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Efficient Email System for Blind People using Automatic Speech Recognition

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Abstract - *Internet has become a widely used service in today's day to day life. Every person has the power to access the internet for different needs like gaining knowledge ,information or for communication purpose. The main feature of internet in communication is the Email System. It's easier for us to use the emailing system, but it is very difficult for the Blind people to do the same. There are many different screen readers which help them to read or compose their mails. This application helps them to perform the mail functions efficiently using voice commands. The message is composed as a voice recording attachment and then it is been sent to the specified user. Through this the sending and receiving of the emails can be done in any native languages. This method will also help in avoiding any in-between text change problems.*

Keywords: ***Text -to -speech(TTS), Voice Mail, Speech- to -Text(STT), Speech Recognition Engine, Visually impaired.***

1. INTRODUCTION

Internet is the most important means of information and communication. The email system is one of the most important form of communication. However, it is completely useless for visually impaired and blind people. Current systems like screen readers or recognizer do not provide necessary efficiency to blind people to use the application. As nearly a million people worldwide are visually impaired so it is very needful to make internet facilities for communication usable for them. In this project, we will be developing an "Efficient Email System for Blind People Using Automatic Speech Recognition" to use email facilities with ease. The server enables the registered users to log in to their accounts through typing the credentials as that is the most secure way. Further, there will be two options displayed ie, either to check the inbox or the Compose Mail. Through this, we can either compose a mail or check the received mail. There will be prompts on each step of the process. Technologies used will be Text to Speech, Speech to Text, Automatic Speech Recognition. Different speech engines will be used. This desktop application includes blind or partially sighted users, people with dyslexia or learning difficulties. Hence all people due to the ease of use will freely use this desktop application. It considerably reduces the effort required to type and the effort required to read. The main technical requirements of the system, Microsoft's Speech Application Programming Interface (SAPI) to provide speech output.

2. PROBLEM STATEMENT

At the present time, access to information on the World Wide Web is difficult for disabled people. This voice based email application is a desktop application that presents an interactive voice user interface to the user, useful to those who have difficulty reading or seeing. We aim to overcome the short comings of the existing system in making the user completely independent with our proposed system.

3. EXISTING EMAIL SYSTEM

There are many email accounts created until 2014 and there are 3.9 billion active email users early in 2019. This makes the email system is the most important form of communication. It's easier for us to use the emailing system, but it is very difficult for the Blind people to do the same. There are many different screen readers which help them to read or compose their mails. As they cannot understand and recognize what is present on screen they cannot make out where to click to perform the particular operations. For a blind person using computers not that very easy as it is for normal people even though it is user friendly. Although there are some screen readers available still these people face many difficulties. Screen readers help to read whatever content is present on the screen and to perform those actions the person will have to use keyboard shortcuts as mouse clicks or location cannot be traced by the various screen readers. Our project aims to overcome these drawbacks.

4. WORKFLOW

The below figure shows the flow of the project. The user can send emails to listen to what they have written and also receive emails and listen to them with voice commands. In Email application, the SMTP protocol is used that is for sending emails and the POP3 protocol is used for receiving emails. SMTP (Simple mail transfer protocol) is the reliable protocol to send emails and in a

simple way that the SMTP server will pass on the emails messages quickly. POP3 (post office protocol) is also used to receive emails .it works in this way that the POP3 server stores the email and on request the emails are displayed the same is implemented in the project on the request of using the emails are being downloaded.

