AI-Powered Project Management Assistant

An innovative solution leveraging Prompt Engineering to revolutionize project management processes. Developed by Juilee Patil and Soumya Nayak as part of the Prompt Engineering & AI course.

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Introduction

1 Project Overview

AI-powered project management assistant using Prompt Engineering to provide instant, accurate responses about project details.

2 Objectives

Streamline project management processes and enhance decision-making through advanced AI technologies.

3 Industry Relevance

Sets new standard for efficiency in project management, demonstrating practical application of cutting-edge AI.

Detailed Project Description

1 Problem Statement

Project managers struggle with quick access to specific information from voluminous documents, causing inefficiencies.

2 Solution Approach

Develop an AI bot for natural language queries, retrieving relevant information from uploaded documents.
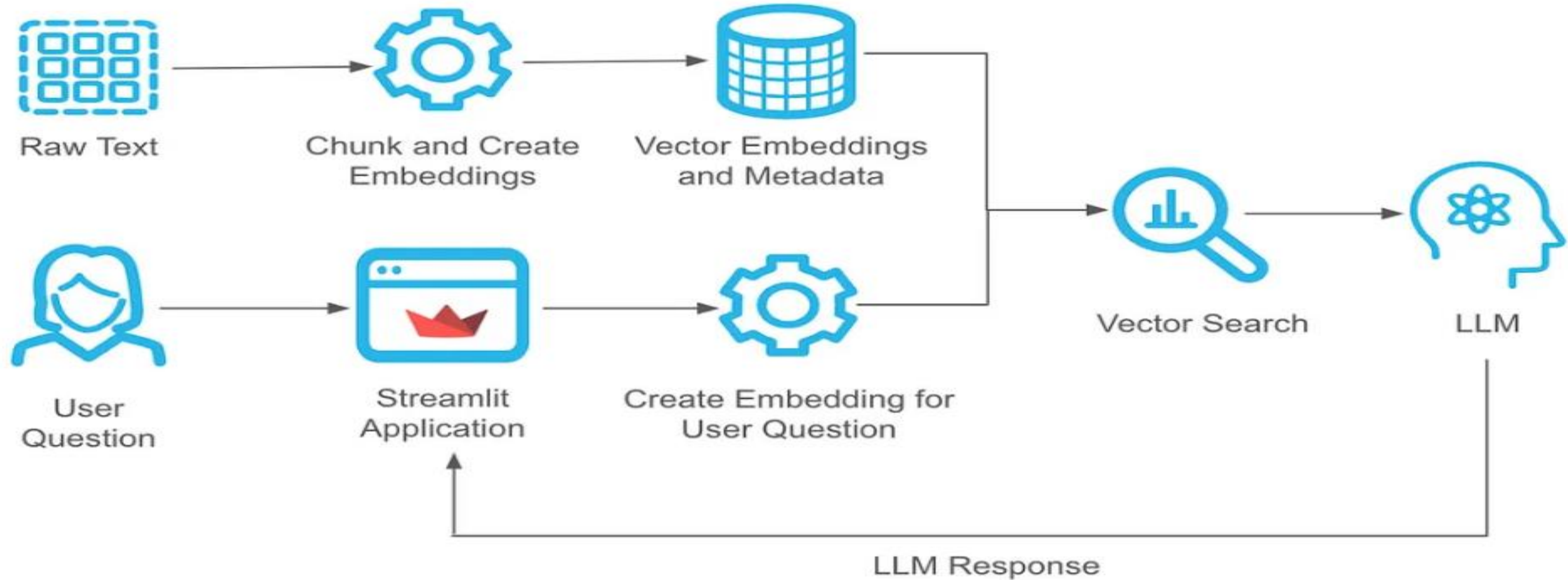
3 Key Features

