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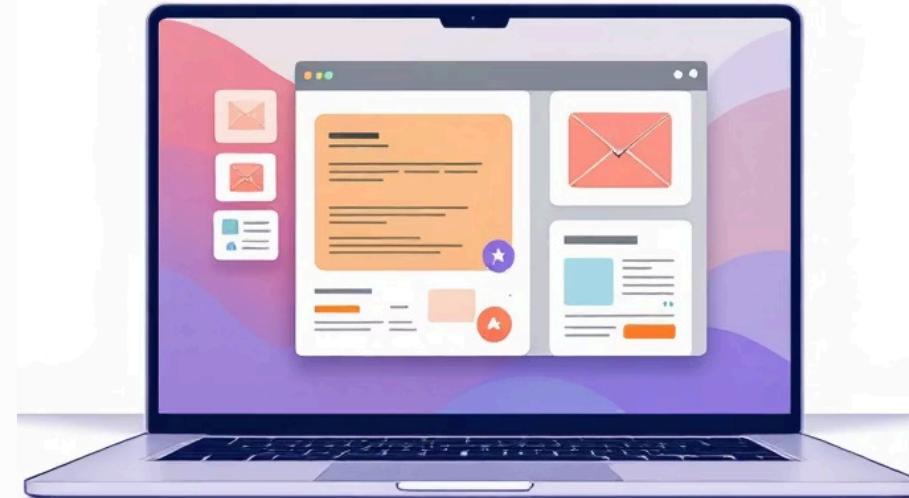
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**Subject – Project Presentation for Generative AI**

# **Scannify - AI-Powered PDF Scanner & Enhancer**

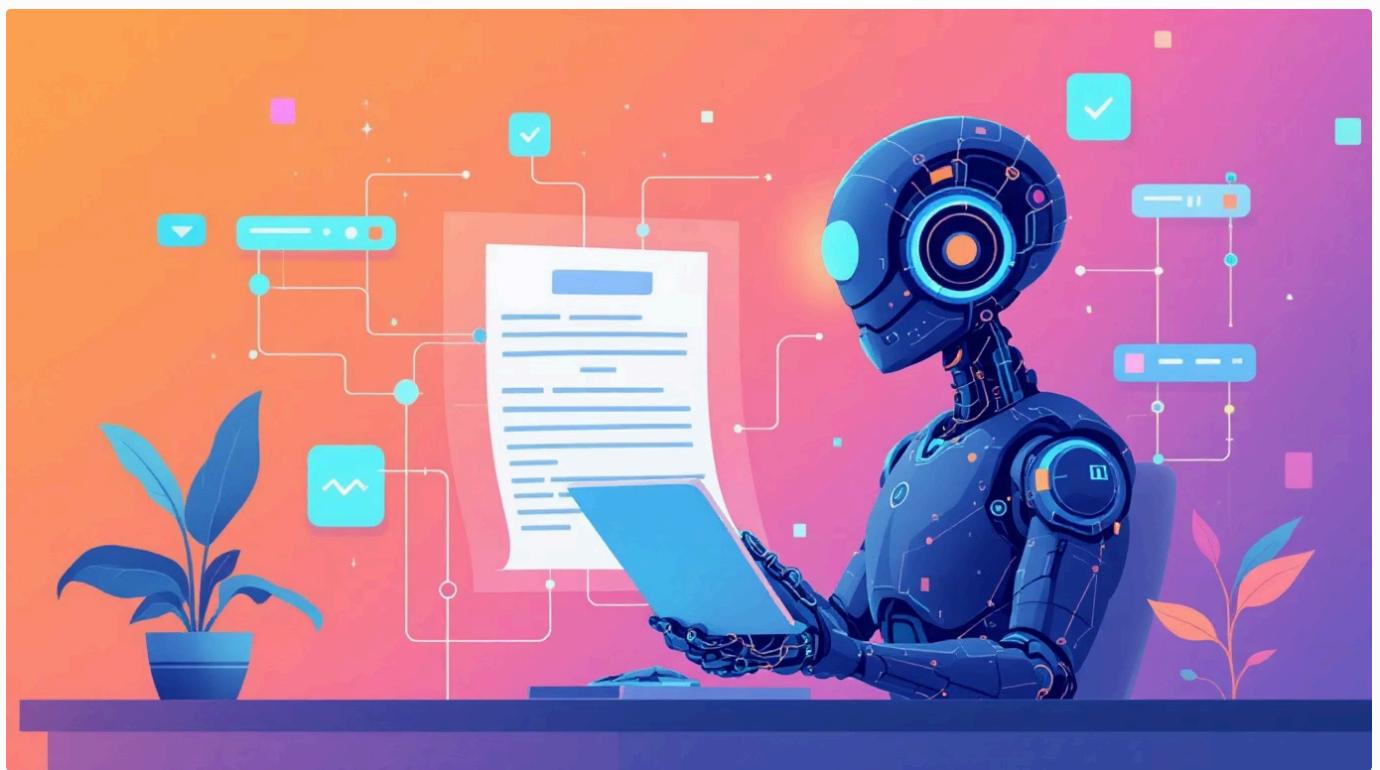
Complete project documentation for an intelligent PDF processing application that transforms documents into actionable insights using cutting-edge AI technology.



