Project Design Phase

Solution Architecture

Date: 21 JUNE 2025

ID **Team ID**: LTVIP2025TMID38244

Project Name: HealthAI: Intelligent Healthcare Assistant Using IBM Granite

☐ **Maximum Marks:** 2 Mar

✅ Solution Architecture – **HealthAI**

Solution architecture in HealthAI serves as the bridge between real-world healthcare challenges and advanced AI-driven technology. It outlines how HealthAI is built to deliver accurate, personalized, and responsive medical support.

🎯 Goals of HealthAI's Solution Architecture:

1. **Identify the most effective AI-driven technology** to solve the problem of inaccessible or unreliable healthcare information.

2. **Design the complete structure** — from user input (like symptoms or questions) to backend AI processing using IBM Granite and secure API handling.

3. **Define key features and development phases**, including modules like:

   o Patient Chat

   o Disease Prediction

   o Treatment Plan Generation

   o Health Analytics

☐ Key Characteristics of the HealthAI Architecture:

- **Modular and Scalable Design**: Each core functionality is independently built using Python and Streamlit.

- **AI Integration**: IBM Granite (13B Instruct v2) is used to process all medical queries and generate accurate, natural-language responses.

. **User Interface**: Streamlit provides an intuitive frontend with form-based inputs, chatbot interfaces, and dynamic visualizations using Plotly.

- **Data Flow**: User inputs are sent to the AI model via a central shared function (shared_model.py), processed securely, and returned in structured output.

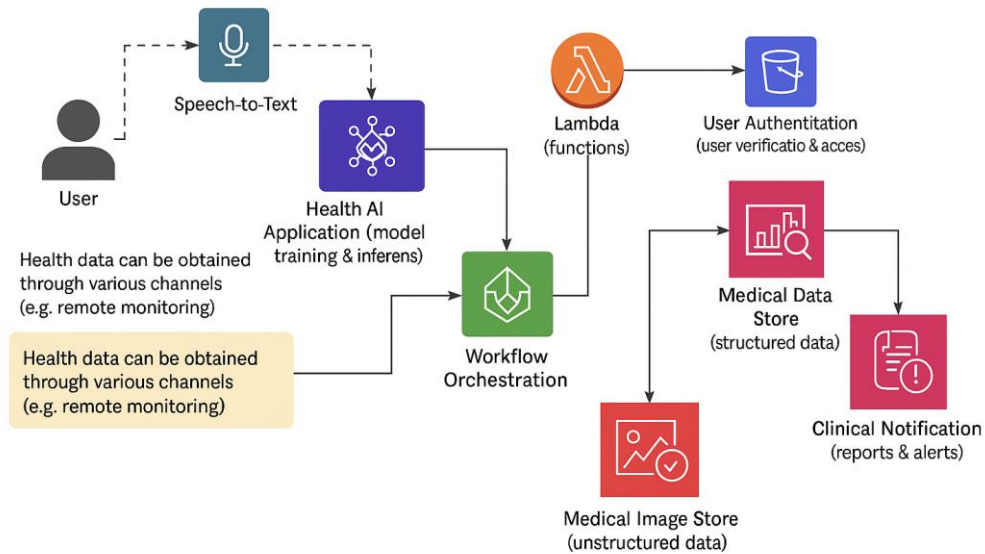- **Security**: Environment variables (.env) are used for API key management to protect sensitive credentials.

Figure 1: Architecture and data flow of the health AI system

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