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

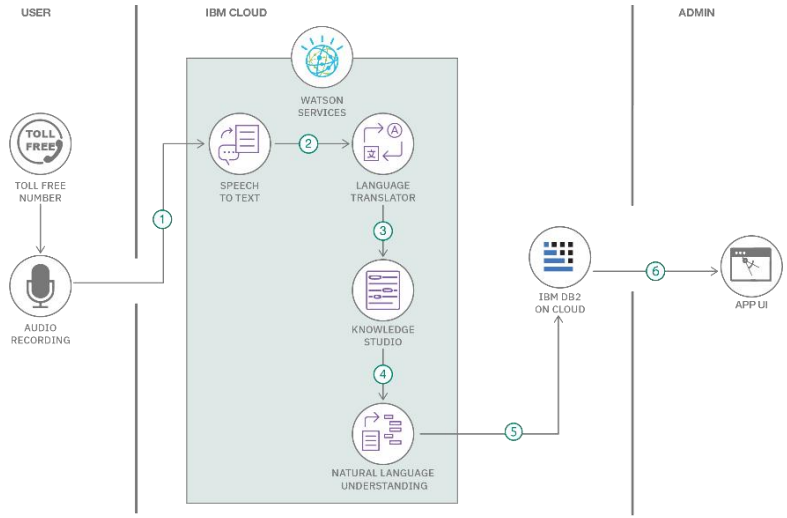
Date	6-11-2023
Team ID	592974
Project Name	Airline Review Classification using ML
Maximum Marks	4 Marks

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)

