NestWise – Agentic AI Retirement Guide

**Vision Document**

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## Introduction

### 1.1 Overview

NestWise – Agentic AI Retirement Guide is a prototype web-based application that leverages agentic AI, prompt engineering and retrieval-augmented generation (RAG) to assist individuals in creating personalized retirement plans. The system provides a guided, user-friendly experience for collecting financial and demographic data, assessing risk tolerance, and generating tailored recommendations using trusted financial sources.

The following document explores the vision of the project, namely:

* Statement of the problem and the proposed solution
* Description of the project stakeholders and the application’s users
* Major features and optional requirements
* Project dependencies and priorities

### 1.2 Definitions, Acronyms, and Abbreviations

* **AI**: Artificial Intelligence – the simulation of human intelligence in computers.
* **RAG**: Retrieval-Augmented Generation – combines language models with data retrieval for accurate outputs.
* **LLM**: Large Language Model – advanced neural model capable of understanding and generating human-like text.
* **PII**: Personally Identifiable Information – data that can identify an individual.
* **UI**: User Interface – the visual elements users interact with.
* **API**: Application Programming Interface – software intermediary enabling communication between applications.

### 1.3 References

* OpenAI GPT-4o API Documentation: https://platform.openai.com/docs/overview
* LangChain Documentation: https://python.langchain.com/docs/
* FastAPI Documentation: https://fastapi.tiangolo.com/
* MongoDB Documentation: https://www.mongodb.com/docs/

## Problem Statement

**Current Situation:**

Currently, retirement planning remains a complex and often confusing process for individuals without strong financial backgrounds. Many people rely on generic online calculators or one-size-fits-all advice that fails to address personal goals, income variations, and risk tolerance. The lack of accessible, intelligent financial planning tools prevents individuals from understanding how to effectively save, invest, and prepare for long-term stability. Traditional financial advisors, while effective, are often expensive or inaccessible for the average consumer.

**Problem:**

Existing retirement planning resources are fragmented, outdated, or overly technical, making it difficult for everyday users to make confident financial decisions. Static online tools lack personalization and adaptability, while professional guidance is limited by high costs and availability. As a result, individuals often postpone retirement planning or make uninformed choices that impact their financial security later in life.

**Proposal:**

The goal of this project is to create NestWise, a web-based application that leverages agentic artificial intelligence and Retrieval-Augmented Generation (RAG) to guide users through the retirement planning process. Users will input demographic, financial, and personal data through an intuitive interface. The system will generate dynamic prompts for an AI model that retrieves verified financial information, analyzes user-specific factors, and produces a comprehensive, personalized retirement plan. This plan will include projections, recommendations, and educational insights designed to empower users with actionable knowledge.

**Predicted Outcome:**

The NestWise system will significantly enhance accessibility and personalization in retirement planning. By combining AI reasoning with reliable financial data, users will gain clear, data-driven recommendations tailored to their unique situations. The prototype will promote financial literacy, transparency, and engagement while providing a foundation for scalable, ethical AI-driven decision-support tools in personal finance.

## Stakeholder and User Descriptions

### 3.1 Stakeholder Summary

|  |  |  |
| --- | --- | --- |
| Name | Description | Responsibilities |
| PFW Information Analytics and Visualization Center (Dr. Beomjin Kim) | Project Sponsor and Advisor | Provide guidance, resources, and evaluation of project deliverables. |

### 3.2 User Summary

|  |  |  |
| --- | --- | --- |
| Name | Description | Responsibilities |
| End Users | Individuals seeking retirement planning assistance. | Provide demographic and financial data, review generated plans. |
| Project Team | Development team for NestWise. | Design, build, and test the web application. |
| Advisor/Sponsor | Faculty advisor overseeing progress. | Evaluate progress and ensure project goals align with objectives. |

### 3.3 User Environment

NestWise will be accessible via modern web browsers on desktop. Users will interact with a guided interface to input financial and personal details, with data processed securely through the backend.

