Health AI: Intelligent Healthcare Assistant

Team Member Name	Roll Number
Adabala Pujitha Sri Naga	22P31A4201
Ganga Bhavani	
Animireddy Sai Gowtham	22P31A4202
Datla Vijaya Durga Devi	22P31A4208
Dwarampudi Navya Bindu	22P31A4211

1. INTRODUCTION

1.1 Project Overview

Health AI is an advanced AI-powered healthcare platform that leverages **IBM Watson Machine Learning** and **Generative AI** to deliver personalized and intelligent medical assistance. Designed with a focus on accessibility, accuracy, and user experience, Health AI provides a comprehensive suite of healthcare services to help users make informed decisions about their health.

A conversational assistant that answers user queries related to health, symptoms, and wellness using natural language understanding.

2. **Disease Prediction**

An AI model evaluates symptoms entered by users and provides potential conditions or diagnoses with medical context.

3. Personalized Treatment Plans

Offers tailored medical recommendations and care plans based on user inputs and predicted conditions.

4. Health Analytics

Visual dashboards and metrics to help users monitor trends in symptoms, health history, and risk factors over time.

1.2 Purpose

The purpose of **Health AI** is to create a smart, accessible, and user-friendly healthcare assistant that leverages **IBM Watson Machine Learning** and **Generative AI** (**Granite-13b-instruct-v2**) to deliver accurate and personalized medical guidance. Health AI is designed to empower users to **understand**, **manage**, **and make informed decisions** about their health—even without direct access to healthcare professionals.

Target Audience:

- **General Public**: Individuals seeking quick, reliable health advice or disease insights without needing a doctor's appointment.
- **Tech-Savvy Users**: People comfortable using digital tools for personal healthcare management.
- Rural & Underserved Communities: Populations with limited access to medical infrastructure.

• **Students & Researchers**: Those studying healthcare or AI, using HealthAI as an educational tool.

Social Impact:

- **Improved Healthcare Access**: Helps bridge the healthcare divide by providing ondemand support to users in remote or resource-limited areas.
- **Health Awareness & Education**: Empowers individuals to understand symptoms, conditions, and care options, reducing misinformation.
- Reduced Pressure on Healthcare Systems: Enables basic triage and advice, allowing healthcare professionals to focus on critical cases.
- **Inclusive Design**: Accessible UI ensures that even non-technical users can benefit from AI-driven insights.

® Economic Impact:

- **Cost Savings for Users**: Minimizes unnecessary doctor visits for minor or preliminary concerns by providing quick AI evaluations.
- Affordable Healthcare Assistance: Offers a free or low-cost alternative for health insights, especially useful in low-income regions.
- **Support for Insurance & Health Tech Startups**: Health AI can integrate into larger digital health ecosystems, contributing to cost-effective patient management.
- **Innovation in Digital Health**: Encourages Al adoption in healthcare, driving growth in the health tech sector.

2. Ideation Phase

2.1 Define the Problem Statements

Date	27 June 2025
Team ID	LTVIP2025TMID29210
Project Name	Health AI: Intelligent Healthcare Assistant Using IBM Granite
Maximum Marks	2 Marks

Customer Problem Statements

Problem Statement 1 – Patient Chat Interface

Section	Description
lam	A curious or concerned person with health-related questions
I'm trying to	
	Get clear, reliable answers about my symptoms or conditions
But	
	Searching online gives conflicting or scary information
Because	
	I don't have access to a trusted, AI-powered assistant for quick answers
Which makes me feel	Confused, anxious, and hesitant about taking the right steps

Problem Statement 2 – Disease Prediction System

Section	Description
lam	A patient experiencing multiple symptom s (e.g.,
	headache, fatigue, fever)
I'm trying to	
	Understand what condition I might be facing and what actions to take
But	
	I am unsure which symptoms are serious and what disease they might indicate
Because	
	I don't have the medical expertise or instant access to reliable diagnostics
Which makes me feel	Anxious, confused, and worried about my health decisions

