HealthAI: Intelligent Healthcare Assistant Using IBM Granite

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INTRODUCTION

1.1 Project Overview

HealthAI Assistant is an intelligent web-based healthcare platform that provides users with personalized health information using AI. It includes features like a Symptom Checker, AI Chatbot, and Treatment Plan Generator. The assistant is designed to improve early understanding of symptoms, guide users with relevant medical advice, and support health education in a user-friendly, multilingual environment.

1.2 Purpose

The main objective is to assist users in understanding their symptoms and obtaining personalized health insights using IBM Granite and modern AI. HealthAI does not replace medical professionals but empowers users to take informed actions toward better health.

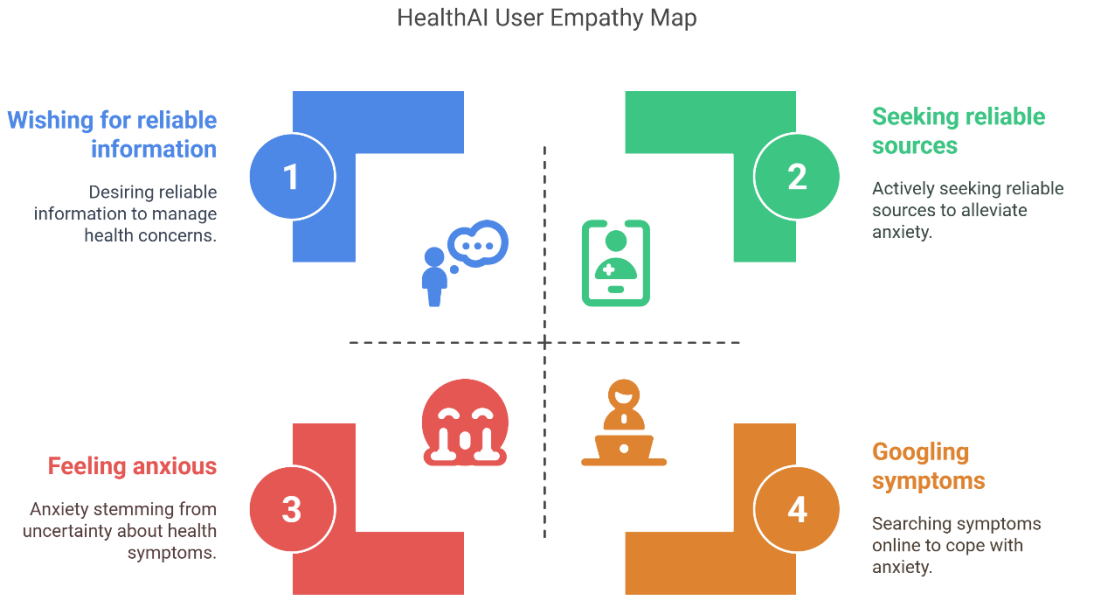
IDEATION PHASE

2.1 Problem Statement

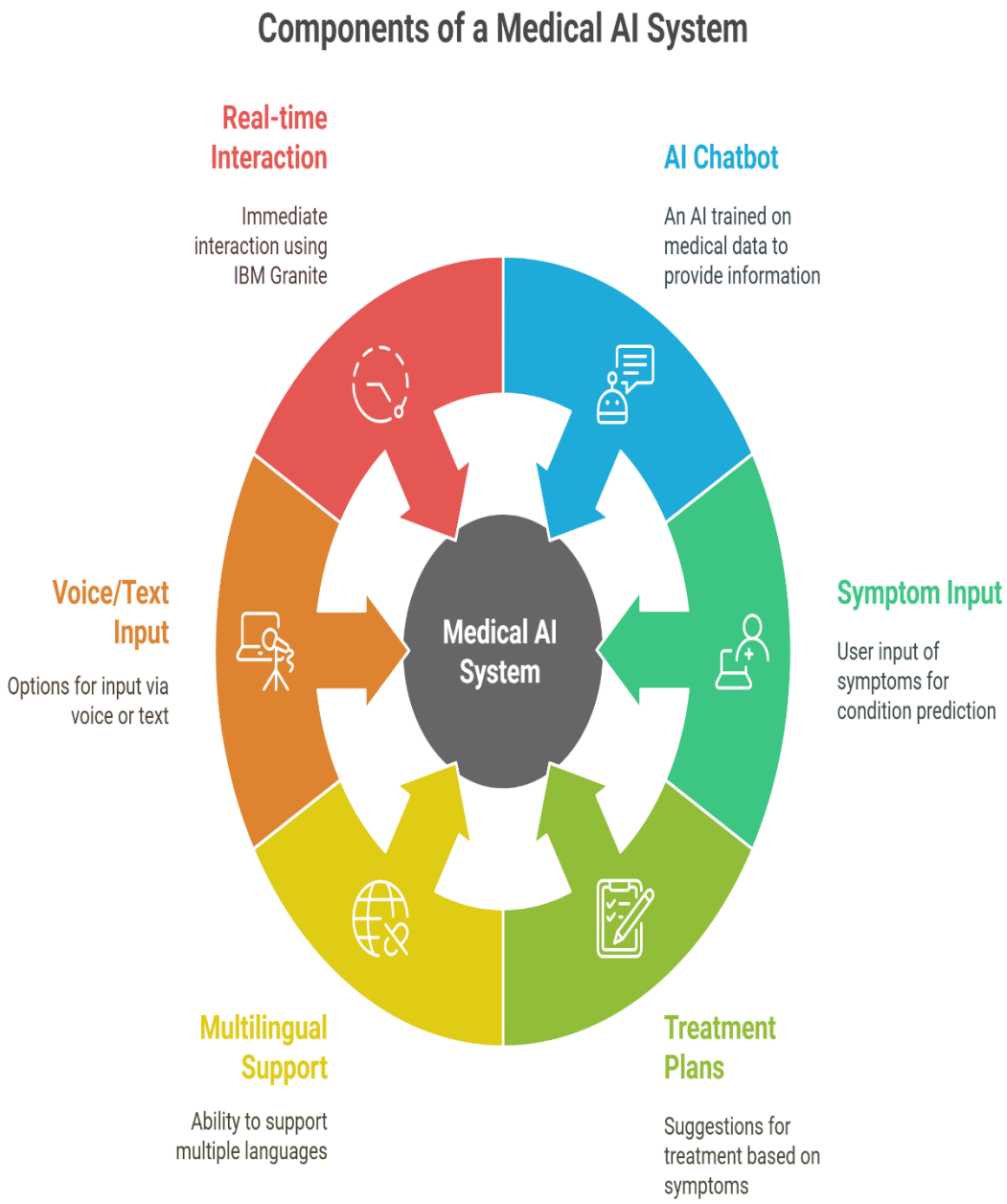
Many individuals experience common symptoms or have health questions but lack instant access to reliable medical guidance. The absence of early understanding can lead to panic or neglect

