Project Title: LLM-Based Investment Advisor

Team Name: Investment Advisor

Team Members

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2. Project Purpose & Goals

The business purpose of this project is to provide a **South African brokerage firm's clients** with a way to make informed financial decisions by offering personalized investment advice. The firm, which is expanding into the **Rwandan market**, aims to help its clients by providing tailored recommendations on investment opportunities, such as **stocks and bonds from the South African market**, based on their financial goals and risk profiles.

Goals

1. **Educate clients on financial markets**: Provide users with clear, concise information on investment options like stocks and bonds from the South African market.
2. **Offer personalized investment advice**: Customize recommendations to each user based on their risk tolerance, budget, and financial goals.
3. **Provide real-time financial updates**: Deliver up-to-date market news and stock data to keep clients informed.
4. **Simulate potential investment returns**: Allow users to simulate how past investments in the South African market might have performed.

3. Team's methodology & initial approach

Hill: Individuals, regardless of their investment background, can become informed investors and confidently make personalized, timely investment decisions.

Epics	User Stories

Epic 1: As an investor, I want to learn about investment opportunities in the South African financial markets so that I can make informed decisions.	**User Story 1**: As an investor, I want to ask the chatbot questions about South African stocks and bonds so that I can better understand the financial markets and my options.
	User Story 2: As an investor, I want to receive easy-to-understand explanations of key financial terms (e.g., stocks, bonds, dividends) so that I can improve my financial knowledge.
	User Story 3: As an investor, I want to stay informed with real-time news about South African stocks and bonds so that I can make timely decisions based on the latest market trends.
Epic 2: As an investor, I want personalized investment recommendations based on my financial goals and risk tolerance so that I can maximize potential returns and manage risk effectively.	**User Story 1**: As an Investor, I want the AI financial advisor to assess my risk tolerance, so that I can receive a personalized asset allocation strategy tailored to my risk profile (conservative, moderate, or aggressive).
	User Story 2: As an investor, I want the AI financial advisor to recommend specific bonds/stocks within my asset allocation, so that I can meet my financial goals (e.g., retirement, education, wealth building)
	User Story 3: As a client, I want to simulate potential gains or losses over the past five years based on my recommended portfolio so that I can assess the performance of my investments.

4. Proposed Solution

We will develop an **AI investment advisor** for the **South African brokerage firm** expanding into **Rwanda**, allowing clients to make informed, personalized financial decisions. The platform will provide real-time financial data, portfolio recommendations, and market insights.

Technologies:

- **LLM with RAG and AI Agents**: Offers personalized advice and retrieves real-time data for optimized investment recommendations.
- **Google Finance API & NewsAPI**: Provide real-time stock data and market news.
- **Dash & Chainlit**: Enable interaction through a dashboard and chatbot interface.
- **Docker, Kubernetes, AWS/GCP**: Ensure scalable and reliable cloud deployment.

5. Possible Major Products

AI Investment Advisor System: A fully functional AI Investment Advisor chatbot using GPT-3.5 with Retrieval-Augmented Generation (RAG) to provide personalized financial recommendations on South African stocks and bonds, integrated with real-time data and deployed on AWS/GCP using Docker and Kubernetes.

Reports: An intermediate report summarizing project progress and a final report detailing system architecture, testing results, and future recommendations.

Final Demo: A live demonstration showcasing the system's ability to provide personalized financial advice, real-time updates, and portfolio recommendations.

Codebase: The complete codebase, including backend logic and API integrations, will be provided in a GitHub repository, containerized with Docker for easy cloud deployment.

User Manual and Technical Documentation: A combined document will guide non-technical users on system interaction and provide developers with detailed information on API integrations, system architecture, and deployment instructions for future maintenance.

6 Scrum Sprint Plan

Sprint	Sub-products	Tasks	Ressources	Goals
Sprint 1 (Weeks 1-2)	LLM knowledge base setup & basic chatbot	Develop a finance-focused Q&A application using Chainlit for the interface, integrate GPT-3.5 as the base LLM, implement a RAG system with a vector store containing financial data.	Computing:GPT-3.5 API Data: Investopedia Storage: FAISS Package: Chainlit	Create a knowledge base for finance-related queries via the chatbot.
Sprint 2 (Weeks 3-4)	Initial portfolio engine	Build recommendation engine for stocks and bonds based on user profiles, and integrate Google Finance API for real-time data.	Flask, Python, Google Finance API, MongoDB	Deliver personalized portfolio recommendations based on user inputs and market data.
Sprint 3 (Weeks 5-6)	Investment gains calculator & news	Integrate an investment gains	Python, Google Finance API,	Provide historical

	integration	calculator (e.g., "What if I invested 5 years ago?") and NewsAPI for real-time updates, ensuring the chatbot displays results and relevant news.	News API	investment gains simulations and real-time news updates for user portfolios.
Sprint 4(Weeks 7-8)	Final reports, user manual, final demo, deployment	Prepare final report, user manual, intermediate report, conduct final demo, deploy on cloud (AWS/GCP).	Docker, Kubernetes, AWS/GCP, Prometheus, Grafana	Deliver final system, reports, and complete cloud deployment with monitoring.

7. Risks and Mitigations

Anticipated Challenges and Risk Mitigation Strategies for Project Success:

Project overscoping: Identify and prioritize core features for a minimum viable product (MVP), while maintaining flexibility to adjust the project scope as needed, ensuring that essential functionality is preserved throughout the development process.

Lack of expertise in financial domain or AI technologies: To ensure our team is well-equipped to handle the complexities of the project, we will begin by conducting a skill gap analysis within our group. This assessment will help us identify areas where we excel and where we need to improve or acquire new expertise.

Communication gaps between team members working on different components: To maintain clear communication and project visibility, we will implement regular stand-up meetings, complemented by the use of collaborative project management and documentation tools. This approach will ensure that all team members are aligned, progress is tracked effectively, and project information is easily accessible and up-to-date.

Poor user experience leading to low engagement: Throughout the development process, we will prioritize user-centered design by conducting regular usability tests, implementing a comprehensive feedback system, and continuously refining the chatbot's responses based on user interactions. This iterative approach will ensure that the AI Investment Chatbot evolves to meet user needs effectively, enhancing its usability and relevance over time.

Integration challenges between different components: To ensure system reliability and maintainability, we'll implement early integration testing, use well-documented components, and adopt a modular architecture, facilitating easier troubleshooting and future enhancements of the AI Investment Chatbot.