Voice Based Email for the Blind

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Abstract

Voice-based email system for the blind allows people with visual impairments to send and receive emails using voice commands. The system is intended to give blind people an effective and accessible form of communication, removing the need for them to rely on other people to read and reply to their emails. With voice-based email, the user's spoken commands are translated into text using speech recognition technology, which is subsequently processed and forwarded to the intended recipient. Simple voice commands like "compose," "send," and "read" make it easy for users to traverse their inbox and create new emails with this system. The blind can keep their freedom and communication with friends, family, and coworkers by using voice-based email.

1 INTRODUCTION

Email, a vital form of communication in the modern world, can be challenging for the visually impaired to use and manage. The issue originates from email programmes' dearth of accessibility capabilities, which makes it challenging for people with visual impairments to utilise them. The visually impaired need equal access to communication technologies because they make up a sizeable segment of the population. Those who are blind or visually handicapped may find it easier to read, write, and manage emails using the voice-based email system.

2 MOTIVATION

Developing assistive technologies that make use of machine learning is crucial since India has the highest number of visually impaired persons in the world—approximately 8 million—and the majority of these cases are avoidable. With the help of voice commands and email access, visually impaired individuals can access their emails and communicate through voice commands, resulting in an enhanced quality of life and improved social interaction.

3 PROBLEM STATEMENT

Our goal is to improve the conversion of speech data with background noise to text, as existing systems struggle to do so. The system is a complete email management system because it includes special features like email navigation and management Users with typing issues, disabilities, limited skills or knowledge, and elderly people can also benefit from voice-based email systems as it offers a user-friendly and straightforward communication method.

4 LITERATURE REVIEW

[1] This research solution is based on the creation of a desktop programme that will enable users with visual impairments to quickly and simply retrieve email by integrating it with certain email clients, providing users the ability to access their features. However, there is a requirement for a system that is more inclusive of users with speech disabilities or individuals with different languages and also there is a dependency for additional hardware cost of mic if using a desktop.

[2] The paper outlines a novel technique intended to improve email accessibility for those with specifically only having visual impairments. Those with physical limitations can also benefit from the system, creating the potential to be expanded to include other uses in the future. The study focuses on ways to strengthen the sense of community among people with vision impairments in this constrained setting. However, there is a need for a comprehensive email management platform which is also inclusive of individuals with limited cognitive abilities, physical disabilities which hinders their ability to type, elderly people etc.

[3] The article describes a web application that employs voice commands to operate the system. Users can access numerous services with speech commands and register for utilizing a voice-assisted method. In order to access services and acquire all the necessary information through voice commands, the system will prompt users to carry out particular actions. The system will function in accordance with the various areas of the dashboard to give the user the requested service.

[4] The article highlights a system that offers email services using speech recognition and mouse clicks. The requirement for using a keyboard has been completely eliminated. The user can enter their login credentials, which is verified and encrypted before redirecting them to the dashboard. When the user replies to a voice command from the system to do an action, the system transforms the voice command to text and carries out the requested action, such as sending an email or performing other tasks. However, implementing speech based login verification creates the need for careful consideration of security and privacy. Unauthorized attacks and access should be prevented and the system should be robust against voice

mimicking or other types of threats. Therefore, it is recommended to implement additional security measures, such as multi-factor authentication, to ensure the system is secure.

[5] The present email systems are reliant on visual impressions making them ineffective for those with visual impairments. In order to give visually impaired persons a straightforward and convenient way to access email, the paper suggests a new email system based on voice control principles designed to be further helpful to people with other disabilities, the system.

5 PROPOSED METHODOLOGY

The proposed system will use state-of-the-art speech recognition technology and natural language processing algorithms to convert the user's voice commands into text and then into actionable email commands. With the aid of voice-based email technology, users can create and send email messages entirely orally. For those who prefer speaking to typing or who have trouble using a keyboard, this innovation is meant to make emailing simpler and more accessible. Users can dictate their emails and deliver them to recipients using speech-based email by using just a few straightforward voice commands.

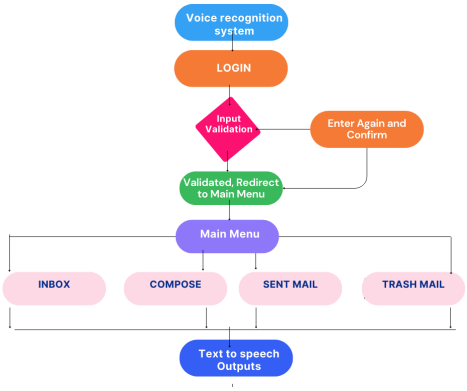

Figure 1: Workflow

- Voice recognition system: The email system records spoken input from patients who are blind or visually challenged and accurately transcribes it.
- User Input: The user will be required to provide their login information and confirm their entry.
- Input Validation: The user is then directed to the main menu, where he or she can select one of the five options for the email operation to be carried out: inbox to check the received emails, compose mail to send the desired email to the desired recipient, trash to check the deleted emails, and sent mails to check the user's outbox.
- Speech-to-text transcription: After the user dictates their message, the system uses a speech-to-text transcription technology to turn it into text.
- Text-to-speech output: The system reads out the contents of the user's messages to them using a text-to-speech tool when they are listening to their messages. Overall, the voice-based email system user interface ought to be simple to operate and navigate, with audible prompts that are easy to understand and voice recognition that works as expected.

