**PROJECT ON**

**VOICE BASED EMAIL SERVICE FOR VISUALLY CHALLENGED PEOPLE**

*(CSE -ML IV SEMESTER MINI PROJECT)*

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**HARDWARE REQUIREMENT**

PROCESSOR : INTEL CORE i5

RAM : 8 GB

STORAGE : 5 MB(MAX)

OPERATING SYSTEM : WINDOWS 10

**SOFTWARE REQUIRED**

PYCHARM/VS CODE

**ABSTRACT**

In today’s world communication has become so easy due to integration of communication technologies with internet. However the visually challenged people find it very difficult to utilize this technology because of the fact that using them requires visual perception. Even though many new advancements have been implemented to help them use the computers efficiently no naïve user who is visually challenged can use this technology as efficiently as a normal naïve user can do that is unlike normal users they require some practice for using the available technologies.

This paper aims at developing an email system that will help even a naïve visually impaired person to use the services for communication without previous training. The system will not let the user make use of keyboard instead will work only on mouse operation and speech conversion to text. Also this system can be used by any normal person also for example the one who is not able to read. The system is completely based on interactive voice response which will make it user friendly and efficient to use.

**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 the main 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 you 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. It is very unlikely that every time a visually impaired person can find someone for help.

**PROJECT OBJECTIVES**

The application will be a python-based application for visually challenged persons using IVR- Interactive voice response, thus sanctioning everyone to control their mail accounts using their voice only and to be able to read, send, and perform all the other useful tasks. The system will ask the user with voice commands to perform certain action and the user will respond to it. The main advantage of this system is that use of keyboard is completely eliminated , the user will have to respond through voice only.

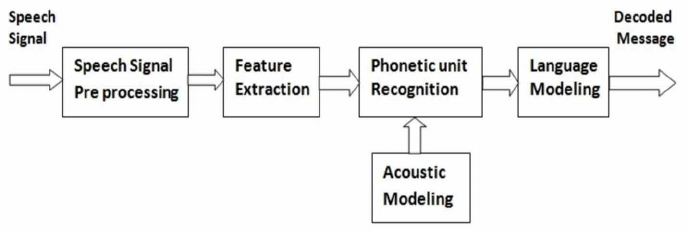
**SPEECH RECOGNITION**

**Speech recognition**, the ability of devices to respond to spoken commands. Speech recognition enables hands-free control of various devices and equipment (a particular boon to many disabled persons), provides input to automatic translation, and creates print-ready dictation. Among the earliest applications for speech recognition were automated telephone systems and medical dictation software. It is frequently used for dictation, for querying databases, and for giving commands to computer-based systems, especially in professions that rely on specialized vocabularies. It also enables personal assistants in vehicles and smartphones, such as Apple’s Siri and Bixby from Samsung.

Before any  machine can interpret speech, a microphone must translate the vibrations of a person’s voice into a wavelike electrical signal. This signal in turn is converted by the system’s hardware—for instance, a computer’s sound card—into a digital signal. It is the digital signal that a speech recognition program analyses in order to recognize separate phonemes, the basic building blocks of speech. The phonemes are then recombined into words. However, many words sound alike, and, in order to select the appropriate word, the program must rely on the context. Many programs establish context through trigram analysis, a method based on a database of frequent three-word clusters in which probabilities are assigned that any two words will be followed by a given third word. For example, if a speaker says “who am,” the next word will be recognized as the pronoun “I” rather than the similar-sounding but less likely “eye.” Nevertheless, human intervention is sometimes needed to correct errors.

Programs for recognizing a few isolated words, such as telephone voice navigation systems, work for almost every user. On the other hand, continuous speech programs, such as dictation programs, must be trained to recognize an individual’s speech patterns; training involves the user reading aloud samples of text. Today, with the growing power of personal computers and mobile devices, the accuracy of speech recognition has improved markedly. Error rates have been reduced to about 5 percent in vocabularies containing tens of thousands of words. Even greater accuracy is reached in limited vocabularies for specialized applications such as dictation of radiological diagnoses.

**BLOCK DIAGRAM OF SPEECH RECOGNITION PROCESS**



**SPEECH RECOGNITION USING PYTHON**

To implement speech recognition using python, we require some important packages for installation:

* speech recognition
* pyaudio
* pyttsx3

**1.speech recognition**

The main component of speech recognition is, of course, speech. Speech must be converted from physical sound to an electrical signal with a microphone, and then to digital data with an analog-to-digital converter. Once digitized, several models can be used to transcribe the audio to text.

To decode the speech into text, groups of vectors are matched to one or more phonemes—a fundamental unit of speech.

**INSTALLATION**

pip install SpeechRecognition as sr

**the recognizer class**

All of the magic in SpeechRecognition happens with the Recognizer class.The primary purpose of a Recognizer instance is to recognize speech. Each instance comes with a variety of settings and functionality for recognizing speech from an audio source.

r = sr.Recognizer()

**2.pyaudio**

PyAudio provides Python bindings for PortAudio, the cross-platform audio I/O library. With PyAudio, you can easily use Python to play and record audio on a variety of platforms.

**INSTALLATION**

pip install pyaudio

**3. pyttsx3**

pyttsx3 is a text-to-speech conversion library in Python. Unlike alternative libraries, it works offline, and is compatible with both Python 2 and 3

**INSTALLATION**

pip install pyttsx3

**CONCLUSION**

*The project that we have projected is a system which will help the visually impaired people to access email services efficiently.*

*This system will help in overcoming some drawbacks that were earlier faced by the blind people in accessing emails. We have eliminated the concept of using keyboard shortcuts along with screen readers which will help reducing the cognitive load of remembering keyboard shortcuts.*

*Also any non-sophisticated user who does not know the position of keys on the keyboard need not bother as keyboard usage is eliminated. Instructions given by the IVR accordingly to get the respective services offered.*

*Other than this the user might need to feed in information through voice inputs when specified.*

*It is a observation that about 70% of total blind population across the world is present in INDIA. This project, describe the voice mail architecture used by blind people to access Email and multimedia functions of operating system easily and efficiently.*

*This architecture will also reduce cognitive load taken by blind to remember and type characters using keyboard.*

*It also helps handicapped and illiterate people.*