Aspect	Problem Statement 1 (PS-1)	Problem Statement 2 (PS-2)
I am (Customer)	An individual experiencing mild or confusing symptoms	A concerned person seeking trusted health guidance
I'm trying to	Understand what my symptoms might mean	Ask health-related questions and get instant, relevant answers
But	I don't know if it's serious or needs a doctor visit	I don't have access to real-time, reliable medical advice
Because	Online information is overwhelming, inconsistent, or misleading	Consulting a doctor every time is time-consuming and costly
Which makes me feel	Anxious, confused, and unsure about what to do next	Helpless, worried, and unprepared to take the right action

2.2 Empathy Map Canvas



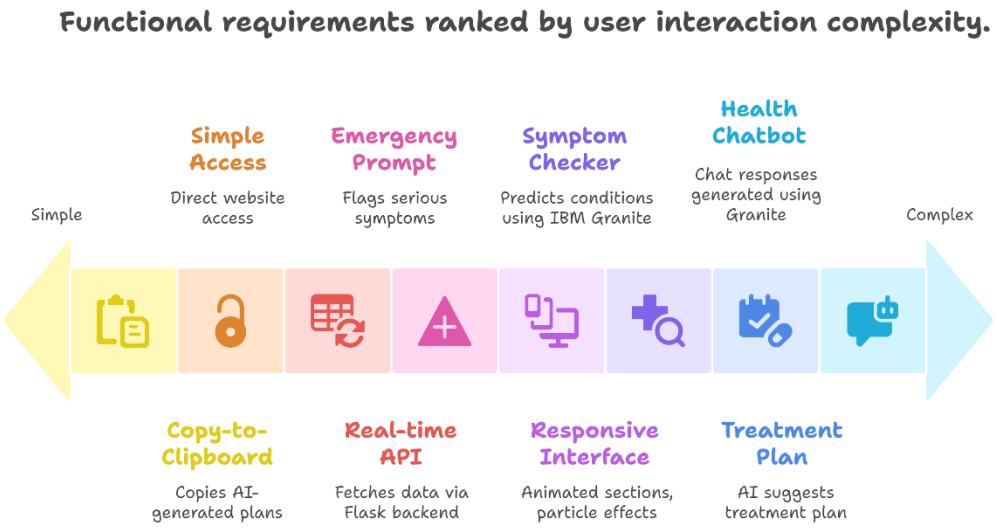
2.3 Brainstorming

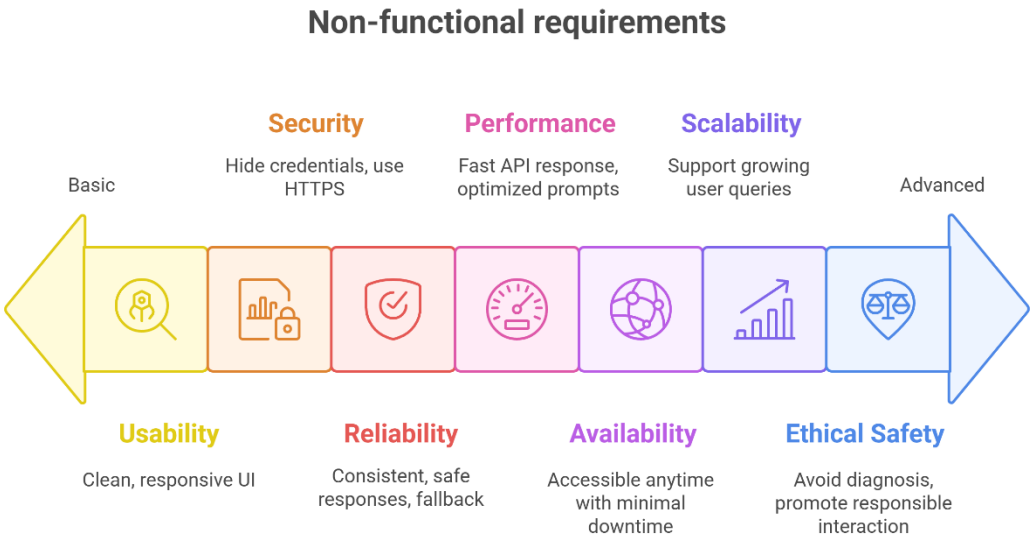


3. REQUIREMENT ANALYSIS

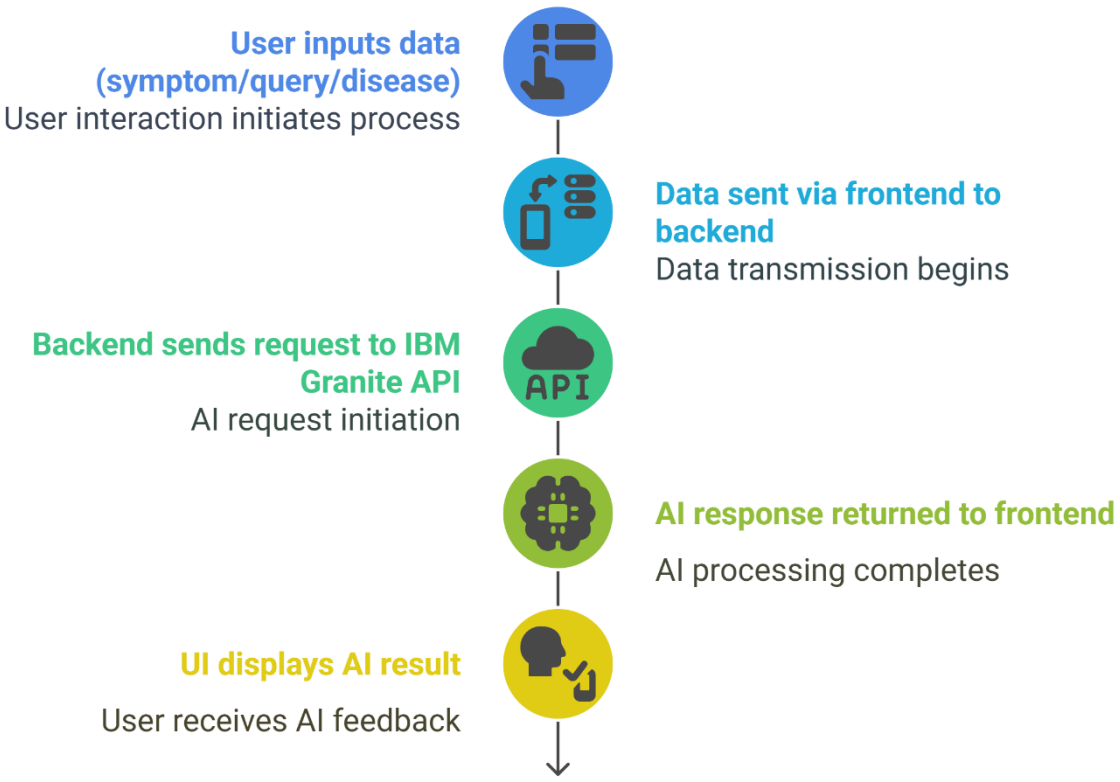
3.1 Customer Journey Map

3.2 Solution Requirement





3.3 Data Flow Diagram

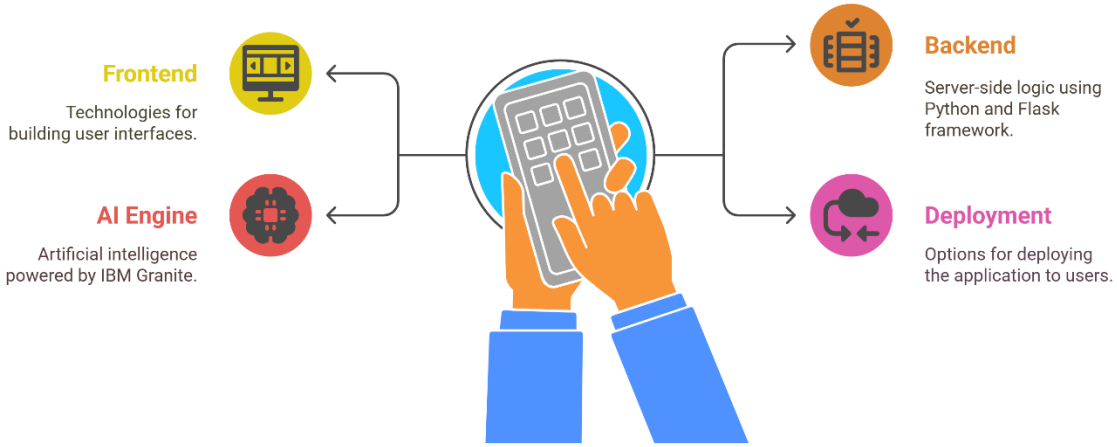


3.3 User Stories – HealthAI Assistant

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
General User	Symptom Checker	USN-1	As a user, I can enter my symptoms and get a possible condition prediction	AI returns a likely health condition based on symptoms	High	Sprint-1
