

VOICE BASED EMAIL SYSTEM FOR BLIND

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Abstract: - In today's world, communication has become very easy due to integration of communication technologies with the internet. However, the visually challenged people find it very difficult to utilize this technology because using it requires visual perception. This project aims at developing an email system that will help even a naïve, visually impaired person to use the services for communication without previous training. The project is a python-based voice-controlled email application for visually impaired persons using speech to text voice response, thus enabling everyone to control their mail accounts using their voice only.

Keywords: - TTS, STT CONVERSIONS and IV

I. INTRODUCTION

Emails are one of the most common forms of communication. However, it is not very useful for visually impaired and illiterate people. As nearly 43.3 million people worldwide are visually impaired, so it is necessary to make internet facilities for communication usable for them. There is a special criterion for humans to access the Internet and the criterion is you must be able to see and type for your login credentials & message. In this project we are developing a voice-based email system which will aid the visually impaired people who are naïve to computer systems to use email facilities with ease. All the functions are based on simple mouse click operations making it very easy for any type of user to use this system. Also, the user need not worry about remembering which mouse click operation he/she needs to perform in order to avail a given service as they can click anywhere on screen to perform certain operation. Although all the contents will be read by the system and user's voice will be used to perform action, mouse clicks are for navigation purpose.

II. PROBLEM FORMULATION

As there is a special criterion for humans to access the Internet and the criterion is one must be able to see and know how to use digital equipment like PC, Mobile Phones etc. So, for the betterment of society and giving an equal advantage of technology to visually impaired people we have come up with this project idea.

III. LITERATURE REVIEW

In 2020, the number of email users reached the 4 billion marks, which means that over 50% of the world's population was using email. Considering how many people use email, it shouldn't be surprising the number of emails is as high as 3 million per second. The latest report for 2021 suggests 319.6 billion per day[2]. Such widely used mailing services cannot be used by the visually impaired. As it is difficult for them to visualize the contents already existing on the screen. For a blind person using a

computer is not that easy as it is for an ordinary user though it claims to be user friendly. In the existing system the users' need to use the computer for visual perception proves to be troublesome for the blind. The above proposed system is established on an entirely different idea and is different from the existing mail systems. A web system or any application or service is said to be flawless or completely accessible only if it can be exploited efficiently by all sorts of people independent of a person being able or disable. The existing systems fail to provide this accessibility. Therefore, the above proposed system proves to be different from the existing system. Unlike the existing system that accentuates more on user friendliness of ordinary users, this system emphasizes more on user friendliness of all sorts of people comprising ordinary people, visually compromised people as well as illiterate people. The whole system is based on IVR- interactive voice response. One of the key benefits of this system is that usage of the keyboard is eliminated, and all the operations will be based on voice commands. Therefore, the above proposed system is perfectly accessible to all sorts of users as it is based on speech inputs.

IV. METHODOLOGY

The above proposed system allows the users to compose a mail and check their inbox through Interactive Voice Response technology. This application not only prompts the users with voice commands but also takes their voice input, converts it into text using the features like Text To Speech, Speech to Text. One of the main advantages of the above proposed system is that the use of keyboard and mouse is eliminated; that is, the user will have to respond through voice commands only.

