

# VOICE BASED E-MAIL SYSTEM FOR BLINDS

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## Abstract:

Currently, visually challenged people are not able to use computers on their own mainly because keyboards are user-friendly to them. With advancement in technology, these people find themselves technologically more challenged. This is true especially in the case of social networking, which these people cannot do without external help. Voice-Mail architecture helps blind people to access e-mail and other multimedia functions. Nowadays, advancement made in computer technology has opened platforms for visually impaired people across the world. Here; we describe the voice based e-mail architecture which can be used by the blind people to access E-mail and multimedia functions easily and efficiently. It will help to reduce the cognitive load taken by the blind to remember and type characters using the keyboard. In this context, we have proposed a voice based e-mail system which will definitely help them communicate over e-mails comfortably on their own, based on artificial intelligence.

**Keywords:** Voicemail, speech to text converter, Mouse click event, Screen reader.

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## I. 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 been 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. 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 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 is a tedious job. We are going to develop an information retrieval toolkit for the blind and then transform the information into a voice so that they can hear the message and access the mail easily. We are searching for without a browser and how we are going to access the mail without the use of keyboard or mouse.

## II. METHODS AND MATERIALS

### 2.1 Related work

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 is a 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 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. 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 a 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 a 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. 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.

### 2.2 Proposed Work

The proposed system is a desktop application that allows sending and receiving of mails via the internet. We use artificial intelligence to benefit the blind to make use of the advanced technology for their growth and improvement. The proposed system is a desktop application which makes use of artificial intelligence that makes it cost-effective and easy to maintain. The proposed system makes use of the voice detection and conversion. It overcomes the disadvantages of the existing system in that it is fully voice based and gives no work to the mouse or keyboard. Since it uses voices, it provides an intuitive, as well as interactive and easy to use GUI that can be used by a blind user even if they are not computer literate. The idea is to create a class in .Net with .Net SMTP option. Voice Authentication is enabled using a simple malefic feature. The dictation mode is activated and events are generated when the user tells the number respective to the commands like send compose and read. The speech is typed into text in text box editor. When the number corresponding to "send" is said the mail is sent and when number corresponding to "read" is

said the mail is read .Inbox, as well as the IVR technology proves very effective for them in the terms of guidance. The visually impaired people can advance from Desktop application to the web based application.

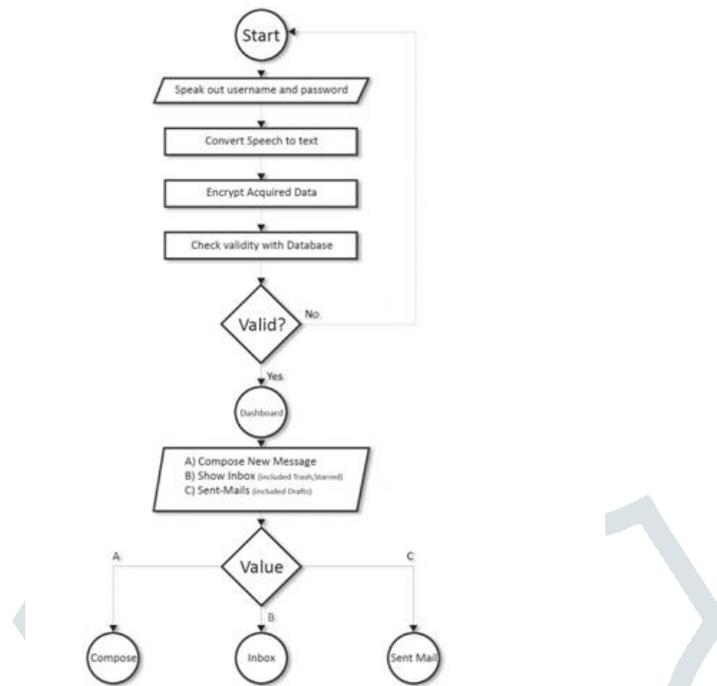


Figure 2.1 Flowchart For Desktop Application

**III. G-MAIL:**

**3.1 User Authentication System:**

In user authentication module user has to give login information such as his/her username .Password through voice command for blind users, all operation performed will get a n voice based feedback. There options to save particular user profile so that the user does not need to enter the same details again.

**3.2 Options In Mailing:**

**Sending mail:** In send mail module the compose window will open, the user has option to record a voice message or to type a text .In order to record the voice the user can either click on the “Initialize recording” button or can press the mouse right button on anywhere on the screen .The GUI of the system has been designed in such a way that bluntly of the options of the mouse pointer, the mouse click operation.

