

Voice Controlled Personal Assistant Bot with Smart Storage

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Abstract - The goal of the project is to create a system which can act as portable storage device as well as also serve the purpose of virtual personal assistant. Voice-controlled intelligent personal assistant bot is a software agent that can perform tasks or services for an individual. The bot has no other advantages for the user using the agent. The integration of file storage system which can be accessed by heterogeneous client devices with voice-controlled intelligent personal assistant bot leads to a smart memory assistant device with processing capacities for the memory, this processing power for the memory adds up to the operations like user interactions, streaming, personal cloud storage etc.

Key Words: Smart Memory Assistant, Storage Bot, Virtual Assistant, Google Home, Amazon Alexa, Wireless Storage.

1. INTRODUCTION

A voice assistant is a software agent that performs tasks or services assigned to it by the user through various commands. The software agent which is accessed by online chat is referred as 'chatbot' in software terms which is a part of Virtual agent domain. Voice assistants of the same domain are able to interpret human speech and respond to it. On the other hand, data storage is major issue in day-to-day life. Every smart device has a limited data storage capacity. After the storage is full, managing data is a tedious job. For this given issue, we make use of multiple hard drives which also have a limited capacity. Moving data from different storage devices becomes difficult and is time consuming. Once the surface of the disk is damaged by regular crashes, it leads to the loss of the data stored in the disk.

Cloud Storage is a model of computer data storage in which the digital data is stored in various logical pools of disks, but there is a need of an active internet connection for accessing the data stored in the cloud. Several cloud storage services have a specific bandwidth allowance, the additional charges could be significant and requires more time. Hence creating a file storage system accessed by heterogeneous client devices and integrating this system to voice assistant software agent makes a smart storage device.



Fig -1: Alexa Activity

2. LITERATURE REVIEW

Veton Këpuska, "Next-Generation of Virtual Personal Assistants (Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home) ", Published in 2018, This paper gives us knowledge about the uses of the multi-modal dialogue systems which process two or more combined user input modes, such as speech, image and user interface in order to design. We moreover get broad idea about the multiple user specific interactions. This paper gives idea about the next generation of virtual personal assistant and modifications that can be made to interact with the assistants.[1]

Sumit kumar Sarda, "VPA: Virtual Personal Assistant" Published in 2017. This paper describes the approach to develop a personal assistant that reduces the utilization of input devices like keyboard and mouse on our Personal Computer. This paper gives idea about using personal assistant in our day to day life rather than using personal computers.[2]

Amit Rakesh Shrivastava, "Home Server and NAS using Raspberry Pi", Published in 2017, The paper proposed aims at providing a low cost NAS system which is easy to use and configure. It also comprises of added security features and Web Server capabilities. It enables you to have round the clock available storage device which is handy as well as power saving and allows accessibility to data on and off the network[3]

Zhang Huili, "Realization of Files Sharing between Linux and Windows based on Samba", Published in 2008. With the development of computer network, there are

multiple operating systems in one local area network frequently. Windows and Linux are comparatively popular within these operating systems. It is necessary to realize files sharing between different operating systems in local area network. Samba software package acts as the bridge between Windows and Linux.[4]

Md.Al-Amin, "Design of an Intelligent Home Assistant ", Published in 2006. An intelligent system for home automation is a desired technology in the 21st century. The main motive of any automated system is reducing human labour, effort, time and errors due to human negligence. The goal of this project is to design a voice control and remote control (via World Wide Web) based intelligent system. Using remote control system via World Wide Web or Internet gives the ability to control home appliances from anywhere in the world.[5]

P. Milhorat, "Building the next generation of personal digital Assistants," Published in 2014. Voice-based digital Assistants such as Apple's Siri and Google's Now are currently booming. Yet, despite their promise of being context-aware and adapted to a user's preferences and very distinct needs, truly personal assistants are still missing. In this paper we highlight some of the challenges in building personalized speech-operated assistive technology and propose a number of research and development directions we have undertaken in order to solve them. In particular we focus on natural language understanding and dialog management aspects as we believe that these parts of the technology pipeline require the biggest amount of augmentation.[6]

Key Players in Smart Speakers Market

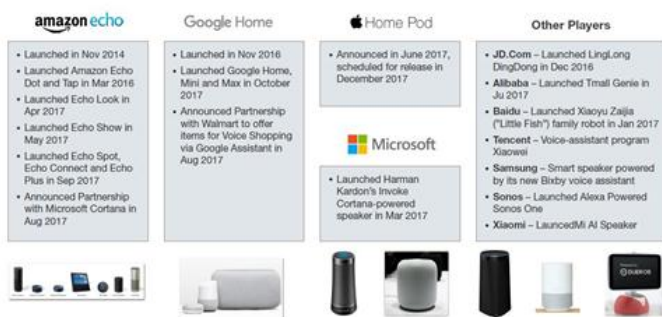


Fig -2: Various Virtual Assistants

3. MOTIVATION

In our everyday life we are using voice assistant at our home for various purposes like playing music to scheduling our work. These devices can also stream music or video on our Televisions but they do not provide storage to the user for storing data. For storing excess data, user depends upon various devices like PC's and hard disks, which is not that much of convenience and

cloud storage requires internet connectivity. Hence there is need of convenient storage device which can be accessed by multiple users simultaneously.

