

# AI Care Companion: Generative AI Agent for Remote Healthcare Assistance

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DATA 298A: MSDA Project I

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# Purpose and Importance

This project focuses on creating a conversational AI system designed to assess symptoms, provide consultations, and assist in managing chronic conditions. The system aims to reduce unnecessary hospital visits, enhance medication adherence, and alleviate the workload of healthcare professionals.

Healthcare systems globally are under pressure due to an increasing number of patients, particularly those with chronic conditions who need constant monitoring and timely intervention. The need for quick, accurate, and reliable health assessments, especially in underserved areas or during medical emergencies, is critical.



# Targeted Problem

1

## Pre-Operative Care

Lack of personalized plans and preparation before surgeries.

AI will provide tailored symptom assessments to improve readiness

2

## Post-Operative Care

Insufficient monitoring after surgery leads to complications.

AI assists in tracking recovery and improving medication adherence

3

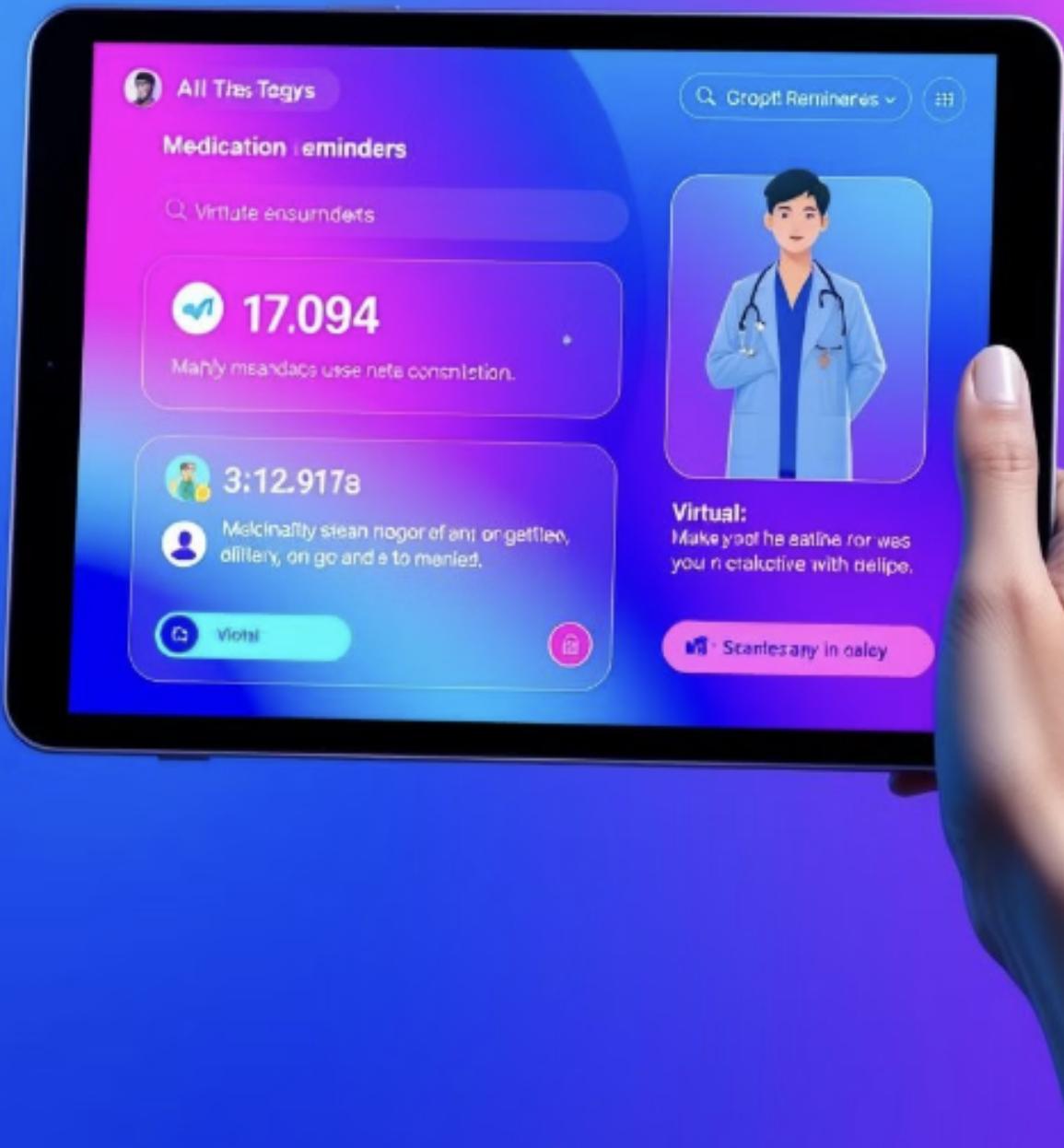
## Chronic Care Management

Difficulty in managing long-term conditions and treatments.

AI supports real-time monitoring, improving medication adherence and reducing hospital visits



# Market Needs for AI Healthcare Solutions



## Timely Medical Advice

Patients often experience delays in receiving timely medical advice due to overburdened healthcare workers and overcrowded facilities.

## Medication Management

Medication misuse is a significant problem, leading to poor patient outcomes, higher readmission rates, and increased healthcare costs.

## Workload Reduction

The market demands solutions that reduce the workload on healthcare professionals while simultaneously improving patient care quality.

# Significance

## Telemedicine Shift

The project holds significance in the ongoing shift towards telemedicine and AI-assisted healthcare.

## Bridging the Gap

The conversational AI will help bridge the gap between patient needs and the availability of healthcare professionals, providing a reliable virtual assistant that can guide patients through their health concerns.





# Data Collection

1

## Gather Medical Datasets

Gather medical datasets, symptom records, and patient consultation data to train AI models.

2

## Hospital Partnership

We are planning to take the dataset from a well known hospital in India.

3

## Data Pre-processing

Pre-process the data to ensure it is clean, structured, and ready for machine learning algorithms.

