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INTRODUCTION

The idea behind the Personal Virtual Assistant is creation of an inexpensive, reliable and easy to use assistant. PVA includes a digital camera and a Table PC with a touch-screen display. PVA can be mounted on the door of the person whom it serves. The assistant identifies the user using the User Identification System (UIS) and then assists him with a variety of possible solutions.

Such solutions include easy access to the supervisor's schedule with the option of adding or deleting a meeting using an easy and friendly user interface. The visitor sees right away all the available slots for possible appointments time and is able to add him to the list. The supervisor can see all the appointments with important details such as visitor's picture, history of previous meetings with this person, and a short description of current and past meetings. The schedule is available online as well. All parties involved in the scheduled meeting have the ability to cancel a meeting. The cancellation of a meeting automatically updates the schedule, and sends e-mail to all involved that the meeting was canceled. All involved will have access to options that allow them to be notified of upcoming meetings via e-mail.

Another important task that PVA includes is based on videoconference module. If the supervisor is out of the office, but is available for a videoconference meeting, such arrangements can be made though the PVA. The most challenging part of the PVA is the User Identification module which will identify user by digital picture pattern comparison.

Identification of a person by image processing and computer vision has always been a very challenging task. This is a difficult problem because it requires implementation of several complex mathematical algorithms of an advanced level. The probability of identification should be high enough to eliminate all possible mistakes.

In our research we provide the ability for basic comparison of content based images with the ability for farther integration of various technologies. We are trying to take the Human Computer Interaction (HCI) to the next level. The main goal of this project is to make our system friendlier than others, but at the same time to be as reliable as possible. We want to create a friendly system which will identify users without invasion to their privacy and

without any direct input from them. The visitor is not required to perform any action. In similar systems the user is required to perform some action in order to be identified, such as enter a username, punch code, slide card or a similar identifying password. The user does not have to worry about remembering a card or password because the PVA will not need identification card in order to function. This advanced feature will work due to complex hardware and software interaction. This makes the HCI both more enjoyable and easier to use.

LITERATURE SURVEY

A computer primarily based approach for performing a command via a voice consumer interface on a subset of objects. The subset is selected from a fixed of items, each having an object type at least one taggable field is associated with the object type and has a corresponding value. The set of objects is saved in the laptop memory. An utterance is acquired from the person and consists of a command, an object type choice, a tag-gable field selection, and a price for the taggable discipline. Responsive to the utterance, at least one item is retrieved from the set of gadgets, the item of the sort selected through the user and having a price within the taggable area selection that matches the taggable field fee obtained from the user the command is done on the item. The object includes textual content that's converted to voice output. They envisioned that someday computers will recognize natural language and count on what we need, whilst and where we need it, and proactively whole responsibilities on our behalf.

However, speech recognition and machine getting to know have persevered to be refined, and based records served through packages and content providers have emerged. We agree with that as computer systems turn out to be smaller and greater ubiquitous [e.g., wearable's and Internet of Things (IoT). The recognizer is designed to change a verbal articulation from an individual into an alternate method of data (e.g., text). A hand held individual colleague including a voice-recognizer and a characteristic dialect processor is disclosed. This snippet of data can be a plan for the day, data in the individual's logbook or data from the individual's address book, Such as a telephone number.

The Most well-known utilization of iPhone is "SIRI" which causes the end client to impart end client versatile with voice and it additionally reacts to the voice charges of the client. It is named as Personal Assistant with Voice Recognition Intelligence, which takes the client contribution to type of voice or content and process it and returns the yield in different structures like activity to be performed or the item is directed to the end client. Furthermore, this proposed framework can change the method for communications between end client and the cell phones. Open Data is currently gathering consideration for imaginative administration creation, predominantly in the zone of government, bio science, and shrewd venture. Be that as it may, to advance its application more for purchaser administrations, a

web crawler for Open Data to realize what sort of information is there would be of assistance.

This paper presents a voice colleague which utilizes Open Data as its learning source. It is highlighted by change of precision as per the client criticisms, and obtaining of unregistered information by the client support. We additionally demonstrate an application to help for a field-work and affirm its viability. The paper gives a diagram of the VPA applications, and the normal highlights and future patterns. The paper proposes also a bound together choice model in light of a quantitative appraisal of the significance of the solicitations and the accessibility of the client. Virtual Personal Assistant (VPA) is the up and coming age of bearer administrations for portable clients. VPA is accepted to be the smart advancement of administrations to take care of the regularly expanding demand by the portable experts for portability and network. The VPA controls the phone calls, deals with the individual exercises through logbook, 192 A. S. Tulshan and S. N. Dhage empowers the client to get to his undertaking administrator by means of voice interfaces, and incorporates every one of the elements of Unified Messaging. The Virtual Personal Assistant (VPA) will empower the client to productively handle expanding interest of phone calls, messages, gatherings and different exercises

