

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

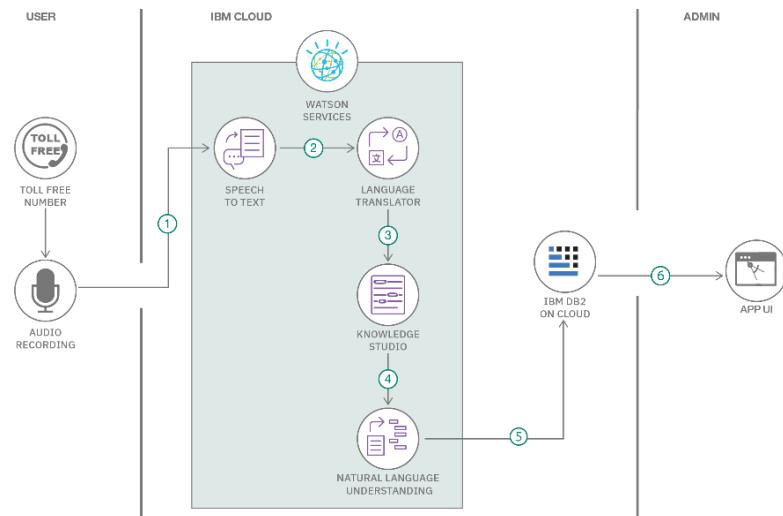
Date	6/11/23
Team ID	593161
Project Name	Anticipating Caloric Expenditure With ML
Maximum Marks	4 Marks

Technical Architecture:

A tech stack is the set of technologies used to develop an application, including programming languages, frameworks, databases, front-end and back-end tools, and APIs.

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	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	ML Algorithms	Processes collected data to build predictive models	Machine Learning (ML) - Python / TensorFlow / PyTorch
3.	Wearable Integration	Integrates with fitness trackers and wearables to collect real-time data	OpenAPIs, Wearable Technology
4.	Data Collection System	Aggregates user data including age, weight, heart rate, etc.	Custom Data Collection System
5.	User Feedback Mechanism	Provides real-time feedback during activities for user motivation	Custom Feedback System
6.	Personalized Recommendations	Generates tailored fitness and nutrition recommendations	Machine Learning (ML) - Python / Scikit-Learn, etc.
7.	Visualization Tools	Presents visualizations for caloric expenditure and activity impact	Visualization Libraries (e.g., D3.js, Plotly), etc.
8.	Security Measures	Ensures privacy and security of user health data	Data Encryption, Security Protocols.
9.	Cloud Integration	Supports cloud deployment and scalability	Cloud Services (e.g., AWS, Azure, IBM Cloud), Kubernetes
10.	Database	Manages data types and configurations	MySQL, NoSQL (e.g., MongoDB), etc.
11.	External API Integration-1	Utilizes external APIs for additional data (e.g., Weather API)	IBM Weather API, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Utilizes open-source frameworks to enhance flexibility and community support.	Django, Flask (Python frameworks), TensorFlow
2.	Security Implementations	Implements robust security measures including SHA-256 encryption, IAM controls, and compliance with OWASP standards.	SHA-256, Encryptions, IAM Controls, OWASP
3.	Scalable Architecture	Adopts a scalable architecture, leveraging microservices to ensure flexibility and scalability.	Microservices architecture, Docker, Kubernetes

S.No	Characteristics	Description	Technology
4.	Availability	Ensures high availability through the use of load balancers and distributed servers.	Load Balancers, Distributed Server Architecture
5.	Performance	Prioritizes performance with considerations like a high number of requests per second, caching, and CDN usage.	High-performance caching, CDN integration

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>