CPE 327 : Software Engineering Project

Final Project

Topic : SPFNA - Stock Simulation Investment Idea

Created by

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Present to

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Abstract

When talking about investing, investors want to find ideas and a thesis for investing in an individual company. Nowaday, there are a lot of investment platforms such as SeekingAlpha which is the most famous investment thesis for investors around the world but the thesis content is poor, some of the deep dive have a few details and weak thesis of the investment. As a Human we want to know what our friend holds the stock position and what their thesis behind those investment. Most of the normal investors found the stock idea from maybe Line or Facebook, but this type of resource is completely poor. Another problem when talking about a new investor who wants to try to invest in the stock market is they want to try sandbox investment or in another word "simulation stock platform", but the main issue is that there are few places to try.

This project came up with the idea to try to solve the pain point of the investor. SPFNA stock platform is a stock simulation investment game platform which is a platform that allows users to share their investment thesis and also simulate their stock portfolio, compete with friends or other users. SPFNA stock platform has five main features. The first feature is a stock simulation platform which allows login users to simulate their stock portfolio with an initial money of 200,000 USD. The second feature is Leaderboard, this feature shows all portfolio profit of the contestants. The Third feature is called Idea space, it is a feature that allows users to share their own ideas or deep dive analysis. This platform also allows admin users to post the announcement for login users to understand activity related to the competition.

Waterfall process has been used in this project. Due to the miss understand of the Scrum process at the beginning. We found that ours work process is more likely to be Waterfall process more than Scrum after we had the consultation from Asst. prof. Phond Phunchongharn and Asst. prof. Khajonpong Akkarajitsakul. The scope that we planned at the beginning is bigger than we expected so we decided to deduct some sub features. We also have a problem with the API to get the data to convert currency from one currency to another currency that doesn't work as we expected and there are limitations that we didn't think about at the beginning.

1.Problem definition

1.1 What is SPFNA-Stock about?

The project is started from the pain point of a new investor who has no where to find the data or research on an individual company. Nowaday, there are a lot of investment platforms such as SeekingAlpha which is the most famous crowd-sourced content service for financial markets. Articles and research covers a broad range of stocks, asset classes, exchange-traded funds (ETFs), and investment strategies. SeekingAlpha allows investors around the world who SeekingAlpha members can write content, comment or view the content but some of the equity thesis content is poor, some of the deep dive have a few details. SeekingAlpha isn't a free platform. As a Most of the investor want to know what our friend holds the stock position and what their thesis behind those investment or in another word investor want to find and copy idea from another person.Most of the normal investors found the stock idea from maybe Line or Facebook, but this type of resource isn’t provide a lot of information to use as a decision to buy or sell stock. Another problem when talking about a new investor who wants to try to invest in the stock market is they want to try sandbox investment or in another word “simulation stock platform”, but the main issue is that there are few places to try and some of them allow users to be available for only some period of time.

This project came up with the idea to try to solve the pain point of the investor. SPFNA stock platform is a stock simulation investment game platform which allows users to share their investment thesis and also simulate their stock portfolio, compete with friends or other users. The SPFNA consists of 2 main features and 3 subfeatures. The First main feature is a stock simulation investment game platform, which allows the user to simulate their stock portfolio and compete with friends, who can make the most return on investment will be the winner of the game. The SPFNA is created as a web-based platform, allowing login users to simulate investing around the world including US, Europe, Hong Kong, Shanghai, Canada, Australia, Thailand, Japan, and London. The second main feature is IDEA space. This feature allows users to share ideas about their own thesis investment and comment on other friend investment thesis.

1.2 SPFNA Features

1.2.1 Stock simulation platform

Allows the user to design their own stock portfolio with the initial money starting at 200,000 USD. Login users can select any stock around the world including the US, Europe, Hong Kong, Shanghai, Canada, Australia, Thailand, Japan, and London.

1.2.2 Leaderboard

Allows any user to view all top return portfolio contestants. Any user can see top contestants holding.

1.2.3 Portfolio P&L Distribution

Allows any user to view the portfolio profit and loss distribution of contestants.

1.2.4 IDEA space

This feature allows login users to post their stock ideas to the public and other login users can comment and share the Ideas.

1.2.5 Admin Announcement

This feature allows Admin users to announce activity related to the competition.

