Software Engineering
Software Requirements Specification (SRS) Document

[Stock Tracker App]

[https://github.com/Daviidr3/Mkrt.git]

[09/25/2023]

[0.1]

By: [David Vasquez, Salomon Perez, Ro Mei]

[Honor Code]

Table of Contents

1. Introduction

1.1. Purpose

The goal of the Stock Tracking App is to allow its users to monitor changes in the stock market whenever they wish to do so. The app will allow its users to select the stocks they want to track, check news information that are deemed relevant to stocks, and allow its users to access historical stock data.

1.2. Document Conventions

The purpose of this Software Requirements Document (SRD) is to describe the client-view and developerview requirements for the Stock Tracking App (STA). Client-oriented requirements describe the system from the client's perspective. These requirements include a description of the different types of users served by the system. Developer-oriented requirements describe the system from a software developer's perspective. These requirements include a detailed description of functional, data, performance, and other important requirements.

1.3. Definitions, Acronyms, and Abbreviations

Java	A programming language originally developed by James Gosling at Sun Microsystems. We will be using this language to build the Restaurant Manager.
MySQL	Open-source relational database management system.
.HTML	Hypertext Markup Language. This is the code that will be used to structure and design the web application and its content.
SpringBoot	An open-source Java-based framework used to create a micro Service. This will be used to create and run our application.
MVC	Model-View-Controller. This is the architectural pattern that will be used to implement our system.
Spring Web	Will be used to build our web application by using Spring MVC. This is one of the dependencies of our system.
Thymeleaf	A modern server-side Java template engine for our web environment. This is one of the dependencies of our system.

NetBeans	An integrated development environment (IDE) for Java. This is where our system will be created.
API	Application Programming Interface. This will be used to implement a function within the software where the current date and time is displayed on the homepage.

1.4. Intended Audience

- Section 1: Stakeholders, Users, Project Managers, Developers and Users.
- Section 2: Stakeholders, Developers, Project Managers.
- Section 3: Developers, Project Managers.
- Section 4: Developers, Project Managers.
- Section 5: Developers, Project Managers.
- Section 6: Developers, Project Managers.

1.5. Project Scope

The goal of the software is to provide an easy-to-use, and accurate, interface for Stock Trackers, News Readers, and Stock Market Researchers, as well as provide users with the flexibility to meet their needs. This aligns with the overall business goals of the stock tracking app as a stock tracking system requires fast, efficient, and accurate services in order to fulfill the needs of its users.

The benefits of the project to it users include:

- Allowing its users to be able to check their preferred stocks from anywhere, without having to give up too much personal information (SSN, Government issued ID, etc.) like you'd do in stock trading apps.
- Giving users relevant stocks-related information that they may otherwise not have heard of, allowing our users to be caught up to everything deemed relevant by the API in the stocks world..
- Providing historical stock data to our users, allowing them to be able to research and study the market.

1.6. Technology Challenges

The application is to be ran on the Windows OS, using a XAMPP database by the name of "csc340-f23-crud"

1.7. References

- Ticker News - Polygon. (n.d.). Polygon.io. https://polygon.io/docs/stocks/get_v2_reference_news
- Morah, C. (2022). What are all of the major US stock exchanges? *Investopedia*. https://www.investopedia.com/ask/answers/08/security-market-usa.asp
- Srivastava, S. (2023, June 30). Stock Trading App Development: A Complete guide. Appinventiv. https://appinventiv.com/blog/stock-trading-app-development/

- Chen, J. (2022). Tracking Stock: Definition, Benefits, Risks, and example. Investopedia. https://www.investopedia.com/terms/t/trackingstocks.asp#:~:text=A%20tracking%20stock%20is%20a%20specialized%20equity%20security%20issued%20by,independent%20of%20the%20parent%20stock.

2. General Description

2.1. Product Perspective

The stock app originated from an idea of having a single place that is beginner friendly for keeping up with stock news and price updates, as well as historical stock data, of any selected stock, all intended for beginning traders.

2.2. Product Features

The product features include the ability for users to create a listing of stocks of their choice to follow current market trends. The software also includes the ability to see news related to stocks chosen by the user allowing them to be informed on events involving the company. The ability to see historical information related to pricing of the stock is another feature that will allow users to see how the stock has performed in the past.

2.3. User Class and Characteristics

Our website application does not expect our users to have any prior knowledge of a computer, apart from using a web browser. It does however require a user to be familiar with basic stock market knowledge and the concept of financial growth and shrinkage.

2.4. Operating Environment

The application is designed to operate on the web across many different devices.

2.5. Constraints

The use of a free API that will provide the stock data may not be able to quickly provide updated information in comparison to a subscription-based service.

2.6. Assumptions and Dependencies

The software will be dependent on Spring Web and Thymeleaf in order to create and execute the MVC architecture that will be developed within NetBeans. The application will also use the Polygon API (https://polygon.io/docs/stocks/getting-started) that provides the application with current stock price information, news, and historical data related to the stocks.

3. Functional Requirements

3.1. Primary

- FR0: The system will allow the user to lookup stocks and see current pricing information.
- FR1: The system will allow the user create a list of stocks to track and follow updates on.
- FR2: The system will allow the user to view news and historical data related to the stock of their choice, as well as compare them.

3.2. Secondary

- The ability for users to create accounts that will keep their lists saved.
  - A personal portfolio for Stock Trackers.
  - Search bar for Stock Trackers to look up stocks.
  - News tab for News Recipients.
  - Pin system that allows Stock Researchers to select and compare stocks.

4. Technical Requirements

4.1. Operating System and Compatibility

The application will be compatible with any operating system that is able to view and to interact with traditional web pages.

4.2. Interface Requirements

4.2.1. User Interfaces

The user will have a Navbar at the top of their screen with three buttons: News, Tracker, and Research.

By clicking on News, the user will be redirected to a news page, with the title of the news pushed by the API, as well as a picture, being displayed within a box. By clicking on the title of the news, the User will be redirected to the news story in the publisher's website. The background of the news add will be ghost white, with the actual boxes being white themselves.

By clicking on Tracker, the user will be redirected to a page where they can add a stock ticker to a table. If the user adds a stock ticker they've already added, an error message will display to tell them about it. The background of the tracker page is ghost white, with the table itself being white.

By clicking on the Research button at the top of the Navbar, the user will be redirected to the market research page. The market research page will have a ghost white background with white search bars, as well as the background of its tables and graphs being white as well. Within two of the three search bars, a calendar option will be present to allow the user to select their dates in a more visually appealing and interactive way.

4.2.2. Hardware Interfaces

The Stock Tracker application will run on any hardware device that has access to the internet, the ability to display webpages and interact with web pages. User can use the app on smartphones, tablets, desktop computers, and laptops.

4.2.3. Communications Interfaces

It must be able to connect to the internet as well as the local database on phpMyAdmin. The communication protocol, HTTP, must be able to connect to the Polygon API and return the current date and time.

4.2.4. Software Interfaces

We will use React and Spring Boot ThymeLeaf to help build the frontend, as well as JPA for the backend database functionality. We will also use Spring Boot with Java to connect the frontend to the backend.

5. Non-Functional Requirements

5.1. Performance Requirements

- The redirecting from page to page should not take >2 seconds.

- The addition of a stock to the personal portfolio should not be >1.5 seconds.

- The display of a historical data graph should not be >3 seconds.

- The RAM usage of the program should not go above 100MB.

5.2. Safety Requirements

- The first safeguard to be implemented to the application is the use of methods that will prevent a user from adding the same stock ticker/news over and over again, displaying an “error” message whenever they try to do so.
- The second safeguard is implementing a method that will block a user from inputting a stock ticker that does not exist, as it can break the page due to the API failing to call on anything, blowing the page up.

5.3. Security Requirements

- Implementation of Spring boot security dependency
- Implementation of encrypted passwords within the database

5.4. Software Quality Attributes

5.4.1. Availability

If the application is running, as well as the database, the application will always be available.

5.4.2. Correctness

The correctness of the program will come down to the handling of the API. By making helper methods to correctly format the information of the API, the correctness of the application is guaranteed.

5.4.3. Maintainability

Implementing basic CRUD-application classes will lead the program to be straightforward to navigate for an experienced programmer, making it’s maintainability extremely easy.

5.4.4. Reusability

Foundational programs, that do very general things, such as CRUD-application classes, are to be implemented in the code, as doing so will result in a foundational program that, with the change of a Thymeleaf template, and the addition/deletion of certain helper methods, can result in an entirely different application, hence, it’s reusability.

5.4.5. Portability

For portability, the code of the application is to be pushed to an external repository, such as GitHub, such that the application can be retrieved and accessed from anywhere in the world where there is an internet connection, through any device capable of accessing, downloading, and running files from GitHub.

5.5. Process Requirements

5.5.1. Development Process Used

The software process model that we based our project on was on the MVC-model architecture, which is a pattern in software design commonly used to implement user interfaces, data, and controlling logic. It emphasizes a separation between the software's business logic and display.

5.5.2. Time Constraints

Finish by end of semester.