Will be register and the system will work accordingly. In order to stop the recording again the user can either click on the “end recording” button are release the mouse right button anywhere on the screen i.e. the mouse right button anywhere on the screen 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 senders 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 system will prompt the user to send the mail or to cancel the mail operation. In order to send the mail user can either press the “send mail” button or Left click on the mouse to send the mail. We will define all mouse click operation in details in the following sections.

**3.3 Check inbox:**

In the inbox module, the blind user can check the voice mail received in mail box. Blind user can choose one of the two options first is checking the ten mails and second option is check all the mails 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.

**IV. GUI ACCESSING BY USING VOICE COMMAND AND MOUSE KEYPRESS**

The GUI operation access by using voice command and mouse operation performed by the user instead of searching the short cut key from the keyboard. The user can apply the same keyboard command by performing different mouse operation and voice operation in our system each voice operation mapping to certain keyboard operation. This mouse operation can be easily changed. The mapping rules is shown in table 1 as below

- CommonRule:
- LeftClick=NextStep
- RightClick=Back
- Scroll Button Click = Dashboard

**4.1 Compose a Mail:** This module is used to compose a new mail. Below are the steps followed by this module to compose a new mail.

1. Left Click from dashboard to compose a new Mail.
2. Give Voice Data about the Recipient, and CC.
3. BCC, the Subject and then the body.
4. If satisfied with current input Left Click to go to next Stage.
5. In next Stage your voice will be recognized, Left Click to proceed.
6. In this stage your voice and input will be verified if any problem is found you are redirected to that or Left Click to proceed to send the Mail or Right Click to Double Left Click to save as Draft.

#### 4.2 Inbox:

1. This page will store all of the mails received by user. Below steps explains how to access a mail from inbox.
2. All the received Mails will be listed sorted in order of date.
3. Double left Click to give voice input to filter Mail, when Satisfied Left click to proceed
4. At, this Stage your mail will be read out, Double Left Click to start/pause

#### 4.3 Trash:

1. This folder will store all of mails deleted by the user. Below steps provide detailed explanation about this module.
2. All the deleted Mails will be listed sorted in order of date.
3. Double left Click to give voice input to filter Mail, when Satisfied Left click to proceed to Read Section.
4. In this Stage your mail will be read out.
5. Double Left Click to start/pause.
6. Left Click to proceed to delete the Mail or Right Click to back.
7. If in Delete Section Left Click to Delete the Mail.

#### 4.4 Sent Mail:

1. This folder will store all of the mails sent from the user. Below steps explains the working of this module.
2. All the sent Mails will be listed sorted in order of date.
3. Double left Click to give voice input to filter Mail, when Satisfied Left click to proceed to Read Section.
4. In this Stage your mail will be read out, double Left Click to start/pause
5. Left Click to proceed to delete the Mail or Right Click to back.
6. If in Delete Section Left Click to Delete the Mail.

**4.5 Tools Used:** Apache HTTP Server, My SQL database and interpreters for scripts, PHP for handling backend of web interface, HTML and CSS for creating Web based UI, Google Speech-to-text and text-to-speech APIs.

#### 4.6 Application:

This project is proposed for the betterment of society. This project aims to help the visually impaired people to be a part of growing digital India by using internet and also aims to make life of such people quite easy. Also, the success of this project will also encourage developers to build something more useful for visually impaired or illiterate people, who also deserve an equal standard in society.

TABLE I  
Mouse Click And Voice Command Operation

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

#### 4.7 RSS:

RSS stands for "Really Simple Syndication". It is easy way to distribute a list of headlines, update notices and sometime content to a wide number of people. It is used by computer programs that organize those headlines and notices for easy understanding and reading.

#### 4.8 RSS Working:

RSS works by having the website author maintain a list on their website in a standard way. This list of notifications is called "RSS feed". People who are interested in finding out the latest headlines or changes can check this list. Special computer

programs called “RSS Aggregators” have been developed that automatically access the RSS feeds of websites you care about your behalf and organize the results for you. RSS feeds and aggregates are sometimes called as “RSS Channels” and “RSS Readers” respectively. Producing an RSS feed is very simple and hundreds of thousands of websites now provide this feature including major news organization like the New York Times, The BBC and Reuters as well as many weblogs.

#### C.Desktop Browser

Desktop browser provides voice feedback in this system the when user operate a particular drive then system informed the user by speaking out particular drive name such as “this is D drive” this help the user to confirm whether he or she in correct location or not.