# Project Overview

**Scannify** is an advanced AI-powered PDF document processing application that leverages Google's Gemini AI to scan, analyze, enhance, and interact with PDF documents. Built with Python and Streamlit, it provides a modern web interface for intelligent document processing.

The application combines multiple AI capabilities into a single platform, enabling users to extract insights, improve document quality, and engage in natural language conversations with their documents.



## Key Value Proposition



### Transform Documents

Convert any PDF into actionable insights and structured content



### AI Enhancement

Content restructuring and quality improvement powered by Gemini AI



### Interactive Q&A

Ask questions and get answers using RAG technology



### Professional Output

Generate beautifully formatted enhanced PDFs

# Core Features

## 1 Smart PDF Scanning

Extract text from any PDF document with multi-page support. Maintain document structure while displaying file information including size, type, and page count.

## 2 AI-Powered Analysis

Get concise summaries, identify key points, assess writing quality, analyze sentiment, and receive actionable improvement recommendations with audience detection.

## 3 Content Enhancement

Reorganize content structure, improve clarity and readability, transform into professional format, optimize conciseness, and generate executive summaries.

## 4 RAG-Powered Chat

Find relevant information using semantic search, get context-aware answers, track chat history, use pre-built questions, and fall back to text search when needed.

## 5 Enhanced PDF Generation

Create professionally formatted PDF output with custom styling, headers, and structured layout. Download with one click while keeping original and enhanced versions.

## 6 Advanced Tools

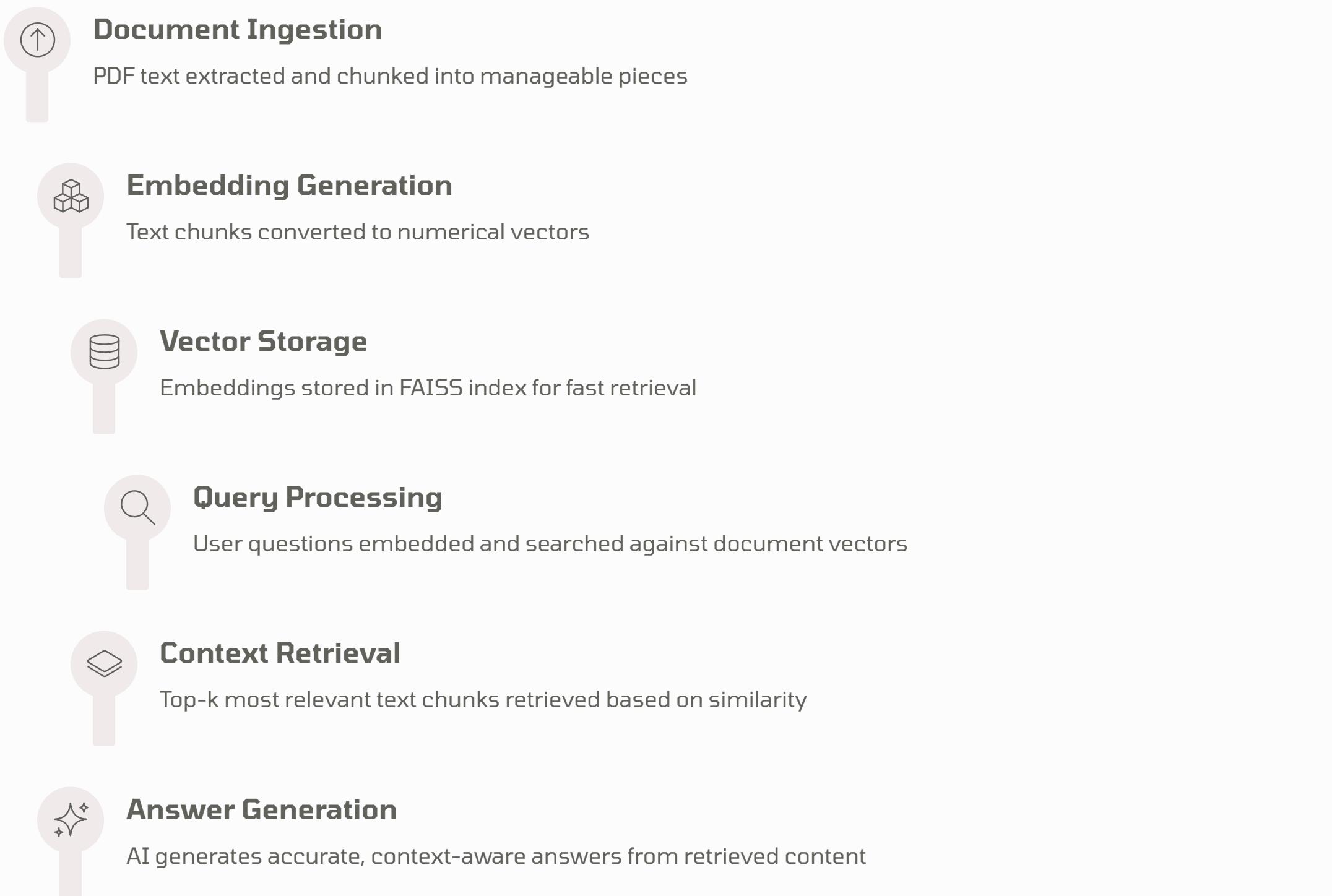
Receive visual improvement suggestions, deep document insights, and RAG analytics to monitor search performance and relevance.

