Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	PNT2022TMID12764
Project Name	Real-Time Communication System Powered by AI for Specially Abled
Maximum Marks	4 Marks

Technical Architecture:

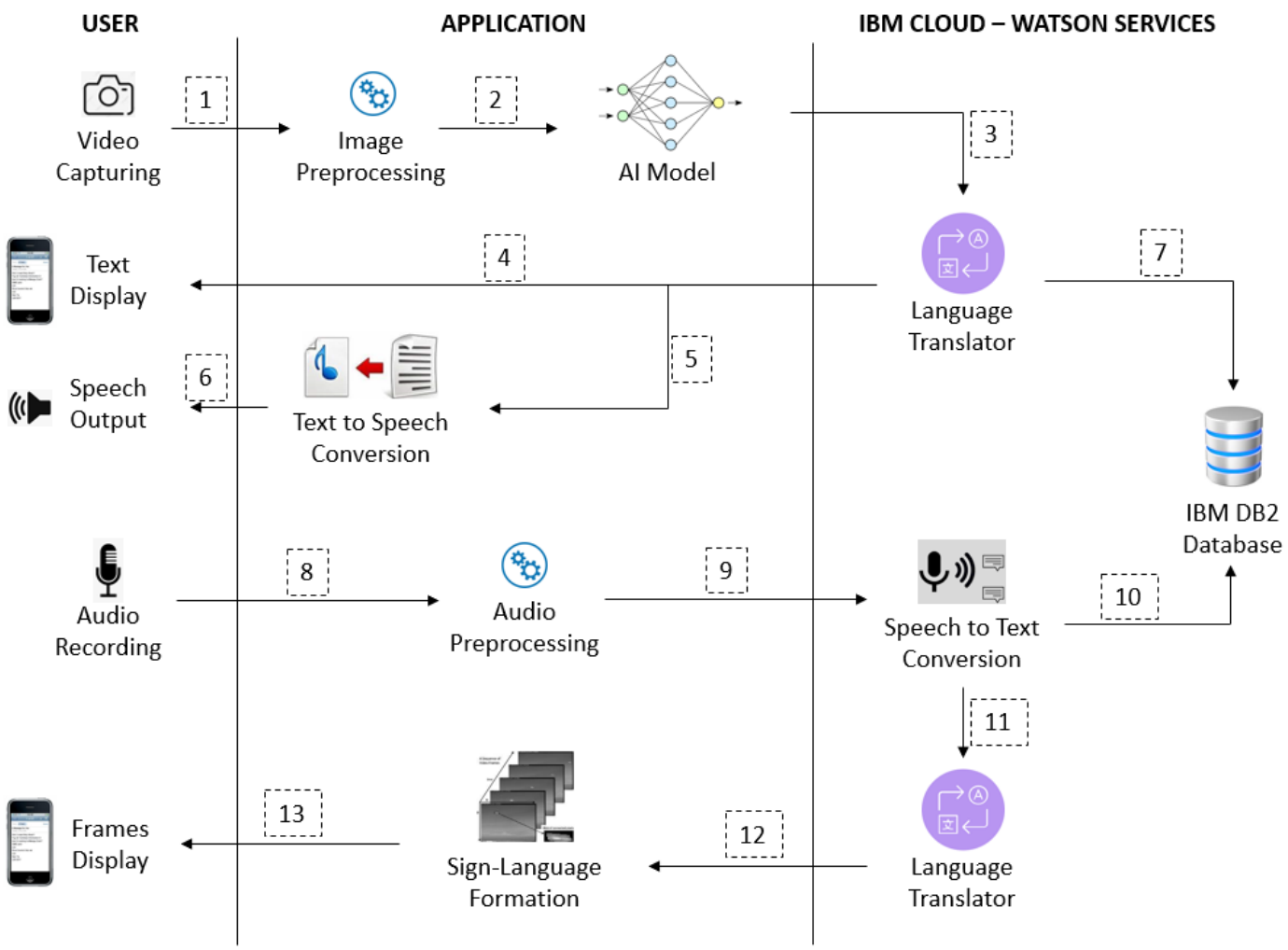
The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Example: Order processing during pandemics for offline mode

Reference: https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/

Guidelines:

- Include all the processes (As an application logic / Technology Block)
- Provide infrastructural demarcation (Local / Cloud)
- Indicate external interfaces (third party API's etc.)
- Indicate Data Storage components / services
- Indicate interface to machine learning models (if applicable)


USER
APPLICATION
IBM CLOUD – WATSON SERVICES
Video Capturing
1
Image Preprocessing
2
AI Model
3
Language Translator
7
IBM DB2 Database
Text Display
4
Speech Output
6
Text to Speech Conversion
5
Audio Recording
8
Audio Preprocessing
9
Speech to Text Conversion
10
11
Language Translator
12
Sign-Language Formation
13
Frames Display

1 - video of the sign-language should be taken at the user side and it should be given to the image preprocessing stage of the application.

2 - after image preprocessing, the processed image should be fed to AI model for gesture recognition

3 -the English text output from the AI model should be fed to the language translator of the IBM Cloud. This is optional as it should be done if the user choose different language in the settings page

4 - the translated text should be fetched by the application and displayed at the user side.

5 - the fetched text should be converted to speech

6 - the speech should be given as output through speaker at the user side

7 - the resultant data is stored in the database. This is optional and should be done if the user preferred to backup data

8 - Audio should be recorded at the user's side and should be given to audio preprocessing stage in the application

9 - the processed audio is given to the speech to text conversion system in the IBM Watson cloud

10 - the converted text is stored in the database. This is optional and should be done if the user preferred to backup data

11 - the english language text is translated to the user's desired language. This is optional as it should be done if the user choose different language in the settings page

12 - the translated text is fetched .

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Mobile App	AI Model
2.	Application Logic-1	Output from the AI model should be fed to the language translator of the IBM Cloud.	Java / Python
3.	Application Logic-2	The translated text should be fetched by the application and displayed at the user side.	IBM Watson
4.	Application Logic-3	Audio recorded at the user's side and should be given to audio preprocessing stage in the application.	IBM Watson Cloud
5.	Database	The converted text is stored in the database	MySQL, NoSQL, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Creating mobile applications, using a text-to-speech service, and storing data in the cloud.	IBM Watson
2.	Security Implementations	Putting encryption to use for security.	SHA-256, Encryptions
3.	Scalable Architecture	The application can load as many members as there are logged in.	IBM Watson
4.	Availability	Application is offered 24/7	IBM Watson, IBM Cloud

S.No	Characteristics	Description	Technology
5.	Performance	Audio is recorded at the user's side and the processed audio is given to the speech to text conversion system and the converted text is stored in the database.	IBM Watson Cloud

References:

https://c4model.com/

https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/

https://www.ibm.com/cloud/architecture

https://aws.amazon.com/architecture

https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d