

# ■ Health AI – Smart Healthcare Assistant

## 1. Introduction

Project Title: Health AI – Smart Healthcare Assistant

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### Problem Statement

Healthcare accessibility is a challenge in both rural and urban areas. Patients face delays, lack of immediate medical help, and difficulty in understanding complex reports. This leads to poor treatment outcomes.

### Objectives

- Provide a 24x7 AI-powered assistant for patients.
- Assist doctors with risk prediction and report analysis.
- Deliver simplified health insights for patients.
- Build a feedback loop between doctors and patients.

## 2. Project Overview

### Purpose

Health AI provides an intelligent assistant for patients, doctors, and hospitals, powered by Artificial Intelligence. It improves healthcare accessibility, monitoring, and decision-making.

### Features

- Conversational Chat Interface – Natural language interaction for patients.
- Symptom Checker – AI analyzes symptoms and suggests possible causes.
- Medicine Reminder – Sends timely alerts for prescribed medicines.
- Health Report Summarization – Simplifies complex medical reports.
- Risk Prediction – Identifies early signs of diseases.
- Doctor–Patient Feedback Loop – Supports continuous monitoring.
- Anomaly Detection – Alerts doctors on unusual patterns.
- Multimodal Input Support – Accepts lab reports, images, CSV records.
- User-Friendly Dashboard – Easy interface for patients and doctors.

## 3. Architecture

- Frontend (Streamlit/Gradio): Dashboards, chat, report uploads, feedback.
- Backend (FastAPI): APIs for chat, predictions, reminders, and data.
- LLM Integration (IBM Watsonx / OpenAI): Chatbot and report summarization.
- Database (MongoDB / MySQL): Stores patient records and reminders.
- ML Modules (Scikit-learn, TensorFlow): Risk prediction & anomaly detection.

## 4. Setup Instructions

## Prerequisites

- Python 3.9+
- API keys for AI model integration
- Internet access

## Process

- Deploy backend services.
- Launch frontend dashboard.
- Upload medical reports or records.
- Interact with chatbot, predictions, and reminders.

## 5. Folder Structure

- app/ – Backend APIs (chat, prediction, summarization, reminders)
- ui/ – Frontend files (Streamlit/Gradio dashboard)
- report\_summarizer.py – Handles report summarization
- health\_predictor.py – Risk prediction module
- reminder\_manager.py – Medicine reminder system
- anomaly\_checker.py – Detects unusual data

## 6. Running the Application

- Start backend server
- Launch frontend dashboard
- Upload patient records
- Chat with assistant and view reports/reminders

## 7. API Documentation

- POST /chat/ask – Patient queries and chatbot responses
- POST /upload-report – Upload and summarize medical reports
- GET /get-reminders – Fetch upcoming medicine reminders
- POST /predict-risk – Predict disease risks
- POST /submit-feedback – Collect patient feedback

## 8. Authentication

- Secure login with Doctor / Patient / Admin roles
- Token-based authentication (JWT)
- Role-based permissions for privacy

## 9. User Interface

- Sidebar for navigation
- Tabs: Chat, Reports, Predictions, Reminders
- Dashboard with visualizations
- Option to download reports

## 10. Testing

- Unit Testing – Chatbot and prediction modules
- API Testing – Swagger UI, Postman

- Manual Testing – Upload reports and reminders
- Edge Cases – Wrong inputs, invalid files

## 11. Screenshots (to be added)

- Chat interface
- Report upload form
- Prediction results dashboard

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FEVERFUEL PANDA

Enter Symptoms

fever

Analyze Symptoms

Possible Conditions & Recommendations

The symptom of fever is quite common and can be associated with a wide range of conditions, from mild viral infections to severe bacterial or viral illnesses. Here are some possible medical conditions related to fever, along with general medication suggestions based on common treatments for these conditions:

- "Viral upper respiratory infections":** Common colds, flu (influenza)
  - Treatment: Over-the-counter (OTC) pain relievers and fever reducers like acetaminophen (Tylenol) or ibuprofen (Advil, Motrin) for pain and reducing fever. Do not use aspirin for children and teenagers due to the risk of Reye's syndrome. Hydration and rest are crucial.
- "Bacterial infections":** Some examples include strep throat or sinusitis
  - Treatment: Antibiotics, usually prescribed by a doctor, are necessary for bacterial infections. Common choices are penicillin, amoxicillin, or clindamycin. Ensure to complete the full course of antibiotics as prescribed, even if symptoms improve.
- "Fever of unknown origin (FUO)":** A serious condition where the cause of fever cannot be identified despite extensive testing
  - Treatment: Depends on the underlying cause. This may involve a variety of investigations, including blood tests, imaging studies (e.g., CT scans), and sometimes hospitalization for observation and treatment. Specific treatments are unavailable for some cases.

Medical Condition

diabetes

Age

30

Gender

Male

Medical History

none

Generate Treatment Plan

Personalized Treatment Plan

- "Lifestyle Modifications:"**
  - "Diet:"** Adopt a balanced, Mediterranean-style diet rich in whole grains, fruits, vegetables, lean proteins, and healthy fats (e.g., olive oil). Limit processed foods, sugars, and unhealthy fats. Aim for 5 servings of fruit and 4 servings of vegetables daily.
  - "Exercise:"** Engage in regular physical activity, such as brisk walking, cycling, or swimming, for at least 150 minutes per week or 75 minutes for vigorous exercise. Aim for at least 3 days of activity per week.
  - "Weight Management:"** Maintain a healthy body weight by monitoring caloric intake and balancing it with energy expenditure.
- "Medication:"**
  - "Metformin:"** Start with a low dose (500-1000 mg) and gradually increase based on blood sugar control and tolerability. Metformin helps lower glucose production in the liver and improves insulin sensitivity.
  - "Lifestyle Adjustments:"** If metformin causes gastrointestinal side effects (e.g., bloating, gas, or diarrhea), try taking it with meals or after a small snack.
  - "Monitor Blood Sugar:"** Regularly check blood glucose levels using a home glucose meter. Adjust medication or lifestyle changes as needed.
- "Home Remedies:"**
  - "Ginger:"** Add 1-2 to 1 teaspoon of ginger powder to meals. Ginger supports

Use via API - Built with Gradio - Settings

Medical Condition

diabetes

Age

30

Gender

Male

Medical History

none

Generate Treatment Plan

Personalized Treatment Plan

Use via API - Built with Gradio - Settings

## 12. Known Issues

- ## 13. Future Enhancements

- ## 14. Conclusion

Health AI makes medical help more accessible and faster. It connects patients and doctors through AI, supports decision-making, and improves communication for better healthcare outcomes.