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A Review on Voice-Based Email System for Visually Impaired

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Abstract: One of the necessities for daily life is now the internet. Through the internet, knowledge and information are broadly accessible to all people. However, blind individuals have trouble reading these text resources and utilizing any online service. The development of computer-based accessible solutions has greatly expanded the opportunities available to the blind worldwide. Blind persons have benefited greatly from using audio feedback-based virtual environments such as screen readers in accessing online apps. We outline the architecture of the voicemail system so that a blind person can effectively and readily access emails. Audio-based environments, screen readers, and many other features have helped blind individuals to take advantage of the workspace. Private information must now be sent via email. One technological tool that aids in corporate facilitating communication and enabling users to send emails to one another. The main objective is to develop an email system that is voice-based for those who are visually challenged or blind, enabling them to send and get emails on a computer. It will leverage the latest features to produce an atmosphere that is advantageous for visually pushed individuals to work without assistance from outside sources.

Keywords: Accessibility, Computer-based accessible solutions, Audio feedback-based virtual environments, Audio-based environments.

I. INTRODUCTION

1.1 Overview:

In a world increasingly driven by digital communication, accessing, and managing emails is a fundamental skill that connects people, facilitates information exchange, and empowers individuals in both personal and professional spheres. However, the barriers to this vital form of communication are significant for visually impaired individuals. The absence of accessible tools and interfaces often relegates them to the periphery of the digital age, limiting their opportunities for social interaction and employment. In response to this profound challenge, developing a Voice-Based Mail System for visually impaired individuals emerges as a beacon of inclusivity and technological innovation. This system harnesses the power of voice recognition technology and artificial intelligence to create a user-friendly, accessible, and intuitive platform for individuals with visual impairments to send, receive, and manage their emails.

This groundbreaking system not only addresses the digital divide between visually impaired individuals and their sighted counterparts but also serves as a testament to the potential of technology to break down barriers and foster greater independence and connectivity. The equation is multileveled and inserted into your text as a graphic in this exploration, we will delve deeper into the concept of this Voice-Based Mail System, highlighting its benefits, technological foundations, and the transformative impact it has on the lives of the visually impaired individuals, ultimately driving us toward a more inclusive and equitable digital future. The internet has become one of the desirable or practical things for daily living. By obtaining access to knowledge, facilitating human relationships, and increasing enterprises with associations, it has improved people's quality of life. The first luxury for a round-the-clock lifestyle is the internet. everyone who accesses the online data and information. The internet makes people's lives easier when they use it for the exchange of ideas. The Internet has drastically changed the fields of exchange of ideas.

II. METHODOLOGY

Voice prompts and move events underpin the entire system. The computer will prompt the user to carry out certain actions to access the appropriate services when using this system, and the user must carry out those actions to access the relevant services. A primary benefit of this technique is that most of the time, users won't need to utilize the keyboard. Every action will be dependent on mouse click occurrences. Presently, the topic of how blind users will locate the mouse pointer emerges. Given that a specific place cannot the blind user's tracking, therefore the user must move the mouse from top to bottom on the screen and then go to.

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The voice prompts and move events serve as the system's foundation. When utilizing this system, the user will be prompted by the computer to perform specific tasks; the user must follow those instructions to access the required services. The main advantage of this method is that Users won't need to use the keyboard most of the time. Each operation will be reliant on mouse click events. Right now, it is brought up how blind users will find the mouse pointer. Since a particular location cannot be the blind user's tracking, they must scroll the mouse up and down the screen to then proceed.