REQUIREMENT ANALYSIS

Hardware & Software requirements :-

Android 5.0+ with at least 1.0GB of available memory
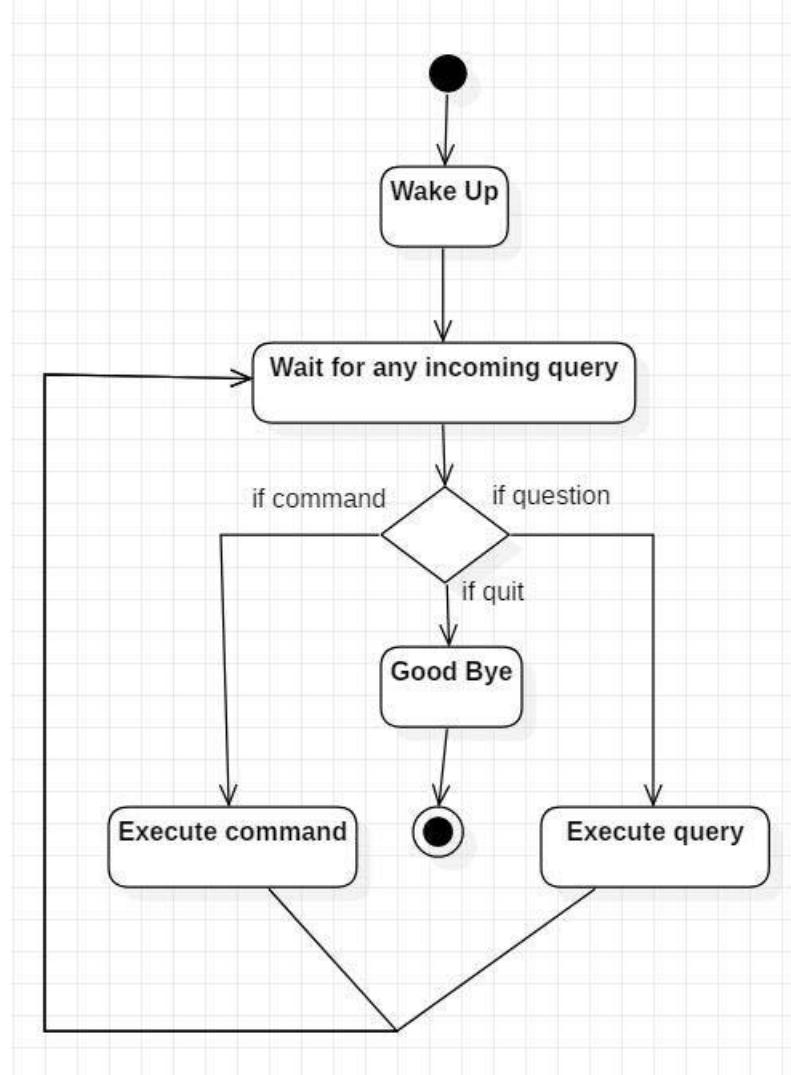
Google app 6.13 or higher

Google Play services

720p or higher screen resolution
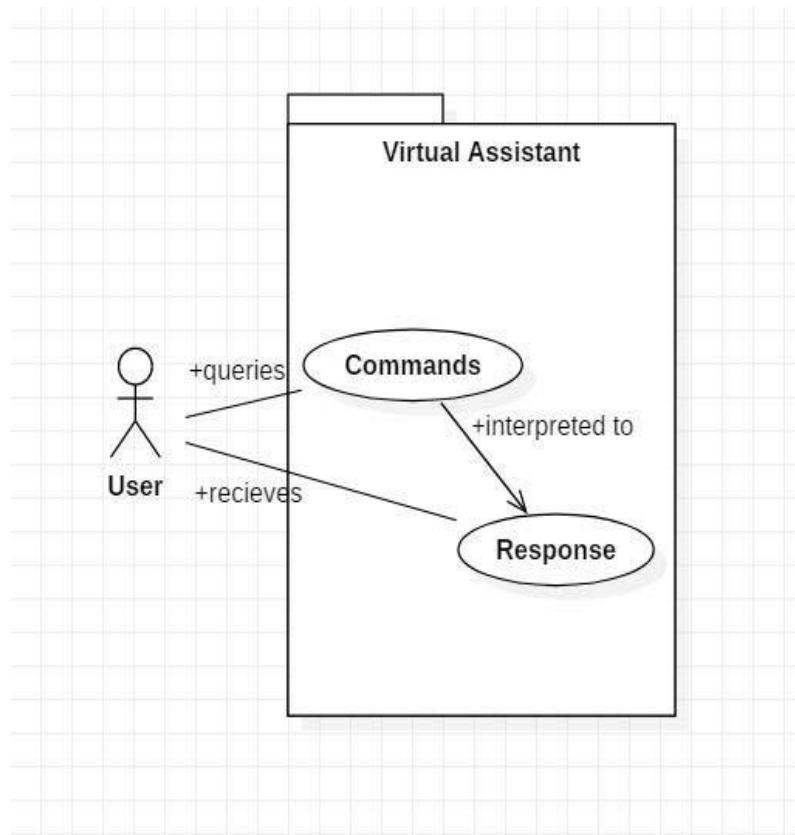
PROJECT DESIGN

