**ECHO TRADE – NEWS TO MARKET MOVEMENTS**

**FEASIBILITY STUDY**

**FRONT END:** Create an interactive UI that displays stock price trends, sentiment analysis, and the impact of news articles.

Components:

- Interactive visualizations for stock prices, news events, and sentiment analysis
- Dashboard for users to explore correlations and timelines of stock movements and news events

Tools and Technologies:

- Frameworks/Libraries: React or Flask (for building dynamic and interactive UI)
- Visualization Libraries: Plotly (for rendering charts and graphs)
- Additional Tools: Fetch API (for handling API requests)

**BACK END:** Handle data processing, API integration, sentiment analysis, and serve as the communication layer between the front-end and the database.

Components:

- API integration for fetching data from news and stock APIs
- Sentiment analysis implementation
- Manage user requests from the front-end
- Process historical data and compute correlations

Necessary Tools and Technologies:

- Frameworks: Flask (for building the back-end server and handling API requests)
- Sentiment Analysis: NLP (for processing and analyzing news article sentiment)

**DATA (External API Integration):** Collect stock price and news data from external sources, process and store it in a structured format.

Components:

- Retrieving historical stock prices
- Collecting and storing news articles
- Processing the data

Necessary Tools and Technologies:

- Stock Data API: Alpha Vantage (for retrieving historical stock prices)
- News API: NewsAPI or Google News API (for retrieving news articles based on keywords or event dates)
- Data Processing Libraries: Pandas (for cleaning and processing financial and news data)

**STORAGE:** Store historical stock data and news articles, along with the computed analysis (e.g., sentiment, impact scores).

Components:

- Scalability for increasing volumes of data as real-time features is introduced

Necessary Tools and Technologies:

- Database: MongoDB

**DATA PREPROCESSING AND ANALYSIS:** Perform calculations and analysis to correlate news impact with stock price movements.

Components:

- Analyzing stock data to identify trends and correlations before and after news events

- Applying statistical methods to get the news impact
- Storing and updating analysis results

Necessary Tools and Technologies:

- Libraries: NumPy, SciPy (for statistical analysis and mathematical computations)
- Data Analysis Tools: Pandas (for data manipulation and analysis)
- Data Transformation: Scikit-learn (for any normalization or transformation of the dataset)
- Machine Learning (Future): TensorFlow, Keras, or PyTorch (for integrating predictive models later on)
- Sentiment Analysis Tools: NLP (for processing and analyzing news sentiment)

**VISUALIZATION AND REPORTING:** Provide insights through visual representations of data and offer reports summarizing key findings.

Components:

- Generating charts and graphs to display correlations and trends
- Interactive reporting and analytics to display news impact on stock prices

Necessary Tools and Technologies:

- Visualization Libraries: Matplotlib, Plotly (for creating static and interactive charts)
- User Export: CSV file export functionality (to allow users to download reports)

**PROJECT MANAGEMENT AND COLLABARATION:** Track project progress, facilitate collaboration, and maintain version control.

Components:

- Task management and team coordination
- Version control for collaborative code development.

Necessary Tools and Technologies:

- Version Control: Git, GitHub (for managing code repositories and version control)
- Collaboration: Discord (for real-time team communication)
- Documentation: Microsoft Word (for documenting project progress, decisions, and technical documentation)

**SURVEY SUMMERY**:

Our survey reveals that news significantly influences stock prices, with respondents knowing that headlines can trigger notable changes in a company's stock performance. Many agree that analyzing news events is important for predicting future success or challenges, making it an important factor in investment decisions. The idea of using an API to gather historical stock data and applying natural language processing to analyze news sentiment was well-received, especially with the inclusion of a dashboard to visualize stock price fluctuations along with sentiment analysis. While participants appreciated the concept, some suggested adding economic indicators and filters for different news types. Although a concern was raised about the difficulty of acting on news in real-time, as it's often quickly reflected in stock prices. However, the project's focus on past trends was seen as a valuable tool for understanding how news has historically impacted stock performance, supporting the overall goals of providing investors with meaningful insights.

Link to summery results:
https://docs.google.com/spreadsheets/d/1rW25RXu7yhYL633MS9hLyZIsrrzbPCPQVKRItW0UaAE/edit?usp=sharing