Voice Based E-Mail System for Blind People

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Available online at: www.isroset.org
Received 14th Jun 2017, Revised 26th Jun 2017, Accepted 20th Jul 2017, Online 30th Aug 2017

Abstract—The visually challenged people find it very difficult to access the technology because of the fact that using them requires visual perception. Even though much new advancement has been implemented to help them use the computers efficiently no naïve user who is visually challenged can use this technology as efficiently as a normal naïve user can do that. Unlike normal users they require some practice for using the available technologies. This application aims at developing an email system that will help even a visually impaired person to use the services for communication without prior training. This system will also reduce cognitive load taken by blind to remember and type characters using keyboard. The system will be keyboard independent and will work only on mouse operation and speech recognition. The system is completely based on interactive voice response (IVR) which will make it user friendly and efficient to use.

Keywords—Keyboard Independent, Voice Mail, Interactive voice response (IVR), Automatic Speech Recognition (ASR), Text to speech (TTS).

I. INTRODUCTION

Internet is considered as a major storehouse of information in today’s world. No single work can be done without the help of it. It has even become one of the de facto methods used in communication. And out of all methods available email is one of the most common forms of communication especially in the business world. However not all people can use the internet. This is because in order to access the internet you would need to know what is written on the screen. If that is not visible it is of no use.

This makes internet a completely useless technology for the visually impaired and illiterate people. Even the systems that are available currently like the screen readers TTS and ASR do not provide full efficiency to the blind people so as to use the internet. As nearly 285 million people worldwide are estimated visually impaired it become necessary to make internet facilities for communication usable for them also. Therefore we have come up with this project in which we will be developing a voice based email system which will aid the visually impaired people who are naïve to computer systems to use email facilities in a hassle free manner.

The users of this system would not need to have any basic information regarding keyboard shortcuts or where the keys are located. All 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 the system itself will be prompting them as to which click will provide them with what operations.

II. LITERATURE SURVEY

The systems available nowadays uses screen readers which read information displayed on desktop or it prints information on Braille printer. ASR (Automatic speech recognizer) and TTS (text to speech) get used for converting speech to text and vice versa. Although these technologies are being improved continuously, some major problems still persist which make them unusable as a way of accessing email to a large segment of Blind people.

These systems have following drawbacks.
1) With the help of screen readers it is difficult for blind person to access E-mail system and computer operating easily because it has noisy audio interface.
2) ASR is still in development stage. In case of noisy environment performance of ASR degrade.
3) Both ASR and TTS are highly language dependent. So the system developed for one language is not applicable to other.

4) Now a day’s mobile is very common word it is known to almost all peoples even school goers also use mobile. Moreover, tools and technologies above for the blind users are unavailable for mobile devices.

5) These systems are not very much useful for small scale application for E-mail.

6) These available systems require use of keyboard which is very difficult for blind people to recognize and remember characters of keyboard.

III. PROPOSED METHOD

Keeping in view all of the drawbacks of the existing system, goal of our project is to reduce limitations and problems in the current systems. In this system, we are trying to make a system for the blind people through which they can easily use an important feature such as email in a very interactive manner. Here, we are designing a system which will work on the voice commands and prompts for confirmations of actions. The user can also add attachments, create labels, etc in the system.

This system has following advantages:

1) Browser is used and done via a desktop application.
2) The system provides an intuitive, interactive and easy to use GUI that can be easily used by a blind user even if they are not computer literate.
3) The system help not only for blind user to access Email, but it may also help other sighted people who can’t type text due to illiteracy.

The following are the functional requirements for designing the system:

1) The need for IVR systems in mailing for ease of use for visually impaired.
2) Avoidance of use of keyboard shortcuts which are difficult to remember.
3) Uses of mouse click operations.
4) Continuous prompting so as to reduce cognitive load of user.

IV. ARCHITECTURE

The architecture of our proposed system is depicted in below fig. Our system is designed using html, java-script, PHP. It takes input in voice form and then converts to text and performs the functions such as compose mail, edit mail, send mail, attach files, etc. The input is taken through a mic and then through various speech to text algorithms gets converted to text format. Also for the converse that is converting text to speech, we have TTS algorithms working. The output for the same is shown onto the desktop. Hardware should be well configured for the proper interaction with the online system. As the system is online, communication is handled dynamically and gives results by following the assigned working.

V. IMPLEMENTATION DETAILS

A. 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.

B. Options in Mailing:

1) Compose mail: In the compose module, the blind user can give the voice command to open the compose mail window where user can again speak the mail contents and create a mail.
2) **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.

3) **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.

4) **Create label:** In this option the user can create a label as per the need for example the user can create a meeting label under which he can save all the meeting related mails. So this will provide easy access to the user for meeting related mails.

![Fig.3](image)

**VI. FUTURESCOPE**

Along with the email system this architecture can be extended for the usage of other activities of the blind user such as browsing, accessing files on the desktop, creating folders, listening music and likewise activities. The system can provide option of desktop browser which helps to search contents in computer. Operate multimedia functions of computer such as audio, text, News on internet can be read by system. So the blind people can access the entire system independently which will help them gain confidence in their activities also make their task’s efficient and much easier.

![Fig.4](image)

**VII. CONCLUSION**

Voice based Email system helps the visually impaired people to access email. It has been observed that nearly about 60% of total visually impaired population across the world is present in India. This system, works on the voice mail 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 eliminated the concept of using keyboard shortcuts along with screen readers which will help reducing the cognitive load of remembering keyboard shortcuts. Also any naive 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 accordingly 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.

**REFERENCES**


