Voice Assisstant

Report submitted in partial fulfilment of the requirement for the

degree of

B.Tech.

In

Computer Science & Engineering

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Project Id: 23_CS_2C_01

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DECLARATION

This is to certify that Report entitled “VOICE ASSISSTANT” which is submitted by me in partial fulfilment of the requirement for the award of degree B.Tech. in Computer Science and Engineering to Pranveer Singh Institute of Technology, Kanpur Dr. A P J A K Technical University, Lucknow comprises only my own work and due acknowledgement has been made in the text to all other material used.

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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.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

A voice assistant is a digital assistant that uses voice recognition, language processing algorithms, and voice synthesis to listen to specific voice commands and return relevant information or perform specific functions as requested by the user.

Based on specific commands, sometimes called intents, spoken by the user, voice assistants can return relevant information by listening for specific keywords and filtering out the ambient noise.

Virtual assistants are software programs that help you ease your day to day tasks, such as showing weather reports, giving daily news, searching the internet etc. Artificial Intelligence when used with machines, it shows us the capability of thinking like humans. In this, a computer system is designed in such a way that typically requires interaction from human. As we know Python is an emerging language so it becomes easy to write a script for Voice Assistant in Python. The instructions for the assistant can be handled as per the requirement of user. Speech recognition is the Alexa, Siri, etc. In Python there is an API called Speech Recognition which allows us to convert speech into text. It was an interesting task to make my own assistant. It became easier to send emails without typing any word, Searching on Google without opening the browser, and performing many other daily tasks like playing music, opening your favorite IDE with the help of a single voice command. In the current scenario, advancement in technologies are such that they can perform any task with same effectiveness or can say more effectively than us. By making this project, I realized that the concept of AI in every field is decreasing human effort and saving time. As the voice assistant is using Artificial Intelligence hence the result that it is providing are highly accurate and efficient. The assistant can help to reduce human effort and consumes time while performing any task, they removed the concept of typing completely and behave as another individual to whom we are talking and asking to perform task. The assistant is no less than a human assistant but we can say that this is more effective and efficient to perform any task. The libraries and packages used to make this assistant focuses on the time complexities and reduces time.

The functionalities include , It can send emails, It can read PDF, It can send text on WhatsApp, It can open command prompt, your favourite IDE, notepad etc., It can play music, It can do

Wikipedia searches for you, It can open websites like Google, YouTube, etc., in a web browser, It can give weather forecast, It can give desktop reminders of your choice. It can have some basic conversation.

1.1.1 History

The history of voice assistants dates back several decades, and their development has evolved alongside advancements in technology and artificial intelligence.

1960s - IBM's Shoebox: IBM introduced the "Shoebox" in 1961, which was a machine capable of recognizing 16 spoken words and digits. It was a significant advancement in the early stages of speech recognition technology.

1980s - Dragon Dictate: Dragon Systems, founded by Dr. James and Janet Baker, released the first commercially available speech recognition software.

1990s - Introduction of Voice Commands: IBM introduced voice commands in its OS/2 operating system in the early 1990s, allowing users to control certain functions using spoken commands.

2000s - Virtual Assistants on Mobile Devices: The integration of voice technology into mobile devices became more prominent in the 2000s. Companies like Apple introduced voice recognition features, such as Siri on the iPhone in 2011, which marked the beginning of mainstream virtual assistants.

2010s - Rise of Virtual Assistants: The popularity of virtual assistants grew significantly during the 2010s. Amazon introduced Alexa in 2014 with the release of the Echo smart speaker. Google launched Google Assistant in 2016, and Microsoft introduced Cortana around the same time. These virtual assistants incorporated advanced natural language processing (NLP) and artificial intelligence (AI) capabilities.2017The release of voice-activated smart speakers, such as Amazon Echo and Google Home, brought voice assistants into homes on a large scale. These devices not only featured virtual assistants but also became hubs for smart home control.

2020s - Continued Advancements: Voice assistants have continued to evolve with improvements in AI, machine learning, and natural language processing. They are now integrated into a wide range of devices, including smartphones, smart speakers, cars, and various smart home devices. Throughout this history, voice assistants have become more sophisticated in understanding natural language, recognizing accents, and providing more contextually relevant responses. They have become integral parts of our daily lives, offering convenience and functionality across various applications and platforms.

