


# Portfolio Web Application with Integrated RAG Chatbot

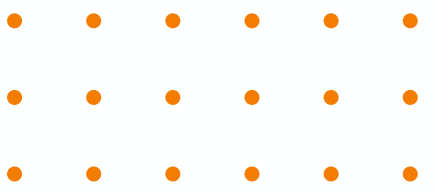
## Final Project Proposal

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# Overview

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# Introduction

## Overview:

- Development of a personal portfolio website.
- Integration of a personal assistant chatbot using advanced AI techniques.

## Objectives:

- Showcase personal skills and projects.
- Provide an interactive and engaging experience for visitors.
- Utilize cutting-edge AI for personalized user interactions.

## Relevance:

- Demonstrates proficiency in frontend and backend development.
- Applies course concepts in a practical, real-world project.



# Project Description

## Project Description

- A modern, responsive portfolio website.
- Sections include: About, Projects, Skills, Education, Work Exp., Certifications, Contact.
- Integrated personal assistant chatbot for enhanced user interaction.

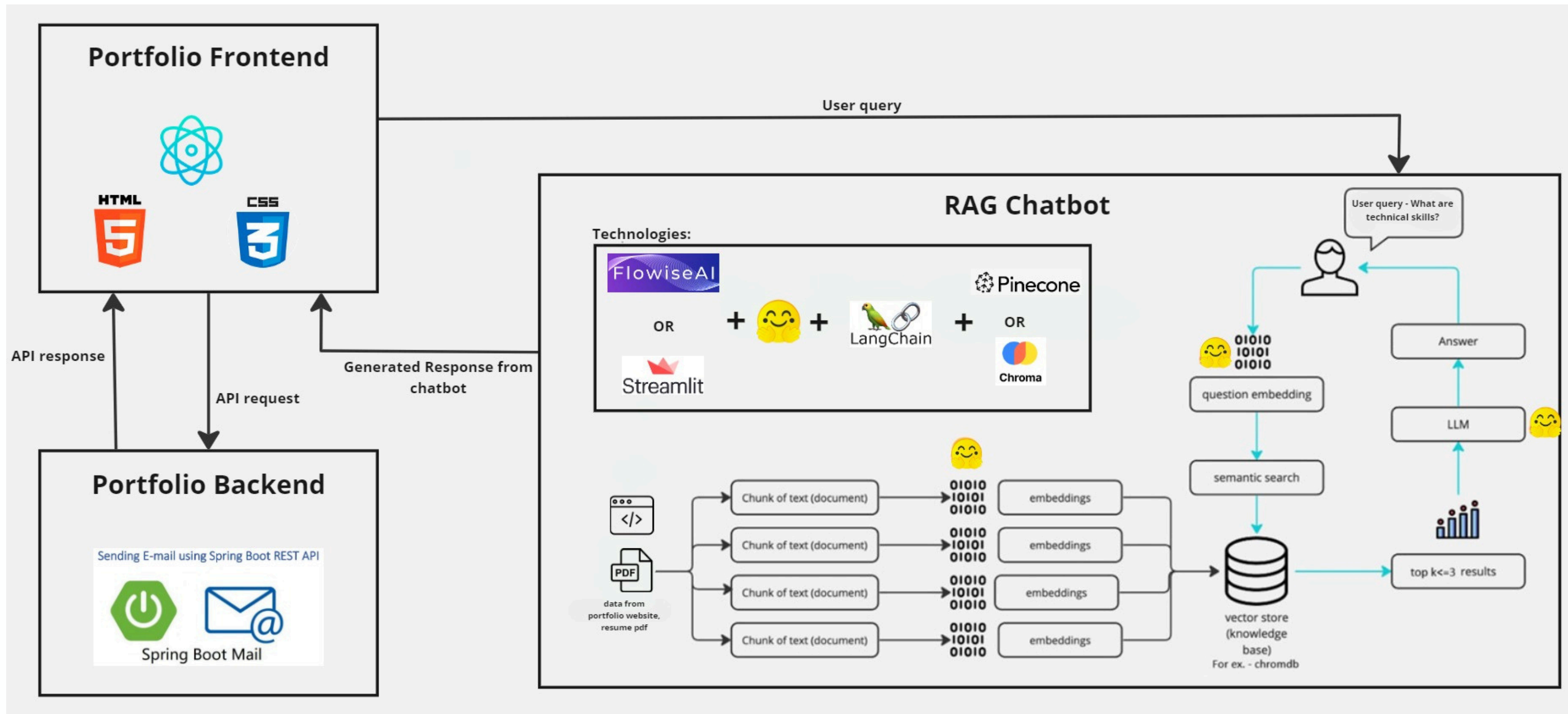
## Problem Solved

- Creates a professional online presence.
- Offers an interactive way to learn about the individual's skills and projects.
- Provides instant, AI-driven responses to visitor queries

