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Enunciate Mail: An IVR Approach for Blind to Access E-mail

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***Abstract*—**Internet is a rich source of knowledge and information without which very few works can be done. It is most important mode of communication and connection. E-mail overall is most common mode of communication in business world. Internet is quite useless technology for visually impaired and illiterate people. Proposed system not only helps visually impaired but also illiterate people and hence will be an important approach towards connecting people which earlier was not possible and tedious for visually impaired people to operate all functionality of E-mail system. Proposed System overcomes shortcomings of existing systems. Idea focuses on providing basic functionalities like compose, send, receive E-mail along with advance feature like Voice based operation, Search Mail, provision for voice based mail.

***Keywords*—** *Google API, microphone, Voice Commands, IVR (Interactive voice response), speech to text convertor, Text to speech Converter, Android.*

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1. INTRODUCTION

One of the main fields that Internet has revolutionized is communication. And talking about communication over Internet, the first thing that comes in our mind is E-mail. E-mails are considered to be the most reliable way of communication over Internet, for sending or receiving some important information. But there is a special criterion for humans to access the Internet and the criteria is you must be able to see. You must be thinking that what sort of criteria is this, everyone with eyes can see. But there are also especially abled people in our society who are not gifted with what you have. Yes, there are some visually challenged people or blind people who cannot see things and thus can not see the computer screen or keyboard. Need of an application like what we are developing is that it supports and help blind user to send email with ease.

E-mail above all is most common mode of communication in business world. Internet is quite useless technology for visually impaired and illiterate people. It is estimated that nearly 285 million people in world are visually impaired and idea is to facilitate to provide suitable communication system for them But this is not a correct way to deal with this problem. It is very less likely that every time a visually challenged person can find someone for help. Although for these reasons the especially abled people are criticized by our society.

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.

2. MOTIVATION

It is estimated that nearly 285 million people in the world are visually impaired and idea is to facilitate suitable communication system for them. This reason was driving force behind developing given system. One of the major disadvantage of existing system is that all operations are based on mouse click events. Operations depend completely on types of clicks specified by idea. Also sometimes remembering keyboard shortcut is difficult. The extent of existing system is limited for blind and visually impaired people. There is high need of developing a proper system which curbs all the above drawbacks and turn into a simple system. Idea focuses on providing basic functionalities like compose, send, receive E-mail along with advance features like voice based operation, search mail, provision for voice as well as text based email with added ease and simplicity.

2. RELATED WORK

Interaction of the users to the system earlier was based on Screen reader based technology also the systems given in

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are based on mouse click based operations were in for every operation there is associated mouse click for example to compose email let say to left clicks. Therefore interaction with the system is tough also there is need to keep events in mind.

This paper focuses on developing an email system which helps blind people to use communication services. The system based in IVR is used, major idea is to discard keyboard and use of mouse operation.

Internet is rich source of knowledge and information, blind people face difficulties in accessing text based material. Theidea is to develop audio feedback based virtual environment like screen reader, text to speech, etc.

Voice mail architecture helps blind people to access info. in form of audio, text, self-read system. Idea focuses on helping visually impaired and illiterate people to access technology by reducing cognitive load. Decision making depends on eyesight and everything that happens or appears

4. FRAMEWORK FOR BLIND PEOPLE

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', 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.

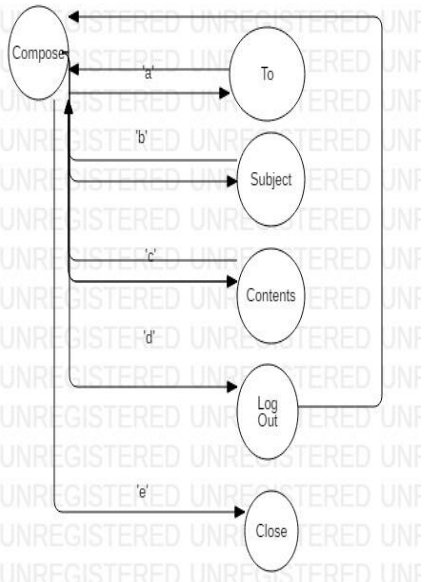

Fig 1. State diagram for email compose

4.1. Existing System

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. 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 mobile 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 thescreen only if they are in basic.

4.2. 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

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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.

4. Result

The interaction with the system is greatly simplified with help of speech-to-text and text-to-speech. Every operation within the system takes place with the help of voice commands the environment is entirely voice command driven with proper feedback from the system at every stage of interaction mouse click based interaction is completely avoided and whole interaction with the system is made voice based. In addition to text based email system Voice based Email has been also provided for added mailing options.

5. Methods Used

5.1 Speech to Text Conversion using Google API

Google Cloud Speech-to-Text enables developers to convert audio to text by applying powerful neural network models in an easy-to-use API. The API recognizes 120 languages and variants to support your global user base. You can enable voice command-and-control, transcribe audio from call centers, and more. It can process real-time streaming or prerecorded audio, using Google's machine learning technology

5.2. Text to Speech Conversion using Google API

Text-to-speech (TTS) is a type of assistive technology that reads digital text aloud. It's sometimes called "read aloud" technology.

With a click of a button or the touch of a finger, TTS can take words on a computer or other digital device and convert them into audio. TTS is very helpful for kids who struggle

with reading. But it can also help kids with writing and editing, and even focusing.

TTS works with nearly every personal digital device, including computers, smartphones and tablets. All kinds of text files can be read aloud, including Word and Pages documents. Even online web pages can be read aloud.

The voice in TTS is computer-generated, and reading speed can usually be sped up or slowed down. Voice qualityvaries, but some voices sound human. There are even computer-generated voices that sound like children speaking.

Many TTS tools highlight words as they are read aloud. This allows kids to see text and hear it at the same time.

6. Conclusion and future work

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.

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