CODECELL - CMPN, VESIT

SYRUS HACKATHON 2025

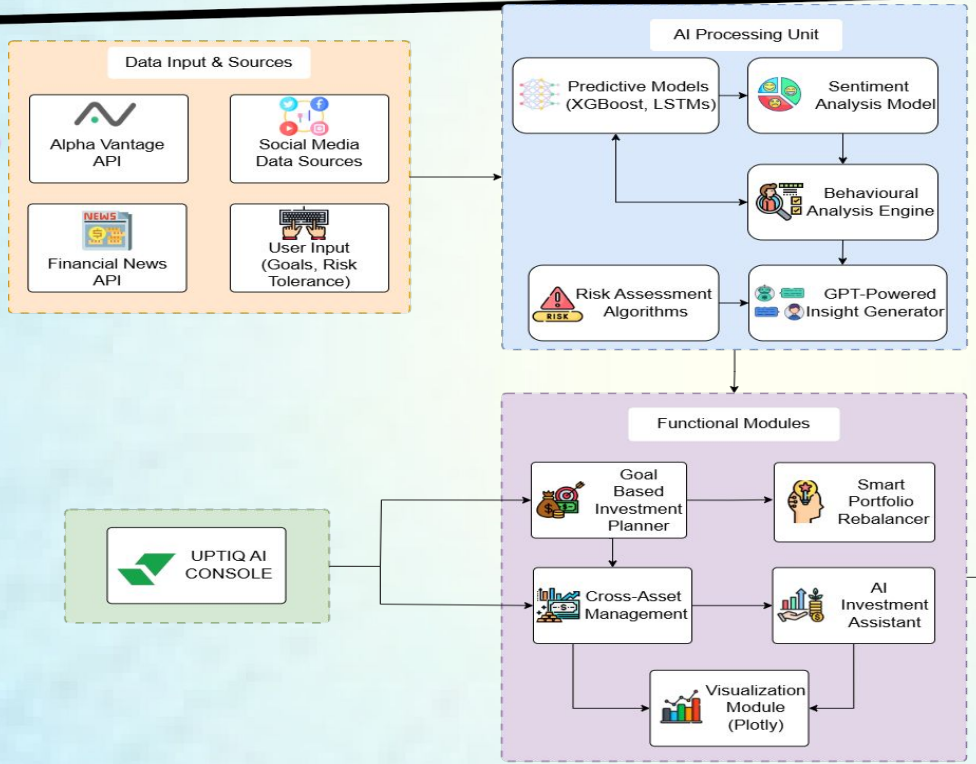
Category Code: C5

Problem Statement Title: InvestWise AI: Intelligent Wealth Creation Platform (Investment & Stock Market Insights)

Team Name: EPIC BYTES

Institute Name: Vivekanand Education Society's Institute of Technology

Idea / Approach details (& implemented features)



Uptiq Implementation Link:
[Link]

Innovation (Showstopper)

AI Powered Investment Assistant
Live Data: Fetch real-time stock and market data via Alpha Vantage API.

AI Insights: Predict trends using XGBoost & LSTM models.

Smart Rebalancer

Monitors portfolios and suggests rebalancing based on market volatility.

Behavioral Analysis:

Tracks Patterns: Analyzes past investments to understand user behavior.

Stock Recommendations: Suggests stocks based on user preferences (e.g., growth, tech).

Goal-Based Investment Planning:

Set Financial Goals: Users define goals (e.g., buying a house), and the system calculates how much to invest.

Optimal Strategy: Recommends monthly investments and asset allocation based on user goals and timelines.

Sentiment Analysis:

Market Sentiment: Analyzes news and social media to gauge stock mood (e.g., “Positive sentiment for AAPL”).

Guided Decisions: Helps users make informed decisions based on sentiment.

Beginner-Friendly Chatbot:

Investment Guidance: Suggests beginner-friendly investments (e.g., ETFs).

Personalized Assistance: Answers investment questions and guides users.

Innovation (Showstopper)

Real-Time Stock Insights Using UPTIQ AI:

Data Collection:

Use UPTIQ's Market Data API to fetch real-time stock data, including historical prices, market indices, sectors, and individual stock data. You can set up API calls to retrieve:

- Stock prices
- Market indices
- Sector performance
- Historical price data for trend analysis

Model Deployment (XGBoost & LSTM):

UPTIQ's Model Hub: You can deploy predictive models such as XGBoost and LSTM (Long Short-Term Memory) using UPTIQ's Model Hub.

1. XGBoost will be used to analyze historical stock data and identify potential trends and patterns.
2. LSTM is ideal for time-series forecasting, predicting stock price movements over time.

Innovation (Showstopper)

Goal-Based Investment Planning Using UPTIQ AI:

1. **Financial Goal Setting:**
   - **User Input**: Users specify their financial goal (e.g., buying a house, saving for retirement), target amount (e.g., $200,000), and timeline (e.g., 10 years).
   - **UPTIQ AI**: Collect and store user inputs using **Input** and **Question** actions in UPTIQ.
2. **Predictive Model for Optimal Investment Strategy:**
   - **Model Deployment**: Use **UPTIQ's Model Hub** to deploy models like **XGBoost** and **LSTM** for analyzing market data and calculating the best strategy.
     - **XGBoost**: Analyzes past stock performance and suggests asset allocation.
     - **LSTM**: Predicts potential returns using time-series forecasting.
   - **Calculation**: Models calculate the required monthly investment (e.g., "Invest $600/month in a diversified portfolio with 8% expected return over 8 years").
3. **Providing Recommendations:**
   - **Output**: UPTIQ generates an optimal investment plan, displayed to the user.
     - Example: "To reach your $200,000 goal in 10 years, invest $600/month in a balanced portfolio with 8% expected return."

Innovation (Showstopper)

Sentiment Analysis Using UPTIQ AI:

1. **Market Sentiment Analysis:**
   - **User Input**: Users specify the stock or asset they are interested in (e.g., "AAPL" or "S&P 500").
   - **UPTIQ AI**: Use **RAG Query** or **Vector Search** to retrieve relevant financial news, social media posts, and analyst opinions.
2. **Sentiment Evaluation:**
   - **NLP Model**: Use **BERT** or **RoBERTa** models deployed on UPTIQ's Model Hub to analyze the sentiment of the gathered data (e.g., positive, neutral, or negative sentiment around a stock).
   - **Analysis**: Sentiment score is calculated based on the aggregated news and social media data. It helps understand the mood around a stock, such as "positive sentiment for AAPL."
3. **User Output:**
   - **Display**: UPTIQ uses **Display** action to present the sentiment analysis result to the user, providing actionable insights like "Positive sentiment for AAPL due to strong earnings" or "Negative sentiment for TSLA due to market volatility."

Innovation (Showstopper)

Sentiment Analysis Using UPTIQ AI (RAG-Enhanced):

1. **Market Sentiment Analysis:**
   - **User Input**: Users specify the stock or asset they want insights on (e.g., “AAPL” or “S&P 500”).
   - **UPTIQ AI**: **Retrieval-Augmented Generation (RAG):** Uses **Vector Search** to fetch relevant financial news, social media posts, and analyst opinions from the **MongoDB vector store** indexed with OpenAI’s **text-embedding-3-large** model.
   - **LLM-Enhanced Insights: GPT-3.5 Turbo (Azure)** generates contextualized responses based on the retrieved data.
2. **Sentiment Evaluation:**
   - A **sentiment score** is calculated by aggregating news, social media data, and expert opinions.
   - Example: “Positive sentiment for AAPL due to strong earnings” or “Negative sentiment for TSLA due to market volatility.”
3. **User Output:**
   - **Display Action:** Sentiment analysis results are presented with key insights, supported by **retrieved evidence via RAG** for transparency.

Innovation (Showstopper)

Behavioral Analysis Using UPTIQ AI:

1. **User Behavior Tracking:**
   - **User Input**: Users input their investment preferences, past investments, and risk tolerance (e.g., "I prefer growth stocks" or "I've invested in tech stocks").
   - **UPTIQ AI**: Use **Input** actions to capture this data and store it for behavioral analysis.
2. **Clustering for Personalized Recommendations:**
   - **Clustering Algorithm**: Use **K-Means** or **DBSCAN** clustering algorithms deployed on UPTIQ's Model Hub to segment users based on their past investment patterns and risk tolerance.
   - **Analysis**: The system identifies patterns like "high-risk tolerance, growth stock preference" or "low-risk tolerance, stable dividend stocks preference."
3. **Stock Recommendations:**
   - **Personalized Recommendations**: Based on the clusters, UPTIQ provides personalized stock recommendations. For example, for a user with high risk tolerance, the system might suggest "Consider investing in TSLA or NVDA."
   - **Output**: Use the **Display** action to show the recommendations, guiding users to investment opportunities that align with their behavior and preferences.