Problem Statement 3 – Treatment Plan Generator

Section	Description
I am	A user diagnosed with a health condition
I'm trying to	

	Get personalized, evidence-based treatment recommendations
But	
	I receive generic advice that doesn't consider my unique health profile
Because	
	I lack access to tailored medical guidance outside clinical visits
Which makes me feel	
	Uncertain and unsupported in managing my condition effectively

Problem Statement 4 – Health Analytics Dashboard

Section	Description
lam	A health-conscious individual tracking my health over time
I'm trying to	
	Visualize my health metrics and detect trends or risks early
But	
	I can't interpret raw data or recognize what the numbers really mean
Because	
	I don't have access to a smart tool that explains patterns in simple terms
Which makes me feel	

	Overwhelmed and unsure about how to improve my health proactively
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2.2 Empathize & Discover

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Maximum Marks	4 Marks

Empathy Map Canvas

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

Empathy Map - HealthAl Intelligent Healthcare Assistatant

SAYS

- I don't know if my symptoms are serious or not.
- I just want a quick answer without waiting for a doctor.
- Why is it so hard to find reliable health into online?
- I'm overwheimed by medical terms

3 HEARS

- Use Google, but be careful
 It can be misleading
- Doctors are busy: appointments tak time
- Al in healthcare is risky but promising
- There are apps, but not all are accurate

THINKS

- Am I making ithe right health decisions?
- What it I miss something important?
- Is this app secrure and reliable?
- This feels like it could help others too

SEES

- Complex health websifes with medical jargon
- Apps that provide too little or too much information
- Charts without explanation
- Conflicting results from different platforms

FEELS (Pains)

Confused by too much or too little information

Anxious about health outcomes Powerless without professional guidance Worried about data privacy

GAINS (Needs)

- · Clear, trustworthy health advice
- Easy-to-use interface
- · Personalized insights
- Confidential and secure experience
- Suggestions on when to seet k
 a doctor



2.3 Brainstorm & Idea Prioritization Template

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Maximum Marks	4 Marks

Team Members & Roles

Name	Role
Adabala PujithaSri Naga GangaBhavani	Team Leader, Full Stack & LLM Integration using IBM Granite
Animireddy Sai Gowtham	Frontend Developer (Streamlit)
Datla Vijaya Durga Devi	Backend Developer (Python)
Navya Bindhu	Model Testing, Dashboard Data Aggregation

Step 1: Team Gathering, Collaboration, and Selecting the Problem Statement

Problem Statement:

To develop an AI-powered Intelligent Healthcare Assistant using IBM Granite LLM that helps users with real-time medical responses, disease prediction, personalized treatment plans, and health analytics—improving healthcare accessibility and informed decision making.

Motivation:

People often struggle to access timely, accurate, and personalized healthcare information. Traditional healthcare systems lack real-time support for symptom analysis, treatment guidance, and health monitoring. HealthAI bridges this gap by providing conversational AI for medical queries, AI-driven disease predictions, personalized treatment plans, and health analytics—empowering users to make informed health decisions quickly and confidently.

Step 2: Brainstorming, Idea Listing, and Grouping

Initial Ideas:

Integrate a conversational health assistant using IBM Granite

- Enable disease prediction based on user-reported symptoms
- Generate personalized treatment plans for users
- Visualize patient health metrics through an analytics dashboard
- Implement a user profile section with basic health details
- Build the app using Streamlit with Python backend and Plotly for charts

Grouped into Modules:

- 1. Chat Module Al-powered patient chat using IBM Granite LLM
- 2. Disease Prediction Module Predicts diseases from symptoms entered by users
- 3. **Treatment Plan Module** Generates personalized treatment suggestions
- 4. **Health Analytics Module** Displays patient health trends and metrics using Plotly
- 5. Profile Management Module Manages user profile details like name, age, and blood type
- 6. **UI Module** Streamlit frontend with navigation and feature-specific pages

Step 3: Idea Prioritization (Final Version)

Feature / Module	Importance	Feasibility	Notes
Chat Module	High	High	AI-Powered Patient Chat Using IBM
			Granite LLM.
Disease Prediction	High	High	Predicts Diseases from Symptoms
Module			entered by users.
Treatment Planner	High	High	Generate Personalized treatment
Module			Suggestions.
Health Analytics	High	Medium	Displays Patient health trend
Module			metrics using Plotly.
Profile Management	Medium	High	Manages User profile details like
Module			name, age and Blood group.
UI Module	High	High	Streamlit Frontend with Navigation
			and feature Specification.

