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MIA-My Intelligent Assistant

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Abstract: In these days if we have any general doubts on solution for any arithmetic, it is our tendency either goggling or refer the books and solving it out. Here is the solution for it. We can just ask our doubts, if it is a general or arithmetic, no problem Mia will talk to you by replying the answer. Mia is an automatic answering machine. You can ask any logically correct questions and the Mia will answer you to that question. It is a smart machine which is working using a smart low cost SBC called Raspberry Pi. Raspberry Pi is an ARM based board. This board make us possible to work out this genius answering machine. The raspberry pi will be connected to internet using Wi-Fi or through Ethernet. We can speak to this machine which will be recording our speech. And based on what we asked to the machine, it will convert it to text and will search in internet and find the result regarding the query. Using a text to speech converter we can make the machine to answer the query back in speech. This makes the project smarter. We may be using sound card, Google API's, Python, Wolfram Alpha Engine and Shell Scripting for work outing this project.

Keywords: Mia, SBC, ARM, Raspberry Pi, Wolfram.

I. INTRODUCTION

This hardware device christened MIA is built to serve the purpose of a personal virtual assistant. MIA (My Intelligent Assistant) is an automated answering machine that is capable of answering any questions raised. The questions now supported are within the arithmetic, logical, and general category. MIA is brought to life using Raspberry Pi, and at its core Wolfram Alpha Search Engine is responsible for its intelligence. Furthermore, the voice recognition capability of MIA makes searching for information all the more easy. The main aim of this project is to assist a person in his never ending quest for information. This project is a corner stone in the process of making a personal assistant capable of aiding one in his/her daily tasks as well. An **intelligent personal assistant** (or simply **IPA**) is a hardware and software integration that can perform tasks or services for an individual. These tasks or services are based on user input, location awareness, and the ability to access information from a variety of online sources (such as weather or traffic conditions, news, stock prices, user schedules, retail prices, etc.).

II. RELATED WORK

There is mainly three works which are same as our work in some aspects. Those are Google Now, Cortana, and Apple's Siri.

Google Now is an intelligent personal assistant developed by Google. Google Now is available within the Google Search mobile application for Android and iOS, as well as the Google Chrome web browser on personal computers. Google Now uses a natural language user interface to answer questions, make recommendations, and perform actions by delegating requests to a set of web services. Along with answering user-initiated queries, Google Now proactively delivers to user's information that it predicts (based on their search habits) they may want.

Cortana is an intelligent personal assistant created by Microsoft for Windows 10, Windows 10 Mobile, Windows Phone 8.1 (where it now supersedes Bing Mobile), Microsoft Band, Xbox One, iOS and Android It is named after Cortana, a synthetic intelligence character in Microsoft's Halo video game franchise originating in Bungie folklore, with Jen Taylor, the character's voice actress, returning to voice the personal assistant's US-specific version.

Siri (Speech Interpretation and Recognition Interface) is a computer program that works as an intelligent personal assistant and knowledge navigator, part of Apple Inc.'s iOS, watchOS, and tvOS operating systems. The feature uses a natural language user interface to answer questions, make recommendations, and perform actions by delegating requests to a set of Web services. Siri was originally introduced as an iOS application available in the App Store by Siri Inc., which was acquired by Apple on April 28, 2010. There are several accent and gender combinations for the voice of Siri.

The fact is that these are proprietary software that doesn't allow any modification to the source code/behaviour. We can just use it but cannot try to change their framework. Also they are of high cost. So according to the ordinary people, a low cost system is needed.

III. SYSTEM MODEL

The hardware used in our project are,

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- Raspberry Pi
- USB Soundcard
- Headset
- Projector/Monitor for Display
- Speaker for output (Optional)
- Ethernet Cable

Technical side of our project is completed with

- Shell Scripting
- Python and
- Wolfram Alpha Search Engine

Fig 1 shows the overview of the system model and Fig 2 shows the physically connected system.

