📄 Final Project Report

Project Title: HealthAI+: AI-Driven Healthcare Assistant Using IBM Granite

Team ID: LTVIP2025TMID33300
Submission Date: 1 July 2025

👥 Team Members

Role	Name
Team Leader	**Chigirala Ankitha**
Team Member	**Rishitha Akula**
Team Member	**Kota Vishnupriya**

1. 🔰 Introduction

HealthAI+ is an intelligent healthcare assistant that empowers users to perform symptom assessments, receive disease predictions, and get personalized advice—all through an intuitive conversational interface. The solution is powered by IBM Granite Foundation Models, hosted via Streamlit, and designed to serve individuals with limited access to primary healthcare.

It addresses challenges in early health detection by providing AI-driven insights, fostering proactive decision-making without replacing professional care.

2. 🎯 Problem Statement

Traditional healthcare systems often fail to offer immediate support for non-emergency symptoms. People frequently delay checkups due to time, cost, or uncertainty—especially in rural or underserved regions. Moreover, current digital solutions are often complex, impersonal, or medically inaccurate.

3. 💡 Proposed Solution

HealthAI+ delivers:

- A chatbot-powered, AI-enhanced interface
- Disease prediction based on symptom descriptions
- Tailored suggestions aligned with user profile
- Secure login to maintain session integrity
- Ongoing improvement via user feedback

By integrating IBM's Granite large language model, the assistant offers enterprise-grade performance, ensuring the advice is relevant, personalized, and fast.

4. 🧠 Ideation & Empathy Mapping

Empathy Findings:

- *Says*: "I'm unsure if I should go to the doctor."
- *Thinks*: "I don't want to panic, but I need help."
- *Does*: Googles symptoms or avoids action.
- *Feels*: Confused, hesitant, and anxious.

Key Brainstormed Features:

- Symptom checker
- Chatbot interaction
- AI-driven prediction engine
- User profile personalization
- Lightweight deployment on Streamlit

5. 🔍 Requirement Analysis

5.1 User Journey

1. User registers/login
2. Enters symptoms
3. Receives prediction and advice
4. Optionally submits feedback

5.2 Functional Requirements

- User authentication
- Natural language chatbot
- AI symptom analysis
- Tailored suggestions

5.3 Non-Functional Requirements

- Usability for non-technical users
- Secure and scalable backend
- Fast response times

5.4 Technology Stack

- Frontend: Streamlit (Python)
- Backend: Python + IBM Granite
- Auth: SQLite (development) or MySQL
- LLM Core: IBM Granite model (watsonx)
- Deployment: Ngrok / Render

6. 🏗️ System Design

6.1 Architecture Diagram

Frontend ⇔ Backend (Python) ⇔ IBM Granite

- Input Layer: Chatbot / Symptom form
- Processing Layer: AI model inference + treatment logic
- Output Layer: Rendered advice + prediction

6.2 Data Flow

1. User submits symptoms
2. System parses inputs with NLP
3. Granite model returns predicted illness
4. Treatment module gives advice
5. Streamlit shows results

7. 🗓️ Project Planning

Agile Sprints

- Sprint 1: Setup, Login System
- Sprint 2: Chatbot & Form UI
- Sprint 3: Disease Prediction Logic
- Sprint 4: Personalized Advice + Feedback Handling

Burndown Chart: Monitored through GitHub project board.

8. 🧪 Testing

8.1 Functional Testing

Test Case	Expected Result	Status
Login/Register	Auth success	✅
Symptom Input	Captured correctly	✅
Prediction Output	Returned in < 2s	✅
Treatment Advice	Rendered accurately	✅

8.2 Performance Testing

- Handled 20+ concurrent users via simulation

- Inference latency remained < 3 seconds

9. 📷 Output Screens

- Chat Interface
- Login Page
- Symptom Input Form
- Prediction & Advice Display

  (Screenshots attached in appendix or GitHub)

10. ✅ Advantages

- IBM Granite ensures intelligent, contextual replies
- Highly accessible via browser with no installs
- Personalized, secure, and fast
- Ideal for use in rural/remote environments