3. Requirement Analysis

3.1 Customer Journey Map

HealthAI: Intelligent Healthcare Assistatant

Entice	Interactions	Positive Moments	Negative Moments	Areas of Oppo-	Opportunity
Enter	User becomas aware of HealthAl yla web search or referral	Exicitel to explore Al health fools	tricited to excertain, confusing, angering costly, or time cons	Add a clear latol- to-action, brief app intro video	Add aclear to aovid vistera preferericlation:
Enter	User enters app, sees home page with title, logo, background image, feature links	Navigation buttons	Guided, clear navigation	Highlight disclanner/provide next steps recommendation	Allow at-in/fout for notifications
Engage	User asks a health question in Patient Chat	Patient Chat UI Dicease Predicition form Treatment Prediction Genetetor Health Analytics Dashboard	Immediate response finds AI diagnosis interesting Likes personalized recommendation teels empowered	Hightight disclather / provide next steps recommendation • Prorviding fito sources/add confidence score to output	Allow sest-in-&ruf feedback popup
Experience	User satisfied with Al assistance ends session	Navigation butto- ns	Likes seeing charts, feels informed	Allow user if filter/ select which metrics to show	Add session-end feedback popup
Exit	User satisfied with Al assistance ends session	Satisfied if got useful info	May leave if UI lags or unclear output	Acti-veryone if too frequent	Allow opt-in/out for notifications

3.2 Solution Requirements (Functional & Non-functional)

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Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Profile Management	Manage patient details (Name, Age, Gender,
		Blood Type, Profile Pic)

FR-2	Patient Chat Assistant	
		Query submission and AI response using IBM Granite (Patient Queries
FR-3		Symptom input form, Al-based disease prediction with likelihood percentages.
	Disease Prediction	manness personages.
FR-4		Condition input and AI-generated personalized
	Treatment Plan Generator	treatment plan.
FR-5	Health Analytics Dashboard	Display patient health metrics (Heart Rate, BP, Glucose
		Trends) using Plotly.
FR-6	Navigation and Home Landing	Streamlit-based multi-page navigation (Home $ ightarrow$ Chat $ ightarrow$
	Page	Prediction \rightarrow Treatment \rightarrow Analytics).

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

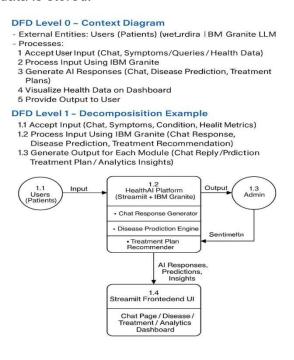
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Clean, responsive UI using Streamlit with custom CSS styling for healthcare look.
NFR-2	Security	API key management with dotenv, secure IBM Watson API calls, and data confidentiality
NFR-3	Reliability	Should handle multiple simultaneous patient queries and API calls without crash
NFR-4	Performance	Average AI response time within 2–4 seconds for chat, disease prediction, and treatment generation.
NFR-5	Availability	HealthAI should be accessible 24/7 with minimal maintenance, hosted on Replit or Streamlit Cloud.
NFR-6	Scalability	Easily extendable to add new AI models (e.g., IBM Granite upgrades) or more healthcare features.