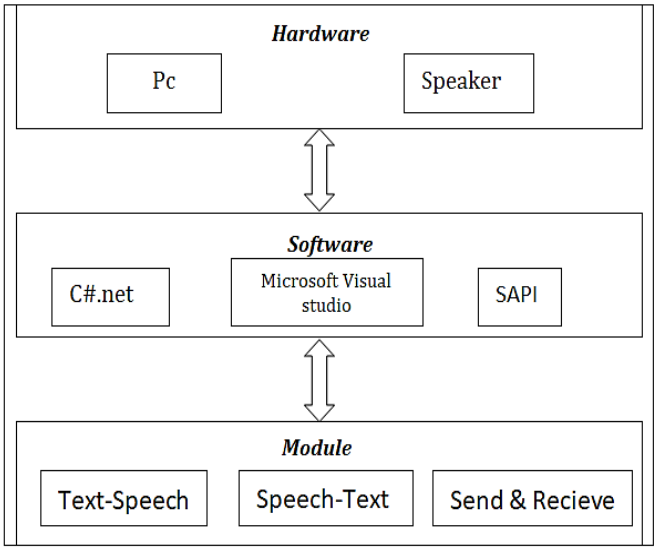

Fig1-Workflow of proposed system

The proposed system of an email application is made to access various mails with bits of help to voice commands.

C#.NET- C# was developed by Microsoft and is employed in essentially all of its products. It is mainly used for developing desktop applications, it is also a part of. NET so it's used alongside languages like ASP in web development and apps.in our proposed system we are developing the desktop application of voice email system using C#.

Microsoft Visual Studio- Microsoft Visual Studio is a very famous platform for developing various computer and mobile devices application and web applications, its integrated development environment (IDE) from Microsoft. It is wont to develop computer programs for Microsoft Windows and web services. We are using this platform to defining our voice email system.

SAPI(Speech Application Programming Interface**)-**
The Speech Application Programming Interface or SAPI is an API developed by Microsoft SAPI is used for speech recognition and handling various speech application or services. SAPI will directly connect with various device for speech recognition, its work as a speech engine in any speech-related applications, in our proposed system SAPI is an important tool for developing the voice mail.

Text-Speech and Speech-Text
Text to speech exactly sounds like a human voice, using a Speech tool we can able to develop the TTS. If we provide some text to the application it will read that text in the human voice. This application we are using in the check mail module, with the help of this engine user can easily listen to the received mail. And another one is the speech to text this is also an important application for converting human voice into text format, it will print the letter or words said by users.in our system this application is used for composing a short message.

5. MODULES

Module 1: Login and registration
The user can login to the account by providing the username and password. If the user is new to the application, then he needs to register to the mail account by providing his details and registering to it.

Module 2: Inbox
In the inbox module, when the user tabs over the button, he will be informed who the sender is. If a user wants to listen to the mail, he has to click the button. On clicking the respective button for the mail, the corresponding mail will be read out for user.

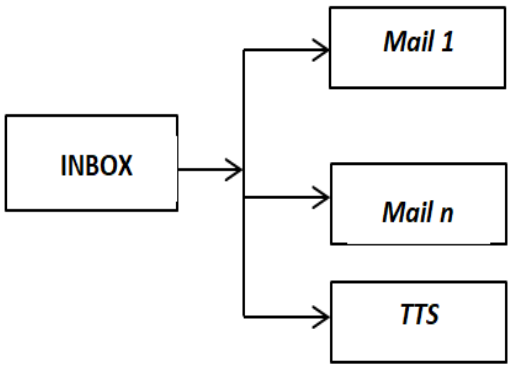

Fig2-Inbox Module

Module 3: Compose
In main module(Compose), the user has three options: to record, play and send the mail. On clicking the record button, user can record the message for a maximum time limit. This recording will be saved as an audio file. He can now listen to this message by clicking on the "Play" button. Finally, by clicking the "Send" button, the audio message will be sent to the specified recipient.

