# VOICE BASED EMAIL SYSTEM FOR VISUALLY IMPAIRED

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## ABSTRACT

Internet is one of the basic luxury for daily living. Every person is using the facts and information on internet. On the other hand, blind people face difficulty in accessing the text resources. The development in computer based handy systems has opened up numerous opportunities for the visually disabled across.

Audio response based virtual environment; the screen readers are helps blind people a lot to use internet applications.

This project introduces the Voicemail system structural design that can be used by a blind person to access E-Mails easily. The involvement of research is helping blind individual to send and receive voice based mails messages in their inhabitant language with the help of a computer.

## INTRODUCTION

### 1.1 Introduction

We have seen that the introduction of Internet has revolutionized many fields. Internet has made life of people so easy that people today have access to any information they want easily. Communication is one of the main fields highly changed by Internet.

E-mails are the most dependable way of communication over Internet, for sending and receiving some important information. But there is a certain norm for humans to access the Internet and the norm is you must be able to see.

But there are also differently abled people in our society who are not gifted with what you have. There are some visually impaired people or blind people who can't see things and thus can't see the computer screen or keyboard.

A survey has shown that there are more than 240 million visually impaired people around the globe. That is, around 240 million people are unaware of how to use Internet or E-mail. The only way by which a visually challenged person can send an E-mail is, they have to speak the entire content of the mail to another person( not visually challenged )

and then that third person will compose the mail and send on the behalf of the visually challenged person. But this is not a right way to deal with the problem. It is very unlikely that every time a visually impaired person can find someone for help.

## 2. LITERATURE SURVEY

Several contributions have been made for visually challenged people so as to give them accessibility in the field of communication via E-mails. Following are the technologies of each paper: Recently in 2020, Voice based email system was proposed to overcome drawbacks of traditional ASR and screen reading systems as shown in figure 2 & 3[1]. The system consists of advanced features so that blind people can operate easily. It consists of Login module as first module and validating the login credentials. The client then moves to home module after signing in and following choices are available there: Inbox, Create, Sent mail and Junk. IVR technology is used in PC Program design and STT(Speech-to-message) and TTS(Text-todiscourse) is also used. The proposed system also makes use of mouse click events [1]

In paper [2], the authors proposed Voice based email system by linking the application with Google's Gmail. Traditional systems provided their own user developed email services. The system consists of (a) Speech-to-text Converter (b) Text-to-speech Converter. The application makes use of SMTP protocol for sending emails and POP3 protocol for receiving emails. Accuracy of speechto-text is low as there is a need to train it. It is a desktop application that can be used by illiterate and handicapped people also. The proposed system not only ensures the user's data security but also give users a sense of secure mailing.

In paper [3], the authors have proposed the email system that can be used by visually impaired people easily. System design consist of three modules: TTS(Text-tospeech) module, STT(Speech-to-text) module and Mail Programming Module (Compose, Inbox and Sent Mail) module. In this system Speech-to-text is done using Artificial Intelligence (AI) through API involving neural network models provided to developers by Google Cloud Speech-to-text. Also, it uses various Hashing Algorithms (MD5, SHA) to store passwords or other credentials in database by converting them into hash functions which results in higher security than traditional systems. The process of using hashing algorithm is shown in figure 4 [3].

## 3. OVERVIEW OF THE SYSTEM

### 3.1 Existing System

There are a total number of 4.1 billion email accounts created until 2014 and an there will be estimated 5.2 billion accounts by end of 2018.[4] this makes emails the most used form of communication.

The most common mail services that we use in our day-to-day life cannot be used by visually challenged people. This is because they do not provide any facility so that the person in front can hear out the content of the screen. As they cannot visualize what is already present on screen they cannot make out where to click in order to perform

the required operations.[3] For a visually challenged person using a computer for the first time is not that convenient as it is for a normal user even though it is user friendly.

Although there are many screen readers available then also these people face some minor difficulties. Screen readers read out whatever content is there on the screen and to perform those actions the person will have to use keyboard shortcuts as mouse location cannot be traced by the screen readers. This means two things; one that the user cannot make use of mouse pointer as it is completely inconvenient if the pointer location cannot be traced and second that user should be well versed with the keyboard as to where each and every key is located. A user is new to computer can therefore not use this service as they are not aware of the key locations.

## Disadvantages:

• Although there are many screen readers available then also these people face some minor difficulties. Screen readers read out whatever content is there on the screen and to perform those actions the person will have to use keyboard shortcuts as mouse location cannot be traced by the screen readers

Another drawback that sets in is that screen readers read out the content in sequential manner and therefore user can make out the contents of the screen only if they are in basic HTML format.

