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Voice Based Email for Blind People

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Abstract: *The advancement in computer based accessible systems has opened up many avenues for the visually impaired across a wide majority of the globe. Audio feedback based virtual environment like, the screen readers have helped blind people to access internet applications immensely. However, a large section of visually impaired people in different countries, in particular, the Indian sub-continent could not benefit much from such systems. This was primarily due to the difference in the technology required for Indian languages compared to those corresponding to other popular languages of the world. In this paper, we describe the voicemail system architecture that can be used by a blind person to access e-mails easily and efficiently. The contribution made by this research has enabled the blind people to send and receive voice-based e-mail messages in their native language with the help of a mobile device. Our proposed system GUI has been evaluated against the GUI of a traditional mail server. We found that our proposed architecture performs much better than that of the existing GUIs. In this project, we use voice to text and text to voice technique access for blind people.*

Keyword: *Email Assistance for visually challenged, Speech_To_Text Converter, Text_To_Speech Converter.*

I. INTRODUCTION

The navigation system uses TTS (Text-to-Speech) for blindness in order to provide a navigation service through voice. Suggested system, as an independent program, is fairly cheap and it is possible to install onto Smartphone held by blind people. This allows blind people to easy access the program. An increasing number of studies have used technology to help blind people to integrate more fully into a global world. We present software to use mobile devices by blind users.

The software considers a system of instant messenger to favor interaction of blind users with any other user connected to the network. Nowadays the advancement made in computer technology opened platforms for visually impaired people across the world. It has been observed that nearly about 60% of the 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 the operating system easily and efficiently.

This architecture will also reduce cognitive load taken by the blind to remember and type characters using the keyboard. It also helps handicapped and illiterate people.

II. SYSTEM ANALYSIS

A. Existing System

In previous work, blind people does not send email using the system. The multitude of email types along with the ability setting enables their use in nomadic daily contexts. But these emails are not useful in all types of people such as blind people they can't send the email. Audio based email are only preferable for blind peoples. They can easily respond to the audio instructions. In this system is very rare. So there is less chance to available this audio based email to the blind people.

B. Proposed System

We describe the voicemail system architecture that can be used by a blind person to access e-mails easily and efficiently. The contribution made by this research has enabled the blind people to send and receive voice-based e-mail messages in their native language with the help of a computer or a mobile device. Our proposed system GUI has been evaluated against the GUI of a traditional mail server. We found that our proposed architecture performs much better than that of the existing GUIs.

C. System Requirements

Hardware Requirements:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive: 1.44 Mb.
- Monitor : 15 VGA Color.
- Mouse : Logitech.
- RAM : 512 Mb.
- MOBILE : ANDROID

Software Requirements:-

- Operating System : Windows XP/7.
- Coding Language : Java 1.7
- Tool Kit : Android 4.4 ABOVE
- IDE : Eclipse
- Front End : Android and Java
- Back End : My SQL.

D. List of Modules

- SPEECH_TO_TEXT Converter
- TEXT_TO_SPEECH Converter
- Word Recognition

E. Module Description

• SPEECH_TO_TEXT Converter

The system acquires speech at run time through a microphone and processes the sampled speech to recognize the uttered text. The recognized text can be stored in a file. We are developing this on Android platform using Eclipse workbench. Our speech-to-text system directly acquires and converts speech to text. It can supplement other larger systems, giving users a different choice for data entry. A speech-to-text system can also improve system accessibility by providing data entry options for blind, deaf, or physically handicapped users. Speech recognition system can be divided into several blocks: feature extraction, acoustic models database which is built based on the training data, dictionary, language model and the speech recognition algorithm. Analog speech signal must first be sampled at time and amplitude axes, or digitized. Samples of the speech signal are analyzed in even intervals. This period is usually 20 ms because the signal in this interval is considered stationary. Speech feature extraction involves the formation of equally spaced discrete vectors of speech characteristics. Feature vectors from training database are used to estimate the parameters of acoustic models. The acoustic model describes properties of the basic elements that can be recognized. The basic element can be a phoneme for continuous speech or word for isolated words recognition.

• TEXT_TO_SPEECH Converter

Converting text to voice output using speech synthesis techniques. Although initially used by the blind to listen to written material, it is now used extensively to convey financial data, e-mail messages, and other information via telephone for everyone. Text-to-speech is also used on handheld devices such as portable GPS units to announce street names when giving directions. Our Text-to-Speech Converter accepts a string of 50 characters of text (alphabets and/or numbers) as input. In this, we have interfaced the keyboard with the controller and defined all the alphabets as well as digits keys on it. The speech processor has an unlimited

dictionary and can speak out almost any text provided at the input most of the times. Hence, it has an accuracy of above 90%. It is a microcontroller based hardware coded in Embedded C language. Further research is to be done to optimize various methods of inputting the text i.e. Reading 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.