# Technical Architecture

## Technology Stack

Frontend	Streamlit (Python Web Framework)
AI Engine	Google Gemini AI (gemini-2.5-flash)
Vector Store	FAISS (Facebook AI Similarity Search)
PDF Processing	PyPDF2, pdfplumber
PDF Generation	ReportLab
Embeddings	Google Generative AI
Framework	LangChain
Language	Python 3.10+

## RAG Pipeline



# User Interface

## Main Dashboard

Scannify features a clean, modern dark theme design with intuitive navigation. Users can drag and drop PDF files directly into the interface, with real-time processing progress indicators showing extraction and analysis status.

The tabbed interface organizes functionality into logical sections, making it easy to switch between document views, AI insights, and interactive features.



## Sidebar Features

- Feature highlights and descriptions
- OCR capabilities information
- Processing options and settings
- Quick access to common actions

## Tab Structure

01

### Original Text

View extracted PDF content with formatting preserved

02

### AI Insights

Analysis results, recommendations, and document metrics

03

### Enhanced Content

AI-improved document version with better structure and clarity

04

### RAG Chat

Interactive Q&A interface with chat history tracking

05

### Download

Export enhanced PDF with professional formatting

06

### Advanced Tools

Additional AI features and analytics

# Key Capabilities



## Document Processing

- Text extraction from PDFs
- Multi-page document support
- Large file handling (up to 200MB)
- Progress tracking during processing



## AI Analysis

- Automatic content summarization
- Key points identification
- Writing quality evaluation
- Improvement suggestions
- Target audience detection



## Content Enhancement

- Structure reorganization
- Clarity improvement
- Professional formatting
- Conciseness optimization
- Executive summary creation



## Interactive Features

- Natural language Q&A
- Semantic document search
- Chat history tracking
- Quick analysis questions
- Context display for answers



## Output Generation

- Enhanced PDF creation
- Professional formatting
- One-click download
- Multiple enhancement styles

# Use Cases

Scannify serves diverse professional needs across multiple industries and use cases.

## Business Professionals

Quickly analyze lengthy reports, extract key insights from contracts, generate executive summaries, and improve document clarity for presentations and meetings.

## Students & Researchers

Summarize academic papers efficiently, extract key findings from research articles, ask specific questions about complex topics, and improve academic writing quality.

## Content Creators

Enhance article structure and flow, improve readability for diverse audiences, receive AI-powered writing suggestions, and generate professional versions from drafts.

## Legal & Compliance

Analyze lengthy legal documents, extract important clauses and sections, ask specific questions about terms, and generate compliance summaries.



# Installation & Setup

## Requirements

- **Python 3.10 or higher**

Latest Python version with pip package manager

- **Google AI API Key**

Authentication token for Gemini AI access

- **Internet connection**

Required for API calls and AI processing

## Quick Start

```
# Install dependencies  
pip install -r requirements.txt  
  
# Set API key in .env file  
GEMINI_API_KEY=your_api_key_here  
  
# Run application  
python -m streamlit run main_app.py
```



## Dependencies

- streamlit
- langchain
- langchain-google-genai
- faiss-cpu
- PyPDF2
- pdfplumber
- reportlab
- python-dotenv
- Pillow



# API Integration

## Google Gemini AI

### Primary Model

`gemini-2.5-flash` - Fast, cost-effective processing for most document tasks

### Fallback Models

`gemini-2.0-flash` and `gemini-2.5-pro` for automatic switching when primary model reaches quota limits