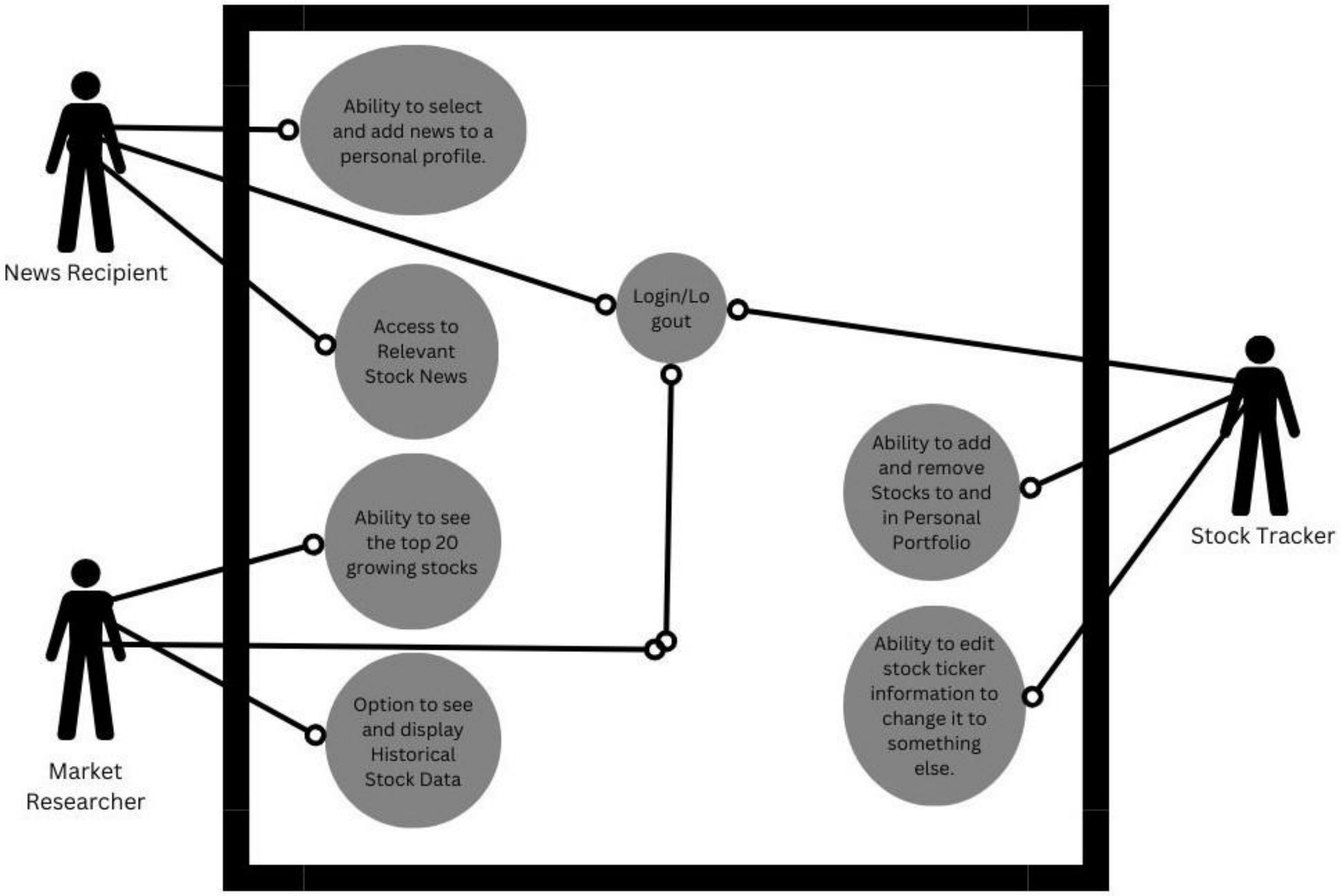
5.5.3. Cost and Delivery Date

While the application itself is free, the cost of the API used (the Polygon API) was $30. The reason for the cost of the API is because the free version of the API will only allow for a total of 5 API calls per minute, resulting in constant crashes if you reload.

5.6. Other Requirements

NONE

5.7. Use-Case Model Diagram


News Recipient
Ability to select and add news to a personal profile.
Access to Relevant Stock News
Login/Logout
Ability to see the top 20 growing stocks
Option to see and display Historical Stock Data
Ability to add and remove Stocks to and in Personal Portfolio
Ability to edit stock ticker information to change it to something else.
Stock Tracker
Market Researcher

5.8. Use-Case Model Descriptions

5.8.1. Actor: News Recipient (Responsible Team Member: Ro Mei)

- **Add Wanted News to Personal Profile**: [Allows the News Recipient to add news they particularly liked to a personal portfolio]
- **Access to Relevant Stock News**: [Allows the News Recipient access to a news tab containing relevant stock-related news.]

5.8.2. Actor: Market Researcher (Responsible Team Member: David Vasquez)

- **Ability to see top 20 growing stocks**: [Allows Market Researchers to see the top 20 growing in a given day.]
- **View of Historical Data**: [Market Researchers have access to historical data of stocks, allowing them to study and analyze the stocks available.]

5.8.3. Actor: Stock Tracker (Responsible Team Member: Salomon Perez)

- **Addition and Deletion of Stocks to Personal Portfolio**: [Allows the Stock Tracker to look up and add stocks to their personal portfolio, to keep track of them for later use.]
- **Ability to Edit Information** [The Stock Tracker is able to edit the information of the ticker that they added, being able to change the name of the ticker to use another, instead of having to delete and add another.]

5.9. Use-Case Model Scenarios

5.9.1. Actor: News Recipient (Responsible Team Member: Ro Mei) -

Use-Case Name: **Access to Relevant Stock News.**

- **Initial Assumption**: The user will have the ability to access a tab of news related to stocks.
- **Normal**: The user will have the ability to access a tab of news related to stocks.
- **What Can Go Wrong: The news tab will not correctly link to the API, displaying an empty tab.**
- **Other Activities**:
- **System State on Completion**: That user will successfully see the news given by the API.

- **Use-Case Name**: **Add Wanted News to Personal Profile.**
  - **Initial Assumption**: The user will have the ability add their preferred news to a personal profile.
  - **Normal**: The user will have the ability to access a personal profile.
  - **What Can Go Wrong**: Adding news may not result in anything being added.
  - **Other Activities**:
  - **System State on Completion**: That user will successfully see the news they added in their profile.

5.9.2. Actor: Market Researcher (Responsible Team Member: David Vasquez) -

Use-Case Name: **Ability to see top 20 growing stocks.**

- **Initial Assumption**: Allows Market Researchers to see the top 20 growing in a given day.
- **Normal**: Allows Market Researchers to see the top 20 growing in a given day
- **What Can Go Wrong**: The API can display no information, leaving the table blank, or some values blank.
- **Other Activities**:
- **System State on Completion**: The system will appropriately display the percentage values of the displayed stocks.

- **Use-Case Name**: **View of Historical Data.**

- **Initial Assumption**: The user will have access to historical stock data to analyze/study.
- **Normal**: The user will have access to historical stock data to analyze/study.
- **What Can Go Wrong**: The system can display erroneous data, or no data at all.
- **Other Activities**:
- **System State on Completion**: Will display the appropriate historical data for the selected stock.

5.9.3. Actor: Stock Tracker (Responsible Team Member: Salomon Perez) -

Use-Case Name: **Addition of Stocks to Personal Portfolio**

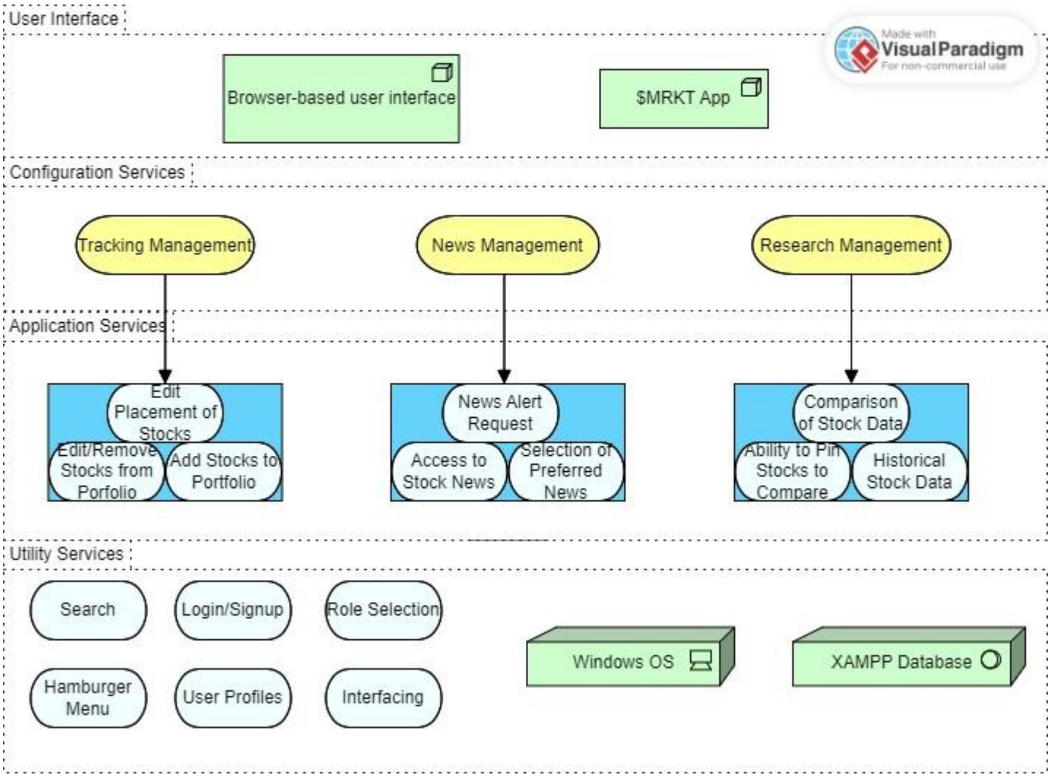
- **Initial Assumption**: The user will be able to search for and select stocks to add to their personal portfolio.
- **Normal**: The user will be able to search for and select stocks to add to their personal portfolio.
- **What Can Go Wrong**: The “adding” mapping will not work properly, not adding anything at all. In addition, inserting a stock ticker that does not exist, for example: “aaaaa” can result in crashing, and to get the program running again you’d have to manually delete the ticker from the database.
- **Other Activities**:
- **System State on Completion**: Will add the proper stock to the user portfolio.

- **Use-Case Name**: **Ability to Edit Information.**

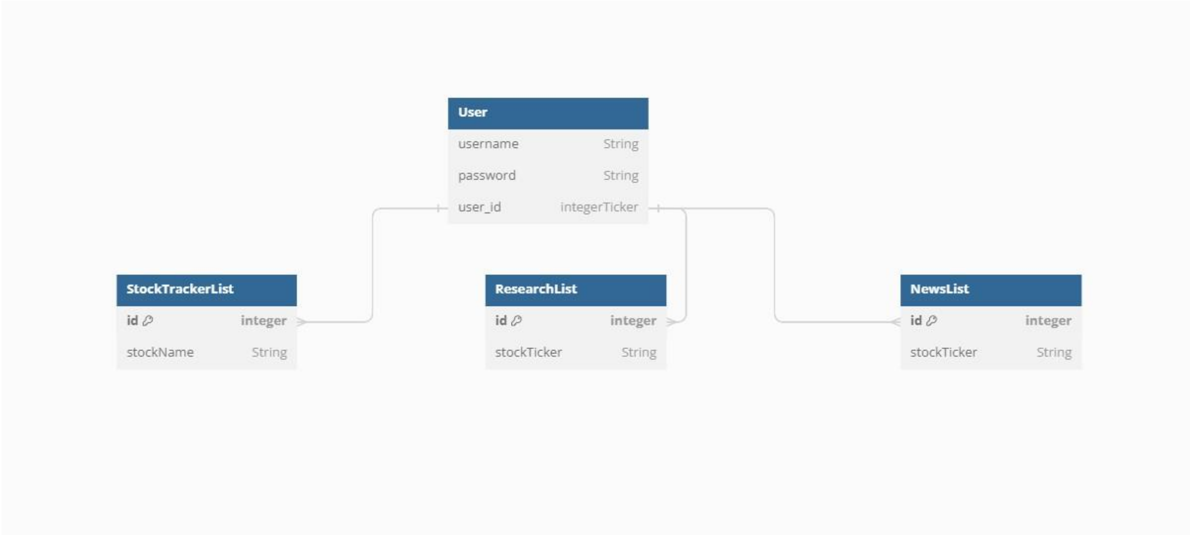
- **Initial Assumption**: The user will be able edit the information of the stocks they’ve added.
- **Normal**: The user will be able edit the information of the stocks they’ve added.
- **What Can Go Wrong**: The “update ticker” mapping may go wrong, and the name of the ticker may not change (rare). IN addition, editing the name of a ticker to a non-existent ticker can result in a crash, having to manually delete the now edited ticker from the database.
- **Other Activities**:
- **System State on Completion**: The system will display the appropriate changes done.