- **WORD RECOGNITION**

Voice recognition software (also known as speech to text software) allows an individual to use their voice instead of typing on a keyboard. Voice recognition may be used to dictate text into the computer or to give commands to the computer. Voice recognition software allows for a quick method of writing onto a computer. It is also useful for people with disabilities who find it difficult to use the keyboard. This software can also assist those who have difficulty with transferring ideas onto paper as it helps take the focus out of the mechanics of writing. Word recognition is measured as a matter of speed, such that a word with a high level of recognition is read faster than a novel one. This manner of testing suggests that comprehension of the meaning of the words being read is not required, but rather the ability to recognize them in a way that allows proper pronunciation. Therefore, context is unimportant, and word recognition is often assessed with words presented in isolation in formats such as flash cards. Nevertheless, ease in word recognition, as in fluency, enables proficiency that fosters comprehension of the text being read.

III. DIAGRAMS

A.UML Diagrams

The **Unified Modeling Language (UML)** is a general “purpose modeling language in the field of software engineering, which is designed to provide a standard way to visualize the design of a system”.

It was created and developed by Grady Booch, Ivar Jackson and James Rumbaugh at Rational Software during 1994-1995 with further development led by the through 1996.

- *Use-Case Diagram*

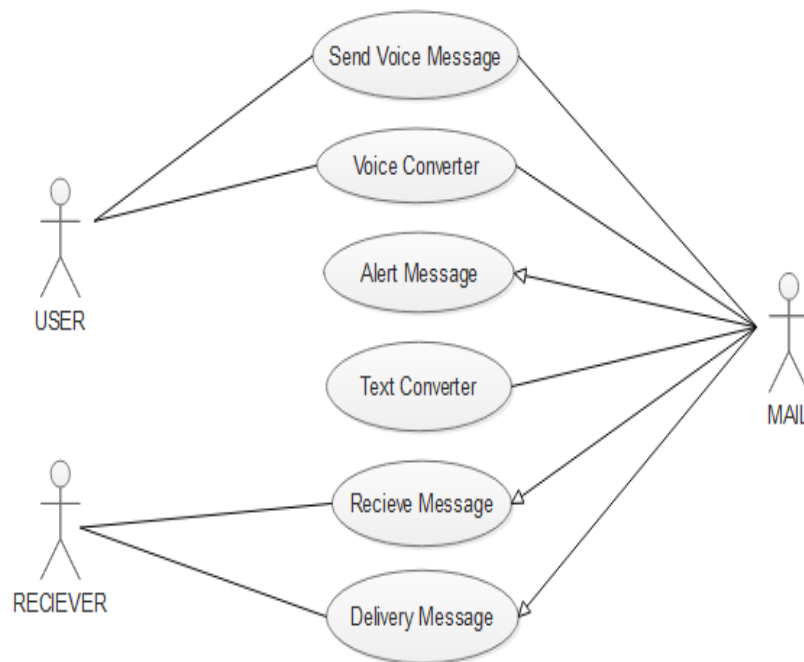


Fig No. : 1 Use Case diagram for user

- *Class Diagram*

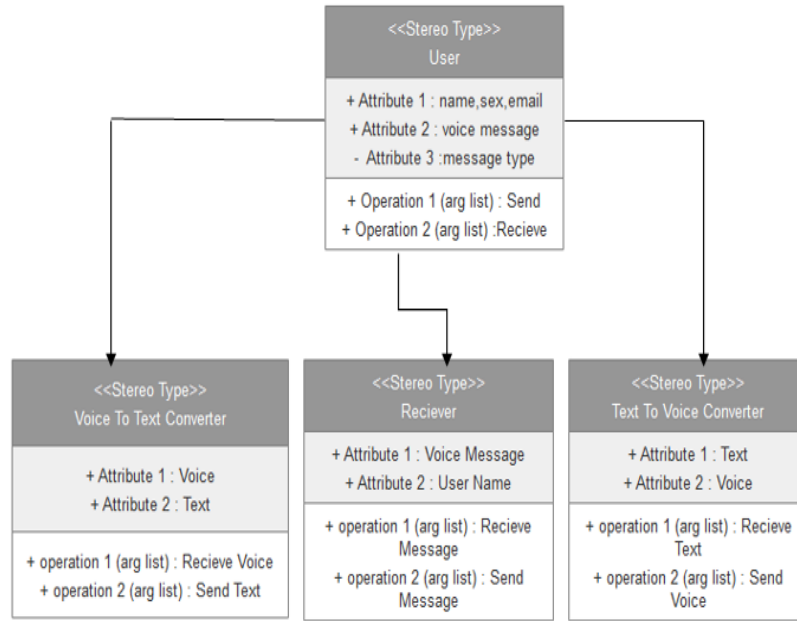


Fig No. : 2 Class diagram for user

- Sequence Diagram

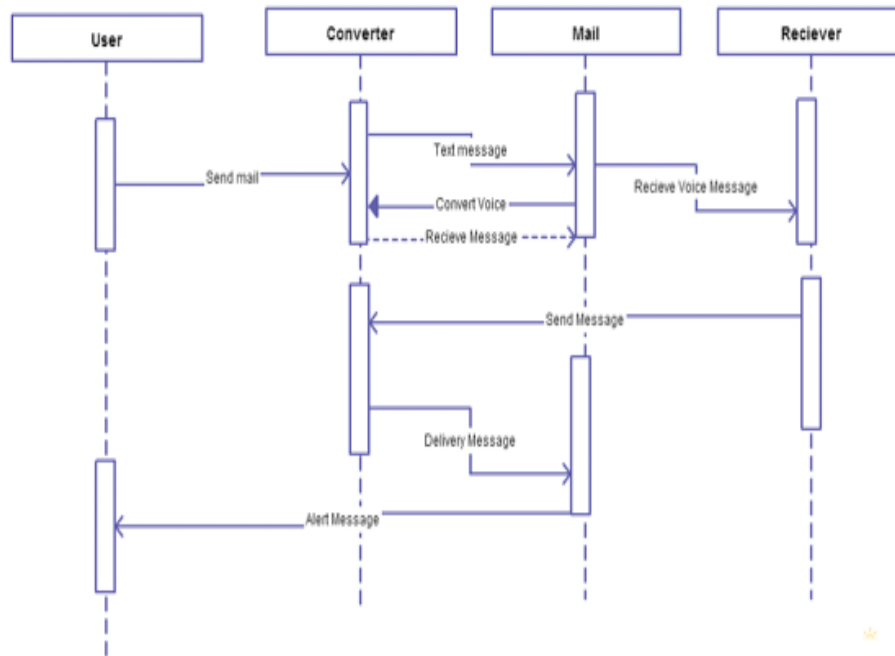


Fig No. : 3 Sequence diagram for user

B. DFD(Data Flow Diagram)

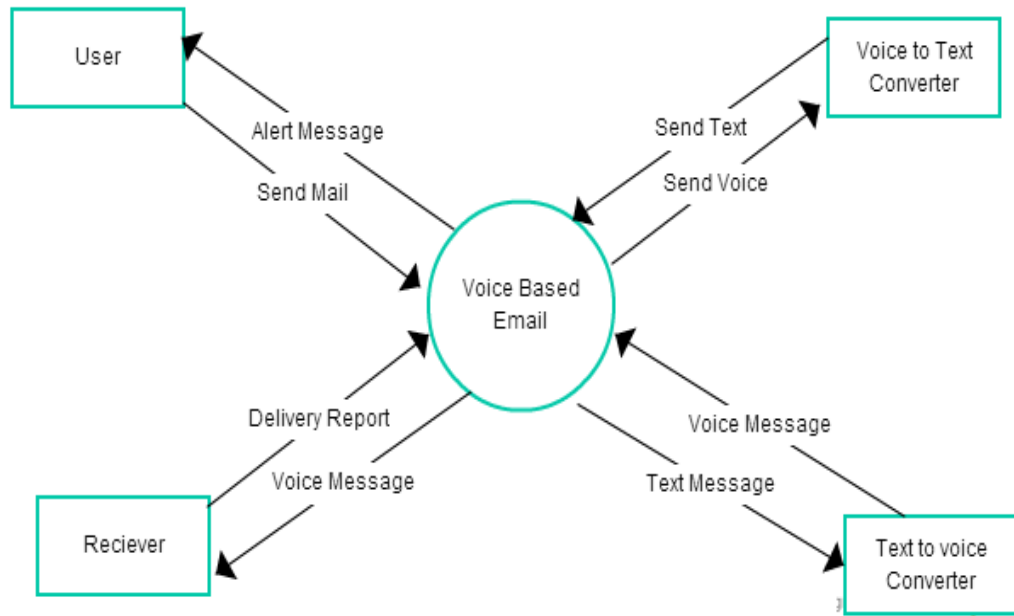


Fig No. : 4 User Details

IV. SYSTEM DEVELOPMENT

- *Welcome Page*

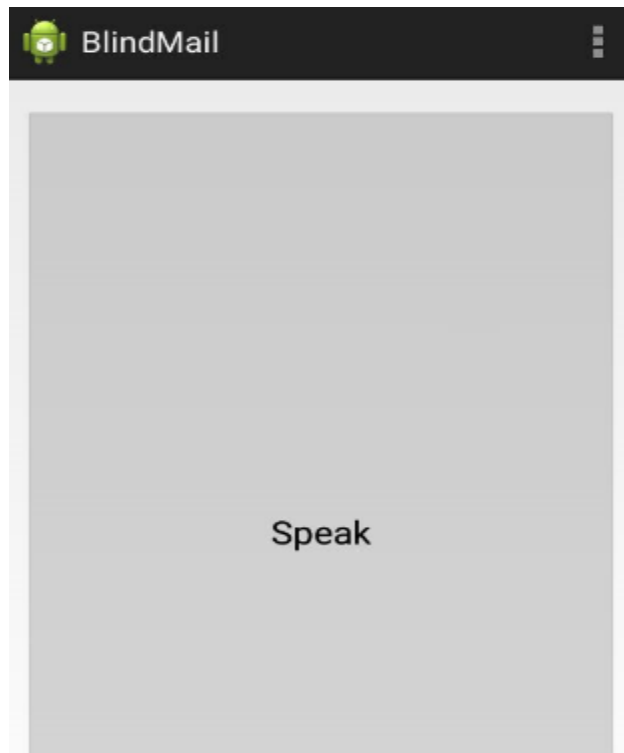
