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

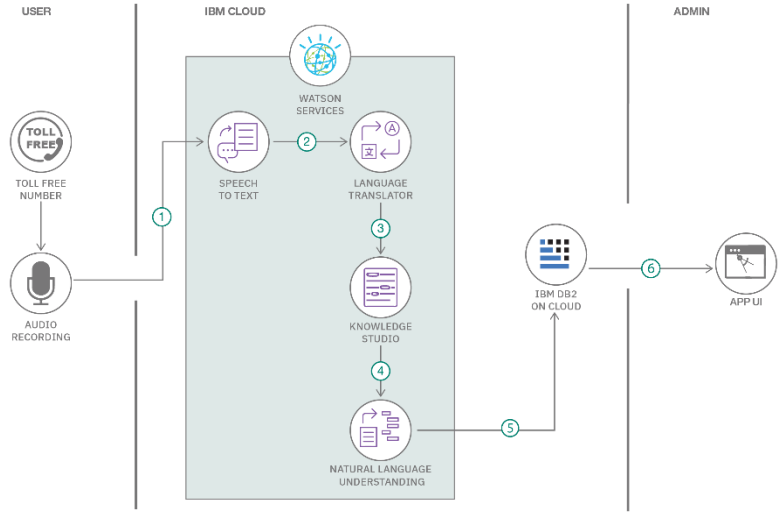
Date	03 November 2023
Team ID	Team-592063
Project Name	AI enabled car parking using open CV
Maximum Marks	4 Marks

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:

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

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User Interface is used by user in mobile application or in Build in car display itself	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Framework used for design the software	Python, python-flask
3.	Application Logic-2	Access the software in the car by the driver to detect the spot	Python, OpenCV
4.	Application Logic-3	Open CV is an open source platform for providing real time computer vision technology	Open CV
5.	Database	Contains images and video frames stores in data base	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	They make it easy for developers to store manage and deploy container images	Container registry
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Uses test and trained data images and video to learn the environment	Object Recognition Model, etc.

11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description
1.	Real-time processing	The OpenCV library provides fast and efficient image processing functions, making it possible to detect and track vehicles in real-time. This is important for car parking systems as it allows parking availability information to be updated in real time
2.	Scalability	An AI-enabled car parking system using OpenCV can be easily scaled to accommodate a large number of parking spots.
3.	Scalable Architecture	Open CV provides accurate object detection and tracking algorithms. Making it possible to accurately detect and track vehicles within the parking lot.
S.No	**Characteristics**	**Description**
4.	Customizability	OpenCV provides a wide range of customizable image processing algorithms, allowing car parking systems to be tailored to specific requirements. For example, the system can be trained to detect and track specific types of vehicles, such as motorcycles or trucks.
5.	Performance	OpenCV can be easily integrated with other technologies, such as IOT sensors or payment systems. This allows car parking systems to be seamlessly integrated with other systems and services.

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