# Key Technologies



BioMistral, MedLLama2, Meditron

BioMistral, an open-source LLM tailored for the medical domain



PubMed-BERT

Embedding For precise medical responses



Ollama, Pinecone DB

For Vector Database



PyTorch and LangChain

For workflow development

# Technologies Involved in Development



## Model Training

Utilize **PyTorch on Google Colab** for initial model training and development.

## Text Generation :

### Context-aware

### Communication

## Medical Responses

Use **Biomistral LLM** with **PubMed-BERT** embeddings for medical query responses, ensuring the AI provides relevant and medically sound advice.

## Speech-to-Text

Incorporate **Faster-Whisper API** for real-time speech-to-text conversion, allowing the system to interact with users via voice inputs.

A photograph of a server room with rows of server racks. The room is illuminated by blue light from the server racks, creating a glowing atmosphere. A large screen on the left side of the room displays a digital interface with a central cloud icon and various data visualizations. The overall theme is technology and data processing.

# Backend Infrastructure

1

## API Development

Use FastAPI to handle interactions between the front-end user interface and the AI models, ensuring secure and fast API calls.

2

## Cloud Deployment

Deploy the API on cloud platforms like AWS or GCP to ensure scalability and reliability.

3

## Data Storage

Utilize Pinecone or Qdrant for vector-based data storage to store patient data, responses, and symptom records.

4

## Security Compliance

Ensure compliance with medical data security standards (HIPAA, etc.) to protect sensitive patient information.

# Expected Outcomes of AI Care Companion



## High accuracy in consultations

AI Care Companion aims to provide highly accurate medical consultations, improving patient care.



## Low latency time

The system is designed to deliver quick responses, reducing wait times for medical advice.



## Improved customer satisfaction

By providing timely and accurate assistance, AI Care Companion aims to enhance overall patient satisfaction.



## Better medication compliance and chronic condition management

The AI system will help improve medication adherence and support patients in managing chronic conditions effectively.

# Potential Impacts of AI Care Companion

## 1 Virtual Health Assistance

Virtual health assistance and remote patient monitoring will improve access to healthcare services.

## 2 Early Disease Identification

Early disease identification and diagnosis can lead to better health outcomes.

## 3 Enhanced Patient Engagement

Empowers to take active role in their health, promote overall Well-being

THANK YOU