General User	Chatbot Interaction	USN-2	As a user, I can ask health-	Chatbot responds accurately	High	Sprint-1

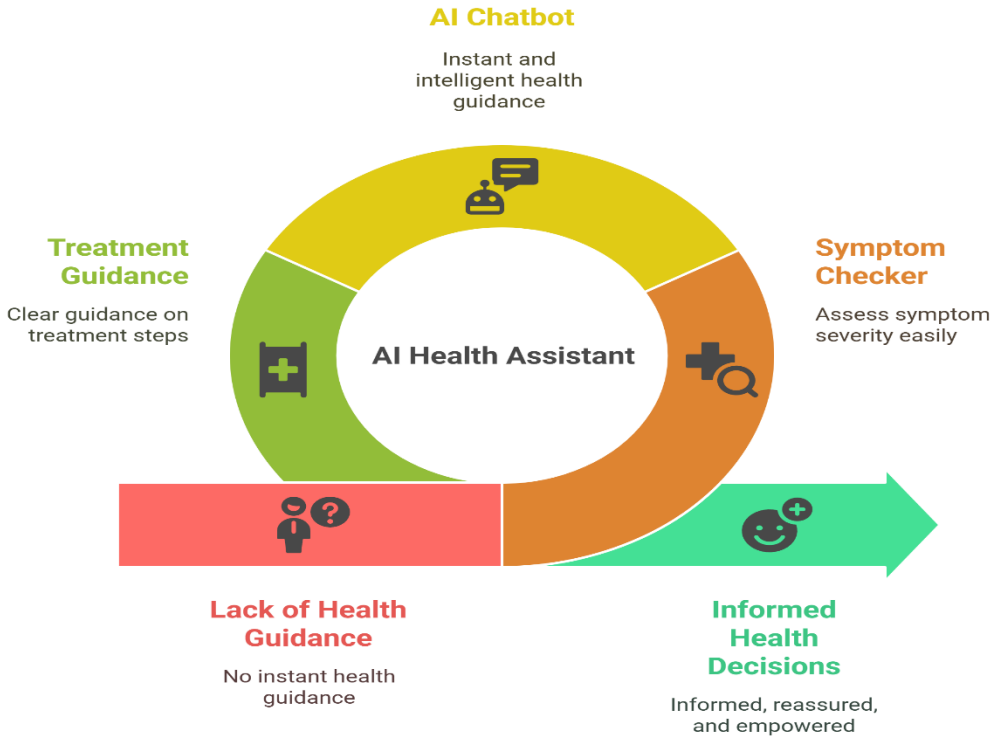
			related questions to an AI chatbot	using IBM Granite		
General User	Treatment Plan Generator	USN-3	As a user, I can enter a disease name to get a general treatment plan	Treatment plan is displayed and can be copied	High	Sprint-1
General User	Emergency Prompt Detection	USN-4	As a user, I am alerted if my symptoms suggest emergency conditions	System warns me for inputs like “chest pain” or “vision loss”	High	Sprint-1
General User	Copy-to-Clipboard	USN-5	As a user, I can copy the treatment plan to clipboard	Clicking the button copies the plan without error	Medium	Sprint-1
General User	Navigation & UI	USN-6	As a user, I can easily navigate between Chatbot, Symptoms, and Treatment Plan pages	All feature cards/buttons work and load correct content	High	Sprint-1
Guest User	Access Without Login	USN-7	As a guest, I can use all major features without creating an account	I am not forced to log in and can still access full functionality	Medium	Sprint-2
General User	Responsive Design	USN-8	As a user, I can access the app from mobile and desktop devices	Layout adjusts correctly and remains fully functional on both screen sizes	Medium	Sprint-2

