Project Design Phase-
IITechnologyStack(Architecture&Stack)

TeamID	PNT2022TMID50471
ProjectName	Project-Real-TimeCommunicationSystemPoweredbyAIforSpeciallyAbled
MaximumMarks	4Marks

TechnicalArchitecture:

TheDeliverableshallincludethearchitecturaldiagramasbelowandtheinformationasperthetable1&table2

Example:Real-TimeCommunicationSystemPoweredbyAIforSpeciallyAbled

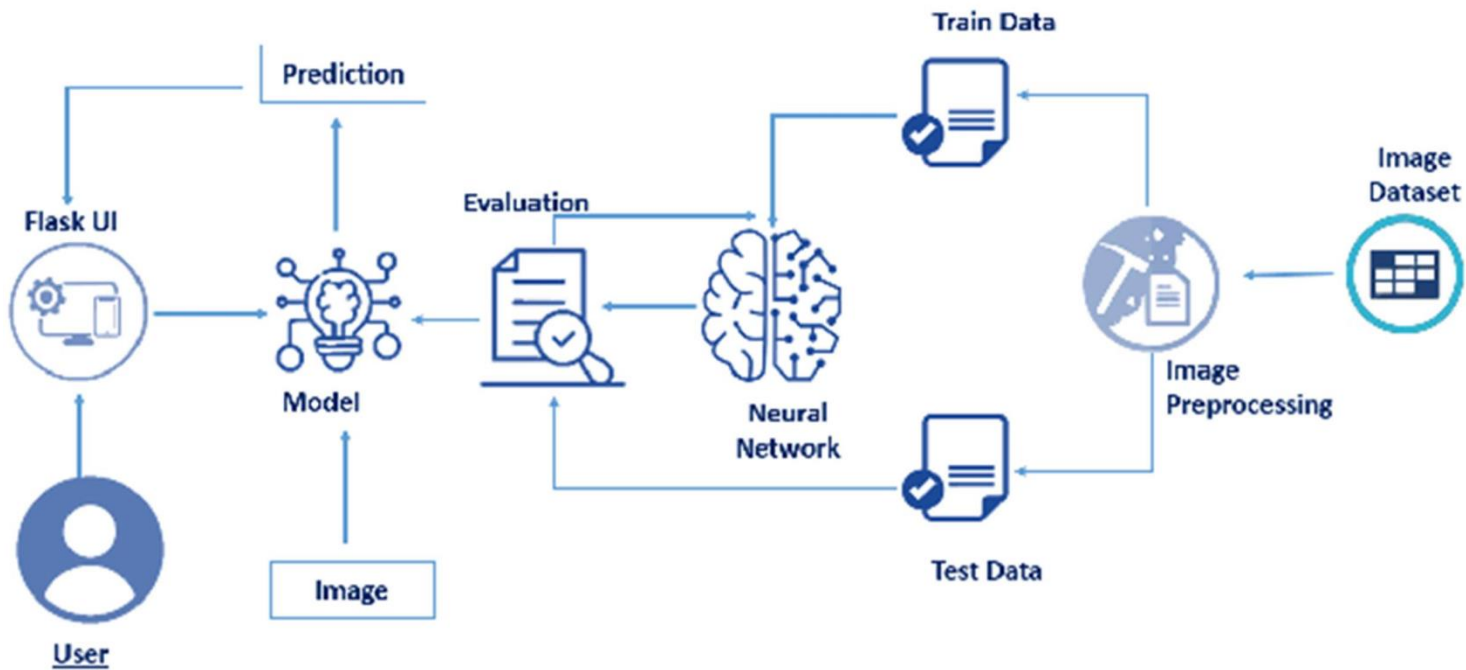**Table-1:Components&Technologies:**

S.No	Component	Description	Technology
1.	User	Deaf and dumb people willing to communicateefficiently,withoutanyhasslewithot hersintheir Surroundingenvironment	AItechniques
2.	FlaskUI	The components of Flask's User Interface allowonetointeractwithclientsthatmakeuseofyou r applicationandgatherinformation.	Canbeexecutedusingexistingcloudte chnologies
3.	ImageDataset	Theinitialprototypeofthisapplicationistrainedon a subset of the dataset containing 20 differentsignsadheringtotheAmericanSignLang uage	AItechniques
4.	ImagePreprocessing	The images in the dataset are preprocessed toincreasethesharpness/clarityandremoveanyn oise	ANN,CNN,OpenCV
5.	Training	SVM is run on the training dataset to extractattributes from the images which are then fed totheNeuralNetworkinordertomaketheprediction	Scikit-learn,NaturalLanguageProces sing(NLP)
6.	Testing	Thetrainedmodelisthenrunonanadditionalunte sted10-15sign-languageimagesandtheperformance parameters are evaluated andrecorded	Scikit-learn,NLP
7.	NeuralNetwork	Thesameneuralnetworkarchitectureisusedfor bothtop-viewandbottom-viewmodels;theonlydifferenceliesinthenumbero foutputunits	ANN
8.	Evaluation	Recordsthegeneralizationaccuracyofthepr oposedmodelonfuture/unseendata	
9.	Model	MLalgorithmslikeSVM(SupportVectorMachine)ar eappliedtoclassifythegivenimagedataset	MachineLearning
10.	Prediction	The attributes extracted from the images areexaminedandpredictionsaremadeinorderto convertthesign-languagetothecorrespondingtext	ANN,CNN

Table-2:ApplicationCharacteristics:

S.No	Characteristics	Description	Technology
1.	Open-SourceFrameworks	RobotsandvariousotherAItoolshavemadeit Possibleforpeoplewithdisabilitiestolivecomfortably	AItechniqueslikeself-movingrobotsandothersoftwaresystems
2.	SecurityImplementations	Users are authenticated based on theirusername/passwordpairand/orOTPsenttotheirgiven mobilenumbers	SHA-1,Encryptions,IAMControls
3.	ScalableArchitecture	We implement a modular 3-tier client-serverapplicationarchitecturethatimprovesscalability,availability,andperformance.Individualtiers arecontainerized	Presentationlayer,ApplicationlayerandDataLayermodularity,Docker
4.	Availability	Theapplicationhasanextremelylowdowntimeand load balancers forward request to otheravailablemachinesincaseoffailures	Keyperformanceindicators(KPI)
5.	Performance	Theapplicationperformsefficientlyunderaheavy Loadoftranslationrequestswithoutanysignificantreductionintheconversionaccuracy	Numberofrequestsperminute, accuracyoftranslation(sign-languagetospeech&texttosign-language)