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Virtual Assistant using NLP Techiques

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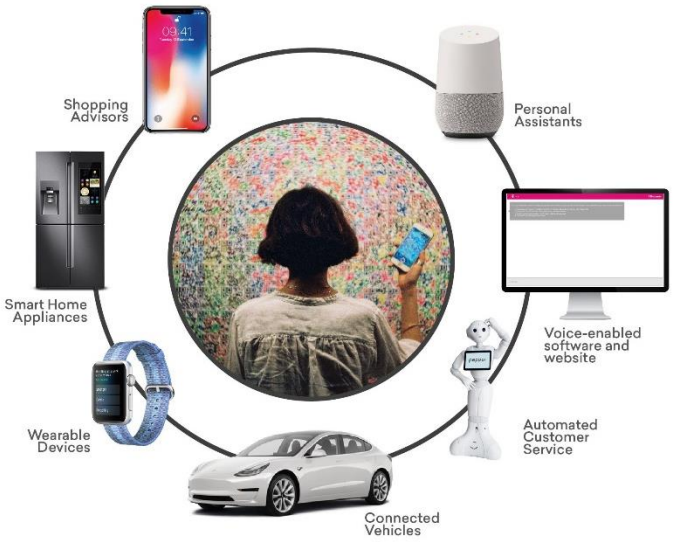
Abstract: Now-a-days, A Virtual Assistant is software that can have Natural Language Conversations with people. The modelling of dialogue is one of the key tasks in Artificial Intelligence, Voice Recognization and Natural Language Processing. Making a good Virtual Assistant has been the most difficult challenge since the advent of Artificial Intelligence. Although Voice Assistants are capable of a variety of activities, their main responsibility is to recognize human speech and react properly. There are still some issues with developing data-driven systems despite the fact that there are now many Voice Assistant platforms available because a substantial amount of data is needed for their creation. Consequently, implementing these Virtual Assistants with Python libraries(like NLTK, SpaCy, Polyglot, Text Blob, Flair) may be Accomplished. Moreover, to provide a better platform, Web Connectivity is also can be done to evaluate the Voice Assistant on a Web-based platform which will help in analyzing Human Voice Assistant Interactions.

Key Words **:- Virtual Assistant, Artificial Intelligence, Natural Language Processing, Python libraries, Voice Recognization , Speech Synthesizer, Data Flow Sequence Algorithm , Porter Stemming Algorithm.**

I. INTRODUCTION

In today's world,Natural Language Processing is the area of computer science—more specifically, the area of artificial intelligence—that focuses on teaching computers how to comprehend written and spoken language in a manner that is similar to that of humans. NLP aids programmers in organising tasks like speech recognition, automatic summarization, named entity recognition, and translation. NLP enables computers to speak the languages of people. It saves a lot of time. The majority of businesses employ NLP to increase the effectiveness of documentation procedures and extract information from sizable databases. Voice Assistants are gadgets or applications that respond to people by using AI, NLP, and voice recognition technology[5]. The technology enables the gadget to synthesise, deconstruct, assess, and provide a relevant response to the user's message in return. AI voice assistants can be divided into two categories: general-purpose and bot voice assistants. Brands of voice assistants like Siri and Alexa fall under the first category. Voice Chatbots, on the other hand, are typically the second type where the assistant is built into an application or website to aid consumers in navigating the service. A voice assistant, sometimes known as an intelligent personal assistant, is a brand-new category of goods promoted by Apple, Amazon, and Google that relies on speech recognition for natural language. They enable information retrieval using voice synthesis as well as searches that can be conducted using user-inputted voice commands.



Importance of Virtual Assistant

Virtual assistants highlight key points throughout dialogue. Without even sitting on the couch, we may access laptops, mobile devices, and many more devices. These voice assistants gather responses to questions you may ask. The biggest benefit is the time and effort these virtual assistants save.

II. LITERATURE SURVEY

In paper [1] Ritik Porwal, Ujjawal Tomar, Vishakha Dubey mainly focuses on the most efficient way for Voice Recognization. Microsoft Speech Synthesizer is used for the speech synthesis which consists of STT (Speech to text), it sound or voice receive from user is converted to text for processing of information and gives us respective output through a voice assistance by TTS(Text to speech). It Continues to expand its digital abilities in organizing several events like playing music , guiding services for travelling(Google maps) , game prediction.

In paper [2] Abhay Dekate, Rohan Killendar introduced an **Data-Flow Sequence Algorithm**.The study on Home Automation system based on Internet of Things was proven to work satisfactorily by connecting simple appliances(like lights, fans Etc..) It always keep listening for its Name and responds to calls with the designated functionality while awake. Sentence given or receive is passed to NLP and after that NLP core engine process these sentences and it is moved forward to speech synthesizer to respond. The main goal of Author is to make human life more comfortable.