6. Design Documents

6.1. Software Architecture

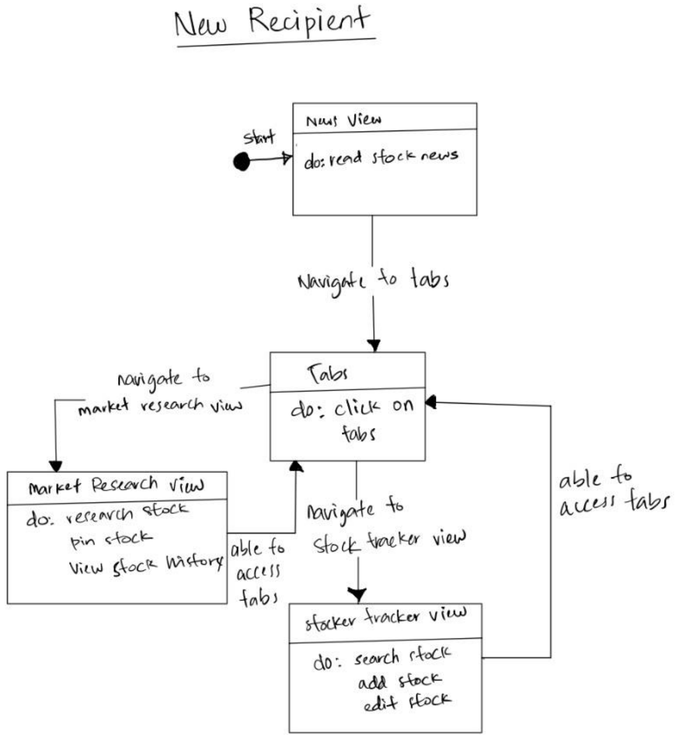


6.2. High-Level Database Schema

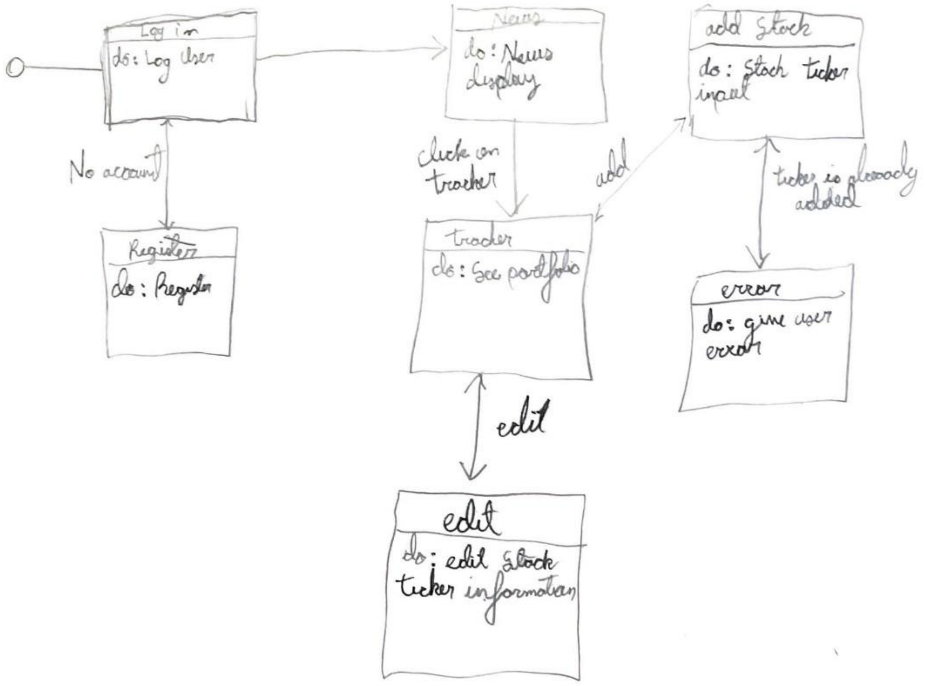


6.3. Software Design

6.3.1. State Machine Diagram: News Recipient (Ro Mei)

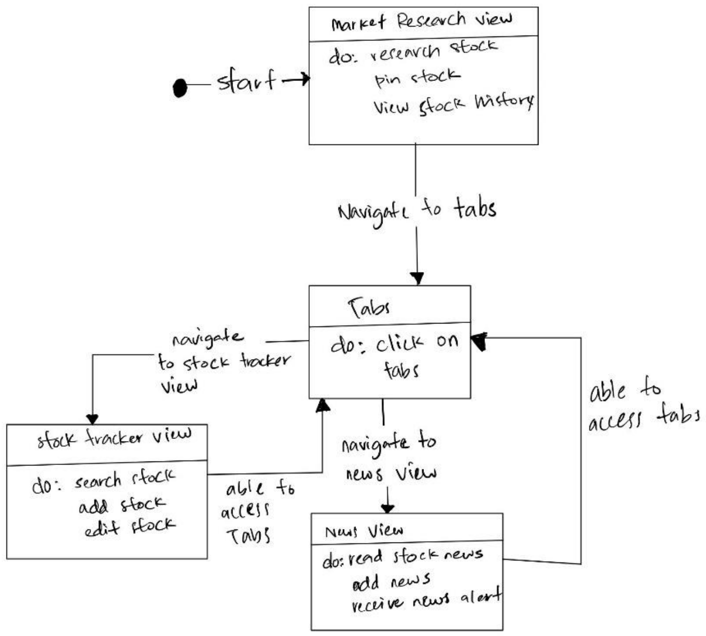


6.3.2. State Machine Diagram: Stock Tracker (Salomon Perez)

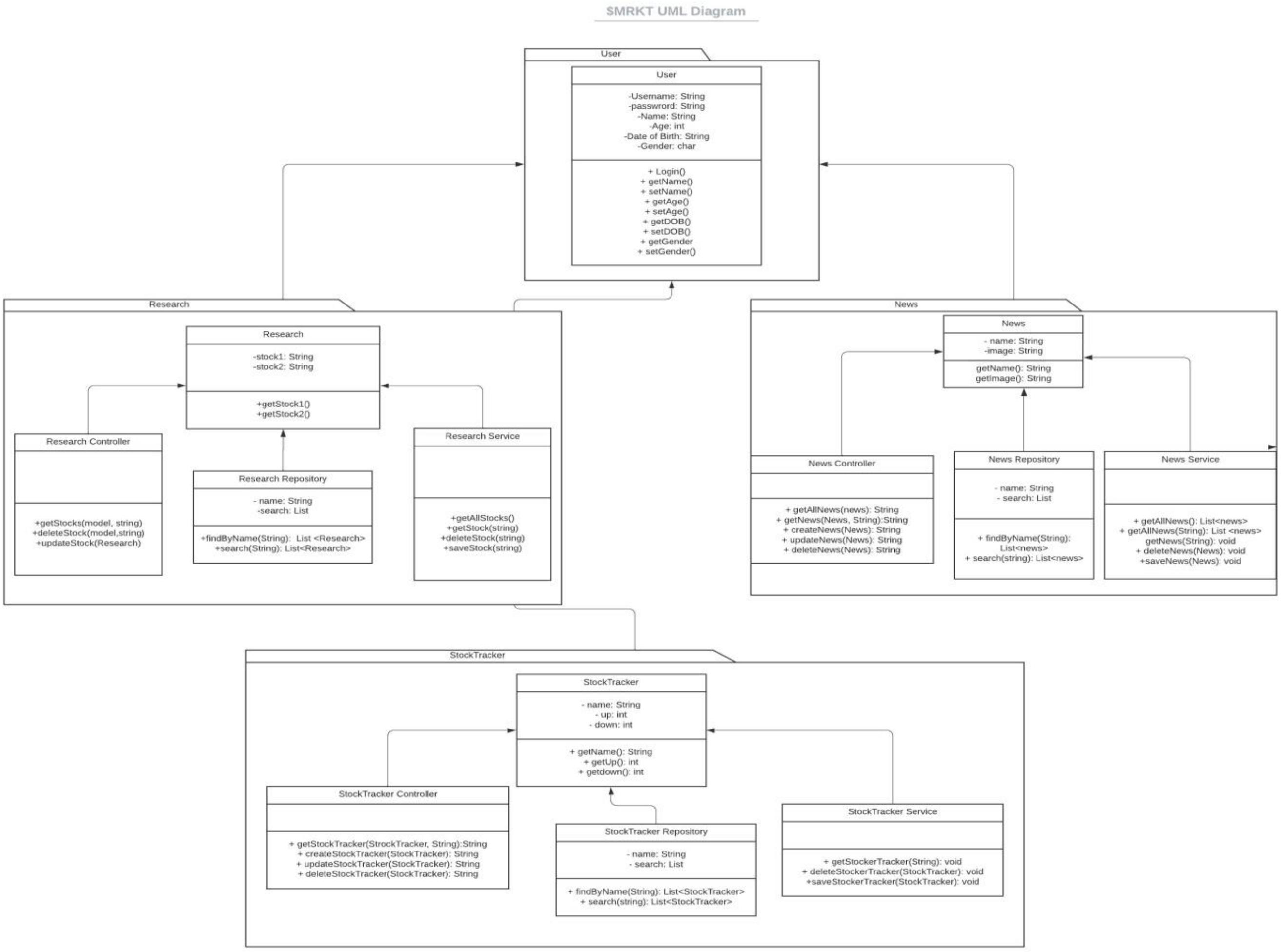


6.3.3. State Machine Diagram: Market Researcher (David Vasquez)

Market Research



6.4. UML Class Diagram

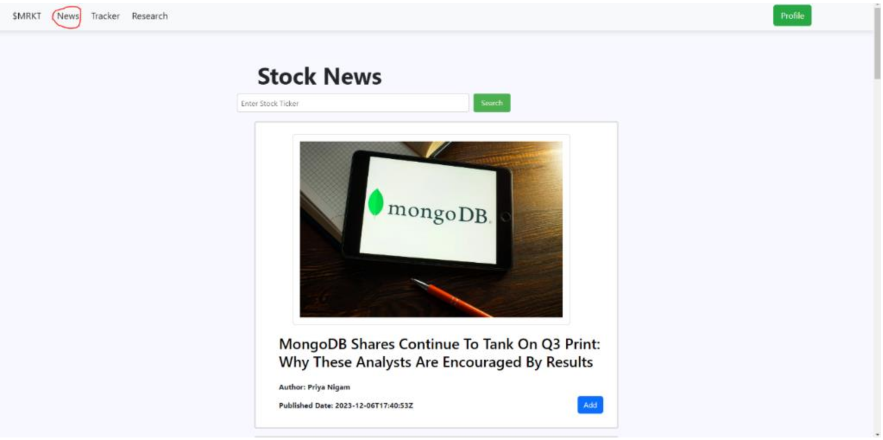


7. Scenario

7.1. Brief Written Scenario with Screenshots

Written Scenario: News Recipient.

