

Software Design and Architecture

Stock Market Data Processing Application

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Project Overview

The project is about building a web application that will handle stock market data from the Macedonian Stock Exchange (MSE). The app will focus on stock data from the past 10 years, excluding bonds. It will automatically collect stock issuer lists from the MSE website, check the database for missing data, and then collect any missing stock data. The data will be cleaned, formatted, and stored in a structured way, making it ready for analysis.

The system will use the **Pipe and Filter**. This means the data will move through a series of steps like collecting, cleaning, and saving, ensuring the process is organized and efficient. The main goal is to build an app that is reliable and can handle more data over time without any issues, while keeping everything updated for easy analysis.

Functional and Non-Functional Requirements

Functional Requirements:

- Automatically download the list of stock issuers (excluding bonds and codes with numbers) from the MSE website and regularly update this list without manual input.
- Check the database to see if any stock data is missing information, reducing the chances of duplicates and ensuring the database stays current with minimal redundancy.
- Ensure consistent formatting for dates and prices: use a standard format for dates (DD-MM-YYYY) and display prices with commas and periods.
- Add new data to the database or file easily, making sure it's correct and avoiding any data loss during updates.
- Support data from various sources by reusing the same data pipeline (including pipes and filters), improving maintainability and scalability.

Non-Functional Requirements:

- The system should process data quickly, minimizing delays for users.
- The system should handle increasing amounts of data over time without performance issues.
- Data should be stored accurately and completely, with no loss or corruption.
- Data must be protected from unauthorized access to ensure privacy and data safety.
- The system should be built in components, allowing easy reuse and extension of each part.
- The code should be simple to update and improve as needed.

Personas

Financial Analyst

Name: Ilir

Age: 35

Goal: Study long-term stock trends for his reports.

Problem: Getting data late or incomplete, making more work for him.

Part-time Investor

Name: Trim

Age: 28

Goal: Keep track of his favorite companies' stock.

Problem: Not having access to accurate or up-to-date data

User Scenarios

Ilir the Analyst:

Ilir is a financial analyst who regularly needs accurate and complete stock data for reports on long-term trends. Each time he logs into the app, it automatically checks for any missing stock data, downloads it if necessary, and formats it for easy analysis. This saves him time and ensures his data is always up to date for making data-driven recommendations.

Trim the Investor:

Trim is a part-time investor who likes to keep an eye on a few favorite stocks. He relies on the app to gather and fill in any gaps in stock data, presenting it in a simple format he can use for quick analysis. The app's reliability and accuracy help Trim make better investment choices without needing to dig through incomplete or outdated information.

Descriptive Narrative

Ilir, a financial analyst, logs into the app each morning to review Macedonian stock trends. As soon as he logs in, the app automatically checks the database for the latest stock data, identifies any gaps, and retrieves any missing information. The data is formatted in a consistent way that makes it easy for Ilir to analyze, saving him time and ensuring accuracy in his reports.

Trim, a part-time investor, also uses the app to keep track of his favorite companies' stocks. Whenever he opens the app, it's already gathered and organized the latest data, filling in any missing pieces and presenting it in a clean, user-friendly layout. With accurate and up-to-date information at his fingertips, Trim can make confident investment decisions without needing to search multiple sources.

Both Ilir and Trim rely on the app to provide fast, accurate, and reliable stock data, enabling them to make informed choices and focus on their goals without worrying about incomplete or outdated information.