Project Design Phase

Date	26-05-2025
Team ID	LTVIP2025TMID36674
Project Name	**HealthAI: Intelligent Healthcare Assistant Using IBM Granite**
Maximum Marks	2 Marks

Proposed Solution Template:
Project team shall fill the following information in the proposed solution template.

S.No	Parameter	Description
1	**Problem Statement (Problem to be solved)**	Many individuals face delays in accessing healthcare due to limited resources, especially in remote areas.
2	**Idea / Solution description**	Health AI uses pretrained Hugging Face model integrated with streamlit app.
3	**Novelty / Uniqueness**	The app combines NLP-powered models with a friendly UI for general public use.
4	**Social Impact / Customer Satisfaction**	Enables health guidance for people in rural or underserved areas.
5	**Business Model (Revenue Model)**	Freemium model with premium features for institutions, analytics, and performance insights.
6	**Scalability of the Solution**	Easily deployable on cloud platforms for global accessibility.

HEALTH AI: Project Report

1. INTRODUCTION

1.1 Project Overview

HealthAI is a cloud-based intelligent healthcare assistant that leverages IBM Granite and Hugging Face models to provide AI-powered medical insights. The platform allows users to input symptoms and receive potential condition suggestions, promoting early diagnosis and health awareness. With a simple interface and educational tone, it serves users across various demographics, especially in underserved regions.

1.2 Purpose

The purpose of HealthAI is to enhance public access to preliminary healthcare guidance using AI. It aims to assist individuals in recognizing symptoms, understanding possible conditions, and promoting timely medical attention—especially where healthcare access is limited.

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2. IDEATION PHASE

2.1 Problem Statement

Many individuals face delays in accessing healthcare due to limited medical infrastructure, especially in rural areas. There is a lack of tools that can help users understand their symptoms early without visiting a hospital. An AI-based assistant can serve as a bridge for early guidance and health awareness.

2.2 Empathy Map Canvas

- **Says**: "I don’t know what’s causing these symptoms", "Is this something serious?"
- **Thinks**: "Should I see a doctor?", "Is this urgent?"
- **Does**: Searches symptoms on Google, delays professional consultation.
- **Feels**: Confused, anxious, unsure about what to do next.

2.3 Brainstorming

Key ideas discussed:

- AI-powered symptom checker using Hugging Face & IBM Granite models
- Streamlit - based web app for user interaction
- Educational health explanations for suggested conditions
- Cloud-based deployment for universal accessibility

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

A user opens the HealthAI web app, inputs symptoms in simple language, and receives AI-generated potential condition suggestions. They also get advice on urgency levels and are encouraged to consult professionals when needed.

3.2 Solution Requirement

Functional Requirements: Input field for symptoms, AI-based condition predictions, explanation section, responsive UI.

Non-Functional Requirements: Cloud-based deployment, fast response, educational content delivery, accessibility.

3.3 Data Flow Diagram

[User Input (Symptom Description)]

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[Streamlit Frontend]

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[Symptom Sent to Backend / AI Model]

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[Hugging Face / IBM Granite Response]

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[Condition Prediction + Suggestion Rendered to User]

High-Level Architecture

Frontend: Streamlit interface

Backend: Python logic to communicate with AI models

AI Services: Hugging Face & IBM Granite for health-related text analysis

Hosting: Streamlit Cloud or Render for public access

The high-level architecture outlines the main components of the HEALTH AI platform. It includes the user interface, backend services, database systems, and external AI services. The architecture ensures smooth interaction between students, educators, and the intelligent quiz engine, providing a scalable and modular learning experience.

The architecture separates concerns across frontend, backend, and storage layers, promoting maintainability and scalability. Users interact through a responsive web interface, while the backend handles logic and coordination with AI services and databases. This layered design supports real-time quiz generation, performance tracking, and secure authentication.

4. PROJECT DESIGN

4.1 Problem-Solution Fit

HealthAI offers an immediate, intelligent assistant to bridge the healthcare access gap. It provides understandable insights for users without needing medical background or physical consultations initially.