3.3 Data Flow Diagram & User Stories

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	IBM Granite
Maximum Marks	4 Marks

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria
Patient (Web User)	Registration/Log in	USN-1	As a Patient, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard and chats
Patient (Web User)	Patient Chat Assistant	USN-2	As a patient, I can ask health-related questions and receive clear, empathetic AI responses with medical facts and advice when to consult a doctor.	I get a factual, empathetic response with limitations and suggestions for professional consultation if nee
Patient (Web User)	Disease Prediction	USN-3	As a patient, I can input my symptoms to receive possible condition predictions with likelihoods and next steps.	I get list of predicted conditions with likelihood score recommended next actions.
Patient (Web User)	Treatment Plan Generator	USN-4	As a patient, I can enter my diagnosed condition to receive personalized treatment plans including	I receive a treatment plan that includes evidence-ba medications, lifestyle advice, and recommended tes

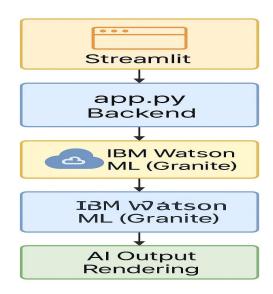
medications, lifestyle changes, and follow-up

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria
			tests.	
Patient (Web User)	Health Analytics Dashboard	USN-5	As a patient, I can view my health trends and vital signs over time with Algenerated insights and recommendations.	I see graphical trends of my vitals and get insights with improvement suggestions or alerts for concerns.
Admin (Governme nt)	Authentication	USN-6	As an admin, I can securely log in to manage the Health AI system and access only authorized administrative pages.	I am redirected to the admin dashboard after succe and unauthorized access is restricted.

3.4 Technology Stack (Architecture & Stack)

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Maximum Marks	4 Marks

Technical Architecture:



- The Web Interface is developed for displaying health data chain
- The backend is built with Pyth user inputs and API calls.
- The AI responses for chat, dis treatment plans come from IB Watson ML API.
- API keys and sensitive inform dotenv in a .env file.
- The application is deployed or environment variable support.

Guidelines:

Include all the processes (As Block)

Provide infrastructural dema Indicate external interfaces (Indicate Data Storage comp Indicate interface to machine

Table-1: Components & Technologies:

S.No	Component	Description	Tec
1.	User Interface	Web UI for patients (Chat, Disease Prediction, Treatment Plans, Health Analytics)	Stre
2.	Application Logic-1	Handle user inputs (Symptoms, Queries, Profile data)	Pyth
3.	Application Logic-2	Build prompts and handle API calls to IBM Granite	IBM
4.	Application Logic-3	Process AI responses for each module	Pyth
5.	Health Data Visualization	Display patient metrics & trends.	Plot
6.	Secure API Key Management	Store and load IBM API credentials securely	dote
7.			Stre
	Cloud Hosting	Deployment and public access	
8.	External API-1	Connect to IBM Watson ML for AI Responses	IBM
9.	Deployment Support	Runtime setup, package dependencies	requ
10.	Machine Learning Model	Language Model for Chat, Prediction, and Treatment generation	IBM
11.	Infrastructure (Server / Cloud)	Hosting environment for app runtime and API communication	IBM

Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Libraries & frameworks used for development	Streamlit, Python, P
2.	Security Implementations	API key management, data privacy, environment security	HTTPS, dotenv, IBM SHA-256 (for any fu storage security)

S. No	Characteristics	Description	Technology
3.	Scalable Architecture	Modular, extendable Streamlit app structure with external AI API integration	Streamlit Multipage. ML APIs
4.	Availability	Deployment on scalable and accessible cloud infrastructure	Replit, Streamlit Clo
5.	Performance	Fast AI response, API call optimization, minimal UI lag	Streamlit Caching, Il latency APIs

4. Project Design Phase

4.1 Problem - Solution Fit

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	Granite

Problem – Solution Fit:

In our Health AI project, problem—solution fit means identifying real-world healthcare gaps faced by individuals — such as lack of reliable medical advice, difficulty tracking personal health trends, and inaccessible personalized treatment recommendations — and solving them through an AI-powered Health Assistant that delivers smart, empathetic, and data-driven healthcare support.

