



Building Your First RAG Agent

A comprehensive guide to creating intelligent AI workflows with N8N, Pinecone, and OpenAI for personalized knowledge retrieval

Created by Chinmay Kaitade

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What is RAG?

Retrieval

Search through your knowledge base to find relevant information based on user queries

Augmented

Enhance AI responses by combining retrieved data with the model's training knowledge

Generation

Generate accurate, contextual responses using both retrieved and learned information

RAG agents transform static documents into intelligent, conversational knowledge bases that can answer questions with precision and context.

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The Six-Step RAG Blueprint

01

Create Knowledge Base

Compile your data into structured documents

02

Upload to Google Drive

Store documents in organized folders

03

Connect Google Drive API

Set up N8N workflow integration

04

Configure Pinecone

Set up vector database for embeddings

05

Add OpenAI Embeddings

Transform text into searchable vectors

06

Build Retrieval Workflow

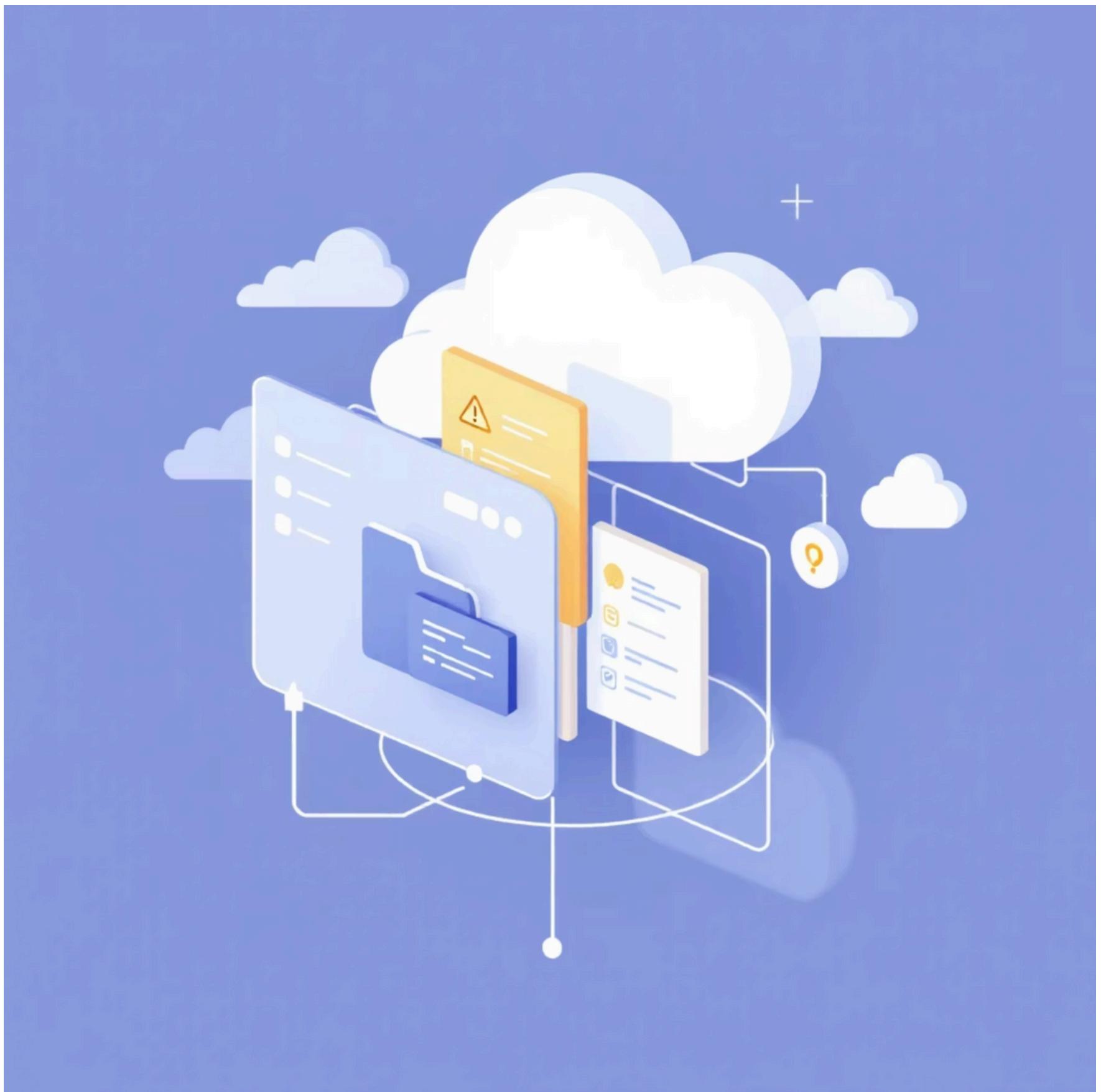
Create the interactive chatbot interface

