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# Voice Based Email Service for Visually Impaired

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***Abstract: Communication plays a crucial role in every field in one's life. It is an integration of the communicating technologies with the help of internet. But this facility is not for blind people. Hence, we aimed to develop an web based email application that can facilitate visually challenged people to use email services for communication. The application will work solely on voice commands spoken by the user which will enable them to communicate with the world. They can send and receive any mails whether it is a text document, picture, audio, video, etc. using this system using the internet. By providing the platform in which they can speak the operation and can able to send and receive the messages.***

## I. INTRODUCTION

We have seen that the introduction of Internet has revolutionized many fields. Internet has made life of people so easy that people today have access to any information they want easily. Communication is one of themain fields highly changed by Internet..

E-mails are the most dependable way of communication over Internet, for sending and receiving some important information. But there is a certain norm for humans to access the Internet and the norm is you must be able to see.But there are also differently abled people in our society who are not gifted with what we have. There are some visually impaired people or blind people who can't see things and thus can't see the computer screen or keyboard.

A survey has shown that there are more than 240 million visually impaired people around the globe. That is, around 240 million people are unaware of how to use Internet or E-mail. The only way by which a visually challenged person can send an E-mail is, they have to speak the entire content of the mail to another person (not visually challenged) and then that third person will compose the mail and send on the behalf of the visually challenged person. But this is not a right way to deal with the problem.

Every time finding a third person is not possible for a visually challenged person and also sometimes the content can be personal, for maintaining the Integrity of the Specifications.

Therefore, for helping these people and developing societyauthors have come up with this idea that helps a visuallychallenged person by providing ability to send and receive emails throw voice commands without using any keyboardand visual thing. We have come up with this project asMulti-lingual voice-based e-mail system that would helpthese people by allowing them to communicate with the system to send and read e-mails in any language they are comfortable with.

### *A. Problem Statement*

E-mails are considered to be the most reliable way of communication over Internet. But there is a special criterion for humans to access the Internet services where specially disabled people in our society are not gifted with what normal people have. Hence, they are unable to use the internet and access many facilities provided by it and finally need to depend on others.

### *B. Proposed Solution*

The proposed system is relying on a very fresh plan and obscurity just like the accessible mail systems.

This project is an aid to the visually impaired people by giving them an access to the basic and most important feature of the internet i.e., emails by proposing a service that is multilingual based on IVR- interactive voice response to perform relevant e-mail services. So, by using this voice-based email service, they can take a step forward to independently use the benefits of the internet.

### *C. Objectives*

*1)* To develop a voice mail service for visually impaired persons to access the e-mail services and performs therelated operations.
*2)* To apply IVR- Interactive voice response, that sanctions everyone to control their mail accountsusing their voice.
*3)* To provide language choice to the user

## II. LITERATURE SURVEY

Rijwan Khan &Pawan Kumar Sharma et. al.[1] proposed a system overcomes many drawbacks that were faced by visually challenged people such as sending and receiving emails. Success of this project can make an impact on developers motivating them to make something useful that can help visually challenged or blind people. This paper proposes a system that will be beneficial for society by allowing disable people also to grow along with society. This project makes visually challenged people ableenough to be part of growing digital India by allowingthem to communicate via internet and also making life of such people much easier.

Pandapotan Siagian & Sindak Hutauruk [2] have developed interactive android application and addition of the Android Voice Controlled apps on smartphone and alsoadded some features which are currently available in android based smartphones such as attending for a line- calling feature and out-going calling feature, over the voice commands. This apps also helps people such as blind and other physically limited people who face. They have been calling his families using line-calling feature or out-going calling feature by android based smartphones. Speech recognition technology is being implemented in many ways.

Taslima Binte Hossain et. al. [3] The voice mail application can be used easily and efficiently by a blind person to access mails. Thus, reliance of visually impaired persons on other people for their activities related to mail can be reduced. Since, right now our system can't take voice signals in Bangla, our future plan is to make the system more robust so that blind people can use the system with Bangla speech.System is a voice mail android application rather than desktop application by which visionless people can easily transfer email through their voice. To make this application several processing has been employed to transfer the Voice Signals to Gmail server. They are i)Process the Voice using API ii)Convert to Text iii)Process the text API iv)Convert to Voice v)Connecting to server using Gmail using API.

