Macedonian Stock Exchange Web Application

Software requirements specifications (SRS)

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Overview

This project aims to develop a database-driven web application that automates the retrieval, transformation, and storage of stock data for companies listed on the Macedonian Stock Exchange. The application will collect data, process, and filter the data, fill in missing entries, and maintain an up-to-date database covering the past 10 years.

Functional Requirements

1. Data Retrieval and Filtering

- The system shall automatically retrieve a list of the issuers.
- The system shall filter the retrieved list of issuers based on predefined criteria.
- The system shall retrieve any missing data for completeness.

2. Data Consistency and Parsing

- The system shall check the last updated date for each issuer in the database.
- The system shall ensure all retrieved data is correctly parsed and consistent.

3. Data Storage and History

- The system shall store data for each issuer, covering a history of the past 10 years.
- The system shall store all processed data in the database.

4. Data Validation

- The system shall perform data validation to ensure the integrity and accuracy of the data.

5. Machine Learning Prediction

- The system shall implement machine learning to predict stock changes with an accuracy of 70-80%.

6. User Feedback

- The system shall provide feedback to the user with suggestions to buy, sell, or stay neutral based on predictions.

Non-functional requirements

1. Performance and Scalability

- The system shall be able to handle large volumes of data efficiently.
- The system shall process and store data within 6 minutes.
- The system shall be designed to scale without significant loss in performance.

2. Security and Data Protection

- The data sent between the user and the server shall be protected with up-to-date security protocols.

3. Compatibility and Availability

- The system shall be compatible with multiple operating systems.
- The system shall be available 99.999% of the time.

4. Usability

- The system interface shall be simple and easy to navigate.

5. Machine Learning Operations

- The system shall be able to train the ML model consistently without affecting other functionalities.

User Scenarios

Scenario 1: Automated Data Retrieval for Multiple Issuers

- Persona: Jovan, a financial researcher at a local bank, is responsible for conducting market research on many issuers in the Macedonian Stock Exchange.
- Goal: Jovan needs to automatically download and update historical stock data for 100 different issuers, including companies from multiple industries, for the past 10 years.

- Action: Jovan runs the application, which automatically fetches the full list of issuers from the MSE website. The system checks the last available data for each issuer and only downloads missing data. The system then stores the processed data in a CSV file, ready for analysis.
- Outcome: Jovan successfully retrieves and processes the historical data for 100 issuers, saving time and ensuring accuracy without any manual intervention.

Scenario 2: Predictive Stock Recommendations

- Persona: Ana, a financial advisor, wants to provide investment recommendations to her clients.
- Goal: The system should offer suggestions to buy, sell, or stay neutral based on stock price predictions.
- Action: Ana selects a stock and uploads historical data, then the system analyzes trends and predicts future price movements. Based on the prediction, the system provides Ana one of three recommendations, buy if the stock price is expected to rise, sell if the price is predicted to drop, or stay neutral if the price shows minimal movement or uncertainty.
- Outcome: Ana receives clear recommendations to help guide her client's investments based on the system's predictions.

Descriptive narrative

Elena, a financial advisor, opens the stock analysis application and uploads historical data for a selected stock. The system processes the data using predictive algorithms to forecast the stock's future price movement. After a brief analysis, the system recommends that Elena buy the stock, as it is predicted to rise by 8% in the coming weeks. The recommendation is accompanied by a confidence score of 85%, assuring Elena of the prediction's reliability. With this insight, Elena is ready to make an informed decision and continue advising her clients effectively.