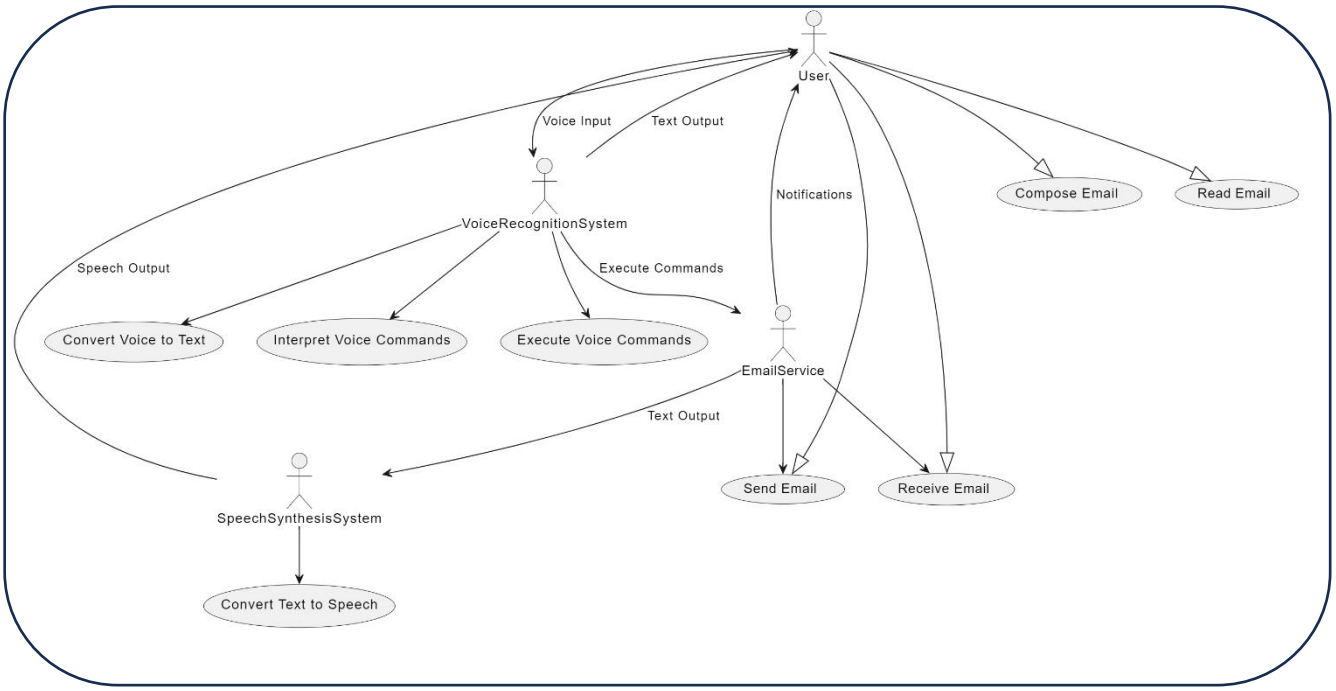

Fig. 1. Use Case Diagram for Voice-based E-mail System for Visually Impaired

A voice-based email system for the blind is a valuable technology that aims to improve accessibility and communication for individuals with visual impairments. This literature review provides an overview of existing research and developments in this field, highlighting the key challenges, technologies, and solutions associated with such systems.

1. **Introduction to Accessibility Technology:** Access to email is essential in today's digital age. However, the visually impaired face unique challenges when it comes to reading and sending emails. Voice-based email systems are designed to bridge this accessibility gap by providing a means of interaction that relies on spoken language.

2. **Challenges Faced by the Blind:** Visual impairment poses numerous challenges for email communication, such as reading text, understanding attachments, organizing messages, and managing email folders. These challenges underline the importance of developing effective voice-based solutions.

3. **Text-to-Speech Technology:** Text-to-speech (TTS) technology is a fundamental component of voice-based email systems for the blind. It converts text into spoken words, making written content accessible. Research has focused on improving the naturalness and accuracy of TTS systems to enhance the user experience.

4. **Speech Recognition and Voice Commands:** Voice recognition and natural language processing technologies are crucial for enabling users to compose and send emails using their voice. Research in this area has aimed to make these systems more reliable and efficient.

5. **Navigation and User Interfaces:** The design of user interfaces that are intuitive for blind users is a key consideration. Studies have explored the effectiveness of different navigation methods, such as screen readers, gesture-based interactions, and voice commands.

6. **Security and Privacy:** Ensuring the security and privacy of email communication is paramount. Researchers have examined various methods for safeguarding the content and access to voice-based email systems.