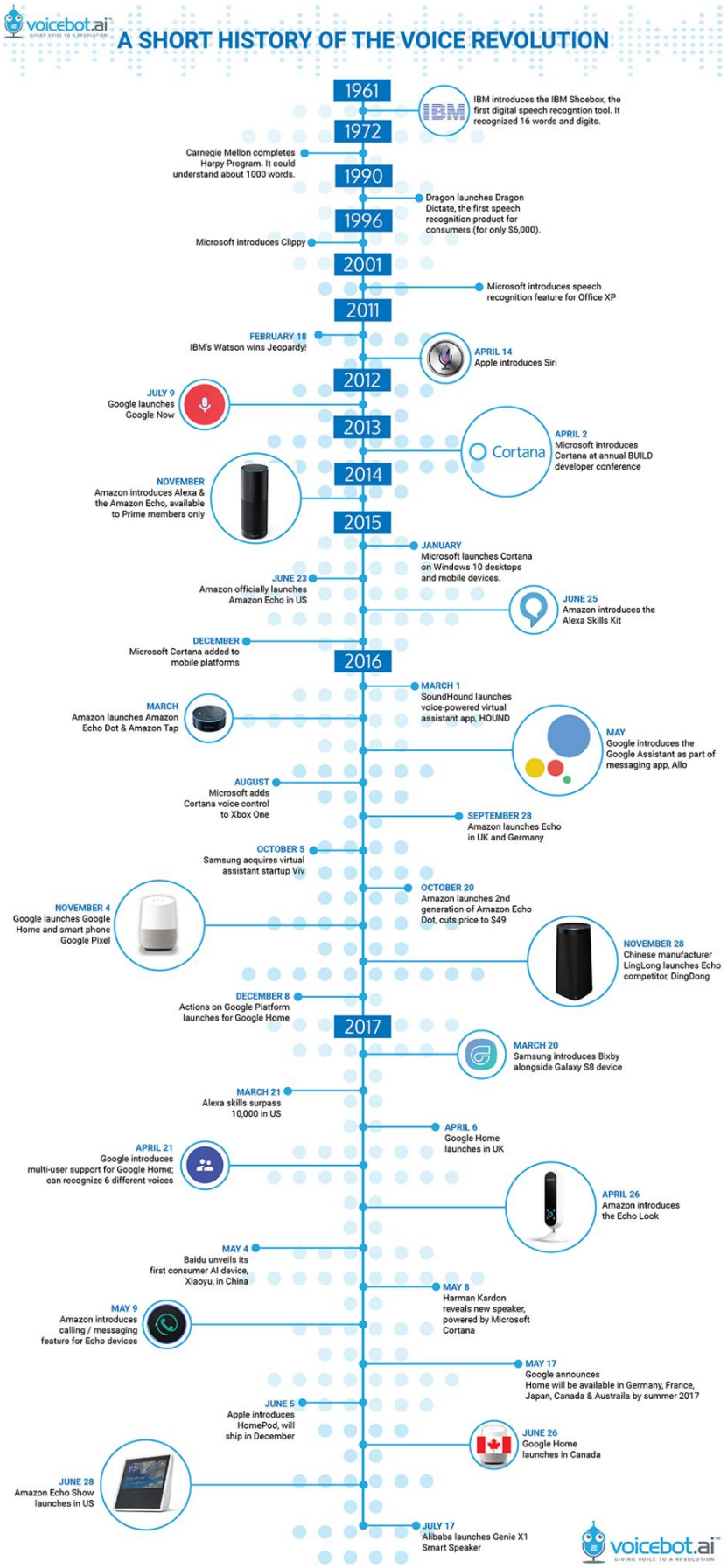

Figure-1.1-history

1.2 Background of problem

While voice assistants have become increasingly popular and advanced, there are still some challenges and concerns associated with their development and usage. Here are some background issues related to voice assistants:

1. Privacy Concerns: Privacy is a significant concern when it comes to voice assistants. Since these systems involve recording and processing voice commands, there is the potential for sensitive information to be inadvertently captured and stored. Users may worry about the misuse of their data, and there have been instances of voice recordings being reviewed by human contractors for quality control purposes, leading to privacy controversies.

2. Security Risks: Voice assistants are vulnerable to security risks, including unauthorized access and hacking. There have been cases where attackers exploited vulnerabilities to gain access to personal information or manipulate connected devices. Ensuring the security of voice-enabled systems is an ongoing challenge for developers.

3. Accuracy and Understanding: While advancements in natural language processing (NLP) have improved the accuracy of voice assistants, challenges still exist in understanding complex commands, accents, and contextual nuances. Users may experience frustration when the assistant fails to comprehend their requests accurately.

4. Limited Multimodal Interaction: While voice is a powerful mode of interaction, it has its limitations. Integrating voice with other modes, such as touch or gesture, in a seamless and intuitive manner is a challenge. Ensuring a consistent and user-friendly experience across various input methods is an ongoing area of development.

5. Dependency on Internet Connectivity: Many voice assistants rely on cloud-based processing to understand and respond to user commands. This dependency on internet connectivity can lead to delays or disruptions in service when there is a poor or no network connection. Offline capabilities are a consideration for improving user experience in such scenarios.

6. Lack of Standardization: Different voice assistants, developed by various companies, may have different capabilities, languages, and command structures. Lack of standardization can create interoperability issues and make it challenging for users to

seamlessly switch between devices and platforms.

7. Ethical and Bias Concerns: There is growing awareness of ethical considerations and biases in voice assistants. These biases can arise from the data used to train the models, leading to potential discrimination against certain demographics. Efforts are being made to address bias and ensure fairness in voice assistant technologies.

8. Over-Reliance on Voice as the Sole Interaction Mode: While voice is a natural and convenient input method, there are situations where it may not be the most appropriate or comfortable choice. For example, in public spaces, users may prefer to type rather than speak. Striking a balance between voice and other input methods is a consideration for developers.

1.3 Current System

We are familiar with many existing voice assistants like Alexa, Siri, Google Assistant, Cortana which uses concept of language processing, and voice recognition. They listens the command given by the user as per their requirements and performs that specific function in a very efficient and effective manner.

As these voice assistants are using Artificial Intelligence hence the result that they are providing are highly accurate and efficient. These assistants can help to reduce human effort and consumes time while performing any task, they removed the concept of typing completely and behave as another individual to whom we are talking and asking to perform task. These assistants are no less than a human assistant but we can say that they are more effective and efficient to perform any task. The algorithm used to make these assistant focuses on the time complexities and reduces time.