1.3 SPFNA-Stock Web Application Requirement

1. The system must allow users to register and create profiles that include (at least) user name, and password.
2. The system must allow registered users to log in to participate in the competition or access to the Stock simulation platform.
3. The system allows Login users to convert currency between each currency. The system has to support USD, HKD, GBP, EUR, AUD, CAD, THB, CNY.
4. The system must allow Login users to buy or sell stock in the US, Europe, Hong Kong, Shanghai, Canada, Australia, Thailand, Japan, and London.
5. The system must allow Login users to buy the selected stock from the marketplace and have a value equal to the currently selected stock value (Est. Real-time).
6. The system must allow Admin users to set the competition and restart the competition at any time.

7. The system must allow registered users to log out of the system and the simulation stock asset information still remains in the system.
8. The system allows any users to view the leaderboard of top returns in portfolio contestants.
9. The system allows any user to view the portfolio profit and loss Distribution of contestants.
10. The system allows Login users to post their stock ideas to the public.
11. The system allows Login users to comment on stock ideas.
12. The system allows admin users to add the announcement to the website.

1.4 Use Case Diagram

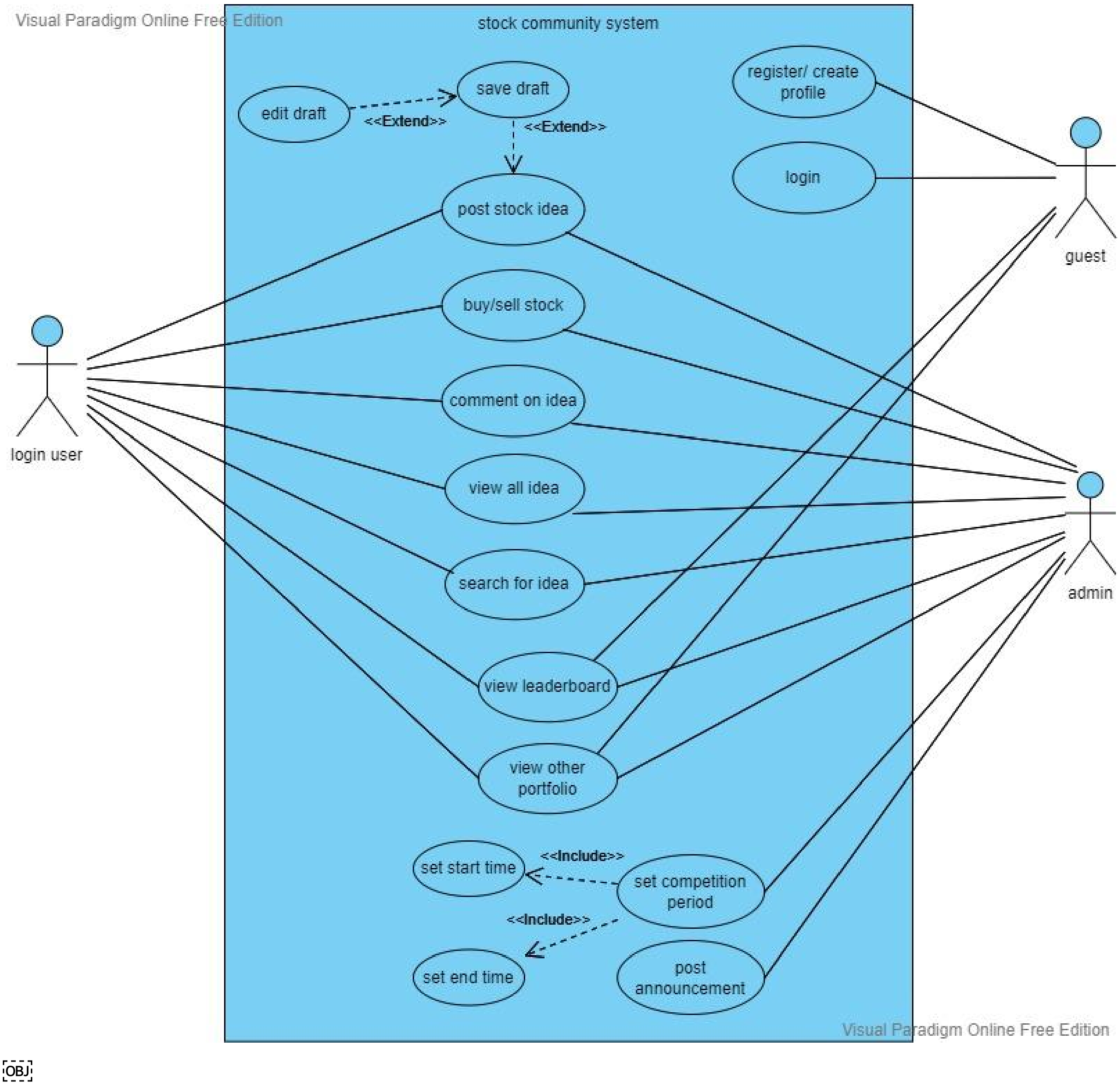


Figure 1.4.1 Use Case Diagram of SPFNA platform

1.5 Use case narrative:

1.5.1 **Use case name:** Buy stock

Actors: Login user and admin

Goal: User buys stock in an adjusted holding period.

Preconditions: The user has logged in

Main success scenario:

1. User go to My Portfolio page
2. User selects Buy button
3. System ask user to input Country, symbol and number of share
4. User click confirm
5. System ask for buy confirmation
6. User confirm the buying
7. System announce the buy notification
8. System return to the My Portfolio page.

Extension (a)

6. System doesn't find the stock in the database

7a. System sorry for the user. Return step 3.

Extension (b)

4b. System warning that the user doesn't have enough money to buy stock.

5b. Return to the My Portfolio page.

Extension (c)

6c. User does not confirm the purchase.

7c. Return to the step home page.

1.5.2 **Use case name:** Sell stock

Actors: Login user and admin

Goal: User sells stock in an adjusted holding period.

Preconditions: The user has logged in

Main success scenario:

1. User go to My Portfolio page
2. User selects Sell button
3. System ask user to input Country, symbol and number of share
4. User click confirm
5. System ask for sell confirmation