ACTIVITY DIAGRAM

Initially, the system is in idle mode. As it receives any wake up cal it begins execution. The received command is identified whether it is a questionnaire or a task to be performed. Specific action is taken accordingly. After the Question is being answered or the task is beingperformed, the system waits for another command. This loop continues unless it receives quitcommand. At that moment, it goes back to sleep.
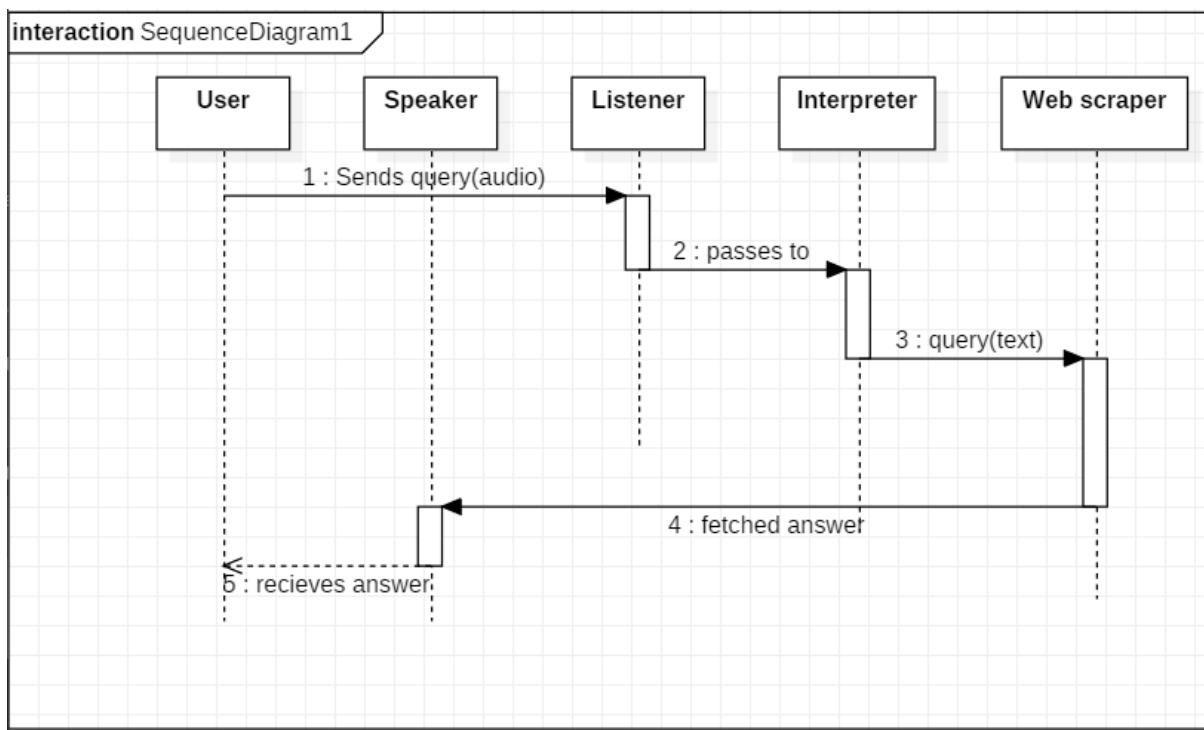
USE CASE DIAGRAM

In this project there is only one user. The user queries command to the system. System then interprets it and fetches answer. The response is sent back to the user.
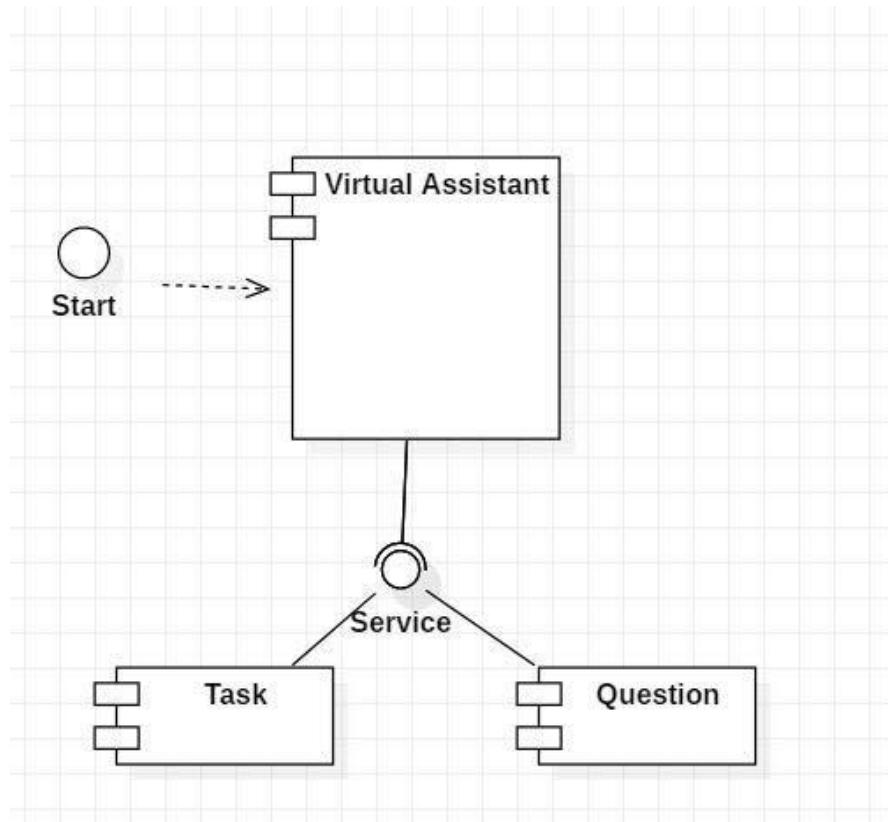
SEQUENCE DIAGRAM

Sequence diagram for Query-Response

The above sequence diagram shows how an answer asked by the user is being fetched from internet. The audio query is interpreted and sent to Web scraper. The web scraper searches and finds the answer. It is then sent back to speaker, where it speaks the answer to user.

COMPONENT DIAGRAM

The main component here is the Virtual Assistant. It provides two specific service,executing Task or Answering your question.