But for using these assistants one should have an account (like Google account for Google assistant, Microsoft account for Cortana) and can use it with internet connection only because these assistants are going to work with internet connectivity. They are integrated with many devices like, phones, laptops, and speakers etc.

1.4 Security issues

1. voice assistants have made significant advancements, but there are still some challenges and issues in the current systems. It's essential to note that developments in technology may have occurred since then. Here are some common issues associated with voice assistants:
2. Voice Data Storage: Many voice assistants store voice recordings in the cloud, raising concerns about user privacy. Users may worry about the security of their voice data and the potential for unauthorized access.
3. Unauthorized Access: Security vulnerabilities in voice assistant systems could lead to unauthorized access or hacking, compromising user data. Ensuring robust security measures is crucial to prevent such incidents.
4. Misinterpretation: Voice assistants may struggle to accurately understand certain accents, dialects, or complex commands. Users may experience frustration when the assistant misinterprets their requests.
5. Limited Context Understanding: Voice assistants may have difficulty maintaining context over a conversation, leading to misunderstandings or the need for repeated clarification.
6. Dependency on Cloud Services: Many voice assistants rely on cloud-based processing, which can result in delays or disruptions in service when there is poor or no internet connectivity.
7. Bias in Responses: Voice assistants can reflect biases present in their training data, leading to potentially discriminatory responses. Addressing bias and ensuring fairness is an ongoing challenge.
8. Interoperability Issues: Different voice assistants may have different command structures, capabilities, and integrations, leading to interoperability challenges and limiting users' flexibility in using multiple platforms.
9. Dependency on Voice Alone: While voice is a natural interaction method, there may be situations where users prefer other input methods, such as typing or tapping. Enhancing multimodal capabilities is an area of improvement.
10. User Awareness: Users may not always be fully aware of how their voice data is used or whether human reviewers are involved in the processing. Ensuring transparency and obtaining informed consent are crucial.
11. False Activations: Voice assistants often rely on wake words or phrases to activate, but

there can be instances of false activations, where the system responds to unintended triggers.

12. Inconsistencies: Integrations with third-party services may not always provide consistent user experiences, and users may face issues when attempting to use voice commands with specific applications or devices.
13. Stilted Interactions: While voice assistants have improved in natural language understanding, interactions may still feel stilted or lack the fluidity of human conversation.

1.5 Proposed Work

It was an interesting task to make my own assistant. It became easier to send emails without typing any word, Searching on Google without opening the browser, and performing many other daily tasks like playing music, opening your favourite IDE with the help of a single voice command. Jarvis is different from other traditional voice assistants in terms that it is specific to desktop and user does not need to make account to use this, it does not require any internet connection while getting the instructions to perform any specific task.

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

With the advancement Voice Assisstant can perform any task with same effectiveness or can say more effectively than us. By making this project, I realized that the concept of AI in every field is decreasing human effort and saving time. Functionalities of this project include, It can send emails, It can read PDF, It can send text on WhatsApp, It can open command prompt, your favourite IDE, notepad etc., It can play music, It can do Wikipedia searches for you, It can open websites like Google, YouTube, etc., in a web browser, It can give weather forecast, It can give desktop reminders of your choice. It can have some basic conversation.

1.6 Functionality

In this we check the functionality of the system whether the system performs the task which it was intended to do. To check the functionality each function was checked and run, if it is able to execute the required task correctly then the system passes in that particular functionality test. For example to check whether Voice Assisstant can search on Google or not, user said “Open Google”, then Voice Assisstant asked,” What should I search on Google?” then user said, “What is Python”, Jarvis open Google and searched for the required input.

1.7 Security

The security testing mainly focuses on vulnerabilities and risks. As this Voice Assisstant is a local desktop application, hence there is no risk of data breaching through remote access. The software is dedicated to a specific system so when the user logs in, it will be activated.

Chapter 2

LITERATURE REVIEW / DESIGN METHODOLOGY

2.1 Literature Review

A literature review on voice assistants involves exploring academic and industry publications to understand the current state, challenges, and advancements in voice assistant technologies. Here's a brief overview of key themes you might find in such a review:

1. Natural Language Processing (NLP) and Speech Recognition:

Explore studies and articles on the advancements in natural language processing and speech recognition technologies that form the backbone of voice assistants. Understand how these technologies have evolved to enhance the accuracy and effectiveness of voice interactions.

1. User Experience and Interaction Design:

Investigate literature on the design principles and user experience considerations in voice assistant interfaces. This may include studies on conversational design, user engagement, and methods for improving the overall user interaction with voice-enabled systems.

2. Privacy and Security Concerns:

Examine research and discussions around the privacy implications of voice assistants. Investigate how voice data is handled, stored, and secured, and review studies on potential privacy concerns associated with the use of voice-activated technologies

3. Accessibility and Inclusivity:

Explore literature on how voice assistants contribute to accessibility for users with disabilities. Understand how these technologies are designed to be inclusive and cater to a diverse range of users, including those with visual or motor impairments.

4. Ethical Considerations and Bias:

Investigate studies that address the ethical considerations and potential biases in voice assistants. Understand how biases can be unintentionally incorporated into the technology and explore proposed solutions to mitigate these biases.

5. Integration with Smart Home Devices:

Examine literature related to the integration of voice assistants with smart home devices. Understand how voice-enabled technologies contribute to the development of smart homes and the associated challenges in terms of interoperability and security.

