

Medical Assistant ChatBot

This innovative AI-powered chatbot is designed to provide immediate and reliable medical advice to users based on their symptoms. Developed by Abdulafeez Abobarin for the Prompt Engineering & AI course, this project demonstrates the practical application of advanced AI technologies to simulate interactions with medical experts.

Presented by Abdulafeez Abobarin



Introduction

Overview

The Medical Assistant Chatbot provides immediate and reliable medical advice based on user symptoms, utilizing advanced AI to simulate expert interactions.

Objectives

Develop a user-friendly chatbot for diagnosing common symptoms and offering medical recommendations. Reduce healthcare system burden by providing initial consultation.

Importance

Addresses healthcare accessibility issues and demonstrates practical application of AI and NLP technologies covered in the Prompt Engineering course.

Project Description

1

Detailed Description

User-friendly interface for symptom input and medical advice, using language models and retrieval-augmented generation.

2

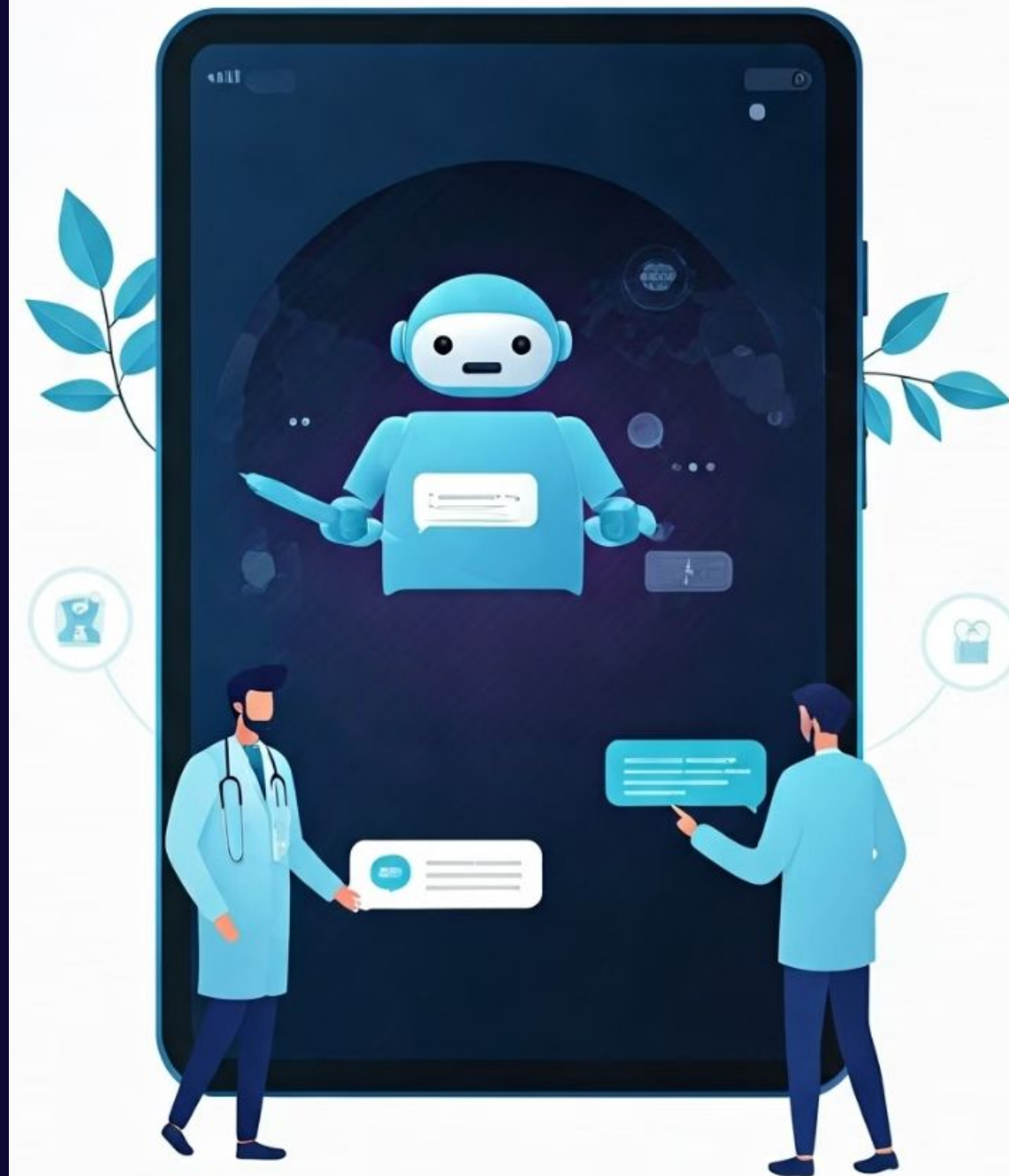
Problem Statement

Agents to assist Doctors in their day to day medical practices and easy access to medical advice to patients, especially in remote or underserved areas, bridging the gap in immediate medical advice.

3

Scope

Major targets are Doctor's and this can also be extended to patients and caregivers seeking quick medical advice, focusing on symptom diagnosis and recommendations.