Ruchi Khedekar & Sonu Gupta [4] have proposed a system which will help the visually impaired people to access email services efficiently. This system will helpovercome the drawbacks that were earlier faced by the blind people in accessing emails. They have eliminated the using of keyboard shortcuts along with screen readers which will help reducing the cognitive load ofremembering keyboard shortcuts. Also, any naive user whodoes not know the location of keys on the keyboard need not worry as keyboard usage eliminated. The user only needs to follow the instructions given by the IVR and use mouse clicks accordingly to get the respective services offered. Other than this the user might need to feed in information through voice inputs when specified. When using this system, the computer will be prompting the user to perform specific operations to avail respective services he/she will have to perform operation. One of the major merits is that user do not need to use keyboard. All operations will be on mouse click events. But the question arise was how will a blind person find the location ofmouse pointer. As particular location cannot be tracked by the blind user the system has given the user a free will to click blandly anywhere on the screen which type of click will perform which function will be specified by the IVR. Also, because of IVR facility those who cannot read need not worry as they can listen to the prompting done by the system and perform respective actions.

Paulus A. Tiwari et. al. [5] Due to its simplicity and accessibility, Internet is widely used in almost all the communication applications. In the recent times, numberof applications based on internet have been developed to make the communication as a more reliable and efficient in nature. Out of these numerous applications, E-mail is the most widely used and reliable way to communicate with each other. The usage of e-mail is quite easy and lucid for regular users but when it comes to the user with visual defect, the system is yet very difficult to use. The current system is not useful for people with visual defect as the available system are based on the visual perceptions. There is huge up gradation in the technologies now days, especially for the visually challenged people. Still the current emailing system is yet not upgraded for the use of visually impaired. This arises a significant need to upgrade the existing system to make it more useful for the visually impaired. In this study we present an email system working on the voice controlling principle for the people with visual impairment to deliver a simple and easy access to the email system. This framework will also be helpful for the individuals with other weaknesses alongside the visually impaired individuals

Carmel Mary Beinda M.J. et al. [6] have proposed an android application by designing specifically for visually challenged people. It provides a voice-based mailing service where they could read and send mail on their own, without any guidance. Here the users have to use certain keywords which will perform certain actions for e.g., Read, Send, Compose Mail, Address Book etc. This EMAIL system can be used by a blind person to access mails easily and efficiently. Thus, reliance of visually impaired on other people for their activities related to mail can be reduced. The major drawbacks of the application can be used as the future enhancements for this project. There are two major drawbacks in this application i.e.., the exact voice recognition and the image or document attachment. So, in the future enhancement, we can add the image ordocument attachment for the sender

K. Venkatesh et. al.[7] The main aim of this system is for strengthening and welfare of our society. The main theme is to help visually challenged persons to perform tasks of E-Mail for communication through the internet. This system makes disabled, blind, visually challenged people life easy. This is a very useful system in our society in the communication field. This will bring a drastic change in the field of communication.

Real time object detection and tracking play a vital role in video surveillance system which keeps track of the information video data. The drawback in background subtraction is that detection time of object is tedious. Workflow Scheduling deals with the implementation of inter-reliant jobs on distributedresources. Based upon the work performed in this paper, montage workflow with bat optimized workflow scheduling is well suited for object detection based on background subtraction since computation time is very lesswhen compared to other workflows.

The method explainedabove is the best way out of all the solutions for thisproblem since it is easy to implement compared to others with accessing many features.

Latha L et. al. [8] suggested an application with the aim that it can be used by both visually challenged and normal sighted people. Screen readers, Braille keyboards, etc., were useful for their studies. But when it comes to searching or using an application, it is bit difficult. Hence this application can be used to send and receive mail from the sender and receiver. To ensure privacy of sending message, a hardware to identify the presence of human has been arranged which can be made using Micro Electro Mechanical Elements.