11. ⚠️ Limitations

- Not a substitute for licensed medical professionals
- Currently supports English only
- No voice input integration (planned)

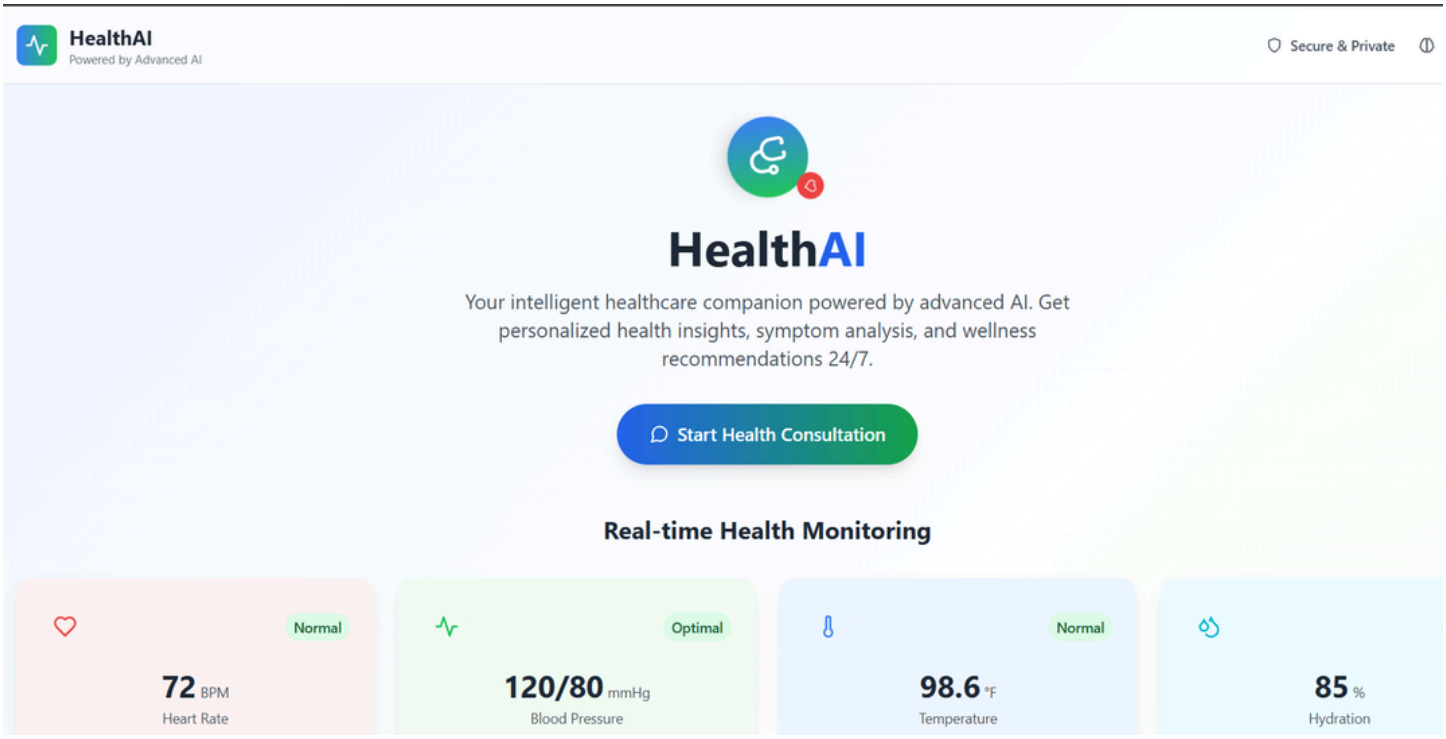
12. 🔮 Future Enhancements