Project Architecture

1

Streamlit Frontend (Doctor's cheat)

Provides an interactive user interface for symptom input and advice reception.

2

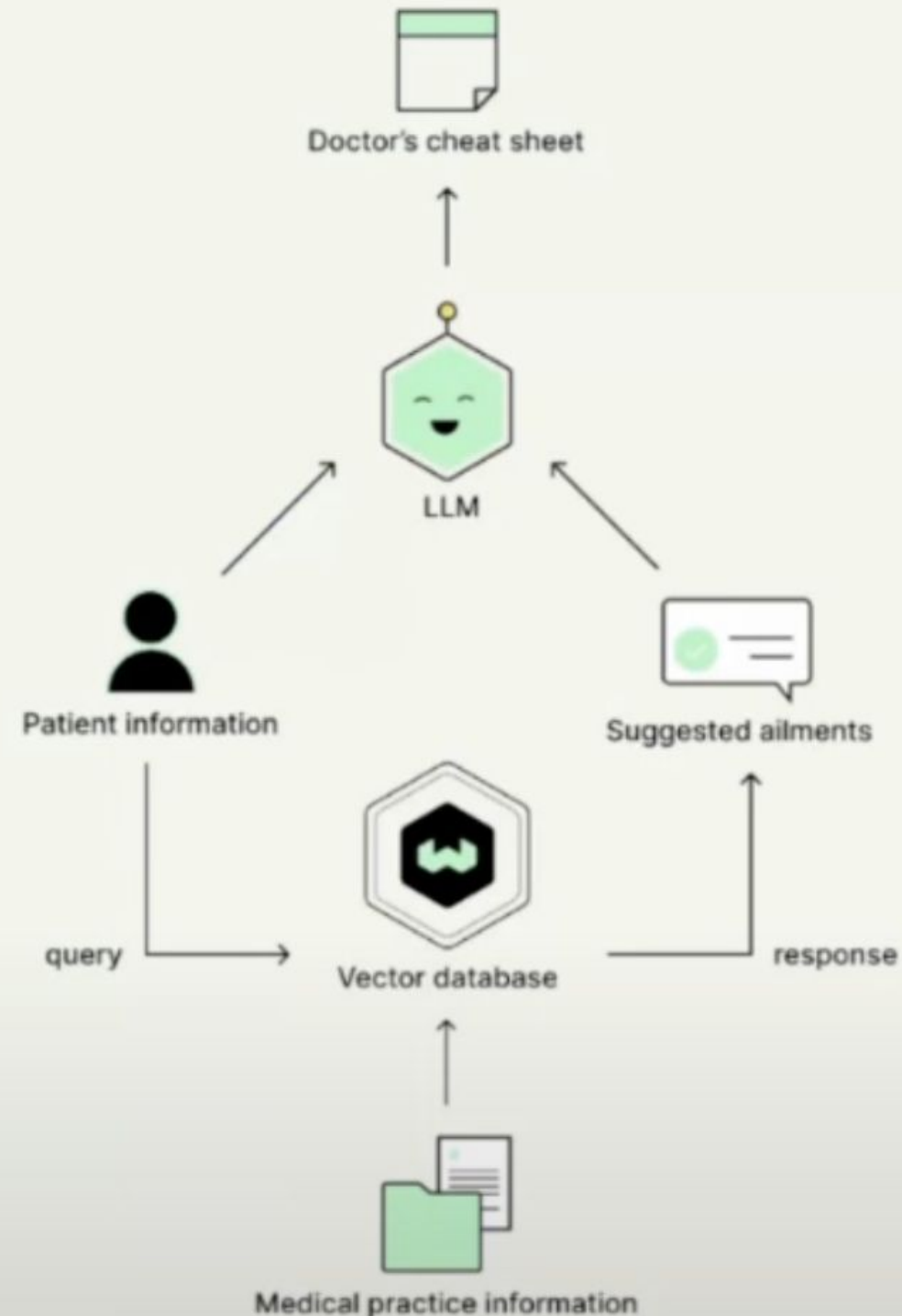
Ollama Llama3 Model/Meditron-70B

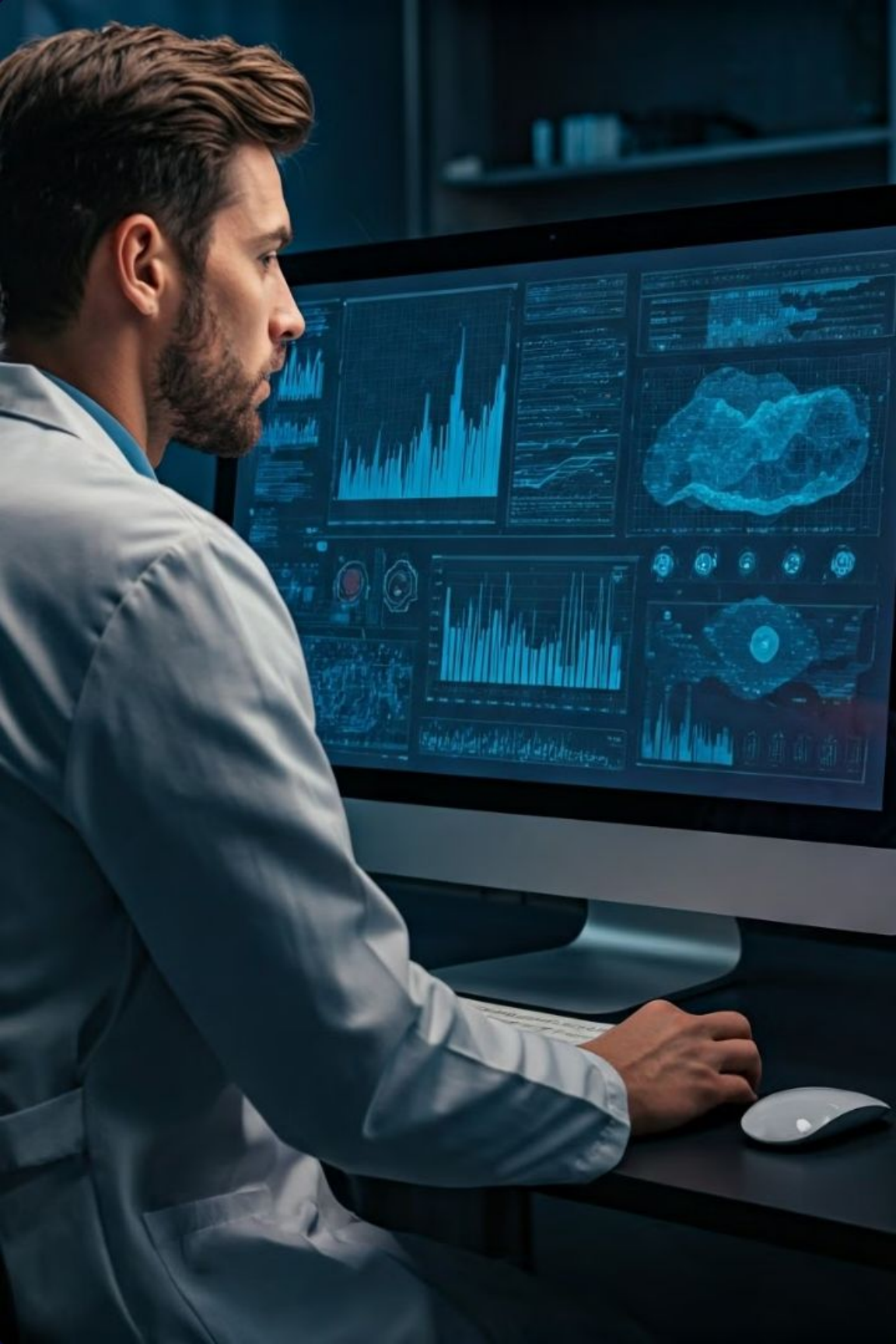
Processes retrieved data from VDB and generates appropriate responses.

3

Weaviate Database

Stores and retrieves relevant medical data to support chatbot responses.





Data Collection and Preprocessing

1

Data Source

Primary source: [PMC-Patients.json](#) file containing detailed patient records and medical articles.

2

Data Nature

Includes patient demographics, symptoms, diagnoses, medical history, and related medical literature.

3

Preprocessing Steps

Data cleaning, tokenization, and embedding creation for efficient querying and storage in Weaviate.

RAG Pipeline Implementation

RAG Overview

Combines retrieval of relevant documents with generative models for accurate and contextually relevant responses.

Implementation Steps

Query processing, data retrieval from Weaviate, and response generation using Llama3 model or [Meditron-70B](#).

Challenges and Solutions

Ensuring accurate data retrieval and maintaining response quality through fine-tuning and regular updates.





Performance Metrics

Metric	Description	Calculation Method
Accuracy	Chatbot advice matching medical professionals' opinions	Comparison with expert diagnoses
Precision and Recall	Relevance and completeness of retrieved documents	Information retrieval techniques
User Satisfaction Rate	Feedback on quality and usefulness of advice	User surveys and feedback forms

Methods to Improve Metrics



Fine-tuning LLM Parameters

Adjusting model parameters to improve response accuracy.



Enhancing Retrieval Algorithms

Using advanced search algorithms to improve relevance of retrieved documents.



Performance Monitoring

Regularly tracking metrics to identify areas for improvement.





Deployment Plan



Future Work



Multilingual Support

Expanding the chatbot to support multiple languages for a wider user base.



Voice Interaction

Adding voice input and response capabilities for ease of use.



Long-term Vision

Integration with healthcare systems and scaling to serve a global audience with diverse medical needs.

Conclusion

Summary

- The Medical Assistant Chatbot aims to provide reliable and immediate medical advice using advanced AI technologies.
- Combines a user-friendly frontend with a powerful backend to ensure accurate and relevant responses.

Key Takeaways

- This presentation demonstrates the potential of AI in transforming healthcare accessibility.
- Highlights the importance of continuous improvement through user feedback and performance monitoring.

Final Thoughts

- The project represents a significant step towards making healthcare more accessible and efficient.
- Future enhancements and real-world deployment can further solidify its impact in the healthcare industry.