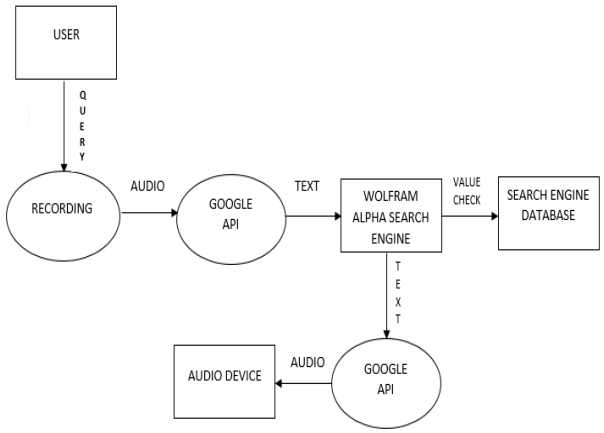

Fig. 1. System Overview

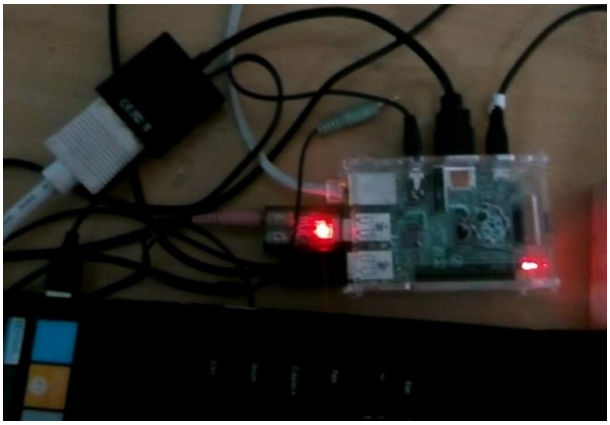

Fig 2. Physical Connection

IV. EXPERIMENTS AND RESULTS

Core steps in Mia are,

1. Listen to Query
2. Respond to Query

Background steps are,

1. Run Shell Script
2. Run Python Script(Embedded inside shell script)

The working in detail, initially, a query is made via speech to MIA. This can be done using a microphone. The ALSAMIXER software embedded in the Raspbian OS captures the recorded voice. This recorded voice is saved in .wav format as it is the most compressed, which makes it easier to upload to Google API server. Fig 3 shows the screen in the recording phase.

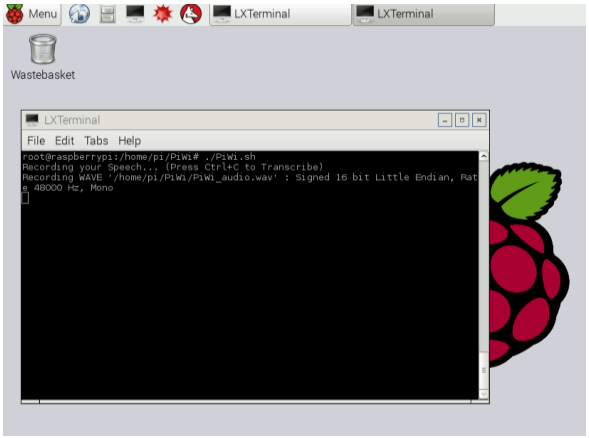

Fig 3. Recording Audio

The Google Speech to Text Conversion API then converts the encoded audio file with query into a .txt file. A working internet connectivity is always required for the processing of the same. Fig 4 shows the screen displaying the transcribed query. The .txt file is very important as it contains the query to be processed.

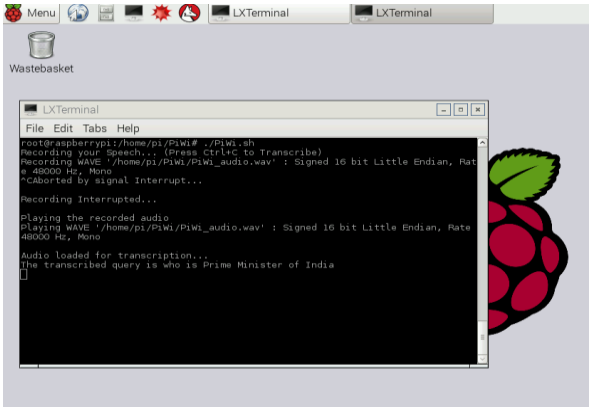

Fig 4. Displaying the Transcribed Query

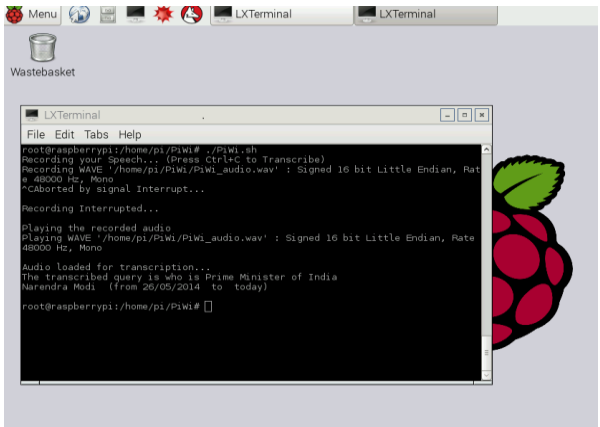

Fig 5. Displaying the Answer

Subsequently, the same is then uploaded to the Wolfram Alpha Search Engine Database for processing. The

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Wolfram Engine then extracts the query made from the .txt file and compares the value with its database. The search result is based on the query comparison made and the result for the same is written into another .txt file. This .txt file is then once again uploaded to the Google API Server for conversion of the text to speech. Fig 5 shows the screen which displays the answer.

The result is then returned as speech via headset/speaker, and text format of the result is displayed on screen as well.

V. CONCLUSION

This project as a prototype has been tested and is working as per expectation. Any query raised is recorded and the result is send back in text view as well as voice, once the command for the same is triggered. The implementation of this project has thus accomplished the soul aim of the project.

The future scope of this project is stellar as it is a 100 per cent open source. Integration of a database & search instead of Wolfram Engine can make MIA's information related intelligence tailor made for a particular person/organisation. Further addition of API's such as Google Map API, Google Tasks API to MIA can make it more intelligent, allowing it to serve you as a more intelligent virtual assistant.

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