## Scope

- Complete design and development of the portfolio website.
- Backend API for the contact form and Email Sender service.
- Development and integration of the LLM based RAG chatbot.

# Project Architecture



# Tools & Technologies



## Frontend Component

- React
- HTML
- CSS



## Backend Component

- Spring Boot RESTful web service
  - Spring Boot Starter Mail dependency



## Chatbot Component

- RAG pipeline - Langchain
- LLM - Hugging face transformer
- Vector DB - Pinecone/Chroma
- Frontend - Flowise/Streamlit

# Data Collection & Preprocessing



## Step 1: Data Sources:



Portfolio  
Website



Resume

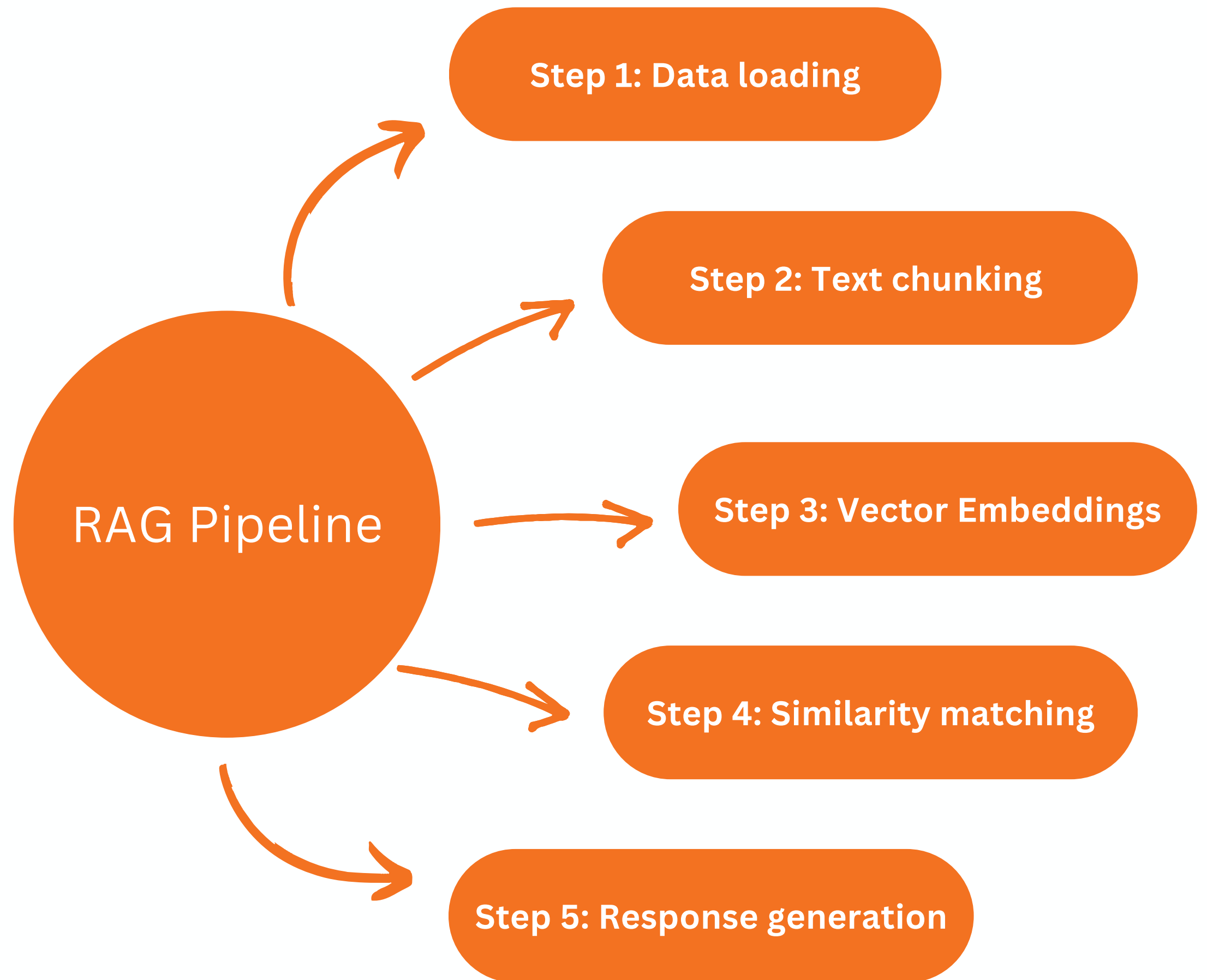
## Step 2: Data Collection Techniques:

