Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	27-06-2025
Team ID	LTVIP2025TMID48676
Project Name	Cosmetic Insights
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/

S.No	Component	Description	Technology
1	User Interface	How user interacts with application e.g., Web UI, Mobile App, Chatbot	HTML, CSS, JavaScript / AngularJS / ReactJS etc
2	Application Logic-1	Logic for a process in the application	Java / Python
3	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5	Database	Data Type, Configurations etc.	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 Services
8	API Gateway	Manages and routes API calls between client and backend	IBM API Connect, AWS API Gateway, Postman
9	Authentication Service	Handles login, registration, and access control	Firebase Auth, OAuth 2.0, JWT, IBM App ID
10	Notification Service	Sends alerts/notifications to users	Firebase Cloud Messaging, Twilio, SendGrid, IBM Push Notifications

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Data Ingestion & Storage	How raw cosmetic data (e.g., product reviews, ingredient lists, social media trends, sales data) is collected, processed, and stored efficiently for analysis	e.g., Apache Kafka, AWS S3, Google Cloud Storage, PostgreSQL, MongoDB, Snowflake, Databricks
2	Data Processing & ETL	The methods and tools used for cleaning, transforming, and loading raw data into a format suitable for analysis and model training.	e.g., Apache Spark, Pandas, SQL, AWS Glue, Google Dataflow, Azure Data Factory
3	Machine Learning Models	The types of AI/ML models employed for tasks like sentiment analysis, trend prediction, product recommendation, image recognition (for product attributes), or ingredient analysis. Justify model choices.	e.g., TensorFlow, PyTorch, Scikit-learn, XGBoost, Hugging Face Transformers, AWS SageMaker, Google AI Platform
4	Scalable Analytics	Justify the scalability of the analytics infrastructure to handle growing datasets and increasing query loads for real-time or batch insights.	e.g., Distributed computing frameworks (Spark), Cloud-native analytics services (BigQuery, Redshift)
5	API & Integration	How the cosmetic insights are exposed to other applications or front-end interfaces, including data retrieval and model inference endpoints.	e.g., REST APIs, GraphQL, FastAPI, Django REST Framework, Flask, AWS API Gateway, Google Cloud Endpoints

Reference:

- https://www.prophecy.io/blog/data-pipeline-architecture-modern-best-practices
- https://www.striim.com/blog/guide-to-data-pipelines/
- https://medium.com/sciforce/machine-learning-changing-the-beauty-industry-ab3a2fa0aaf
- https://theappsolutions.com/blog/how-to/how-to-use-ai-in-the-beauty-industry/
- https://www.guardianowldigital.com/2024/04/01/ai-in-the-cosmetics-industry/