

# A Review on Voice Based Electronic Mail for Visually Challenged

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**Abstract**— *One of the essential conveniences for modern day living is Internet. The expanded utilization of innovation and its boundless open doors have made it unavoidable for the current ages to apply the Web innovation without limit. Everyone is utilizing current realities and data on web. Whereas visually challenged people face difficulties in using the data provided by internet. The improvement of Personal Computer based on existing frameworks made it possible to open various paths for visually challenged across the globe. Sound assessment based on virtual climate like, screen peruses support visionless individuals to use web applications massively. Notwithstanding, the blind individuals find it truly challenging to utilize this innovation since it requires visual discernment. Even after a lot of development have been done to assist these individuals in using different devices, no gullible client who is visually impaired can use these innovations as proficiently as an ordinary client. The project makes the commitment that it will empower the visually impaired individuals to compose and receive voice-based email. The proposed framework GUI (Graphical User Interface) has been considered in contrast to the GUI of a customary mail service. The utilization of STT (Speech-To-Text) and TTS (Text-To-Speech) access for these individuals is made easier and efficient. Moreover, this system can be used by any regular individual. The model is established on IVR (Interactive Voice Response) which is very efficient and user friendly for communication with the system.*

**Keywords**— *Voice based Email, Visually Challenged, Speech-To-Text, Text-To-Speech, Speech Recognition.*

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## I. INTRODUCTION

The invention of Internet has changed our life in various fields. Messages are very private, and confidential data we share over the internet. Be that as it may, there are a set of requirements for people to access the Web and one of the basic requirement is the person should be able visualize. However, there are likewise distinctively capable individuals who are not gifted with vision. There are a few hindered individuals who have problem related to vision which causes to not have a clear view of what is being displayed on a screen or console. A statistical research states that around 240 million outwardly disabled individuals all over the planet. All these individuals know nothing about how to utilize the Web or Email. In reality if a blind person has to exchange Email, one of the ways is to narrate the contents required to be on the mail to someone else (with normal vision) and later that third individual shall create and share for the mail. Yet, this is not an effective way of handling this issue. It is far-fetched that each time a blind person wants to share a Email they would find a person at the appropriate time who would help them out. Despite the fact that the outwardly weakened individuals are reprimanded by our general public. Thus, to improve and give an equivalent status to such differently abled individuals we thought of creating a system to help these people in need with the capacity to access all the features of mail using voice command which helps to eliminate visual requirements.

To make these systems helpful for the blind individuals who are outwardly tested there are different innovations given like screen per user, programmed discourse recognizer, braille console, TTS, and so on. Nonetheless, majority of these innovations are not sufficient enough to give results that are helpful for the people in need because it could not produce a legitimate reaction like a ordinary system. This application depends on utilizing discourse to-message and message to discourse converters, consequently empowering blind individuals to control their mail accounts by the use of their voice which helps to perform without the help from another person.

This system will provoke the user by the use of voice command to perform specific activity and the user has to answer something in response. Using a dot net structure, the modules TTS and STT are implemented. The STT otherwise called Programmed Discourse Acknowledgment changes over spoken discourse into text, which makes messages as a simple errand. The TTS module gives sound result of the mail received, with source name, subject and body of the mail i.e. shown by the framework.

## II. LITERATURE SURVEY

Sunny Kumar et al [1] proposed a system completely based on the ease of accessibility of the user. It is useful for all types of people in the globe. The framework is focused on the client's way of behaving and their point of view. It is open to a wide range of individuals including uneducated individuals

and, surprisingly, new clients. It utilizes IVR (interactive voice commands) to communicate with the clients. This makes the framework sensible and regular approach to convey the messages and sentiments. This system will automatically produce the voice directions to do the activities when users interact with it.

The methodical procedure prescribes that the users must hear the voices and respond to carry out the required actions. The system's fundamental benefit is that there is no application of keystrokes; instead, only one button operation is needed initially. Once the system runs, each step is assisted with voice instructions, and users must wait and then respond to do the necessary activities. Users do not need to bother about using the mouse. Every step is voice-based, so when one action is taken, it signals to the users that it has been completed. Regardless of the outcome, the system will convey everything with a reason.