Innovation (Showstopper)

Smart Rebalancer Using UPTIQ AI:

User Portfolio Input:

- **User Input**: Users provide their current portfolio details (assets, risk tolerance, and preferences).
- **UPTIQ AI**: Use Input actions to collect and store this data for rebalancing analysis.

Market Data Collection:

- **Data Collection**: Use UPTIQ's Market Data API to fetch real-time data on stocks, bonds, and other assets in the portfolio.
- **Risk & Performance Metrics**: Retrieve key metrics like asset performance and market volatility.

Portfolio Monitoring and Prediction:

- **AI Models**: Use LSTM and XGBoost deployed on UPTIQ's Model Hub to predict market trends and forecast future asset performance.
- **Risk Assessment**: Calculate portfolio risk (e.g., Value-at-Risk) based on market conditions.

Rebalancing Suggestions:

- **Optimization Logic**: Based on predictions, UPTIQ AI calculates the optimal portfolio adjustments (e.g., increase bonds, reduce tech stocks).
- **Proactive Advice**: Recommend actions like "Increase bond allocation by 5%" during market volatility.

Displaying Recommendations:

- **User Output**: Use UPTIQ's Display action to show rebalancing recommendations and visualizations (e.g., pie charts of portfolio allocations).

Tech Stack

Frontend

- React(Vite.js)

Backend

- Node.js, Express.js
- XGBoost, LSTMs

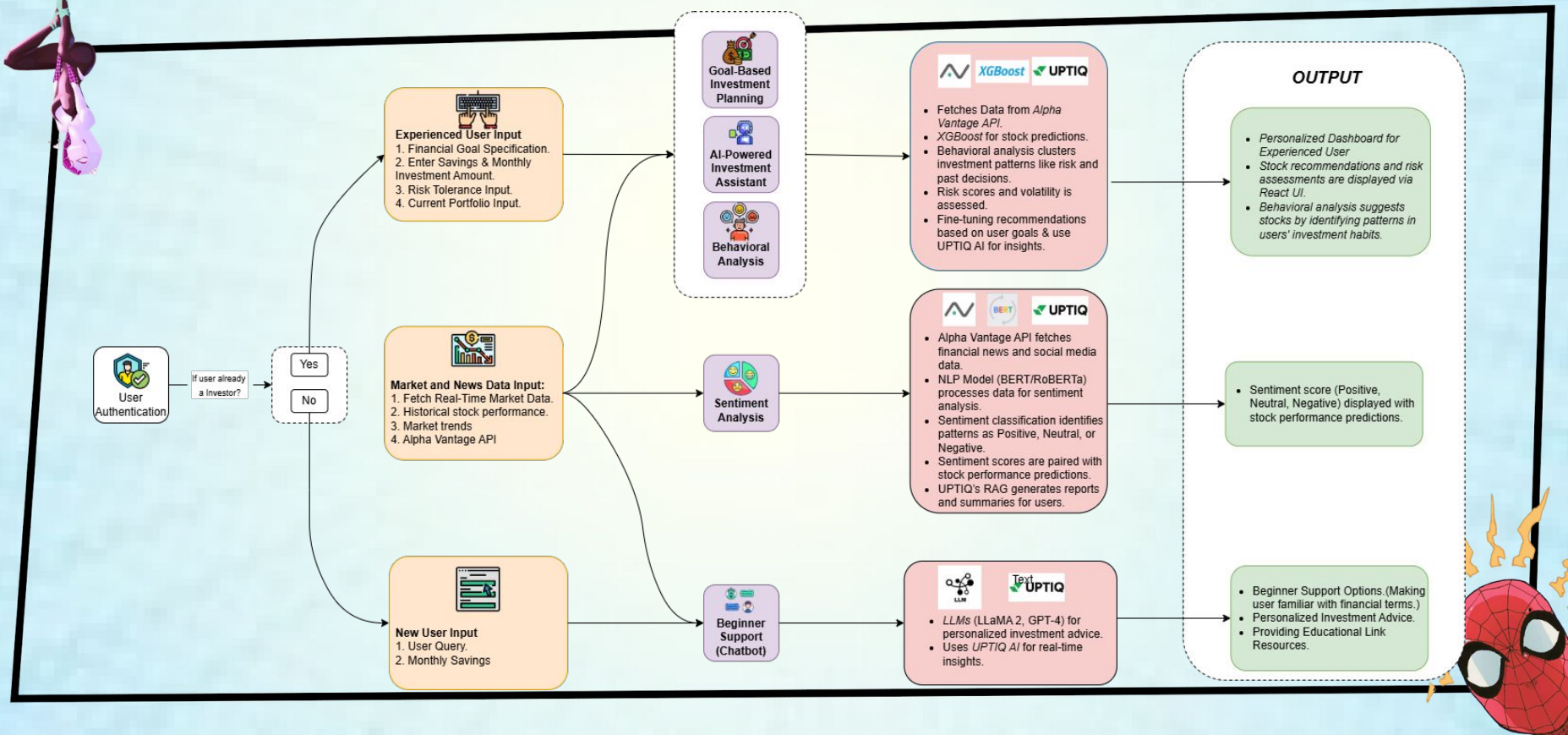
Data Handling and APIs

- Alpha Vantage API
- Mongo DB
- JSON, CSV

UPTIQ AI

- AI Model Hosting
- AgenticAI Automat[n]
- Gen AI Reporting

Implementation/Prototype/Use Case Diagram (screenshots)