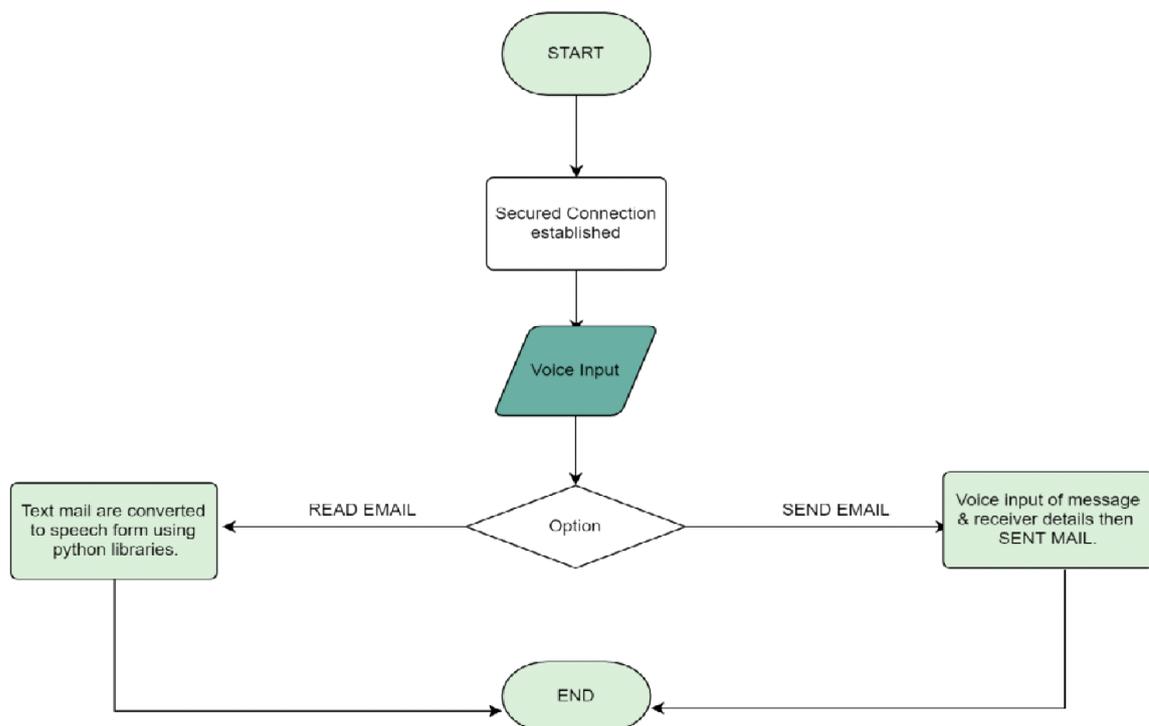
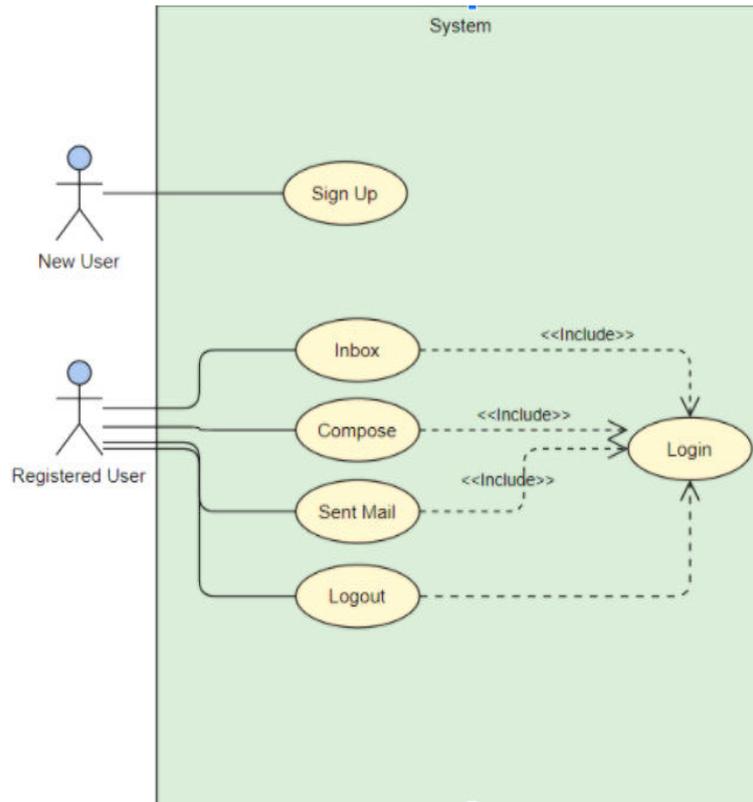


Figure 1. FLOWCHART



Use Case	Voice based email for blind
Actor	New User , Registered User , G-mail
Description	The use case begins when the actor indicates the intent to register and login to the system. In between users can perform certain tasks like accessing inbox, composing and sending mails. It ends when the actor is logged out.
Pre-condition	Login exists
Post-condition	Able to access email system