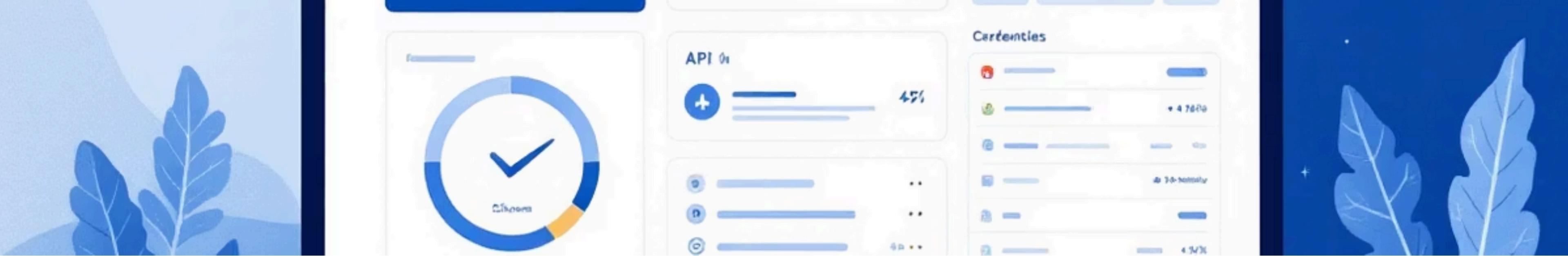
Step 1-2: Knowledge Base & Storage

Building Your Knowledge Base

Transform your portfolio content into structured documents. Include skills, projects, work experience, and achievements in PDF or Google Docs format.

- Extract content from portfolio websites
- Organize by categories (skills, projects, experience)
- Convert to PDF for processing





Step 3: Google Drive API Setup

1 Create Google Cloud Project

Set up "N8N Test RAG Workflow" project and enable Google Drive API

3 Handle Access Issues

Publish app to production in OAuth Consent Screen if you encounter "Access Blocked" errors

2 Configure OAuth Credentials

Create OAuth client ID for web application with proper redirect URIs

4 Connect N8N Workflow

Add Google Drive nodes for file monitoring and downloading with proper credential mapping

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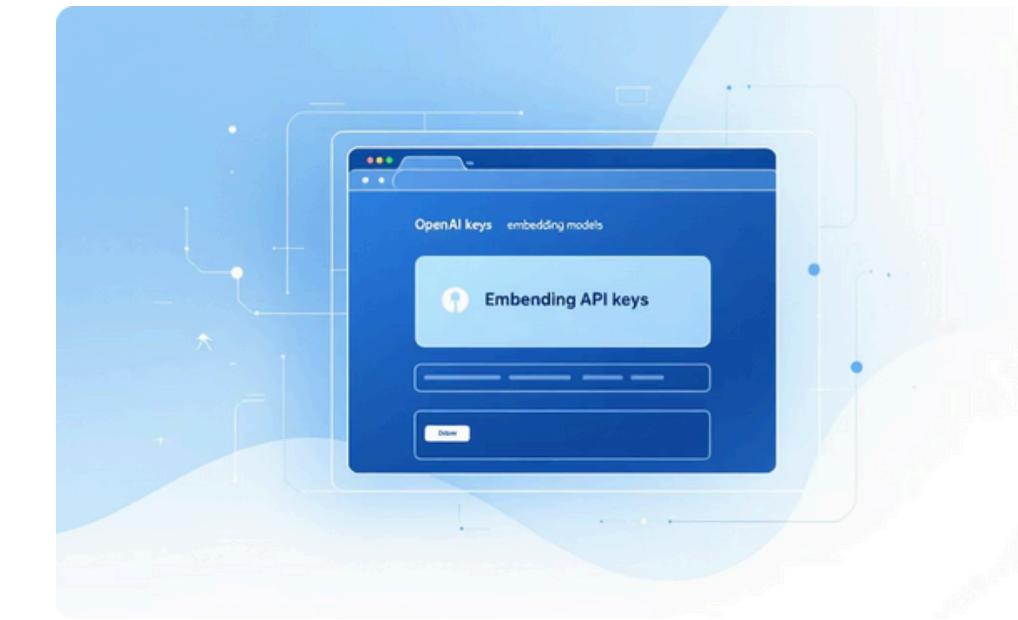
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Step 4-5: Vector Database & Embeddings



Pinecone Setup

Create your vector index (e.g., "portfolio-rag") and generate API credentials for secure N8N integration



OpenAI Embeddings

Configure "text-embedding-3-small" model to transform documents into searchable vector representations

Embeddings convert text into mathematical vectors, enabling semantic search that understands meaning beyond exact keyword matches.

Data Processing Configuration



Vector Store Configuration

Set Document Dropdown to "Binary File" with automatic MIME type detection for seamless file processing

Metadata Mapping

Add fileName property mapping to track document sources in your vector database

Text Splitting Parameters

Configure 500-character chunks with 200-character overlap for optimal retrieval performance

Test your preprocessing workflow to ensure documents are properly vectorized and stored in Pinecone before proceeding to the retrieval phase.