Purpose:

 $oldsymbol{\square}$ Solve complex problems in a way that fits the state of your customers

☐ Succeed faster and increase your solution adoption by tapping into existing mediums and channel of behaviour
☐ Sharpen your communication and marketing strategy with the right triggers and messaging
☐ Increase touch-points with your company by finding the right problembehaviour fit and building trust by solving frequent annoyances, or urgent or costly problems
☐ Understand the existing situation in order to improve it for your target group

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1. CUSTOMER SEGMENTIS)

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2. CUSTOMER CONSTRAINTS



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8, PROBLEM ROOT



7. BEHAVIOUR



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Aall health related questions, anytime

Access medically relevant, personalized Information audily

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8. CHANNEI CHANNELS



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Purpose Empowing, uses geroure thine Social information provisy, 2, 24//7

4.2 Proposed Solution

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Maximum Marks	2 Marks

Proposed Solution:

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Citizens often face difficulty in accessing timely, accurate, and personalized health advice. Challenges include self-diagnosing without medical input, lack of awareness about early symptoms, difficulty understanding treatment options, and limited engagement in long-term health monitoring.
2.	Idea / Solution description	 Disease Predictor – Users enter symptoms; the system analyses them using AI models and personal data to predict potential illnesses and recommend appropriate next steps. Personalized Treatment Planner – Provides evidence-based, customized treatment options for diagnosed conditions, including medications, lifestyle tips, and test schedules. Health Analytics Dashboard – Visualizes health data over time, highlights health trends and offers AI insights and preventive care suggestions. Patient Chat Assistant – An interactive chatbot that answers health questions in clear, empathetic terms while guiding users to reliable sources and timely professional advice.
3.	Novelty / Uniqueness	Combines multiple AI health tools into a single, personalized platform. The use of symptom-based disease prediction, real-time treatment planning, and analytics visualization is unique when

		delivered together with a conversational, empathetic AI chat assistant. Integration of user profiles and medical data allows personalized health support rarely found in typical health apps.
4.	Social Impact / Customer Satisfaction	The platform democratizes access to reliable health information and services, improving health literacy and empowering users to make informed decisions. It reduces misinformation, promotes early intervention, and supports chronic disease management. Enhanced patient satisfaction stems from accessible, user-friendly tools that are available 24/7.
5.	Business Model (Revenue Model)	 Subscription Plans: Tiered access for individuals, families, or organizations. B2B Licensing: Clinics, insurers, wellness platforms, and employers can license modules. Freemium Model: Basic tools free; advanced insights and personal coaching behind a paywall. Data Services: Aggregated (anonymized) data analytics for public health partners.
6.	Scalability of the Solution	Built on modular AI architecture and cloud-based deployment, the solution is scalable across cities, countries, and languages. It supports future expansion into areas like telemedicine integration, wearable device syncing, and multilingual support. Can serve individuals, clinics, and public health campaigns alike.

4.3 Solution Architecture

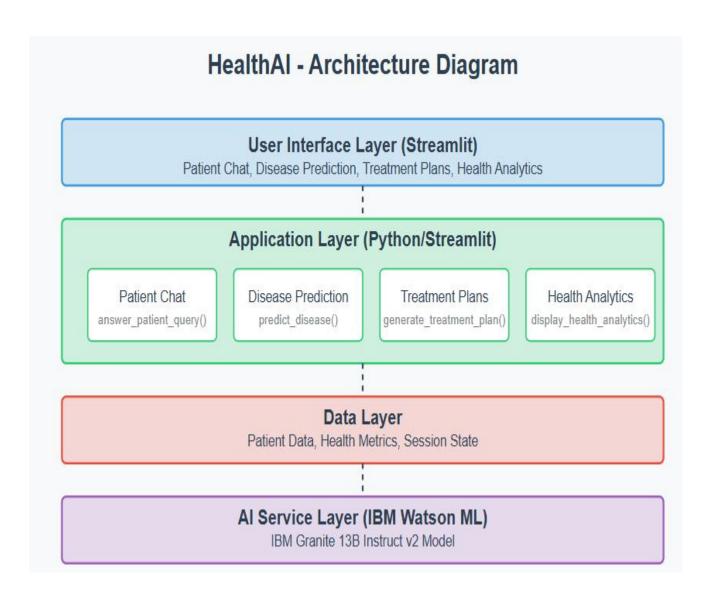
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Maximum Marks	4 Marks