### 3.4 Operating Environment

NestWise will be a web-based application developed using a modern, modular technology stack. To ensure scalability and performance we will employ the following technologies:

* **Frontend Framework:** React with Tailwind CSS for building a responsive, user-friendly interface.
* **Backend Framework:** Python (FastAPI or Flask) for API management, business logic, and integration with AI components.
* **Database:** MongoDB or PostgreSQL for secure storage of structured user and financial data.
* **Prompt Engineering**
* **Vector Database:** ChromaDB for managing embeddings and enabling Retrieval-Augmented Generation (RAG) queries.
* **AI Integration Framework:** LangChain for orchestrating communication between the LLM (GPT-4o) and the retrieval system.

For users to access the NestWise web application, all that is required is a device with an active internet connection and a modern web browser that can display dynamic web content and support secure HTTPS connections.

### 3.5 Key Stakeholder or User Needs

|  |  |  |  |
| --- | --- | --- | --- |
| **Need** | **Priority** | **Concerns** | **Proposed Solution** |
| **Provide a secure, interactive tool for generating personalized retirement plans** | Critical | The tool must handle sensitive user data while maintaining a responsive and intuitive interface. | Develop a secure web-based platform using encryption, authentication, and modular architecture to ensure interactivity and data protection. |
| **Incorporate real-time financial data using Retrieval-Augmented Generation (RAG)** | High | Integrating live data sources may cause latency or API inconsistencies. | Implement RAG pipelines with caching and fallback mechanisms to ensure consistent and reliable real-time data retrieval. |
| **Ensure transparency and explainability in generated results** | High | Users may not trust AI-generated recommendations without clear explanations. | Incorporate explainable AI (XAI) methods to display data sources and reasoning behind financial suggestions. |
| **Maintain privacy and security of user Personally Identifiable Information (PII)** | Critical | Mishandling or storing sensitive information could lead to compliance and ethical risks. | Use anonymization, encrypted data storage, and session-based processing to protect PII and comply with privacy standards. |
| **Support plan export in PDF and JSON formats** | Medium | File generation must preserve data accuracy and formatting consistency. | Integrate reliable export modules that convert AI-generated outputs into standardized PDF and JSON files for user download. |

## Product Overview

### 4.1 Overview & Scope

The NestWise system will provide users with a guided retirement planning experience. Through adaptive AI prompts, the system will collect necessary information and produce an individualized retirement strategy. The deliverable includes a working prototype, a responsive frontend, secure backend, and data-driven insights with citations.

### 4.2 Assumptions & Dependencies

**Assumptions:**

* API services (e.g., OpenAI GPT-4o) remain available.
* Users have internet access.
* Financial data sources are reliable and updated regularly.

**Dependencies:**

* OpenAI GPT-4o API
* MongoDB / PostgreSQL
* LangChain Framework
* Hosting environment (PFW or AWS)

### 4.3 Product Features

**Critical Features:**

* Guided financial data input via user-friendly interface.
* Dynamic prompt generation for personalized user interactions.
* Retrieval-Augmented Generation for financial data accuracy.
* Secure data handling and encryption.
* Retirement plan visualization and export (PDF/JSON/HTML).

**Optional Features:**

* User account creation and personalized dashboards.
* Simulation of plans under varying market conditions.
* Integration of user-specific financial goals (loans, education savings, etc.).

### 4.4 SWOT Analysis

**Strengths:**

* Innovative use of AI and RAG in financial planning.
* Strong technical stack (React, Python, LangChain).
* Interdisciplinary, collaborative team.

**Weaknesses:**

* Limited prior experience with financial modeling.
* High dependency on third-party APIs.

**Opportunities:**

* Can be scaled to broader financial education tools.
* May attract partnerships with fintech companies.

**Threats:**

* API cost and rate limitations.
* Evolving financial regulations and data compliance requirements.