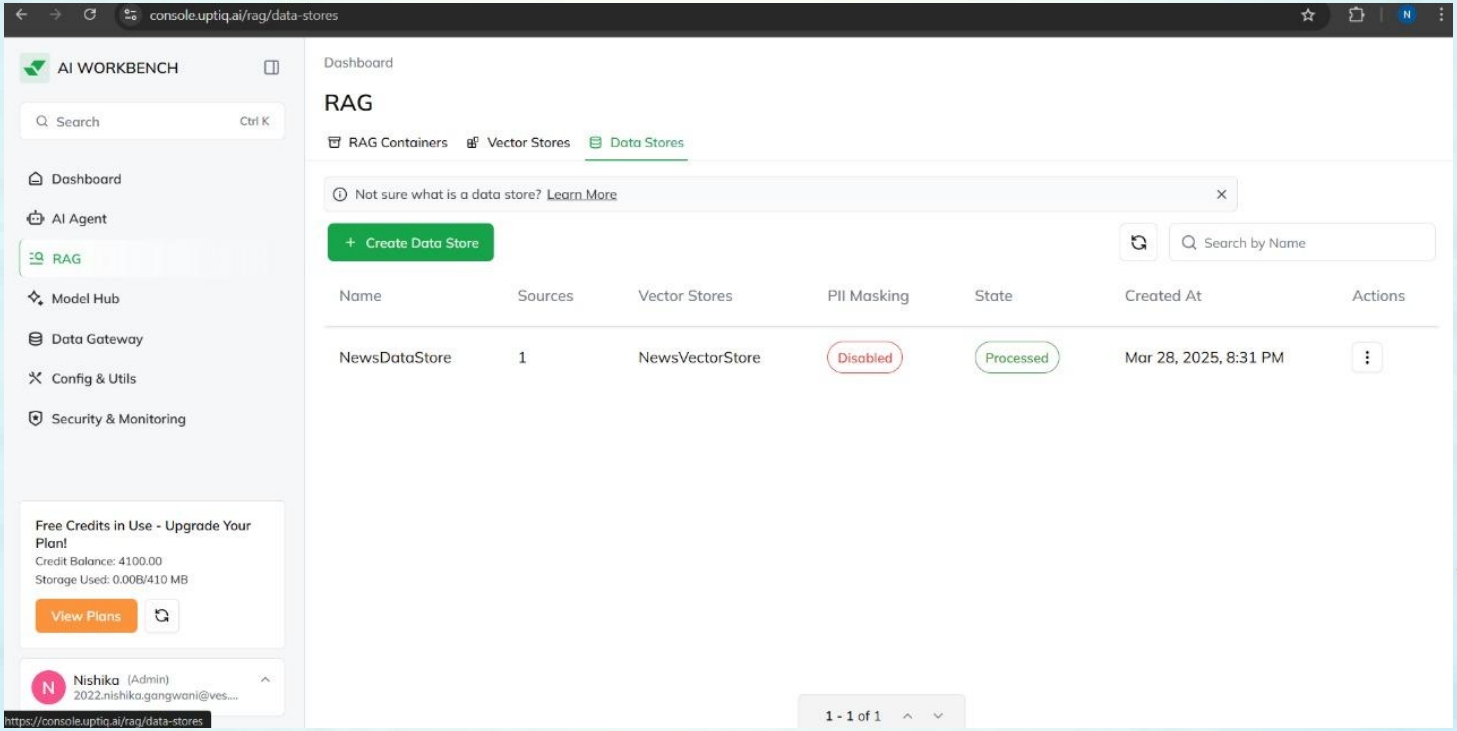


Implementation of Sentiment Analysis

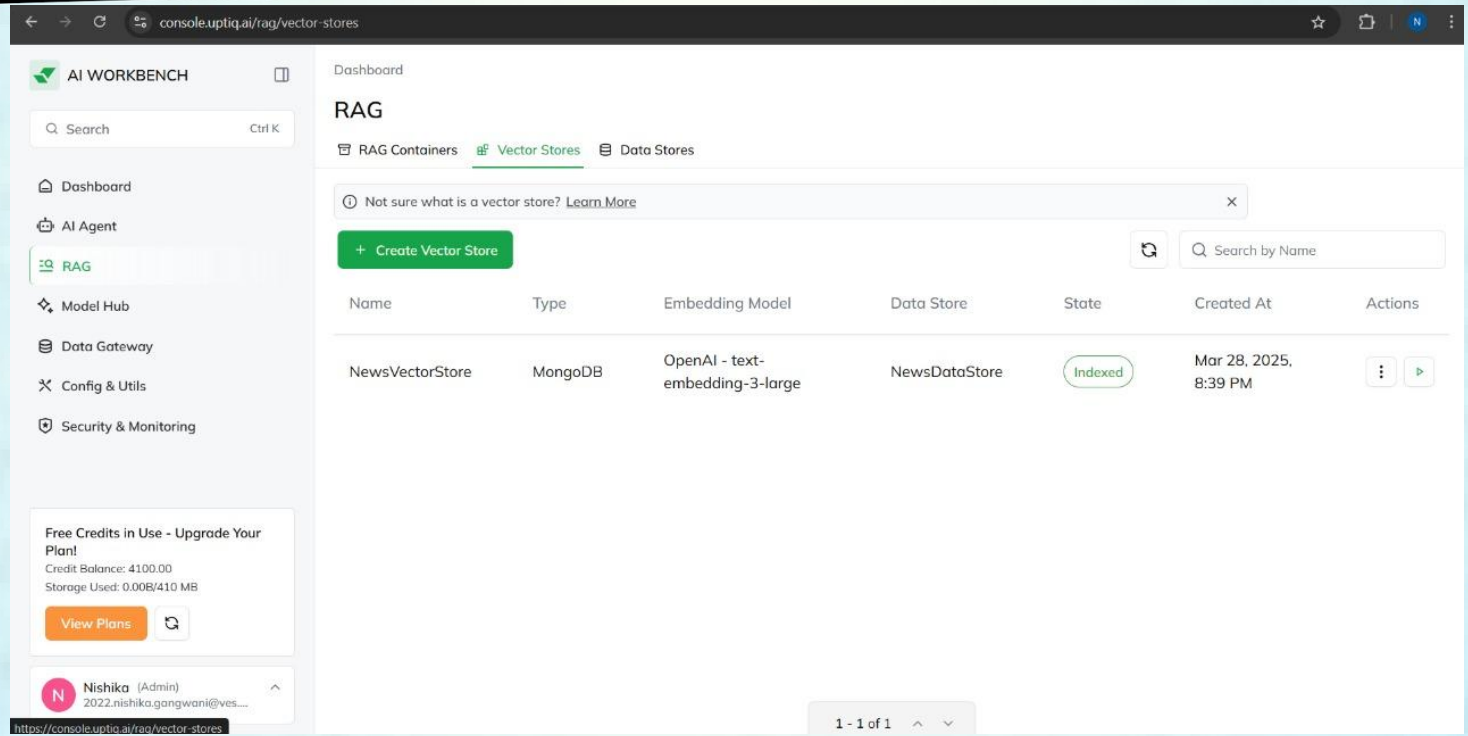
Steps

1) Created a API key in NewsAPI.
2) Ran a Python Code and got a JSON file which we then converted to CSV due to some incompatibility issues.
3) Then we created Data sources after that created vector store and after that we made a RAG Container.
4) We choose the LLM model as GPT-3.5 Turbo Azure.
5) Then the model was working fine with the queries it was tried on.

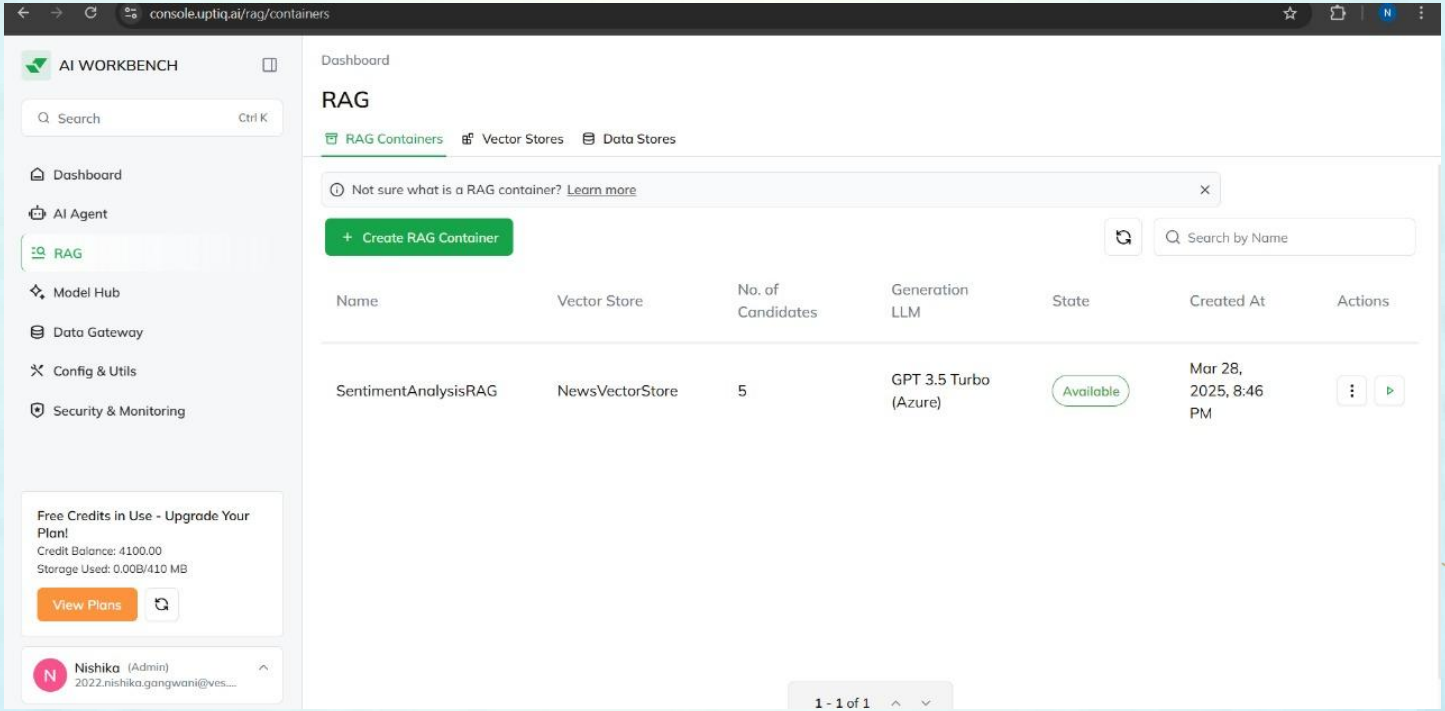
Implementation of Sentiment Analysis



Implementation of Sentiment Analysis



Implementation of Sentiment Analysis



Implementation of Sentiment Analysis

RAG Playground

GPT 3.5 Turbo (Azure)
An economical model designed for speed and simple tasks.

