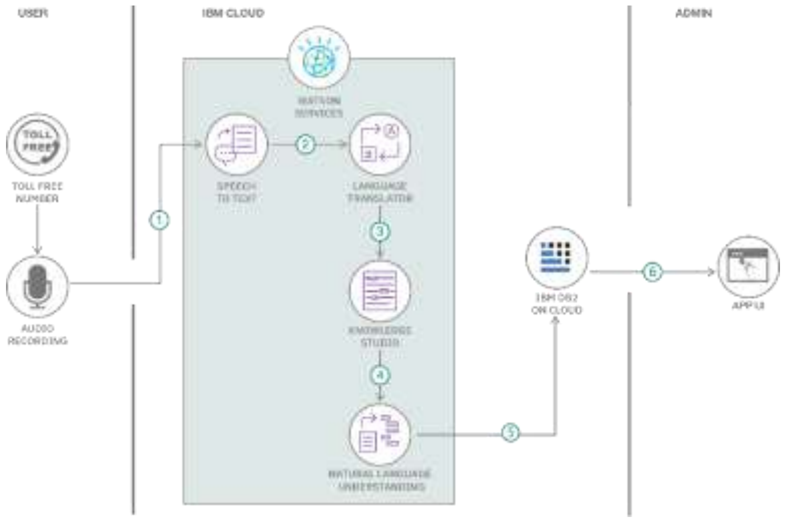
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	27 October 2023
Team ID	592689
Project Name	Online Payment Fraud Detection 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

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	Interface for monitoring and managing fraud alerts	Web UI (HTML, CSS, JavaScript)
2.	Fraud Detection Engine-1	Core logic for real-time fraud detection	Python, TensorFlow, Scikit-learn
3.	Fraud Detection Engine-2	Secondary logic for pattern analysis and validation	Python, Pandas, NumPy
4.	Transaction Database	Storage of transaction data for analysis	MongoDB, Cassandra, etc.
5.	Cloud Database	Cloud-based storage for scalable data management	Amazon DynamoDB, Google Cloud Firestore
6.	File Storage	Storage for additional data and model checkpoints	Amazon S3, Google Cloud Storage
7.	External API-1	Integration for identity verification APIs	KYC Verification API, IdentityMind API
8.	External API-2	Integration for transaction validation APIs	Visa Risk Manager API, Mastercard Decision Intelligence API
9.	Machine Learning Model-1	Model for anomaly detection in transaction patterns	Isolation Forest, One-Class SVM
10.	Machine Learning Model-1	Model for user behavior analysis	Neural Networks, LSTM
11.	Infrastructure (Cloud) Server Configuration	Deployment of the system on a cloud platform Cloud server configuration for high availability	Amazon AWS, Google Cloud Platform Kubernetes, AWS Elastic Beanstalk

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Django, Flask, TensorFlow, Scikit-learn
2.	Security Implementations	Security measures implemented, access controls, firewalls, etc.	SHA-256, AES Encryption, IAM Controls, OWASP
3.	Scalable Architecture	Justify the scalability of architecture (3-tier, Micro-services)	Kubernetes, Docker, Horizontal Scaling

S.No	Characteristics	Description	Technology
4.	Availability	Justify the availability of the application (load balancers, distributed servers, etc.)	Load Balancers, High Availability Architecture
5.	Performance	Design considerations for application performance (requests per second, use of Cache, use of CDN's, etc.)	Caching Strategies, Content Delivery Networks (CDN)

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