- Stock interested user logs in to their account and arrive to the news tab of the application.

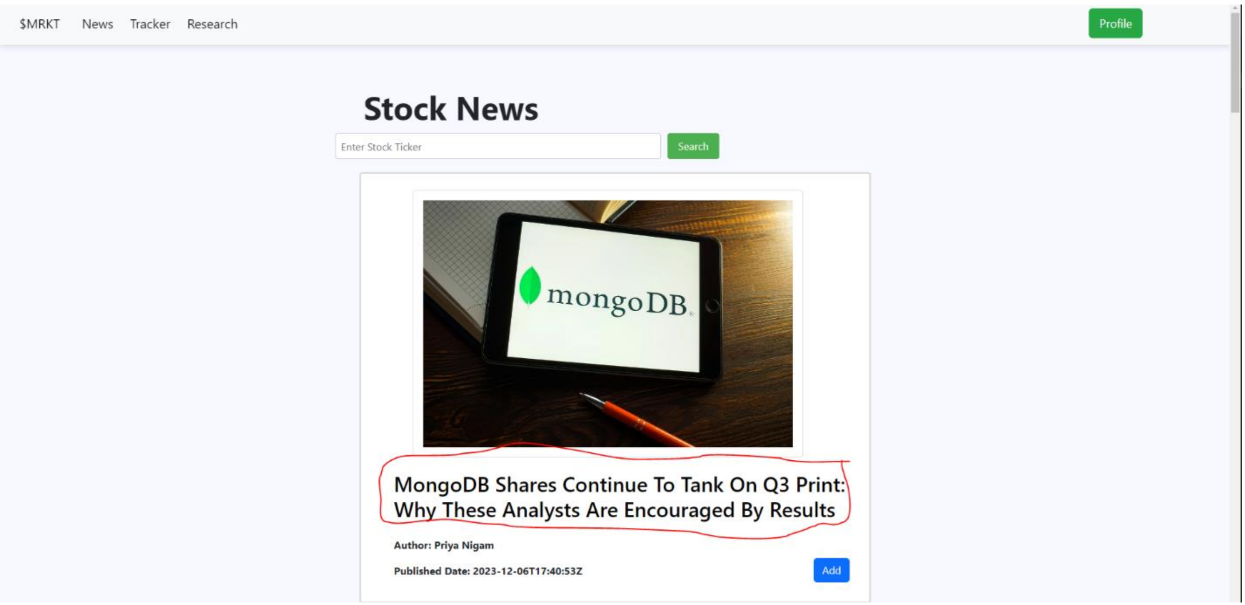


MongoDB Shares Continue To Tank On Q3 Print: Why These Analysts Are Encouraged By Results

Author: Priya Nigam

Published Date: 2023-12-06T17:40:53Z

- The stock-interested user reads the title of the stock-news, and if they are interested, they can click on the title and it will take them to the news website.



Stock News

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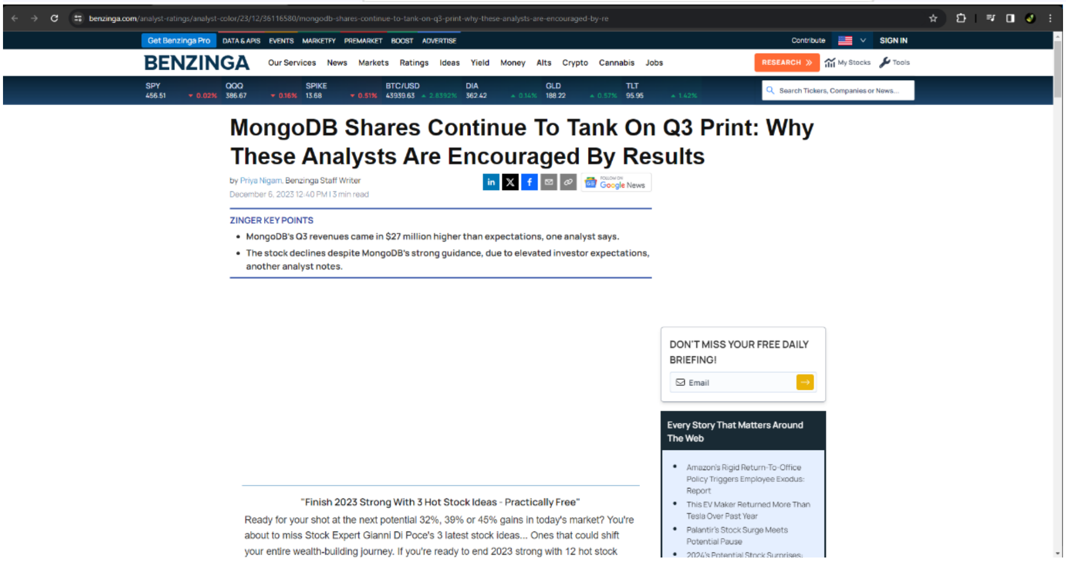

MongoDB Shares Continue To Tank On Q3 Print: Why These Analysts Are Encouraged By Results

by Priya Nigam, Benzinga Staff Writer

December 6, 2023 12:40 PM | 3 min read

ZINGER KEY POINTS

- MongoDB's Q3 revenues came in $27 million higher than expectations, one analyst says.
- The stock declines despite MongoDB's strong guidance, due to elevated investor expectations, another analyst notes.

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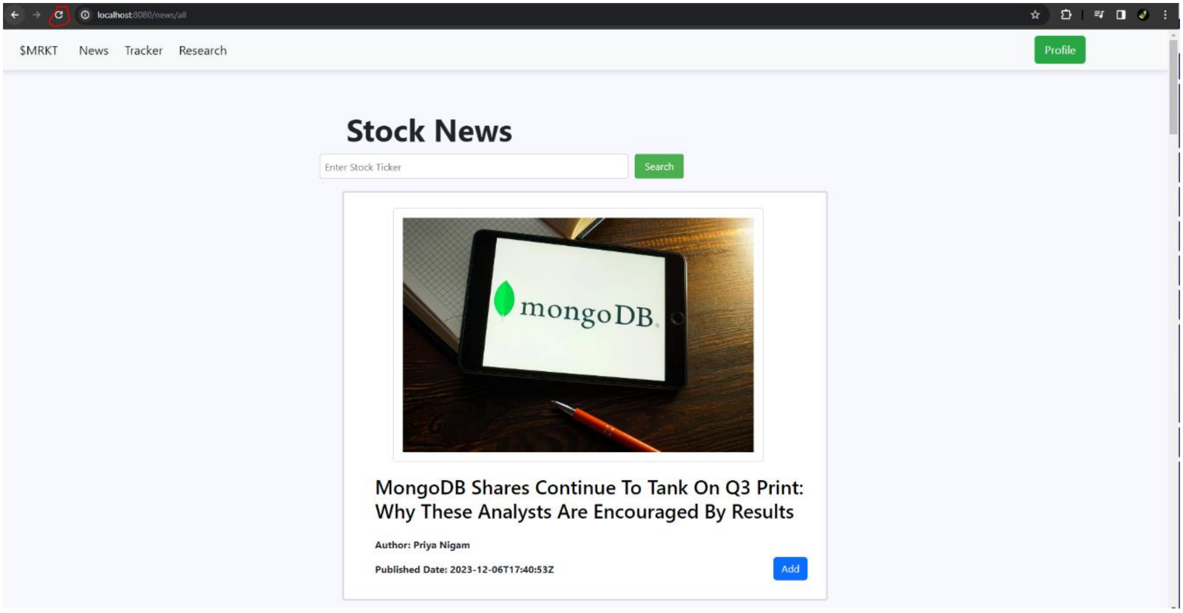
- This EV Maker Returned More Than Tesla Over Past Year
- Palantir's Stock Surge Meets Potential Pause
- 2024's Potential Stock Surprises:

- The user decides to refresh the page to get more news.



Stock News

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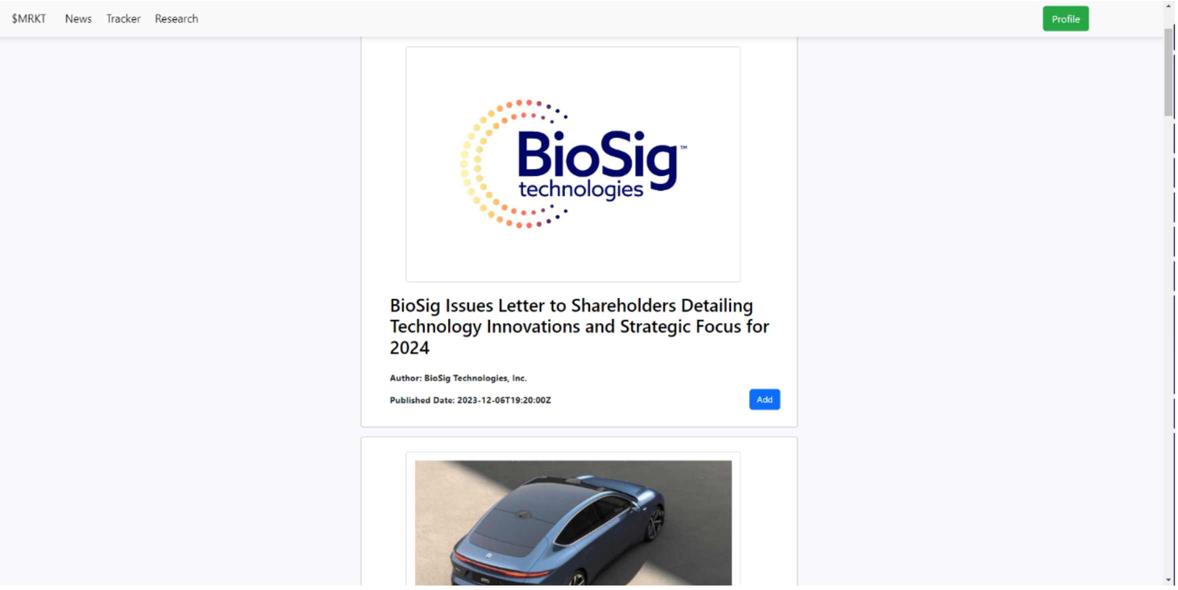
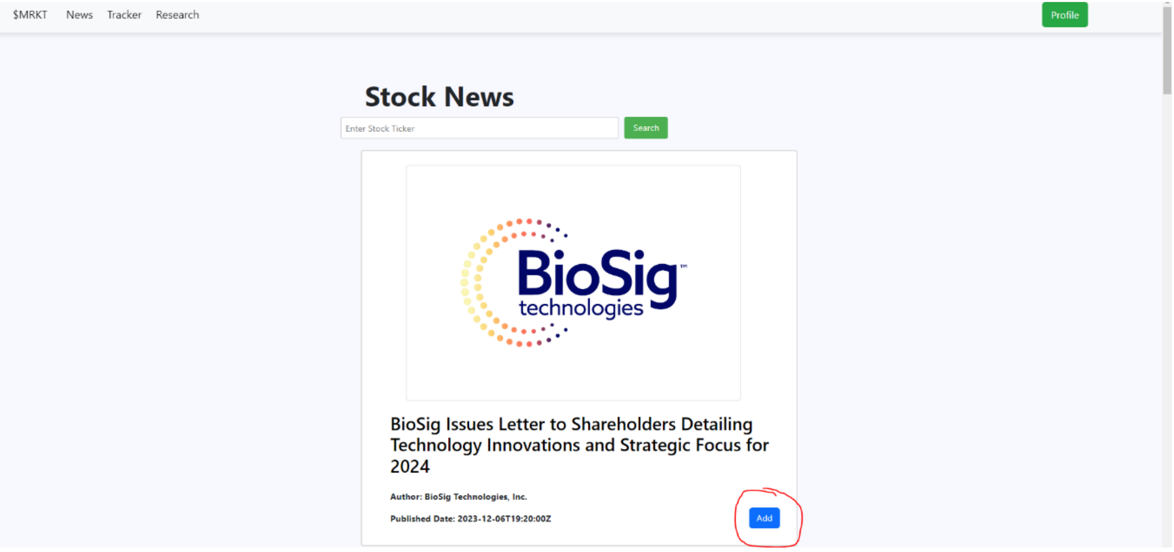


BioSig Issues Letter to Shareholders Detailing Technology Innovations and Strategic Focus for 2024

Author: BioSig Technologies, Inc.