IMPLEMENTATION AND CODING

Source code:

File name: **Android Manifest.xml**

```xml
xmlns:android="http://schemas.android.com/apk/res/android"

  xmlns:tools="http://schemas.android.com/tools"

  package="com.justai.aimybox.assistant">


  <uses-permission android:name="android.permission.RECORD_AUDIO"/>


  <application

    android:name=".AimyboxApplication"

    android:allowBackup="true"

    android:icon="@drawable/app_icon"

    android:label="@string/app_name"

    android:roundIcon="@drawable/app_icon"

    android:supportsRtl="true"

    android:theme="@style/AppTheme"

    tools:ignore="GoogleAppIndexingWarning">


    <activity android:name=".MainActivity">

      <intent-filter>

        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
```

</intent-filter>

</activity>

</application>

</manifest

File name: **Main Activity.kts**

package com.justai.aimybox.assistant

import android.os.Bundle

import android.view.WindowManager

import androidx.appcompat.app.AppCompatActivity

import com.justai.aimybox.components.AimyboxAssistantFragment

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {

        super.onCreate(savedInstanceState)

        setContentView(R.layout.layout_activity_main)

        window.addFlags(WindowManager.LayoutParams.FLAG_KEEP_SCREEN_ON)

```kotlin
    val assistantFragment = AimyboxAssistantFragment()

    supportFragmentManager.beginTransaction().apply {

      replace(R.id.assistant_container, assistantFragment)

      commit()

    }

  }


  override fun onBackPressed() {

    val assistantFragment =
(supportFragmentManager.findFragmentById(R.id.assistant_container)

        as? AimyboxAssistantFragment)

    if (assistantFragment?.onBackPressed() != true) super.onBackPressed()

  }

}
```

File name: **AimyboxApplication.kts**

```kotlin
package com.justai.aimybox.assistant


import android.app.Application

import android.content.Context
```

```kotlin
import com.justai.aimybox.Aimybox

import com.justai.aimybox.api.aimybox.AimyboxDialogApi

import com.justai.aimybox.components.AimyboxProvider

import com.justai.aimybox.core.Config

import com.justai.aimybox.speechkit.google.platform.GooglePlatformSpeechToText

import com.justai.aimybox.speechkit.google.platform.GooglePlatformTextToSpeech

import java.util.*


class AimyboxApplication : Application(), AimyboxProvider {


  companion object {

    private const val AIMYBOX_API_KEY =
"Ldf0j7WZi3KwNah2aNeXVIACz0lb9qMH"

  }


  override val aimybox by lazy { createAimybox(this) }


  private fun createAimybox(context: Context): Aimybox {

    val unitId = UUID.randomUUID().toString()


    val textToSpeech = GooglePlatformTextToSpeech(context, Locale.ENGLISH)

    val speechToText = GooglePlatformSpeechToText(context, Locale.ENGLISH)


    val dialogApi = AimyboxDialogApi(AIMYBOX_API_KEY, unitId)
```

```
        return Aimybox(Config.create(speechToText, textToSpeech, dialogApi))

    }

}
```

File name: **build.gradle.kts(:app)**

```kotlin
val componentsVersion: String by rootProject.extra

val aimyboxVersion: String by rootProject.extra


plugins {

    id("com.android.application")

    kotlin("android")

    id("kotlin-android-extensions")

}


android {

    compileSdkVersion(29)


    defaultConfig {

        applicationId = "com.justai.aimybox.assistant"


        minSdkVersion(21)
```

```
      targetSdkVersion(29)


      versionName = componentsVersion

      versionCode = 1

   }


   compileOptions {

      sourceCompatibility = JavaVersion.VERSION_1_8

      targetCompatibility = JavaVersion.VERSION_1_8

   }


   buildTypes {

      getByName("debug") {

         isMinifyEnabled = false

      }

      getByName("release") {

         //TODO configure pro guard

      }

   }


   lintOptions {

      isCheckAllWarnings = true

      isWarningsAsErrors = false
```

```
        isAbortOnError = true

    }

}


repositories {

    mavenLocal()

    google()

    jcenter()

    mavenCentral()

    maven("https://kotlin.bintray.com/kotlinx")

}


dependencies {


    debugImplementation("com.squareup.leakcanary:leakcanary-android:2.0-beta-3")


    implementation("androidx.appcompat:appcompat:1.1.0")

    implementation("androidx.recyclerview:recyclerview:1.0.0")

    implementation("androidx.constraintlayout:constraintlayout:1.1.3")

    implementation("androidx.core:core-ktx:1.1.0")

    implementation("androidx.lifecycle:lifecycle-extensions:2.1.0")


    implementation(kotlin("stdlib"))
```

implementation("org.jetbrains.kotlinx:kotlinx-coroutines-android:1.3.1")

implementation("com.justai.aimybox:components:$componentsVersion")

implementation("com.justai.aimybox:core:$aimyboxVersion")

implementation("com.justai.aimybox:google-platform-speechkit:$aimyboxVersion")

}

File name: **BuildConfig.java**

/**

 * Automatically generated file. DO NOT MODIFY

 */

package com.justai.aimybox.assistant;

public final class BuildConfig {

 public static final boolean DEBUG = Boolean.parseBoolean("true");

 public static final String APPLICATION_ID = "com.justai.aimybox.assistant";

 public static final String BUILD_TYPE = "debug";

 public static final int VERSION_CODE = 1;

 public static final String VERSION_NAME = "0.1.10";