SentimentAnalysisRAG

Filter | Config

Retrieve the top 5 news articles about AAPL and provide a summary of their content.

Based on 5 sources

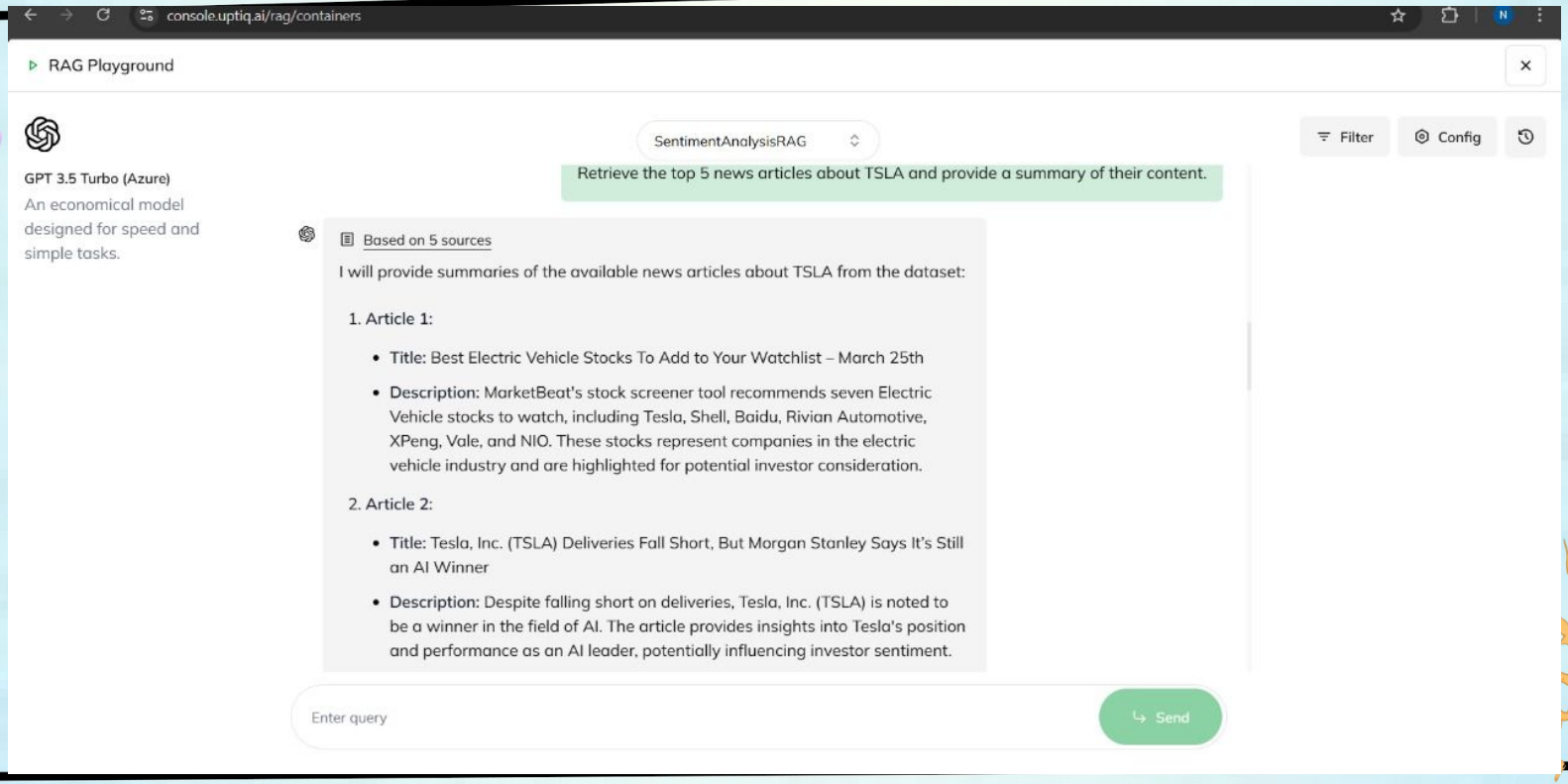
I can provide summaries of the top 5 news articles about AAPL based on the information available in the dataset. Here are the summaries:

1. Article 1:
   - **Title:** Cibc World Market Inc. Acquires 117,592 Shares of Apple Inc.
   - **Description:** Cibc World Market Inc. increased its holdings in Apple Inc. by 2.8% in the fourth quarter. The institutional investor acquired 117,592 shares of Apple Inc. This acquisition shows a positive sentiment towards the company's stock.
2. Article 2:
   - **Title:** FSA Investment Group LLC Invests $495,000 in Apple Inc.
   - **Description:** FSA Investment Group LLC invested $495,000 in Apple Inc. during the 4th quarter, acquiring 2,123 shares of the company's stock. This