6. User confirm the selling
7. System announce the sell complete notification
8. System return to the My Portfolio page.

Extension (a)

6. System doesn't find the stock in the database

7a. System sorry for the user. Return step 3.

Extension (b)

4b. System warning that the user doesn't have enough stock to sell.

5b. Return to the My Portfolio page.

Extension (c)

6c. User does not confirm the purchase.

7c. Return to the step home page.

1.5.3 Use case name: Admin set Start/End competition

Actors: Admin user

Goal: set the competition and end the competition

Preconditions: The admin has logged in

Main success scenario:

1. Admin select Admin page
2. System check is the competition is already not started yet
3. System asks if the admin wants to start the competition or not.
4. Admin select to start the competition
5. System reset the total balance of every login user and reset login user holding.
6. System announces to the login user that the competition has started.
7. System returns to the home page.

Extension (a)

2a. System found that the competition has already started.

3a. System asks if the admin wants to end the competition or not.

4a. Admin select to end the competition.

5a. System asks for confirmation.

6a. Admin accepts the confirmation.

7a. System reset the total balance of every login user and reset users holding.

8a. System announces to the login user that the competition has ended.

Extension (b)

2a. System found that the competition has already started.

3a. System asks if the admin wants to end the competition or not.

4a. Admin select not to end the competition.

5a. System goes back to the home page.

Extension (c)

1. Admin select competition menu.
2. System check is the competition has not started yet.
3. System asks if the admin wants to start the competition or not.
4. Admin selected not to start the competition.
5. System returns to the home page.

1.5.4 Use case name: Post stock idea

Actors: Login user and admin

Goal: to post the idea to the public.

Preconditions: The user has logged in

Main success scenario:

1. User selects the Idea Space page
2. User select Create Post button
3. System asks the user to write the post including topic and detail
4. User input post topic and detail.
5. The user submitted the post.
6. System validate the post.
7. System publishes the user post.

Extension (a)

6a. System show alert for wrong validation.
7a. System asks the user to edit the post.
8a. Return step 4.

Extension (b)

5b. User cancel the post
8b. System returns to the Idea Space page.

Extension (c)

4c. User has not finished the writing.
5c. User click draft button
6c. System saves the post to the database.