This will be very useful in comparison with the other applications of visually challenged. Many researches are undergoing regarding the usage of internet by the visually challenged. In the total population of the world there are about 60% of visually challenged in India.

The literacy rate of visually challengedis also getting high. Hence it is necessary to make developments in the visual perception of internet to make them use the internet as like normal person. Currently available systems such as Screen readers, Interactive voice Response, etc. also requires some visual perception by disabled to create account and to use them. An interactive voice-based email system can help visually challenged to communicate easily in this modern world. To ensure privacy there are systems to identify human presence.

Many sensors such as accelerometer, gyro meter is getting embedded in smart phones as Micro Electro Mechanical Elements hence they are embedded. If person identificationsensor is also able to embed in smart phone specially designed for visually challenged, then it will be very usefulfor them to use email and other applications

Rohit Rastogi et. al. [9] proposed a user-friendly application, efficient and an economical system, which allows a visually challenged individual to interact with an Android application easily. It involves the developmentand implementation of a real-time email interaction systemfor visually impaired.

They have planned to develop a system that could facilitate the visually challenged individuals to access email services in an efficient way. Their application can help in overcoming some of the drawbacks of the existing email systems. In this system, the use of keyboard has been eliminated completely and thus reduces the cognitive load of remembering keyboard shortcuts as well as the position of the keys on a keyboard.

The user only requires listening to the voice commands given by the system and respond accordingly in order toget the desired operations performed. This requires user to speak the operation in the email application and then the system will perform the required operations. The user would be requested to feed info through voice inputs whenever required and system will ensure the authentication of the user details.

T.Shabana, et. al. [10] In this paper a system is proposed which will help the visually impaired people to access email services efficiently. The user only needs to followthe instructions given by the IVR and use mouse clicks accordingly to get the respective services offered.

For people who can see, e-mailing is not a big deal, but for people who are not blessed with gift of vision it postures a key concern because of its intersection with many vocational responsibilities. This voice-based email system has great application as it is used by blind people as they can understand where they are. E.g., whenever cursor moves to any icon on the website say Register it will soundlike “Register Button”.

There are many screen readers available. But people had to remember mouse clicks. Rather, this project will reduce this problem as mouse pointer would read out where he/she lies. This system focuses more on user friendliness of all types of persons including regular persons, visually compromised people as well as illiterate.

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## III. SYSTEM DESIGN

The system design is the process of defining the architecture, components, modules, interfaces and data for a system to satisfy requirements. Systems design could be seen as the application of systems theory to product development. The general design architecture of the system depicts the interaction of the subsystems in thesystem as shown in figure