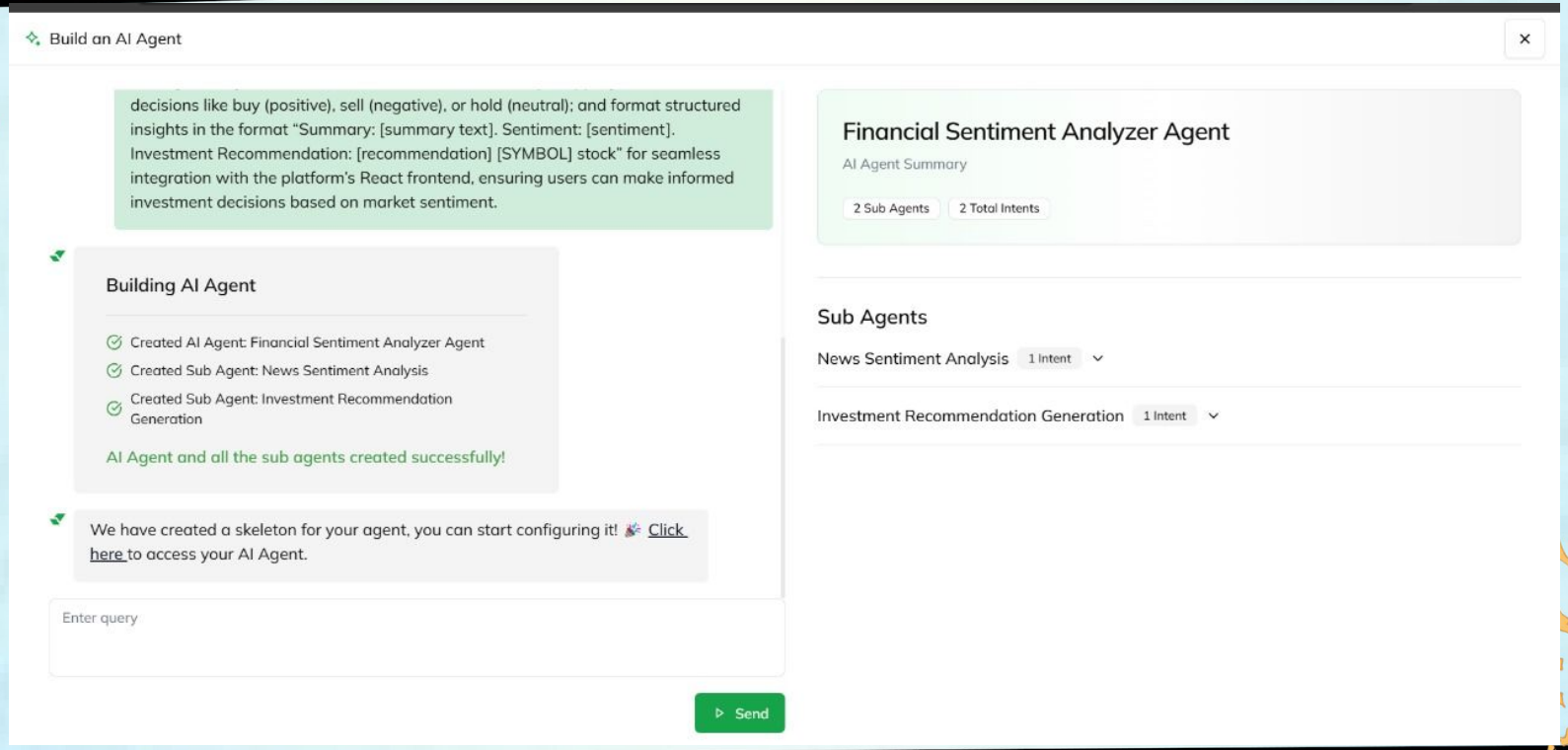
Enter query

Send

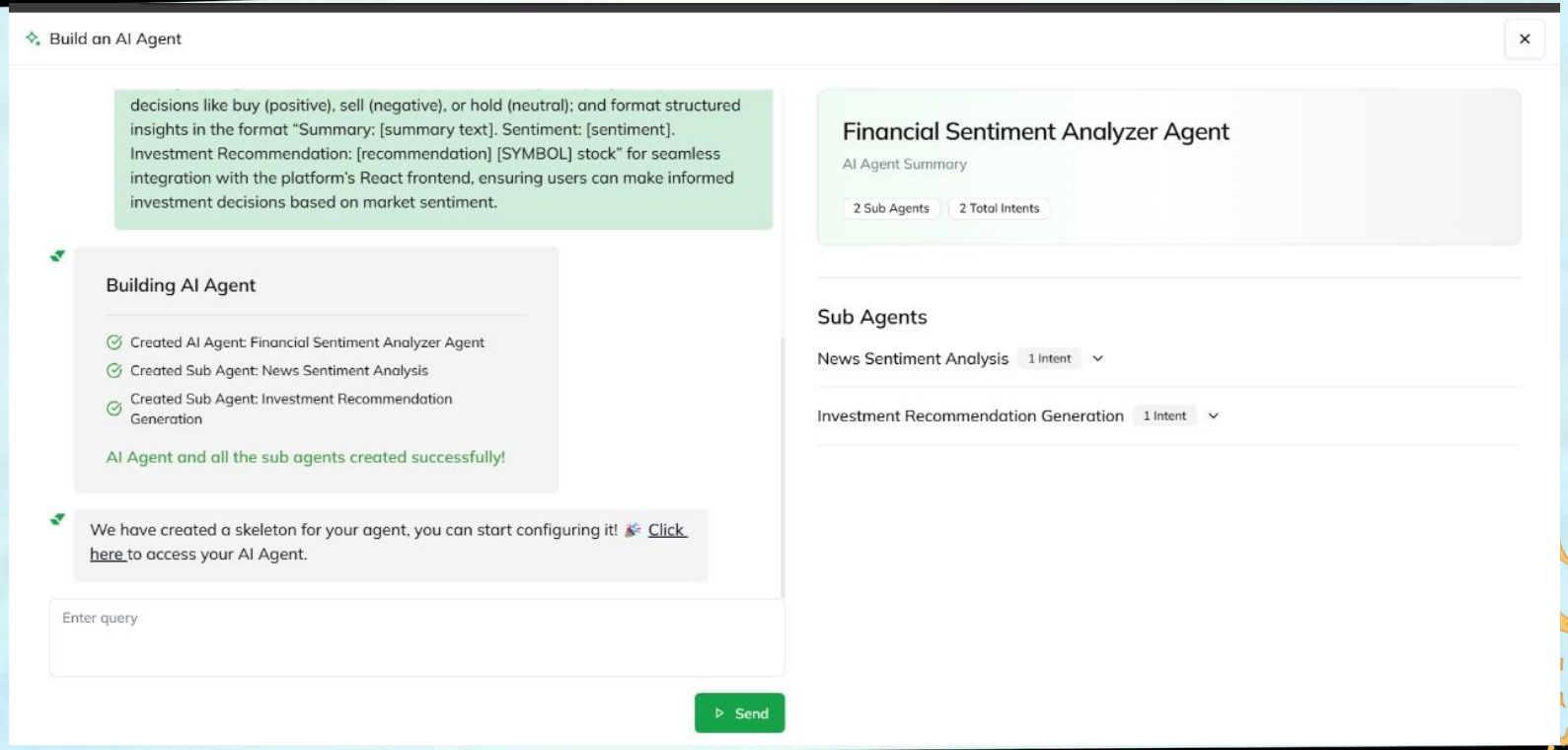
Implementation of Sentiment Analysis



Implementation of Sentiment Analysis