### V. VOICE BASED SYSTEM FOR MOBILE

Proposed system read messages on users mobile. As well as E-mail, other multimedia functions like (audio, text), news are handled same as discussed in voice based system for desktop. Thus, we created a version of the same desktop applications up and running on and 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”x4.0”.
2. Android OS version 2.3.6 or higher.
3. CPU speed >= 400 MHz
4. At least 30MB of free phone memory, with support for SD card installation.
5. System requires at

#### 5.1 Voice Based Email Implementation

Least 80MB of secondary storage

### VI.RESULTS AND DISCUSSIONS

This mailing system is developed using artificial intelligence. The proposed system is implemented by using the following hardware and software. They are as follows

#### Hardware:

Pentium IV processor

512 MB RAM

Microphone

#### Software:

Front End: ASP .Net

Back End: MS SQL Server 2000

The proposed system has 4 stages of implementation namely

1. System and mailing server
2. Traditional mailing system
  - 2.1. Mail composes and Send
3. Voice based command detection
5. Voice based mailing system
6. Mail composes and sends
7. Read mail

Each level is implemented using .net in the front end and Ms SQL at the backend.

#### 6.1 System and Mailing Server

A System is an application that accesses a service made available by a server. To send the request to the server, the users have to be registered in the server. A mail server is similar to a post man who receives the letters and sends it to the appropriate recipient. Similarly the mail is sent to the Server from where it is sent to the recipient using Pop3 protocol, SMTP etc..

Although it may seem like a message is sent instantly zipping from one PC to another in the blink of an eye - the reality is that a complex series of transfers takes place.

#### 6.2 Traditional Mailing System

Initially a traditional mailing system is developed which makes use of the keyboard and mouse. It does two basic operations namely mail compose and sending the mail.

#### 6.3 Voice Based Command Detection

A voice command based on ground truth collection system that uses grammar based commands from residents to start and end activities. It makes use the algorithm works in the way that the system detects the most appropriate word when user spells it and then matches the word that is guessed with the actual word that is pronounced by the user. If both of them are found to be same then the word is selected from the dictionary and typed by the system without giving any burden to the user.

#### 6.4 Voice Based Mailing System

Here the main purpose of proposed system is implemented.

##### 6.4.1 Mail Compose and Send

In this we compose the mail through the voice based detection method where the speech is converted to text and the commands are saved in the server. Thus the mail is composed using text to speech conversion method. Based on the command the voice is recognized and it will be converted into the text and understood by the application and then the mail is sent through the mail server to the specified recipient.

##### 6.4.2 Read Mail

When viewing a list of conversations in your Inbox or, you can open a particular mail to read its messages. A mail is opened and read according to the user's convenience and mostly priority is given to the unread mails. When a user chooses a mail by telling

the number of the mail it opens and the text in it is converted into voice and the mail is read. All these activities take place without the use of keyboard

#### **6.5 The contributions of this paper are summarized as follows**

We point out that Voice based email is an initiative of introducing the mailing system that entirely concentrates on the benefits and comfort of the visually challenged and blind people. However, by taking advantage of the voice mail a detailed version of mailing system has been developed to benefit the blind. To the best of our knowledge, this paper is an early feasible work on Voice based email for blind. We propose desktop ap 6 clicks. Rather, this project will reduce this problem as mouse pointer would read out where he/she lies. This system focuses more on user friendliness of all types of persons including regular persons, Visually compromised people as well as illiterate. Inbox, as well as the IVR technology proves very effective for them in the terms of guidance. The visually impaired people can advance from Desktop application to the web based application. Application that can be accessible from elsewhere any this application is platform independent and it is supported by windows of any versions ranging from windows Xp to windows 8.1. The proposed method benefits from platforms, and it is easy to implement. We establish the dynamic feature of notification that is entirely based on voice to enhance the performance of the proposed system. The research based analysis and experiments conclude that it is possible to add more features to the mailing system.

### **VII. FUTURE ENHANCEMENTS**

Future enhancements include adding more features to the developed mailing system like attaching audio and rar files. The proposed system includes only features like mail compose, sending a mail and receiving a mail through voice based detection which are basic features. So further features can also be added

### **VIII.ADVANTAGES**

1. The disabilities of visually impaired people are thrashed.
2. This system makes the disabled people feel like a normal user.
3. They can hear the recently received mails to the available. But people had to remember mouse clicks. Rather, this project will reduce this problem as mouse pointer would read out where he/she lies.
4. This system focuses more on user friendliness of all types of persons including regular persons, visually compromised people as well as illiterate.
5. The disabilities of visually impaired people are thrashed.
6. This system makes the disabled people feel like a normal user.
7. They can hear the recently received mails.

### **IX.CONCLUSION**

Voice based architecture helps blind people to access email 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 project 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.

### **X. ACKNOWLEDGEMENT**

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