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7. **User Experience and Acceptance:** Understanding the user experience and the acceptance of these systems among blind users is critical. User studies and surveys have been conducted to gather feedback on the usability and overall satisfaction with voice-based email solutions.

8. **Integration with Assistive Technologies:** Integration with other assistive technologies, such as braille displays and screen readers, is important for providing a comprehensive email solution for the blind. Research has explored how these technologies can be seamlessly integrated.

9. **Case Studies and Implementations:** Several voice-based email systems and applications have been developed and implemented. Case studies and real-world examples showcase the practicality and benefits of these solutions in improving the lives of blind individuals.

10. **Challenges and Future Directions:** The literature also addresses current challenges and potential areas for future research, such as improving multilingual support, enhancing email organization and search capabilities, and developing mobile-friendly solutions. A voice-based email system for the blind holds great promise in enhancing the accessibility and independence of visually impaired individuals.

While there have been significant advancements in this field, ongoing research and development are essential to continually improve the functionality and user experience of such systems. In conclusion, voice-based email systems for the blind are an important area of research and development within the realm of accessibility technology. This literature review provides insight into the current state of the field, highlighting the technologies, challenges, and potential for future improvements in this domain.

III. SYSTEM DESIGN

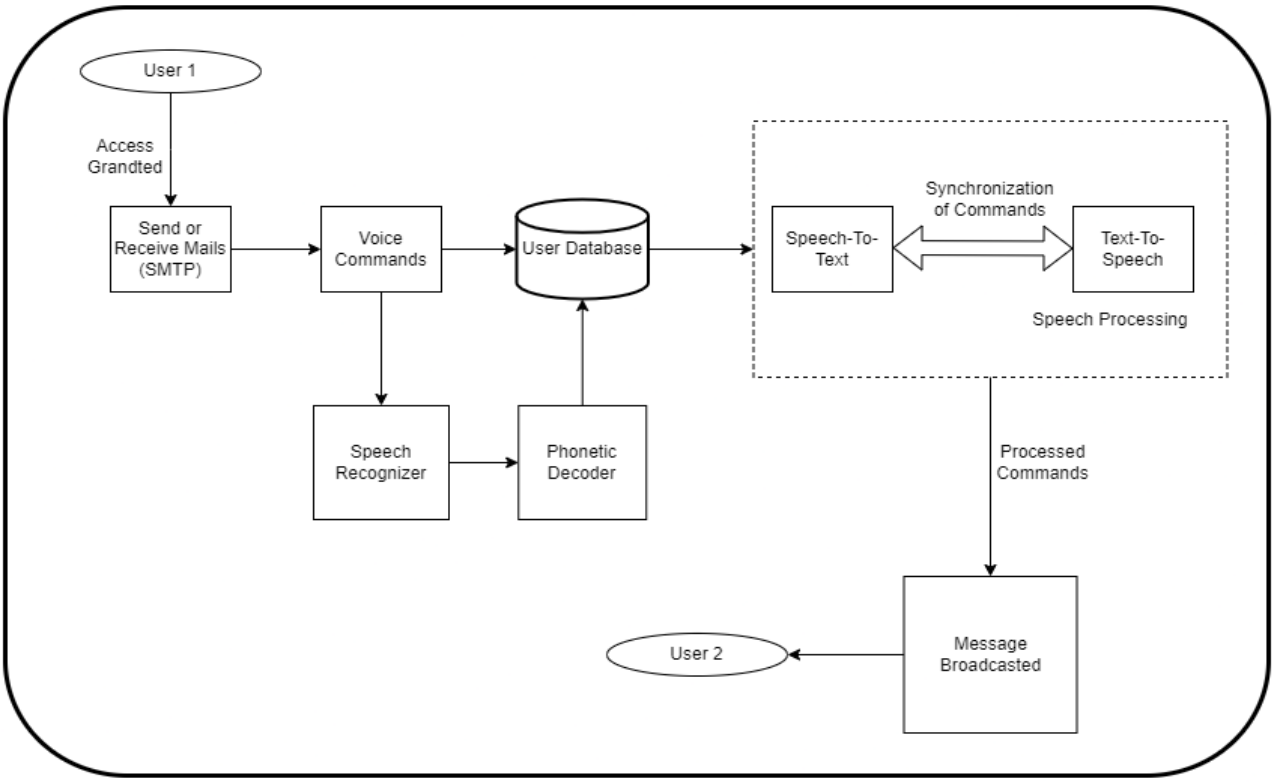

Fig. 2. System Architecture of Voice-Based E-mail System for Visually Impaired

The process of specifying a system's architecture, parts, modules, interfaces, and data to meet specifications is known as system design. One may think of systems design as product development using systems theory. Software engineering divides the design into two general categories. They consist of low-level and high-level design.