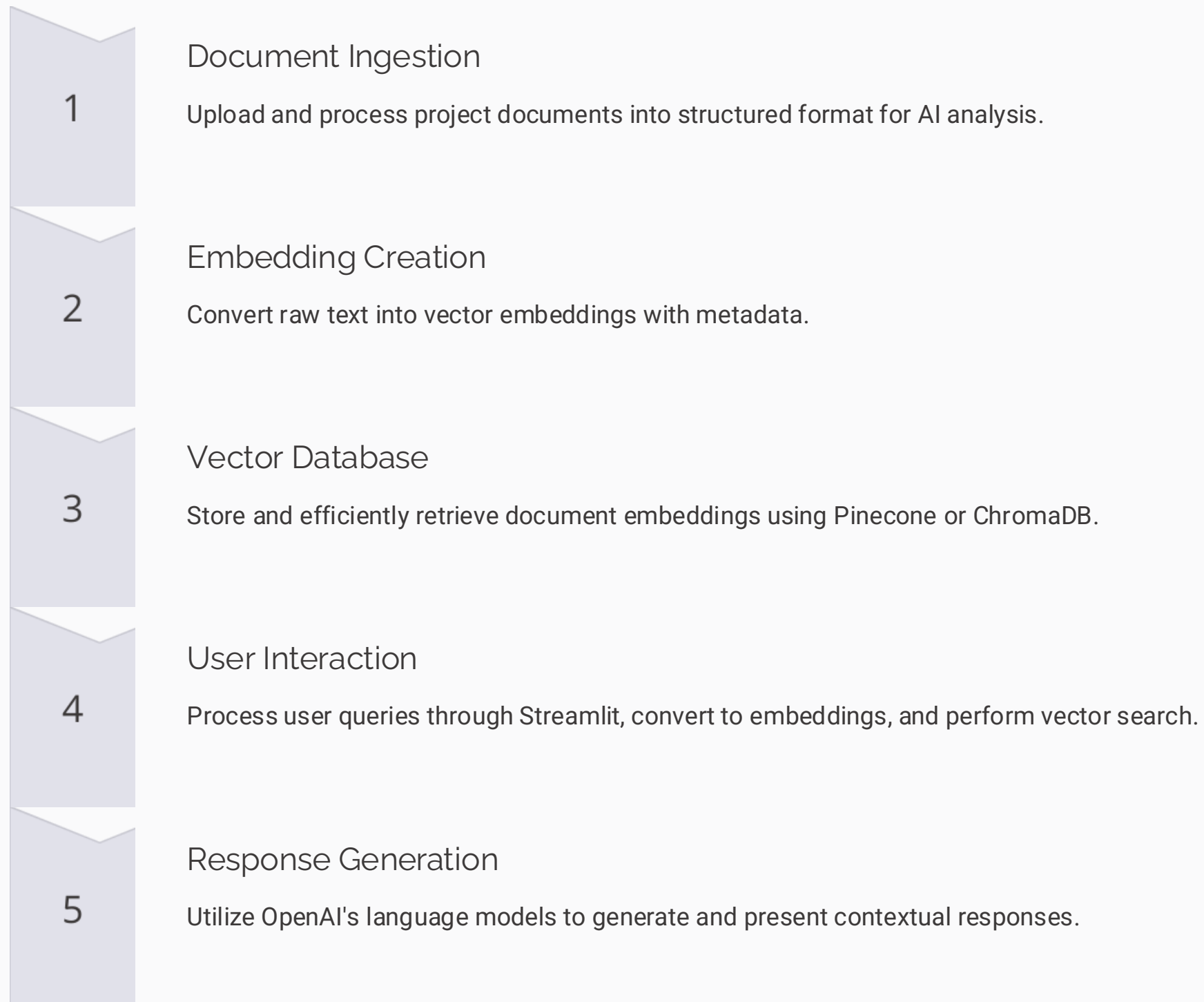Implement NLP, vector database integration, and Streamlit interface for seamless AI interaction.

4 Expected Outcome

A robust AI-powered tool reducing information retrieval time and enhancing project management efficiency.

Project Architecture

Raw Text → Chunk and Create Embeddings → Vector Embeddings and Metadata

User Question → Streamlit Application → Create Embedding for User Question

Vector Search → LLM

LLM Response

Project Architecture Details

1

Document Ingestion

Upload and process project documents into structured format for AI analysis.

2

Embedding Creation

Convert raw text into vector embeddings with metadata.

3

Vector Database

Store and efficiently retrieve document embeddings using Pinecone or ChromaDB.

4

User Interaction

Process user queries through Streamlit, convert to embeddings, and perform vector search.

5

Response Generation

Utilize OpenAI's language models to generate and present contextual responses.

Project Overview and Objectives

Develop AI Assistant

Create an intelligent bot for understanding and responding to project queries accurately.

Enhance Information Access

Provide instant access to critical project data, improving decision-making speed.

Streamline Management

Reduce manual document searches and increase project efficiency through AI assistance.

Demonstrate RAG Pipeline

Showcase Retrieval-Augmented Generation for context-aware responses to complex queries.