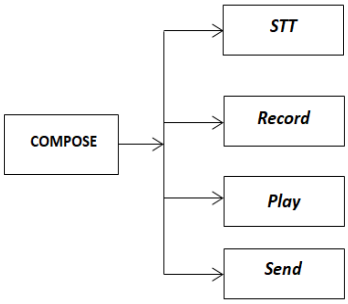

Fig3-Compose Module

6. FLOWCHART

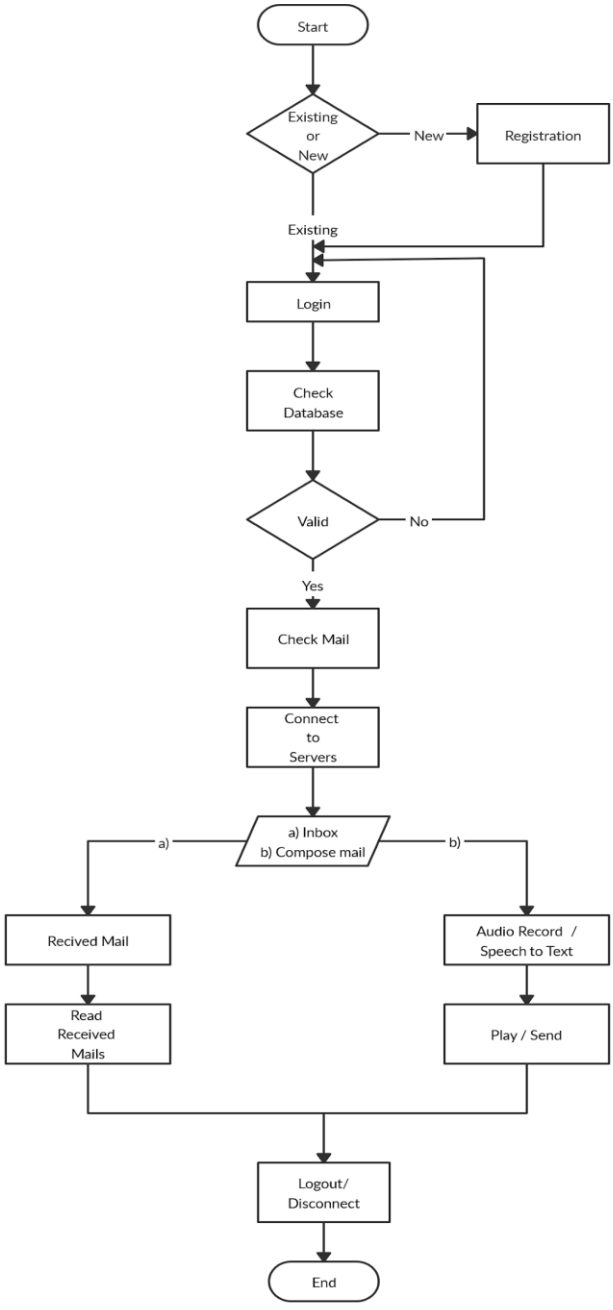

Fig4-Flowchart of proposed system

7. TEST CASES

Table1: Test Case of system

Test Case	Description	Action	Expected Result	Actual Result	Result
Register	Click on Register	Check password entries match	Match: login Page Mismatch: Error message	Same as expected	Pass
Login	Click on Login button	Check username & password are valid	Valid: inbox Page Invalid: Error message	Same as expected	Pass
Inbox (Check mail)	Click on Inbox button	Show the list of all the received mails	Mail: Read out the received mail	Same as expected	Pass
Compose	Click on Compose button	Show different compose options	Record: Record message Listen: Play the recorded message & send	Same as expected	Pass
Sent Mail	Click on Sent Mail button	Show the mails sent by the user	Play: Play the message	Same as expected	Pass

During testing, the software to be tested is evaluated to determine if the system is performing as expected. We have various test cases, such as Register, login, check mail, compose mail and sent mail. Every test case in this implementation giving completely expected results as the flow of project. Actions are performed correctly for the Actual result.