6. Mobile Applications and Wearable Devices:

Explore how voice assistants are integrated into mobile applications and wearable devices. Understand the impact on user behavior, the advantages of hands-free interactions, and any challenges associated with the integration.

7. Corporate and Business Applications:

Investigate studies that discuss the use of voice assistants in corporate and business settings. Understand how businesses are leveraging these technologies for productivity, customer service, and internal operations.

2.2 Methodology

Clearly outline the tasks and functions your voice assistant will perform

- Choose Platform:

  Decide whether it will be integrated into an existing platform (e.g., mobile app) or standalone (e.g., smart speaker).

- Speech Recognition:

  Integrate a reliable speech recognition system to convert spoken language into text.

- Natural Language Processing (NLP):

  Implement NLP to understand user intents and context, enabling more natural conversations.

- Intent Recognition:

  Train models to accurately recognize user intents, linking spoken commands to specific actions.

- Response Generation:

  Develop a system to generate appropriate and coherent responses based on recognized intents.

- Integration with Services:

  Connect your voice assistant to relevant APIs and services for task execution (e.g., weather updates, calendar events).

- User Authentication:

  If needed, implement secure methods for user authentication to access personalized information.

- Feedback Mechanism:

  Provide feedback to users through voice or other means to confirm actions and enhance user experience.

- Continuous Learning:

  Implement mechanisms for the voice assistant to learn and improve over time based on user interactions.

- Privacy and Security:

  Prioritize user privacy and ensure data security, especially when handling sensitive information.

- Device Compatibility:

  Optimize the voice assistant for various devices and platforms, considering different screen sizes and input methods.

- User Interface (UI):

  Design a simple and intuitive UI for users who prefer visual interactions alongside voice commands.

- Testing:

  Thoroughly test the voice assistant in various scenarios to ensure accuracy, reliability, and a positive user experience.

- User Feedback:

  Gather feedback from users to identify areas for improvement and enhance the voice assistant's capabilities.

- Updates and Maintenance:

  Regularly update the voice assistant to add new features, improve performance, and address security issues.

  Remember, ongoing refinement and adaptation based on user feedback and technological advancements are crucial for the success of a voice assistant.

Chapter 3

IMPLEMENTATION

3.1 Project Objective

The project objective of a voice assistant is depending on its intended use and application. Here are s objectives for voice assistants:

- Enhance User Experience**:** Improve user interactions and experiences by providing a convenient and natural interface for users to interact with devices, services, or applications using voice commands.
- Automate Tasks**:** Enable users to perform various tasks and actions more efficiently by automating processes through voice commands. This can include setting reminders, sending messages, E-mails, and more.
- Increase Accessibility: Create a voice assistant to make technology more accessible to a wider range of users.

3.2 System Design

3.2.2 Data flow

The system is designed using the concept of Artificial Intelligence and with the help of necessary packages of Python. Python provides many libraries and packages to perform the tasks, for example pyPDF2 can be used to read PDF. The details of these packages are mentioned in Chapter 3 of this report.

The data in this project is nothing but user input, whatever the user says, the assistant performs the task accordingly. The user input is nothing specific but the list of tasks which a user wants to get performed in human language i.e. English.

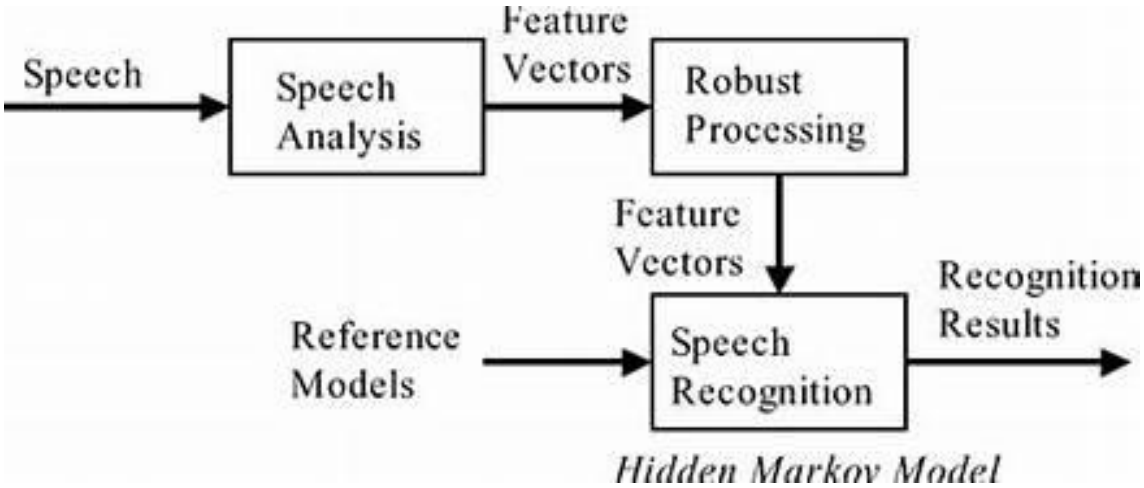

Fig 3.2.2.-Data flow of voice assisstant

3.3 Speech recognition working

Voice assistant applications work based on Automatic Speech Recognition (ASR) system. ASR systems record the speech and then break it down into phonemes, which are later get processed into text. A phoneme (not words of syllables) is a basic unit of measurement for human speech recognition. Phoneme recognition delivers better results than the process of word decoding, as the last one tends to analyze word as a standalone unit ignoring the context limits.