3.4 Technology Stack

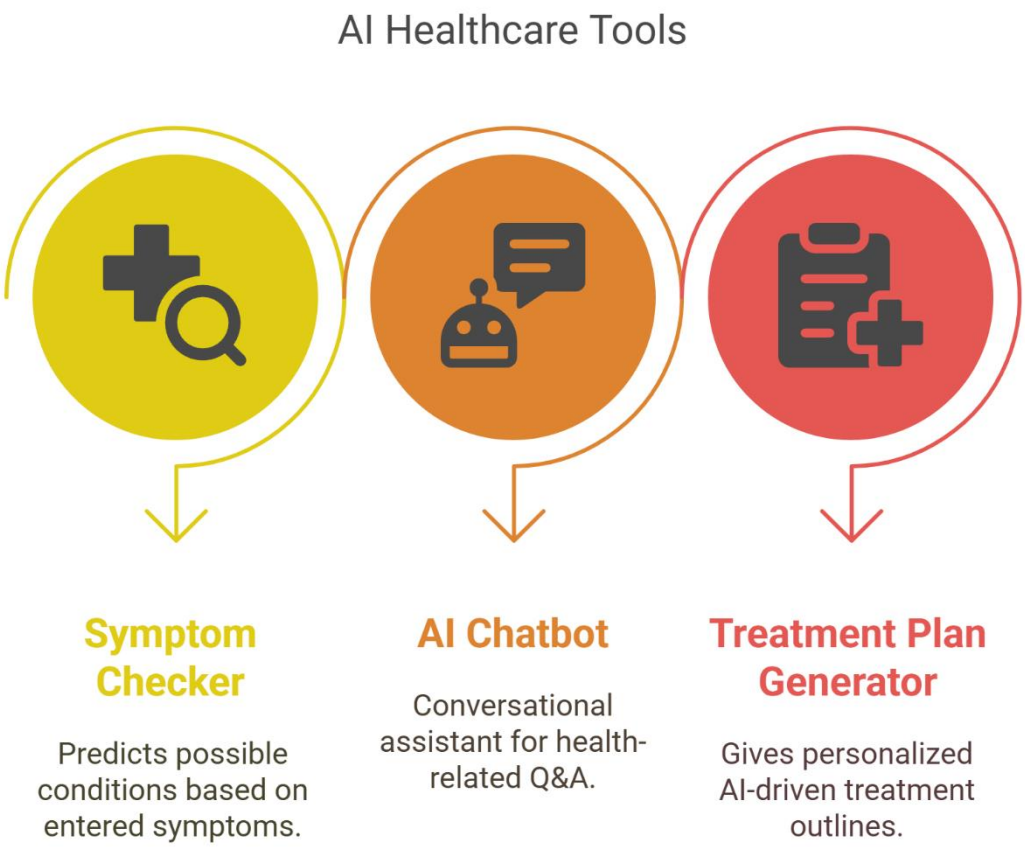


4. PROJECT DESIGN

4.1 Problem-Solution Fit



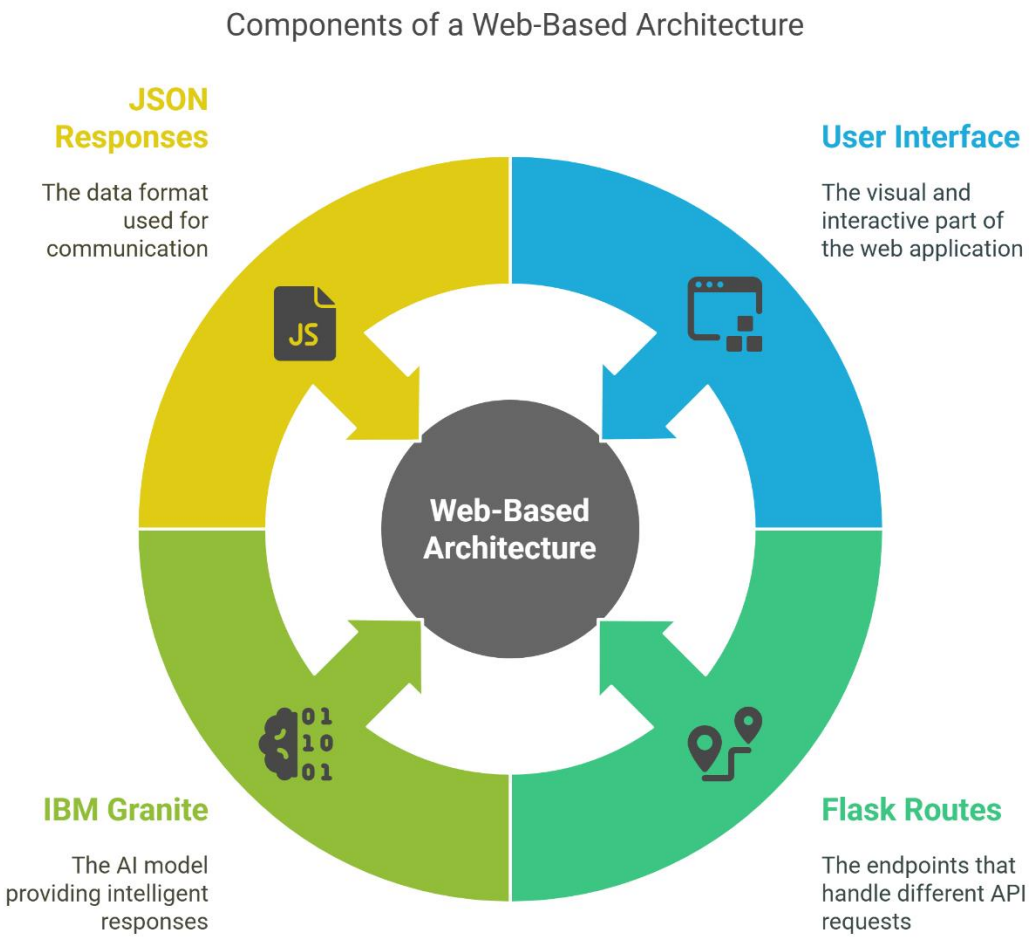
4.2 Proposed Solution



HealthAI offers three core tools:

- Symptom Checker: Predicts possible conditions based on entered symptoms
- AI Chatbot: Conversational assistant for health-related Q&A
- Treatment Plan Generator: Gives personalized AI-driven treatment outlines