Implementation of Sentiment Analysis



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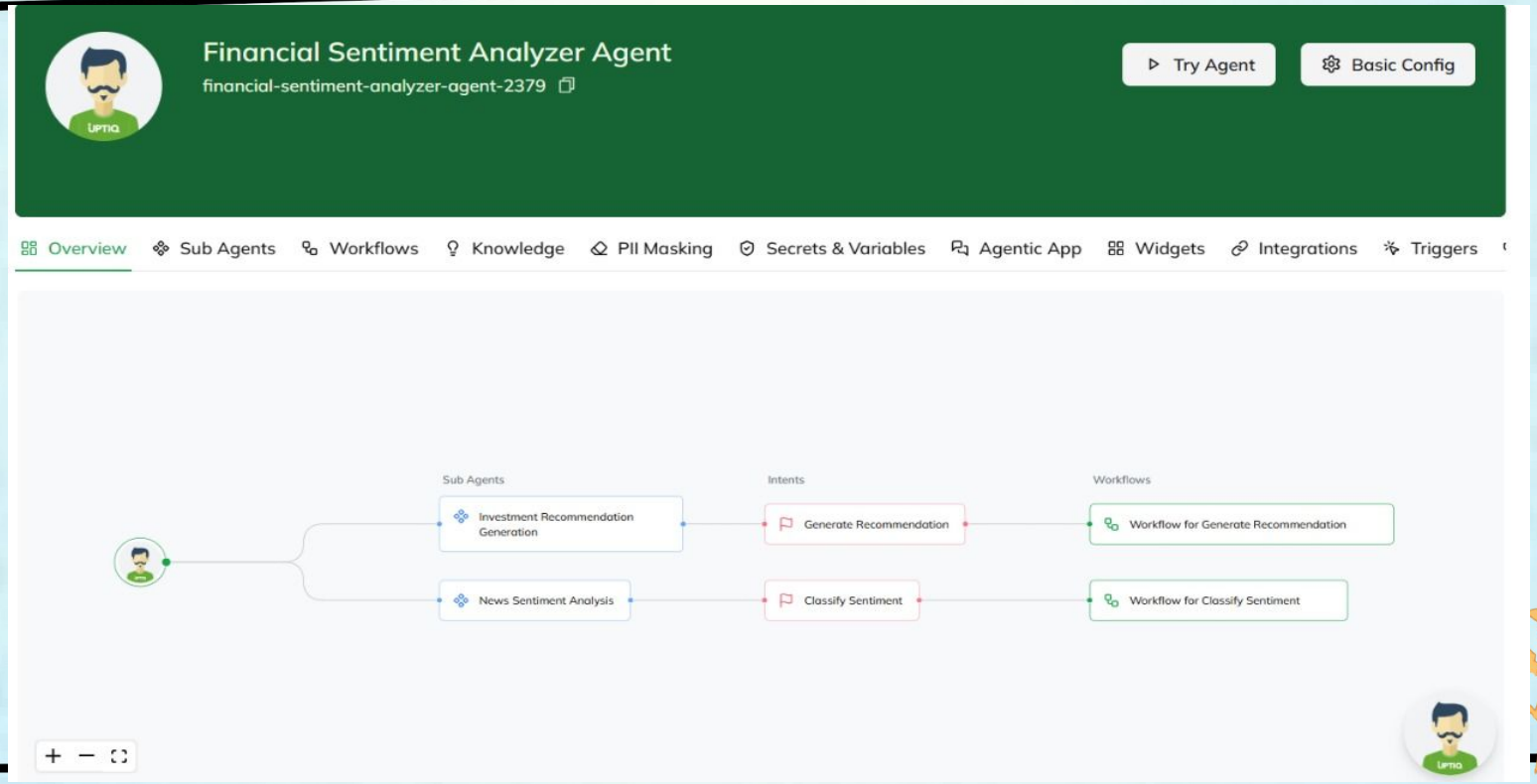
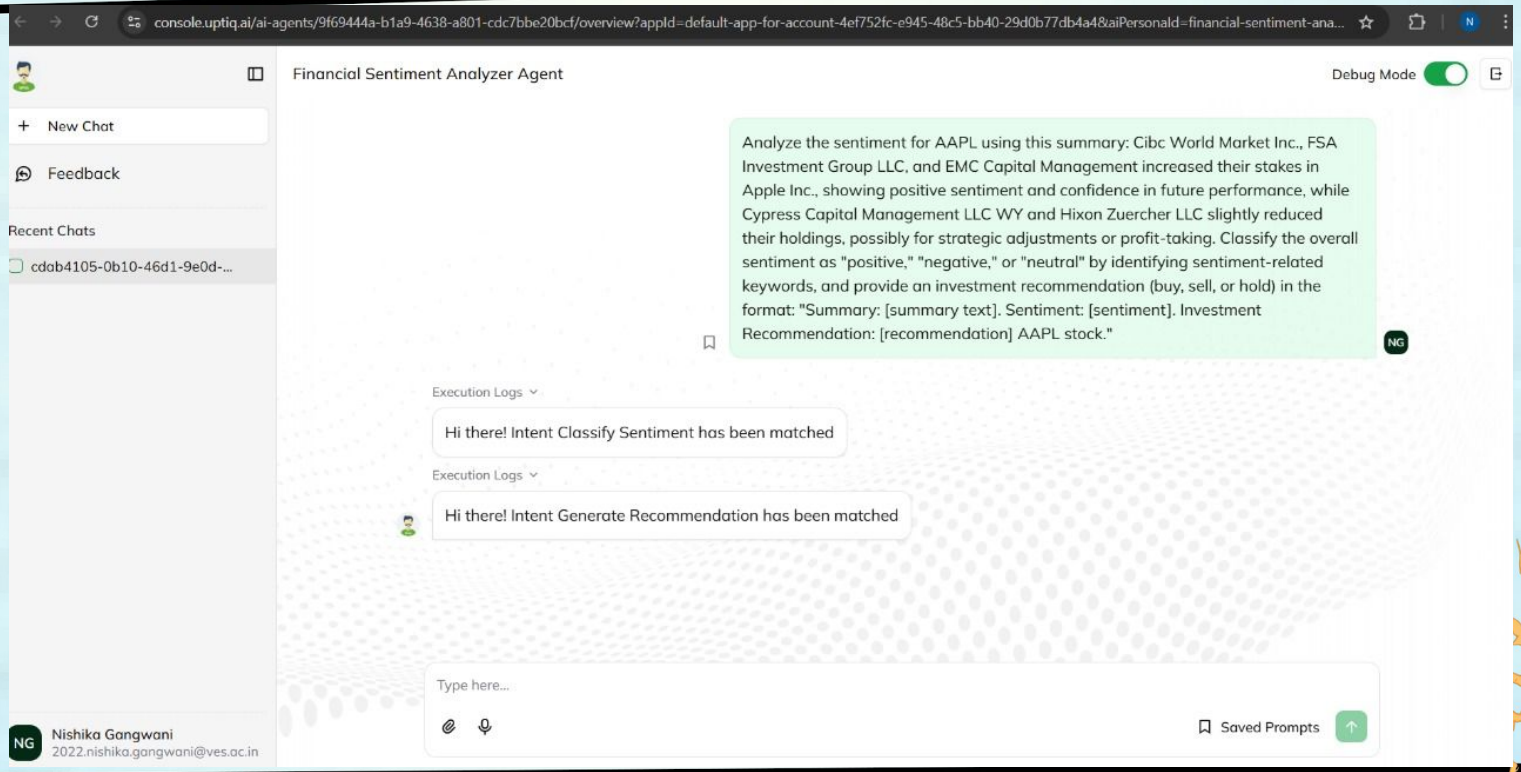
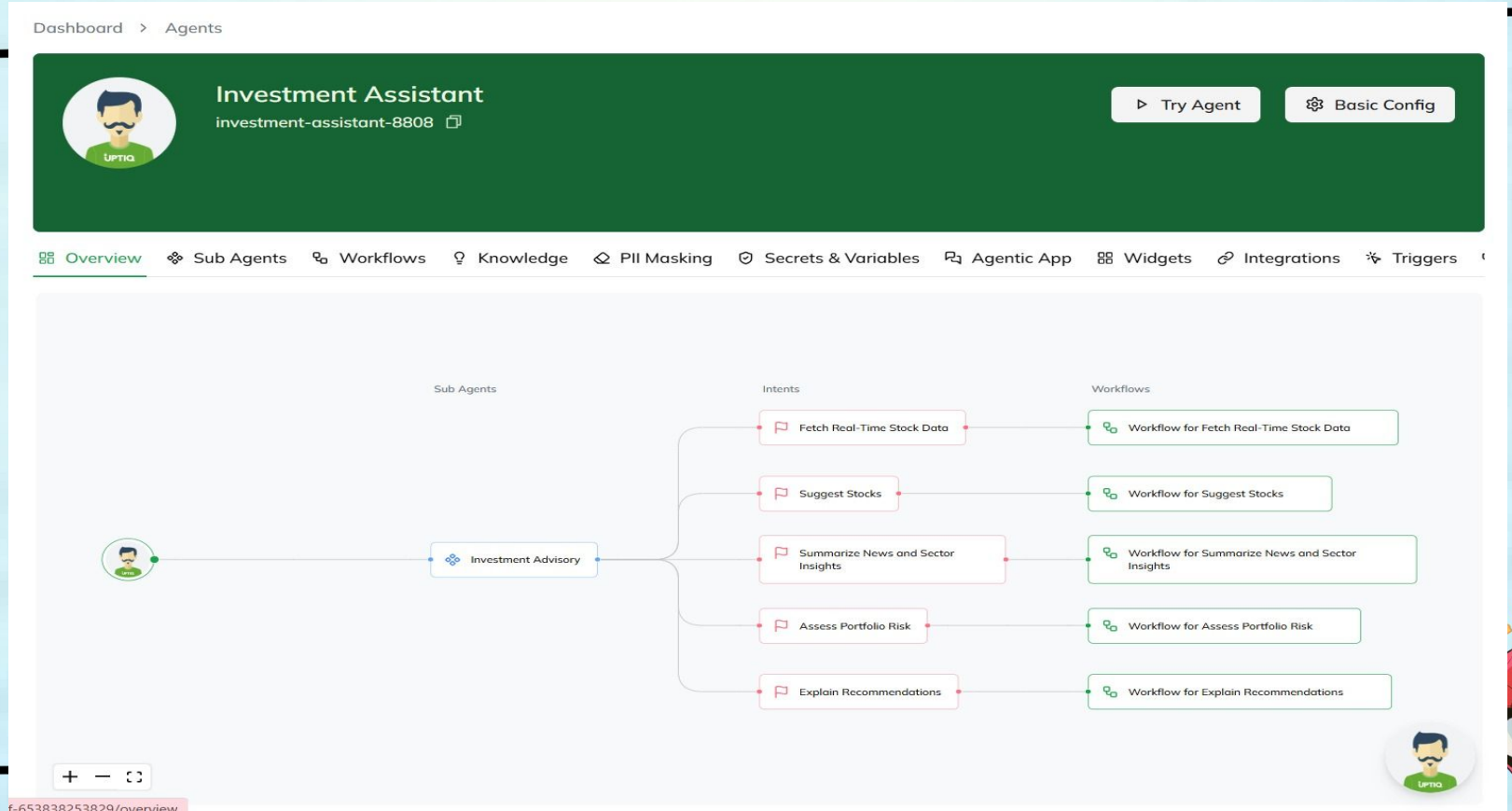