No matter what kind of speech recognition software you may use, all the magic happens in its ASR. If you have ever wondered how to create a virtual assistant software, the foremost thing to do would be to get familiar with how ASR works. In a nutshell, the process starts with the device gathering audio with the microphone. Recorded speech waveforms get straight to acoustic analysis, which is performed on three different levels:

acoustic modeling, which represents the which phonemes were pronounced and what are the words these phonemes complete;

pronunciation modeling, that analyzes the way phonemes are pronounced, is there any accent or other peculiarities of the vocal apparatus to capture the phonetic variability of speech;

language modeling, which is aimed at finding contextual probabilities depending on what phonemes were captured. All the data get processed by AI without human interaction. The low error rate became that low due to improvements enforced by machine learning. The speech waveforms data is then transmitted to the decoder, where it finally transforms into text for further use like command or dictation

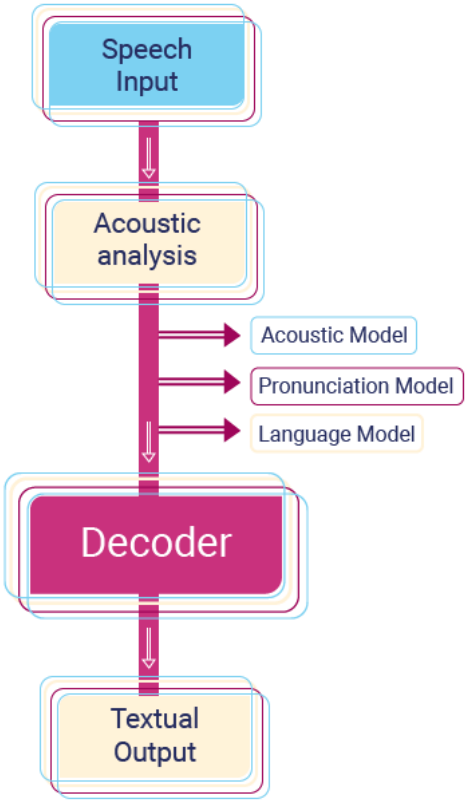

Fig-3.3-Speech recognition working

Artificial intelligence gives modern voice assistant apps the freedom of not relying on a limited vocabulary, but use cloud storage with millions of words and phrases instead. In its turn, machine learning makes applications listen to

the whole speech, not every word separately. That way, voice apps analyze context and probabilities to determine what are you trying to say. For example, Google uses a neural network with digital neurons similar to ones in human brain cells. Basically, this artificial neural network simulates the mental activity of our brains and mimics the processes that start when we hear the continuous stream of sounds. Regardless of the differences in architecture, all the most spread voice assistants like Google Assistant, Cortana, and Siri are powered by a deep neural network-based engine at the backend.

3.4 Libraries Used

PYTHON LIBRARIES

In Voice Assisstant following python libraries were used:

1. pyttsx3: It is a python library which converts text to speech.

2. Speech Recognition: It is a python module which converts speech to text.

3. pywhatkit: It is python library to send WhatsApp message at a particular time with some additional features.

4. Datetime: This library provides us the actual date and time.

5. Wikipedia: It is a python module for searching anything on Wikipedia.

6. Smtplib: Simple mail transfer protocol that allows us to send mails and to route mails between mail servers.

7. pyPDF2: It is a python module which can read, split, merge any PDF.

8. Pyjokes: It is a python libraries which contains lots of interesting jokes in it.

9. web browser: It provides interface for displaying web-based documents to users.

10. Pyautogui: It is a python library for graphical user interface.

11. os: It represents Operating System related functionality.

12. sys: It allows operating on the interpreter as it provides access to the variables and functions that usually interact strongly with the interpreter.

