, open ums etc. this function try to reorganize what order we are giving to him

***Code(Python)***

*import pyttsx3 #pip install pyttsx3*

*import speech\_recognition as sr #pip install speechRecognition*

*import datetime*

*import wikipedia #pip install wikipedia*

*import webbrowser*

*import os*

*import smtplib*

*engine = pyttsx3.init('sapi5')*

*voices = engine.getProperty('voices')*

*# print(voices[1].id)*

*engine.setProperty('voice', voices[1].id)*

*def speak(audio):*

*engine.say(audio)*

*engine.runAndWait()*

*def wishMe():*

*hour = int(datetime.datetime.now().hour)*

*if hour>=0 and hour<12:*

*speak("Good Morning!")*

*elif hour>=12 and hour<18:*

*speak("Good Afternoon!")*

*else:*

*speak("Good Evening!")*

*speak("I am your virtual assistant Sir. Please tell me how may I help you")*

*def takeCommand():*

*#It takes microphone input from the user and returns string output*

*r = sr.Recognizer()*

*with sr.Microphone() as source:*

*print("Listening...")*

*r.pause\_threshold = 1*

*r.energy\_threshold = 200*

*audio = r.listen(source)*

*try:*

*print("Recognizing...")*

*query = r.recognize\_google(audio, language='en-in')*

*print(f"User said: {query}\n")*

*except Exception as e:*

*# print(e)*

*print("Say that again please...")*

*# speak("Say that again Please")*

*return "None"*

*return query*

*if \_\_name\_\_ == "\_\_main\_\_":*

*wishMe()*

*while True:*

*# if 1:*

*query = takeCommand().lower()*

*# Logic for executing tasks based on query*

*if 'wikipedia' in query:*

*speak('Searching Wikipedia...')*

*query = query.replace("wikipedia", "")*

*results = wikipedia.summary(query, sentences=2)*

*speak("According to Wikipedia")*

*print(results)*

*speak(results)*

*elif 'open youtube' in query:*

*webbrowser.open("youtube.com")*

*elif 'open google' in query:*

*webbrowser.open("google.com")*

*elif 'open stackoverflow' in query:*

*webbrowser.open("stackoverflow.com")*

*elif 'open touch' in query:*

*webbrowser.open("ums.lpu.in")*

*elif 'play music' in query:*

*music\_dir = 'D:\\backup\\SHAREit\\files\\UCDownloads'*

*songs = os.listdir(music\_dir)*

*print(songs)*

*os.startfile(os.path.join(music\_dir, songs[0]))*

*elif 'the time' in query:*

*strTime = datetime.datetime.now().strftime("%H:%M:%S")*

*speak(f"Sir, the time is {strTime}")*

*elif 'open code' in query:*

*codePath = "C:\\Users\\Kaushalendra Singh\\AppData\\Roaming\\Microsoft\\Windows\\Start Menu\\Programs\\Visual Studio Code"*

*os.startfile(codePath)*

*elif 'quit' in query:*

*exit()*

**Literature Review & Result**

**The Growth of Voice Assistants**

Technology is constantly advancing and changing, and the voice assistant market will progress along with it. In April 2015, the research firm [Gartner](https://www.gartner.com/doc/3021226/market-trends-voice-ui-consumer) predicted that by the end of 2018, 30 percent of interactions with technology would be through “conversations” with smart machines, many of them by voice.

Tractica is a market intelligence firm that focuses on human interaction with technology. Their [reports](https://www.tractica.com/newsroom/press-releases/the-virtual-digital-assistant-market-will-reach-15-8-billion-worldwide-by-2021/) say unique consumer users for virtual digital assistants (which they define as automated software applications or platforms that assist the human user through understanding natural language in written or spoken form) will grow from more than 390 million worldwide users in 2015 to 1.8 billion by the end of 2021. The growth in the business world is expected to increase from 155 million users in 2015 to 843 million by 2021. With that kind of projected growth, revenue is forecasted to grow from $1.6 billion in 2015 to $15.8 billion in 2021.

According to [Global Market Insights, Inc](https://gminsights.wordpress.com/tag/virtual-assistant-industry-statistics/)., between 2016 and 2024, the market share for the technology will grow at an annual rate of almost 35 percent. More and more sectors of the economy, like healthcare and the automotive industry, are finding uses for the speech recognition technology in addition to those found in devices like smart speakers and phones.

### What Is an Intelligent Personal Assistant?

An intelligent personal assistant can help someone with basic tasks. They often understand natural language and can help with things like creating meeting requests, reporting a sports score, and sharing the weather forecast. Intelligent personal assistants have access to a large amount of information on a device or online, which enables them to perform simple tasks.

Other terms for an intelligent personal assistant include [chatbot](https://www.smartsheet.com/artificial-intelligence-chatbots), automated personal assistant, or automated virtual personal assistant.

Siri, Google Assistant, Cortana, Amazon Alexa, and others are examples of intelligent personal assistants.

**CONCLUSION**

Voice Controlled Personal Assistant System will use the Natural language processing and can be integrated with artificial intelligence techniques to achieve a smart assistant that can control IoT applications and even solve user queries using web searches.. It can be designed to minimize the human efforts to interact with many other subsystems, which would otherwise have to be performed manually. By achieving this, the system will make human life comfortable. More specifically, this system is designed to interact with other subsystems intelligently and control these devices, this includes IoT devices or getting news from Internet, providing other information, getting personalized data saved previously on the system, etc. The android application should let the user add data such as calendar entries, set alarm, or even reminders. The software will facilitate ease of access to various other devices and platforms. The system will have the following phases: Data collection in the form of voice; Voice analysis and conversion to text; Data storage and processing; generating speech from the processed text output. The data generated at every phase can further be used to find patterns and suggest user later. This can be a major base for artificial intelligence machines that learns and understand users. Thus, since literature survey and by analyzing the existing system, we have concluded that the proposed system will not only ease to interact with the other systems and modules but also keeps us organized. There is still a lot of ground to be covered up in the world of automation, but the skills of the device can help to build a new generation of voice-controlled devices and bring a new sustaining change in the field of automation. This paper can also act as a prototype for many advanced applications

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| **Team Efforts:**  Name | Work Done |
| Adarsh Ranjan (52) | * Wish Me function : which help the program to wish the user according to the time at the moment by comparing its hour. * Open Code: When we speak open code the program will recognize it with and open the visual studio |
| Kaushalendra (51) | * Take command Function: This function allow the program to understand natural language and recorsnize what user is asking for. * Open YouTube: When we speak open YouTube the program will recognize it with and open www.youtube.com |
| Abhishek (58) | * Speak function: this module of the program help the program to listen the command and reply it by using other function * Open Google : When we speak open google the program will recognize it with and open www.google.com |