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Approach for voice-based email service

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Abstract

In these days, the Internet is one of the most commonly used methods of communication due to its simplicity and accessibility. Email is the most common communication procedure used globally. However, if we talk about people who have visual impaired, the system is still difficult to use. There has been advancement in computer technology that has made many opportunities available to the visually impaired around the world. The virtual environments of 'Audio feedback' based on screen readers which helps visually aided people to access the internet and can use its applications immensely.

Keywords: Visually Impaired People; Voice Based; Email system; IVR (Interactive voice response); Screen Reader; Python

1. Introduction

This framework is a Python-based programmed for visually impaired individuals that use speech to text voice response, enabling everyone to manage their mail accounts using only their voice and to be able to read, send, and carry out all the other practical activities. The user will respond to voice orders from the system asking them to carry out specific actions. The key advantage of this method is that it fully does away with the usage of a mouse, forcing users to only react verbally.

The internet is a valuable source of information in today's world. There are many social media sites and networking, but email is the most reliable and convenient way of online communication. The current email system is not useful for visually impaired people, as it is based on visual as well as virtual perceptions. In 2020, it is expected to be 4 billion global email users in 2025.

In 2020, approximately 306 billion emails were sent and received daily worldwide. Not all people have access to the internet. This is due to the fact that there are 285 million visually impaired individuals in the world, and it is vital to make internet services for communication purposes available to them as well. This application is also useful for illiterate people.

There are numerous various methods utilized to make this framework useful for people who are visually impaired. Even the solutions that are currently available, such as the screen readers TTS (Text to speech) and ASR (Automatic speech reader), do not fully enable the internet use of blind persons.

1.1. Existing system

In previous systems, e-mail services can be accessed through written mode but with the advancement in technology, it is also access by text-to-speech and voice recognition systems which completely work on speech mode. This voice or

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speech-based e-mail system has made use of Screen Reader, Speech to text converter, IVR and Mouse click event. In this system, Input is given through speech mode & output can be generated only by clicking on the mouse but it is difficult for visually impaired people to click on mouse every time.

1.2. Proposed system

This proposes a system; a python-based application, designed for the users who want to send email via voice-based recognition. This framework provides a voice-based mailing service that allows users to read and send mail without any help from the other applications. To use the search feature on the website, you must use certain keywords. Mail, send, and compose email. The VMAIL system makes it easy for blind people to access emails. It means that they no longer have to depend on other people for their activities related to mail. This application will be a Python-based application that uses IVR-Interactive voice response, so you can use voice only to control your email account and read, send, and perform all other useful tasks. Sanction all users so that they can.

A user with voice commands to perform a specific action. The user responds to it. This voice-activated system has many advantages, including the fact that users no longer need to use a keyboard. There are mainly three technologies such as Text to Speech, Interactive Voice Response, Speech to text.

A voice command registration process will be required when a user accesses the website for the first time. The user's voice will also be captured after registration and saved in the database. User then receives an ID and password. The user can access the mail option after logging in.

For people who have difficulty using technology because of their visual impairment; this can be a difficult process. In this system, speech is converted to text using a technology called STT. There will be a tiny speaker button, and by clicking it, the user must speak in order for his or her speech to be translated into text that unclouted people can read and view.

Speech-to-text is fundamentally different from the technique known as text-to-speech (TTS) (STT). The text formatting used in emails is turned to synthesized speech. IVR (Interactive Voice Response) is a cutting-edge technology that explains the user's engagement with the system through a keyboard-response mechanism for the specific voice message. The DFD provides a visual overview of the proposed system's workflow and steps.

2. Design

2.1. User Interface Design

It has many phases to understand the concept

2.1.1. Phase1

The voice prompt will tell you what you can do with the program. The GTTS Python module is used to convert text to speech. The user will be asked to provide input for the following tasks. The input is expected in the form of speech by the user which will be converted to text by the Google speech application interface in Python and accordingly tasks will be performed. You can send and receive email through Gmail.

2.1.2. Phase-2

In phase-2 of our program the user will give speech input to the system.

Speech recognition software will handle this input. It is a Python package that is used to process voice commands and convert speech to text. The speech converter will now save the user's input in the appropriate variables utilized in the script, and depending on their values, it will then insert the appropriate modules to text.

2.1.3. Phase-3

At this point, our system will handle any requests made by the user programmed. The user's verbal input will be used to start the modules.

Send Email through G-mail: - When a user requests to send email using their Gmail account, this module will handle the request. The user will be prompted to provide their credentials via the module's Python script before connecting to their account. After the connection is established, the system will ask the user for the recipient's account email address.

The user can then speak their message, and the system will repeat it for them. By responding "ok," the system will send the email. For the aforementioned task, Python's SMTP module is used.

Read Email through G-mail: - The user's request to read mails through their Gmail account will be handled by this module. The user will be prompted to provide their credentials via the module's Python script before connecting to their account.

