

VOICE BASED E-MAIL SYSTEM FOR BLINDS

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Abstract:

Voice mail architecture helps blind people to access e-mail and other multimedia functions of operating system (songs, text). Also in mobile application SMS can be read by system itself. Now a days the advancement made in computer technology opened platforms for visually impaired people across the world. It has been observed that nearly about 60% of total blind population across the world is present in INDIA. In this paper, we describe the voice mail architecture used by blind people to access E-mail and multimedia functions of operating system easily and efficiently. This architecture will also reduce cognitive load taken by blind to remember and type characters using keyboard. It also helps handicapped and illiterate people.

Keywords—Voice Mail, RSS (Real Simple Syndication) Microsoft Speech SDK.

1. INTRODUCTION

Today in the information age computer has become an integral part of every body's life. We use a computer to hear songs, read something, accessing information from the internet. We use computer everywhere. 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 we need eye sight to handle the information on the computer i.e. if we want to read news from the internet we have to first open a browser and then open a website to read news and then follow the links to read specific news.

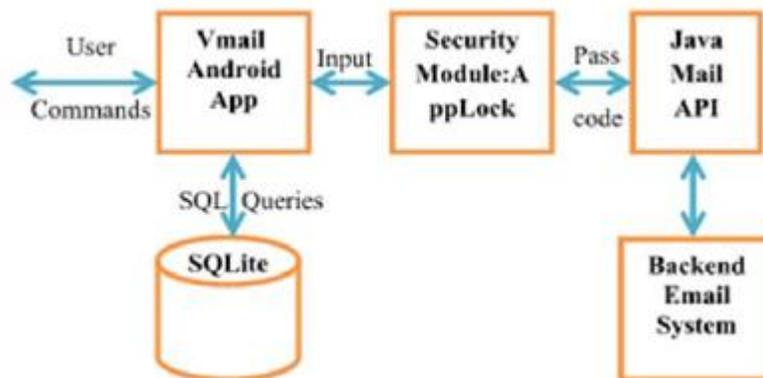


Fig.1.General Structure

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 people cannot read the information and cannot view the mouse cursor to give command to the computer. 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. We are going to develop a information retrieval toolkit for the blind and then transform the information into a Braille language for the blind people to read it and also keep a option of speech to read it. We are searching for a few things like how are we going to access the internet without a browser and how we are going to play the songs and read books without a mouse use. 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. Keeping in view all of these, goal of our project is to reduce limitations and problems mentioned above. Our system allows blind person to his/her voice instead of converting speech to text, the system directly sends recorded voice message to recipients mail address as an attachment. The system also 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. In this system we use Microsoft speech SDK which is a software development kit for building speech engine and application for Microsoft window.

2. LITERATURE REVIEW

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. Among the early attempts, voice input and input for surfing was adopted for the Blind people. In 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. 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. Simple browsing solution, which divides a web page into two dimensions. This greatly simplifies a web page's structure and makes it easier to browse. Another web browser generated a tree structure from the HTML document through analyzing links. As it 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 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.

3. SYSTEM ARCHITECTURE

The architecture of our proposed system is depicted in fig.2. The diagram shows major component of present system which are 1. G-mail- System read messages on recipient mailbox. 2. RSS- Real simple syndication for news 3. Song- listen songs 4. Book reader-system read book 5. Drive browser- To search drives and folders The voice mailing system was built both for the desktop computers as well as for mobile devices. The system changes some of its configuration based on the selected devices. In the following subsections we will discuss working of the proposed system for both desktop as well as mobile platforms.