Published Date: 2023-12-06T19:20:00Z

- If they want to add their desire news to their account, they can just click on add button.



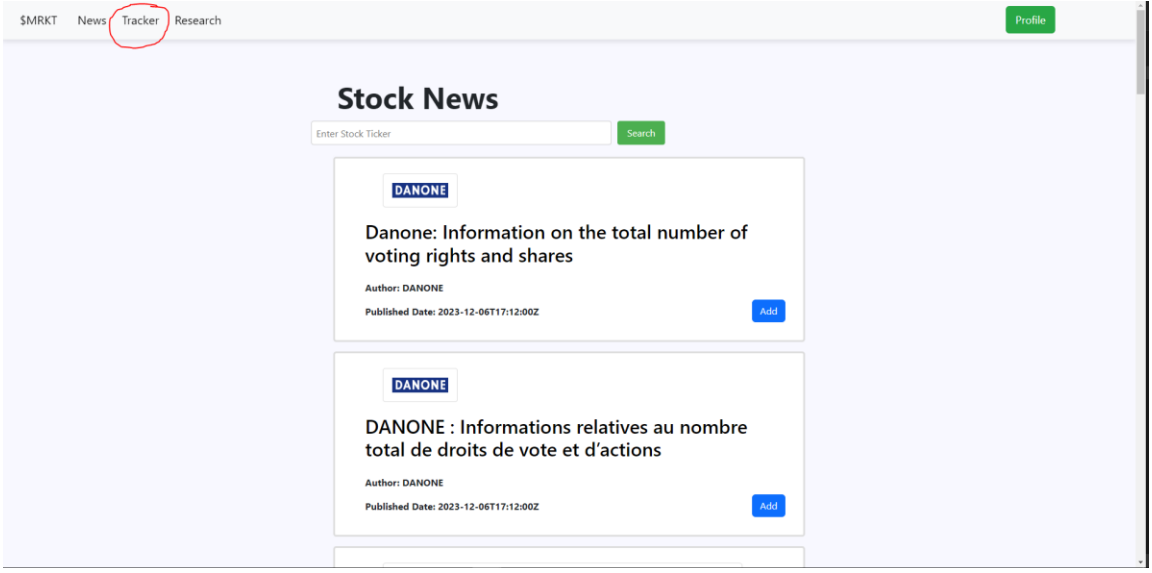
BioSig Issues Letter to Shareholders Detailing Technology Innovations and Strategic Focus for 2024

Author: BioSig Technologies, Inc.

Published Date: 2023-12-06T19:20:00Z

Written Scenario: Stock Tracker.

- Stock-interested user logs in and makes their way to the stock tracking section of the application.



Danone: Information on the total number of voting rights and shares

Author: DANONE

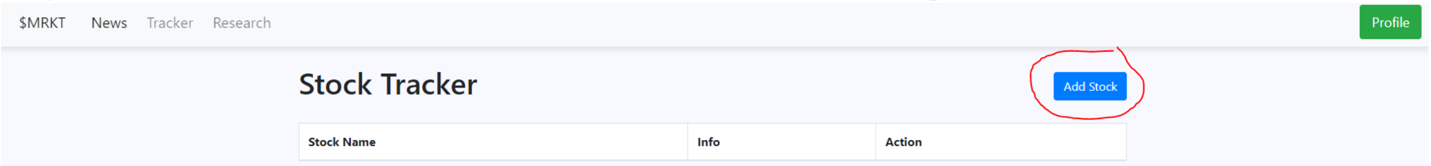
Published Date: 2023-12-06T17:12:00Z

DANONE : Informations relatives au nombre total de droits de vote et d'actions

Author: DANONE

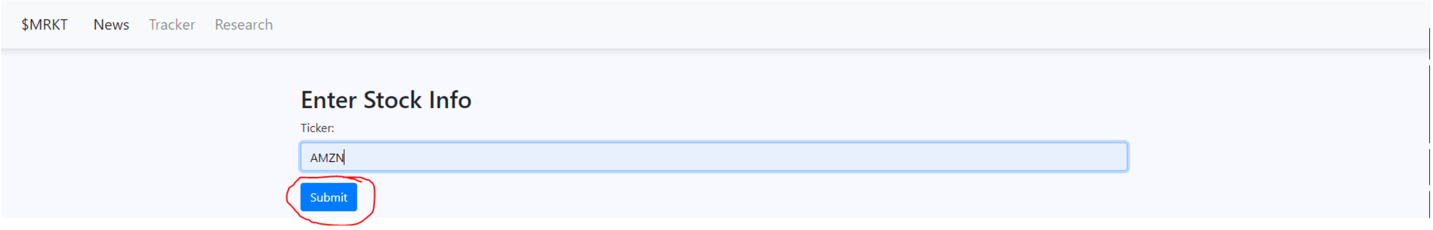
Published Date: 2023-12-06T17:12:00Z

- They choose their first stock-ticker (stock name abbreviation) and add it to the portfolio.



Stock Tracker

Stock Name	Info	Action

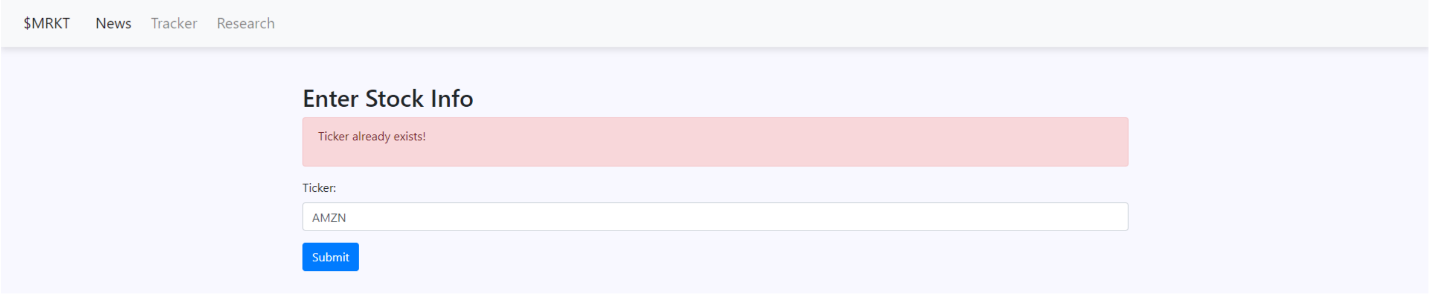


Enter Stock Info

Ticker:

AMZN

- They decide to add a second ticker, accidentally adding the same ticker and getting an error, but quickly changes it.



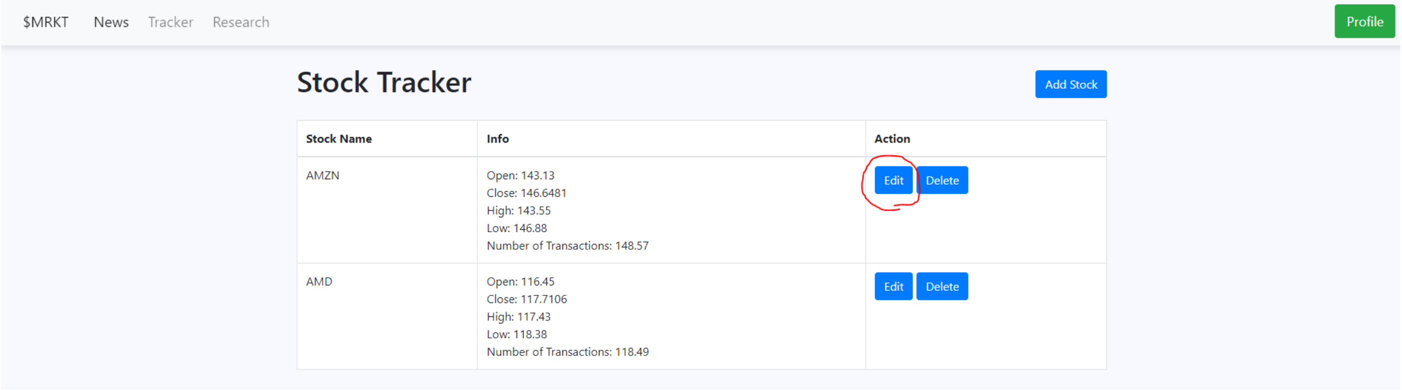
Enter Stock Info

Ticker already exists!

Ticker:

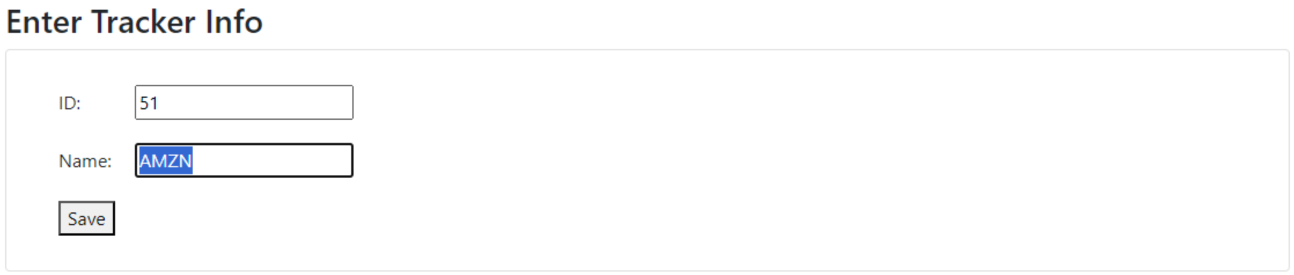
AMZN

- The stock-interested user decides to edit their first ticker, to change it to something else.