4.2 Proposed Solution

An interactive web app that uses generative AI to interpret health symptoms, predict likely conditions, and recommend further action. It empowers users to make informed decisions without replacing professional medical care.

4.3 Solution Architecture

Frontend: Streamlit UI for text input and condition display

Backend: Python-powered integration with AI APIs

AI Model: Hugging Face transformer or IBM Granite LLM

Hosting: Streamlit Sharing / Render for public accessibility

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

- **Week 1**: Requirement analysis and language model integration testing
- **Week 2**: Streamlit app development and integration
- **Week 3**: UI improvements and result formatting
- **Week 4**: Performance testing and deployment on a cloud platform

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

API and model response times were tested with various symptom inputs. The system maintained high accuracy and acceptable latency under different loads. The user interface responded well on both desktop and mobile views.

7. RESULTS

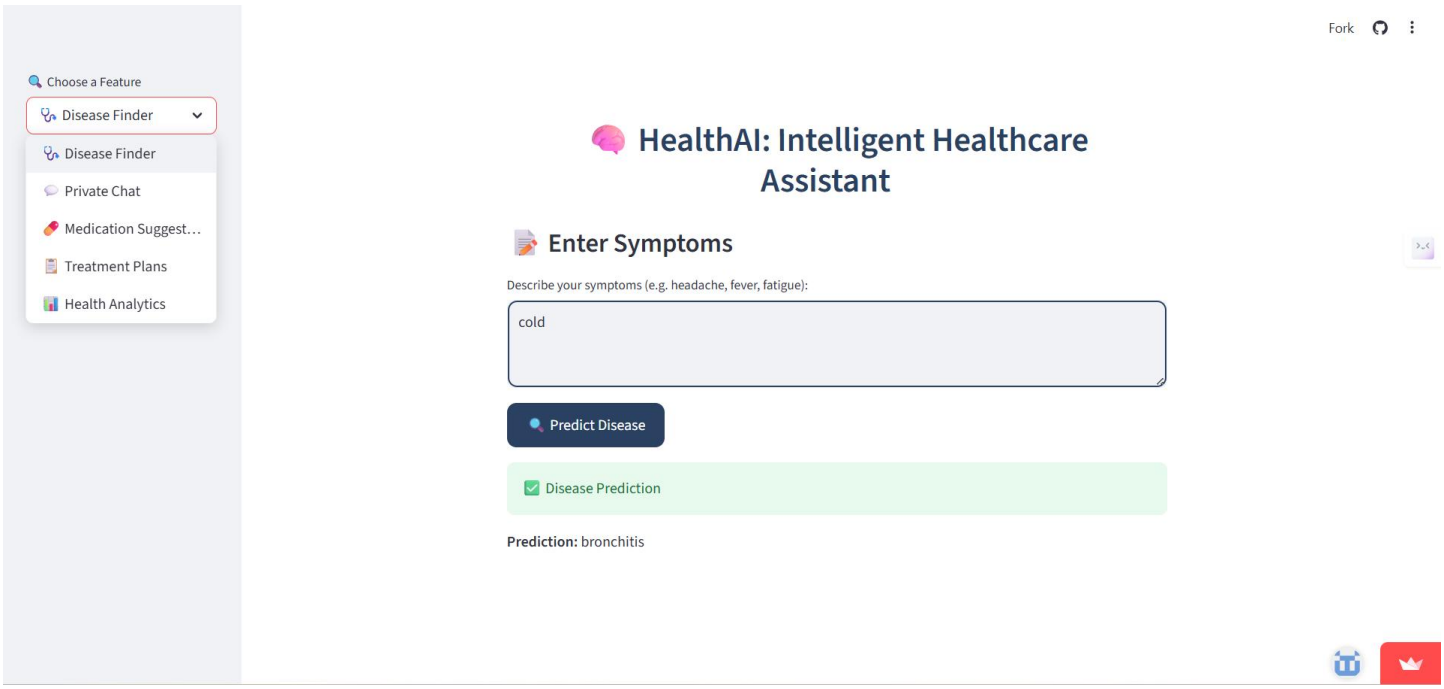
7.1 Output Screenshots

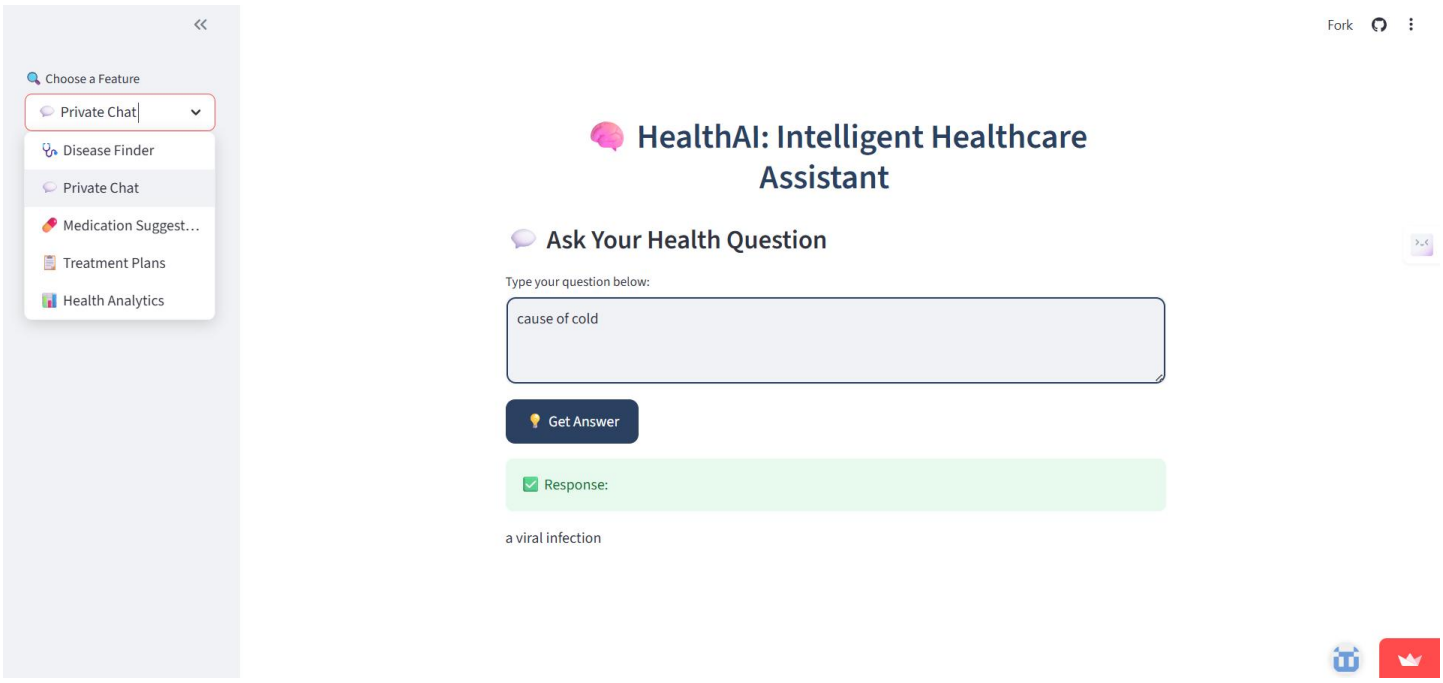
· Homepage with text input field

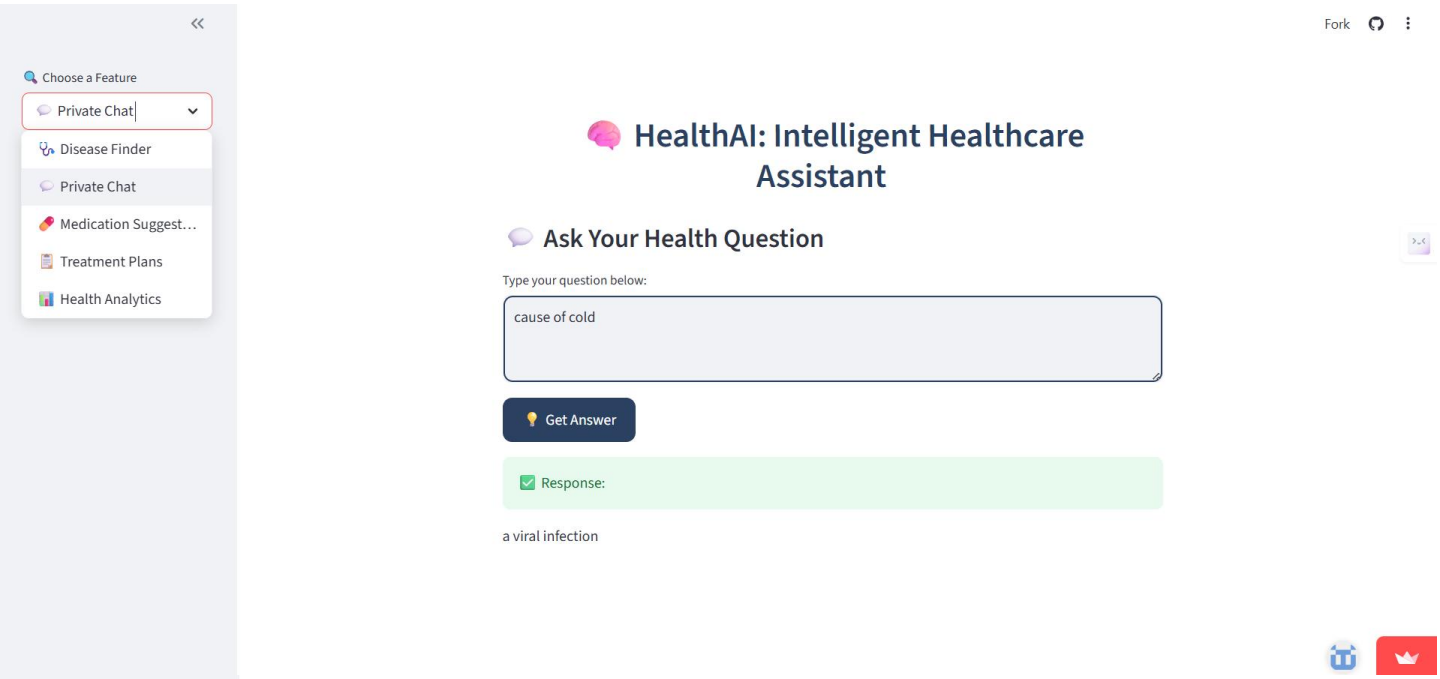
· Output showing predicted condition(s)