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A. **Situation 1:** After the application launches, the user is presented with two choices: register as a new user or log in as an existing user. The user will be sent to the Registration Page, where they must reenter their password and provide their name if they would like to sign up. The two passwords are compared when the Register button is clicked, and an error notice is shown if they don't match. In contrast, the user's Home Page will be shown if there is a match. The user must provide their name and password to access their account. After successfully authenticating, they are taken to the appropriate Home Page. As an example of a mismatch, the error message will appear once more. The Welcome Page appears**,** and the user is signed out of the account upon pressing the Logout button.

B. **Situation 2:** The user has four options on the Home Page: Inbox, Compose, Sent Mail, and Log Out. The Inbox button must be pressed by the user to view the received emails. This page has multiple buttons, each of which represents a mail that has been received. Click the appropriate button corresponding to the email they want to read. The Return to Homepage button must be pressed to return to the Home Page after the user has finished using the inbox. Click the compose option if you want to compose a mail. The user can record a message, listen to a recorded message, or transmit a message using this module.

When Record is clicked, the voice input from the for a predetermined amount of time, the user is recorded. The user can play back this recorded message to see if he's satisfied. To accomplish this, click the Listen option. The user is then taken back to the Home Page after clicking Send, which sends the email. The option to view sent mail is another one that the user has on the Home Page. The message that was just recorded and transmitted can be played back at this point for the user. After completing this, the user can click the corresponding button to go back to the Home Page. Upon selecting Logout, the user is taken to the application's Welcome Page and is no longer logged into his account.

IV. USAGE

This voicemail can be used by • Adults • Children • Elderly people • People with disabilities.

• Adults: The findings show that people refer to technology in a variety of ways and a modest level of sociability.

• Children: Studies show that children use these voice mails to easily access their email.

• Elderly people: Active users with basic computer abilities were described as participants. The authors also emphasize the necessity for more research on how elderly individuals utilize voicemail.

• People with disabilities: A little research investigated how voice interfaces can help people with cognitive disabilities or vision problems in their daily lives, as well as how easy it is for them to use voicemail.

V. CONCLUSION

The development of a voice-based email system for individuals with visual impairments represents a significant step towards fostering inclusivity and independence for this community. By addressing the unique needs and challenges faced by blind individuals in accessing and managing emails, this system has the potential to enhance their daily lives in several ways. First and foremost, the voice-based email system empowers individuals with visual impairments by providing them with a means of communication that is both accessible and efficient.

It eliminates barriers that exist in traditional email interfaces, enabling users to send, receive, and manage emails through natural language and voice commands. Furthermore, the incorporation of text-to-speech and speech-to-text capabilities ensures that the content of emails can be conveyed audibly and that users' spoken responses are accurately transcribed. This is crucial for enabling seamless email interactions and keeping blind users informed and engaged. The system's compatibility with major email platforms ensures that users can integrate their existing email accounts, such as Gmail and Outlook, making the transition to this voice-based system smoother and more convenient. Most importantly, the system fosters independence among visually impaired individuals. It allows them to manage their emails, create folders, organize their correspondence, and perform various email-related tasks with minimal assistance.

This independence not only enhances their overall quality of life but also expands their opportunities for participation in education, employment, and social interactions. In conclusion, the development of a voice-based email system for the blind is a significant stride toward digital accessibility and inclusivity. It acknowledges the diverse needs of this community and leverages technology to provide them with a powerful tool for managing their email communications, ultimately contributing to a more inclusive and equitable digital world.

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