MyFalconAdvisor Project Proposal

Introduction

Traditional robo-advisors have gained traction by offering low-cost, automated rebalancing, yet they often lack interactivity and dynamic personalization. Most platforms quietly adjust portfolios in the background, leaving users detached from their financial journey. Early-career investors and underserved individuals in particular need guidance that is contextual, transparent, and interactive.

MyFalconAdvisor addresses this gap by introducing an **AI-powered, conversation-driven advisory platform**. Instead of static dashboards, users engage in natural dialogue to receive tailored portfolio insights, compliance-checked recommendations, and execution support. This solution democratizes access to high-quality advice for individuals who may not qualify for traditional wealth management services.

Related Work

Existing platforms such as **Betterment, Vanguard Digital Advisor, and Fidelity Go** provide automated rebalancing and portfolio optimization but primarily rely on predefined models. While chatbots exist in fintech, they are typically customer service tools rather than robust financial advisors.

Recent academic and industry prototypes focus on **automation** rather than **user-driven interaction**. MyFalconAdvisor differentiates itself by integrating:

- **Conversational AI** (LangGraph + LangChain) for dynamic, contextual advice.
- **Real-time compliance validation for tax-loss harvesting** against policy feeds (SEC, IRS, RBI).
- **Execution transparency** with immutable audit trails.
- **Gamification, simulation, and tax-loss harvesting** features are designed to boost engagement and outcomes.

Research Objectives

The project aims to design and evaluate a **multi-agent AI framework** that balances personalization, compliance, and transparency.

Key objectives:

- Develop a **conversational Advisor Agent** capable of contextual portfolio analysis.
- Implement a **Compliance Agent** that validates and rewrites recommendations against real-time governance data.
- Build an **Execution Agent** that confirms user intent, executes trades, and records an immutable paper trail.
- Incorporate **scenario-based planning, gamification, and tax-loss harvesting** to enhance user financial literacy and decision-making.

Data

The system will be trained and validated using:

- **Synthetic Portfolio & User Profile Data** – AI-generated profiles representing diverse demographics and goals for model testing.
- **Real-Time Market Data** – From sources like Yahoo Finance, Alpha Vantage, Bloomberg, and FRED.
- **Governance/Policy Data** – SEC, IRS, FINRA, and RBI feeds to enforce compliance.
- **Scenario Data** – Historical downturns, shocks, and macroeconomic events for simulation and stress-testing.

Limitations: Real-time policy data integration may face API reliability issues; synthetic data may not fully capture behavioral finance nuances.

Agentic Framework

The platform uses **LangGraph** for orchestration:

- **Advisor Agent (Supervisor)** – Performs portfolio analysis, scenario simulation, and customer interaction.
- **Compliance Agent** – Validates/rephrases recommendations based on real-time governance rules.
- **Execution Agent** – Manages trade confirmations, execution, and transparent logging.

This modular multi-agent approach supports extensibility (e.g., ESG optimization, retirement planning modules).

System Agents

1. **Advisor Agent (Conversational AI)** – Generates tailored recommendations and scenario-driven advice.
2. **Compliance Agent** – Validates against governance data, ensuring regulatory safety.
3. **Execution Agent** – Executes approved trades with immutable logs and partial-trade support.

Proposed Breakout Structure

1. Advisor Agent & Recommendations (Conversational AI Engine) — *Akshay / Monoo*

Objectives/Deliverables

- Analyze user profiles, investment goals, portfolio health, and market conditions.
- Generate dynamic recommendations responding to user queries (e.g., *"How's my portfolio doing?"*)
- Support scenario simulations (job loss, pay increase).
- Deliver natural-language financial advice.

Key Technical Tasks

- Implement dialogue management (LangGraph + LangChain).
- Integrate APIs (Yahoo Finance, Alpha Vantage, etc.).
- Build scenario simulation & portfolio analytics logic.
- Develop user profile parser (income, expenses, goals).