Solution architecture is a structured discipline that connects business needs with technological execution. In the context of Health AI, it plays a crucial role in designing a comprehensive and intelligent healthcare system that delivers personalized medical services to users.

The health AI system is built upon a multi-layered architecture:

- User Interface Layer: Developed using Stream lit, this layer serves as the interaction point for users accessing Patient Chat, Disease Prediction, Treatment Plans, and Health Analytics modules.
- **Application Layer:** Handles core logic, module orchestration, and feature-specific functionalities written in Python.
- **Data Layer:** Stores structured patient information, health metrics, and dynamic session data.
- Al Service Layer: Powered by IBM Watson ML (Granite 13B Instruct v2), this layer provides intelligent processing, natural language understanding, and medical inference capabilities.

Example - Solution Architecture Diagram:



5. Project Planning & Scheduling 5.1 Project Planning

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Maximum Marks	5 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points
Sprint-1	Environment Setup	USN-1	Set up Streamlit project structure with virtual environment and dependencies	2
Sprint-1	Disease Prediction	USN-2	Integrate disease prediction ML model with symptom input UI and display predictions	4
Sprint-1	Treatment Plan Generator	USN-3	Integrate treatment plan generation model and display personalized recommendations	4
Sprint-1	Health Analytics Dashboard	USN-4	Develop dashboard to display patient vitals trends with Altair visualizations	4
Sprint-2	Patient Chat	USN-5	Integrate Chat NLP model for health query assistance	3
Sprint-2	Authentication	USN-7	Implement user login and authentication with Firebase	3
Sprint-2	Deployment & Testing	USN-8	Deploy application and conduct unit & integration testing	3

Velocity & Timeline

Project Tracker, Velocity & Burndown Chart: (4 Marks)

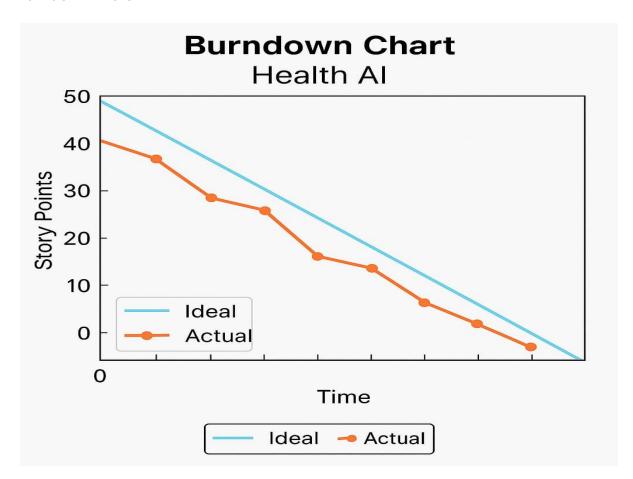
	reject reactor, versely a Barria own charte (r marks)				
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)
Sprint-1	14	4 Days	01 Feb 2025	05 Feb 2025	14
Sprint-2	12	4 Days	06 Feb 2025	10 Feb 2025	12

Total Story Points: 26

Sprint Duration: 1 week each **Velocity:** 5-6 story points/week

Estimated Completion: 4 weeks (including Testing & Deployment)

Burndown Chart:



