

Project Design Phase-II

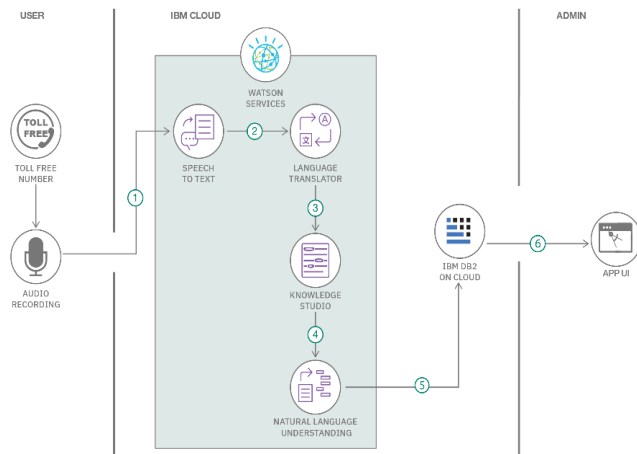
Technology Stack (Architecture & Stack)

Date	21 June 2025
Team ID	LTVIP2025TMID60014
Project Name	Health AI-Intelligent Healthcare Assistant Using IBM Granite
Maximum Marks	4 Marks

Technical Architecture:

A healthcare assistant's technical architecture typically involves a combination of software and hardware components designed to support various tasks like patient monitoring, communication and data management. This architecture should be scalable, interoperable and reliable, ensuring efficient and safe healthcare delivery.

Example: Order processing during pandemics for offline mode



Guidelines:

- Incorporating all relevant processes as either application logic or technology blocks.
- Emphasises clearly defining the boundaries .
- Specifies all data storage components and services used in the system.
- Machine learning models are integrated and their interfaces must be clearly indicated.
- Requires identifying and documenting any interfaces that interact with external systems such as third-party APIs.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How patients or healthcare professionals interact with AI applications	Web UI, Mobile apps, Chatbots, voice assistants
2.	Application Logic-1	Logic for core processes in health AI applications	Java , Python
3.	Application Logic-2	Logic for integrating specialized AI services in healthcare	IBM Watson Health, Google cloud healthcare API
4.	Application Logic-3	Logic for AI-driven patient engagement and support	IBM Watson Assistant , Google dialogflow, specialized AI engines
5.	Database	Storage of diverse healthcare data	SQL databases, NoSQL databases
6.	Cloud Database	Scalable and secure storage for large-scale healthcare datasets in the cloud	IBM DB2 on cloud, google cloud healthcare API
7.	File Storage	Requirements for storing large files like medical images, large datasets	Cloud storage, google cloud
8.	External API-1	Purpose of External APIs for integrating health data or services	FHIR APIs, HL7 APIs, APIs for medical device integration
9.	External API-2	Purpose of External APIs for specialized AI services or external data sources	APIs for drug-drug interaction, clinical trail data APIs
10.	Machine Learning Model	Purpose of Machine Learning Models in healthcare such as disease diagnosis	Deep learning models, predictive models
11.	Infrastructure (Server / Cloud)	Deployment environment for health AI applications	Secure cloud platforms, Edge computing for real-time device data processing

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Machine learning libraries, deep learning frameworks or data processing tools	TensorFlow, Apache Spark, Hugging Face Transformers
2.	Security Implementations	Protect sensitive health data and ensure compliance with regulations	IAM Controls, AES-256, Secure Multi-Party Computation
3.	Scalable Architecture	It can handle increasing data volumes and user loads in a health AI context	Microservices architecture, Cloud platforms, API Gateways
4.	Availability	Ensures continuous operation and access to critical health services also includes load balancing, distributed servers, and disaster recovery	Load balancers(AWS, ELB), Distributed databases, Geo-redundant storage
5.	Performance	Responsiveness, processing speed for large datasets and efficient resource utilization	Caching mechanisms, Content Delivery Networks for static content, Asynchronous processing queues