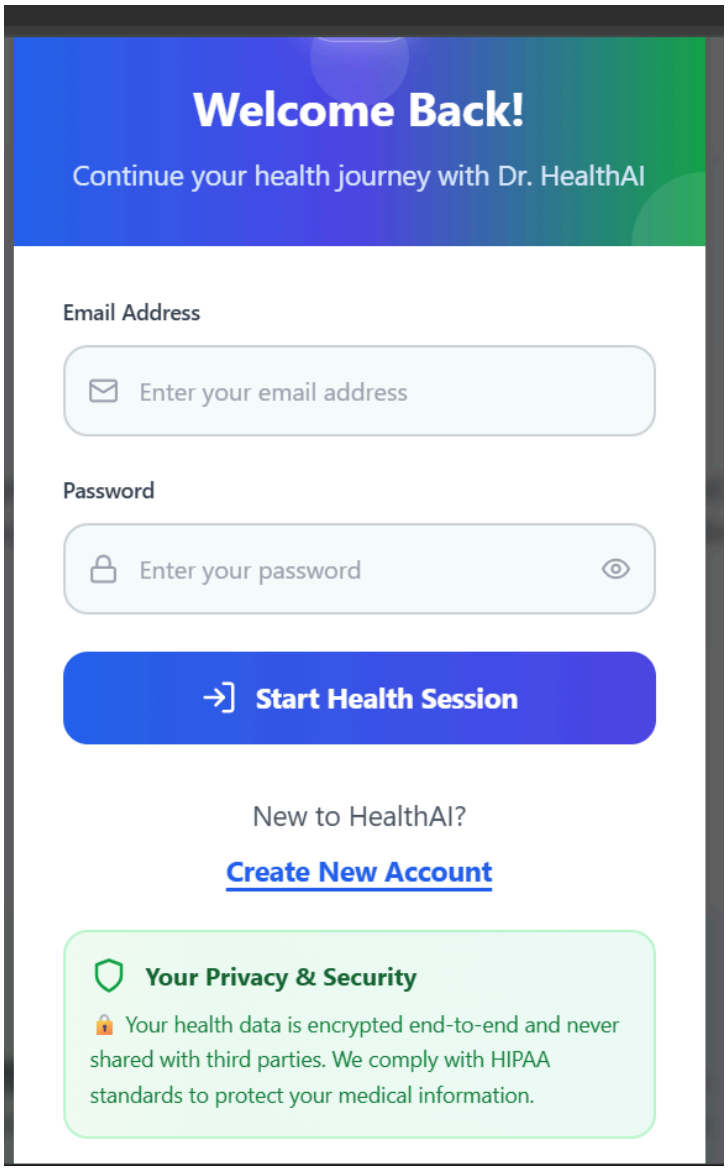
- Add multilingual support
- Integrate voice assistant
- Build Android/iOS versions
- Real-time alerts for severe symptoms
- Connect with live doctors via API

