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Voice-Based Email Assistant for a Blind Person using IVR

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Abstract: ***The technology is growing day by day, it has developed from a big room to a single palm. In a small IC, the whole world can be stored. When we deal with technology we should not forget about the internet. The Internet is the splendor for our day to day life-cycles. The Internet is not just technological innovation but it's a new type of technological innovation. This is the age of information and the computer has become an integral part of life. We the people use the computer for listening to songs, video, official work and so on. We use computers everywhere. It is easier for the common person to use email and its features. This paper shows a voice-based email for a stone-blind person. Technology brings opportunities for blind persons. These projects deal with the audio/voice-based email transmission of messages to send and receive in their local language.***
Keywords: Speech-to-text converter, IVR (Interactive Voice Response), Voice mail, Text-to-speech converter, Email Assistant for a blind person.

I. INTRODUCTION

As we have seen, the inception of the internet has dramatically revolutionized many fields. Communication is one of those fields that have grown to the next level with the advancement in technology and the availability of the Internet. But it's important that everyone should communicate without secondary help, which is the blind person face the problem of interacting with people. When we talk about communication, things that come to our mind are WhatsApp, Facebook, Telegram, etc but the most professional manner is email. The use of email is very easy for common people, but we should also do something for the visually impaired person. They can't see but they can speak, whatever they can speak, and their work can be done. A voice mail system is a computer-based system that allows users and subscribers to exchange messages without typing. These systems are designed to convert a caller's recorded audio message into text and then it will be sent to a recipient. It is mainly useful for blind people, as almost every official message is only sent through the mail, they cannot text the message so our application helps them a lot.

II. EXISTING SYSTEM

There are over 4 billion users who use email regularly for communication. But the main drawback of the existing system is that the blind person finds it difficult to use email for communication, a normal person can easily access it by using a keyboard and mouse to send mail. Normal users can easily view the inbox, compose the mail and send it to the other users and also receive the mail from other users, but in the case of a blind person, they cannot visualize the screen so that they can't send and receive the message.
Although there are many screen reader software on the internet, the software is not convenient for blind people because this software performs the action through the keyboard and mouse.

A. Drawbacks of Existing System

1) A blind person cannot type characters via keyboard and also not able to see the mouse cursor on the screen.
2) Tools and software are not very useful for a blind person which are available today.
3) One of the major drawbacks of the existing system is that the blind person will always have to take help from the normal user.
4) Today, screen reader software is not beneficial because it contains a noisy audio interface.

III. PROPOSED SYSTEM

In our proposed system, we have developed a completely different system as compared to the existing system. This system, not only will be useful for a blind person but also user-friendly for a normal user. Our primary objective is to develop a Voice-based Email that will make the email system easily accessible to a blind person.
Here, we are building a desktop-based application for a blind person using IVR (Interactive voice response) technology, where users can send and receive the email through a voice message.

When the blind person speaks via a microphone, our system will convert its speech into text using a speech-to-text converter and it is usually called speech recognition. The next synthesis of the speech will be carried out using a system synthesizer. With the help of IVR technology, the converted text will be sent to the recipient.

The other user sends mail to a blind person, the mail should be in text form, so our system will convert text to speech by using a text-to-speech converter so that the blind person is able to hear the mail through voice.

One of the main benefits of this system is that the user will not be required to send and receive mail through a keyboard and mouse.

IV. PROJECT IMPLEMENTATION

A. *Process Flow*

1) In this system, the first user will log in using email and password.
2) The next part is speech recognition, all the user's input to the system through a microphone is managed by speech recognition, this internally uses Google web speech API and supports by a default API key that is hardcoded into the speech recognition library for validating mail list when the user speaks the mail address to send then the system defines it and validated with the available mail list in the system.
3) Now, we use Google text-to-speech in our project, whatever system is speaking or prompting is managed by Google text-to-speech, a package called G-TTS is used for this purpose.
4) In the next step, we use the SMTP protocol, which stands for Simple Mail Transfer Protocol, which provides a mechanism to deliver email for sending emails. The SMTP Lib API has been used in our project.
5) The final step is Imap protocol, which stands for Internet message access protocol. It is an advanced protocol for receiving messages for reading inbox emails, we have used soap fourth which is a python library for getting data out of HTML, XML, and other markup languages.

The project (Fig-1) describing the process flow along with the techniques is shown below.

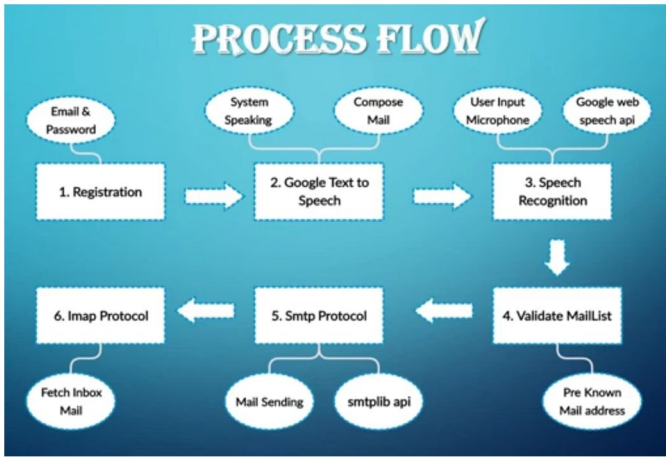

Fig- 1: Process flow

V. SYSTEM DESIGN

A. *Dashboard*

The user will open the software using a voice message, then the user will have the different options:-

1) *Inbox*: As we all know, normal users can easily access all the mail they received into their inbox but a blind person cannot view this mail. So we included the “Inbox” feature, where a blind person can easily access the unread mail. The blind person will need to say “New Mail”. Now if the blind person wants to open the particular mail, then he/she needs to say “Open Mail” and then say “Read Mail”. If the particular mail is not useful for the user, then he/she can delete the mail by saying “Delete”.
2) *Compose a new mail*: If the blind person wants to send the new mail to other users, then he/she needs to say "Compose a new mail", then it will open a mailbox where he/she needs to mention the email address, subject, and main message. After the mailbox is created, the blind person will need to say "Send". Finally, it will be delivered to the respective email address.

