JAGADISH K
ECE
113323106039
aut113323ecb21

Problem Definition & Design Thinking

Title: Artificial Intelligence Healthcare Diagnosis and Treatment

Problem Statement:

☐ In contemporary healthcare, timely and precise diagnosis is paramount but still a common problem. Human mistakes, restricted access to specialist medical practitioners, and unorganized patient data generally imply incorrect or delayed diagnosis—especially in highly complex diseases like cancer or orphan diseases. The problem is even more vital in underserved or rural communities with extremely restricted healthcare access.

Increasingly, what is needed are intelligent systems capable of processing heterogeneous patient data to provide accurate and timely diagnostic results, enable clinical decision support, and guide appropriate treatment options.

Target Audience:

• Isolated community members with limited exposure to health care professionals
• Older patients with chronic diseases that need continuous monitoring
• Those with undiagnosed or hard-to-diagnose symptoms
• Hospitals and clinics that are interested in automating diagnostic and patient triage

Objectives:

• To develop an AI-driven diagnosis system that will correctly interpret patient history and symptoms
• To facilitate the early detection of dangerous or atypical diseases by pattern recognition based on evidence
• To offer scalable, user-friendly diagnostic assistance to clinicians and patients
• To have medical information handled securely, as per privacy legislation

Design Thinking Approach:
Empathize:

The frustration and anger experienced by users come about when they feel that what they are going through is not being heard and appreciated. Poor waiting times and variable medical tests undermine trust in healthcare systems. By listening to these

user experiences, we wish to develop an instrument that will facilitate quicker, safer, and more informed choices.

Key User Concerns:

  • Faith in accuracy of AI diagnosis
  • Fear of abuse of health information and misuse of personal data
  • Need for natural interfaces to support elderly and non-technical users

Define:

The AI system must be able to obtain real-time and historical health data and infer likely diagnosis, triage level, and recommend next steps—varying from home care instructions to referral for medical emergencies.

Key Features Required:

• AI systems learned on accredited medical databases to provide accurate diagnosis
• User interface that adapts to age, language, and device preferences.
• Real-time indicators of triage showing emergent and urgent status
• Strong security controls for data protection and compliance

Ideate:

Concepts to discuss are:
• A web/mob application through which users input symptoms and get diagnosed by ai
• Incorporation of electronic health records (EHRs) to facilitate contextual analysis
• Real-time monitoring wearable assistance for more accurate diagnosis

Brainstorming Results:

• Computer-aided symptom screening with risk grading and follow-up questions
• Diagrammatic explanations of diagnoses to facilitate understanding and clarity
• Ease of use and voice-guided accessibility support

Prototype:

The prototype system comprises
• An interactive symptom input facility
• A diagnostic engine powered by AI that has been trained on real clinical data
• A guidance interface that provides likely options and what to do next.

Key Components of Prototype:

• Processes and reads the structured and unstructured health data
• NLP interface for reporting symptoms in conversation
• Clinical triage, prioritization, and recommendation best practices and machine learning strategies

Test:

User testing will be conducted with patients across different populations, including elderly, rural, and underserved. Clinical clinician feedback will also be obtained to validate accuracy and usability for implementation in clinical practice.

Testing Goals:

• Assess diagnostic performance across a range of common and rare conditions
• Assess usability and user satisfaction, particularly among non-technical users
• Justify the system based on actual feedback in an effort to provide maximum medical relevance and credibility