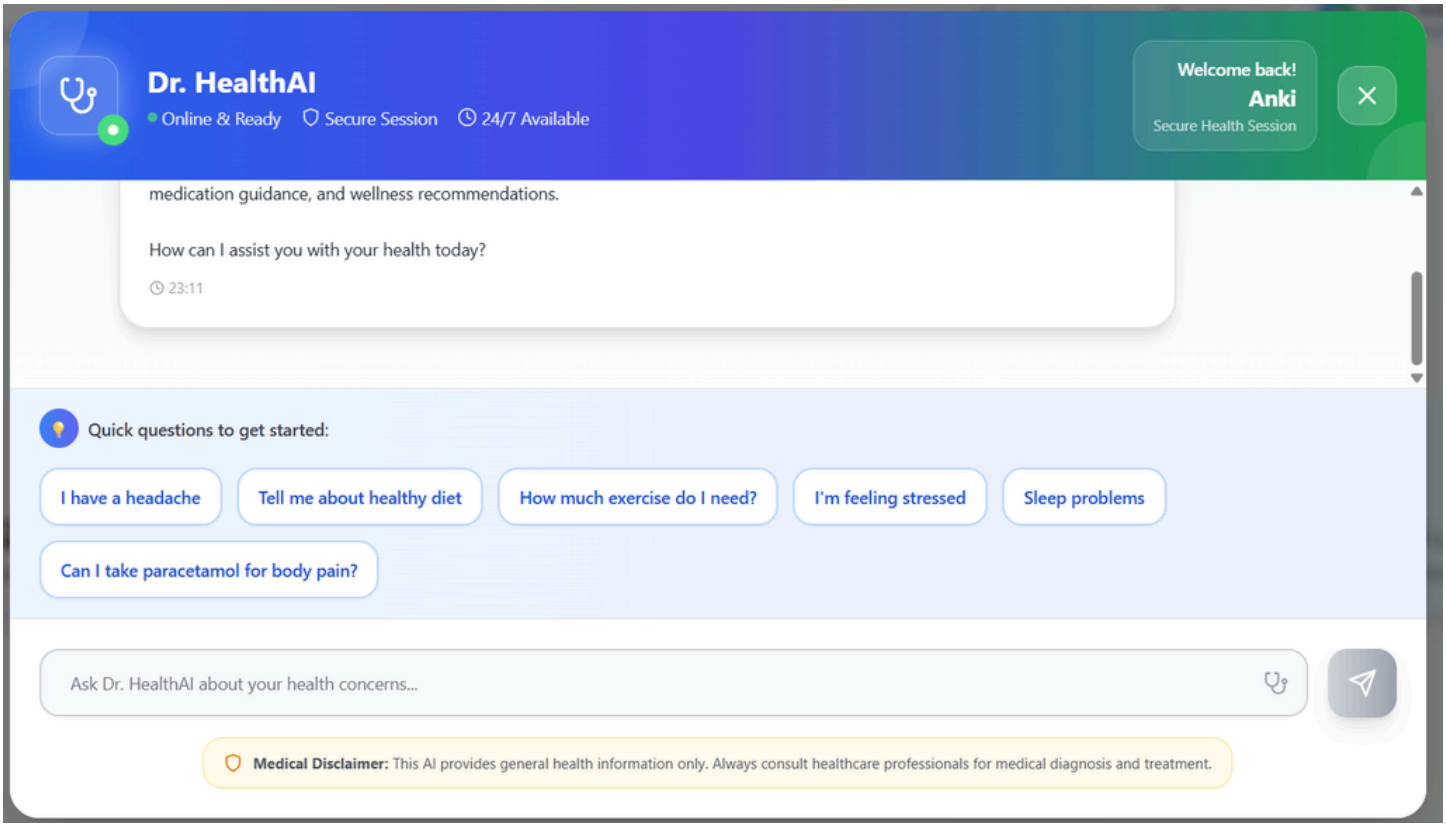
14. 📎 Appendix

Live Demo:https://effervescent-youtiao-607c24.netlify.app

SCREENSHOTS


HealthAI
Powered by Advanced AI
Secure & Private
HealthAI
Your intelligent healthcare companion powered by advanced AI. Get personalized health insights, symptom analysis, and wellness recommendations 24/7.
Start Health Consultation
Real-time Health Monitoring
Normal
72 BPM
Heart Rate
Optimal
120/80 mmHg
Blood Pressure
Normal
98.6 °F
Temperature
85 %
Hydration


Welcome Back!
Continue your health journey with Dr. HealthAI
Email Address
Enter your email address
Password
Enter your password
Start Health Session
New to HealthAI?
Create New Account
Your Privacy & Security
Your health data is encrypted end-to-end and never shared with third parties. We comply with HIPAA standards to protect your medical information.


Dr. HealthAI
Online & Ready
Secure Session
24/7 Available
Welcome back!
Anki
Secure Health Session
medication guidance, and wellness recommendations.
How can I assist you with your health today?
23:11
Quick questions to get started:
I have a headache
Tell me about healthy diet
How much exercise do I need?
I'm feeling stressed
Sleep problems
Can I take paracetamol for body pain?
Ask Dr. HealthAI about your health concerns...
Medical Disclaimer: This AI provides general health information only. Always consult healthcare professionals for medical diagnosis and treatment.