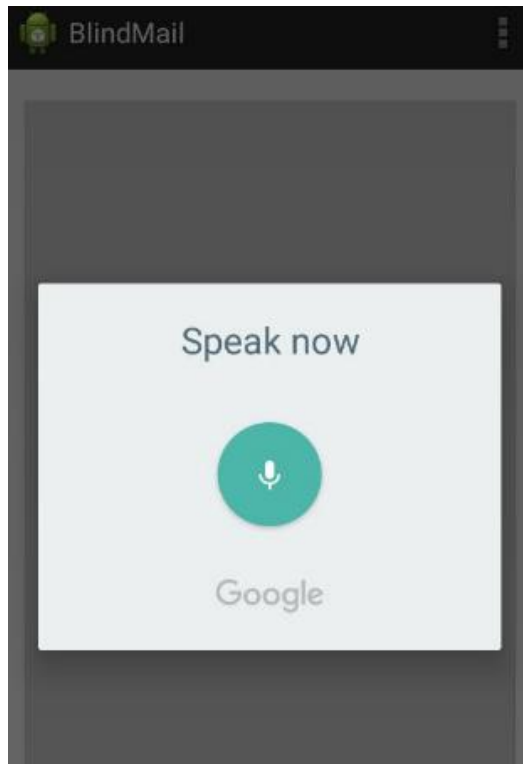


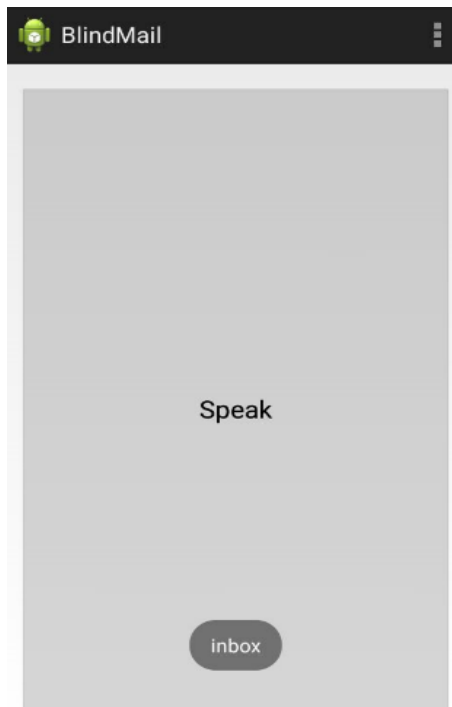
Fig: Welcome to the Voice based Email for Blind People.

- *Compose Page*



This is one of the most important options provided by the mail services. Since the system is for visually challenged people and keyboard operations are completely avoided composing mail would only be done on voice input. No typed input will be required. The user can directly record a message that needs to be propagated and can send it. The receiver can hear the recording and get the message user wanted to send.

- *Inbox Page*



The user can listen to mails he/she wants to by performing the click operation specified by the prompt.

CONCLUSIONS

This e-mail system can be used by any user of any age group with ease of access. It has the feature of speech to text as well as text to speech with speech reader which makes designed a system to be handled by a visually impaired person as well as blind people.

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