}

File name: **Strings.xml**

```xml
<resources>

    <string name="app_name">Aimybox Assistant</string>

    <string name="prompt">Your Virtual Assistant is ready! Tap on button below to start
recognition.</string>

    <string name="initial_phrase">How may I help you?</string>

</resources>
```

File name: **Styles.xml**

```xml
<resources>


    <!-- Base application theme. -->
    <style name="AppTheme" parent="Theme.MaterialComponents.Light.NoActionBar">
        <item name="android:colorPrimary">@color/primary</item>
        <item name="android:colorPrimaryDark">@color/primaryDark</item>
        <item name="android:colorAccent">@color/accent</item>


        <!-- Customize Assistant components here -->


        <item
name="aimybox_assistantButtonTheme">@style/CustomAssistantButtonTheme</item>
        <item
name="aimybox_recognitionTheme">@style/CustomRecognitionWidgetTheme</item>
```

```xml
    <item
name="aimybox_responseTheme">@style/CustomResponseWidgetTheme</item>

    <item
name="aimybox_imageReplyTheme">@style/CustomImageReplyWidgetTheme</item>

    <item
name="aimybox_buttonReplyTheme">@style/CustomButtonReplyWidgetTheme</item>

  </style>


  <style name="CustomAssistantButtonTheme"
parent="DefaultAssistantTheme.AssistantButton">


    <!-- Customize Assistant button theme here -->


    <!-- <item name="aimybox_backgroundColor">@color/primary</item> -->

    <!-- <item name="aimybox_recordingAnimationColor">@color/recording</item> --
>

    <!-- <item name="aimybox_buttonExpandedColor">@color/white</item> -->

  </style>


  <style name="CustomRecognitionWidgetTheme"
parent="DefaultAssistantTheme.Widget.Recognition">


  </style>

  <style name="CustomResponseWidgetTheme"
parent="DefaultAssistantTheme.Widget.Response">
```

```
        </style>


        <style name="CustomButtonReplyWidgetTheme"
parent="DefaultAssistantTheme.Widget.ButtonReply">


        </style>


        <style name="CustomImageReplyWidgetTheme"
parent="DefaultAssistantTheme.Widget.ImageReply">


        </style>


</resources
```

TESTING

Test Case ID	Test Scenario	Test Case	Test Conditions	Test Steps	Test Data	Expected Results	Actual Results	Pass/ Fail
VPA_TC_1	Check start-up functionality.	1. Check response on clicking on mic icon.	Application must be launched and also mic access permission should be given to the application.	1. Click on the mic icon.	Hi	Must greet user by displaying text and speaking "Hello, there!". And also by playing welcome song.	"Hello, there!" message is displayed and also has spoken then same. And also the Welcome song is played.	Pass
VPA_TC_2		2. Check response on speaking(greeting) the VPA			Hello			Pass

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VPA_TC_3	Check the search functionality for date and time result.	1. Check response on clicking on mic icon.	Application must be launched and the device should be connected to the internet.		What is date and time?	Current Date and time should be displayed and spoken according to the user's time zone.	Current Date and time is displayed and spoken according to the time zone.	Pass
VPA_TC_4	Check the search functionality for date result.				What is current date?	Current date should be displayed and spoken according to the user's time zone.	Current date is displayed and spoken according to the time zone.	Pass

VPA_TC_5	Check the search functionality for time result.				What is current time?	Current time should be displayed and spoken according to the user's time zone.	Current time is displayed and spoken according to the time zone.	Pass
VPA_TC_6	Check the search functionality for joke.				Tell me some joke	Some random joke should be displayed and spoken.	Joke is displayed and spoken.	Pass