4.3 Solution Architecture

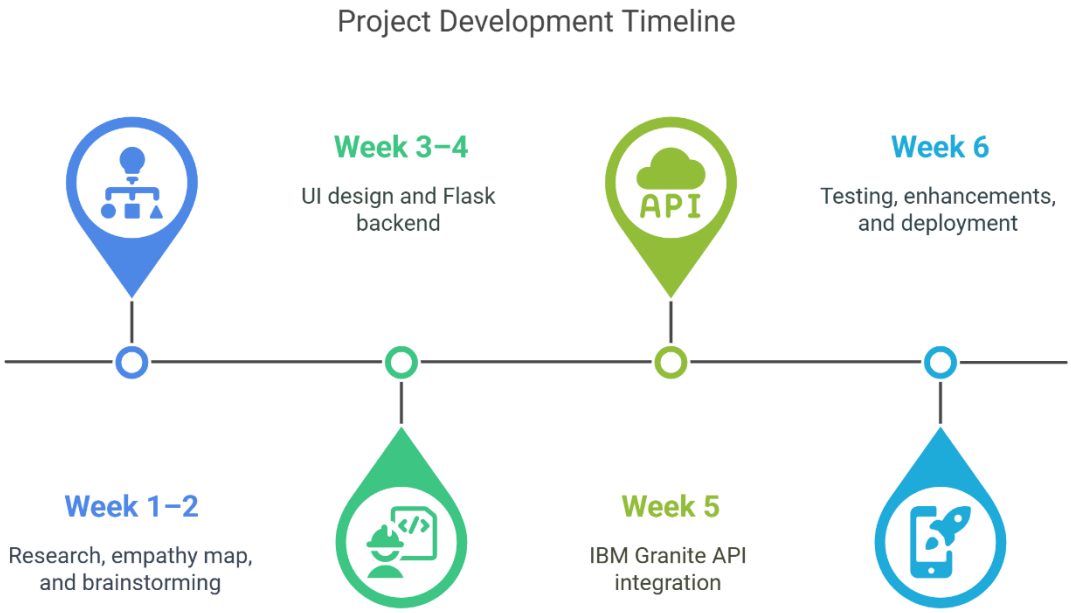


A web-based architecture:

- User Interface (HTML/CSS/JS)
- Flask routes (/api/chat, /api/predict, /api/treatment)
- IBM Granite for intelligent responses
- JSON responses and dynamic UI updates

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning



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6. FUNCTIONAL & PERFORMANCE TESTING

6.1 Performance Testing

Environment Used

- Backend: Flask server running on localhost
- Frontend: HTML/CSS/JS with responsive design, tested in Chrome and Edge
- AI Integration: IBM Watsonx Granite Model via API
- Editor: Visual Studio Code (logging/debugging)
- Network: Stable Wi-Fi (50 Mbps+)

Performance Metrics and Observations:

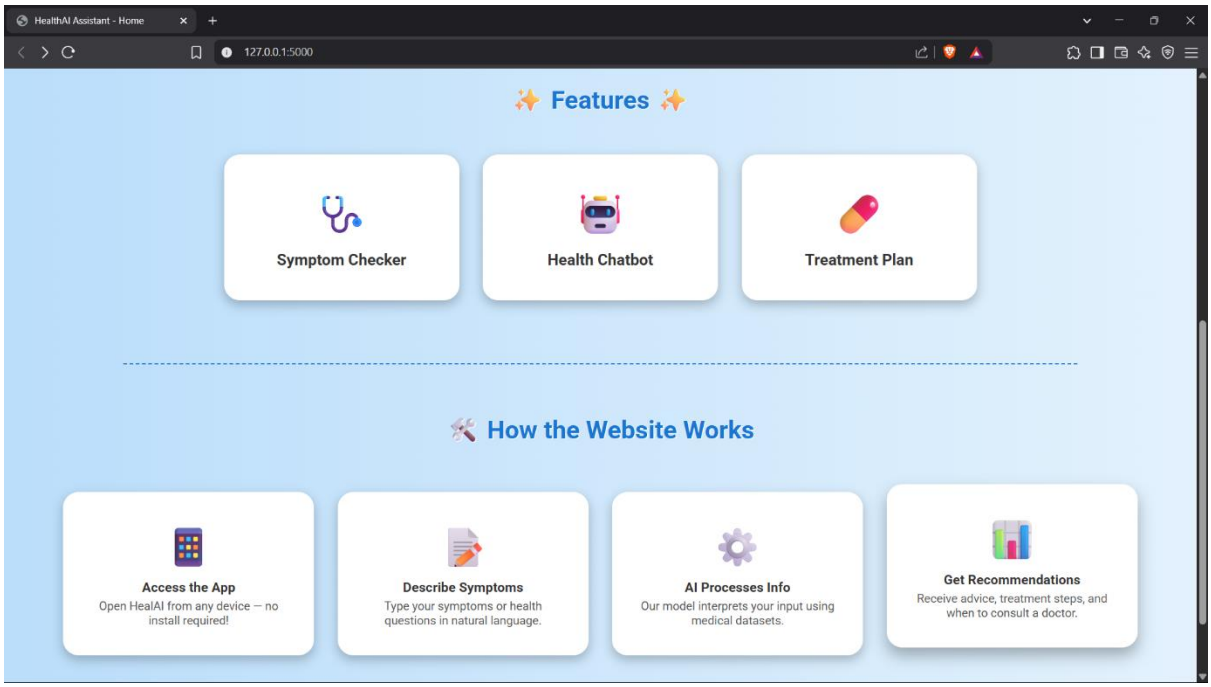
Test Area	Method Used	Expected Result	Actual Result
Page Load Time (Homepage)	Chrome DevTools → Load Timing	≤ 2 seconds	~1.2 seconds
Symptom Checker API Response	Console Log + Flask Debug Logs	≤ 2 seconds	~1.4 seconds
Chatbot Interaction (API)	Network Tab + Flask Response Time	≤ 2 seconds	~1.3 seconds
Treatment Plan Generation	Browser Inspection + Console Timing	≤ 3 seconds	~2.0 seconds
Copy to Clipboard Function	Manual Testing	Instant copy confirmation	Passed
Multi-Tab Usage	Opened in 2–3 tabs simultaneously	Smooth and independent tabs	Passed
Page Navigation (Home → Tools)	Manual observation (click-to-load)	Instant or <1 second	Passed
Tooltip & Particle Effects	UI responsiveness test on hover/move	No lag or stutter	Passed

