



VOICE ASSISTANCE EMAIL MONITORING SYSTEM FOR PHYSICALLY CHALLENGED PERSONS

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ABSTRACT

In an increasingly digital world, access to information and communication is essential for everyone, including individuals with visual impairments. Voice assistance technology has emerged as a promising solution to enhance the independence and accessibility of blind individuals in navigating digital environments. This paper proposes a Voice Assistance Email Monitoring System (VAEMS) specifically designed to cater to the needs of blind persons. Leveraging artificial intelligence (AI) algorithms, VAEMS aims to provide seamless access to email communication by interpreting and presenting email content through voice assistance. The system beings utilize advanced natural language processing (NLP) techniques to convert text-based emails into spoken language, enabling blind users to interact with their emails effortlessly.

Additionally, VAEMS incorporates innovative features such as email filtering, prioritization, and summarization to streamline email management for blind users. Through the integration of AI technologies, VAEMS not only facilitates independent email access for blind individuals but also enhances their overall productivity and efficiency in digital communication. This paper discusses the design, implementation, and potential impact of VAEMS in empowering blind individuals to effectively engage with email correspondence, thereby fostering greater inclusivity and accessibility in the digital realm!

Keyword: Screen readers, Audio Based environment, Speech_To_Text Converter, Text_To_Speech Converter, Audio processing , Natural language processing .

I. INTRODUCTION

With the rapid advancement of technology, there is an increasing focus on creating inclusive solutions to empower individuals with disabilities. Among these, the visually impaired community faces unique challenges in accessing and navigating digital information, particularly in the realm of email communication. Traditional email interfaces primarily rely on visual cues, rendering them inaccessible to blind individuals.

However, recent developments in artificial intelligence (AI) and natural language processing (NLP) offer promising avenues to address these accessibility barriers!

This paper introduces a Voice Assistance Email Monitoring System (VAEMS) tailored specifically to meet the needs of blind persons. VAEMS leverages AI algorithms to interpret and present email content through voice assistance, providing blind users with seamless access to their email correspondence. By converting text-based emails into spoken language, VAEMS aims to facilitate independent and efficient email management for blind individuals.

Here, we provide an overview of the challenges faced by blind individuals in accessing email communication and highlight the potential of AI-driven solutions such as VAEMS to mitigate these challenges. We also outline the objectives of this paper, which include discussing the design, implementation, and potential impact of VAEMS in empowering blind individuals to engage with email correspondence effectively. Through the integration of voice assistance and AI technologies, VAEMS endeavors to promote greater independence, productivity, and inclusivity for blind individuals in the digital age.

II. LITERATURE SURVEY

The literature survey on "Voice-Based Email for the Blind" presents various studies and approaches to developing voice-based email systems to improve email accessibility for visually impaired individuals. Here's a brief summary of the key findings from the surveyed literature:

[1] "Personal Desktop Virtual Voice Assistant using Python!"

Author: Prof. Suresh V. Reddy, Chandresh Chhari, Prajwal Wakde, Nikhi

This paper discussing and implementation of a personal desktop virtual voice assistant using Python. Explain how to building a personal virtual assistant like Alexa or Siri using Python. Also discussing the important of voice assistants in today's world how it help reduce the use of input devices like keyboards, mouses, and touch pens. Paper also includes use machine learning, text-speech-text, voice detection, and artificial intelligence in building a voice assistant also mentioning personal assistants software improve user productivity handling routines tasks and providing information from internet source to user. The current paper assists complete user activities such searching for information about query, movie details, writing a note, sending a message to a specific person at a specific time, provide location, play music, date and time, and opening files. Require usage of a microphone to receive user input. Overall, this paper provides build an intelligent voice personal assistant using Python, provides the capacity to operate devices based on voice or speech for extracting information to conduct activities on a desktop or other smart device.

[2] Voice based searcher engin and web page reader:Author: Ummuhanysifa U. Nizar Banu P. K

This article aims to develop a search engine that supports Man-Machine interactions purely through voices. The all-new Voice based Search Engine and Web-page Reader which lets the users to command and control the web browser through their voice, are introduced. The existing Searchers Engines receive requests from the user in texts and respond by retrieving the relevant documents from the server and displaying in texts. Despite the current web browsers being capable of playing audios and videos, the user must request by typing some texts in the search box and then the user can play the interested audio/videos with the aid of Graphical User Interfaces (GUI). The proposed Voice-based Search Engine aims to cater to the users, particularly the sightless, in surfing the Internet. The user can converse with the computer and the computer will respond to the user in voices. The computer will help the user in reading the documents as well!