Integration & Rationale

- Feeds validated advice to Compliance Agent.
- Core “brains” of the platform; combines NLP, portfolio theory, and AI orchestration.

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2. Compliance Agent & Regulatory Validation — *Nuzhat*

Objectives/Deliverables

- Validate recommendations against SEC/IRS/FINRA policy.
- Rewrite or block non-compliant outputs.
- Maintain upgradable compliance logic core.

Key Technical Tasks

- Integrate real-time regulatory feeds.
- Develop rules engines and compliance monitoring.
- Simulate failures and edge cases.
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- Track compliance pass rates for trust metrics.

Integration & Rationale

- Acts as a safeguard before user-facing outputs.

- Critical for building regulatory trust; complex enough for a governance-focused capstone track.

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3. Execution Agent & Paper Trail — *Monoo*

Objectives/Deliverables

- Capture explicit user consent before trades.
- Execute trades (simulated) and record all actions.
- Provide an immutable paper trail across the full loop.
- Enable partial trade execution.

Key Technical Tasks

- Develop secure logging and transaction management.
- Implement confirmation flows & error handling.
- Integrate with compliance outputs and notification system.
- Integrate with Alpace for paper trading and portfolio updates

Integration & Rationale

- Final checkpoint before portfolio updates.
- Ensures trust, transparency, and auditability.

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4. Web & UX Platform (Data Integration, Desktop/Mobile UI) — *Vibha*

Objectives/Deliverables

- Build full web-based interface (desktop + mobile responsive).
- Enable natural-language interactions & confirmation flows.
- Handle onboarding (income, expenses, account linking).
- Display portfolio analytics, simulations, and logs.

Key Technical Tasks

- Develop frontend in ReactJS/VueJS with secure API endpoints.
- Implement backend integration with agents.
- Build test harnesses for user journeys.

Integration & Rationale

- Entry point for all user actions; ties together Advisor, Compliance, and Execution outputs.
- Highly technical: frontend/backend integration, user experience, and security.

Optional Track (If Needed): Scenario Simulation & Analytics/Benchmarking

- Deep-dive into “what-if” engines (job loss, downturns, salary changes).
- Expenditure benchmarking vs demographic peers.
- Real-time portfolio stress tests.

Team Members & Roles

Role	Name	Contribution
Advisor Agent	Akshay Prabu / Monoo	Conversational AI, portfolio analysis, scenario simulation
Compliance Agent	Nuzhat	Regulatory validation, rules engines, compliance monitoring
Execution Agent	Monoo	Trade execution, logging, transaction security
Web & UX	Vibha Gupta	Frontend/backend integration, UX flows, data onboarding
Quant Analyst	Akshay / Nuzhat	Scenario modeling, portfolio stress testing

Technical Writer	All	Project report & documentation

What Differentiates Our Solution

- **Conversation-Driven Guidance** vs. background automation.
- **Full Advisory Loop (Advice → Compliance → Execution)** unlike existing robo-advisors.
- **Real-Time Compliance Validation** before the user sees recommendations.
- **Gamification Layer** to encourage engagement.
- **Tax-Loss Harvesting Integration** for tangible financial benefits.
- **Alpaca API Integration** for realistic paper-trading and backtesting.

Expected Impact

- **Increased Engagement** – Users converse with an AI financial coach.
- **Improved Outcomes** – Portfolio performance better aligned with personal goals.
- **Trust & Transparency** – Immutable logs, compliance-first approach.
- **Scalability** – Capable of serving millions without requiring human advisors.
- **Financial Inclusion** – Affordable, accessible advice for underserved individuals.

Conclusion

MyFalconAdvisor merges **agentic AI, compliance-first design, and interactive engagement** to create a next-generation financial advisory platform. The project aligns with **BAN 693**

Capstone Learning Outcomes by applying analytics to solve a practical business problem, developing hands-on AI/ML solutions, and communicating findings in a professional, public setting.

This solution not only differentiates itself from existing robo-advisors but also contributes to the broader goals of democratizing financial planning and promoting user trust.