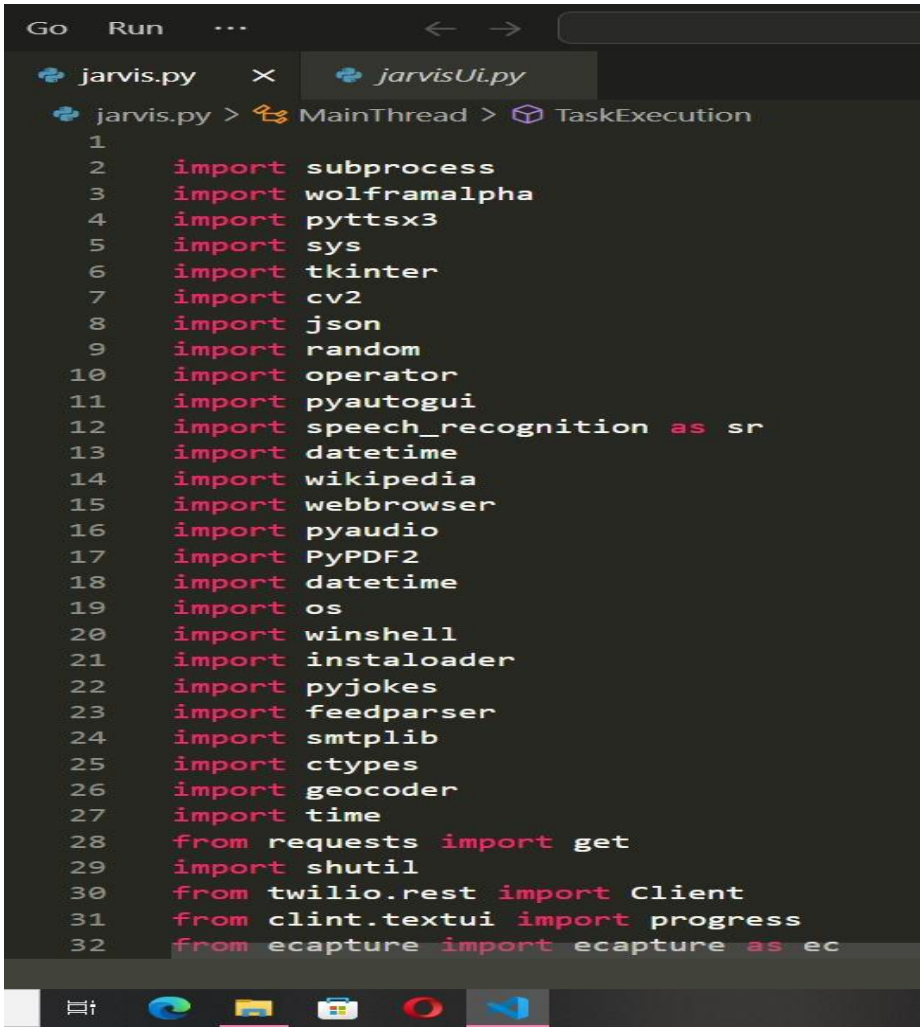

Fig-3.4-Python library

Chapter 4

TESTING/RESULT AND ANALYSIS

4.1 Testing / Result and Analysis

Open ERP's

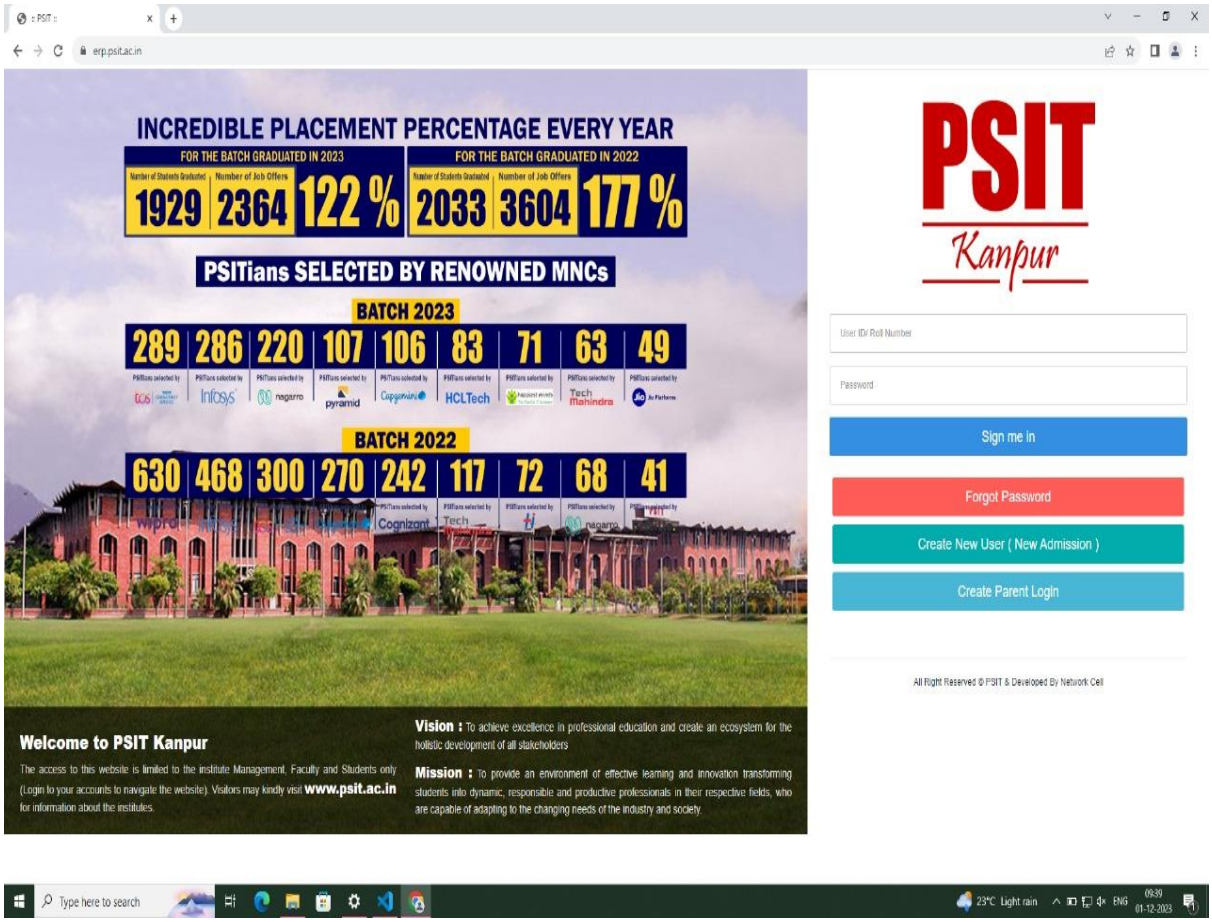

Fig.4.1(a)-College ERP

Fig.4.1(b)-Message

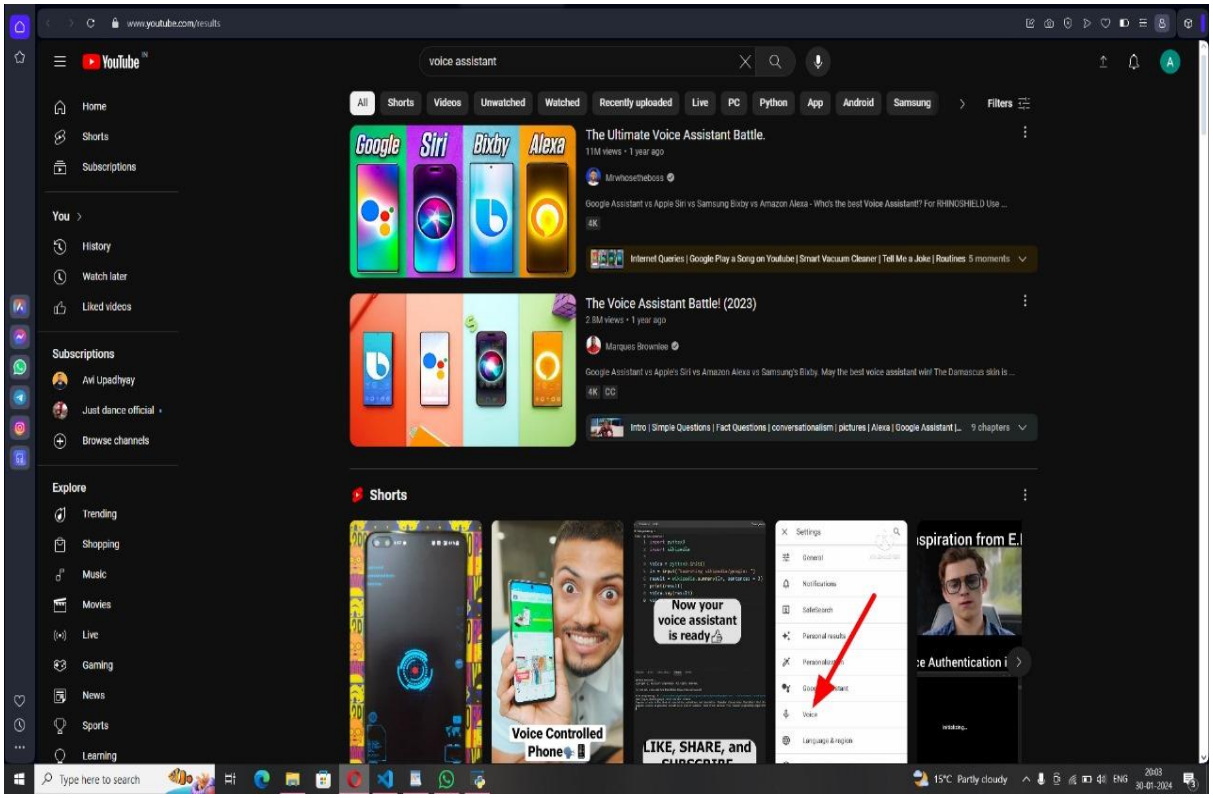

Fig.4.1(c)-View of YouTube

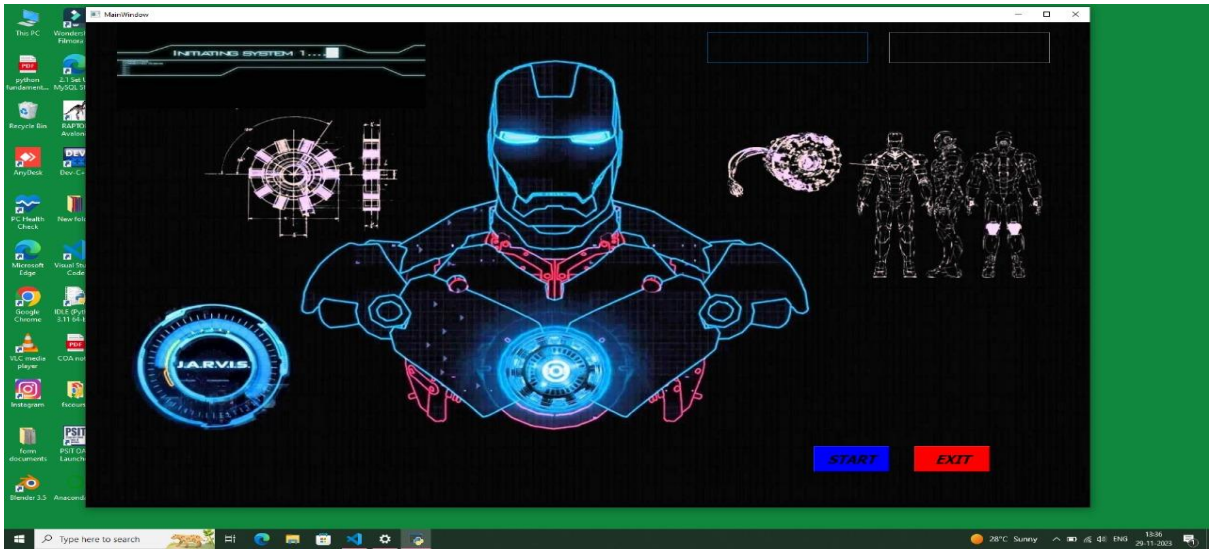

Fig.4.1(d)-Starting of Voice Assisstant

4.2 Analysis

Voice recognition and voice assistants improve accessibility, particularly for individuals with disabilities or those who find traditional input methods challenging. These technologies enable hands-free interaction, which makes navigating and interacting with software easier for people with mobility impairments. This inclusivity is a win-win, improving the overall user experience and ensuring applications are accessible to everyone.