[3] "Smart Personal Attendee"

Authors: Aditya Sinha, Gargi Garg, Gourav Rajwani and Shimona Tayal

Communication and Technology have a lengthy past but still consistently and actively developing and modifying. Technology alters very quickly that today everybody has an AI Personal assistant. The majority of us possess it on our phones in the figure of Google assistant or Siri or Bixby. The use of voice-based individual assistants is growing each day and aiding to make our life simpler. An effort has been produced to form an "Intelligent Personal Voice Assistant using Python" which assists persons to control equipments with their voice(speech), extract data and perform tasks on their desktop. This paper will explain the operation of a voice assistant, their primary difficulties and restrictions. Within this paper it's defined that the tactic of creating a voice assistant without using cloud services, which can enable the growth of such gadgets in the forthcoming".

III. EXISTING SYSTEM:

Currently, email accessibility solutions for blind individuals are quite limited and usually rely heavily on screen reader software or some kind of specialized email clients that don't always work as intended. Unlike the usual tools, they help blind users access email content to some extent, but they tend to be quite basic and might not offer a smooth user experience. Plus, navigating and interacting with emails manually can really take a toll on the blind people's productivity and efficiency, which is not ideal.

Existing Email Accessibility Solutions for Blind Individuals

1. Screen Reader Software

These screen readers like JAWS or NVDA are supposed to make it easier for blind users to maneuver through email clients by converting text into spoken words or braille. While they do provide a basic level of email access, they may not fully support advanced email management features and might need more training to be used efficiently.

2. Specialized Email Clients

Certain email clients come with accessibility features specifically for blind users, offering enhanced keyboard navigation, screen reader compatibility, and simpler user interfaces. Examples are Thunderbird with NVDA or Apple Mail with Voice Over. Nonetheless, these clients could be lacking in some functions compared to mainstream platforms and might not be very popular.

3. Web-Based Accessibility Tools

Some web-based email services try to incorporate accessibility features to enhance the user experience for blind individuals. Look at Gmail for instance, which provides keyboard shortcuts and a basic HTML version for easier navigation. However, these tools might not entirely solve the email management issues and might not fully cater to the blind users' needs.

Email Accessibility Challenges for Blind Individuals

Despite the proliferation of digital communication platforms, blind individuals encounter significant barriers when accessing and managing email correspondence. Existing email accessibility solutions often lack comprehensive features and fail to provide a seamless user experience for blind users. The primary challenges faced by blind individuals in accessing email communication include:

- **Lack of Accessibility:** Traditional email interfaces primarily rely on visual cues, making them inaccessible to blind individuals who rely on screen readers or braille displays for accessing digital content. As a result, blind users may struggle to navigate email interfaces and effectively interact with email content.
- **Limited Functionality:** Existing email accessibility solutions for blind individuals may lack advanced features such as email filtering, prioritization, and summarization, leading to inefficiencies in email management. Blind users may find it challenging to perform tasks such as sorting through emails, identifying important messages, and composing replies in a timely manner.
- **Inefficient Interaction:** Manual navigation and interaction with email interfaces can be time-consuming and cumbersome for blind individuals, impacting their productivity and efficiency in digital communication. Without intuitive interfaces and efficient interaction mechanisms, blind users may face obstacles in accessing and managing their email correspondence effectively.
- **Dependency on External Assistance:** Blind individuals may often rely on external assistance from sighted individuals to access and manage their email accounts, limiting their independence and autonomy in digital communication. This dependency on others may result in privacy concerns and hinder the overall accessibility and inclusivity of email communication for blind users.

IV.SYSTEM DESIGN

- a. **Voice assistance email monitoring system** is design to provide users a hands-free solution managing and monitoring email accounts through voice commands. System integrates natural language processing (NLP) and email APIs to enable seamless interaction between user and email accounts.
- b. **Voice Input Interface:** Component responsible for capturing user voice commands and converting them into text using speech-to-text technology. It utilizes microphone input and speech recognition algorithms to accurately transcribe user voice commands into actionable text.
- c. **Natural Language Processing (NLP) Engine:** NLP engine interprets text input from voice interface and extracts user intent and relevant parameters. It understands context user commands, such

as compose new email, reading inbox messages, or managing folders, through techniques like intent recognition, entity extraction, and sentiment analysis.

d. **Email Integration Module:** Component interacts with user email account(s) via email APIs to execute actions specified by user voice commands. It handles tasks like sending and receiving emails, accessing inbox folders, managing drafts, and performing searches within email account(s).

e. **System follows these steps to fulfill user requests:**

User initiates interaction by activating voice assistant. Voice input interface captures user voice command. NLP engine processes command, identifying user intent and extracting any necessary parameters. Based on interpreted command, email integration module interacts with appropriate email account(s) to perform requested action.