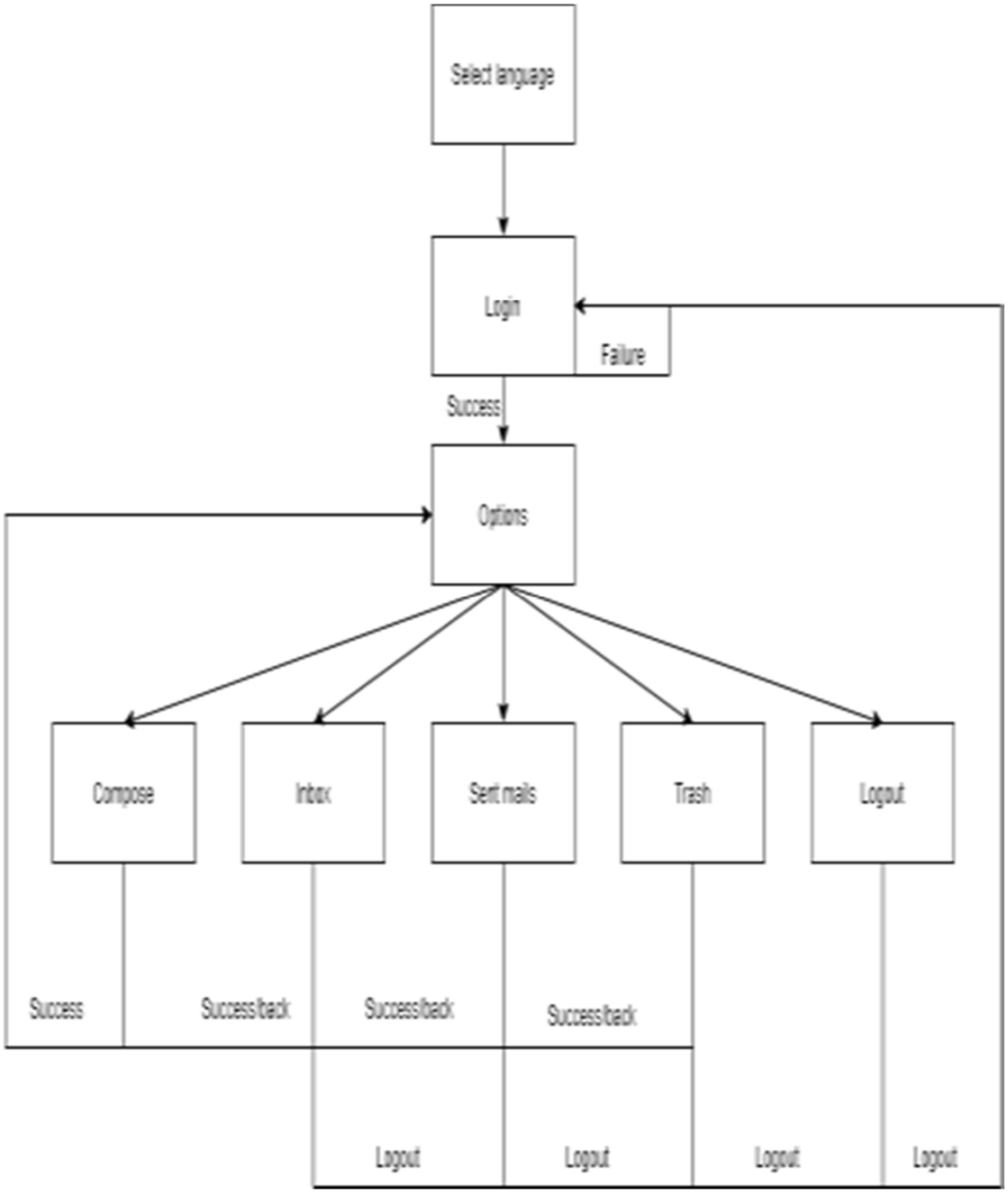


Fig 1 System Design

Once the application is up and running, the user has to choose a language – English, Hindi, or Kannada and then log in. If the Email and Password are authenticated, the user's Options Page will be displayed The Options page has five options to choose from – Compose, Inbox, Sent Mails folder, Trash and logout. User can select these choices and perform operations and the logout at any time which will redirect it to the Home page again. .

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## IV. FLOW DIAGRAM

Flowchart is a diagram of the sequence of movements or actions of people or things involved in a complex systemor activity. It is a graphical representation of a computer program in relation to its sequence of functions (as distinct from the data it processes).