VPA_TC_7	Check the search functionality for user desired searches.	2. Check response speaking given sentences (Test data).			What is Virtual Assistant?	Search result: A virtual assistant is a self-employed worker who specializes in offering administrative services to clients from a remote location, usually a home office. Typical tasks a virtual assistant might perform include	Search result: A virtual assistant is a self-employed worker who specializes in offering administrative services to clients from a remote location, usually a home office. Typical tasks a virtual assistant might perform include	Pass
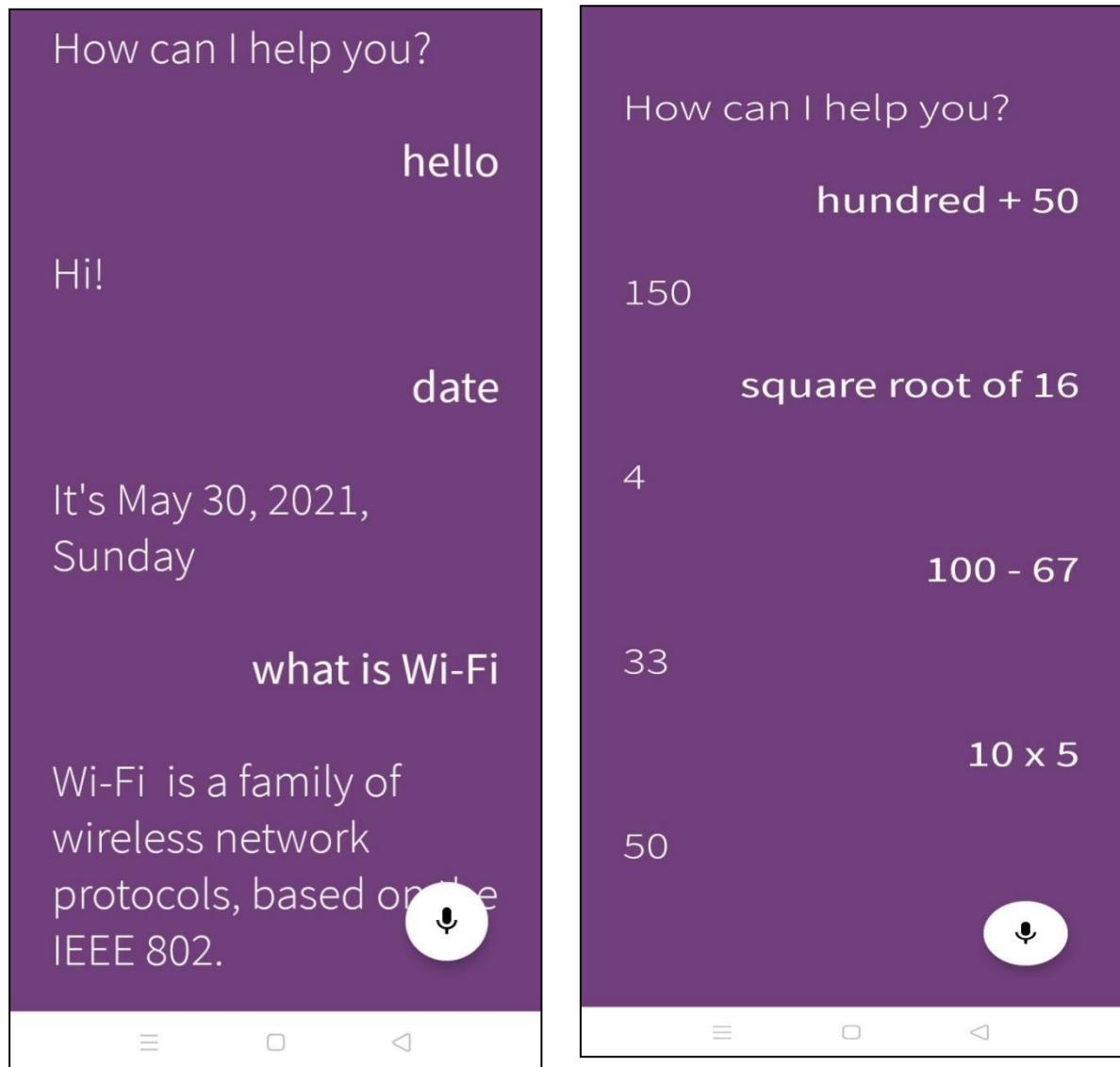
						scheduling appointments, making phone calls, making travel arrangements, and managing email accounts.	scheduling appointments, making phone calls, making travel arrangements, and managing email accounts.	

| VPA_TC_8 | | | | 2. Speak given sentences(Test Data). | What is computer science? | search result: Computer science is the study of algorithmic processes, computational machines and computation itself. As a discipline, computer science spans a range of topics from theoretical studies of algorithms, computation | search result: Computer science is the study of algorithmic processes, computational machines and computation itself. As a discipline, computer science spans a range of topics from theoretical studies of algorithms, computation | Pass |

						and information to the practical issues of implementing computational systems in hardware and software.	and information to the practical issues of implementing computational systems in hardware and software.	

VPA_TC_9	Check the search functionality, incase if user desired searches are not found.				What is current weather?	I could not find the answer.	I could not find the answer.	Pass

SCREENSHOTS

How can I help you?

                    hello

Hi!

                    date

It's May 30, 2021, Sunday

            what is Wi-Fi

Wi-Fi is a family of wireless network protocols, based on the IEEE 802.

How can I help you?

            hundred + 50

150

         square root of 16

4

              100 - 67

33

              10 x 5

50

How can I help you?

what is Infosys

Infosys Limited is an Indian multinational information technology company that provides business consulting, information technology and outsourcing services. The company is headquartered in Bangalore. Infosys is the second-largest Indian IT company after Tata Consultancy Services by 2020 revenue figures and the 602nd largest public company in the world according to Forbes Global 2000 ranking. On 31 December 2020, its market capitalisation was $71.

How can I help you?

joke

I heard a story about a broken pencil that I'd tell you but it's pointless.

joke

Why did the guy store his money in the freezer? - He loved cold, hard cash!