Stock Tracker

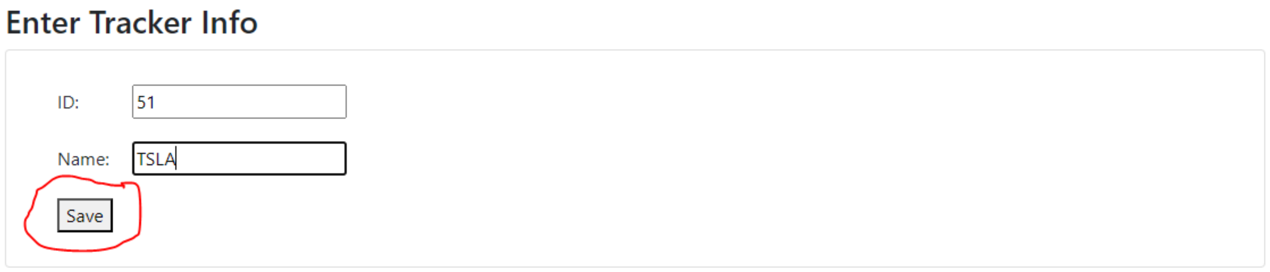
Stock Name	Info	Action
AMZN	Open: 143.13 Close: 146.6481 High: 143.55 Low: 146.88 Number of Transactions: 148.57	Edit Delete
AMD	Open: 116.45 Close: 117.7106 High: 117.43 Low: 118.38 Number of Transactions: 118.49	Edit Delete



Enter Tracker Info

ID: 51

Name: AMZN

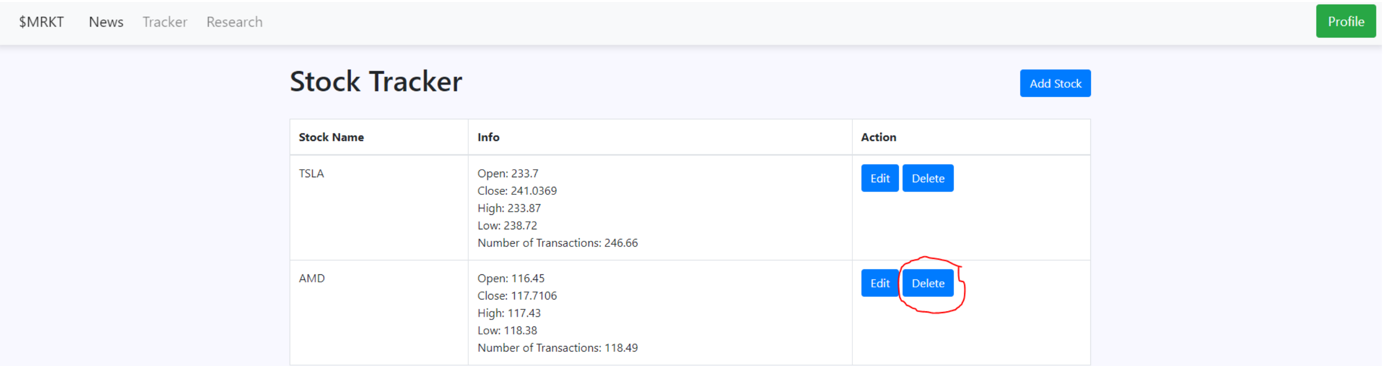


Enter Tracker Info

ID: 51

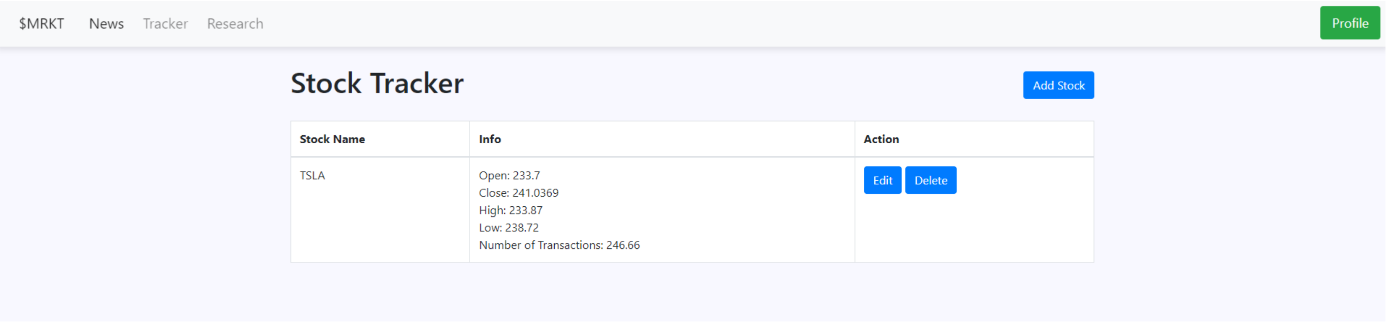
Name: TSLA

- They decide one is enough and deletes the second one.



Stock Tracker

Stock Name	Info	Action
TSLA	Open: 233.7 Close: 241.0369 High: 233.87 Low: 238.72 Number of Transactions: 246.66	Edit Delete
AMD	Open: 116.45 Close: 117.7106 High: 117.43 Low: 118.38 Number of Transactions: 118.49	Edit Delete

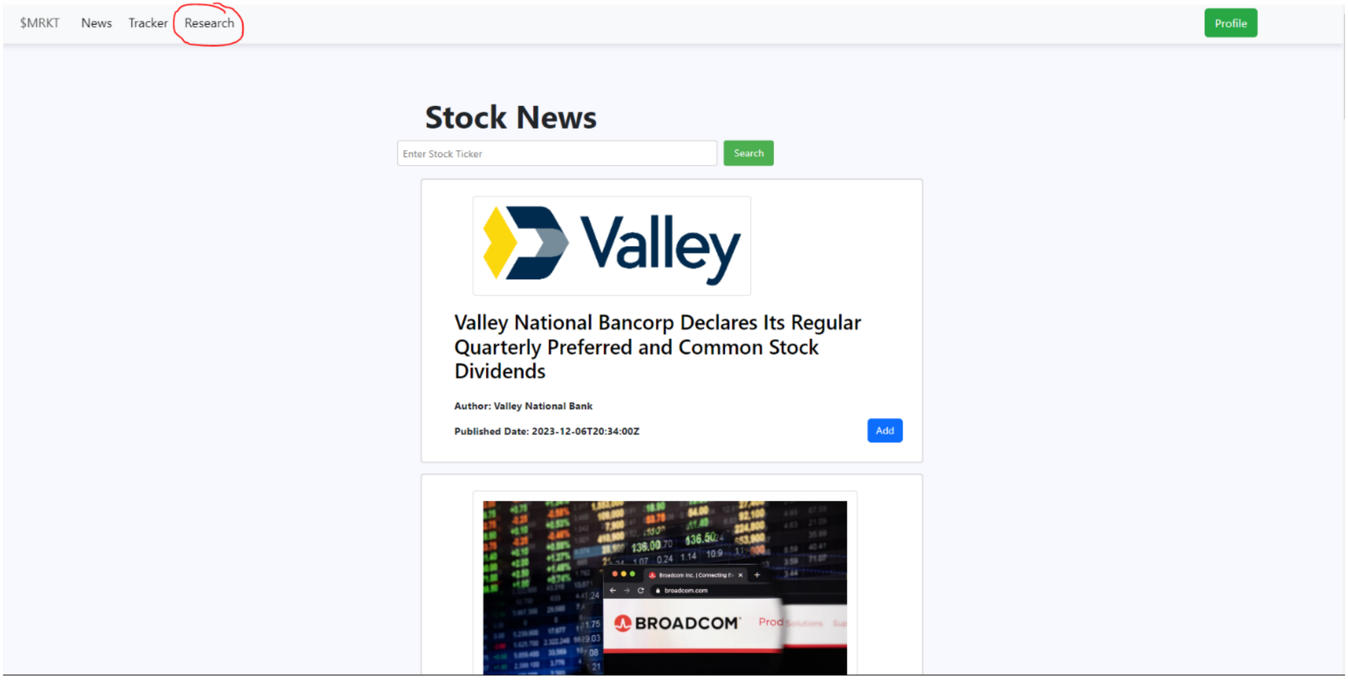


Stock Tracker

Stock Name	Info	Action
TSLA	Open: 233.7 Close: 241.0369 High: 233.87 Low: 238.72 Number of Transactions: 246.66	Edit Delete

Written Scenario: Market Researcher.

- User goes to research tab to add a stock of their choice to research.



Stock News

Valley National Bancorp Declares Its Regular Quarterly Preferred and Common Stock Dividends

Author: Valley National Bank

Published Date: 2023-12-06T20:34:00Z

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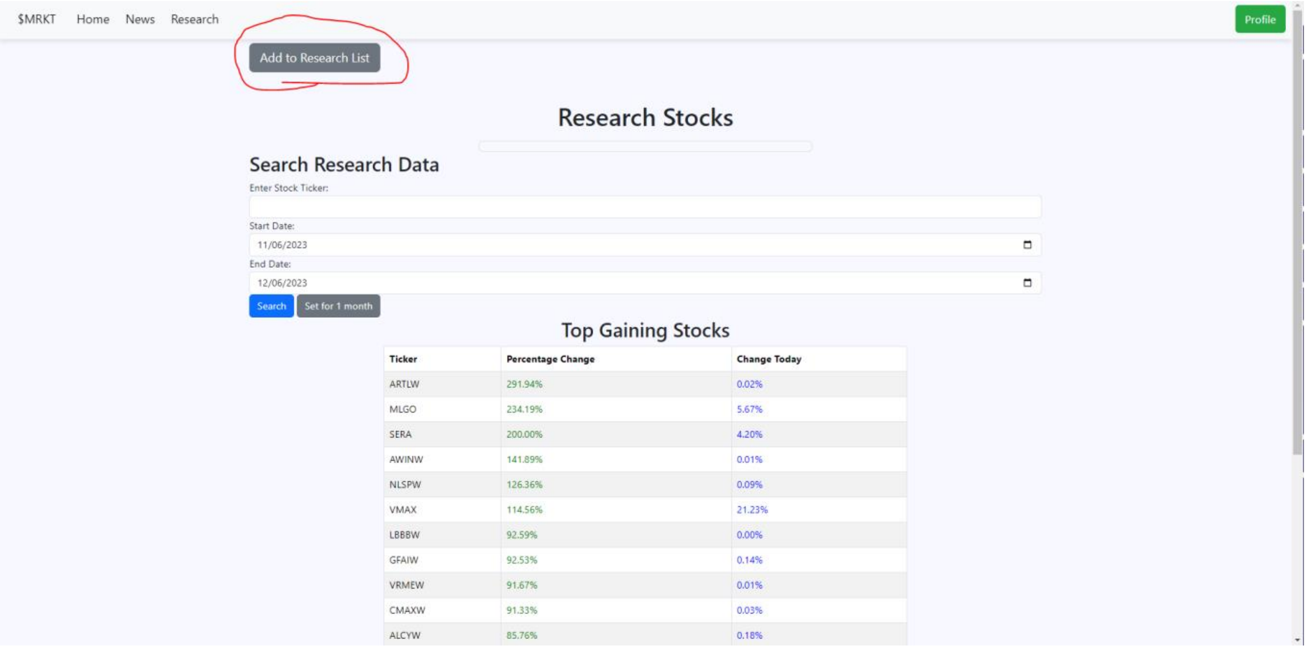


