EGR 404 Final Project Report

Project Title: GenAI Market Summarizer-Powered by FinSight

Name: Chelsie Santos

Course: EGR 404: Generative AI Tools

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GitHub Repository: https://github.com/StayTinyChelsie/genai-market-summarizer.git

Project Overview:

In today’s fast-moving financial landscape, decision-makers often lack time or tools to analyze large volumes of data across multiple platforms. Financials news, livestock data, market trends, macroeconomic indicators, and hedge fund strategies all exist in silos. Researching, analyzing, visualizing, and summarizing market insights is fragmented and time-consuming.

The GenAI Market Summarizer app, powered by FinSight, was developed to streamline this process by offering an intelligent, all-in-one solution. The app uses generative AI to ingest various forms of financial data and user-uploaded content (such as PDFs or news text), summarizes it using large language models (LLMs), generates rich visualization, and presents it in exportable formats like PowerPoint, PDF, Excel, or Google Sheets.

The tool caters to financial analysts, founders, investors, and students seeking efficient, AI-assisted research and reporting. With integrated portfolio simulations, multi-ticker comparisons, and macroeconomic data fetching, FinSight aims to reduce the time between information gathering and decision-making.

Technical Implementation

The app uses Streamlit for the user interface and Python for backend data handling, AI integration, and visualization generation. The modular design includes key components:

* Main.py: Central controller that manages input route, UI elements, and session logic.
* Summary.py: Handles text summarization, market overviews, and AI-generated insights using OpenAI’s API.
* Fetch\_dataset.py: Pulls real-time data using yFinance, World Bank, FRED, and Alpha Vantage.
* Chart\_logic.py: Generates 10 chart types, including heatmap, bar charts, pie charts, histogram, and area charts.
* Exporter.py: supports PowerPoint, Excel, PDF, and Google Sheets exports.
* Ui\_handlers.py: Modular input handler for uploaded files, live ticker lookups, NYT articles, and hedge fund tools.

Generative AI Integration

* OpenAI LLMs summarize financial documents, provide hedge fund strategy suggestions, and generate generative narrative insights for visualizations.
* Summarization supports user-uploaded PDFs or financial news (including New York Times Articles).
* AI is also used to generate automated pitch decks and brainstorm startup ideas.

Architecture Diagram:

Application of Course Labs

The project meaningfully integrates several lab components from EGR 404:

* LLM Assistants: Adapted from Lab 5’s OpenAI assistant implementation, custom prompts are used to provide market overviews and summarizations with financial tone adjustments.
* RAG Pipelines: Used in text and PDF summarization to contextualize uploaded documents using hybrid retrieval and generative responses.
* Vector Stores (Planned Extension): Intended for phase 2 to enable document embedding, search, and relevance-based AI responses.
* Stepwise Pipelines: Inspired by Lab 7’s modular workflows, the charting and export logic follow a similar layered structure (AI summary-Visuals-Report).

Functionality & Screenshots

Core features

* Upload and summarize financial PDFs or text.
* Fetch live data from multiple tickers using yFinance.
* Generate over fifteen visualization types dynamically.
* Export AI-generated summaries and charts into PowerPoint, PDF, Excel, or Google Sheets
* Hedge fund Assistant: Simulate portfolios, suggest allocations, and compare performance vs benchmarks.
* Input modes include Text, PDF, Live Lookup, NYT articles, Ticker Comparison, and Hedge Fund Tools.

Screenshots:

Recent fixes and improvements:

* Fixed chart duplication errors by indexing chart paths correctly
* Implemented timestamped file naming for exports.
* Filtered chart selection to avoid overload in PowerPoint output.

Challenges & Timelines

Technical Challenges:

* Modularizing a previously Monolithic Main.py without breaking internal references or causing circular imports
* Handling API responses, limits, and streamlining multi-ticker input into a clean Mult index Data Frame.
* Preventing Export Duplication and managing long summarizations without exceeding token limits.

Project Milestones

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| --- | --- | --- | --- |
| **Milestone** | **Planned Date** | **Actual Date** | **Status** |
| Project Planning & Wireframe | Mar 24 | Mar 25 | ✅ Complete |
| Initial MVP (Summarizer + UI) | Mar 31 | Apr 1 | ✅ Complete |
| Chart Engine + PowerPoint Export | Apr 10 | Apr 12 | ✅ Complete |
| NYT Integration + UX Upgrades | Apr 20 | Apr 22 | ✅ Complete |
| Excel Export + Hedge Fund Tools | Apr 25 | Apr 27 | ✅ Complete |
| Final Fixes + Report | May 5 | May 5 | ✅ Complete |

Conclusion & Future Work

The GenAI Market Summarizer successfully delivers an integrated, generative-AI-powered platform for market research, analysis, and reporting. It empowers financial users to work more efficiently by combining intelligent automation, financial data APIs, and rich visual outputs.

Key takeaways:

* AI can meaningfully enhance financial decision-making workflows.
* Modular design is critical for managing complex app functionality.
* Chart insight generation adds interpretability to raw data visualization.

Already added my next phase:

* Monte Carlo Simulator and Smart Screener modules
* Implement FAISS/Chroma vector search for embedded file querying.
* Launch secure user accounts and monetized API access tiers.
* Improve speed and token efficiency with GPT-4o integration.

The project reflects deep engagement with generative AI concepts, an elevated level of technical execution, and a clear roadmap for future growth.