4.1 SYSTEM ARCHITECTURE:

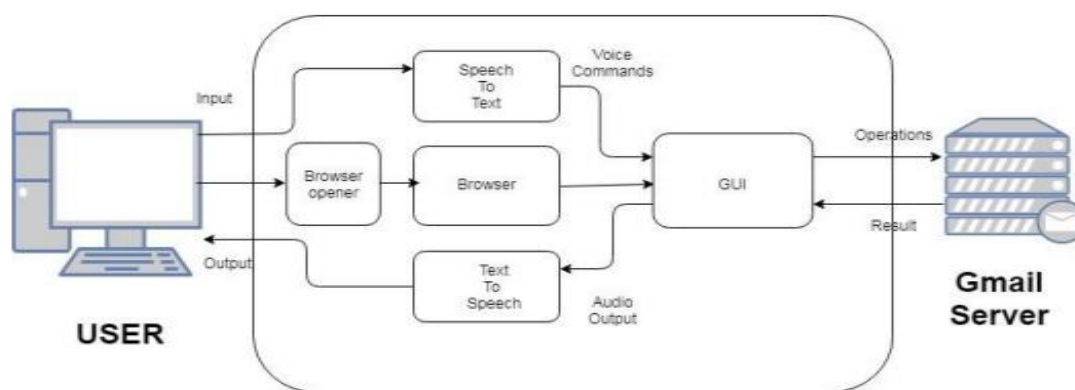


Fig.4.1 Proposed System Mail Assistance Architecture

Step-1 :-Sound Input Processing:

Speech Recognition: Use a talk recognition mechanism to switch vocal words into text. Popular utensils involve Google's Speech-to-Text API.

Step-2 :-Natural Language Understanding (NLU):

Intent Realization: Analyze the script to grasp user's intentions, which in current time could create a new email, read gotten emails, or accomplish other moves.

Step-3 :-User Approval and Authorization:

Authenticate user to assure they can get into their mail account. This could mix with current authentication machines akin to OAuth or carry out a production certification method.

Authorized specimen to make particular rules based on their approvals.

Step-4 :-Correspondence Maintenance:

a. **Mail Unraveling:** Extract relevant details from emails akin to dispatchers, tittle, body, attaches, etc.

b. **Mail Handcraft:** Allow spectators to craft email utilizing vocal rule. Change the text fostered from talk realization into mail content.

c. **Mail Regaining:** Fetch emails from spectator's inbox, involve decoding unpracticed emails or allow retrieving special messages based on spectator bids.

Step-5 :-Natural Language Generation (NLG):

Formulate genuine-sounding reassurances or motives for daily user based on the structure's doings or spectator demands.

Transform text-based mail content into talk for earshot feedback.

Step-6 :-Agglomeration with Mail Service Purveyors:

Integrate with well-liked mail service purveyors akin to Gmail, Outlook, etc., utilizing their APIs for delivering, gathering, and managing mails.

Protect secure communication with mail servers, conforming to industry-standard strategies akin to SMTP, IMAP, or OAuth.

Step-7 :-Mistake Management and Feedback:

Supply decently mistake notices and feedback in crisis of any complications during the method, akin to unnoticed commands, authorization lapses, or contact glitches.

Step-8 :-User Interface:

Forge a user-friendly facade for collaborating with the system, which could be an autonomous usage, a webform, or amalgamated with prevalent voicing benefits akin to Amazon Alexa or Google Assistant.

Step-9 :-Secrecy and Security:

Design approaches to ensure privacy and security of user information, containing encoding of confidential data, adhering to applicable data care ordinances (e.g., GDPR), and habitual security examinations.

Step-10 :-Testing and Recurrence:

Execute complete testing of the scheme to sense and resolve any flaws or user kindness problem.