1.5.5 Use case name: comment on other stock ideas post

Actors: Login user and admin

Goal: comment on the stock ideas post

Preconditions: The user has logged in

Main success scenario:

1. The user selects the post he/she wants to comment on.
2. The user writes the comment
3. User submits the comment.
4. System publishes the user post to the website.

1.5.6 **Use case name:** post the announcement to the web

Actors: Admin user

Goal: Admin posts the announcement activity to the website.

Preconditions: The user has logged in

Main success scenario:

1. The admin user selects the announcement
2. The admin enter the announcement post
3. The admin published the post announcement
4. System published the post on the website.

Extension (a)

3a. The admin does not finish writing the post then the admin saves the post.

4a. System have the post-draft to the database

5a. System return to the home page.

2.Architecture Design

2.1 Architecture System Design

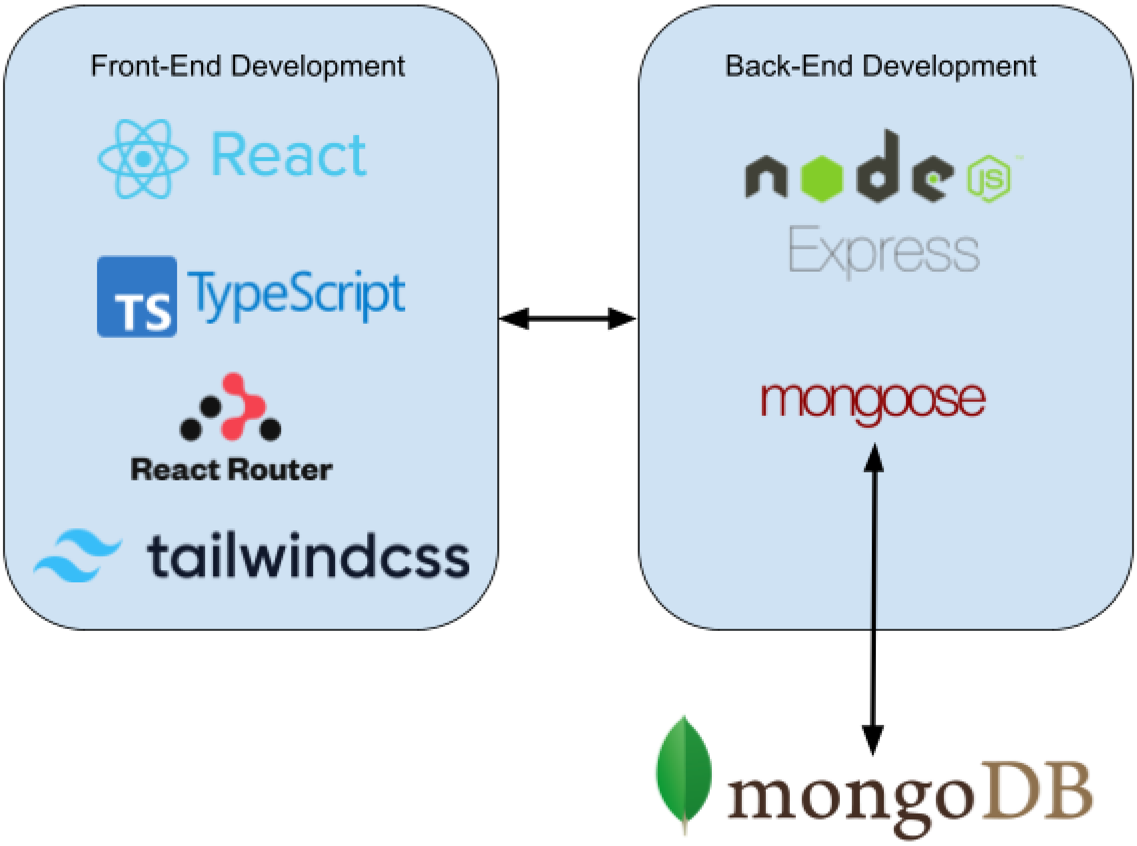


Figure 2.1.1 Architecture Design of The SPFNA platform.

In the Figure 2.1.1 above, show the architecture design of our project. The Technology that we use in this project include.