Efficiency stands as the linchpin of productivity within the domain, and voice recognition and assistants usher in workflow automation that diminishes manual input. Comprehensive testing plays an instrumental role in validating this transformation.

Must provide the user any information which they ask for: -

1) The user might need any information which will be available on the internet but searching for that information and reading that takes a lot of time but with the help of a voice assistant, we can complete that task of getting the information sooner than searching and reading it. So, this is a small proof that a voice assistant helps the user to save time.

2) Telling the day's hot news in the user's location: - In Common, watching a news channel just to know the important news in one's location takes a lot of time and the user might even want to listen to some news which is unnecessary to them or a news of some different location before getting to know the news which they want needs a lot of patience to the user but having a voice assistant makes all that nothing, it'll give the news of the location which the user wants to now or the news which they want to know.

3) Telling some joke to chill up the moment: - Now let's be honest, everyone would have had at least one moment in their life where they were so tensed up or had an argument with their close people. So, these moments can be chilled up at least ten percentage with some random joke which might cool us that moment or stop that fight. We even have a quote stating "Laughter is the best medicine" which is relatable to the words mentioned here in this paragraph.

4) Telling the temperature/weather at the user's location: - Let's start this with a question, why is it important for us to know the weather of the day? or why is it important for us to monitor the weather every day? The answer is pretty simple it forewarns the users asking about the weather telling that "it might rain today so carry an umbrella if you go out" or "It will be a sunny day so wear a sun glass". So, by this we can say that this is also a must have feature.

5) Searching for what the user asks: Today in the 20th century, we people often get doubts and we need to clear that doubt as soon as possible else that one doubt will be multiplied and at the end, we'd have n doubts and to clear the doubts searching the question in the internet will give us an answer and clear our doubts and asking that to the assistant will save a lot of time. Other than clearing the doubts, we need to search a lot of questions or topics in the internet to keep up with the trend and we can do this searching just by giving command to our assistant, asking it to search a specific topic/question.

6) Internet of Things: The final important feature which is the most important feature and that is Internet of Things which is a lot useful because, it'll save a lot of time. Let's take an example, let's say that there is a person with a walking disability and he has to turn on the fan but the switch is a bit far and he can't walk but what he can do is that, he can tell the assistant to turn on the fan and that will turn it on.

This is just one example but with the help of IoT, we can do a lot of helpful stuffs like this. These are the important features of the voice assistant but other than this, we can do an ample of stuffs with the assistant.

Chapter 5

CONCLUSION

5.1 Conclusion

The virtual assistant is a beneficial thing to have in your home. It could help with many tasks and save you a lot of time. What has been achieved in this paper is building a virtual assistant that could answer many types of questions, control IoT devices, and control the peripheral devices like speaker and camera. The work in this field is tremendous, but at the same time, it is shrouded in secrecy, and there is not much information in this field. The reader can find a lot of solutions as API or as Software but not open-source projects or how to do it yourself tutorial which shows the competitiveness in this field. Lastly, the ability to improve the Software is endless. The limit to what you can do, is how much time, effort, and knowledge you want to devote to it. For detecting some spoken academic words, this experiment compared different parameters of a speech recognition system with an artificial neural network.

5.2 Future of voice assistant

We are entering the era of implementing voice-activated technologies to remain relevant and competitive. Voice-activation technology is vital not only for businesses to stay relevant with their target customers, but also for internal operations. Technology may be utilized to automate human operations, saving time for everyone. Routine operations, such as sending basic emails or scheduling appointments, can be completed more quickly, with less effort, and without the use of a computer, just by employing a simple voice command. People can multitask as a result, enhancing their productivity. Furthermore, relieving employees from hours of tedious administrative tasks allows them to devote more time to strategy meetings, brainstorming sessions, and other jobs that need creativity and human interaction.

1) Sending Emails with a voice assistant: Emails, as we all know, are very crucial for communication because they can be used for any professional contact, and the finest service for sending and receiving emails is, as we all know, GMAIL. Gmail is a Google-created free email service. Gmail can be accessed over the web or using third-party apps that use the POP or IMAP protocols to synchronize email content. To integrate Gmail

with Voice Assistant we have to utilize Gmail API. The Gmail API allows you to access and control threads, messages, and labels in your Gmail mailbox.

2) Scheduling appointments using a voice assistant: The demands on our time increase as our company grows. A growing number of people want to meet with us. We have a growing number of people who rely on us. We must check in on certain projects or set aside time to chat with possible business leads. There won't be enough hours in the day if we keep doing things the old way. We need to get a better handle on our full-time schedule and devise a strategy for arranging appointments that doesn't interfere with our most critical job. By working with a virtual scheduler or, in other words, a virtual assistant, we let someone else worry about the organization and prioritize our schedule while we focus on the work.
3) 3) Improved Interface of a voice assistant (VUI): Voice user interfaces (VUIs) allow users to interact with a system by speaking commands. VUIs include virtual assistants like Amazon's Alexa and Apple's Siri. The real advantage of a VUI is that it allows users to interact with a product without using their hands or their eyes while focusing on anything else.

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