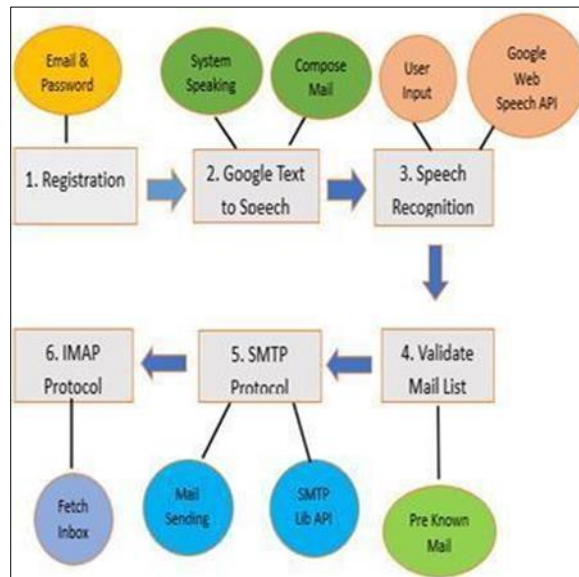


Figure 1 Flowchart Process

Once the connection between modules is established, the programmer will begin retrieving the users' unread emails and speaking them out using the Python text-to-speech (pyttsx3) package.

2.2. Mail Programming Module

Nowadays, email is the inevitable service which is always offered online. Internet applications can deliver email addresses to other users through SMTP protocol. Email sent from the client-side is received using SMTP, whereas emails which are received using POP and IMAP are generally sent using SMTP.

2.3. Sending Email

An email contains header and body when it is forwarded. A series of responses to email requests is queued up by the customer and server prior to delivering an email. The distinction between the two is that when there is a null row, the heading will end. The body of the message contains the precise data that was browsed for reception. In the body, one data point is collected after the other. As a result, the message body contained the exact data searched for receipt. After the body's null line, each piece of information is extracted.

2.4. Receiving Email

The user agent on the server periodically checks the mailboxes. The user is promptly notified if any data is found within this period. Additionally, when a user opens an email, they scan the header content and subject line for specific information before reading the full message. If the content of the mail is beneficial for the user, then he or she will read the whole message.

3. Methodologies

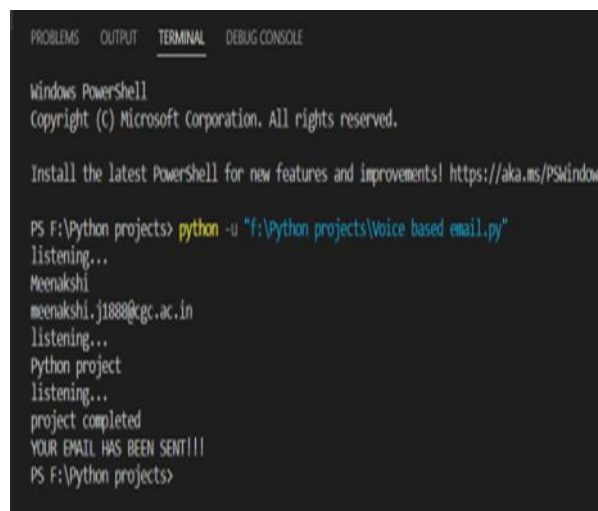
The first step is to import the necessary libraries required. Creating Server and Logging in sender's email account

- Since we can't send emails directly, we need a server in order to send them. A server serves as a middleman; in this case, I'm using the popular and effective "Gmail" server.

- The smtplib library is used to create servers. After creating a server, it is very important to login to the sender's email.
- Creating Listener and Converting to text: We need a listener that can detect text in order to send emails using voice commands rather than typing out the email's content on a keyboard. The "Google assistant" is then used to translate the recognized voice into text.
- Creating an Interactive Application: We want to create an interactive programmed that is very user-friendly. In order to make the user experience feel more participatory, we use the Python Text to Speech package. In order to do this, we must first develop an engine. Then, we must create a function that will accept some text as an argument and turn it into speech.
- Creating Email Content and Sending Email: Before sending an email, the email's content must be formatted. The message body, subject, and sender's email all need to be set. For this, we use the Email Message() function from the email. Message package, which offers the appropriate formatting for emails. Sending the email is the final step after correct formatting. The server is used send the email, and the send message function is called ().

4. Results

It shows the method of sending the mail through voice. It asks the user to enter the data which the user wants to send. It is shown in output.



```
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
Windows PowerShell
Copyright (c) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS F:\Python projects> python -u "f:\Python projects\Voice based email.py"
listening...
Meenakshi
meenakshi.j1888@jgc.ac.in
listening...
Python project
listening...
project completed
YOUR EMAIL HAS BEEN SENT!!!
PS F:\Python projects>
```

Figure 2 Result

5. Conclusion

Any user, regardless of their age group, can easily use the voice-based e-mail system. With the help of this project, persons with visual impairments are now able to contribute significantly to the development of a digital India, make life simpler for others, and communicate online. It contains a text-to-speech capability and a voice reader, making it possible for blind people and anyone with visual impairments to use the system. The developers may be impacted by the project's success, which may inspire them to produce beneficial goods that will benefit blind or low-vision users.

Future scope

This voice -based email system includes a lot of potential in the future for visually impaired and blind people. In addition, this system can be updated with attaching the document as well as adding the mail id through speech. As this system is working with existing email ids in the database. This system is user friendly and focuses on online communication via email for illiterate as well as blind people.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors of this manuscript clearly state all the interests related to this manuscript including financial interests (benefits of research fund, employment, possession of stocks, material support, etc.) and personal interests (concurrent position, conflict of interest, conflict in intellectual property rights, etc.) has no conflicts related to anything.

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