Paulus A. Tiwari et al [2] proposed various strategies that can be utilized to apply voice-based Email framework for Blind. Numerous innovations have been done, for example, Programmed Speech Recognizer, Screen Reader, Text-To-Speech and Speech-To-Text, Braille Console, etc. IVR is a developed function that is used to enhance the communication of a computer to connect with users using voice and Dual Tone Multi Frequency technology input through keypad. During the broadcast correspondences, using telephone keypad or through discourse acknowledgement the IVR empowers clients for interfacing with the associations' host after which the organizations will get some information through the IVR trade. Another innovation which was utilized is utilization of TTS modules for dynamic data, for example, such as reports, electronic mails, news, and weather forecast data. Also, for simple activities IVR is used in vehicle frameworks. TTS is system generated speech which is not originally related to computer voice. Unique speeches were produced where the speech in segments that were consolidated and adjusted before being played to the user. The examined research works assist individuals with visual hindrance to get to the email in issue road which is the most comprehensive sort of contact currently. The proposed framework reduces the barrier, for example, memorization and execution using the mouse clicks and keyboard shortcuts that were used for reading the mails by the visually challenged. Subsequently, this paper prefers voice-based authentication over the use of traditional User-ID and Password.

This model provides necessary actions and eventual outcome of the movement. Considering these multitude of executing techniques this structure gets simple to utilize, safe, and intelligent. The model proposed has great potential in implementing it in smartphones as application, since it is completely dependent on personal machines. Therefore, it can also be implemented with various accents and dialects for more enhancement in this model for efficient and

comfortable usage.

Mullapudi Harshasri et al [3] explains this paper chiefly on four unique kinds of modules namely, Speech-To-Text (STT) where it gathers the discourse given by the client and converts to message, Text-To-Speech (TTS) module changes over the reaction given to framework to discourse, also a chatbot for checking out and for giving reactions more like a human, lastly, mail correspondence module for sending and getting messages. The primary target of the project is to lay out email correspondence considering voice orders for blind individuals due to their inability to utilize web and its capabilities. They accomplished in getting concealed sends giving shippers mail id, subject, message as voice as result. This undertaking accomplished building text-to-speech, speech-to-text modules and furthermore executed a chatbot from successful correspondence between the client and the framework, it can lay out email correspondence as well as answer the inquiries posed to by the client. The undertaking made an enrolment module for straightforward entry to client and giving security and protection dependent upon some degree.

Aishwarya Belekar et al [4] explain the work area application that has been fostered and can be utilized by individuals with different visual impairments, to get to messages effectively and productively. Majority of present voice based electronic mail frameworks, provide unique and self-made benefits which exclude the utilization of Gmail. By considering the this the main aim was to implement a Gmail client because of major population having accounts of it and its benefits. The task portrays how a speech-to-text converter perceives the speech, investigates the sound made by an individual and by filtering what has been said and afterward digitizes it to a configuration that it very well may be perceived. The perceived text then will be saved in the database. Here an open-source application developing platform like dotnet and programming language like C sharp is used for implementing this. The Speech-To-Text framework straightforwardly gets and switches discourse over completely to message. Discourse acknowledgment frameworks can be separated into a few blocks: include extraction, acoustic models data set which is made in view of the preparation information, word reference, language model and the discourse acknowledgment calculation. Utilizing discourse union procedures, it changes text over completely to produce voice. It is currently utilized widely to pass on monetary information, email messages, and other data through the phone for everyone. Text-to-speech is additionally utilized on gadgets, for example, convenient GPS units to report road names while providing guidance. The client can send messages, pay attention to what they have composed and furthermore get messages and pay attention to them with voice orders. Here, the application utilizes a protocol convention for sending the mail i.e., SMTP (Simple Mail Transfer Protocol 3) and another protocol for getting

messages i.e., POP3(Post Office Protocol). SMTP is a solid convention to send messages where the SMTP server transfers the email texts rapidly. The e-mails are stored by the POP3 server and priority-based messages are displayed. The similar process is carried out in client's application, where based on the request from the client the messages will be downloaded.