Research Stocks

Search Research Data

Enter Stock Ticker:

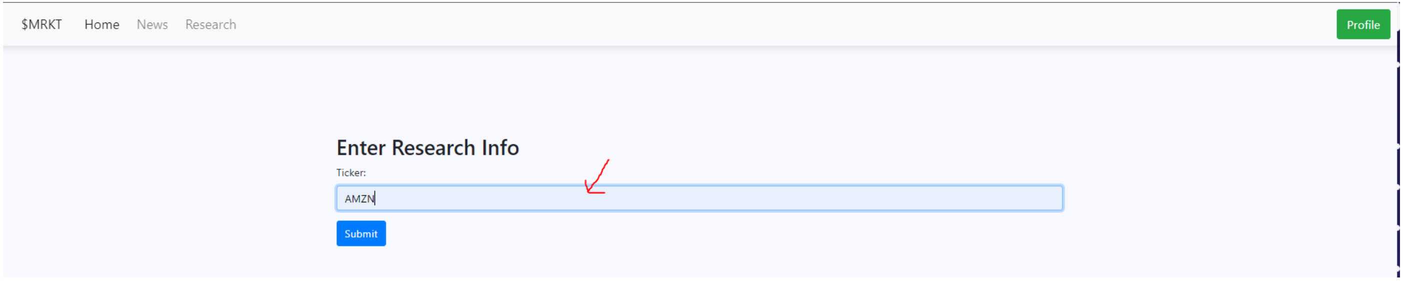
Start Date: 11/06/2023

End Date: 12/06/2023

Top Gaining Stocks

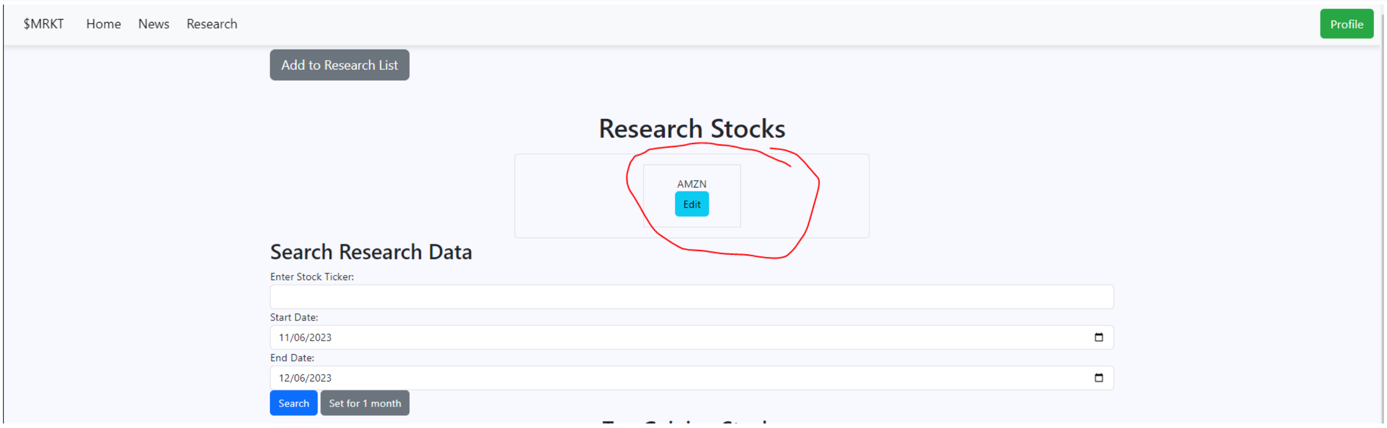
Ticker	Percentage Change	Change Today
ARTLW	291.94%	0.02%
MLGO	234.19%	5.67%
SERA	200.00%	4.20%
AWINW	141.89%	0.01%
NLSPW	126.36%	0.09%
VMAX	114.56%	21.23%
LBBBW	92.59%	0.00%
GFAIW	92.53%	0.14%
VRMEW	91.67%	0.01%
CMAXW	91.33%	0.03%
ALCYW	85.76%	0.18%

- User looks up stock and adds it to dashboard.



Enter Research Info

Ticker: AMZN



Research Stocks

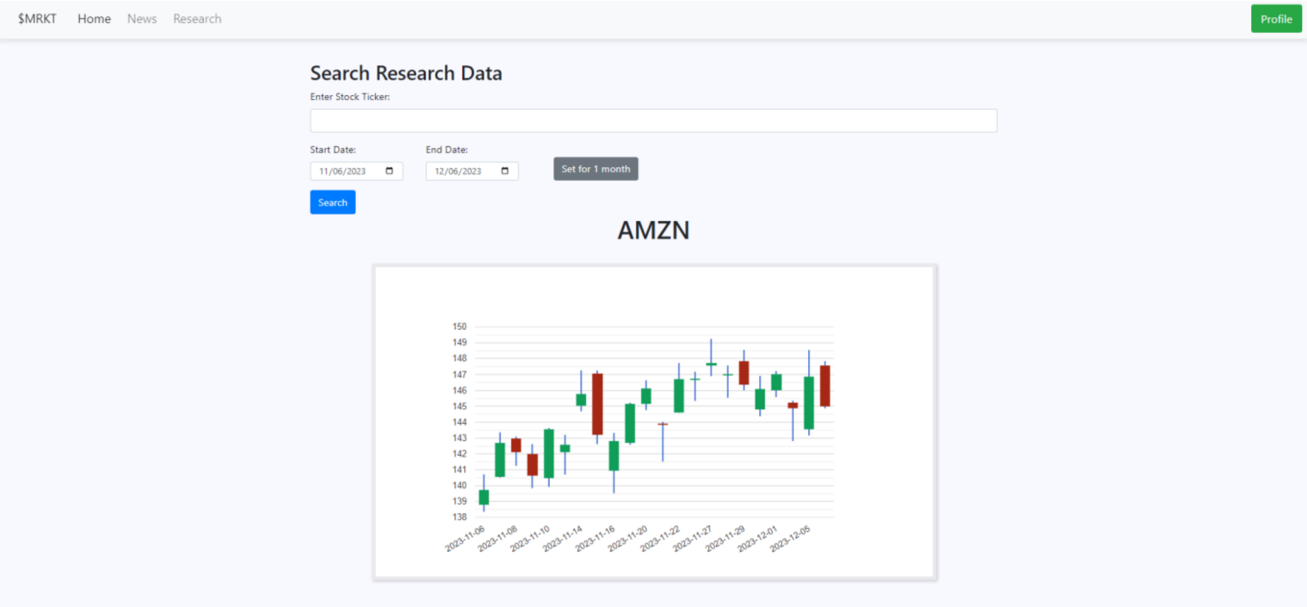
Search Research Data

Enter Stock Ticker:

Start Date: 11/06/2023

End Date: 12/06/2023

- User can now click on stock list with the stock of their choice to retrieve the stock's proformance for the last 30 days.



Search Research Data

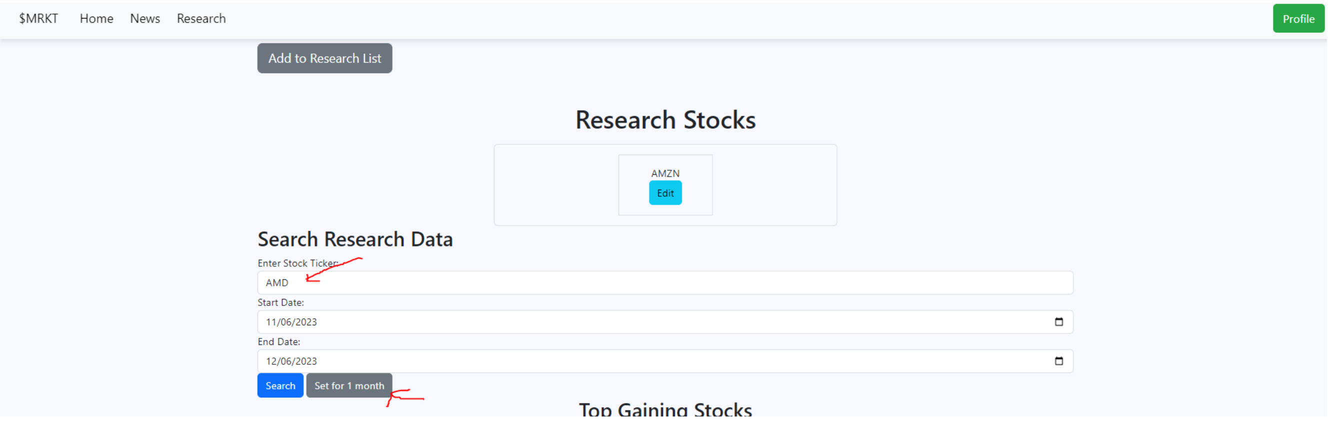
Enter Stock Ticker:

Start Date: 11/06/2023

End Date: 12/06/2023

AMZN

- User decides to look for another stock without adding it to the list by selecting default 1-month range.



