An Adaptive Email access for blind people

[1]V.Priyadharshini, [1]C.Nandhini, [1]R.Nivathi, [1]R.Nivetha, [2]R.Madhumitha
[1]UG students, [2]Assistant Professor,
Dept. of Computer Science and Engineering,
Sri Krishna College of Engineering and Technology,
13bc096@skcet.ac.in,13bc079@skcet.ac.in,13bc084@skcet.ac.in,
13bc085@skcet.ac.in, madhumitha@gmail.com

Abstract-An interactive email system for visually impaired is a concept that assists the visually challenged people to access their email like any other common people. This paper explains the design of such an interactive system for visually challenged people. Web accessibility stands as the inclusive practice of creating web based applications that can be used by people of all kind. When web applications are perfectly prototyped, implemented, and edited, all sort of users can have mutual license to information functionality also that can be facilitated without reducing the usability of the application for normal users. The very basic and important need for using the internet is accessing emails. Micro systematic applied research has been done on how a visually challenged user can have an access to his emails and this paper completely concentrates in filling a few gaps in doing that.

Index Terms – Interactive Voice Response (IVR), Speech Recognition (SR), Speech to Text (STT)

I INTRODUCTION

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Android is a software platform and operating system for mobile devices based on the Linux operating system and developed by Google and the Open Handset Alliance. It allows developers to write managed code in a Java-like language that utilizes Google-developed Java libraries, but does not support programs developed in native code.

The unveiling of the Android platform on 5 November 2007 was announced with the founding of the Open Handset Alliance, a consortium of 34 hardware, software and telecom companies devoted to advancing open standards for mobile devices. When released in 2008, most of the Android platform will be made available under the Apache free-software and open-source licence.

Interfacing System is generally for human computer interactions. Everyone can access their information through emails using internet. They can send and receive any stuff in the form of text document, pictures, audio, video, etc. using email using the internet. Almost everyone can have equal access to information only when the web application is perfectly designed and developed. Moreover its very tough for the visually challenged users to access their email. This paper to pave a way for visually challenged people to easily access their mails with a good confidential manner. When web applications are perfectly modulated, created, changed, all users can have equal opportunity access to information and functionality. They can be facilitated without decreasing the usage of the application for people with no disabilities.

This paper interactive email system for visually challenged is based on the area Artificial intelligence. Artificial intelligence is developing machines or software with

intelligence that focus on the solution of specific problem. Now the particular problem is to make the visually challenged to access the emails of their own without expecting others help.This paper, the visually challenged people can access their email with the help of voice that is given by the application going to be created. This can be fulfilled by the method used in the area of research.

A strong satisfying natural language processing system would accept natural language user interfaces and the capture of knowledge straight away from the human-written scripts, like Internet texts. Some legal applications of natural language processing consist of information backup and machine translation. A basic method of processing and extracting meanings from natural language is by means of semantic indexing. Increase in processing speed and then economical cost of data storage makes indexing the large volumes of abstractions of users input very efficient.

Computer has become an integral part of every one's life.But the information access and computer handling has to be done with the mouse and keyboard and by reading all the things present on the screen and then deciding what to do making it a visual process means need of eyes to handle the information on the computer i.e. if anyone want to read anything from the internet they have to first open a browser and then open a website to read the article and then follow the links to read specific article. The decision making depends upon the eye sight and by reading everything that appears on the screen. So the computer and information age is not for the blind. The blind cannot read the information and cannot see the mouse cursor to give command to the system. They cannot access their mail and cannot send a mail. Thus the computer becomes an impractical

thing for the blind people and information retrieval a tedious job.

II RELATED WORK

There is bulk of information available on technological advances for visually impaired people. This includes development of text to Braille systems, screen magnifiers and screen readers. Recently, attempts have been made in order to develop tools and technologies to help Blind people to access internet technologies.

There are number of technologies on the basis of what the blinds can access the internet. But to access internet they have to handle computer with the help of mouse and keyboard [4][6]. Because of that IBM's Home page the web page is an easy-to-use interface and converts the text-to-speech having different gender voices for reading texts and links [3]. However, the disadvantage of this is that the developer has to design a complex new interface for the complex graphical web pages to be browsed and for the screen reader to recognize.

In previous Braille keyboard labels are used. Braille keyboard labels can convert any standard PC keyboard to a Braille compatible keyboard. Another thing is the cognitive load of blind people. To handle computer, the blind people have given some coaching related to keyboard. With the help of mark on keys 'J' and 'F', it's easy to handle computer. It definitely takes a learning curve to memorize the keyboard and get up to a certain speed, but it really pays off at the end who can't type text due to illiteracy. It also increases the cognitive load by remember characters of keyboard [5].