6 BASELINE RESULTS

The Voice Based email system has been designed in a way that the visually impaired can provide speech inputs to interact with the user interface and the email system will provide him/her with the desired functionalities.

6.1 Login

The login page will allow the users to access their email accounts with the help of their speech inputs as the means of authentication which would be particularly useful for users who have difficulty typing, individuals with disabilities, people with limited skills or education or elderly people. The Following methodology has been implemented to curate the speech-based login page: An interactive user interface that prompts the user to input their email address using speech inputs. Applying speech recognition tools to capture the user's email address. The email address is then validated by checking it against a database of registered users using sqlite. If the email address is valid, the user is then prompted to provide their password using speech recognition. Now, similarly the password is validated by checking it against the user's stored password. If the password is valid, grant the user access to their email account.

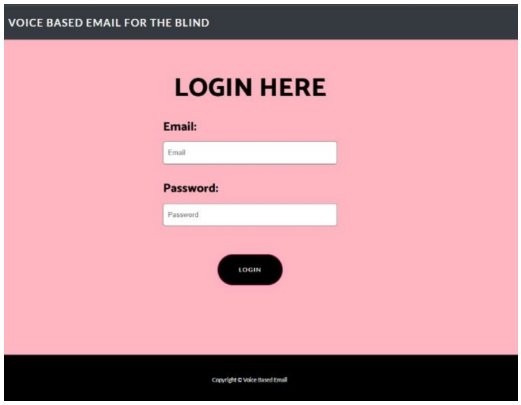

Figure 2: Login

6.2 Main Menu

After the user's credentials have been validated, he/she will be redirected to the main menu where the user will be prompted to select an option from a list of options: compose, inbox, sent, trash, and logout. The following steps have been taken to implement the main menu: The user interface for the main menu that prompts the user to select an option from compose, inbox, sent, trash, and logout. Google speech recognition tools to capture the user's speech input. The option would then be authenticated against the list of the given 5 options. Appropriate action would be taken if the selection is found to be valid and if not valid then the user will be prompted to try again.

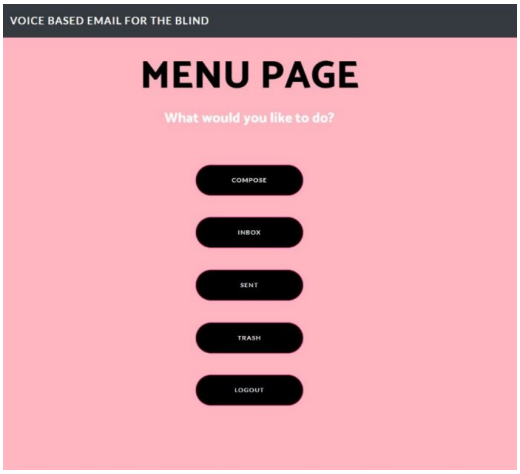

Figure 3: Main Menu

6.3 Compose Mail

If the selection made by the user is "Compose", the user will be asked to input the recipient's email address via speech and then the recipient's email address will be captured accordingly. After that, the user will be asked to speak the email subject and body. After validating those, the user will be asked to compose the email and send it.

6.4 Inbox

If the selection made by the user is "Inbox", the user's inbox will be fetched and the google text to speech tool will read out the email messages in their respective inboxes.

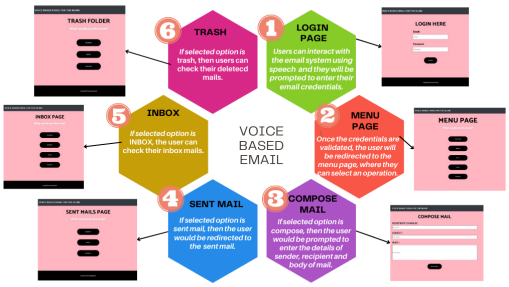

Figure 4: System Prototype

6.5 Sent Mail

If the selection made by the user is "Sent", the user's outbox/sent mails will be fetched and the google text to speech tool will read out the sent out email messages.

6.6 Trash

If the selection made by the user is "Trash", the user's deleted emails will be fetched and the google text to speech tool will read out the deleted email messages.

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