Figure 2. UML

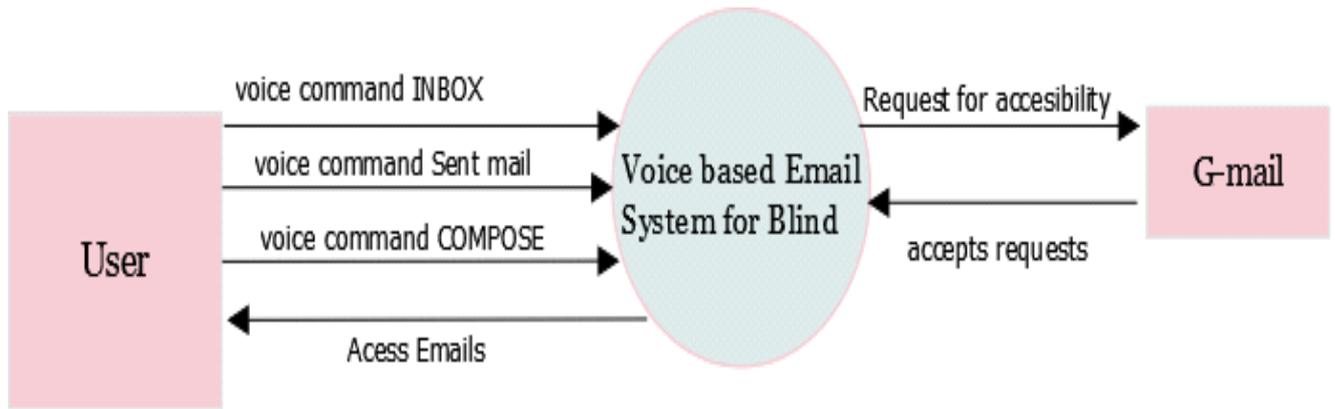


Figure 3.1. Level 0 Data Flow Diagram

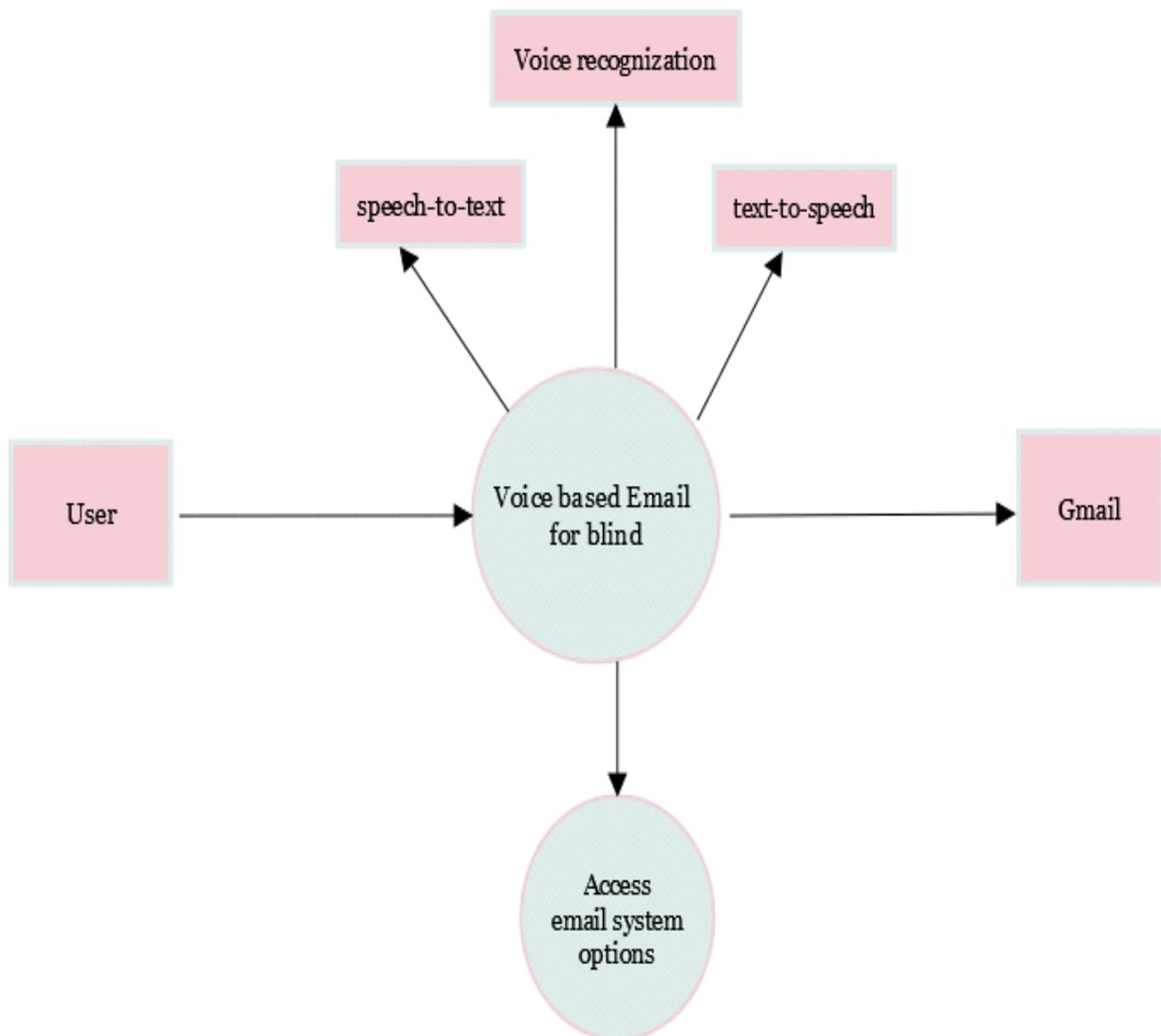


Figure 3.2. Level 1 Data Flow Diagram

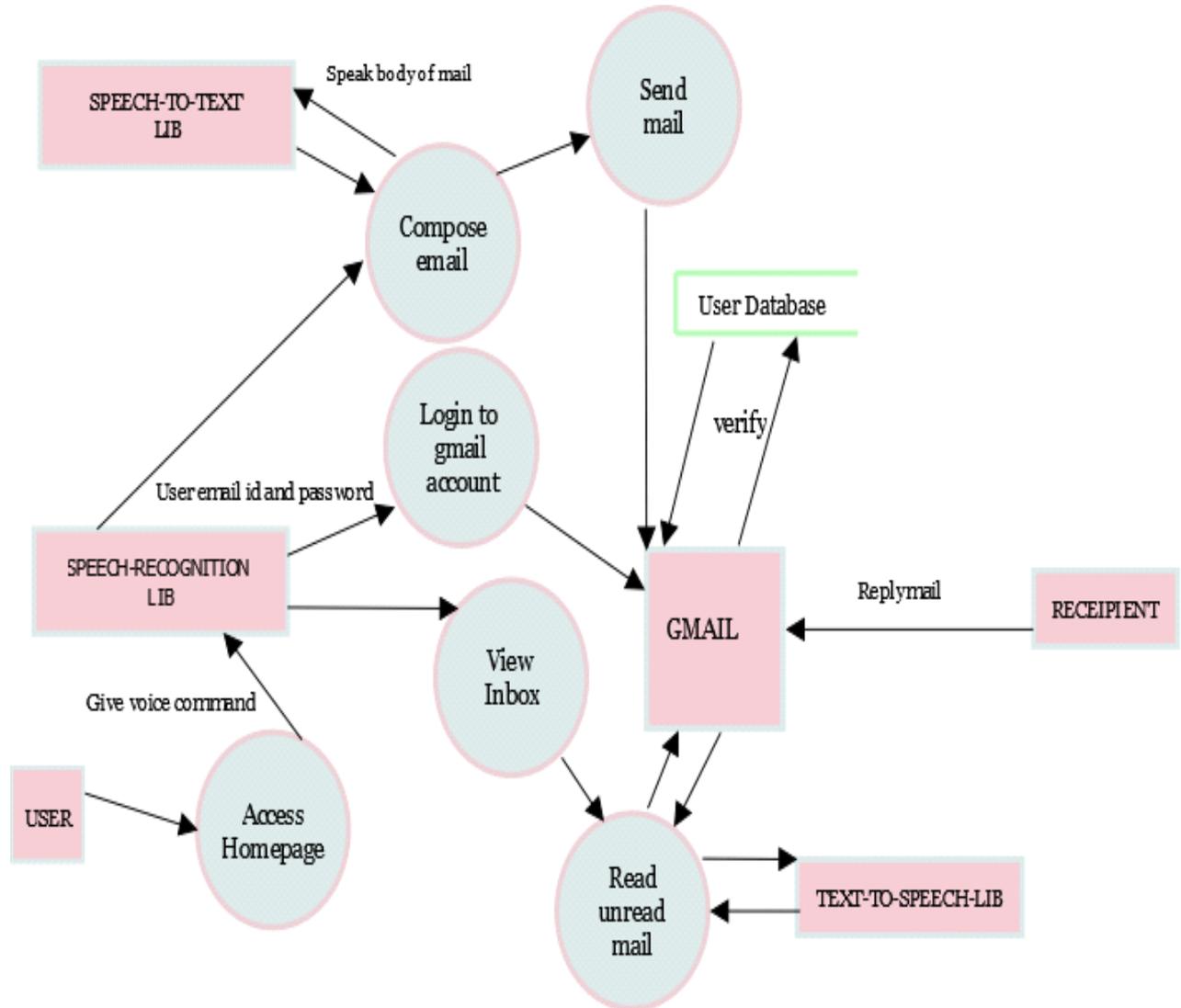


Figure 3.3. Level 2 Data Flow Diagram

Following modules are being used in our project:

- **User Authentication System :**

The user has to give login information such as his/her username, password through voice command, all operations performed will get a voice based feedback.

- **Options in Mailing:**

Compose mail: In the compose module, the blind user can give the voice command to open the compose mail window where the user can again speak the mail contents and create a mail.

Sending mail: In the sending module, the user can send the mail on the voice command send mail, here the user can give the read command to check the mail again before sending.

Attachments: The user can attach the files required using attach voice command after which, the required location of the file will be accessed by the system and the selected file will be prompted to the user and when the user says okay command the file will be uploaded/attached to the mail.