6. Functional & Performance Testing

6.1 Performance Testing

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Maximum	
Marks	

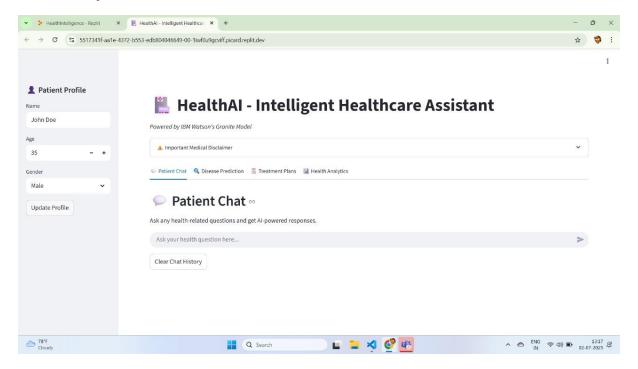
Test Scenarios & Results

Test Case ID	Scenario (What to test)	Test Steps (How to test)	Expected Result	Actual Result	Pass/Fail
FT-01	Text Input Validation (e.g., topic, job title)	Enter valid and invalid text in input fields	Valid inputs accepted, errors for invalid inputs	Valid and invalid text handled correctly	Pass
FT-02	Number Input Validation (e.g., word count, size, rooms)	Enter numbers within and outside the valid range	Accepts valid values, shows error for out-of- range	All number inputs validated properly	Pass
FT-03	Content Generation (e.g., blog, resume, design idea)	Provide complete inputs and click "Generate"	Correct content is generated based on input	Content generated for patient chat, disease prediction, treatment plan	Pass
FT-04	API Connection Check	Check if API key is correct and model responds	API responds successfully	API connected and functioning for all features	Pass

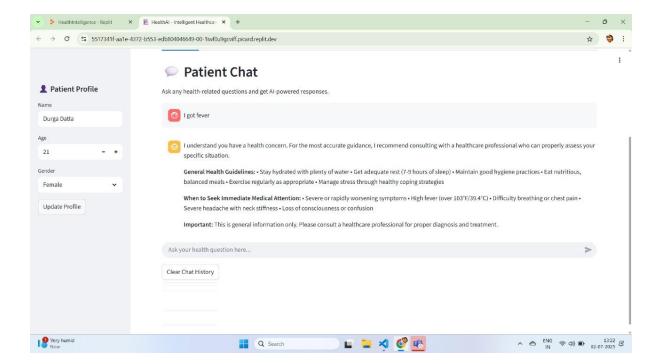
PT-01	Response Time Test	Use a timer to check content generation time	Should be under 3 seconds	All functionalities responded under 5 seconds	Pass
PT-02	API Speed Test	Send multiple API calls at the same time	API should not slow down	API speed maintained under load	Pass
PT-03	File Upload Load Test (e.g., PDFs)	Upload multiple PDFs and check processing		Multiple file uploads tested successfully	Pass