joke

What did one ocean say to the other? Nothing. It just waved.
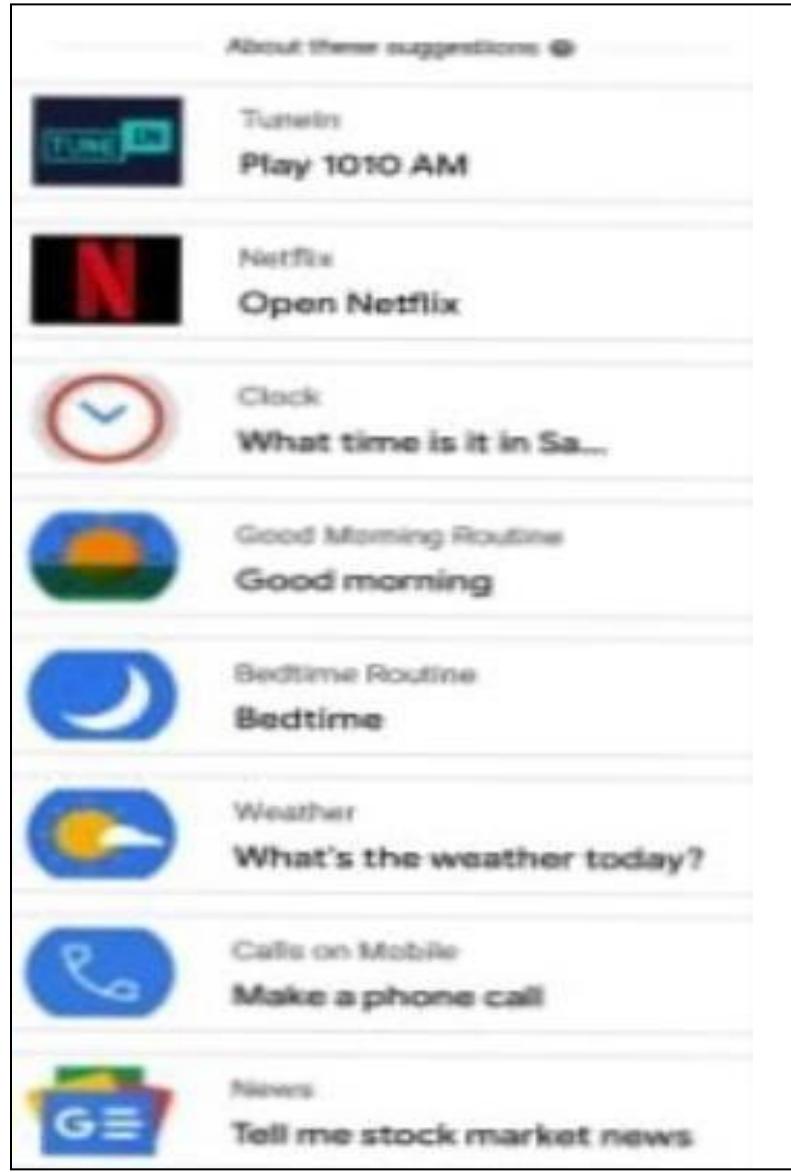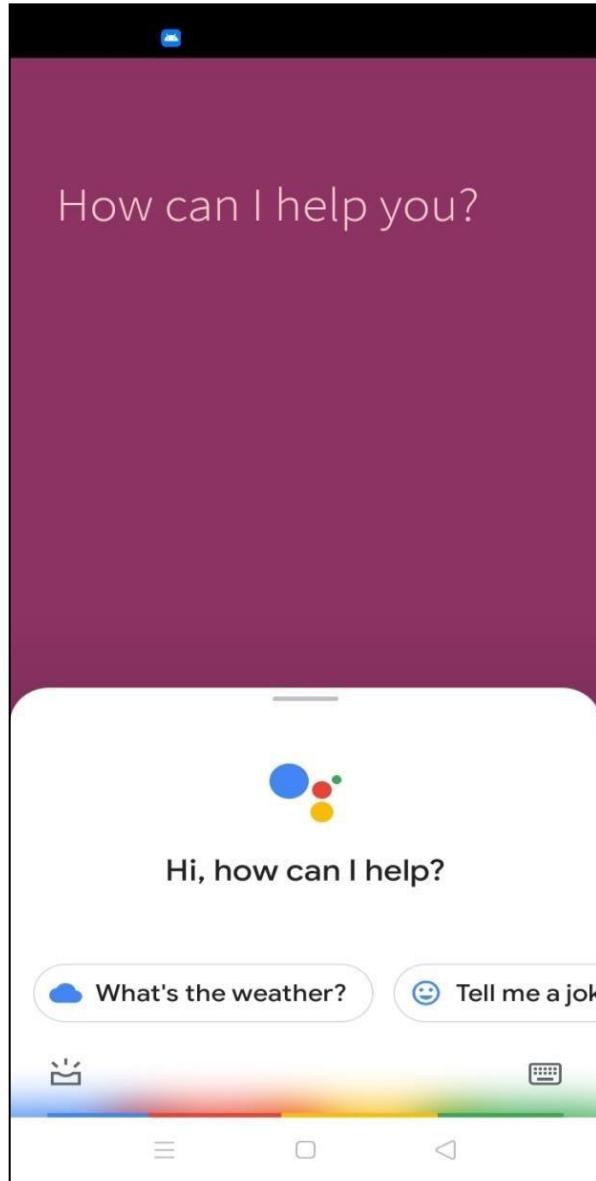
joke
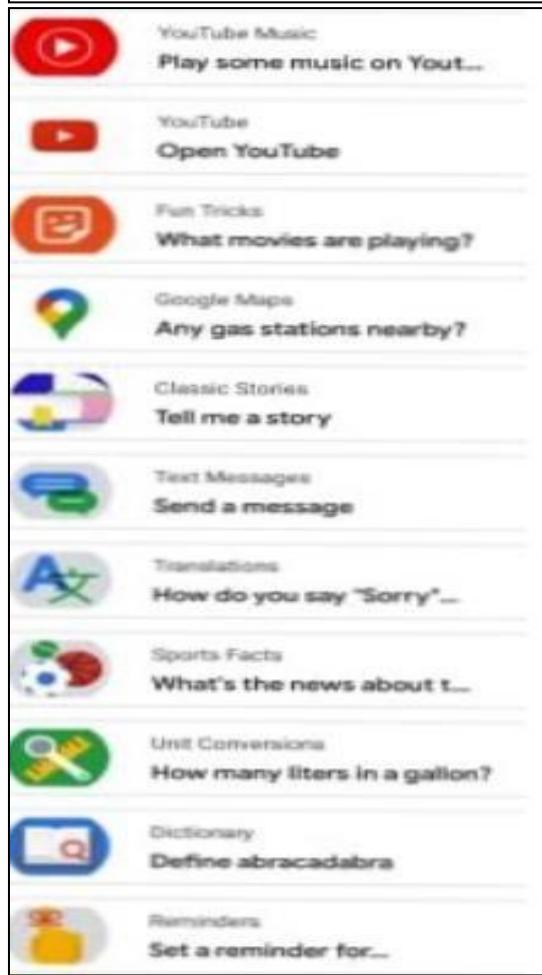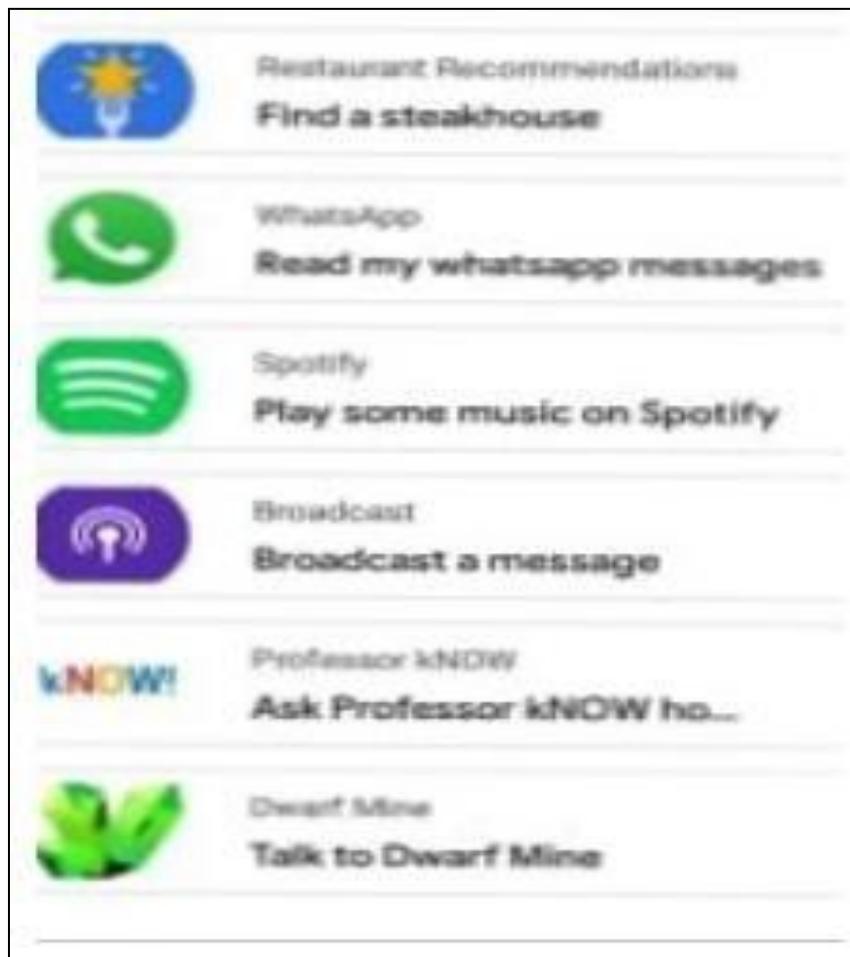
What is the best season to jump on a trampoline? - Spring time.

