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A Literature Survey on Voice Assistance

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Abstract: ***Artificial Intelligence has been in great use when it comes to day to day life. Computer science defines AI research as the study of brilliant agents. In almost any direction one turns today, some form of computer-based information processing technology intrudes, whether to the individual knowingly or not. Artificial Intelligence (AI) has already changed our lifestyle. AI device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Input to recommendation algorithm can be a database of user and items and output recklessly will be the recommendations. The user is the input into system by voice or text. This paper presents a new approach for smart search. Overall, in world there are many people who use assistant. The paper presents applications of virtual assistant and also describes provocation of applying virtual assistant technology.***

Keywords: Voice Assistance, Python, AI, Review, Text to Speech, Speech to Text, Voice Recognition.

I. INTRODUCTION

Voice assistant is a device, app, or computer program that can respond to commands or questions and perform specific tasks. The aim of this paper is to design a voice assistant that will help the user and visually impaired people to have a hands-free experience on using internet and can also automate our tasks with ease and comfort. So, here is a method to develop a Personal Voice Assistant that has a brilliant power of deduction and capability to interact with the environment just by one of the forms of human interaction i.e., HUMAN VOICE. The Hardware device captures the audio request through microphone and processes the request so that the device can respond to the individual using in-built speaker module. The design methodology of Voice Assistant is done in this paper.

II. LITERATURE SURVEY

In this paper entitled “Study of Voice Controlled Personal Assistant Device” author proposed the famous application of iPhone is “SIRI” which helps the end user to communicate end user mobile with voice and it also responds to the voice commands of the user. Same kind of application is also developed by the Google that is “Google Voice Search” which is used for in Android Phones. But this Application mostly works with Internet Connections. But this Proposed System has capability to work with and without Internet Connectivity. It is named as Personal Assistant with Voice Recognition Intelligence, which takes the user input in form of voice or text and process it and returns the output in various forms like action to be performed or the search result is dictated to the end user.
In this paper entitled “AI Based Voice Assistant Using Python” author developed an economically effective and performance wise efficient virtual assistant using Raspberry Pi for home automation based on the concepts of Internet of Things, Speech Recognition, Natural Language Processing and Artificial Intelligence. People who are using it can give voice inputs and the device itself responds through voice commands by itself. It can fetch the date, time, weather, play your favourite music and fetch search results from the internet along with controlling the home appliances. NodeMCU chips are used to control the appliances which receives the command from the Raspberry Pi. In this paper entitled “Virtual Personal Assistant for the Blind” author proposed that there are various communication barriers for people who are blind, and they have to face various challenges. In this paper, we have discussed the implementation of a personal virtual assistant which can take the human voice commands to perform tasks which otherwise would need the dependence on others. It enables user to receive and send emails, know the weather forecast report, maintain a personal diary/Online Blog, recognize image etc., using Speech to Text Engine, Text to speech Engine, OCR (Optical character recognition) using microphone for the input and speakers for the output In this paper entitled “AI-Smart Assistant” author presented the problem of user while developing a computer program. Developing a computer program is not an easy task it needs hardware resources which user have to handle. While continuous typing the code there may be possibility of injuries to the fingers of the user. To avoid the problems, we are designing a system in which the computer program can developed through the voice. The voice will be recognized by the system and that recognized words or word will be compared with the stored keywords in the database and if they are matched then that will be printed on editor and after this again by recognizing the specific keywords the program will be compiled and executed. This system will be easy to use, it reduces human efforts and the use of hardware resources. It would be surely useful for blind.

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In this paper entitled "Smart Python Coding through Voice Recognition" author proposed that in today's world, many artificial intelligence applications developed using programming languages like Python, R and so on. Each language comes with its own programming structure and syntactical forms. Programmers are broadly classified into three categories namely, novice users, knowledge intermittent and expert one. For novice users, it is always a challenge to write a code without typographic errors though users know theoretical knowledge of Programming language, its structure and syntax as well as logic of program. Therefore, this paper explores use of voice recognition technique in the field of programming, specifically for writing program with Python programming language. This paper adds new way of creating interest in beginners for judging their coding paradigm understanding and explore one of the areas for user experience field for better programming Integrated Development Environment Development (IDE).

