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

Date	26 June 2025
Team ID	LTVIP2025TMID59731
Project Name	HealthAI
Maximum Marks	4 Marks

Technical Architecture:

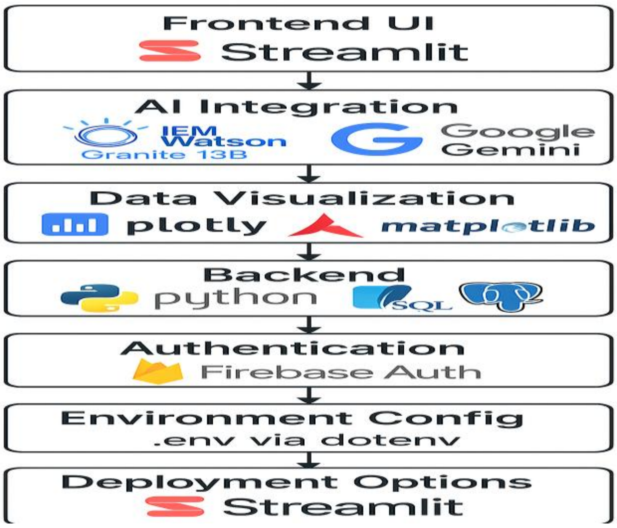

Table-1 : Components & Technologies:

S.No	Component	Description	Technology / Tools
1	User Interface	Web App & Mobile App (chat + dashboard)	Streamlit (Web), Flutter (Mobile), HTML, CSS
2	Application Logic-1	Patient Chat logic (NLP processing)	Python (NLTK, transformers), Streamlit
3	Application Logic-2	Speech-to-text transcription	IBM Watson STT / Google Speech API
4	Application Logic-3	Conversational assistant logic	IBM Watson Assistant
5	Database	Store patient queries, reports, interaction history	SQLite / Firebase Realtime DB / NoSQL
6	Cloud Database	Cloud-based scalable health data storage	IBM Cloudant / Firebase Cloud Firestore
7	File Storage	Store audio inputs, ML models, PDF reports	IBM Cloud Object Storage / Firebase Storage
8	External API-1	For disease info enrichment	Wikipedia Medical API / HealthMap API
9	External API-2	Patient authentication / government records	Aadhaar Verification API (optional)

10	Machine Learning Model	Disease prediction using symptoms	Custom-trained ML/DL models (Scikit-learn, TensorFlow)
11	Infrastructure	Cloud deployment and scaling	IBM Cloud / GCP with Kubernetes / Firebase Hosting

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology Used
1	Open-Source Frameworks	UI and backend frameworks	Streamlit, Flask, Scikit-learn, TensorFlow, Flutter
2	Security Implementations	Data encryption, role-based access, authentication	SHA-256, OAuth2.0, Firebase Authentication, IAM Policies
3	Scalable Architecture	Microservice-ready, Firebase scaling, container deployment supported	Firebase Functions / Kubernetes-based scaling
4	Availability	99.9% uptime via managed cloud infrastructure	IBM Cloud Load Balancer / Firebase Multi-region Hosting
5	Performance	Use of CDN for static content, async API, model inference <3 sec response	Firebase CDN, Model Optimization, Streamlit Caching

References:

https://c4model.com/

https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/

https://www.ibm.com/cloud/architecture

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https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d