System architecture is the conceptual structure and design of a complex system. It defines how all the components and modules of a system or application are organized and interact with each other to fulfill the system's requirements and objectives. The primary purpose of defining a system architecture is to provide a high-level blueprint that guides the development, implementation, and maintenance of the system. a solution for visually impaired individuals to access email services effectively. This system overcomes the challenges faced by visually impaired individuals in accessing email. Users can interact with the system by providing voice inputs, making it accessible

The proposed system aims to provide e and user-friendly for those who cannot use traditional visual and keyboard interfaces.

Email communication is an essential part of modern life!!!! But it can be challenging for visually impaired individuals. This voicebased email system offers a valuable solution. By using voice commands, visually impaired users can compose, send, and read emails; making it a significant improvement in their accessibility to this critical form of communication.

The proposed system leverages voice input to empower visually impaired individuals to use email services, thereby enhancing their independence and access to professional and personal communication.

Email communication is an essential part of modern life, but it can be challenging for visually impaired individuals. This voice-based email system offers a valuable solution. By using voice commands, visually impaired users can compose, send, and read emails! This voicebased email system offers a valuable solution. By using voice commands, visually impaired users can compose, send, and read emails, making it a significant improvement in their accessibility to this critical form of communication.

V .RESULTS:

A. Phase-1: The tasks that can be performed using the program developed will be promoted using the voice prompt. In background python module PYTTX3 is used for text to speech conversion. User will asked to provide input for the following tasks written below. The input is expecting in the form of speech by the user which will convert to text by the Google speech application interface in python and accordingly tasks will be performing.

1. Login to a Gmail account.
2. Sending email through Gmail.
3. Reading emails through Gmail.

B. Phase-2: In phase-2 of our program the user will give speech input to the system. This speech input will be handle by speech recognition module. It is a python library which is used to handle the voice requests and it conversion speech into text. Now after receiving input from the user speech to text converter will saves the response in respective variables used in the script and based on their values it will further enter into respective modules.

C. Phase-3: In this phase our program will handles the requests by the user. Based on the speech input given by the user it will launches the modules.

1. Login to The Gmail account:- This module will handles the requests by the user to login to their 26 Gmail account. This module will makes the connection with the user's Gmail account based on the credentials provided through the voice input. This module's script designed as such it will prompt the user to enter their Gmail username and password and then it will use selenium web-driver to automates the task for the user and as a result connection will be made.

2. Send Email through Gmail:- This module will handles the requests by the user to send email through their Gmail account. The Python script for this module will prompt the user to enter their credentials and then it will make a connection with their account. After the connection have to be done it will further prompt the user to enter the receiver's account, email id and it will then allow the user to speak their message and it will repeats it for them and by saying ok it will send the mail. SMTP library in python is uses for the above task.

3. Read Email through Gmail:- This module will handles the requests by the user to read the email through their Gmail account. The python script for this module will prompt the user to enter their credentials and then it will make a connections with their account. After the connection have to be done it will starts fetching the unread emails for the user and will speak it for them with the help of PYTTSX3 or GTTS library in python for text to speech conversion.

VI. CONCLUSION

In the, improvements to voice assistance email monitoring systems may likely focus on refining natural language processing (NLP) capabilities to better understand and respond to diverse user queries. This will involve the integration of advanced machine learning algorithms to accurately interpret nuances in language, tone, and context, enabling the system to provide more relevant and personalized responses.

Moreover, there will be, like, a concerted effort to enhance the system's ability to like handle multilingual communications seamlessly, like, catering to a global user base. This will like involve not only like language translation capabilities but also, like, cultural adaptation to ensure the responses are like culturally sensitive and appropriate!

Another area of enhancement, um, will be the incorporation of sentiment like analysis to gauge the emotional tone of emails. This will, uh, allow the system to prioritize urgent or, like, sensitive messages and, like, respond like accordingly! This will like enhance the overall efficiency of email management and like streamline communication processes.

Furthermore! Improvements in data security protocols will be, like, essential to safeguard sensitive information exchanged via email. Advanced like encryption methods, um, and authentication mechanisms will be, like, implemented to ensure the confidentiality and integrity of communications!!!!

Additionally, integration with other productivity, uh, tools and platforms, such as calendars and task management applications, will further streamline workflow management, um, and enhance productivity.

Overall, future enhancements to voice assistance email monitoring systems will aim to provide users with a, like, more intuitive, efficient, um, and, like, secure communication experience, ultimately facilitating better productivity and, um, collaboration in both personal and professional settings.

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