### 3.2 Proposed System:

The proposed Voice based Search Engine aspires to serve the users especially the blind in browsing the Internet. The user can speak with the computer and the computer will respond to the user in the form of voice. The computer will assist the user in reading the documents as well.

Voice-enabled interface with addition support for gesture-based input and output approaches are for the “Social Robot Maggie” converting it into an aloud reader. This voice recognition and synthesis can be affected by number of reasons such as the voice pitch, its speed, its volume etc. It is based on the Loquendo ETTS (Emotional Text-To-Speech) software..

**Advantages:**

• One of the most important recompense of this system is that user will not need to use the keyboard. All operations will be based on voice proceedings..

### 3.3 System Modules

**Dataset collection:**

- Detailed Instruction:

**Login:** This is the very first step. The user’s login credentials are fetched from a file stored in a system. We assume that the system is not used by multiple users as normally is the case.

- **Mailbox Home** Once the user logs in he enters him Mailbox home. He gets three options here.

• Compose Mail

• Go to Inbox

• Logout.

**Text-Voice Handling:**

This was on of the core parts of the project. The success of this application depends on how well this module is implemented. We used Google's speech recognition library to convert the command and messages taken through mike, to text. It is an open-source library and on one of the best speech recognizer for English language. We improved over this by calculating the weighted edit distance between all the available command at a given stage and the command recognized by speech recognition library. And it treats the input as the closest distance command option available at that stage provided the distance is less than a threshold Foe example, if a user says has four option after a mails subject and recipient are read out: Reply, Forward, Next, Stop and Read. Now the user gives an input which is recognized by google's speech recognition as 'top', in this case as it is quite certain that the user said stop. So the application will consider the input as stop as its distance to stop is least and less than the threshold, and act accordingly.

**Text to Speech:**

Text to speech conversion is required to give commands and guide a blind user and he s unable to see anything on the screen. For converting text to speech we imported gtts library. We saved the audio generated by gTTS and played it using mpg321.

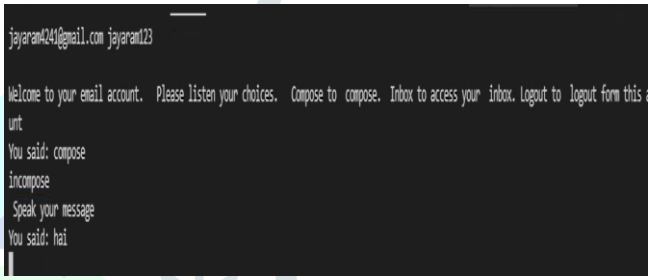
Sending and Retrieving Emails:

**Sending Mails:** For sending emails we have use 'smtplib'. Once the message is composed, to send the mail following steps are there. We establish the connection(TLS) with gmail's smtp server at port 587. Using the login and the password the user is authenticated. Finally the mail is Pushed to the users mailbox through SMTP protocol.

**Retrieving Mails:**

Emails are retrieved from the user's mailbox through IMAP or POP3. Here we use imaplib to retrieve emails. It is used to fetch all the mails in inbox, sent box or draft and bring it on the user's system. The users login credentials are use to fetch these information from the server.

## 4. RESULTS

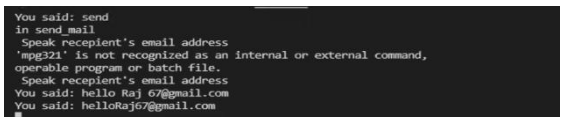



Login to email

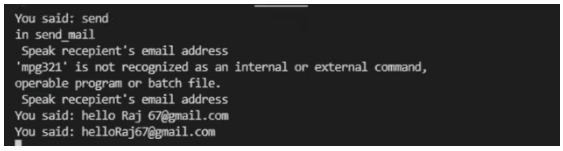
Main menu speech to text

user response message for compose option

User Message with HI


Voice to text messages




Sender email id

## 5. CONCLUSION

The project that we have projected is a system which will help the visually impaired people to access email services efficiently.

This system will help in overcoming some drawbacks that were earlier faced by the blind people in accessing emails.

We have eliminated the concept of using keyboard shortcuts along with screen readers which will help reducing the cognitive load of remembering keyboard shortcuts.

Also any non-sophisticated user who does not know the position of keys on the keyboard need not bother as keyboard usage is eliminated. Instructions given by the IVR accordingly to get the respective services offered.

Other than this the user might need to feed in information through voice inputs when specified..

**Future Enhancements:**

As future work same process of voice based response system can be applied for various others IVR systems like banking sector where when user calls banks response based on user request based on query based answers which are stored in database.

Additional Features like setting reminders, searching in inbox, saving mails automatically Improving on taking recipients email id.

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