Read Out receive mail: Through this option users can hear all the received mail by searching specific email id or can hear last 3 received emails.

- **SPEECH_TO_TEXT Converter:**

The system requires speech at run time through a microphone and processes the sampled speech to recognize the uttered text. The recognized text will be stored in a file. Our speech to-text system directly gets and converts speech to text. A speech-to-text converter system can also improve systems to access data by providing data entry options for blind, deaf, or physically impaired users. Speech recognition system fell into several blocks: feature extraction, acoustic model's database which is structured based on the training data, dictionary, language model and the speech recognition algorithm. Analog speech signal is first to be sampled at time and amplitude axes or digitized. Samples of the speech signal are analysed in even intervals. This period is usually 20 m/s because the signal in this interval is considered stationary.

- **TEXT_TO_SPEECH Converter:**

Converting text to voice output using speech synthesis techniques. Text-to-speech is also used for handling on hand accuracy of above 90%. It is a microcontroller-based hardware which is coded in Embedded C language. Further research is to be done to use various methods of inputting the text i.e., analysing the text using optical sensor and converting it to speech so that almost all sorts of physical challenges faced by the people while communicating are overcome. devices such as portable GPS units to announce street names when giving directions. Our Text-to Speech Converter accepts a group of 50 characters of text (alphabets and/or numbers) as input.

V. RESULT DISCUSSION

This system will provide various services like composing email, reading out mails checking new arrivals, to know about the count of unread emails and spam all with voice assistance. The voice assistance will assist the user to enter their login credentials, recipient address, subject of mail and when to start writing the body of mail. User can do all actions by voice commands. Through this system blind people can access all the facilities related to email without any special training & normal people.