1. React (Front-end JavaScript library for building UI)
2. Sweetalert2 (beautiful popup box react component use in React)
3. TailwindCSS (Css framework for styling the UI and use with React)
4. Chart.js (free open source JavaScript library for data visualization)
5. Node.js (back-end JavaScript runtime environment)
6. Express (Back-end framework for Node.js for building REST API)
7. MongoDB (NoSQL Database)
8. Mongoose (Node.js based Object Data Modelling (ODM) library for MongoDB)
9. Yahoo finance npm package (npm package to get information related to single stock)
10. TypeScript (Extended JavaScript which adding types to the language)

11. Quill is a free, open source WYSIWYG editor built for the modern web. With its extensible architecture and an expressive API you can completely customize it to fulfill your needs.
12. React selects a flexible and beautiful Select Input control for ReactJS with multiselect, autocomplete, async and creatable support.
13. TanStack Query Powerful asynchronous state management for TS/JS, React, Solid, Vue and Svelte.

2.2 Design pattern of project

This project is implemented by following design Model-View-Controller (MVC) Which consist of three basic components including.

1. Model: Manages data and business logic.
2. View: Handles layout and display.
3. Controller: Routes commands to the model and view parts.

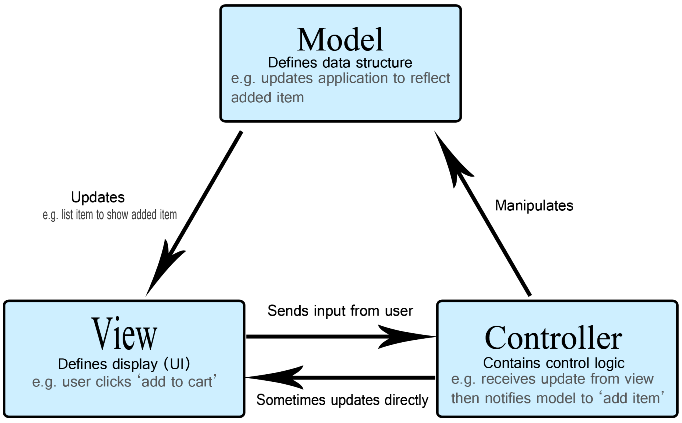
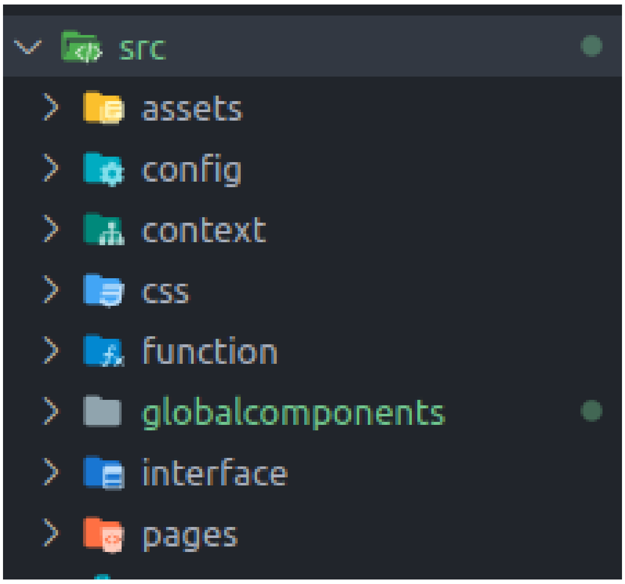

Model
Defines data structure
e.g. updates application to reflect added item
Updates
e.g. list item to show added item
Manipulates
View
Defines display (UI)
e.g. user clicks 'add to cart'
Sends input from user
Sometimes updates directly
Controller
Contains control logic
e.g. receives update from view then notifies model to 'add item'