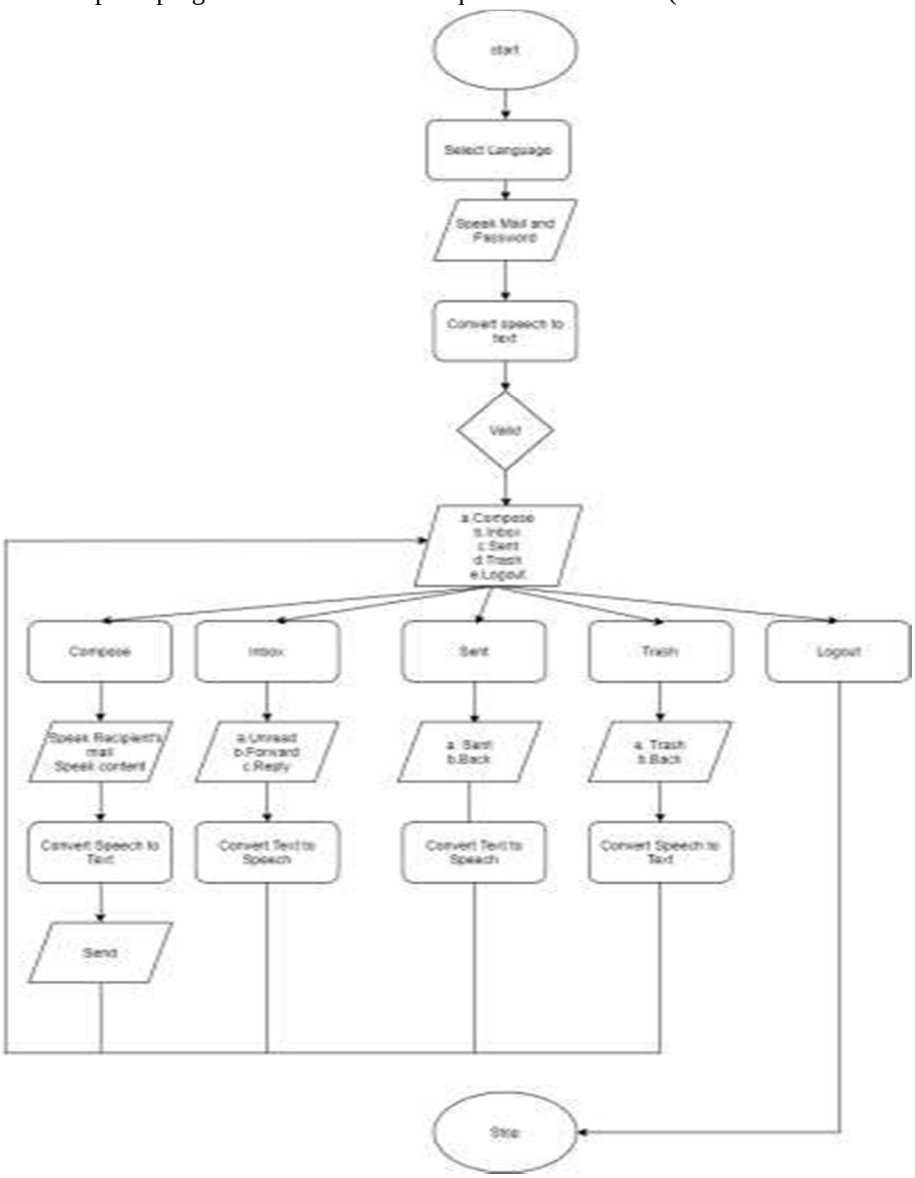


Fig 2 FLOW DIAGRAMS

Once the user is on the Home Page, they have five options namely, Inbox, Compose, Sent mail Trash, Log out. If the user wishes to compose a new mail, the user will input the voice command “Compose “. This will redirect the user to the Compose page. The compose page asks the user to add recipients addresses, subject of the mail and body of the mail. The user can also add attachments by speaking a valid filename with extension. After the mail is successfully sent, the user is redirected back to the Optionspage. If the user wishes to check the received mails, the Inbox option is to be selected by voice command “inbox”. The inbox page has options to read unseen Emails, search for an Email and Logout and go back to the Home page. If the user wishes to check the sent mails, a voice command “sent” is given as input. This will redirect the user to the Sent Page, which has options to read sent mails, search for a specific Email or logout and go back to the home page. Ifthe user wishes to check the trash mails, a voice command “trash” is given as input. This will redirect the user to the Trash Page, which has options to read trash mails, search for a specific Email or logout and go back to the home page.

The option page also has a logout option where the userwill be logged out and redirected to Home Page.

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## V. IMPLEMENTATION

The web application is implemented using Django webframe work and python programming language.
Google text- to-speech and speech recognition libraries areused for the voice inputs and outputs.
Gmail accessed using IMAP and SMTP mail servers.
The application is made multi-lingual by adding 3language choices:

*1)* English
*2)* Hindi
*3)* Kannada

More languages can be added in future.