In paper [3] Laura Burbach , Patrick Halbach , Nils Plettenberg , Johannes Nakayama worked related to the effect of natural language processing performance, price and privacy on acceptance of virtual voice assistants. Author Also explains about the usage of python's NLTK library, TextBlob and spaCy library in making the virtual assistance more better.And mainly now a days,privacy turned out as important aspect for acceptance of voice assistance.

In paper [4] Bayu Setiaji, Ferry Wahyu Wibowo , Department of Informatics Engineering STMIK AMIKOM Yogyakarta, Yogyakarta have explained the sentence similarity measurement so that it is easy to find difference between two sentences or strings.The chatbot using a knowledge in Database-Humanto-Machine Conversation Modeling tells about the probability of calculating a sentence that could be probably represented as equation.

$$\rho(\psi) = \prod_{i=1}^{|\psi|+1} \rho\left(\psi_i | \psi_0 \ldots \psi_{i-1}\right)$$

In paper [5] George Terzopoulos;Maya Satratzemi: The Word Order Similarity Between Sentences is explained and tells the importance of Word Order Similarity in Building a Virtual Assistant.The Porter Stemming Algorithm is used for building a chat bot for Collage Management System,Where Porter Stemming Algorithm is a process for removing suffixes from words in English.

III. Methodology

1.Speech Synthesizer Algorithm:

The steps involved in this Algorithm:

1.NLP Core Engine processes the input given by the user so that it can be sent to the speech synthesizer to respond.

2.Microsoft Speech Synthesizer is used which consists of STT.

STT is speech to text, it sound or voice receive from user is converted to Text for processing of information by bot. Then it responds according to input given by the user.

2.Data Flow Sequence Algorithm:

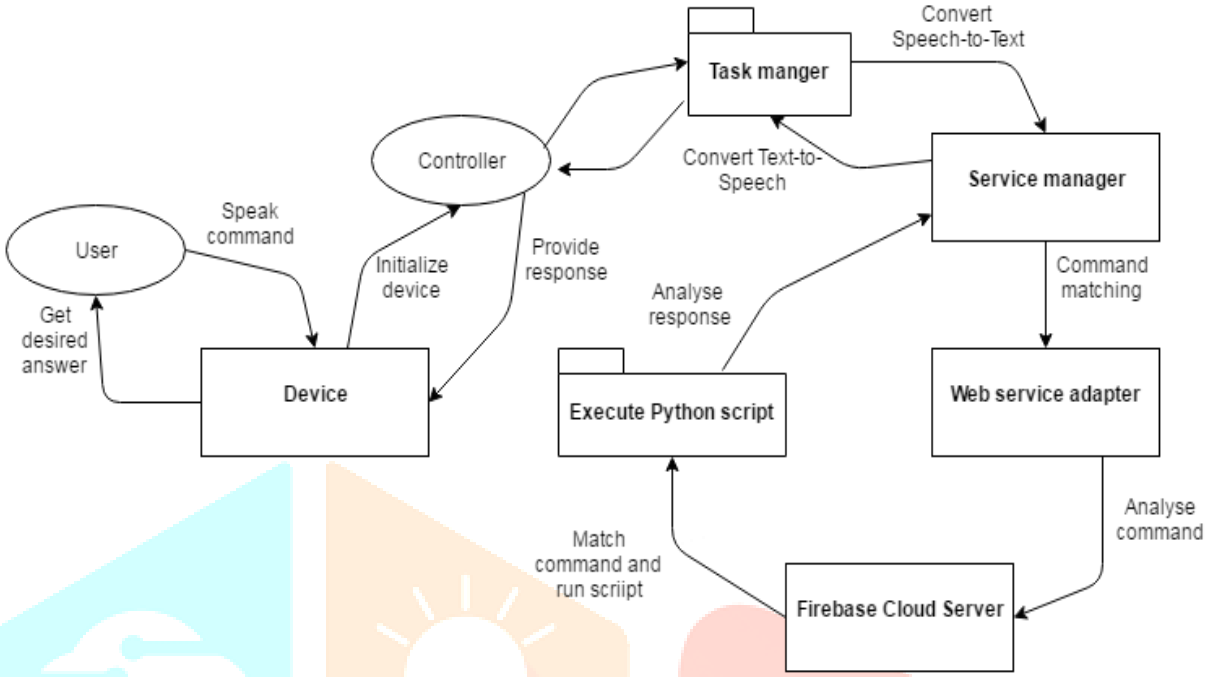
The steps involved in Data Flow Sequence:

1.Initialize Device

2.Task Manager

3.Service Manager : Analyses the commands and matches them with servers.