Research Stocks

AMZN

Search Research Data

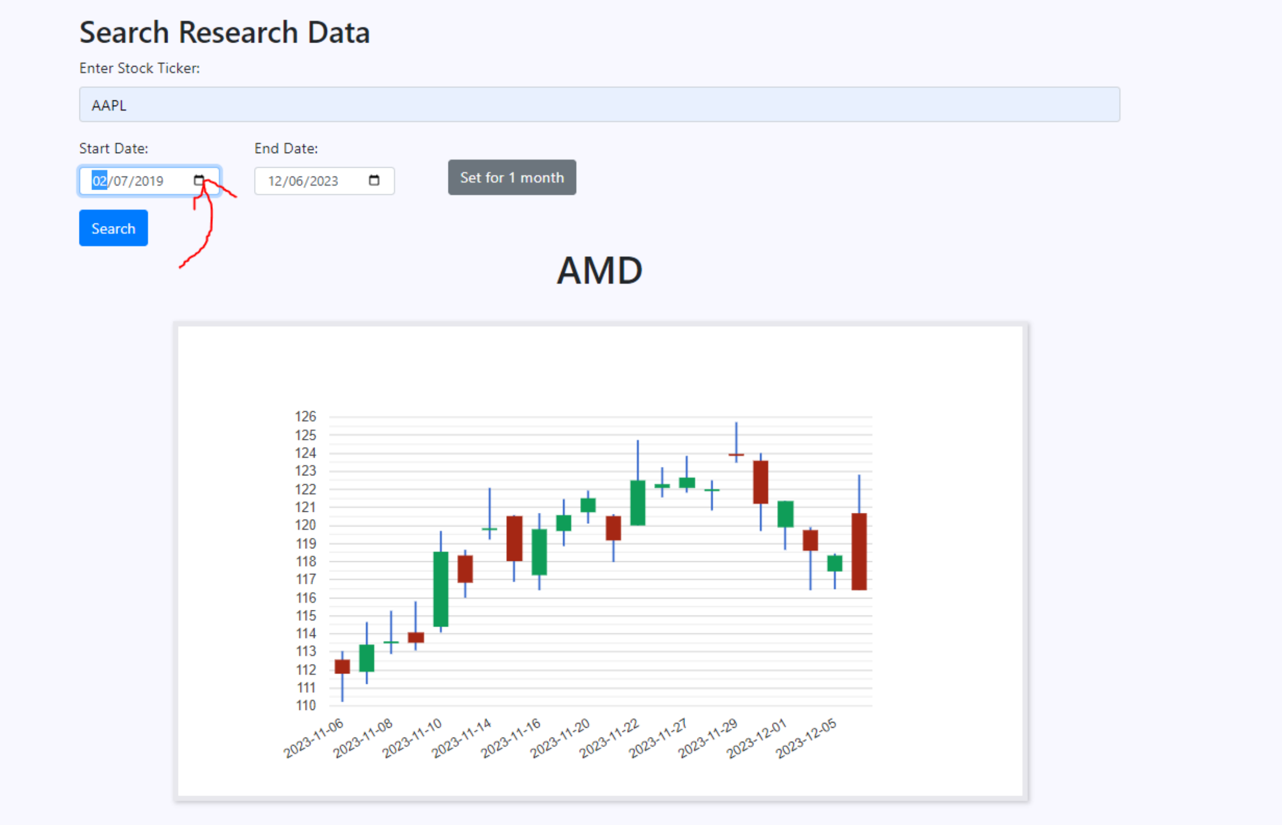
Enter Stock Ticker: AMD

Start Date: 11/06/2023

End Date: 12/06/2023

Top Gaining Stocks

- After the information is displayed, they decide to look for another stock, using custom ranges



Search Research Data

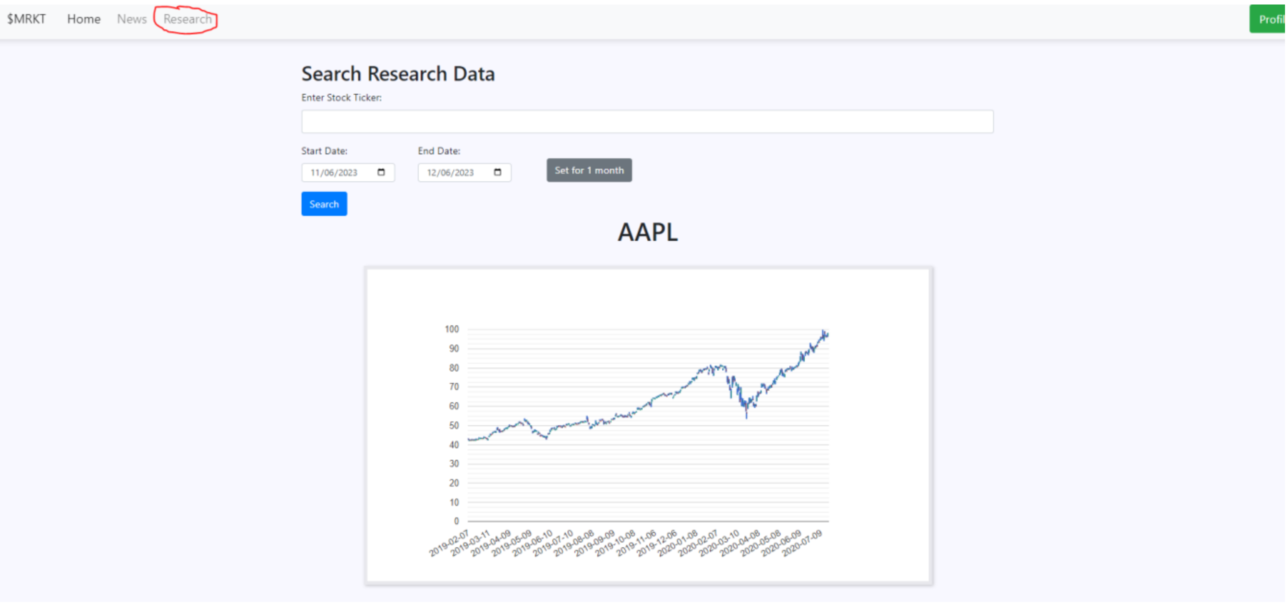
Enter Stock Ticker: AAPL

Start Date: 02/07/2019

End Date: 12/06/2023

AMD

- After seeing the information, the user decides to return to the research tab



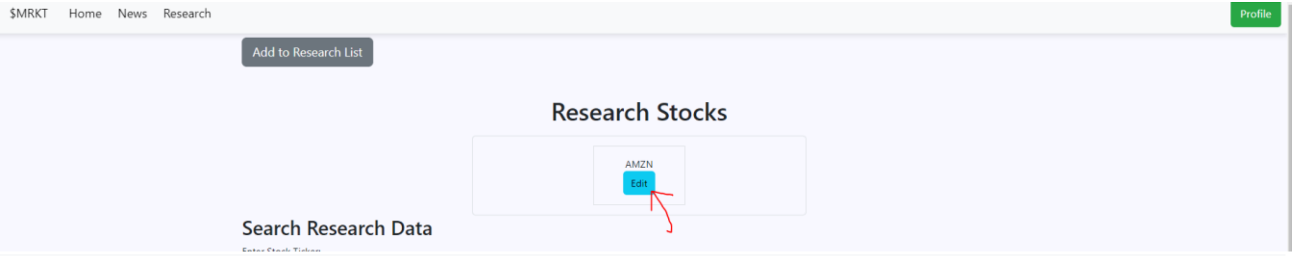
Search Research Data

Enter Stock Ticker:

Start Date: 11/06/2023 End Date: 12/06/2023

AAPL

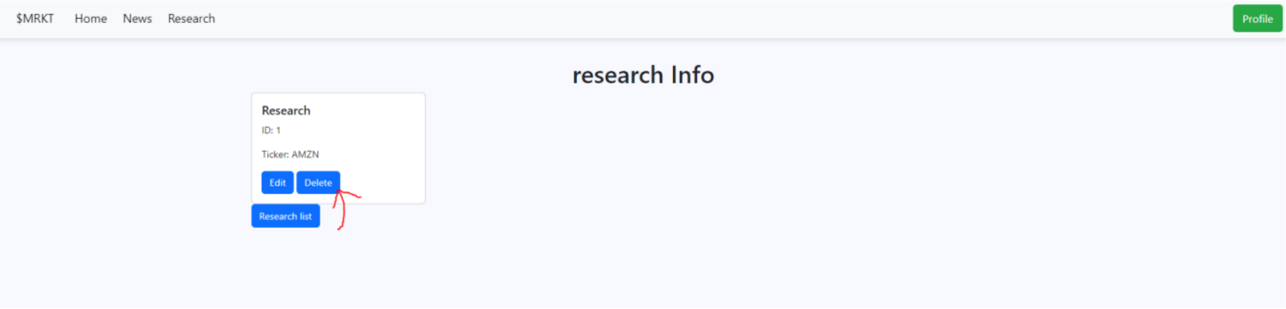
- Once the user arrives at the research tab, they decide to edit their current added stock and delete it.



Research Stocks

AMZN

Search Research Data



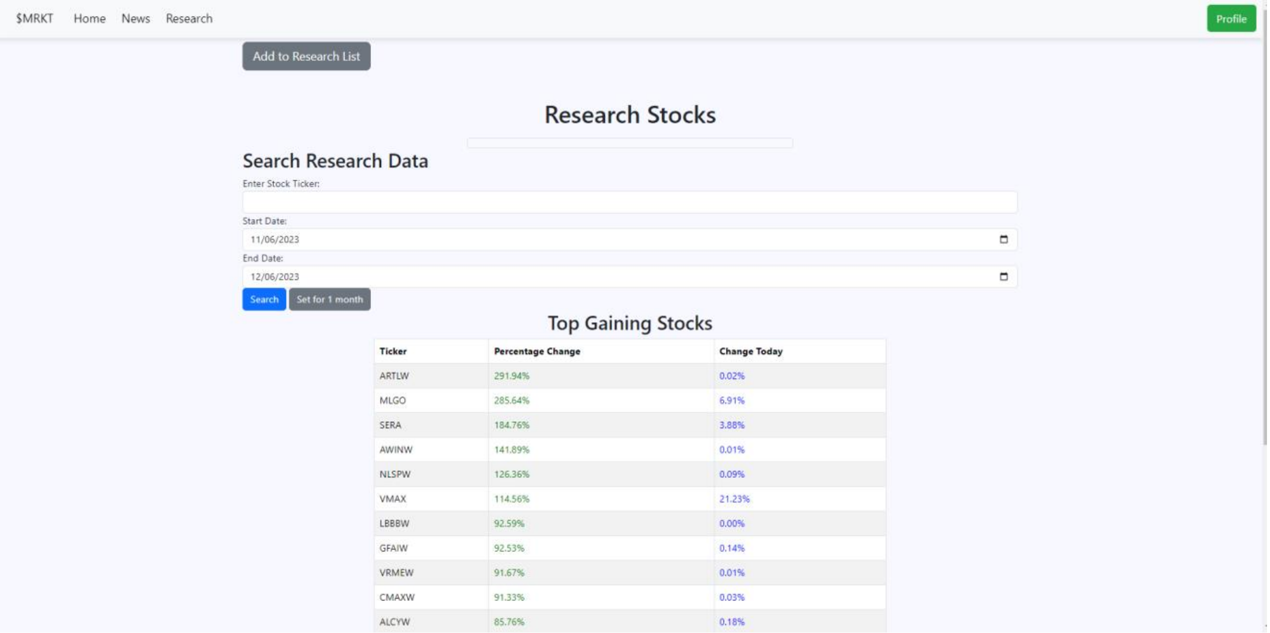
research Info

Research

ID: 1

Ticker: AMZN

- User’s list is now updated, deleting the previous ticker.



Research Stocks

Search Research Data

Enter Stock Ticker:

Start Date: 11/06/2023

End Date: 12/06/2023

Top Gaining Stocks

Ticker	Percentage Change	Change Today
ARTLW	291.94%	0.02%
MLGO	285.64%	6.91%
SERA	184.76%	3.88%
AWINW	141.89%	0.01%
NLSPW	126.36%	0.09%
VMAX	114.56%	21.23%
LBBBW	92.59%	0.00%
GFAIW	92.53%	0.14%
VRMEW	91.67%	0.01%
CMAXW	91.33%	0.03%
ALCYW	85.76%	0.18%