3) *Retrieve a Mail*: Now the blind person can check, send and receive an email by using voice message. In this system, we have also added the feature of "Trash", if the particular email is not useful for a blind person then he/she needs to say "Trash", then the particular email will go to the trash section. This trash feature will keep all the trash emails. If the user wants to retrieve the trash mails, then he/she can recover from the trash section.

VI. CONCLUSION

This project, we have developed will help a blind person to easily send emails to other users by using his/her voice without using a keyboard and mouse. We also took care of the normal user to use this application for more productivity.

This system will help to remove the drawbacks of the existing system, where a blind person faces multiple issues while using email for communication. The system has a feature of speech-to-text and text-to-speech which will help the blind person as well as normal users to send and receive mail via voice.

VII. FUTURE SCOPE

With the help of our proposed system, the blind person can easily view, send, receive, and delete mail via voice without typing a single character on the keyboard and moving a mouse cursor.

But there is always room for improvement.

In this system, we are not able to add the "File attachments" feature such as images, pdf, and videos. So one of the major improvements we can make to this system is to add file attachments so that blind people can also send their files.

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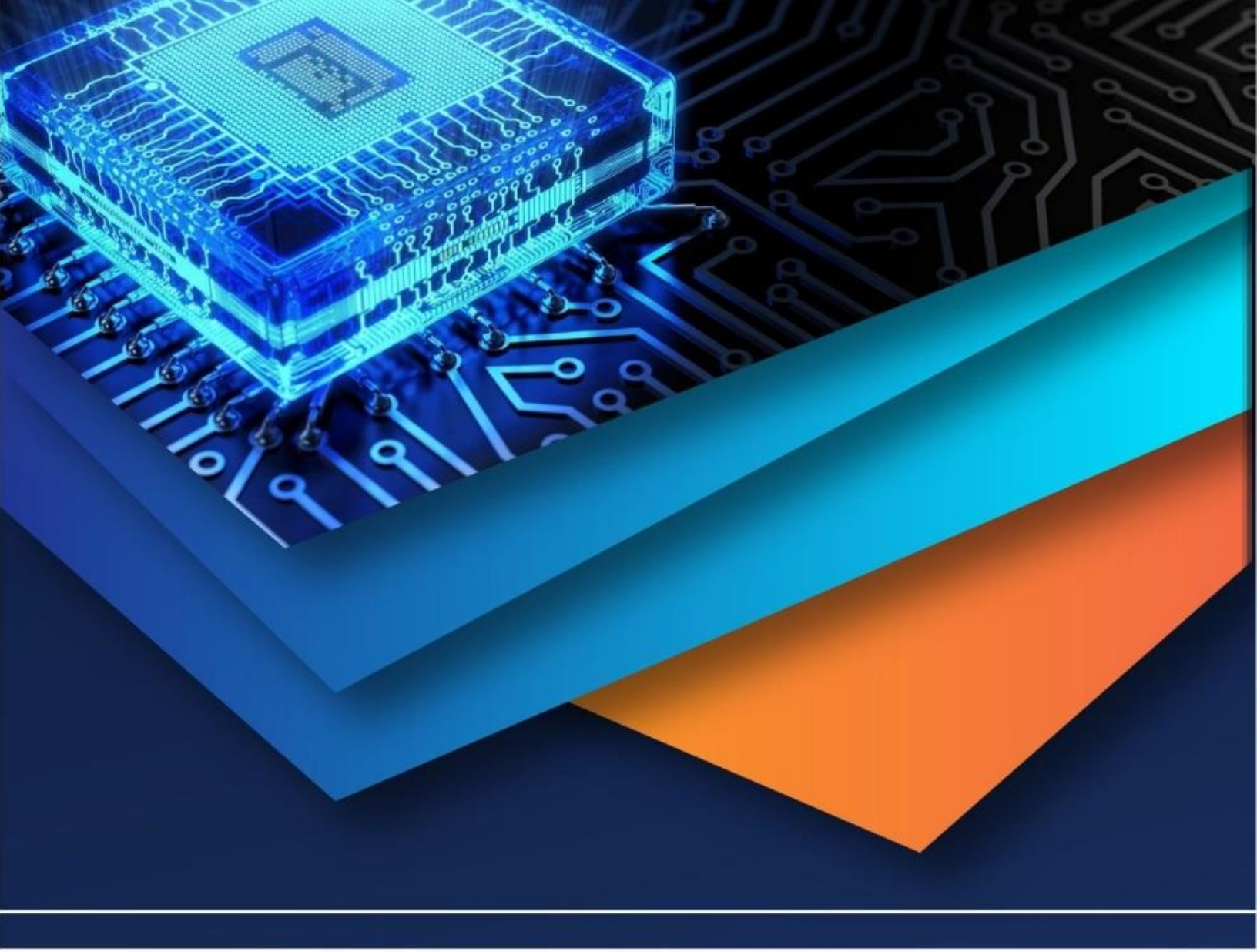

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