4.Execute Command: When the matching found for commands, run the py script and gives response



3.Virtual Assistant consists of core and interface:

The Virtual Assistant consists of core and interface accessing that core. RDBMS, which is a database, is at its core. The interpreter is a stored programme of function and procedure sets for required of pattern matching, whereas the database is made up of tables to store knowledge .The interface could be a standalone application that can be employed by user for chatting or conversationRDBMS, which is a database, is at its core. The interpreter is a stored programme of function and procedure sets for required of pattern matching, whereas the database is made up of tables to store knowledge.

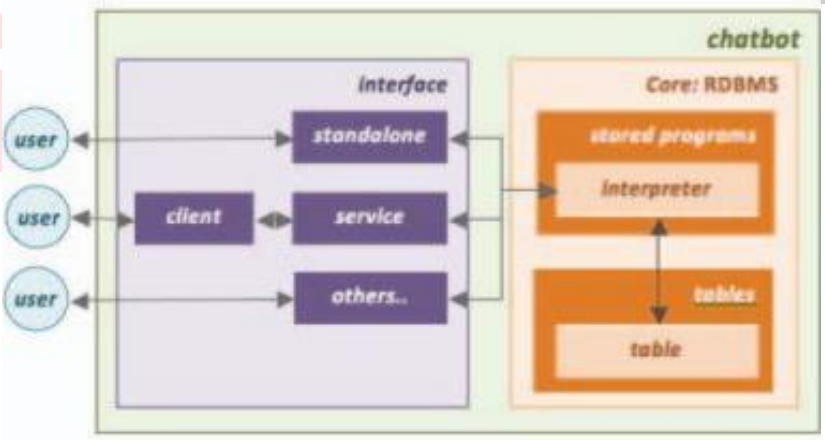


Fig.4.2 Virtual Assistant consists of core and interface accessing that core

4.Porter Stemming Algorithm:

It is the a procees for removing the suffixes from words in English. Removing suffixes automatically is an operation which is especially useful in field of information retrieval.

Following are the steps of this algorithm:

1.Gets rid of plural and -ed or -ing suffixes

2.Turns terminal y to i

3.Maps double suffixes to singles ones: -ization , -ational etc…

4.Deals with sudffixes -full,-ness etc.. Takes off -ant,-ence etc… Removes a final –e

IV. RESULT &DISCUSSION

The table below represents the resultant data, which is subsequently used for training and testing the predictive models. Voice Assistant keeps learning the sequence of questions asked to it related to its context which it remembers for the future. So ,when the same context is mentioned ,it starts a conversation with you asking the relevant questions.

It performs the Arthimatic Calculations based on voice commands and giving back the computer solution through the voice.Search Internet based on user voice input and giving back the reply through a Voice Assistance.Results produced were 98 percent accurate to the input.

After analysing the data, train the model using natural language techniques and get the accuracy for each model as follows in the table below:

S.no	Model	Accuracy %
1	Speech Synthesizer	97.3
2	Data Flow Sequence	98
3	Core and interface Accessing	93.2
4	Porter Stemming	79.6

V. Conclusion

From the analysis conducted in this paper, different algorithms are used.Comparitive study performed amoung the various techiques like speech synthesizer, data flow sequence, core and interface accessing, porter stemming. After the Analysis based on the accuracy on the above mentioned table.The Data Flow Sequence Algorithm has most accuracy for providing the required output as required for the user.

VI. References

[1] Ritik Porwal ; Ujjawal Tomar ; Vishakha Dubey ; Asst.Prof.Akshita Mishra ; Asst.Prof.Gourav Mandloi **"Voice Assistant"** 2021 International Journal of Scientific Research & Engineering Trends(ISSN)

[2] Abhay Dekate ; Rohan Killedar ; **"Study of Voice Controlled Personal Assistant Device"** 2019 International Journal of Emerging Trends & Technology in Computer Science

[3] Laura Burbach ; Patrick Halbach ; Nils Plettenberg ; Johannes Nakayama ; Martina Ziefle; Amdre Calero Valdez ; **"Hey,Siri;Ok,Google;Alexa:Acceptance-relevant factors of Virtual Voice-assistants"** Published:2019 Digital Society Research Program

[4] Bayu Setiaji, Ferry Wahyu Wibowo , Department of Informatics Engineering STMIK AMIKOM Yogyakarta, Yogyakarta **"Chatbot Using A Knowledge in Database-Humanto-Machine Conversation Modeling"**. 2016 IEEE

[5] George Terzopoulos;Maya Satratzemi, **"Voice Assistants and Artificial Intelligence in Education"**, in Department of applied informatics on 26 September,2019