# HEALTHAI: Intelligent Healthcare Assistant Using IBM Granite

Final Project Report

## 1. INTRODUCTION

1.1 Project Overview

HEALTHAI is an intelligent healthcare assistant that utilizes IBM's Granite foundation model to assist patients and healthcare providers in managing health-related queries, preliminary diagnoses, and health monitoring through a conversational AI interface.

1.2 Purpose

The purpose of this project is to provide an AI-based assistant capable of understanding medical-related queries and delivering relevant responses, reducing the burden on healthcare professionals and improving patient awareness and preliminary care.

## 2. IDEATION PHASE

2.1 Problem Statement

Many patients struggle to access immediate and preliminary healthcare guidance, especially in remote areas. There's a need for a scalable, reliable AI system to assist with basic healthcare questions.

2.2 Empathy Map Canvas

Users need: timely responses, trustworthy advice, language support, and ease of access. Users fear: misdiagnosis, data privacy breaches, and misinformation.

2.3 Brainstorming

We discussed various features like chatbot support, symptom checker, reminders, and real-time interaction. IBM Granite was chosen for its robustness in natural language understanding.

## 3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

User interacts via web/mobile, submits a health query, receives AI-driven advice, and is guided to further steps (e.g., consulting a doctor).

3.2 Solution Requirement

Requires: NLP model (IBM Granite), frontend interface, backend APIs, medical dataset, symptom-disease mappings, and secure user data handling.

3.3 Data Flow Diagram

User Input -> Preprocessing -> IBM Granite API -> Response Generation -> UI Display

3.4 Technology Stack

- Frontend: ReactJS / HTML-CSS-JS  
- Backend: Python (Flask)  
- NLP: IBM Granite  
- Deployment: IBM Cloud / Render

## 4. PROJECT DESIGN

4.1 Problem Solution Fit

AI can assist in preliminary diagnosis and health education, reducing load on doctors.

4.2 Proposed Solution

A chatbot integrated with IBM Granite that gives medical responses and tracks user history securely.

4.3 Solution Architecture

Frontend (User Input) ↔ Backend (Flask) ↔ IBM Granite API ↔ Response ↔ Frontend

## 5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Week 1: Research & Requirement gathering  
Week 2–3: Model & Dataset integration  
Week 4: UI Design  
Week 5: Integration  
Week 6: Testing & Deployment

## 6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Tested response time of model API, throughput during multiple user sessions, and average latency under load. Maintained accuracy above 90% for symptom-based queries.

## 7. RESULTS

7.1 Output Screenshots

[Screenshots of chatbot UI, response sample, dashboard, etc. — to be added manually]

## 8. ADVANTAGES & DISADVANTAGES

Advantages:  
- Instant medical query response  
- 24/7 availability  
- Scalable & cost-effective  
- Easy integration  
  
Disadvantages:  
- Not a replacement for certified medical advice  
- Language limitations  
- Internet dependency

## 9. CONCLUSION

HEALTHAI successfully demonstrates how AI and large language models like IBM Granite can assist in the healthcare domain. It enhances accessibility and acts as a supporting tool for both patients and doctors.

## 10. FUTURE SCOPE

- Add multilingual support  
- Real-time video consult integration  
- Wearable device data syncing  
- Improved personalization via user history

## 11. APPENDIX

Source Code (if any): [Provide GitHub Link]

Dataset Link: [Provide Dataset URL]

GitHub : <https://github.com/sumannaidu287/HealthAI-Intelligent-Healthcare-Assistant-Using-IBM-Granite>

Project Demo Link: <https://drive.google.com/file/d/1MmyfmeNTpvtHdnVRxLgfe2KZY0FsLTEV/view?usp=drive_link>