In this paper entitled "An Assistive System for Visually Impaired using Raspberry Pi" author proposed about a different combination of a reading machine (OCR), virtual assistant using Raspberry-Pi which will be a combination of a great system. This is a helpful aid for visually impaired people and people with disabilities. OCR stands for optical character recognition where it recognizes the present text and converts them into audio speech using pre and post processing with GTTS (Google Text to Speech). Google is used as its platform for virtual assistant which can be used in day-to-day life activities like checking mails, weather-forecast, news etc., further using Google Assistant, and python language we implement a voice based home automation. The objective of this project is to help visually impaired by using various fields of technology. By just voice commands tasks such as reading of document, home automation and personal assistant can be achieved.

In this paper entitled "Next-Generation of Virtual Personal Assistants (Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home)" author proposed one of the goals of Artificial intelligence (AI) is the realization of natural dialogue between humans and machines. in recent years, the dialogue systems, also known as interactive conversational systems are the fastest growing area in AI. Many companies have used the dialogue systems technology to establish various kinds of Virtual Personal Assistants (VPAs) based on their applications and areas, such as Microsoft's Cortana, Apple's Siri, Amazon Alexa, Google Assistant, and Facebook's M. However, in this proposal, we have used the multi-modal dialogue systems which process two or more combined user input modes, such as speech, image, video, touch, manual gestures, gaze, and head and body movement in order to design the Next Generation of VPAs model. The new model of VPAs will be used to increase the interaction between humans and the machines by using different technologies, such as gesture recognition, image/video recognition, speech recognition, the vast dialogue and conversational knowledge base, and the general knowledge base. Moreover, the new VPAs system can be used in other different areas of applications, including education assistance, medical assistance, robotics and vehicles, disabilities systems, home automation, and security access control. In this proposal, we have tested the new VPAs model by using IBM Watson cloud server with Python, Node Red.

In this paper entitled "Voice Assistant Application for a college website" author presented in the Modern Era of fast-moving technology we can do things which we never thought we could do before but, to achieve and accomplish these thought s there is a need for a plat form which can automate all our tasks with ease and comfort. Thus, we humans developed applications like Personal Voice Assistant having the ability to inter act with the surroundings just by one of the materialistic forms of human interaction i.e., Human Voice. Here they developed a web application where the voice assistant would be available for a particular website. In this proposed system we have took a college website as an example. It can change the way of inter actions between end user and the website. The Application is being designed in such a way that all the services provided by the website are accessible by the end user on the user's voice commands.

In this paper entitled "AI Based Voice Assistant Using Python" author presented artificial intelligence technologies are beginning to be actively used in human life, this is facilitated by the appearance and wide dissemination of the Internet of Things (IOT). New capacities lead to creation of various systems for integration of smart things into Social Networks of the Internet of Things. One of the relevant trends in artificial intelligence is the technology of recognizing the natural language of a human. New insights in this topic can lead to new means of natural human machine interaction, in which the machine would learn how to understand human's language, adjusting and interacting in it. In this paper, the principles of the functioning of voice assistants are described, its main shortcomings and limitations are given. The method of creating a local voice assistant without using cloud services is described, which allows to significantly expand the applicability of such devices in the future.

In this paper entitled "Study of Voice Controlled Personal Assistant Device" author presented in the Modern Era of fast-moving technology we can do things which we never thought we could do before but, to achieve and accomplish these thoughts there is a need for a platform which can automate all our tasks with ease and comfort.

Thus, we need to develop a Personal Assistant having brilliant powers of deduction and the ability to interact with the surroundings just by one of the materialistic forms of human interaction i.e., Human Voice. The Hardware device captures the audio request through microphone and processes the request so that the device can respond to the individual using in-built speaker module.

