Voice based Email System for Blinds

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Abstract— In today's time communications has become so easy due to internet and technologies. But, the visually challenged people find it very problematic to utilize this technology because of the fact using them requires visual perception. Although, many new advancements have been implemented to help them use the computer efficiently so no novice user who is visually challenged can use this technology as efficiently as any naive user can do that is unlike normal users this require some practice for using the available technologies.

This paper aims at developing an email system that will help even a novice visually impaired person to utilize the services for communication without previous training. The system will not let the user make use of keyboard instead will work only on mouse operation and speech conversion to text. It can be used by a non impaired person who as difficulty reading. The system is fully based on interactive voice response which will make it user friendly to use.

I. INTRODUCTION

Internet is a storehouse of today's world. It has even become one of the facto methods used in communication. And out of which one is email which is one of most common in every aspect of business world. However, not all can make use of it as until it's not visible it's of no use. This makes a completely useless technology for visually impaired and illiterate people. Even the system that are available currently like the screen reader 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 to visually impaired it becomes necessary to make internet facilities for communication usable for them also.

Thus, 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 naive to computer systems to use email facilities in a hassle free manner. The user need not worry about basic information regarding keyboard shortcuts or where the keys are located. All functions are simple mouse click operation he/she needs to perform in order to avail a given service as the system itself will be promoting them as to which click will provide them with what operations.

II. EXISTING SYSTEM

There were total of 5.2 billion accounts by end of 2018 this makes emails the most used form of communication. 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 reader available then also the user face minor problem.

III. PROPOSED SYSTEM

The proposed system is based on a completely novel idea and is nowhere like the existing mail systems. The most important aspect that has been kept in mind while developing the proposed system is accessibility. A web system is only efficient when all types of people/user can use whether able or disable. Thus the system we are developing is completely different form the current system. Our system focuses more on user friendliness of all types of people included normal people and visually impaired people as well as illiterate people. The complete system is based on IVR-interactive voice response.

When using this system the computer will be prompting the user to perform specific operations to avail respective services he/she will have to perform operation. One of the major merit is that user do not need to use keyboard. All operations will be on mouse click events. But the question arise was how will a blind person find the location of mouse pointer. As particular location cannot be tracked by the blind user the system has given the user a free will to click blindly anywhere on the screen which type of click will perform which function will be specified by the IVR. Also, because of IVR facility those who cannot read not worry as they can listen to the prompting done by the system and perform respective actions.

IV. DESIGN

A. User Interface Design

The User Interface Design is designed using Adobe Dreamweaver CS3. The complete website focuses more on efficiency in understanding the IVR rather than the look and feel of the system as the system is primarily developed for blind people.

B. Database Design

Our system maintains a database for user validation and storing mails of the user. There are a total of five tables. The relationship between them is assigned after much consideration. The E-R diagram of our complete system is shown in Fig.1
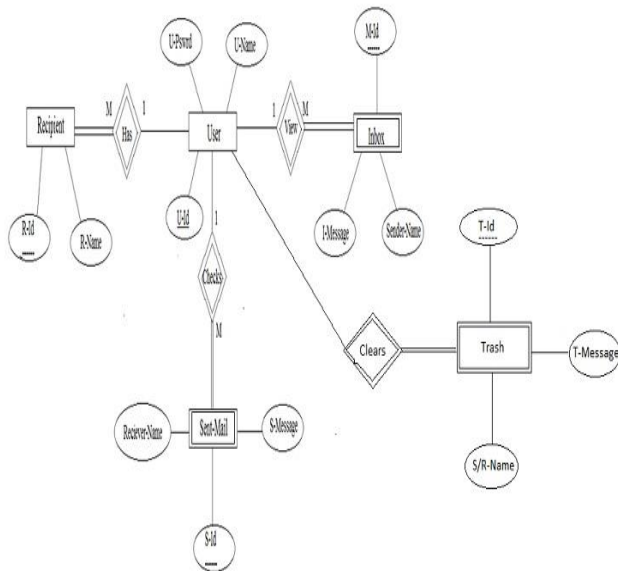
Fig 1. E-R Diagram