Figure 2.2.1 MVC model

2.3 Project file structure

2.3.1 Client Structure



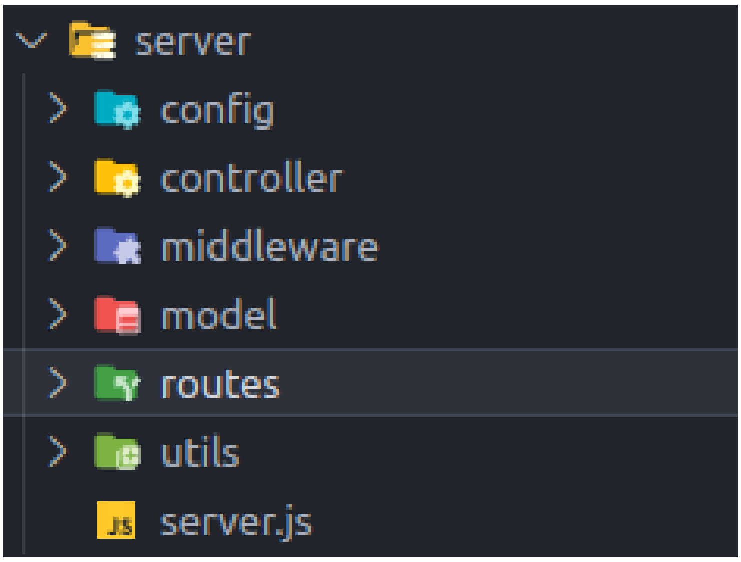
```
src
  assets
  config
  context
  css
  function
  globalcomponents
  interface
  pages
```

Figure 2.3.1 Client File Structure .

Figure 2.3.1 shows the client file structure. The main folder is public and src. Public store the main React file that is used to render in the browser and src is the main working directory. These two are pre-build by react.

Assets : contain image that use
Config : contain config variable.
Context : store react components that are used to transfer data to other components.
CSS : contain all css files.
Function : contain function file.
Globalcomponents : reusable components of react.
Interface : contain react interface for typescript.
Pages : store the page file that are used by each type of users and situation

2.3.2 Server Structure



```
server
  config
  controller
  middleware
  model
  routes
  utils
  server.js
```

Figure 2.3.2

Figure 2.3.2 shows the Server file structure. This folder contains all of the backend process files.

Config : contain config file such as database config.
Controller : contain controller file for each model.
Middleware : contain all authentication and verify token file.
Model : store the model of each data
Routes : route is part of controller and use to store all the URL route for controller and some helper file
Utils : contain utility functions.

2.4 REST API route structure

Express.js API routes can be found in the route folder.

1. **Admin**
   - GET : api/admin/allpublish
     Description : get all publish announcement
   - GET : api/admin/alldraft
     Description : get all draft announcement
   - POST : api/admin/add
     Description : add new announcement
   - POST : api/admin/updatestatus
     Description : update status announcement from draft to publish
   - GET : api/admin/draft/:id
     Description : Get draft announcement by id
   - PUT: api/admin/update
     Description : Update draft announcement

2. **Idea**
   - GET : api/idea/all
     Description : get all idea that have status "publish"
   - GET : api/idea/post/:id
     Description : get single idea post by id
   - GET : api/idea/userpost
     Description : get all idea by user id
   - POST : api/idea/add
     Description : add new idea to the database
   - POST : api/idea/addcomment
     Description : add new comment to the idea
   - PUT : api/idea/update
     Description : update an idea

3. Port

- GET : api/port/price
  Description : get the stock price
- GET : api/port/me
  Description : get all portfolio
- GET : api/port/:userid
  Description : get port using userID
- POST : api/port/buy
  Description : buy and update port
- DELETE :api/port/sell
  Description : sell and update port

4. User

- GET : api/users/leaderboard
  Description : get leaderboard
- POST : api/users/login
  Description : find user and check for password
- GET : api/users/logout
  Description : log user out
- GET : api/users/user
  Description : get current login user
- POST : api/users/register
  Description : add new user
- GET : api/users/:id
  Description : get user using id

3. Other Design Artifacts

3.1 Navigation Map

https://lucid.app/lucidchart/82f8e01e-dce1-4d52-a404-6a6d4ff18e5c/edit?viewport_loc=-879%2C-354%2C4339%2C2235%2C0_0&invitationId=inv_b6021be0-d35b-4431-a96d-7efccc29abbc