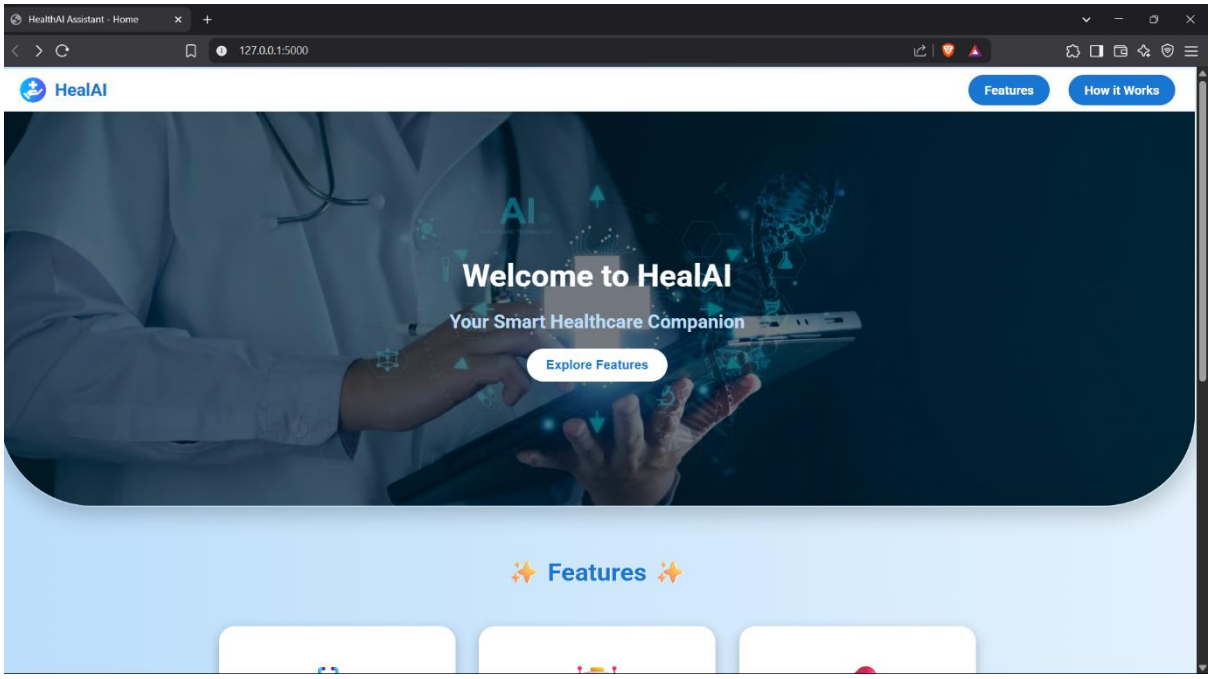
7. RESULTS

7.1 Output Screenshots

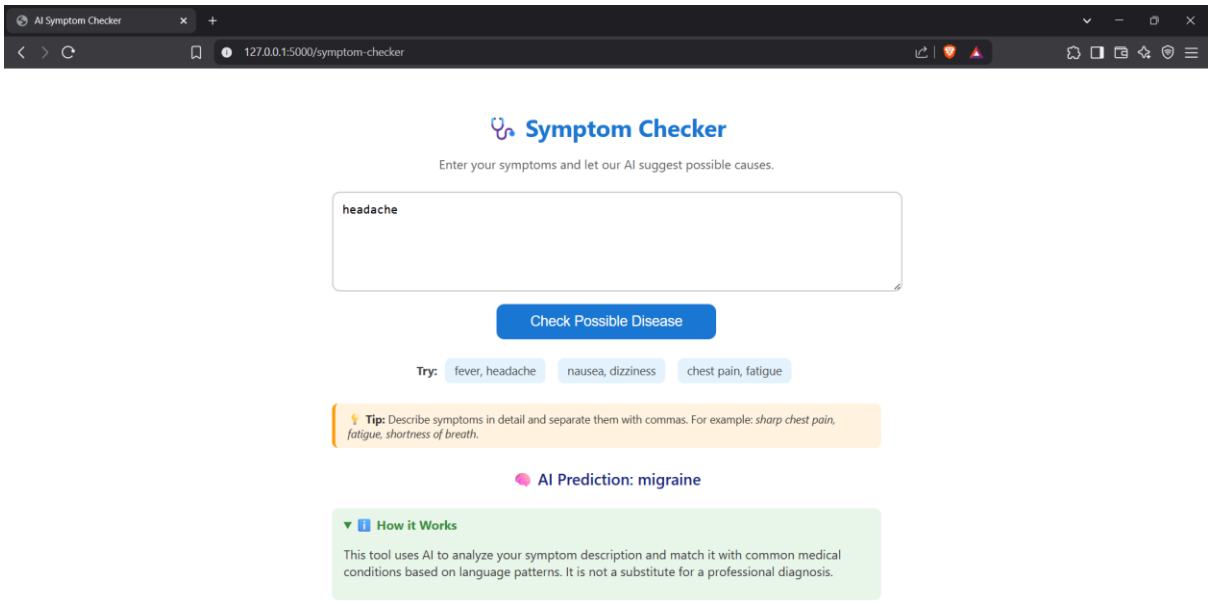
Include screenshots of:

