# Problem Definition & Design Thinking

## Title: AI-Powered Healthcare Assistant

## Problem Statement:

In today's fast-paced world, access to immediate healthcare information and preliminary medical advice is a challenge for many people. Individuals in rural or remote areas, and even urban settings, face difficulties in accessing healthcare professionals promptly. Long waiting times, lack of access to healthcare facilities, and a shortage of professionals exacerbate the situation, especially for non-emergency yet important medical advice.

The problem is how to provide quick, accurate, and accessible healthcare advice without replacing the need for doctors but enhancing patient support, ensuring that patients know when professional medical attention is necessary.

## Target Audience:

- People in remote areas with limited access to doctors
- Elderly individuals who require frequent medical advice
- People with mild or non-emergency medical issues seeking quick information
- Clinics and hospitals looking to reduce patient load for non-emergency issues

## Objectives:

- To design an AI system capable of assisting users with preliminary healthcare advice based on symptoms.
- To ensure the AI system can recommend when to seek professional help.
- To create a user-friendly interface accessible via smartphones and computers.
- To maintain privacy and confidentiality in handling medical data.

## Design Thinking Approach:

## Empathize:

The core of the problem lies in accessibility. Patients often hesitate to visit a doctor for mild symptoms due to cost, time, or availability. The goal is to understand the pain points of these users and address their fear of misdiagnosis or delayed diagnosis.

**Key User Concerns:**

- Trust in AI recommendations.
- Fear of relying on technology without human involvement.
- Ease of use for older adults or non-tech-savvy individuals.

## Define:

The solution should be able to identify basic health concerns using input symptoms, personal medical history, and environment. It will provide a response indicating whether the issue is likely mild, moderate, or severe, and offer advice on what steps to take next, such as self-care or seeing a doctor.

## Key Features Required:

- Symptom checker based on an AI model trained on a medical dataset.

- Easy-to-navigate user interface, especially for the elderly.

- Clear instructions on actions to take (e.g., "Visit a doctor within 24 hours," "Monitor symptoms at home").

- Security protocols to protect sensitive health data.

## Ideate:

Some potential ideas for this solution include:

- An AI chatbot integrated with medical databases to answer basic health-related queries.

- A mobile app where users can input their symptoms and receive AI-driven advice.

- Integration with wearable devices like smartwatches to track vitals and make more accurate recommendations.

## Brainstorming Results:

- A chatbot that interacts with the user to understand symptoms and provides insights based on its training.

- A multilingual interface to reach a wider audience, especially in rural areas.

- Gamification or reminders to ensure patients track their symptoms accurately.

## Prototype:

Developing a basic chatbot where users can input their symptoms, and the chatbot provides:

- A list of potential conditions.

- Suggestions for self-care.

- Recommendations for professional healthcare, including urgency.

### Key Components of Prototype:

- Database of symptoms and related conditions.

- A natural language processing (NLP) model to understand user input.

- Logic to determine whether the symptoms indicate an emergency or routine concern.

## Test:

The prototype will be tested by a focus group consisting of individuals from the target audience (remote area patients, elderly users, etc.). They will interact with the AI healthcare assistant, and their feedback will be gathered to improve the system.

## Testing Goals:

- Understand if the AI's recommendations are trusted by users.

- Gauge how intuitive the system is for the elderly and non-tech-savvy users.

- Verify the accuracy of the symptom checker and its advice.