Data Collection and Preprocessing

Document Sources

Gather project plans, schedules, budgets, and risk documents in various formats.
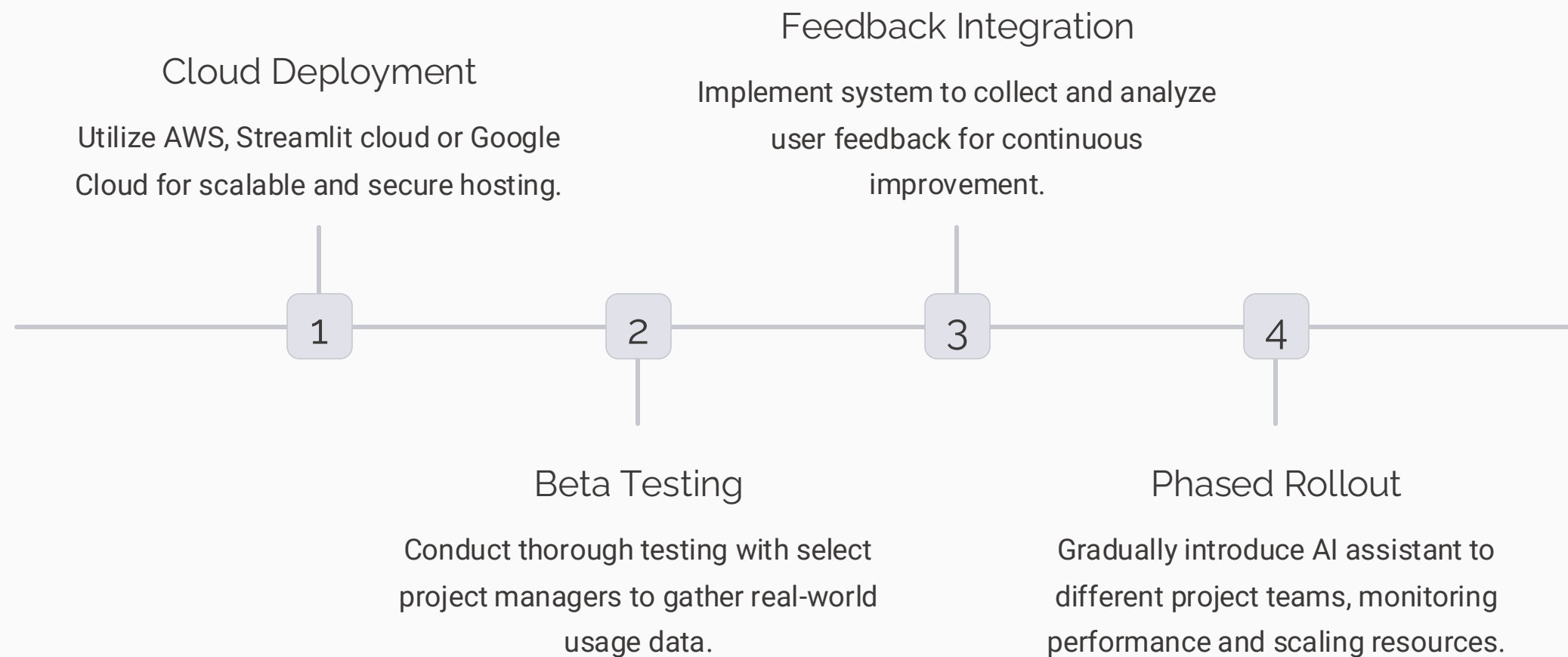
Data Extraction

Enable file uploads and organize data in structured format for processing.

Preprocessing Steps

Clean, normalize, and format extracted data for optimal AI processing and embedding.

Deployment Plan

Cloud Deployment

Utilize AWS, Streamlit cloud or Google Cloud for scalable and secure hosting.

Feedback Integration

Implement system to collect and analyze user feedback for continuous improvement.

1   2   3   4

Beta Testing

Conduct thorough testing with select project managers to gather real-world usage data.

Phased Rollout

Gradually introduce AI assistant to different project teams, monitoring performance and scaling resources.