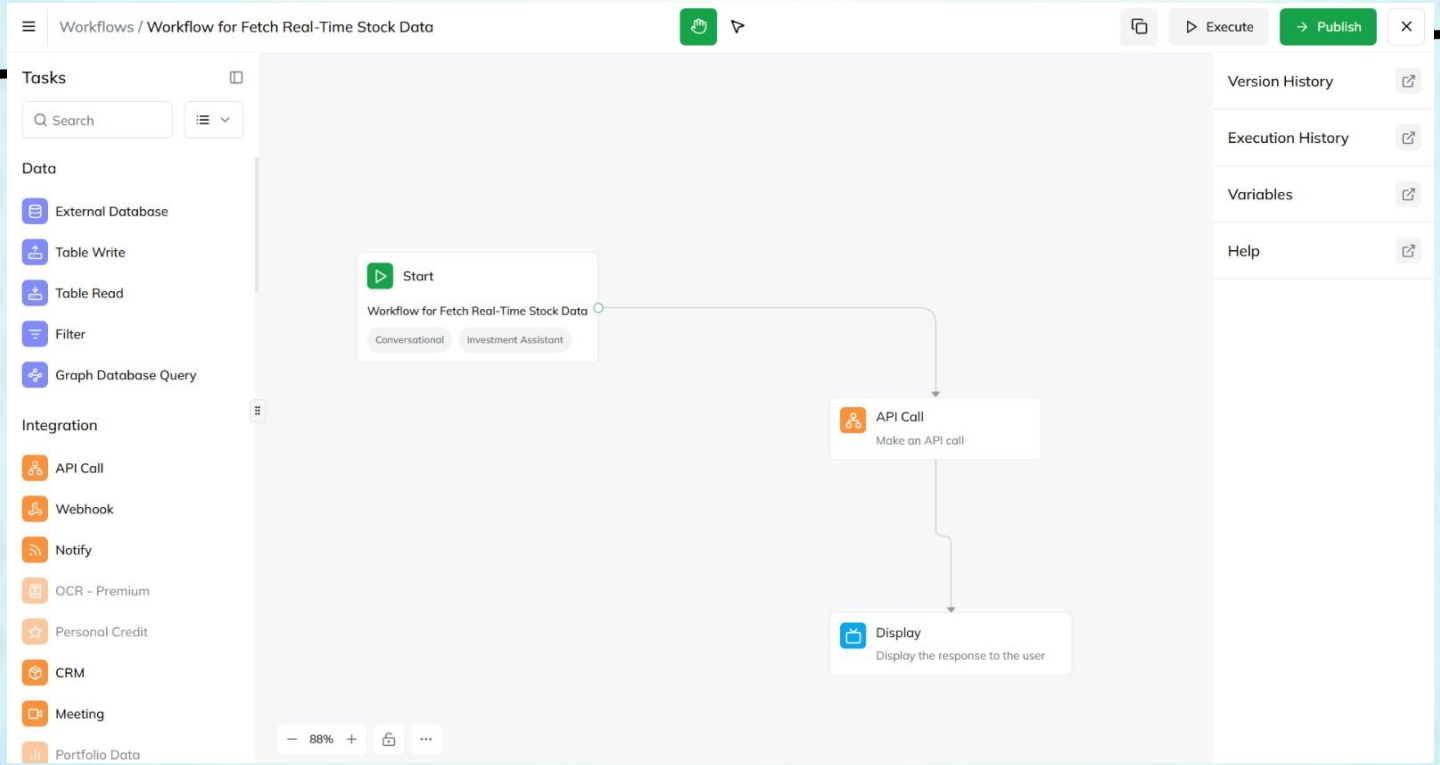
Implementation of Sentiment Analysis



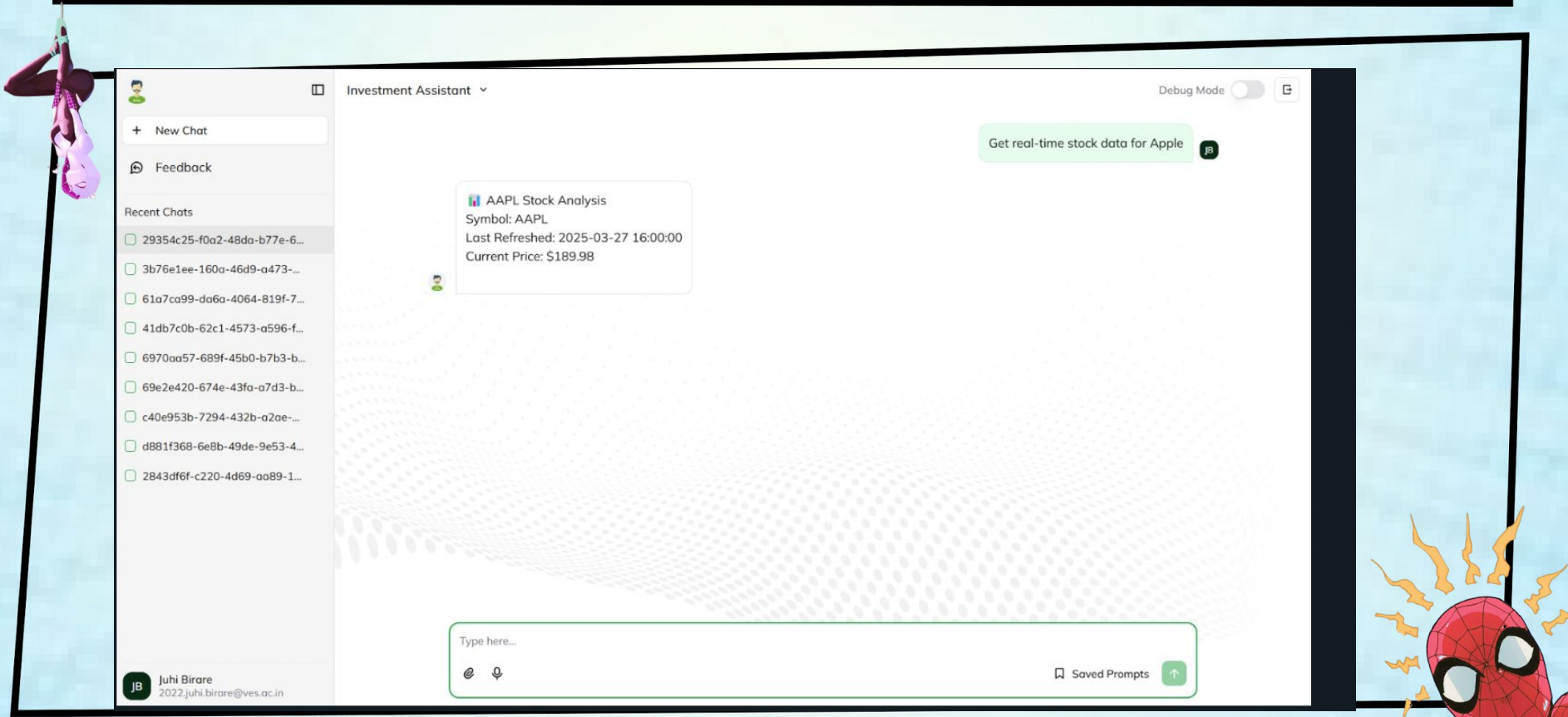
Implementation of AI Powered Investment Analysis