In this paper entitled "Accurate and compact large vocabulary speech recognition on mobile devices" author proposed a design of a compact large vocabulary speech recognition system that can run efficiently on mobile devices, accurately and with low latency. This is achieved by using a CTC based LSTM acoustic model which predicts context independent phones and is compressed to a tenth of its original size using a combination of SVD-based compression and quantization. Quantized deep neural networks (DNNs) and on-the-fly language model rescoring to achieve real-time performance on modern smartphones.

In the paper entitled "Smart Assistance for Students and People Living in a Campus" author designed a conversational assistant, capable of answering common questions, has been combined with a content discovery engine that is more suitable for finding the proper answers from a collection of heterogeneous sources.

In the paper entitled "Artificial Intelligent based Voice Assistant" author presented that many companies of voice assistants are trying to improve interaction and more features to the next level and many of the youth started using a voice assistant in daily life and from many sources the result showed very good feedback

In the paper entitled "POWER EFFICIENT SMART HOME WITH VOICE ASSISTANT" author proposed smart assistants are useful in many fields such as education, home appliances, etc. and the voice assistant is also useful for blind people. They can get any information just by telling the assistant, and this is possible because voice-based Smart assistants. We are using raspberry pi for SSH and different module connections. Raspberry pi is a low cost and small size computer that plugs into a computer or monitor with the help of connectors and standard keyboard and mouse. Raspberry pi having 40 GPIO pins on its hardware module.

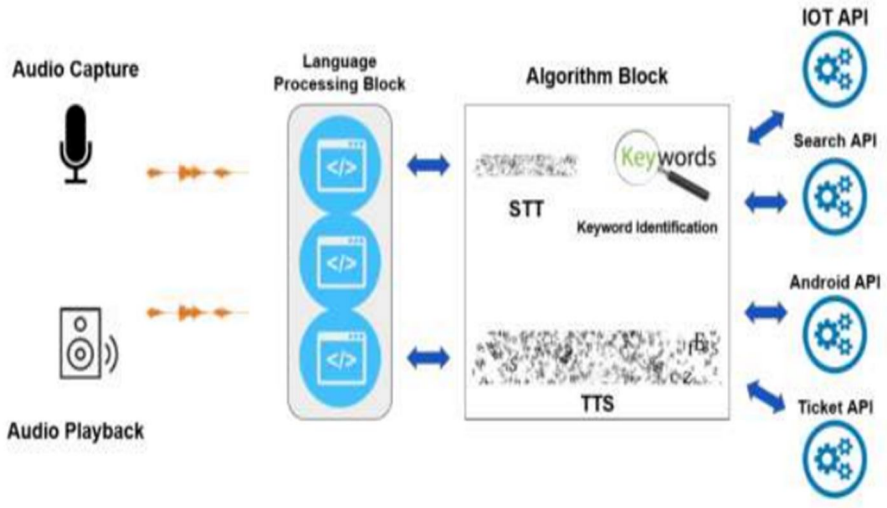
In the paper entitled "Overview of the Speech Recognition Technology" author proposed a system based on the voice as the research object, it allows the machine to automatically identify and understand human spoken language through speech signal processing and pattern recognition.

III. PROPOSED METHOD

The overall proposed system design consists of following phases:

1) Data collection in the form of speech.
2) Voice analysis and conversion to text
3) Data storage and processing
4) Generating speech from the processed text output.

In first phase, the data is collected in the form of speech and stored as an input for the next phase for processing. In second phase, the input voice is continuously processed and converted to text using STT. In next phase the converted text is analyzed and processed using Python Script to identify the response to be taken against the command. Finally, once the response is identified, output is generated from simple text to speech conversion using TTS.