In the current proposed system, we are developing better and efficient system which can provide storage and access to data simultaneously to the end users in various numbers and also serve the purpose of voice assistant being used in our day to day life.

4. SYSTEM ARCHITECTURE

First of all the system starts with respective wake words for the voice assistant. Following the wake word, the system proceeds by receiving voice commands from the users with the help of a microphone, further analyzing the command and processing the given, the device will create appropriate response for the given command. Response is given to user with the help of speakers as shown in diagram given below. Users can also use the device for storing and streaming the data. User can store excess data (Data taking up extra space on the local device) in the wireless storage system of the device with the help of an app on host's device. This application interacts with system. Uploading downloading and streaming of data from the system to the host device is now convenient. The application can also host various users simultaneously. The various constraints acting on the system are as follows :-

The primary design constraint is the autonomous platform. Since the device would be designed to interact with heterogeneous O.S. devices hence, effective GUI and user friendly interaction will be the major design constraint. Creating a user interface which is both interactive and easily navigable is more important. Also as we are incorporating a voice based personal assistant, the need for effective performance is mandatory. Moreover, Noise cancellation is a vital constraint under consideration when voice interaction is used by the user. Other constraints such as processing power are also worth considering. The assistant system is meant to be quick and responsive even when dealing with complex instructions, so each feature of the software must be designed and implemented considering the efficiency. As the proposed system involves complex communication algorithms, the requirements of all the algorithms must be taken under consideration for the designated format of input and output generated, their individual working efficiency and its contribution to overall system application. The system will give the desired results only if the specified requirements are satisfied. The device will have to implement all the required NLP (Natural language processing) algorithms simultaneously with the server protocols, thus a need of synchronized operations is required to carry out the specified functionality smoothly for the end users. Moreover the storage ambiguity must be taken care of as multiple users interact with the device

simultaneously. The low tolerance of failure of the storage system makes the device vulnerable in terms of its performance. As the number of users increases, a need of higher processing power is required by the device, which could lead to some users getting deprived of their service. Such situations need implementation of parallel algorithms to meet the needs of the users.

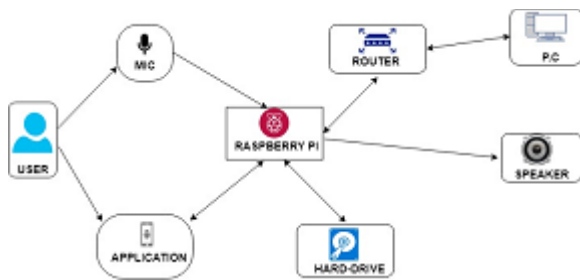


Fig -3: System Model Architecture

4.1 Enhancements

The current Virtual assistant bots in use cost on an average of Rs.3000 to 8000 with the given advantages of following up commands issued by the user. By integrating this device with a wireless storage system with models ranging for different memory capacities (1 TB, 3 TB so on). This storage system boosts the applications of the assistant thereby increasing its targeted market and customer base. Also the usability of the system gets a new perspective to look at making it economical for the end users.

4.2 System Flow Graph

The following graph depicts the working of two subsystems in the device

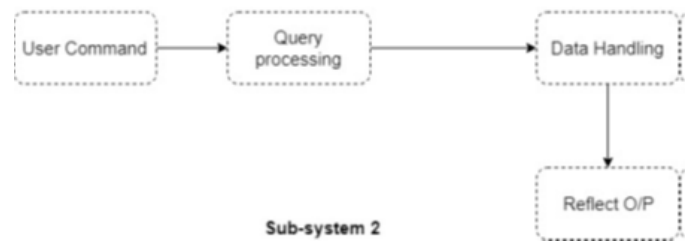
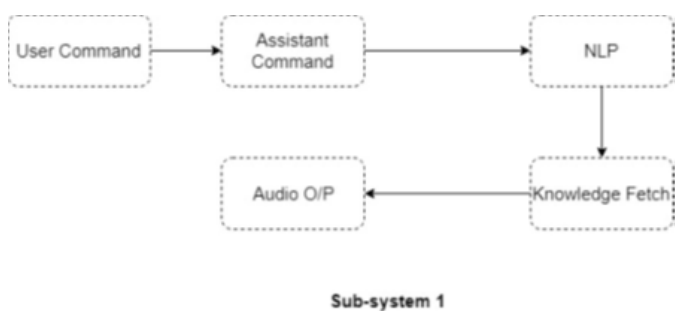


Fig -4: System Flow Graph

3. CONCLUSIONS

On the basis of literature survey and by analyzing existing systems, we have come to conclusion that the proposed system will not only be economical but will also boost the application domain of current systems available in the market.

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