

Solution Design Document for FinMAS system

The objective of the FinMAS (Financial Analysis using Multi-Agent Systems) is to unlock insights into unstructured data for financial analysts. By using LLMs (Large Language models) in a Multi-agent architecture, the system will extract insights from data sources such as news articles and SEC filings, and combine this with the recent technical and fundamental data for a stock ticker to create an overview report. There is a lot of manual effort involved in analyzing unstructured data, thus there is room for improving the efficiency and reducing the time spent on such sources by applying AI technology. This system aims to demonstrate what is possible with the latest technologies in LLM and NLP (natural language processing), with a particular focus on open-source technologies.

Project Specification and Features

The user interacts with the system through a UI with the following features:

- A Ticker can be selected and then generate a summary report from the data sources that are configured in the system.
- Data can be inspected and visualized directly in the main dashboard (Yahoo Finance News, Benzinga News, SEC filings, price data)
- The Multi-agent system can be configured with different LLMs and Agent configurations directly in the app or in the app folder.
- Major Tickers that are listed on NASDAQ and NYSE exchanges are supported.
- Popular LLMs like GPT-4o-mini from OpenAI and Llama 3 from Meta are supported.

App Architecture

The app is developed in a component-based fashion where dedicated components are each responsible for a separate part of the system. This makes it easier to further extend the system if needed with additional functionality within each component. Each component has its respective folder in the codebase.

The main architecture of the app consists of 4 main components:

- **panel:** Component that handles the user interface, all user interactions, and data visualization. The component configures the system with default settings and lets the user further customize the system.
- **crews:** Component that is responsible for setting up and running dedicated Multi-agent systems (crews) that either focus on a specific data source or multiple data sources. Tools that the Agents use to perform their tasks are defined here.
- **data:** This component focuses on fetching data from sources such as SEC filings, Benzinga News, Yahoo Finance News, or Alpha Vantage Fundamentals.
- **utils:** The objective of this component is to gather helper functions that are used across the different components in a commonplace.

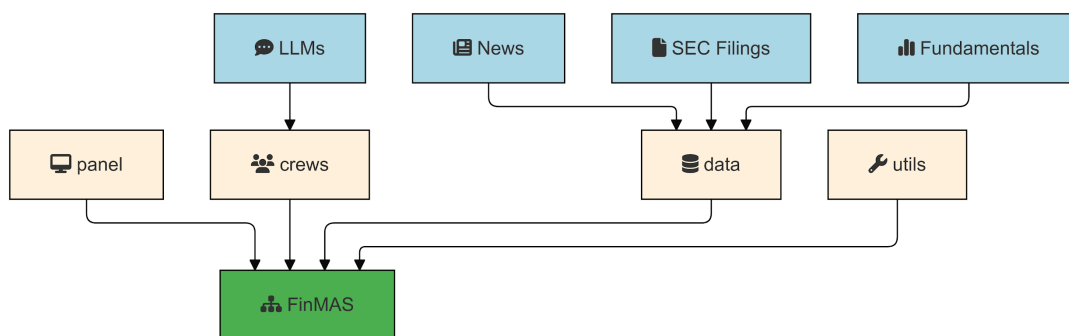


Figure 1. FinMAS App Architecture