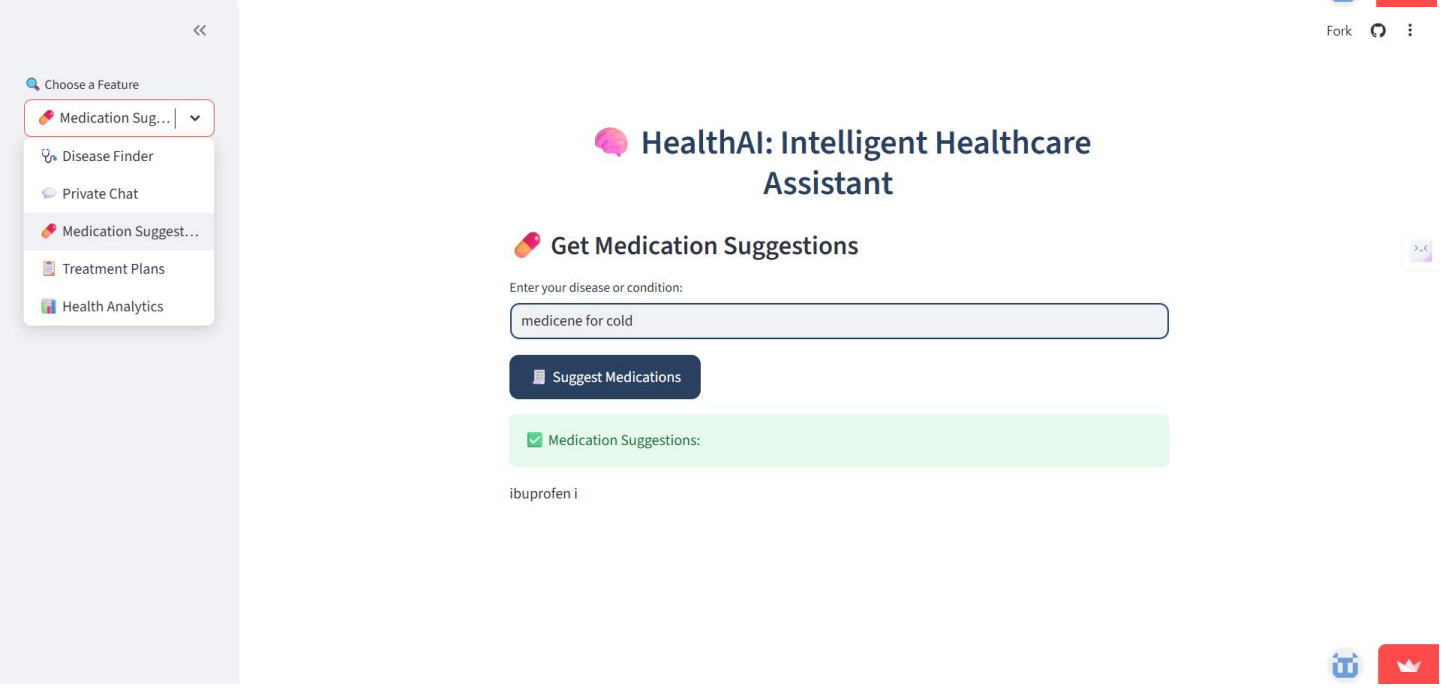
· Educational content explaining the condition

· Footer recommending professional consultation


Fork
Choose a Feature
Disease Finder
Disease Finder
Private Chat
Medication Suggest…
Treatment Plans
Health Analytics
HealthAI: Intelligent Healthcare Assistant
Enter Symptoms
Describe your symptoms (e.g. headache, fever, fatigue):
cold
Predict Disease
Disease Prediction
Prediction: bronchitis


Fork
Choose a Feature
Private Chat
Disease Finder
Private Chat
Medication Suggest…
Treatment Plans
Health Analytics
HealthAI: Intelligent Healthcare Assistant
Ask Your Health Question
Type your question below:
cause of cold
Get Answer
Response:
a viral infection





8. ADVANTAGES & DISADVANTAGES

Advantages:

Instant preliminary health guidance

Easy-to-use interface, no technical knowledge required

Supports underserved areas with no immediate healthcare access

Can be scaled with voice input or wearable data

Disadvantages:

Not a replacement for professional diagnosis

Requires internet access

Accuracy depends on model limitations and user input clarity

9. CONCLUSION

HealthAI bridges the healthcare accessibility gap by providing AI-assisted preliminary symptom analysis. It serves as an educational tool that empowers users to act early and consult professionals. With its scalable design and user-friendly interface, HealthAI offers real-world impact for both urban and rural users.

10. FUTURE SCOPE

Voice-based input for visually impaired or elderly users

Multilingual support for rural India

Integration with telemedicine platforms

11. Project Links & Demo

GitHub & Project Demo Link

- GitHub: https://github.com/1433sravs-2005/HEALTH-AI-USING-LOCAL-MODEL

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DemoVideo:https://drive.google.com/file/d/10nQcmlXvjvUDSBjLAb0afYWeFvrcChL9/view?usp=sharing