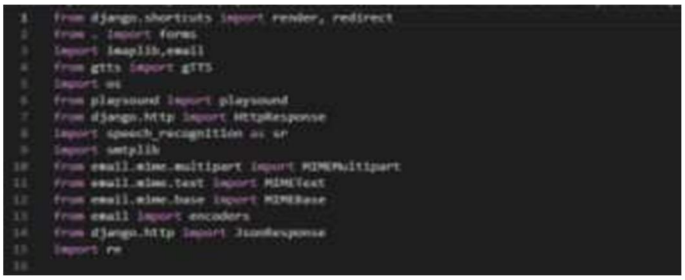


Fig 3 Libraries Used


Fig 4 Text – to – Speech code


Fig 5 Speech- to – text code

## VI. RESULT

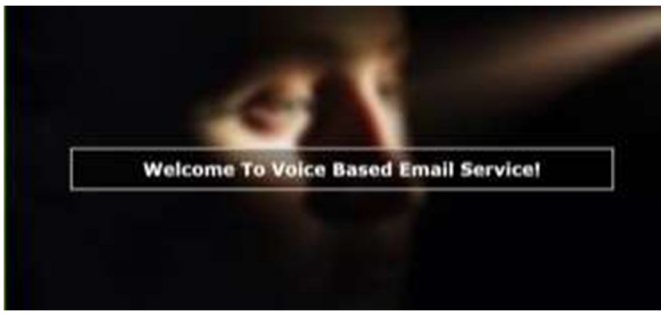


Fig 6 Home Page

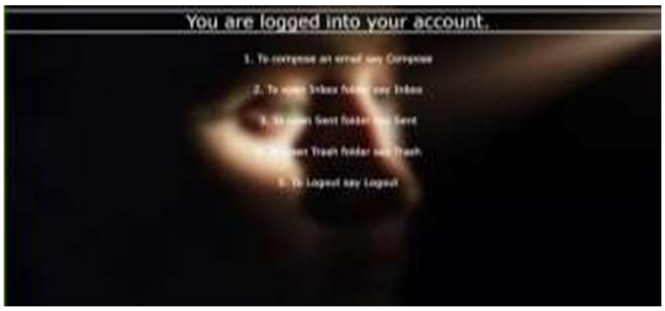

Fig 7 Options Page

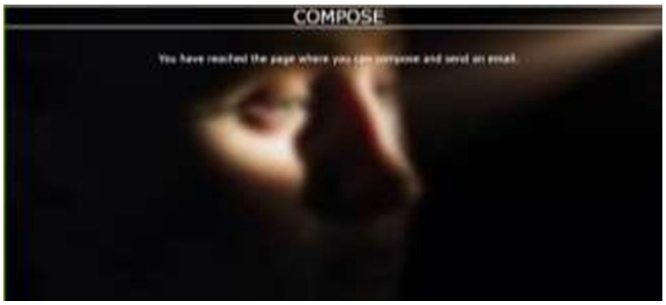

Fig 8 Compose Page

Fig 9 Inbox Page

Fig 10 Sent Mail Page

Fig 10 Trash Folder Page

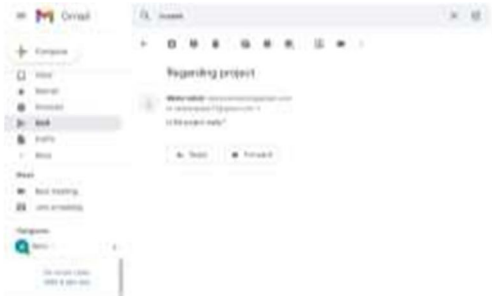

Fig 11 Received Mail

## VII. CONCLUSION

Blind people face difficulties in accessing emails, also in using any service provided through internet. The advancement in computer based accessible systems hasopened up many avenues for the visually impaired across the globe in a wide way. The project involves the development and implementation of a real-time email interaction system for visually impaired Voice based email system architecture that can be used by a Blind person to access e-Mails easily and efficiently. In this system, the use of keyboard has been eliminated completely and thus reduces the cognitive load of remembering keyboard shortcuts as well as the position of the keys on a keyboard. The project uses text-to-speech and speech-to-text to create an email service. The user only requires listening to the voice commands given by the system and respondaccordingly in order to get the desired operations performed. This requires user to speak the operation in the email application and then the system will perform the required operations. The user would be requested to feed info through voice inputs whenever required and system will ensure the authentication of the user details. The project operates on voice and is targeted to visually impaired society. This e-mail system can be used by any user of any age group with ease of access. Therefore, reliance of visually impaired on others for his or her own activities associated with mail are often reduced.