RAG Pipeline Implementation

Document Embedding

Convert preprocessed text into vector embeddings using advanced language models.
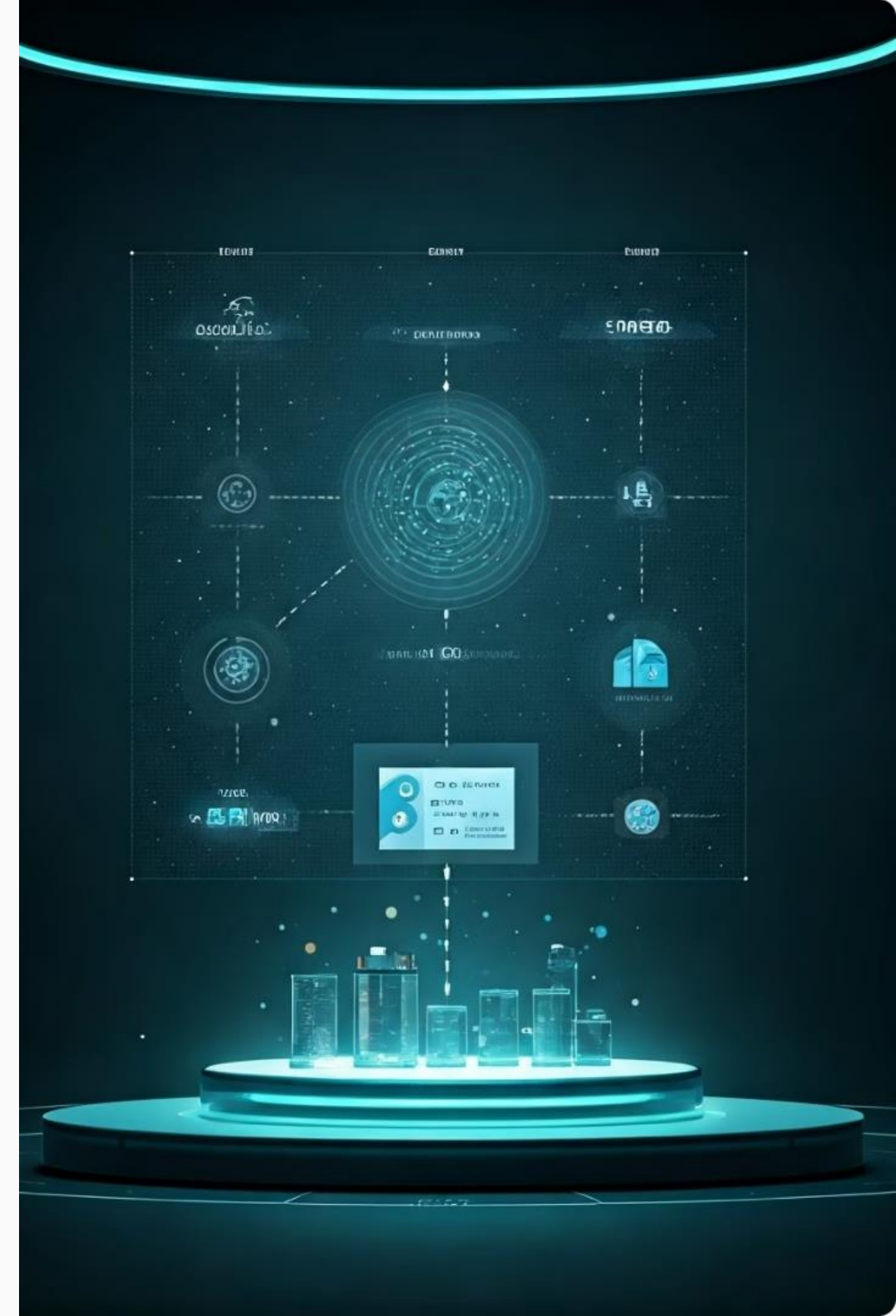
Semantic Search

Implement efficient retrieval mechanisms to find relevant document segments based on queries.

Context Augmentation

Enhance retrieved information with additional context from related document sections.

Response Generation

Utilize GPT models to generate coherent, accurate responses based on augmented information.

Performance Metrics

Metric	Description	Initial Results
Response Accuracy	Correctness of AI-generated answers	85%
Query Processing Time	Time taken to generate responses	3 seconds
Relevance Score	Pertinence of retrieved information	0.5 and more
Overall Rating	User satisfaction with AI assistant	4.2/5

Methods to Improve Metrics

1 Fine-tune Language Models

Adapt pre-trained models to project management domain for improved accuracy and relevance.

2 Optimize Vector Search

Implement advanced indexing and clustering techniques to enhance retrieval speed and accuracy.

3 Expand Training Data

Incorporate wider range of project documents to improve AI's knowledge base.

4 Implement User Feedback Loop

Continuously learn and improve from user interactions and explicit feedback.

Future Work and Vision

Multi-lingual Support

Expand AI capabilities to understand and respond in multiple languages for global teams.

Integration with PM Tools

Develop plugins for popular project management software to incorporate AI assistant into existing workflows.

Predictive Analytics

Implement advanced machine learning models to provide insights on project risks and outcomes.

Voice Interface

Add voice recognition and synthesis capabilities for hands-free interaction with AI assistant.

Conclusion

Summary

Successfully developed AI-powered project management assistant leveraging RAG technology for accurate, timely information retrieval.

Key Takeaways

Highlighted importance of tool selection, model fine-tuning, and continuous improvement based on user feedback.

Final Thoughts

Project serves as foundation for future research in AI-powered project management, with potential for expanded capabilities.

Q & A

Thank You !