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Voice Based Mail System for Visually Impaired Using AI/ML

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Abstract- In today's digital era, email communication plays a vital role in personal and professional interactions. However, traditional email systems are not easily accessible to visually impaired users due to their dependency on graphical interfaces and manual input methods. The proposed system, Voice Based Mail System, provides a solution by enabling users to perform all email-related operations using voice commands. The system utilizes Speech-to-Text (STT) and Text-to-Speech (TTS) technologies to allow seamless interaction without the need for a keyboard or screen. It integrates Artificial Intelligence (AI), Natural Language Processing (NLP), and facial recognition techniques to improve command understanding, enhance security, and provide a user-friendly experience. The system supports functionalities such as composing emails, reading inbox messages, and managing email operations entirely through voice interaction.

Keywords- Voice Based Email System, Email for Visually Impaired, Speech Recognition, Text-to-Speech (TTS), Speech-to-Text (STT), AI-based Email Assistant

I. INTRODUCTION

Email is one of the most widely used communication tools globally. Despite technological advancements, visually impaired users face significant challenges in accessing email services due to reliance on visual interfaces and keyboard inputs. The Voice Based Mail System is designed to eliminate these barriers by providing a fully voice-driven interface. Users can send, receive, and manage emails through spoken commands, making the system highly accessible and easy to use.

The system uses advanced technologies such as:

- Speech Recognition for voice input
- Text-to-Speech for audio output
- NLP for understanding commands
- AI/ML for intelligent processing

This system enhances accessibility and empowers users to interact with digital communication platforms independently.

II. PROBLEM STATEMENT

In today's digital environment, email has become an essential mode of communication, yet it remains largely inaccessible to visually impaired and illiterate users. Traditional email systems rely heavily on graphical user interfaces, keyboard input, and visual navigation, making them difficult for such users

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to operate independently. Although some assistive technologies exist, they often require prior technical knowledge, are not fully voice-driven, or lack real-time responsiveness and accuracy. Additionally, challenges such as complex interfaces, lack of multilingual support, and inadequate security mechanisms further limit usability. As a result, visually impaired users face significant barriers in performing basic email operations like composing, reading, and managing messages. This highlights the need for an intelligent, user-friendly system that enables complete voice-based interaction, ensuring accessibility, ease of use, and secure communication without reliance on visual or manual input methods.

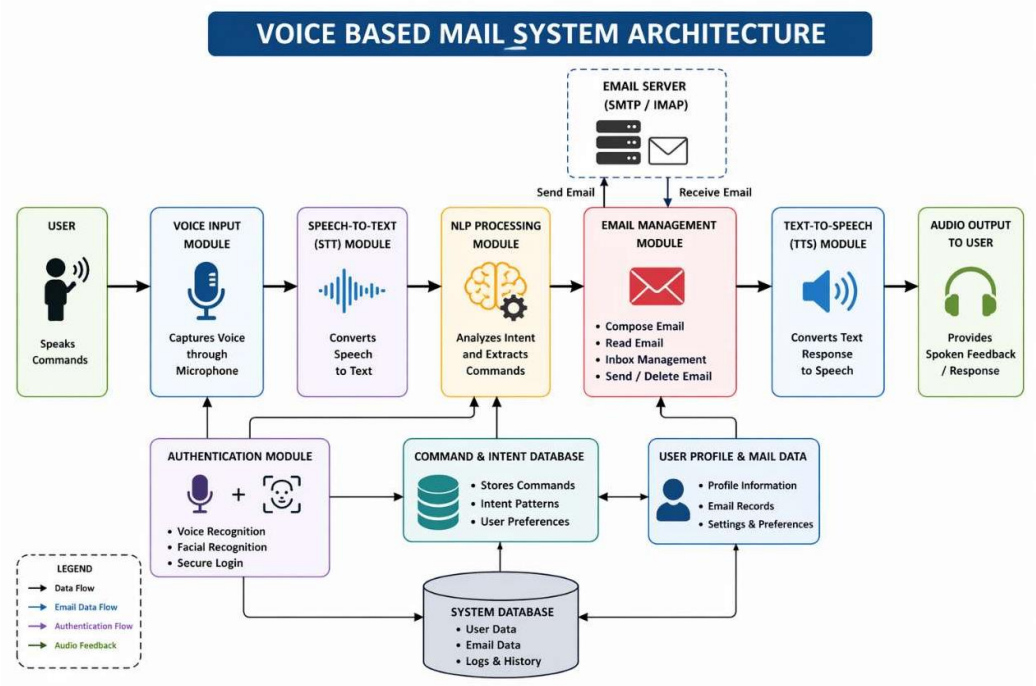

Figure 1: Voice Based Mail System for Visually Impaired Using AI/ML

Table 1: Properties of Structure.

Property	Description
Application Name	Voice Based Mail System
Platform	Desktop / Web
Programming Language	Python
Speech Recognition	Google Speech API
Text-to-Speech Engine	Pyttsx3
Backend	SMTP & IMAP Protocols
AI Techniques	NLP, Speech Processing
Authentication	Voice + Facial Recognition
Database	Local/Cloud Storage

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III. CONCLUSION

The Voice Based Mail System provides an efficient and accessible solution for visually impaired users to interact with email services. By integrating AI/ML, NLP, and speech technologies, the system eliminates the dependency on traditional input methods. It enhances usability, security, and accessibility while promoting digital inclusion. The system demonstrates strong potential for future advancements in assistive communication technologies. Furthermore, the inclusion of AI/ML techniques enhances the system's ability to adapt to user behavior, improve command recognition over time, and deliver a more personalized experience. The addition of security features such as voice and facial authentication strengthens user data protection while maintaining ease of access. Real-time feedback and audio-based navigation further improve usability, making the system intuitive even for first-time users. This system not only improves accessibility but also promotes digital independence, allowing users to communicate efficie

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