8. STATISTICAL EVALUTION OF SYSTEM

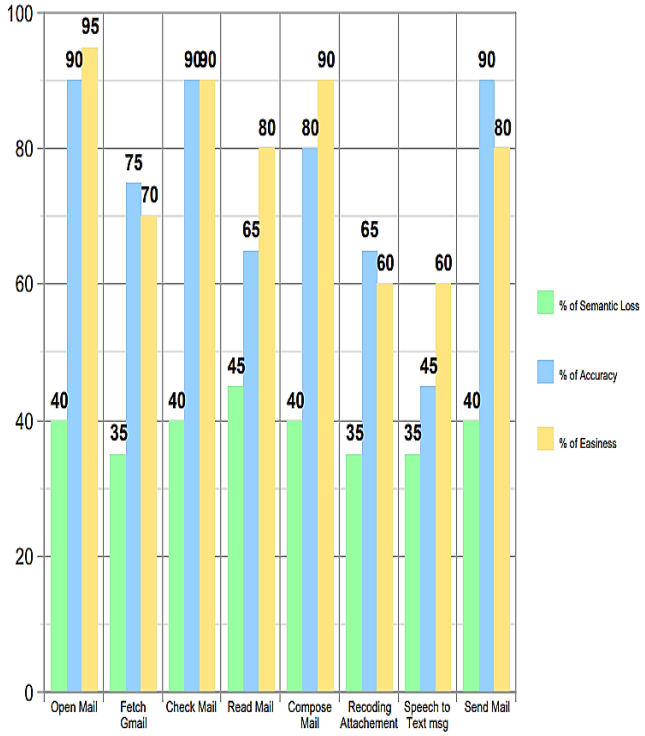

Chart1--Statistical Evalution of Email System

This statistical evaluation of activities contains mainly easy-to-operate activities for all users. The easiness in operations is the proper arrangement, and state representation of the activities in our proposed system. In this analysis, we have represented a standard deviation in performing an activity, the highest value of accuracy was 95%, and the low value was 45%. One of the parameters determined the degree of easiness achieved while performing the given task. This parameter is calculated by the mean and standard deviation (SD) to find out the easiness and accuracy of performing the activity during task completion.

9. TIME ANALYSIS

Time analysis methods for analyzing the time taken for a particular action to extract meaningful statistics of the data.in our proposed system we are analyzed time factor for Check mail(inbox) and compose Mail module.

Time analysis for check mail

Table2: Time analysis for check mail

Actions	Time(in sec)
Email log in	3
Fetching Gmail	10
Reading mail	6
Total time	**19**

check mail module contains various actions like login to mail, fetching mail and reading the received mail, etc. all activities will take a small amount of time to perform tasks related actions.

Time analysis for Compose mail

Table3: Time analysis for Compose mail

Actions	Time (in sec)
Attaching Recorded File	9
Play Recorded File	7
Speech to text msg	8
Send mail	4
Total Time	**28**

Compose module is a very important module of our proposed system, it contains action like Attaching the recorded file, and also play the recorded file for conformation, Speech to Text and then sending mail.