The screen reader keeps track of what the computer is doing, and speaks or magnifies the necessary information that a

user needs in order to use the computer. When you as a sighted person look at the computer screen, of course you see the whole screen, but instinctively you focus your attention on the bit of the screen that is immediately relevant. A screen reader does the same thing. It does not simply read the whole screen, because that would quickly become tedious. But it monitors the screen and automatically tells the blind user the most important information about what is currently happening.

It also attempted to structure the pages that are linked together to enhance navigability, it did not prove very efficient for surfing. After, it did not handle needs regarding navigability and usability of current page itself. Another browser developed for the visually handicapped people was eGuideDog [6][7] which had an integrated TTS engine. This system applies some advanced text extraction algorithm to represent the page in a user-friendly manner. However, still it did not meet the required standards of commercial use.

There are some previous studies about voice mail but not voice based email. In the existing system there is no service that provided to the blind to send email. So it is a big drawback for the blind people to communicate through the internet like mail. Voicemail is an existing system that makes use of keyboard and mouse. There are lot of difficulties for the blind to use the voice mail because it is not fully voice based in nature. Voicemail involves steps like attaching a microphone [8]and opening the sound recorder with the help of mouse or keyboard and then recording the voice and clicking on the stop button and then saving it by giving a name to it which requires typing with the hand and then sending it to the appropriate person [1]. The voice mail may be easy to use for the normal people but it is not the same

with the case of visually challenged people and blind. This is because it is time consuming process for the visually challenged people and quite difficult.

In the existing system there is no service that provided to the blind to send email. So it is a big drawback for the blind people to communicate through the internet like mail .And it is difficult task to send the mail for the blind people in the technology world. The blind people cannot read the information and cannot view the mouse cursor to give command to the computer [2]. They cannot access their mail and cannot send a mail. Thus the computer becomes difficult to use things for the blind people and information retrieval a tedious job.

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

The most common mail services in 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 [9]. As they cannot visualize what is already present on screen they cannot make out where to click in order to perform the required operations.

For 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.

Drawbacks:
1. 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.

2. The user cannot make use of mouse pointers as it is completely inconvenient if the pointer location cannot be traced

3. Second that user should be well versed with the keyboard as to where each and every key is located.

4. Another drawbacks 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.

All these are some drawbacks of the current system will be overcome in the system that is developing.

III PROPOSED SYSTEM

The proposed system is based on a completely novel idea and is nowhere like the existing email systems. The most important aspect that has been kept in mind while developing the proposed system is accessibility.

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 and is the user needs to access the respective services the she/he needs to perform that operation.

Interactive Voice Response (IVR) is a technology that allows a computer the use of voice and DTMF tones input via keyboard.IVR allows customer to interact with a company's host system via a telephone keyboard or by speech recognition, after which they can service their own inquiries by following the IVR dialogue.

Other languages include using Text to Speech (TTS) to speak complex and dynamic information, such as emails, news reports or weather information. TTS is computer generated synthesized speech that is no longer the robotic voice traditionally associated with computers. Real voice creates the speech in fragments that are spliced together (concatenated) and smoothed before being played to the caller.

Advantages

1. One of the major advantages of this system is that user won't require to use the keyboard. All operations will be based on click events. Now the question that arises is that how the blind users find location of the mouse pointer.

2. As particular location cannot be tracked by the blind user the system has given the user a free will to click blandly anywhere on the screen. Which type of click will perform which function will be specified by the IVR.
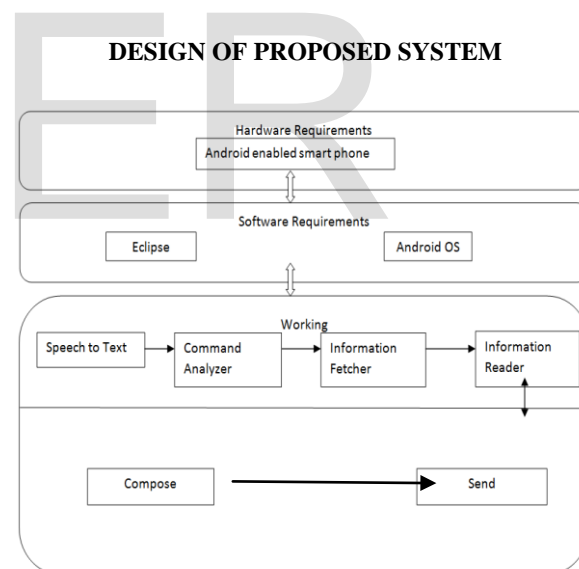
DESIGN OF PROPOSED SYSTEM

Figure 1: Block diagram for design process

The block diagram shows the working structure of Android, conversion of speech to text. This diagram gives the clear overview of all the hardware, software components on which the paper works on. The working system explains about how the speech is converted to text by analyzing the command

from the user. The module explains about the location, search and navigation process.