### Intelligent Error Handling

Automatic model switching, retry logic, and graceful degradation to maintain functionality

## Embeddings

### Model Specification

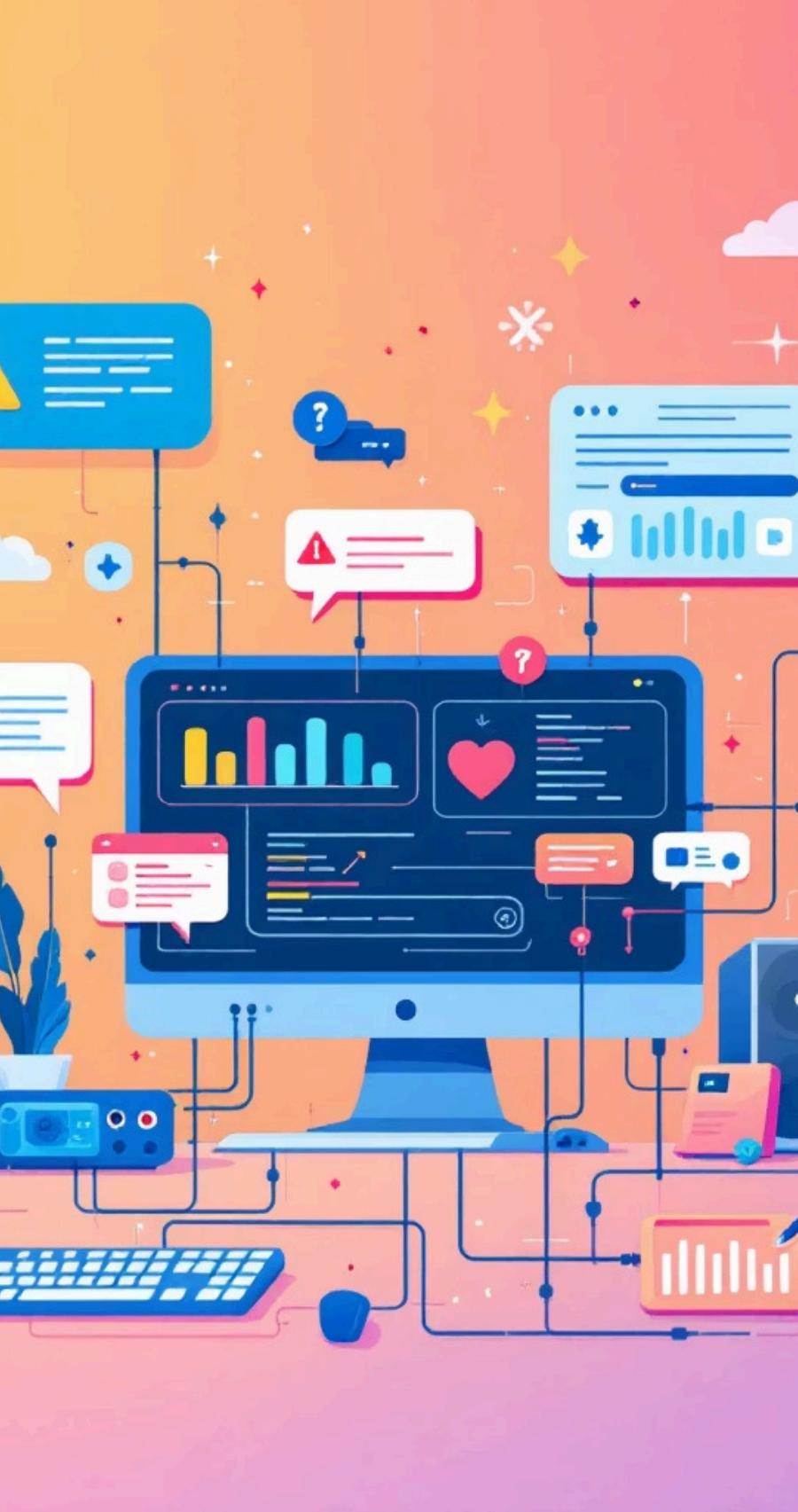
`models/embedding-001` - Google's text embedding model for semantic search

### Vector Dimension

768-dimensional vectors for accurate semantic similarity calculations

### Purpose

Enables semantic search capabilities in the RAG pipeline for context-aware document analysis



# Error Handling



## Quota Management

Automatic detection of rate limits with smart model fallback system

## User-Friendly Messages

Clear error messages with retry suggestions and wait times

## Graceful Degradation

RAG falls back to simple text search when unavailable

## Session State

Preservation of user state during recovery operations

- ❑ **Resilient Design:** Scannify implements comprehensive error handling strategies including automatic model switching, embedding failure handling, API error recovery, and session state preservation to ensure reliable operation even under challenging conditions.