PROJECT PROPOSAL

Team - SNAP

Team Members:
21CS10020 - Choda Y B V Anjaneya
21CS10040 - Maddi Nihith
21CS10052 - Pola Gnana Shekar
21CS10060 - Simma Pavan Kumar

Real Time Stock Market Monitoring Platform

StockFlix

Streaming Market Trends

Introduction:

In today's fast-paced financial markets, having access to real-time stock market data is crucial for investors and traders. Our project, the Real-time Stock Market Monitoring Platform, aims to address this need by providing a comprehensive solution for monitoring stock market data. By leveraging the power of temporal databases, our platform will offer users a valuable tool for tracking stock prices, trading volumes, and other relevant metrics.

Database Point of View:

Temporal databases manage time-varying data, including real-time stock market data and historical stock data. They support efficient storage and querying of time-varying data, including temporal operators and versioning. key points:

- Using temporal databases improves data analysis, supports temporal queries, and ensures compliance with regulatory requirements.

- Temporal databases use models like valid-time and transaction-time, and query languages like TSQL2 and SQL:2011 extensions.
- Queries to the database will include real-time monitoring queries to retrieve the latest stock market data and analytical queries to analyze historical data.
- Query optimization techniques will be employed to enhance query performance, such as indexing, query rewriting, and parallel query processing.
- Temporal databases are used in financial systems, healthcare, and manufacturing, and are crucial for our stock market platform.

Challenges and Considerations:
Some challenges associated with temporal databases include managing large volumes of temporal data, ensuring data consistency and integrity over time, and optimizing query performance for temporal queries. These challenges require careful consideration and planning to overcome in our project.

From a database perspective, our project involves designing and implementing a temporal database to support the real-time stock market monitoring features of the platform. The database design includes tables to store real-time stock market data, historical stock market data, and user-related data. Temporal features of the database, such as versioning and effective date support, will be utilized to manage time-varying data efficiently. Data storage and retrieval mechanisms will be optimized to handle high-frequency updates and manage large volumes of data. Query processing and optimization techniques will be employed to enhance query performance. Overall, the temporal database will play a crucial role in enabling our platform to provide real-time stock market monitoring, offering users a reliable and efficient tool for tracking stock prices, trading volumes, and other relevant metrics.

Abstract

The proposed project aims to develop a comprehensive platform that provides real-time stock market monitoring. The platform will consist of a real-time stock market monitoring dashboard that displays real-time stock market data, including price changes, trading volumes, and other relevant metrics. The dashboard will utilize a temporal database to efficiently store and query time series data, enabling users to track stock market trends and make informed investment decisions.

Weekly Plan

Week 1:

1. Research and Planning:
    - Conduct in-depth research on real-time stock market data sources and APIs.
    - Evaluate the pros and cons of each data source based on reliability, accuracy, and accessibility.
    - Plan the project timeline and milestones.
2. Development Environment Setup:
    - Set up the development environment, including installing necessary software and tools.
    - Configure the project structure and version control system (e.g., Git).
3. User Interface Design:
    - Create wireframes and mockups for the dashboard user interface.
    - Define the layout, components, and visual style of the dashboard.

Week 2:

1. Backend Development:
    - Develop backend functionality for fetching and processing real-time stock market data.
    - Implement APIs or services to retrieve data from selected sources.
    - Ensure data is stored efficiently and securely.

2. UI Implementation:
    - Implement basic UI components to display real-time stock market data.
    - Display stock prices, trading volumes, and other relevant metrics.
    - Ensure the UI is responsive and visually appealing.

Week 3:

1. Data Visualization:
    - Implement advanced data visualization components for the dashboard (eg., charts, graphs).
    - Ensure the visualization effectively represents real-time stock market data.
    - Implement interactive features for data exploration.
2. Database Manipulation:
    - Develop algorithms for aggregating and filtering data based on user preferences.
    - Implement efficient data manipulation techniques to handle large volumes of data.
    - Ensure data integrity and consistency in the database.

Week 4:

1. Integration and Testing:
    - Integrate the backend functionality with the frontend to ensure seamless data flow and real-time updates.
    - Conduct thorough testing to identify and resolve any issues.
    - Ensure the dashboard meets the requirements and is ready for deployment.
2. Database Optimization:
    - Fine-tune database queries for optimal performance.
    - Implement caching mechanisms to improve query response times.
    - Evaluate and optimize database schema for efficient data storage and retrieval.

Conclusion:

This revised plan addresses the concerns raised and provides a more balanced approach to the project timeline. It ensures that sufficient time is allocated to each phase of development while maintaining a focus on timely completion of key milestones.

References and Resources

These are the resources which we have gathered and referred to:

- Timescale Documentation: Analyze financial tick data with TimescaleDB.
- Twelve Data: Real-Time market Data APIs