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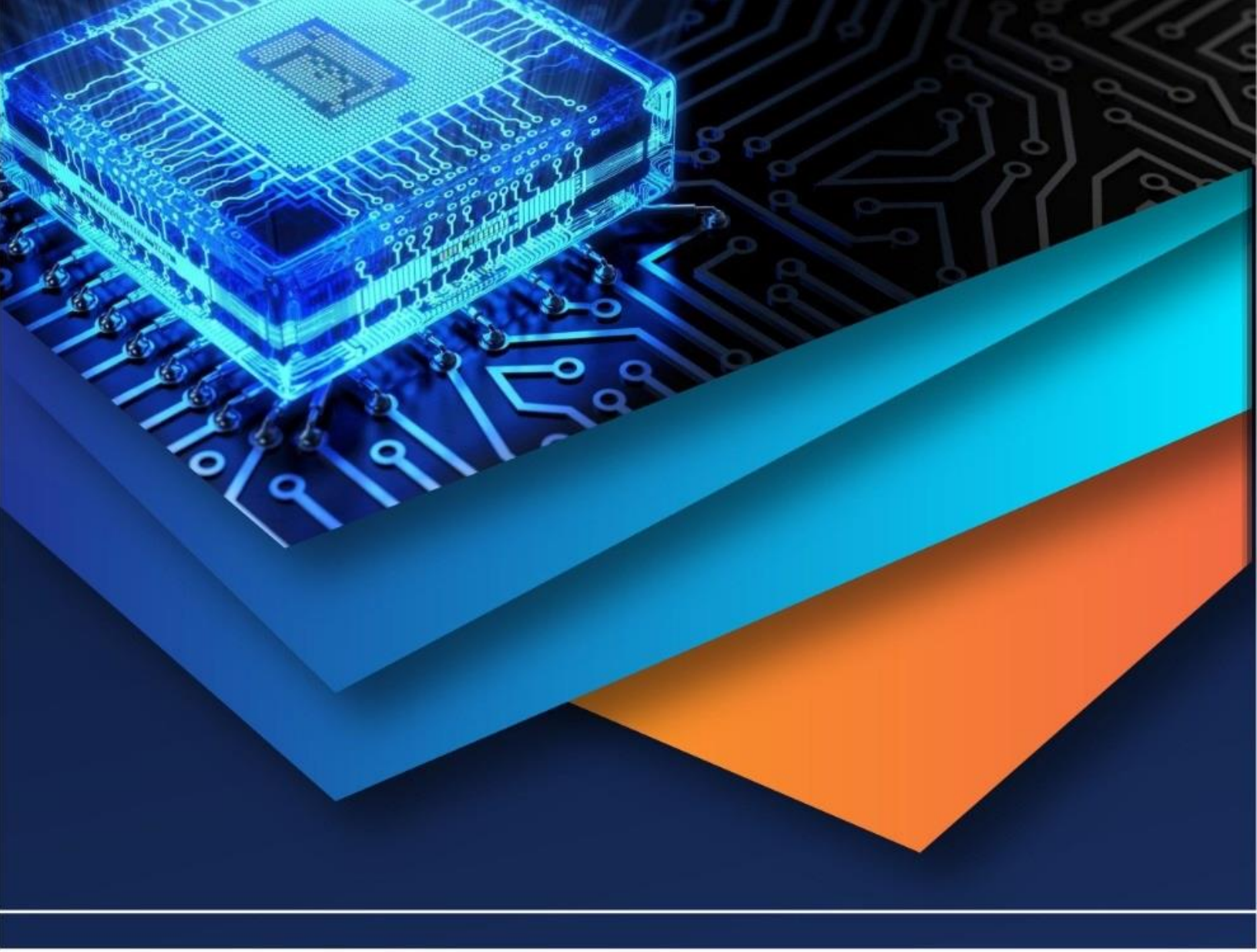

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