1. User Interface Specification

A User Interface Specification (UI Specification) is a document that captures the details of the software user interface into a written document. The specification covers all possible actions that an end user may perform and all visual, auditory and other interaction elements. The UI specification is the main source of implementation information for how the software should work. In information technology, the user interface(UI) is everything designed into an information device with which a human being may interact – including display screen, keyboard, mouse, light pen, the appearance of a desktop, illuminated characters, help messages, and how an application program or a website invites interaction and responds to it. In early computers, there was very little user interface expect for a few buttons at an operator's console. The user interface was largely in the form of punched card input and report output.

Later, a user was provided the ability to interact with a computer online and the user interface was a nearly blank display screen with a command line, a keyboard, and a set of commands and computer responses that were exchanged. This command line interface led to one in which menus (list of choices written in text) predominated. And, finally, the Graphical User Interface(GUI) arrived, originally mainly in Xerox's Palo Alto Research Center, adopted and enhanced by Apple Computer, and finally effectively standardized by Microsoft in its Windows Operating System.

2. Speech Recognition

Speech recognition (SR) is the inter-disciplinary sub-field of computational linguistics that develops methodologies and technologies that enables the recognition and translation of spoken language into text by computers. It is also known as "Automatic Speech Recognition" (ASR), "computer speech recognition" or just by "Speech to Text" (STT). It incorporates the knowledge and research in the linguistics, computer science and electrical engineering fields.

Some SR systems use "Training" (also called "Enrollment") where an individual speaker reads text or isolated vocabulary into the system. The system analyses the person's specific voice and uses it to fine-tune the recognition of that person's speech, resulting in increased accuracy.

3. Speech to Text

Insight IVR can take a voice message and deliver it to any specified email address. This feature allows subscribe to listen to messages on their computers and then archive the messages appropriately on their own computer. Since the message is sent via standard email, the email can be opened from any internet terminal in the world which gives subscribers mobility and flexibility.

4. Compose Mail

The functionality of compose mail option would not match the already existing mail system. Since the system is for visually impaired people and keyboard operations are completely avoided composing mail would only be done on touch operation. No typed inputs will be required. Compose the mail through voice based detection method where the speech is converted to text and the commands are saved. Thus the mail is composed using text to speech conversion method. Then the mail is sent to the specified recipient.

IV CONCLUSION

Voice based architecture helps blind people to access e-mail with no difficulty. The proposed system entirely focuses on the benefit of the blind in making use of advanced technology for their growth and improvement. This design will also reduce cognitive load taken by blind to remember and type characters using keyboard. It also helps handicapped and illiterate people. This paper will be very much useful for today's generation either blind or physically challenged to move a step forward in their way in an easy manner to achieve their desire.

REFERENCES

[1] International Journal of Scientific and Engineering Research, Voice based system in desktop and mobiles for blind users, volume 3, issue 4,april-2012 1 ISSN 2229-5518.

[2] Blind Handicapped vs. Technology: How do Blind people use Computers by Prof. ReetaSingh.

[3] P. Verma, R. Singh, A.K. Singh, V. Yadav, and A. Pandey. An enhanced speech-based internet browsing system for visually challenged. In Computer and Communication Technology (ICCCT), 2010 International Conference on, pages 724–730. IEEE, 2010.

[4] R. Ghose, T. Dasgupta, and A. Basu.Architecture of a web browser for visually handicapped people.In Students' Technology Symposium (TechSym), 2010 IEEE, pages 325 –329, April 2010.

[5] T. Dasgupta and A. Basu. A speech enabled Indian language text to braille transliteration system. In Information and Communication Technologies and Development (ICTD), 2009 International Conference on, pages 201–211. IEEE, 2009.

[6] King, G. Evans, and P. Blenkhorn. Webbie: a web browser for visually impaired people. In Proceedings of the 2nd Cambridge Workshop on Universal Access and Assistive Technology, Springer-Verlag, London, UK, pages 35–44. Citeseer.

[7] An Intelligent Voice-Based eMarketplace for Visually Impaired People web content accessibility guidelines: Design of enhanced text user interfaces for blind internet users," International Journal of Human-Computer Studies, vol. 66, pp. 257-270, 2008.004

[8] C. Sjostrom, "Designing haptic computer interfaces for blind people," in Signal Processing and its Applications, Sixth International, Symposium on., Kuala Lumpur, 2001, pp. 68-71 vol. 1.

[9] M. King, J. W. Thatcher, P. M. Bronstad, and R. Easton, "Managing usability for people with disabilities in a large web presence," IBM Systems Journal, vol. 44, pp. 519-535, 2005.