Pranjal Ingle et al [5] explained how the outwardly tested individuals find it truly challenging in using these innovations since they require visual discernment. In contrast to this not all individuals can enjoy the perks of the web where one must know what is written on the interface. This statement is solely enough to conclude how all these innovations are of no use to the outwardly tested individuals. In this framework essentially three sorts of advancements are utilized in particular: STT module where anything the user talks is converted into a message. In TTS module the strategy is completely inverse of STT. The IVR permits client to collaborate with an email having framework by means of a framework console, after that clients can utilize it further based on the options given matching with their questions by concentrating on the IVR discourse. The frameworks of IVR for the most part answer with pre-recorded sound voice to additionally help the clients on the best way to go on further. The pre-recorded sound and the framework must have enormous storage. When the clients visit the web portal they must register via the database. The user will be directed at every step with the help of IVR discourse while enlisting each fundamental field that are required to be filled as and when it is read by the system, by clicking on that field they would be required to fill them. Frequently used words will be present i.e., as, and when the client speaks it will be composed accordingly. Likewise, the voice will be stored in .mp3 format in the database where after the enrollment, the user will be redirected to a login page, where the user has to be authenticated on the basis of the given credentials which is the login ID and the Password.

Sherly Noel [7] explained how electronic mail is essential in private and professional life. The Data accessible in Internet is principally available as visual medium. To access the WWW (World Wide Web) it requires mouse and a console. For many outwardly tested client's braille consoles will not be reasonable enough. Hence, the potential way to access WWW is by using speech recognition which is more efficient and comfortable. Initially, sending and receiving the electronic mail will be challenging but eventually after some additional training and skill it can be used with ease. This application tunes in and perceives human voice and digitizes it to a format that the system can understand. The client can completely use all the services of an electronic mail just with voice. Interactive voice response highlight adds benefit route to HTML page. Basic voice instructions are executed into speech to message process empowering cordial relationship with the client.

The various application modules are:

- a) User voice: The voice samples taken from the user in the form of commands are stored in database.
- b) Speech Processing: The process has been built on Google web kit Application Programming Interface which is vastly used for speech recognition and processing.
- c) Speech comparison with existing sample: The speech is compared with the initial voice that was recorded from the user.
- d) Speech to Text conversion: In this process the speech is synthesized and recognizes commands like "compose mail", "Read mail" etc.
- e) Send mail: The users voice command is recognized and executes the operation of sending the email.
- f) Read email: The users voice command is recognized and executes the operation of reading the email.

Additionally, there are various more features for creating this application have been used. For example, unwanted sound elimination techniques which are imbibed to enhance precision of voice acknowledgement process. Also, various security techniques are used where the voice is been put in the database. Whenever the client gives voice order, the order is approved prior handling.

Anushka Solanki et al [8] explained how according to the statistics 39 and 246 million number of people are blind and have low vision worldwide respectively. Where, 50-60% use Smartphone today. Studies have demonstrated that over 90% of corporate changes are done through messages. For this exploration they have conducted a visit to few associations to comprehend how the issue can be tackled. The typical composing rate of ordinary individual is 40 words per minute while that of blinds is just 32 words each moment. Likewise, these strokes were assessed as: Number of keystrokes, Right touches, wrong touches. The productivity of outwardly hindered representative emerges to be simply 75% to that of a typical representative. Visually impaired people working in professions like education or who run their own enterprise for this sake take help from the third individual which many a time resulted in less understanding of conversation. The best arrangement that emerged by leading these overviews emerges to be an android application. The utilization of interactive voice response and speech to text converter has made this exploration complete. The application will acknowledge input in voice order design and with assistance of Speech-To-Text converter the voice will be converted into a keyword command. This command is taken up by the system and performs the required actions. And then the result given by the system will be in the form of a sound which will be done with the assistance of Text-to-Speech converter.

### III. CONCLUSION AND FUTURE WORK

This project is designed to help visually challenged individuals access the electronic mail, a widely used form of

communication, in an efficient manner. To make this easier for our users, we have included features such as mouse clicks and keyboard shortcuts to reduce the burden on the user when receiving emails. Instead of traditional username and password combinations, we have proposed a voice-based login system. Our system utilizes IVR technology, which allows users to communicate with the system through Speech-To-Text and Text-To-Speech functions without having to write or type messages. This makes our system easy to use for people of all ages, including those without visual impairments. The system also includes a chat bot for effective communication between the user and the system, upgrading the way we communicate in a quick and efficient manner.