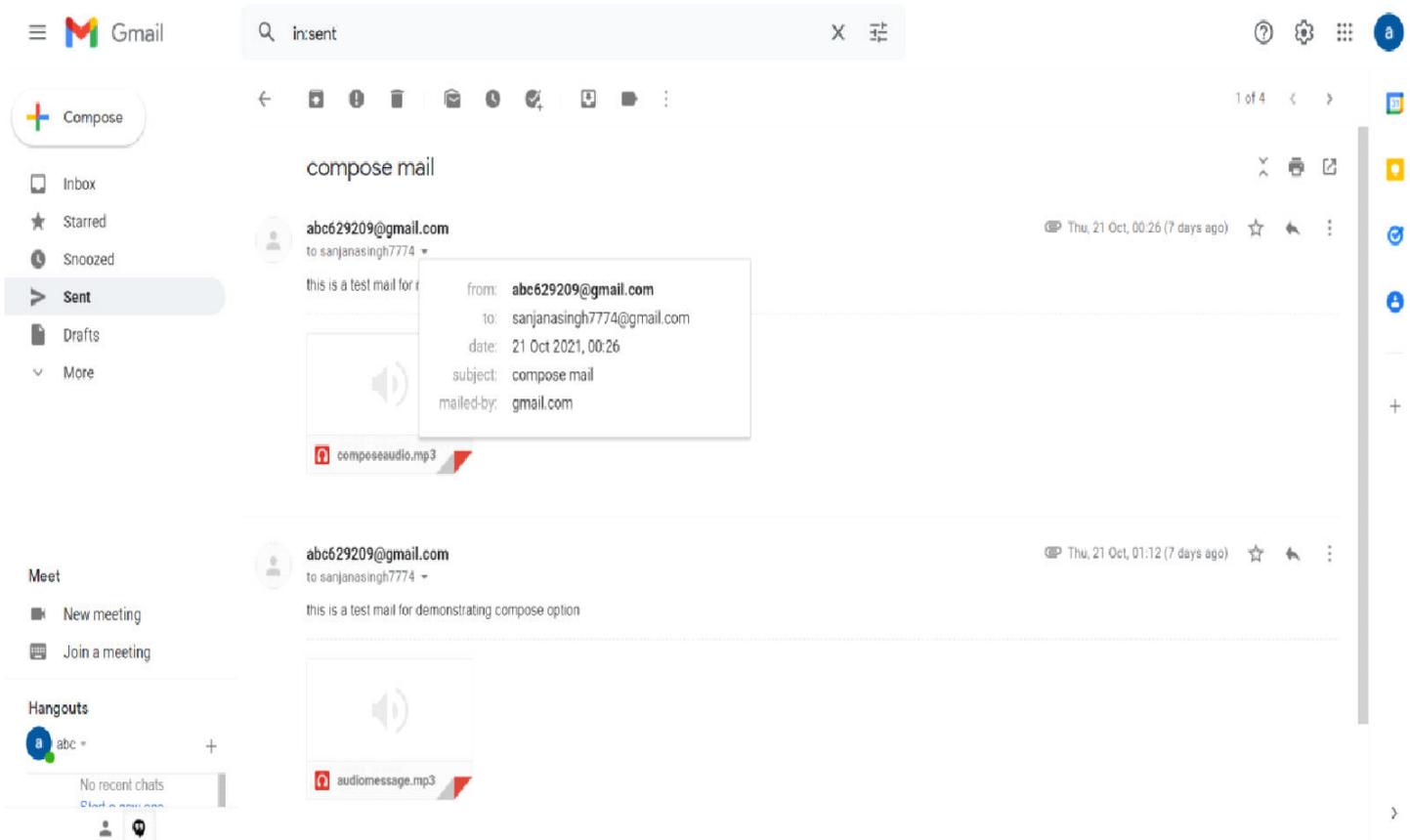


Figure 4. OUTPUT

VI. CONCLUSION

Voice based Email system helps the visually impaired people to access email. It has been observed by the studies that nearly 60% of the total visually impaired population across the world is present in India. This system, working on the basis of the voicemail architecture for blind people to access E-mail easily and efficiently. This system will help in overcoming some drawbacks that were earlier faced by the blind people in accessing emails. We have removed the concept of using keyboard shortcuts along with screen readers which will help reduce the excess load of remembering keyboard shortcuts. Also any computer illiterate user who does not know the location of keys on the keyboard need not worry as keyboard usage is eliminated. The user only needs to follow the instructions given by the IVR and use mouse clicks as per it says to get the respective services offered. Other than this the user might need to feed in information through voice inputs when specified. It also helps handicapped and illiterate people

VII. ACKNOWLEDGMENT

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REFERENCES

- [1] <https://www.blindstreet.com/advantages-disadvantages-using-screen-reader-instead-braille/>
- [2] <https://www.geeksforgeeks.org/prject-idea-voice-based-email-visually-challenged/>
- [3] <https://www.google.com/intl/en-GoB/gmail/about/#>
- [4] [https://www.afb.org/blindness-and-low-vision/using-technology/assistive-technolog_yproducts/screen-readers](https://www.afb.org/blindness-and-low-vision/using-technology/assistive-technologyproducts/screen-readers)