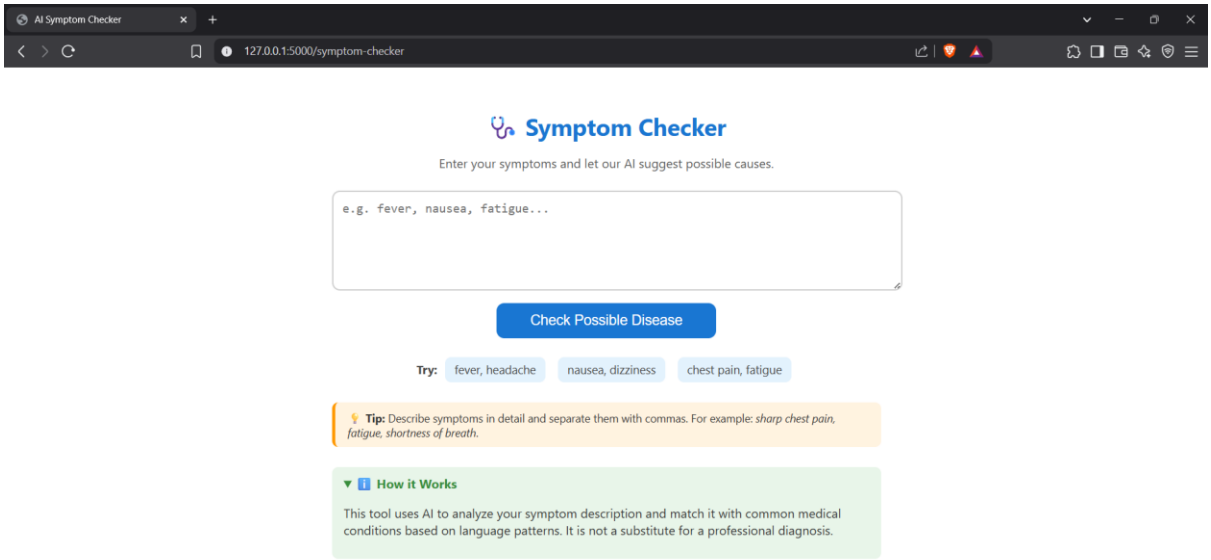
Homepage with parallax and particles



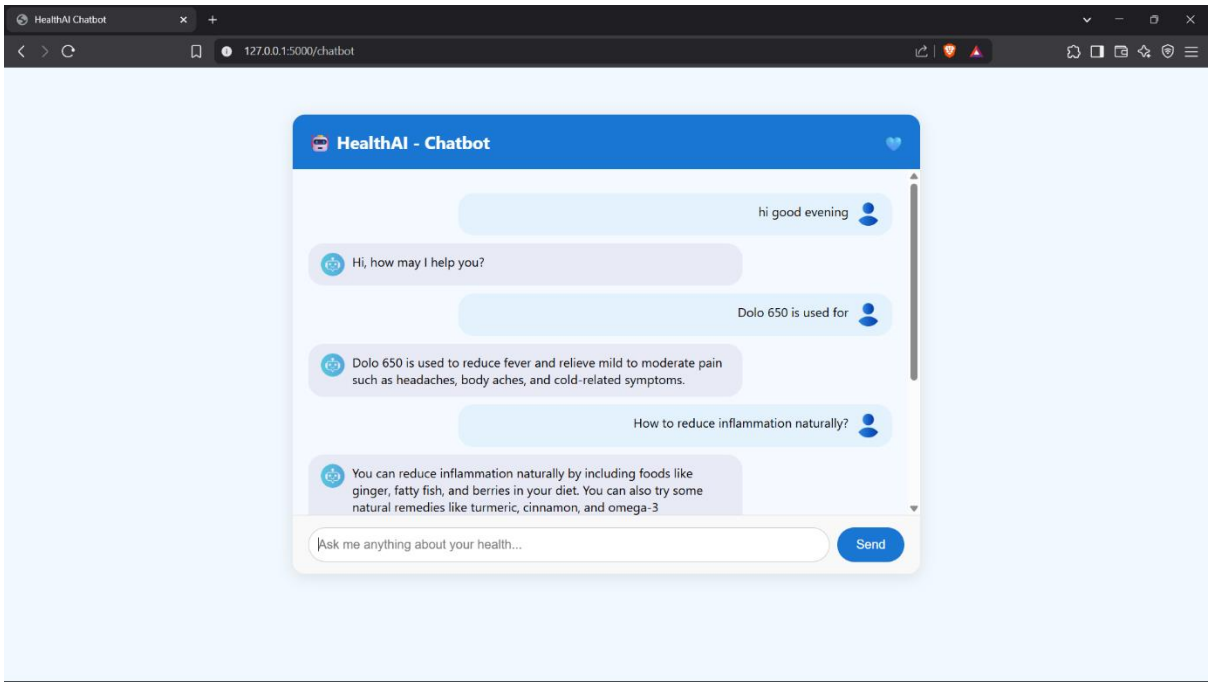


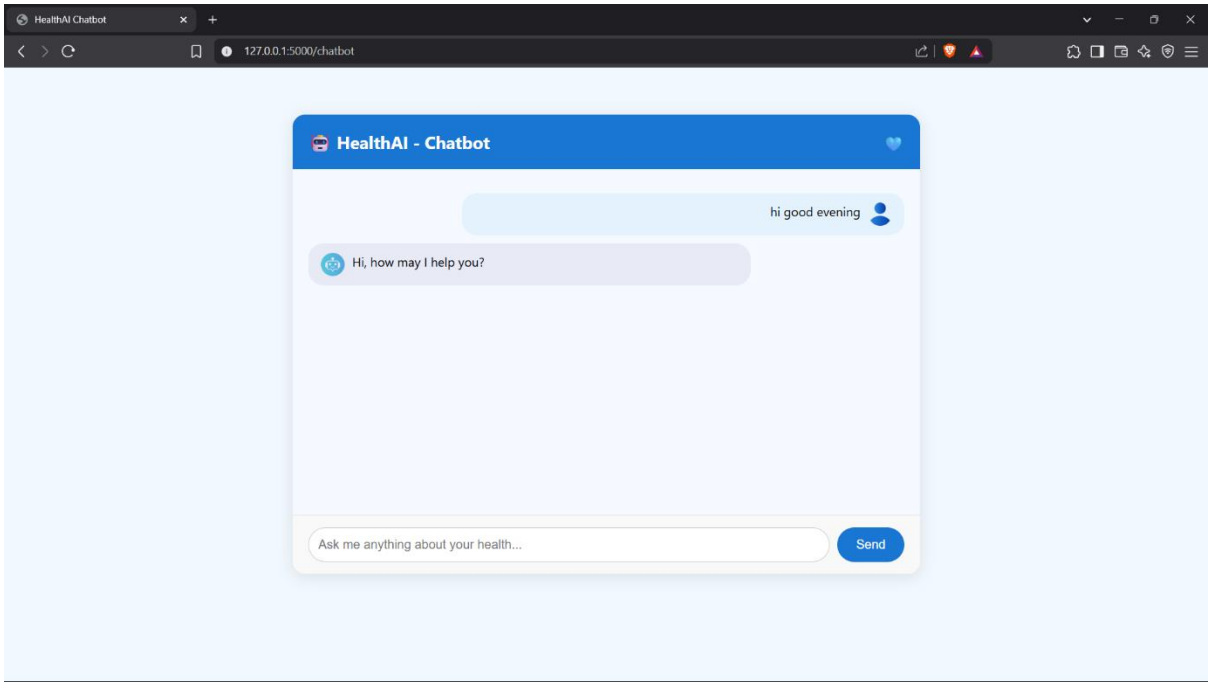
Symptom Checker interface



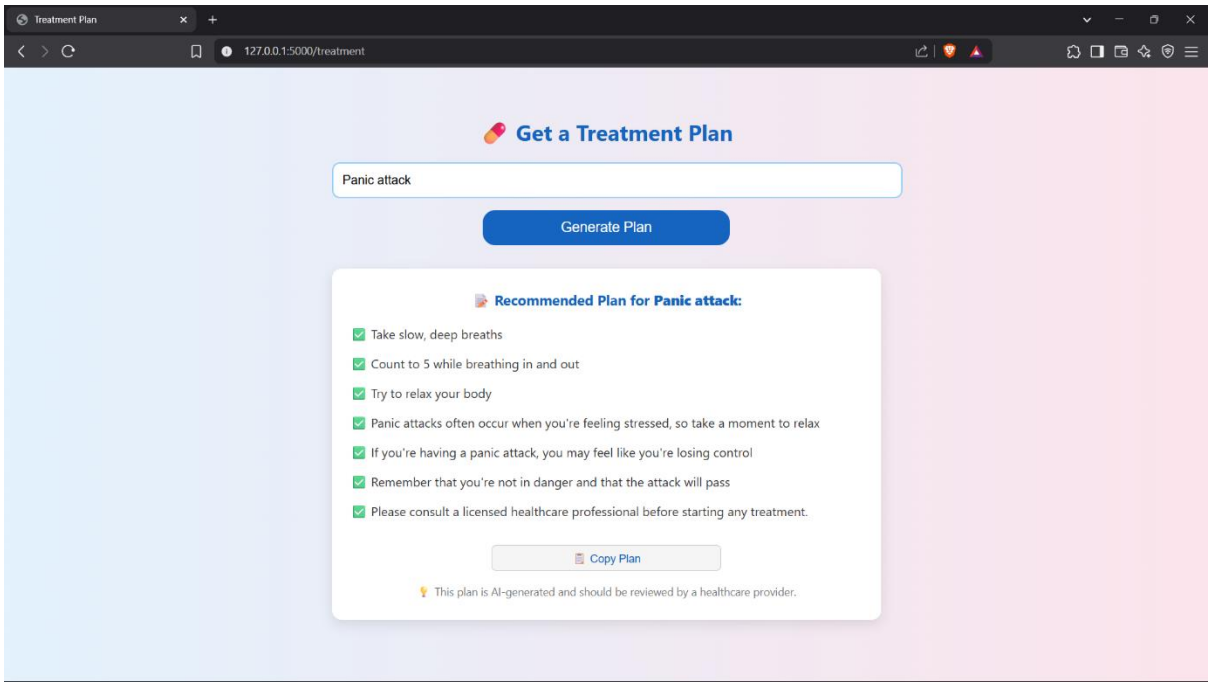


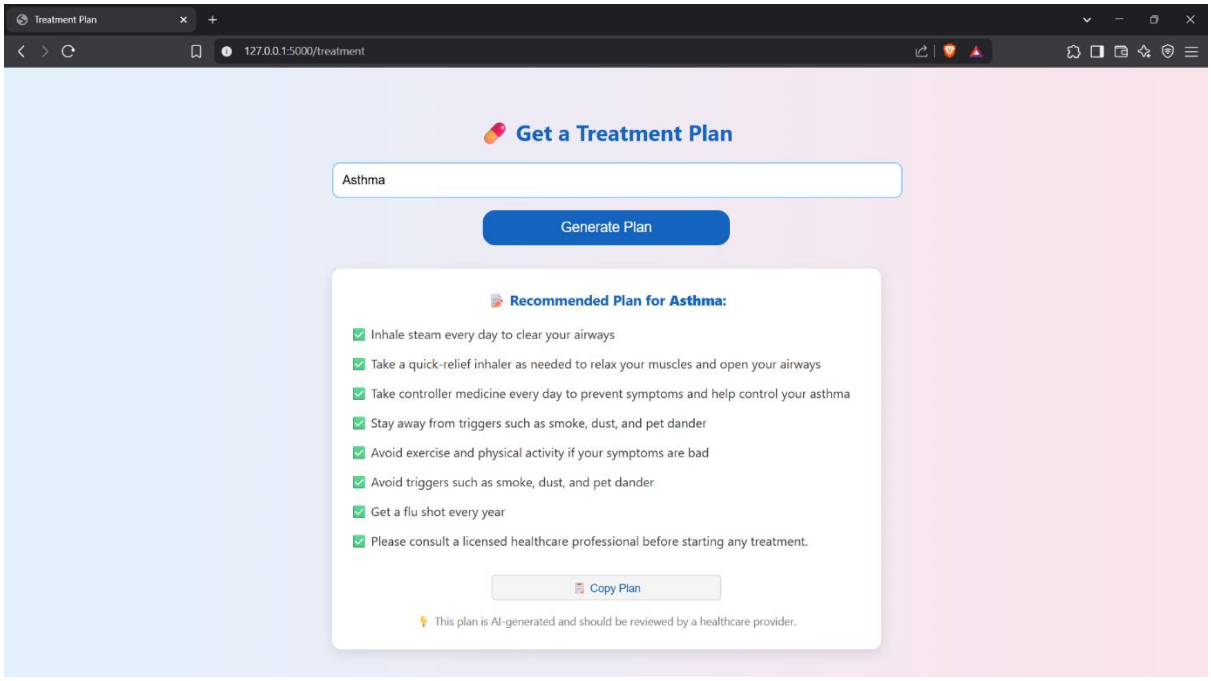
Chatbot with icons and user input



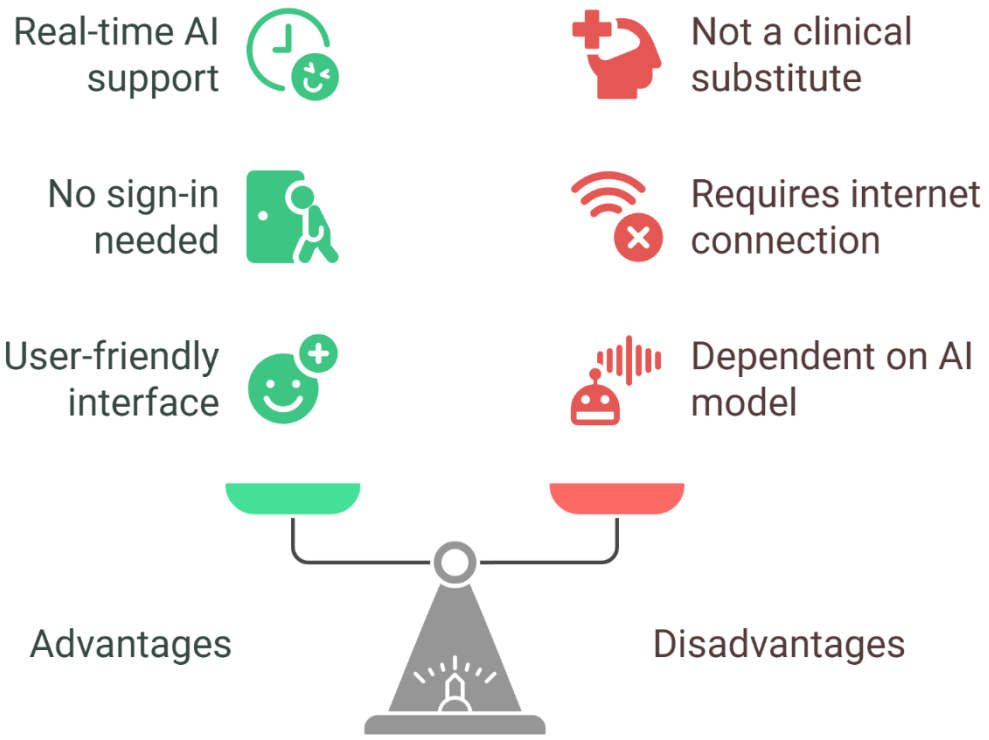


Treatment Plan with copy-to-clipboard feature





8. ADVANTAGES & DISADVANTAGES



9. CONCLUSION

HealthAI bridges the gap between health concerns and actionable information by using AI to educate and empower users. It offers a seamless, responsive, and human-centered experience for health awareness.

10. FUTURE SCOPE

- Add PDF export for plans
- Enable multilingual chat
- Integrate voice input/output
- Connect with real doctors for hybrid AI+human responses
- Store history securely with user consent

11. APPENDIX

- **Source Code**: https://github.com/priyapulakhandam/HealthAi-Assistant
- **Dataset Link**: Not applicable (live AI via IBM Granite)
- **Project Demo**: https://drive.google.com/file/d/14EMZ3F6ywcyPDyr8ig7F9plwFIHskmMz/view?usp=sharing