

Project Evaluator:

Project Summary

This project demonstrates the development of an end-to-end AI-powered strategic decision support system that transforms complex organizational problems into actionable business intelligence. The system integrates multiple large language models (LLMs) with advanced statistical and algorithmic support methodologies, financial modeling, and automated workflow orchestration to deliver enterprise-grade analytical capabilities across six interconnected modules. In essence, it works as an AI-powered, automated, strategic decision-making workflow, which finds the right project to solve an input problem, plans it out, finds out how automatable through AI it is and begins autonomously the process, but only up to the point in which is then wiser to turn to human actors to finish it up.

Core Technical Architecture

The system employs a modular pipeline architecture processing organizational challenges through sequential analytical stages: **Problem Analysis** → **Solution Generation** → **Financial Enrichment** → **Strategic Planning** → **Task Sequencing** → **Automated Execution**. Each module leverages distinct AI models optimized for specific analytical tasks while maintaining data consistency and analytical rigor throughout the workflow.

Key Technical Components

Multi-Model LLM Integration: The system orchestrates Google Gemini 2.5 Pro, Llama 3.2 (via local Ollama deployment), Claude, and ChatGPT across specialized analytical functions, demonstrating practical multi-AI system coordination for enterprise applications.

Statistical Reliability Engineering: Implements sophisticated validation protocols including multi-run consensus validation (70%+ agreement thresholds), median-based outlier removal, and confidence scoring algorithms that ensure analytical consistency despite inherent LLM variability.

Dual-Pathway Analysis Framework: Employs complementary analytical methodologies (archetype classification and dimensional assessment) with dynamic weighting schemes and bias correction algorithms to mitigate single-method analytical limitations.

Advanced Financial Modeling: Integrates professional-grade NPV, IRR, and ROI calculations with automated web research capabilities (via Tavily API) and sensitivity analysis protocols that match traditional financial consulting standards.

Data Science Relevance and Innovation

This project addresses critical challenges in applied data science: **LLM reliability quantification**, **multi-source data integration**, **automated research validation**, and **complex decision support system development**. The architecture demonstrates practical solutions to enterprise-scale analytical problems while maintaining academic rigor through comprehensive validation and citation management systems.

Methodological Contributions

Reliability Quantification for LLMs: Develops statistical frameworks for measuring and ensuring consistency in LLM-generated analytical outputs, addressing a fundamental challenge in production AI applications.

Automated Research Intelligence: Implements AI-powered web research with quality filtering and academic citation tracking, demonstrating scalable approaches to real-time data acquisition and validation.

Multi-Dimensional Risk Assessment: Creates comprehensive risk evaluation frameworks that integrate technical complexity, financial performance, and operational feasibility metrics into unified decision support tools.

Hierarchical Task Automation Assessment: Develops sophisticated methodologies for evaluating AI automation potential across complex organizational workflows, providing practical guidance for human-AI task allocation.

Technical Achievements and Metrics

The system successfully processes enterprise-scale scenarios with measurable performance indicators and metrics.

Data Processing Capabilities: Handles multi-format financial data extraction, currency normalization, contextual pattern recognition, and statistical aggregation across diverse information sources with robust error handling and validation protocols.

Visualization and Reporting: Generates interactive Streamlit dashboards with real-time financial analytics, hierarchical task visualization, and automated multi-format report generation (TXT, PDF, DOCX) suitable for executive distribution.

Relevance to the Portfolio

This novel AI Business Arbiter-Facilitator project demonstrates comprehensive data science competencies including **advanced statistical analysis**, **machine learning system integration**, **financial modeling expertise**, **automated data pipeline development**, and

enterprise software architecture design. The system showcases my practical experience with production-grade AI applications, multi-source data integration, and complex business problem-solving methodologies essential for data science, business intelligence and data analysis roles.

The architecture's emphasis on reliability, validation, and professional deliverable generation reflects understanding of enterprise analytical requirements while the multi-model AI coordination demonstrates familiarity with cutting-edge technological approaches to complex organizational challenges.

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The following sub-pages are a deeper dive into each of the sequential components, modules or sections of the project, as to provide a more detailed explanation (and some sample highlights of the code) for them.

If in any of the subsequent sections of the documentation seems like this project is specially abstract, that is because it most likely is. It is in some ways more complex than the rest of the portfolio and many of the explanations of it's sections would require to go into proprietary data. For our purposes, suffices to keep in mind that the gist of it is a series of dynamic and iterated LLM analyses guided, supported and constrained by parallel algorithmic processes and statistical "rules-of-thumb".