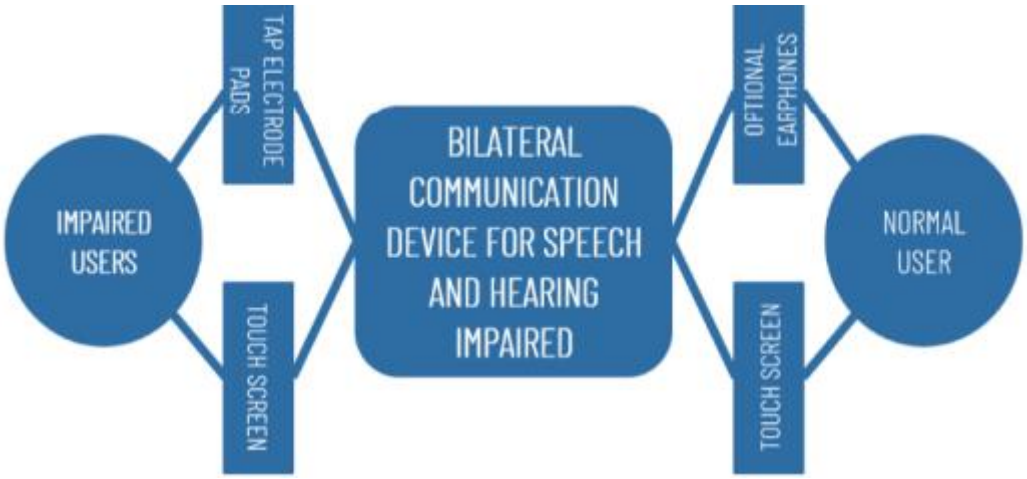
Project Design Phase-I
Solution Architecture

Date	19 September 2022
Team ID	PNT2022TMID47262
Project Name	Project –Real-Time Communication System Powered By AI For Specially Abled.
Maximum Marks	4 Marks

Solution Architecture:

- Communication is a bilateral process and being understood by the person you are talking to is a must. Without the ability to talk nor hear, a person would endure such handicap. Given that hearing and speech are missing, many have ventured to open new communication methods for them through sign language.
- This bilateral communication device can be utilized by both non-sign language users and Deaf-mute together in a single system. The latter has the technology of twelve interactive capacity touch and proximity electrode pads that react when tapped, producing quick response phrases audible via speaker or earphone.
- The device is lightweight weighing at about 3 lbs. The prototype device was piloted in an academic institution of special education for deaf-mute students.The device is designed to promote the face-to-face socialization aspect of the Deaf-mute users to the normal users and vice versa.
- Most people with such disabilities become introverts and resist social connectivity and face-to-face socialization. Imagine the depression and discomfort experienced when one is unable to express their thoughts, for sure frustration arises every now and then. People rely on words and sound from the environment for them to grasp what is happening. Other alternatives to remedy the said language barrier is to acquire a sign language interpreter, but practically speaking it is not the optimal solution.Not everyone around can check what they are saying or is intending to express. Most Deaf-mute just limit themselves to performing simple tasks to avoid irritation to others and to themselves.
- Not everyone has knowledge of sign language. The Deaf-mute have two options either to tap the desired electrode pads preloaded with the most commonly used English words and phrases located on the touch board or to communicate using the TFT touch shield like a multi-touch screen, swiping and tapping hand-sign and illustrative images of English words in alphabetical order by default. A search option is also integrated to the system to find images on the screen faster.

Solution Architecture Diagram:



This module takes text message of a normal person as an input and outputs an image file in a .bmp format, that displays sign language images for the Deaf-mute person. Each image file is given tags and indexing. The steps of normal to Deaf-mute person communication are as follows:

(1) The application takes text of normal person as an input.

(2) The application converts the text message of a normal person into an image by using the text-to-image conversion program.

(3) The program matches the text to any of the image tags and index associated with the file and displays the corresponding sign for the Deaf-mute

Reference: R. Tabiongan / Advances in Science, Technology and Engineering Systems Journal Vol. 5, No. 4, 363-373 (2020)