C. System Design

Fig.2 shows the complete system design. It is level-2 dataflow diagram which gives complete detailed flow of events in the system where there is mouse click event at same place voice input is required.
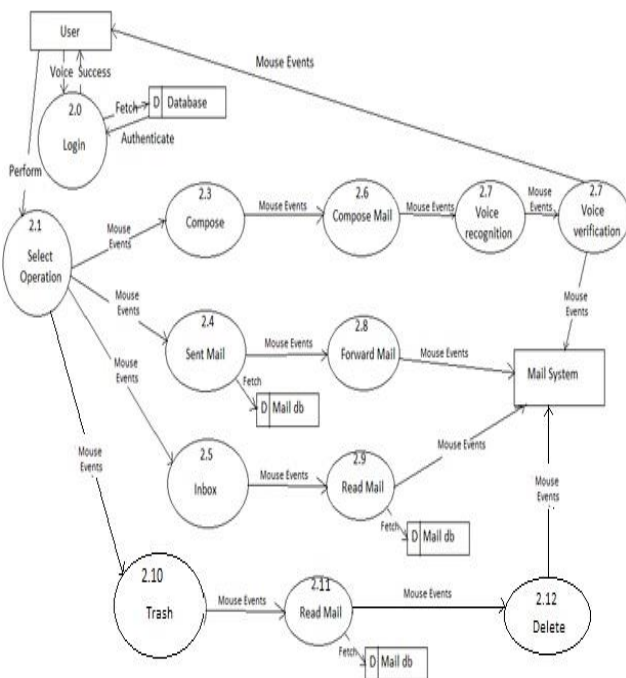

Fig 2. Level-2 Data Flow Diagram

V. IMPLEMENTATION

This system is currently being developed by us. The following are modules that are already developed. Their working is as follows.

- *Registration & Login*

     These is the first modules of the system. Any user wishes to use the system should first register to obtain username and password. Once registration is done the user can login to the system. This module will ask the user to provide the username and password. This will be accepted in speech. Speech conversion will be done to text and user will be told to validate whether the details entered are correct or not. Then database will be checked and if the user is authorized it will be directed to homepage

- *Forgot Password*

     In case where an authorized user forgets the password and thus is not able to login he/she can select forgot password module. In this module the user will be first told enter username. According to username security question will be searched in database. This is the question provided at time of registration. The question will be spoke out by the computer. The user should in turn specify the answer that was provided by him/her during registration. If both get matched, user is given option to change password.

- *Home Page*
     The user is redirected once logged in and following can be performed once logged in.
     1. Inbox
     2. Compose
     3. Sent Mail
     4. Trash

- *Compose Mail*

     This is one of the most important options provided by the mail services. The functionality of compose mail option would not match the already existing mail system. Since the system is for visually challenged people and keyboard operations are completely avoided composing mail would only be done on voice input and mouse operations. No typed input will be required. User can directly record message that needs to be propagated and can send it. This voice massage will go in form of attachment. The receiver can hear the recording and get the message user wanted to send. User would not require attaching the file. Record option will be provided in the compose window itself. Once recorded it will confirm whether the recording is perfect or not by letting the user hear it and if the user confirms it will be automatically attached to the mail.
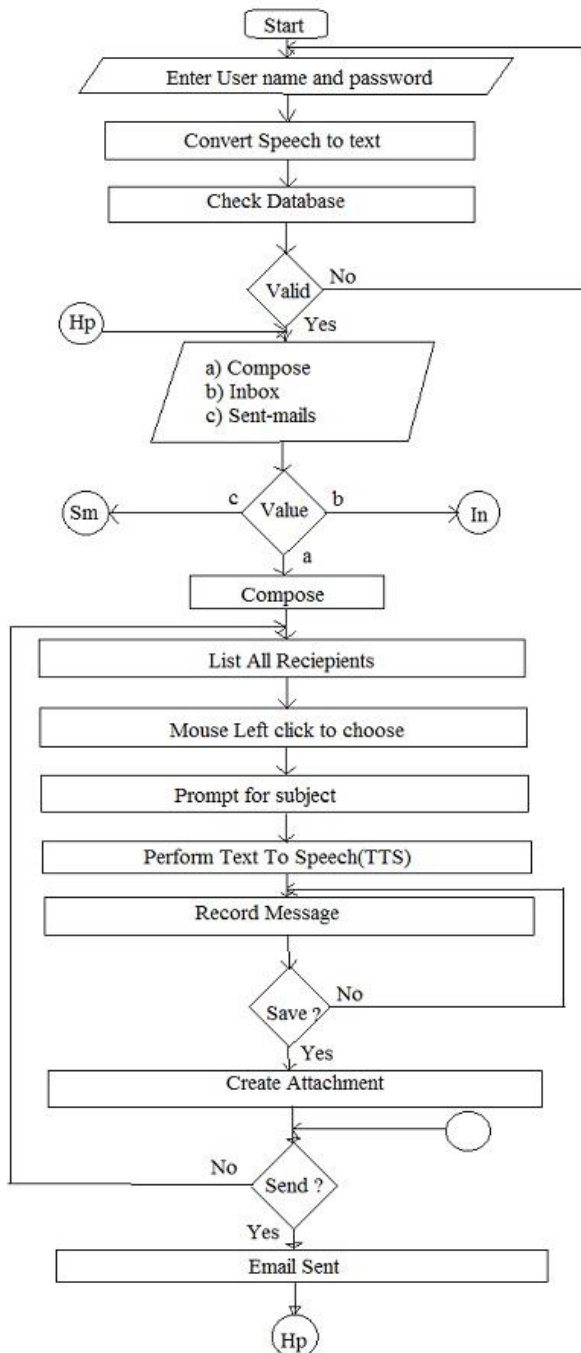
Fig 3. Flow Chart of Compose-Mail