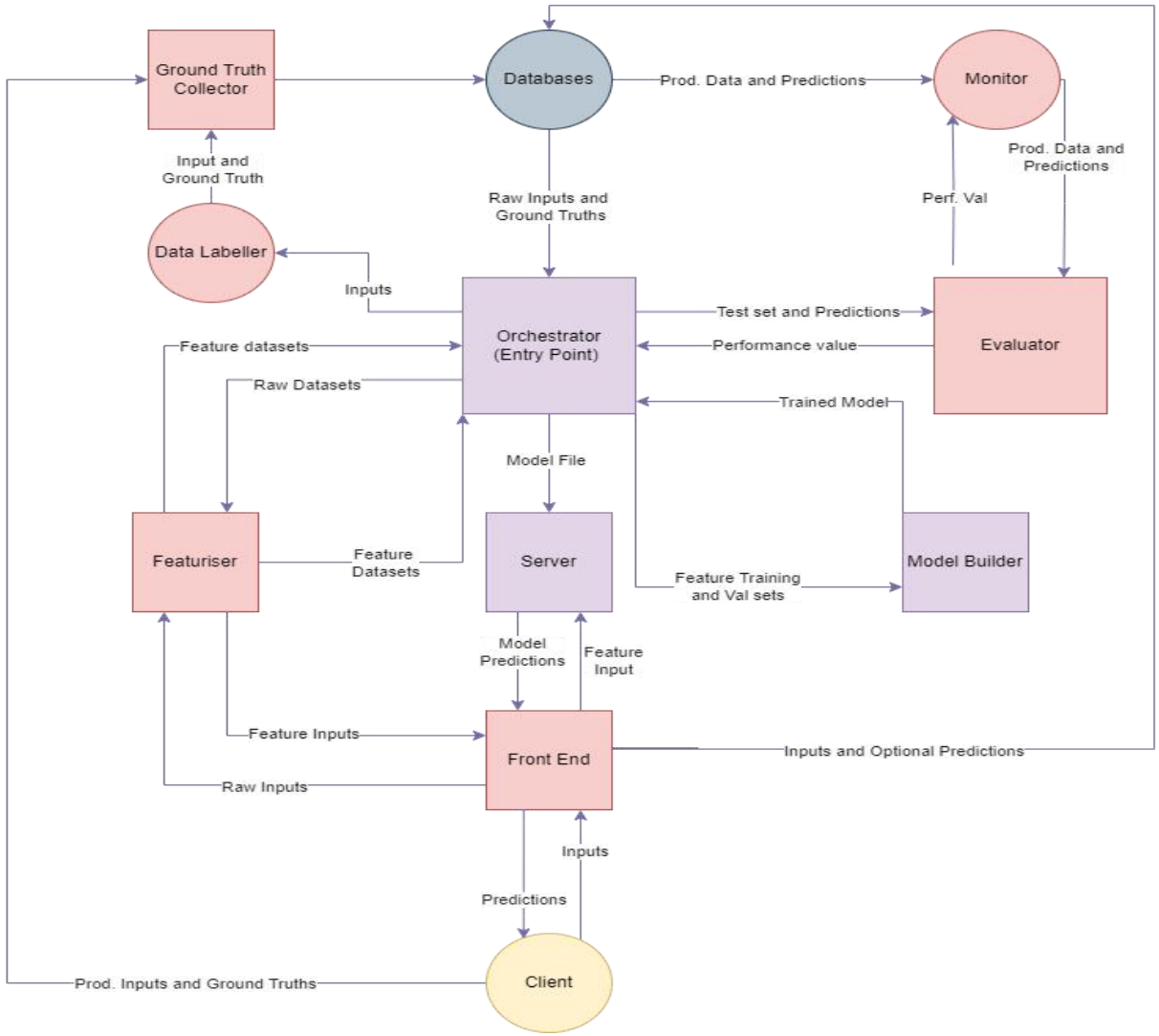

Ground Truth Collector
Databases
Prod. Data and Predictions
Monitor
Input and Ground Truth
Raw Inputs and Ground Truths
Perf. Val
Prod. Data and Predictions
Data Labeller
Inputs
Orchestrator (Entry Point)
Test set and Predictions
Performance value
Evaluator
Feature datasets
Raw Datasets
Trained Model
Model File
Featuriser
Feature Datasets
Server
Feature Training and Val sets
Model Builder
Model Predictions
Feature Input
Feature Inputs
Front End
Inputs and Optional Predictions
Raw Inputs
Inputs
Predictions
Client
Prod. Inputs and Ground Truths

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web interface for passengers to submit and view reviews	HTML, CSS, JavaScript
2.	Application Logic-1	Data Collection and Preprocessing	Web scraping, data connectors
3.	Application Logic-2	Machine Learning Model Training (Sentiment Analysis)	Python (scikit-learn, Pandas)
4.	Application Logic-3	API and Services (RESTful API)	Web framework (e.g., Flask, Django)
5.	Database	Data Storage (Reviews, Classifications, Topics, Insights)	Database system (e.g., PostgreSQL)
6.	Cloud Database	Cloud-Based Database for Data Storage	Cloud database service (e.g., Amazon RDS)
7.	File Storage	Storage for application files (e.g., uploaded images)	Local or Cloud file storage
8.	External API-1	Data Sources (Airline websites, social media, etc.)	Web scraping, data connectors
9.	External API-2	Feedback Mechanism (User Feedback Interface)	Web interface for user feedback
10.	Machine Learning Model	Sentiment Analysis and Topic Modeling	Python libraries (e.g., scikit-learn, Pandas, RegEx)
11.	Infrastructure (Server / Cloud)	Hosting for web application and machine learning model	Web server (e.g., Apache, Nginx), Cloud platform (e.g., AWS, Azure)

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Utilizing open-source frameworks for cost-effective development and community support.	Python (scikit-learn, Flask, Django), open-source NLP libraries, open-source web frameworks
2.	Security Implementations	Implementing security measures to protect user data and ensure compliance with data protection regulations.	SSL/TLS for data encryption, user authentication, role-based access control, secure coding practices
3.	Scalable Architecture	Designing a scalable architecture to handle growing data volumes and user loads.	Cloud infrastructure, containerization (e.g., Docker), auto-scaling mechanisms
4.	Availability	Ensuring high availability and minimizing system downtime through redundancy and fault tolerance mechanisms.	Load balancing, failover mechanisms, data backup and recovery.
5.	Performance	Optimizing system performance to provide real-time processing and responsive user interfaces.	Efficient algorithms, distributed computing, caching mechanisms, responsive web design.

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