Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	15 October2022
Team ID	PNT2022TMID01421
Project Name	Real-Time Communication System Powered by AI for Specially Abled
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data collection	Collection of images and spliting them into train data and test data folders to build the machine learning model.
FR-2	Image processing Tensorflow	TensorFlow is an open-sourced end-to-end platform, a library for multiple machine learning tasks and using this we process the image, image pre-processing includes zooming, shearing, flipping to increase the robustness of the model after it is built.
FR-3	Model building , training and testing	Keras is a high-level neural network library that runs on top of TensorFlow and is used for image pre-processing through imageDataGenerator module and creating Convolutional Neural Network for model building and training.
FR-4	App building	Flask is used for developing web applications using python, implemented on Werkzeug and Jinja2. Advantages of using Flask framework are: There is a built-in development server and a fast debugger provided. is used to create an web application which will act as an interface between the users and our machine learning model.
FR-5	Storing data collected in IBM cloud	Selecting an IBM Cloud Object Storage account. Selecting the specific geographic region where you want the image template stored. Selecting the IBM Cloud Object Storage bucket where image template is to be stored.
FR-6	Training the model on IBM WATSON STUDIO	IBM Watson Studio is used to build, run, manage and deploy AI models, and optimize decisions anywhere on IBM Cloud Pak for Data. Unite teams, automate AI lifecycles and speed time to value on an open Multicloud architecture.
FR-7	Text to speech	IBM Watson Text to Speech is an API cloud service that converts the text into natural-sounding audio in a variety of languages and voices within an existing application or within Watson Assistant.
FR-8	Integrating the model with the web app and deploying it in IBM cloud	IBM cloud service : To deploy our model on cloud so that it can be created as a service and integrated with the web application created using flask framework.

FR-9	User registration and authentication	Users can register via their gmail account or mobile number and will be authenticated using an OTP and also they will able to set passwords and reset passwords.
FR-10	User login	The registered users can now login using their gmail/mobile number, their password and they are good to go.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	This web app connected to the AI model service trained on IBM Watson studio AI model service will be usable by any person who wants to communicate with person using sign language but doesn't understand the sign language the app will convert the sign language into voice in the language understandable by the user.
NFR-2	**Security**	Since the model is built on top of the IBM cloud services scalability can also be done with the support of the IBM cloud services in an efficient way.
NFR-3	**Reliability**	The probability of failure-free operation of this service for a specified period in a specified environment will be high and will ensure that the service meets all the requirements to do so. Reliability is a customer-oriented view of software quality and the way this model will be built and tested with care so that it always provides a high quality interactive experience to our customers and clients
NFR-4	**Performance**	An effective model training process and several testing process will be carried out to make accurate predictions of the sign language to satisfy the user requirements.
NFR-5	**Availability**	This service will be available any time and regular updates based on the users feedback an.
NFR-6	**Scalability**	Since the model is built on top of the IBM cloud services scalability can also be done with the support of the IBM cloud services in an efficient way.