System Architecture of Voice Controlled Personal Assistant

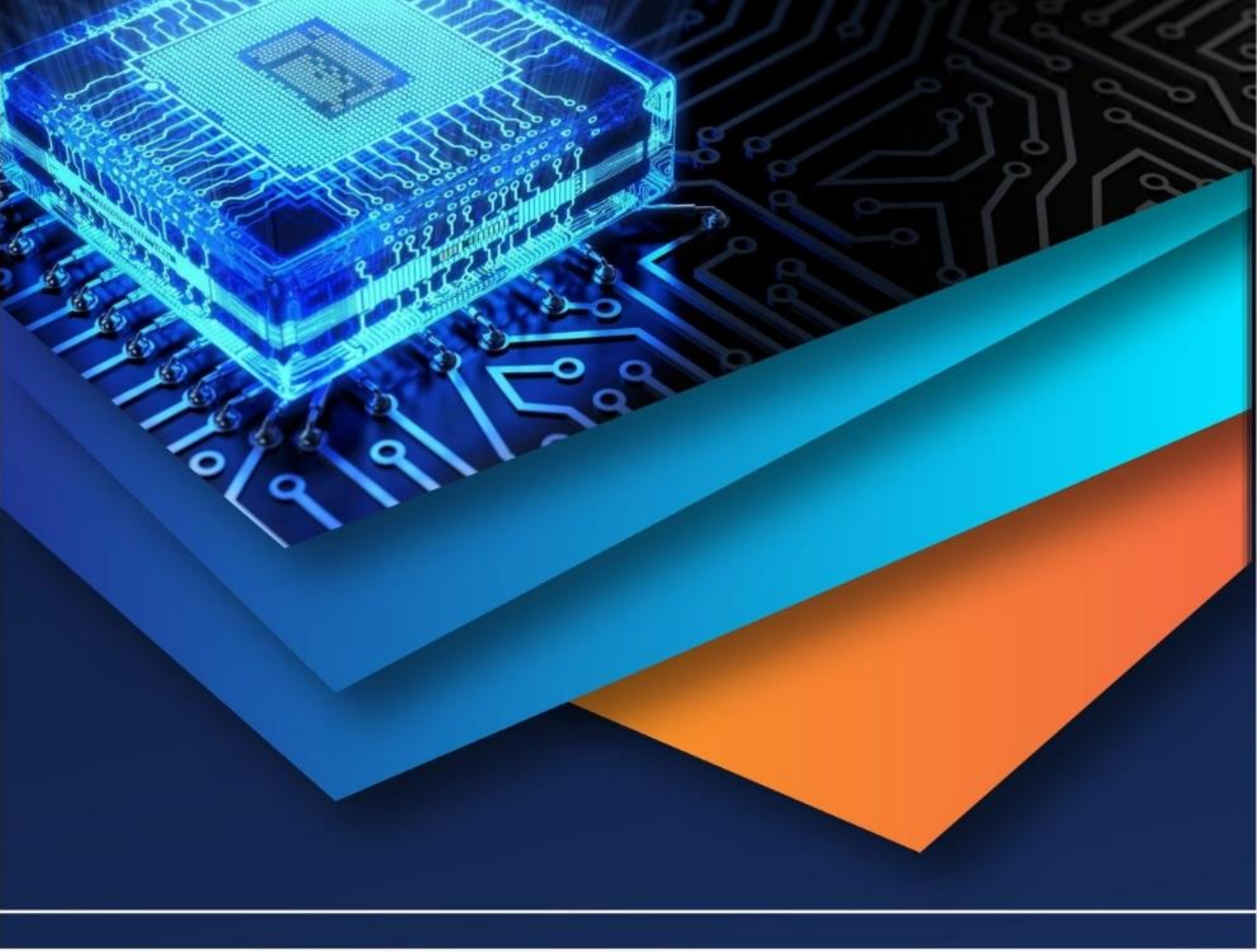
IV. CONCLUSION

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.

Thus, on the basis of literature survey and by analysing the existing system, we have come to a conclusion 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.

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