

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	27 june 2025
Team ID	LTVIP2025TMID59171
Project Name	HealthAI: Intelligent Healthcare Assistant Using IBM Granite
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

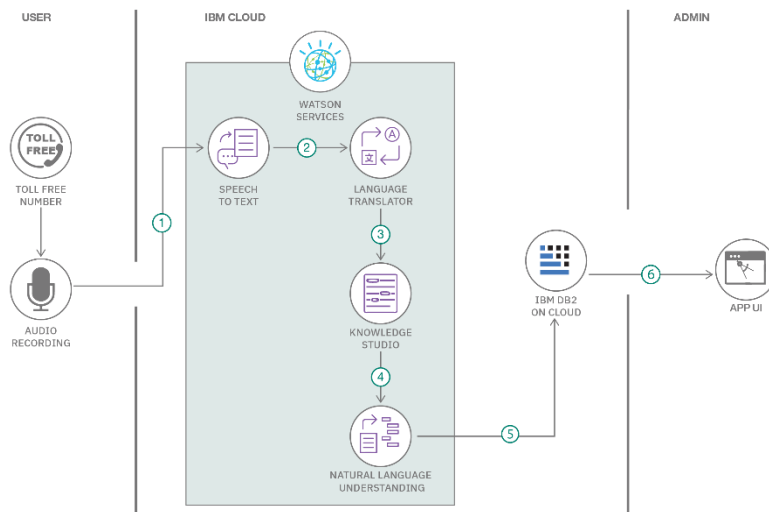


Table-1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	Web and Mobile user interface with forms, chat, and health dashboards	Streamlit (Python), HTML/CSS, JS
2	Application Logic-1	Registration, login, and dashboard logic	Python (Flask)
3	Application Logic-2	Speech-to-text feature for patient voice inputs	IBM Watson Speech-to-Text

4	Application Logic-3	Conversational AI for symptom analysis	IBM Watson Assistant / Hugging Face Transformers
5	Database	Stores users, health logs, vitals, chats, and predictions	MySQL (on IBM Cloud)
6	Cloud Database	Cloud-based backup and data sync	IBM Cloudant
7	File Storage	Store user reports, chat logs, audio files	IBM Cloud Object Storage
8	External API-1	Health-related news, weather condition if relevant	IBM Weather API
9	External API-2	Aadhar verification API (for patient validation)	Aadhar eKYC API
10	Machine Learning Model	AI model to predict diseases based on symptoms	IBM Granite 13B / Hugging Face Transformers
11	Infrastructure	Deployment in the cloud for scalability and uptime	IBM Cloud Foundry / Kubernetes

 **Table-2: Application Characteristics**

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Frontend and backend based on open technologies	Streamlit, Flask, Hugging Face Transformers
2	Security Implementations	SHA-256 for password encryption, IAM roles, HTTPS, OAuth2 login	OpenSSL, JWT, IBM IAM, OAuth 2.0, HTTPS
3	Scalable Architecture	3-tier model with possible microservices expansion	Kubernetes, IBM Cloud Container Services
4	Availability	Load balancers and redundant instances for maximum uptime	IBM Cloud Load Balancer, Multi-zone deployments
5	Performance	Caching for repeated API calls, optimized queries, minimal AI response time	Redis Cache, CDN (Cloudflare), MySQL indexing

Reference Links

1. **IBM Developer – AI-Powered Backend for Order Processing During Pandemics**
<https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/>
2. **IBM Developer – Healthcare Chatbot Architecture**
<https://developer.ibm.com/patterns/healthcare-chatbot-architecture/>

3. **IBM Cloud Architecture Center**
<https://www.ibm.com/cloud/architecture>
4. **C4 Model – Visualizing Software Architecture**
<https://c4model.com/>
5. **AWS Architecture Center**
<https://aws.amazon.com/architecture/>
6. **Medium – How to Draw Useful Technical Architecture Diagrams**
<https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d>