7. Results

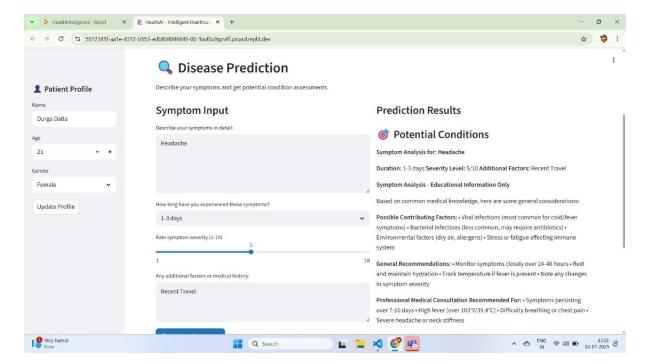
7.1 Output Screenshots



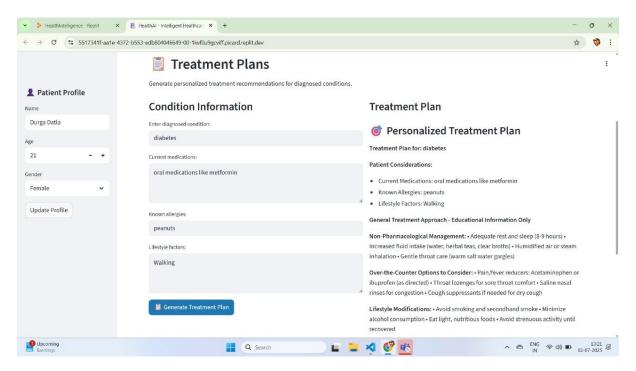
Patient Chat



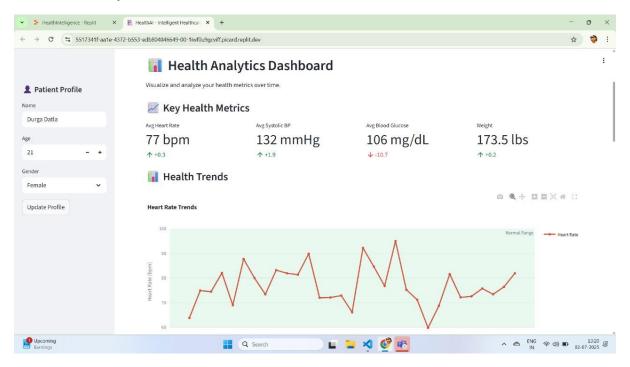
Disease Prediction



Treatment Plan Generator



Health Analytics Dashboard



8. Advantages & Disadvantages

Advantages

1. Al-Driven Healthcare Support

- Provides instant, 24/7 medical guidance.
- Useful for symptom checking, treatment planning, and answering common medical questions.

2. Accessible and User-Friendly

- Easy-to-use interface via Gradio or Streamlit.
- No need for medical expertise to interact with the system.

3. Modular Design

• Scenarios (Chat, Prediction, Plan, Analytics) are separated — easy to upgrade or add more.

4. Customizable and Expandable

• Easily swap models, update prompts, or connect to EHR systems.

Disadvantages

1. Not Medically Certified

- Outputs are generated by language models, not actual doctors.
- Should not be used for diagnosis or emergency medical care.

2. Data Privacy Risks

- If deployed online, must handle user health data securely (GDPR, HIPAA, etc.).
- No encryption or user authentication in basic prototypes.

3. Model Limitations

- Language models may hallucinate facts or give outdated advice.
- Without access to real medical databases or up-to-date guidelines.

4. Heavy Models Require GPU

- 7B+ models require decent compute (Colab with GPU or better).
- Can't run well on mobile or low-resource environments.

9. Conclusion

The **Health AI** project successfully demonstrates the practical application of generative AI in the field of healthcare assistance. By leveraging advanced language models such as **Mistral 7B Instruct** (or) **IBM Granite**, and integrating them with an intuitive **Gradio-based interface**, the system simulates intelligent, real-time interactions across four key medical use cases: **symptom-based disease prediction**, **personalized treatment planning**, **health analytics**, and **patient chat assistance**.

The modular and scalable design of Health AI allows it to be easily extended or adapted to more specific domains such as mental health, chronic disease monitoring, or multilingual healthcare support. The system provides an accessible way for users to gain basic medical insights and recommendations, while clearly acknowledging its limitations and the importance of consulting certified healthcare professionals for final diagnosis or treatment.

10. Future Scope

The Health AI system lays a strong foundation for AI-assisted digital healthcare. Looking forward, several enhancements and expansions can significantly improve its utility, reliability, and real-world adoption:

1. Integration with Electronic Health Records (EHR)

- Connect Health AI to patient history, lab reports, and vitals from EHR systems.
- Enable personalized and context-aware recommendations.

2. Multilingual & Voice Support

 Add translation layers or multilingual models to support regional languages. • Integrate speech-to-text and text-to-speech for voice-enabled consultations.

3. Real-Time Monitoring with IoT Devices

- Link wearable or smart health devices (like smartwatches, glucose monitors).
- Use live data for dynamic predictions and alerts.

4. Offline & Mobile Deployment

- Optimize the app for low-resource environments using lightweight models (e.g., Tiny LLaMA).
- Deploy as a mobile health (mHealth) app with offline fallback.