- *Inbox*

This option helps the user view all the mails that has been received to his/her account. The user can listen to mails he/she wants to by performing the click operation specified by the prompt. In order to navigate through different mails prompt will specify which operations to perform. Each time the mail is selected the user will be prompted as whom the sender is and what is the subject of that particular mail. Accordingly user can decide whether the mail needs to be read or not or it should be deleted. Deleted mails will be saved in trash section.
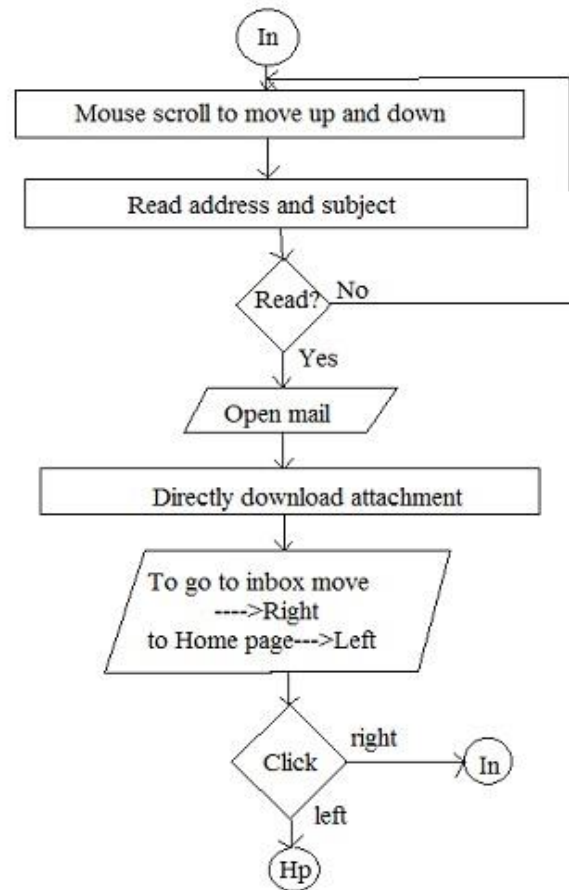

Fig 4. Flow Chart of Inbox

- Sent Mail

This option will keep a track of all mails sent by the user wants to access these mails, this option will provide them with their needs. In order to access the sent mails user will need to perform the actions provided by the prompt to navigate between mails. When the control lands on particular mail user will be prompted as who the receiver was and what is the subject of the mail. This will help the user in efficiently understanding and extracting the required mail.

- Trash

This option will keep track of all deleted mails deleted by the user. Deleted mails could be the ones from inbox or sent mail. If at any time the user needs to retrieve a mail which was deleted it can be done from this option.

CONCLUSION

In this paper we have proposed a system which will help the visually impaired people to access email services efficiently. This system will help overcome the drawbacks that were earlier faced by the blind people in accessing emails. We have eliminated the using of 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 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.

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