10. RESULTS

Fig5: Login Page

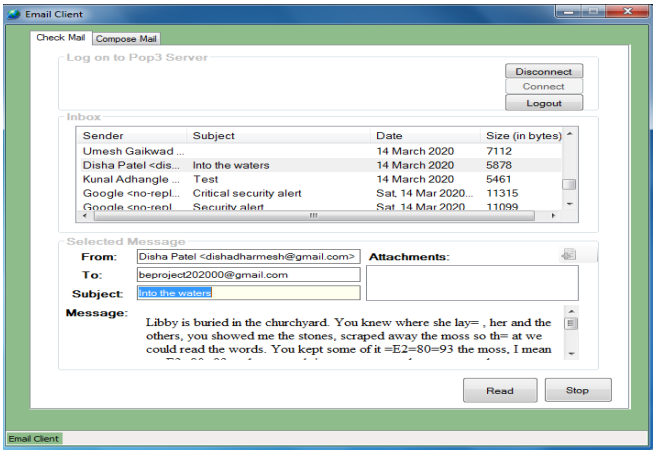

Fig6: Reading mail form inbox

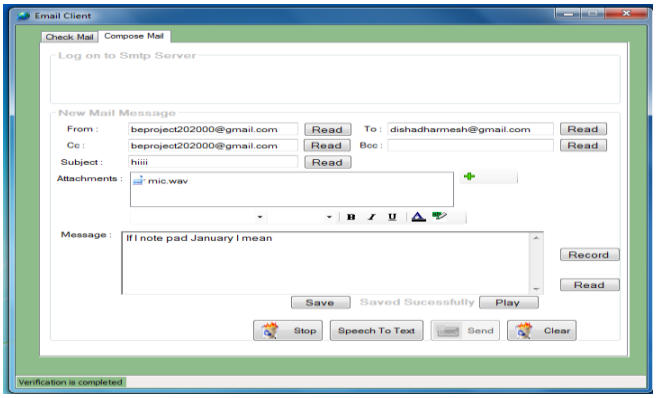

Fig7-Composing mail

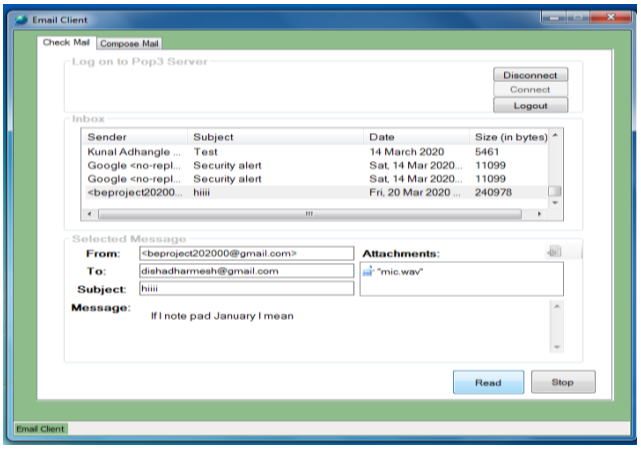

Fig8- Recipient Received mail

11. CONCLUSIONS

The Voice based Email is a System that helps the blind and handicapped people to access email easily and efficiently. It presents a voice-based mailing carrier wherein the blind user could read and send mail on their own without taking the help of anybody. It requires basic information about keyboard shortcuts used or where the keys are located. We have eliminated all these concepts problem and overcome all difficulties faced by blinds. In Voice-based Email, there is no requirement to remember the location of keys on the special characters using traditional Braille keywords available for blind people. It uses a speech recognition application that provides an efficient voice input method for mailing devices for the blind. It is also useful for handicapped and illiterate people.

REFERENCES

[1] Akif KhaN1 · Shah KHUSRO1 · Badam Niazi2 · Jamil Ahmad3 · Iftikhar Alam1 ·Inayat Khan.,' Tetra Mail: a usable email client for blind people', Springer-Verlag GmbH Germany, part of Springer Nature 2018

[2] Anbumani .P,Jayachandran .K,'Voice Based Email for Blind People',International Journal of Advance Research, Ideas and Innovations in Technology.

[3]Dhanashree.D. Zope1, Pooja.B. Nevewani2, 3Pooja.G.Teje, Nusrat Parveen4,' Voice Based E-Mail System for Blind People' International Journal of Scientific Research in Computer Science and Engineering Vol.5, Issue.4, pp.73-75, August (2017)

[4] Hari Priya S L, Karthigasree S, Revathi K.' Voice – Based E-Mail (V-Mail) for blind' International Journal of Scientific Research in Computer Science and Engineering Vol.5

[5] Milan Badigar, Nikita Dias, Jemima Dias, Mario Pinto..' Voice Based Email Application for Visually Impaired' IJSTE - International Journal of Science Technology amp; Engineering — Volume 4 — Issue 12— June 2018

[6] Manjira Sinha, Ritwika Ghose, Anupam Basu, Tirthankar Dasgupta, Aakash Anuj, 'VoiceMail Architecture in Desktop and Mobile Devices for the Blind Peo- ple', IEEE Proceedings of 4th International Conference on Intelligent Human Computer Interaction, Kharagpur.

[7]Nuno Fonsecaa,Roberto Netoa ,'Camera Reading For Blind People' International Conference on Healthand Social Care Information Systems and Technologies

[8] Prince Bose, Apurva Malpthak†, Utkarsh Bansal‡, Ashish Harsola,' Digital Assistant For The Blind' 2017 2ND International Conference for Convergence in Technology (I2CT)

[9] Shaheena Sultana, M. A. H. Akhand, Prodip Kumer Das, M. M. Hafizur Rahman,'Bangla-Speech To Text Conversion using SAPI',International Con- ference on Computer and Communication Engineering (ICCCE 2012), 3-5 July 2012, Kuala Lumpur, Malaysia

[10] Voicebased e-mail System for Blinds International Journal of Research Studies in Computer Science and Engineering (IJRSCSE)Volume 3, Issue 1, 2016, PP 25-30