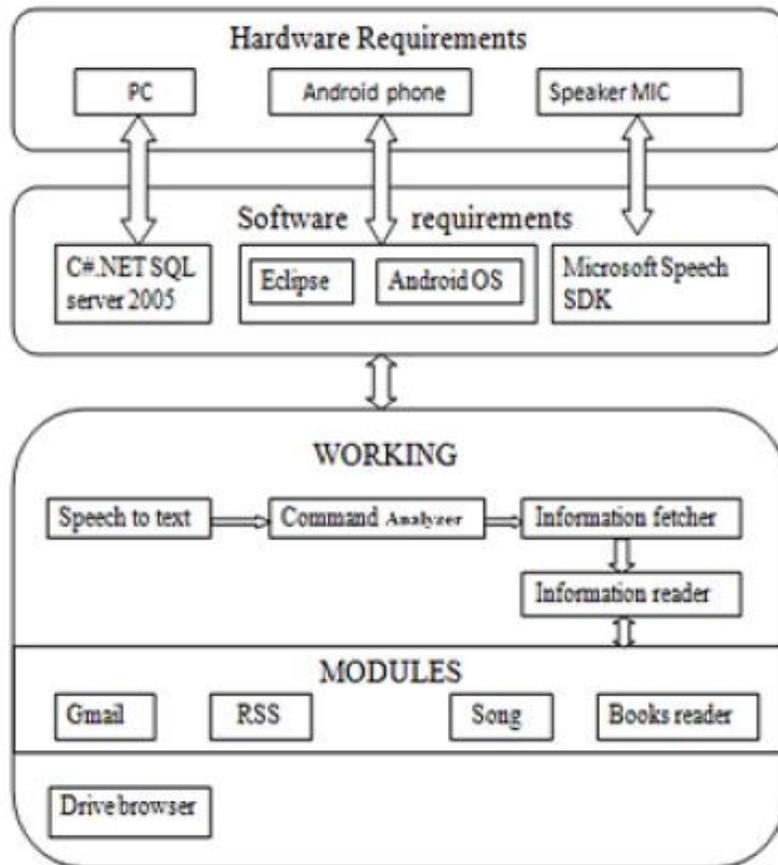


Fig.2.System Architecture

Both the platform shares the same concept of mailing the recorded voice of the sender to the recipient. However, the GUI for both the platforms differs. In the following subsections we will discuss about each of these modules in detail.

4. VOICE BASED SYSTEM FOR DESKTOP

Sending mail: In send mail module the compose window will open; the user has option of either to record a voice message or to type text. In order to record a voice message a user can either click on the

—Initialize Recording button or can press the mouse right button anywhere on the screen. The GUI of the system has been designed in such a way that bluntly of the position of the mouse pointer, the mouse click operation will be registered and the system will work accordingly. In order to stop the recording, again the user can either click on the —End Recording button or release the mouse right button anywhere on the screen i.e. the recording has been initialized by pressing the mouse right click button. Once the recording is finished, the system will ask the user to select the recipients mailing address. This is done by reading out all the mail ids of the sender alphabetically. Once the recipient mail id is entered, the system will prompt the user to send the mail or to cancel the operation. In order to send the mail the user can either press the

Mouse Click	Operation Performed	Voice Command
Right single	Compose Mail	Compose
Right double	Cancel Mail	Cancel
Right triple	NOP	NOP
Left single	Check Inbox	Open Inbox
Left double	Send Mail	Send
Left triple	NOP	NOP
Mouse Scroll Up	Select Next Mail	Next mail
Mouse Scroll Down	Previous Mail	Previous mail
Middle single	Attach Document	Attach
Middle double	Discard	Discard

Table.1. Mouse Click And Voice Command Operation

send mail button or Left click on the mouse to send the mail. We will define all the mouse click operations in details in the following sections. Check inbox: In the inbox module, the blind user can check the voice mail received in mailbox. Blind user can choose one of the two options first is checking the first ten mails and second option is check all the mail sequentially. After the user selects an option the system start to read email id given in list and then system ask to user whether the user want to listen voice message or not, at that time system halt for a moment to receive the response. Then system performs corresponding action.

Desktop browser provides voice feedback. In this system when user operate a particular drive then system inform the user by speaking out particular drive name such as —this is D drive|| this help the user to confirm whether he/she in correct location or not Proposed system read messages on users mobile. As well as E-mail, other multimedia functions like (audio, text), news are handle same as discussed in voice based system for desktop. Thus, we created a version of the same desktop application up and running on an Android based embedded platform. Roughly, the hardware requirements for our Android version of the application are. 1. A touch screen device, preferably of size 4.0|| x 4.0||. 2. Android OS version 2.3.6 or higher. 3. CPU speed \geq 400 MHz 4. At least 30 MB of free phone memory, with support for SD card installation. 5. System requires at least 80 MB of secondary storage.

CONCLUSION

It has been observed that nearly about 60% of total blind population across the world is present in INDIA. This paper, describe the voice mail architecture used by blind people to access E-mail and multimedia functions of operating system easily and efficiently. This architecture will also reduce cognitive load taken by blind to remember and type characters using keyboard. It also helps handicapped and illiterate people.

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