### REFERENCES

- [1] Sunny Kumar, Ms. Yogitha, Ms. R. Aishwarya. "Voice Email Based on SMTP For Physically Handicapped," Proceedings of the Fifth International Conference on Intelligent Computing and Control Systems (ICICCS 2021) IEEE Xplore Part Number: CFP21K74-ART; ISBN: 978-0-7381-1327-2
- [2] Paulus A. Tiwari, Pratiksha Zodawan, Harsha P. Nimkar, Trishna Rotke, Priya G. Wanjari, Umesh Samarth, "A Review on Voice Based E-Mail System for Blind" Proceedings of the Fifth International Conference on Inventive Computation Technologies (ICICT-2020) IEEE Xplore Part Number: CFP20F70-ART; ISBN:978-1-7281-4685-0
- [3] Mullapudi Harshasri, Manyam Durga Bhavani, and Misra Ravikanth K. Elissa, "Voice Based Email for Blind," International Journal of Innovative Research in Computer Science & Technology(IJIRCST) ISSN:2347-5552,Volume-9,Issue-4,July 2021
- [4] Aishwarya Belekar, Shivani Sunka, Neha Bhawar, Sudhir Bagade, "Voice Based E-Mail for Visually Impaired," International Journal of Computer Applications (0975-8887)Volume 175-N0.16,september 2020
- [5] Pranjali Ingle, Harshada Kanade, Arti Lanke, "Voice Based E-Mail System for Blinds," International Journal of Innovative Research in Computer Science & Engineering (IJIRCSE) Volume 3,Issue 1,2016,PP 25-30 ISSN 2349-4840
- [6] Jagtap Nilesh, Pawan Alai, Chavhan Swapnil and Bendre M.R. "Voice Based System in Desktop and Mobile for Blind People".International Journal of Emerging Technology and Advanced Engineering (IJETA),2014 on Pages404-407(Volume 4,issue 2).
- [7] Sherly Noel. "Human computer interaction(HCI) based Smart Voice Email (Vmail) Application – Assistant for Visually Impaired Users (VIU)".Proceedings of the Third International Conference on Smart Systems and Inventive Technology (ICSSIT 2020). IEEE Xplore Part Number: CFP20P17-ART;ISBN: 978-1-7281-5821-1.
- [8] Anushka Solanki, Anushka Dixit, Anushri Saxena, Amit Khare, Kavita Namdev. "E-VOICE Mailing System for Blinds Using Android".International Research Journal of Modernization in Engineering Technology and Science (IJMETS 2020).Volume : 02/Issue:04/April-2020. e-ISSN: 2582-5208.
- [9] Ummuhany sifa U., Nizar Banu P K, " Voice Based Search Engine and Web page Reader". In International Journal of Computational Engineering Research (IJCER). Pages 1-5, May – 2013
- [10] Anchal Katal, Amanpreet Kaur, Jasmeen Gill " Automatic Speech Recognition: A Review", International Journal of Engineering and Advanced Technology (IJEAT), Volume-3, Issue-3, February 2014.
- [11] Isewon, Itunuoluwa, O. J. Oyelade, and O. O. Oladipupo. "Design and implementation of text to speech conversion for visually impaired people." International Journal of Applied Information Systems 7.2 (2012): 26-30.
- [12] Rijwan Khan, Pawan Kumar Sharma, Sumit Raj, Sushil Kr. Verma, Sparsh Katiyar, " Voice Based E-Mail System using Artificial Intelligence" International Journal of Engineering and Advanced Technology (IJEAT), Volume-9 Issue-3, February, 2020.
- [13] Jayachandran.K, Anbumani.P , " Voice Based Email for Blind People" International Journal of Advance Research, Ideas and Innovations in Technology. Volume3, Issue3, 2017.
- [14] Anchal Katal, Amanpreet Kaur, Jasmeen Gill " Automatic Speech Recognition: A Review", International Journal of Engineering and Advanced Technology (IJEAT), Volume-3, Issue-3, February 2014.
- [15] Taslima Binte Hossaina, Yeasmin Ara Akterb, Md. Ataur Rahmanc " Voice mail application for visually impaired persons", Recent Research in Science and Technology, 15-18 special issue on 6th International Conference on Natural Sciences and Technology Vol 12, 2020.
- [16] Naziya Pathan, Nikita Bhojar, Ushma Lakra, Dileshwari Lilhare, " VMail (Voice Based E-Mail Application)", International Research Journal of Engineering and Technology (IRJET), Volume: 06, Issue: 03, Mar 2019.