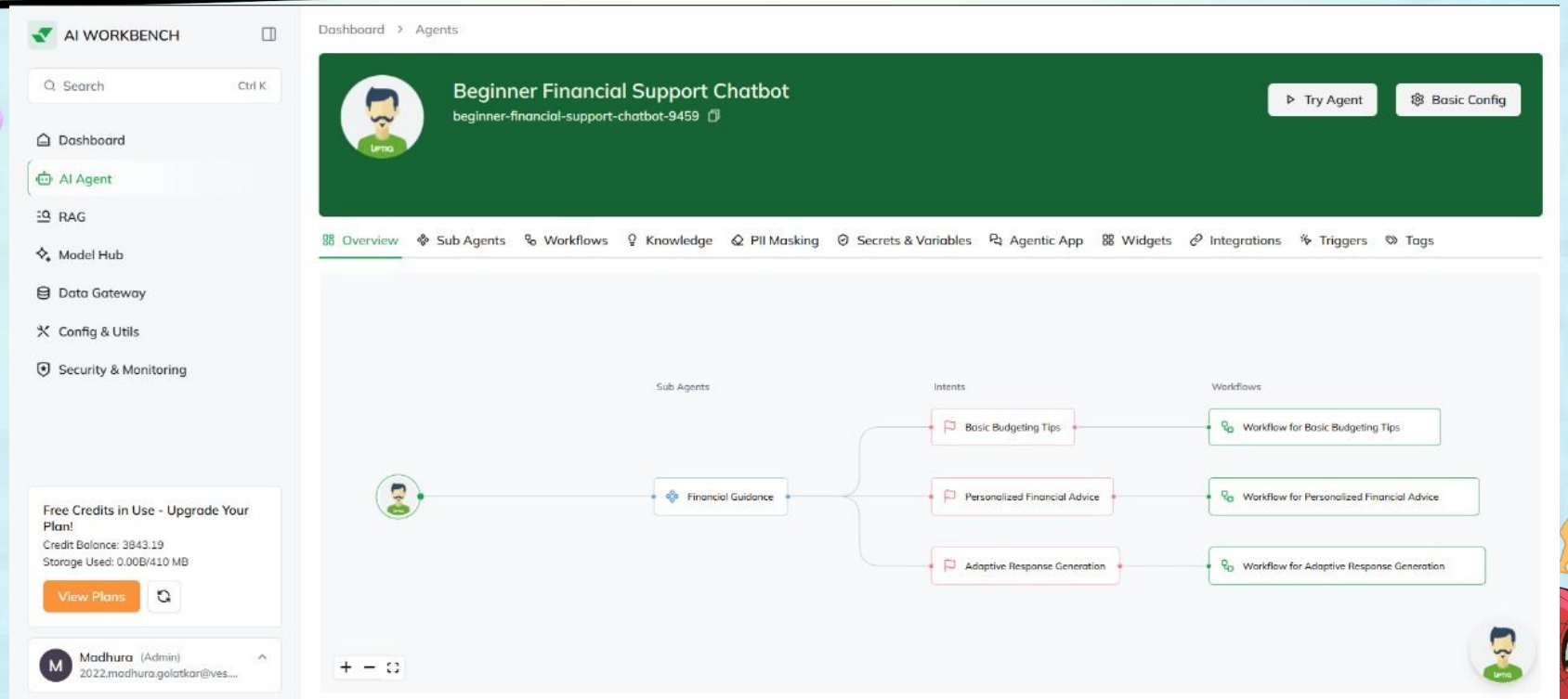
Implementation of AI Powered Investment Analysis



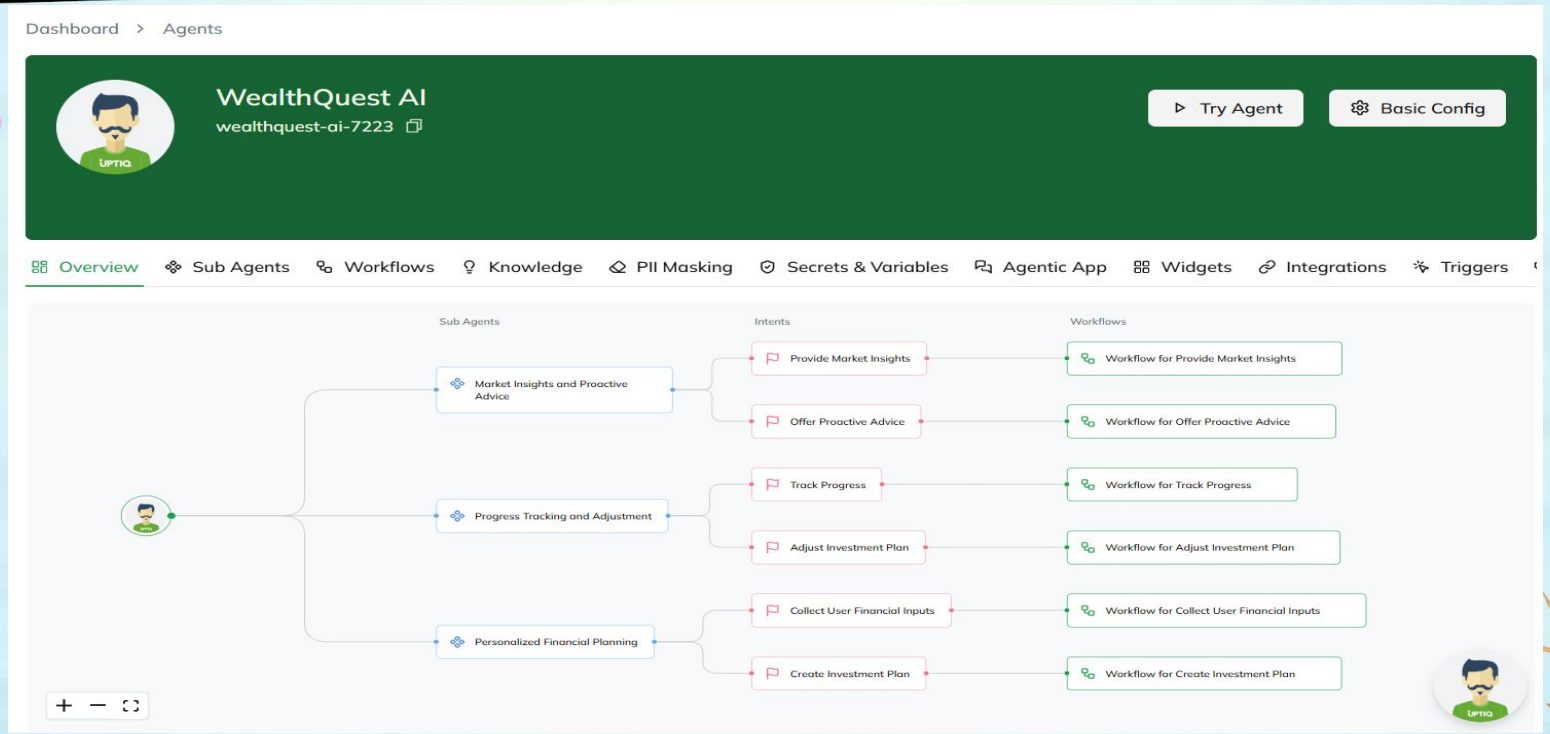
Implementation of AI Powered Investment Analysis



Implementation of Beginner Support ChatBot



Implementation of Goal Based investment Planning



In case of Uptiq category - Your Uptiq Agent (explain in detail)

UPTIQ Platform Features

- **Sentiment Analysis**
  - Scans financial news and social media with BERT/RoBERTa.
  - Tracks trends, updates sentiment, and suggests stocks using **UPTIQ Agentic AI.**
- **Goal-Based Planning**
  - Accesses market data via Model Hub.
  - Creates financial plans (e.g., $500/month for a $100k house).
  - Offers guidance using **UPTIQ RAG Model.**
- **Smart Rebalancer**
  - Assesses market volatility with LSTMs.
  - Adjusts assets (e.g., reduce tech by 5%).
  - Ensures trust using **UPTIQ Agentic AI.**
- **Behavioral Analysis**
  - Evaluates trading habits and updates clusters with K-Means.
  - Recommends stock picks (e.g., TSLA) via **UPTIQ Agentic AI.**
- **Investment Assistant**
  - Gathers data via **Alpha Vantage/XGBoost.**
  - Customizes stock recommendations and adds market context.
  - Provides insights using **UPTIQ RAG Model.**

UPTIQ RAG Model Features

- **Personalized Summaries**
  - Generate daily/weekly portfolio performance reports.
  - Provide contextual market insights.
  - Adapt reports based on user preferences.
- **Beginner Support Chatbot**
  - Deploy conversational **AI using LLMs.**
  - Provide guided financial advice.
  - Generate adaptive responses based on user queries.

Future Objectives

- **Expand Data Sources Globally**
  Integrate international market data using APIs like Quandl and FRED for diversified insights.
- **Enhance AI Model Accuracy**
  Improve prediction reliability with explainable AI using advanced models like XGBoost and LSTMs.
- **Support Diverse Asset Classes**
  Enable investments in cryptocurrencies, REITs, and commodities for comprehensive portfolio management.
- **Hyper-Personalize User Experience**
  Offer AI-driven dashboards tailored to individual goals and risk profiles, adding gamified challenges for engagement.
- **Implement Real-Time Stress Testing**
  Simulate market shocks and economic scenarios to provide proactive risk management strategies.
- **Introduce AI-Driven Tax Optimization**
  Analyze gains using tax data APIs and recommend tax-efficient strategies to maximize user savings.