tell me a joke

How does a celebrity stay cool? - By keeping close to his fans.

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	Restaurant Recommendations
	Find a steakhouse

	WhatsApp
	Read my whatsapp messages

	Spotify
	Play some music on Spotify

	Broadcast
	Broadcast a message

kNOW!	Professor kNOW
	Ask Professor kNOW ho...

	Dwarf Mine
	Talk to Dwarf Mine

	YouTube Music
	Play some music on Yout...

	YouTube
	Open YouTube

	Fun Tricks
	What movies are playing?

	Google Maps
	Any gas stations nearby?

	Classic Stories
	Tell me a story

	Text Messages
	Send a message

	Translations
	How do you say "Sorry"...

	Sports Facts
	What's the news about t...

	Unit Conversions
	How many liters in a gallon?

	Dictionary
	Define abracadabra

	Reminders
	Set a reminder for...

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CONCLUSION

This project proposes a simple Android application enabling all the features of Virtual Assistant which can be accessed through voice commands. An excellent virtual assistant will save time and money by doing the small tasks for you and doing them accurately and with high quality. If you handle the virtual assistant correctly, it will be a boom in your business. Tasks such as Internet research, social media management, data entry can easily be delegated to a virtual assistant. So, don't try to do everything yourself. Instead, delegate these tasks to a virtual assistant and use the time you save to make marketing strategies. This will certainly boost your productivity.The world of virtual assistants was born to make life easier for humans. Our tasks can be solved in a matter of seconds just by using our voice.

REFERENCES

https://www.irjet.net/archives/V6/i3/IRJET-V6I3873.pdf

https://www.researchgate.net/publication/330165159_Survey_on_Virtual_Assistant_Google_Assistant_Siri_Cortana_Alexa_4th_International_Symposium_SIRS_2018_Bangalore_India_September_19-22_2018_Revised_Selected_Papers

https://www.researchgate.net/publication/338591380_Intelligent_Personal_Assistants_A_Systematic_Literature_Review

https://core.ac.uk/download/pdf/46709952.pdf

https://scholarspace.manoa.hawaii.edu/bitstream/10125/59642/0202.pdf