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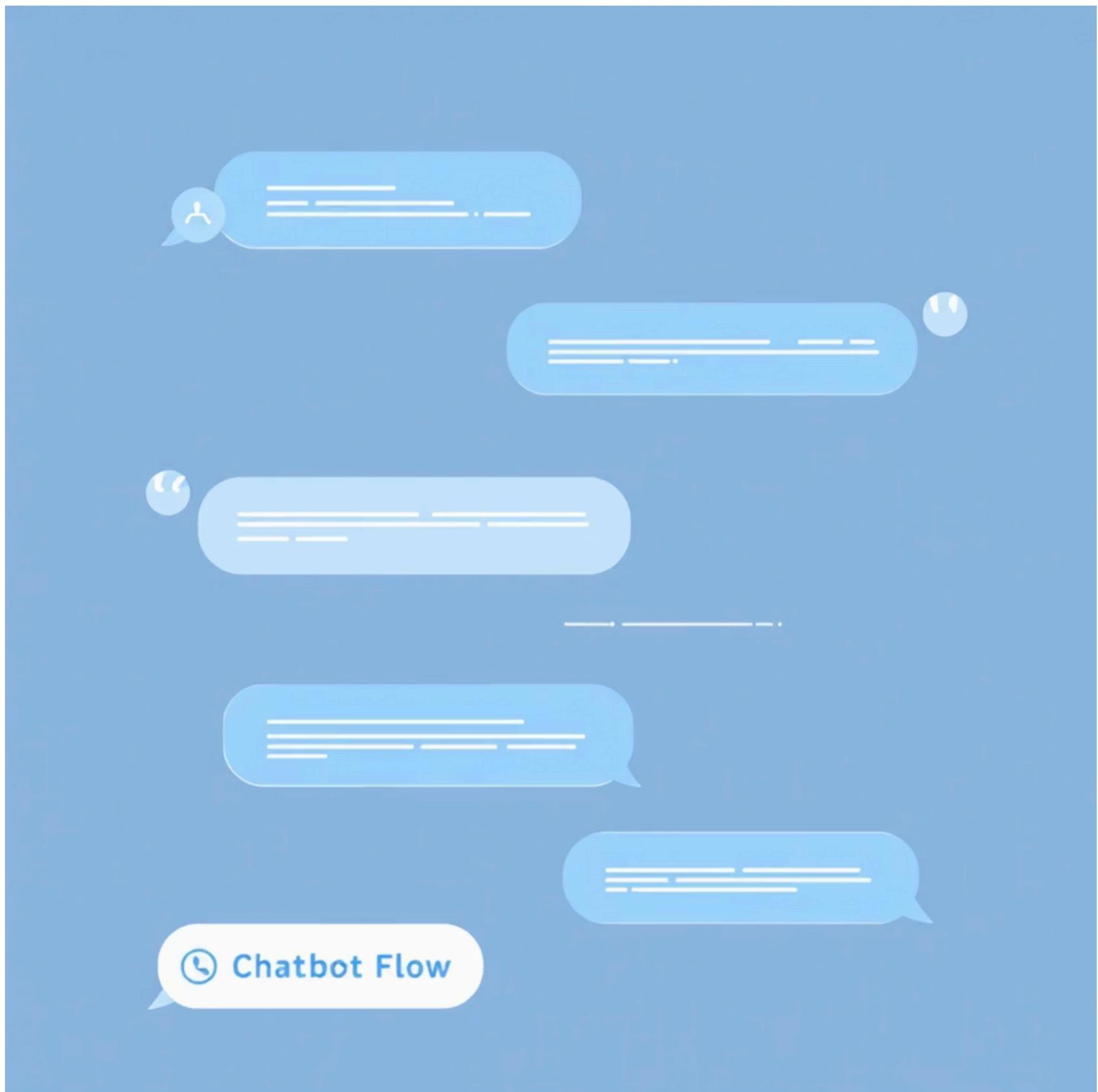
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Step 6: Building the Chatbot

AI Agent Architecture

- Chat Trigger for user interactions
- GPT-4 Mini as the language model
- Simple Memory for conversation context
- Pinecone Vector Store as retrieval tool

Configure descriptive tool names like "Portfolio Knowledge" to help the AI understand when to retrieve information.



Testing & Optimization

Test Query Examples

- "What are Chinmay's technical skills?"
- "Describe the Google Gemini Clone project"
- "What's Chinmay's work experience?"

Optimization Tips

- Adjust chunk size based on document structure
- Fine-tune overlap for better context retention
- Monitor retrieval accuracy and response quality

Continuous testing and refinement ensure your RAG agent delivers precise, helpful responses that truly understand your knowledge base.

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Connect & Continue Learning

Ready to build more advanced AI agents? Let's stay connected and share the journey!



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Building intelligent AI systems is a journey best shared. Join me as we explore the endless possibilities of RAG agents and beyond! ✨

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