- **Web scraping**
  - Identify the sections of our portfolio website to scrape.
  - Scrapy to extract text content.
- **Resume text extraction**
  - Using PyPDF to extract text from pdf

## Step 3: Data preprocessing:

- **Data Cleaning:**
  - Remove HTML tags, special characters, and irrelevant text.
- **Vectorization:**
  - Convert text data into numerical format (embeddings).
  - Use tools like Hugging Face Transformers for embeddings.
- **Indexing:**
  - Store processed data in a vector database (Pinecone/Chroma).

# RAG Pipeline Implementation





# Performance Metrics



Aim to achieve



Metrics



Response Query

User Engagement

Chatbot Performance

Calculation  
methods



Accuracy:  
Compare chatbot  
responses to expected  
answers.

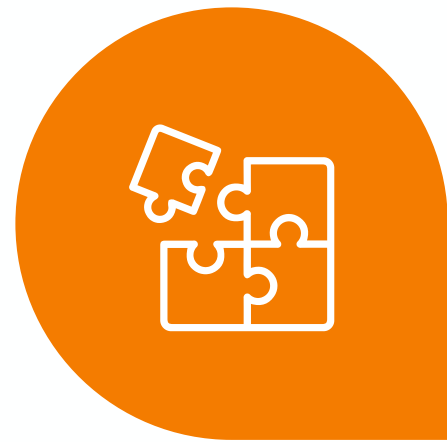
Engagement:  
Track user interactions  
and feedback.

Performance:  
Measure response times  
and processing speed.

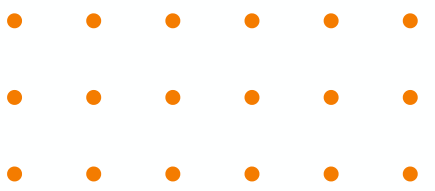
Improvement  
Strategies



- Fine-tuning the language model.
- Enhancing data retrieval techniques.
- Improving preprocessing steps.



# Deployment Plan



## Steps to deploy:

- Deploy chatbot app
- Integrate chatbot app into portfolio website
- Deploy Portfolio website

## Tools and Platforms:

- Vercel/Netlify for portfolio website hosting
- Streamlit/Flowise for Chatbot



## User Testing:

- Collect feedback from initial users.
- Iterate based on feedback.



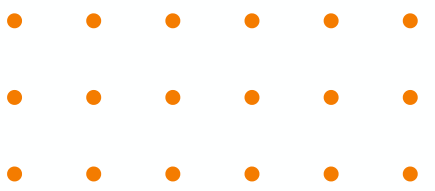
# Future Work

## Potential Extensions

- Add more interactive features (e.g., blog, tutorial section).
- Expand chatbot capabilities (e.g., schedule appointments).
- Integration with Social Media
- Implement a testimonials/recommendation section where clients, colleagues, or users can provide feedback on work or services.

## Long-term Vision:

- Create a comprehensive, AI-powered personal assistant.
- Continuously improve based on user feedback and technological advancements.
- Explore voice-based interactions with the chatbot.



# Conclusion

## Summary:

- Personal portfolio website with integrated RAG chatbot.
- Demonstrates skills in web development and AI integration.

## Key Takeaways:

- Practical application of course concepts.
- Valuable project for showcasing technical abilities.

## Final Thoughts:

- Excited to present and receive feedback.
- Looking forward to future improvements.



**GOT  
QUESTIONS?**