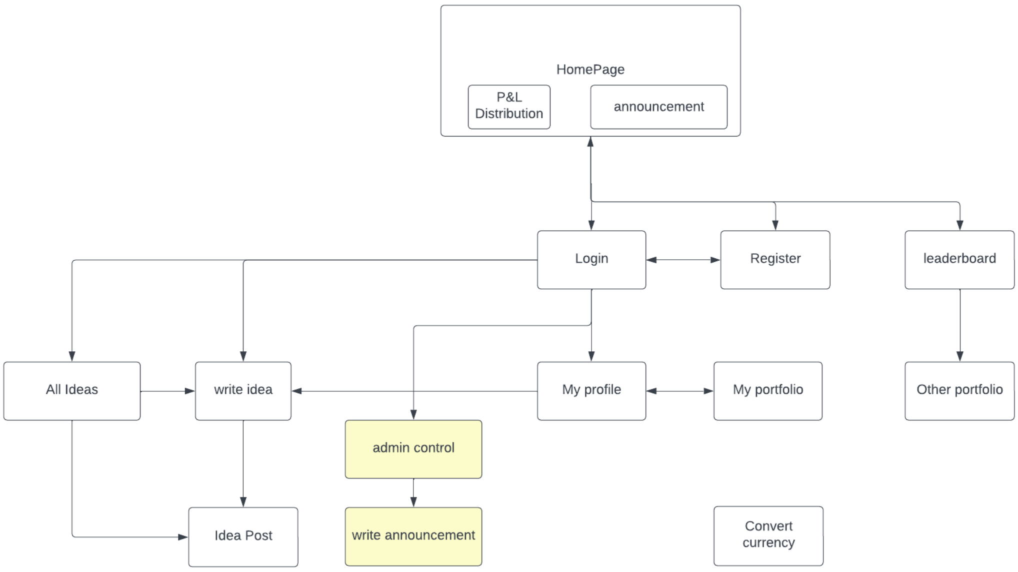


Figure 3.1.1 Navigation Map of The SPFNA System

Figure 3.1.1 shows our SPFNA Navigation Map design.In this website have been planned to contain 12 Pages including.Home Page ,Login Page, Register Page, Leaderboard Page, My profile, My portfolio, Other portfolio,All ideas, write idea, Idea Post ,admin control (only admin user can access). Write Announcement (only admin user can access)

3.2 Class Diagram

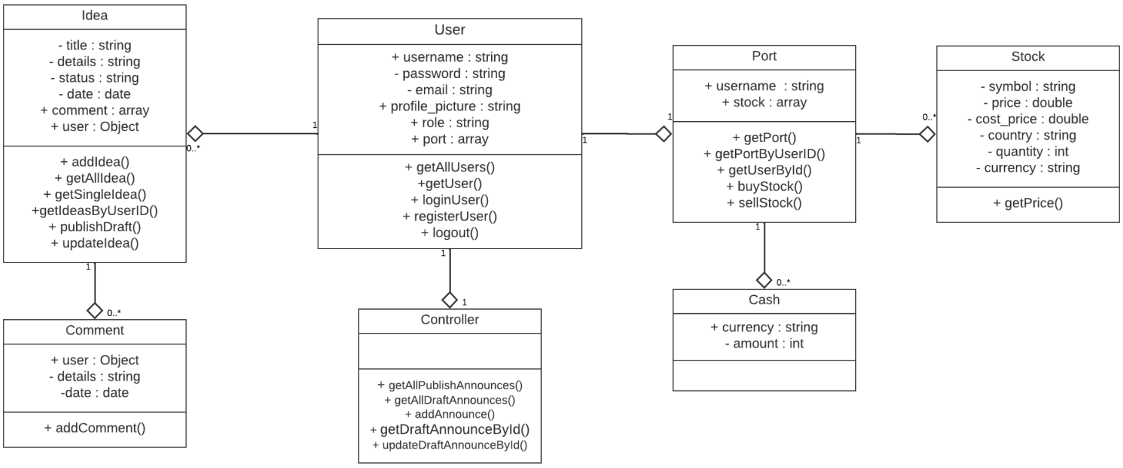


Figure 3.2.1 Class Diagram of The SPFNA System

https://lucid.app/lucidchart/a21ea70e-e4fa-4ab6-800f-8c02fe1518f6/edit?viewport_loc=-334%2C-154%2C2980%2C1535%2CHWEp-vi-RSFO&invitationId=inv_7abcecbb-41c0-4388-a421-e3c602f6f280

3.3 ER diagram

This is the ER diagram of the MongoDB database of the website. The database consists of three collections including Announce, Idea and User.

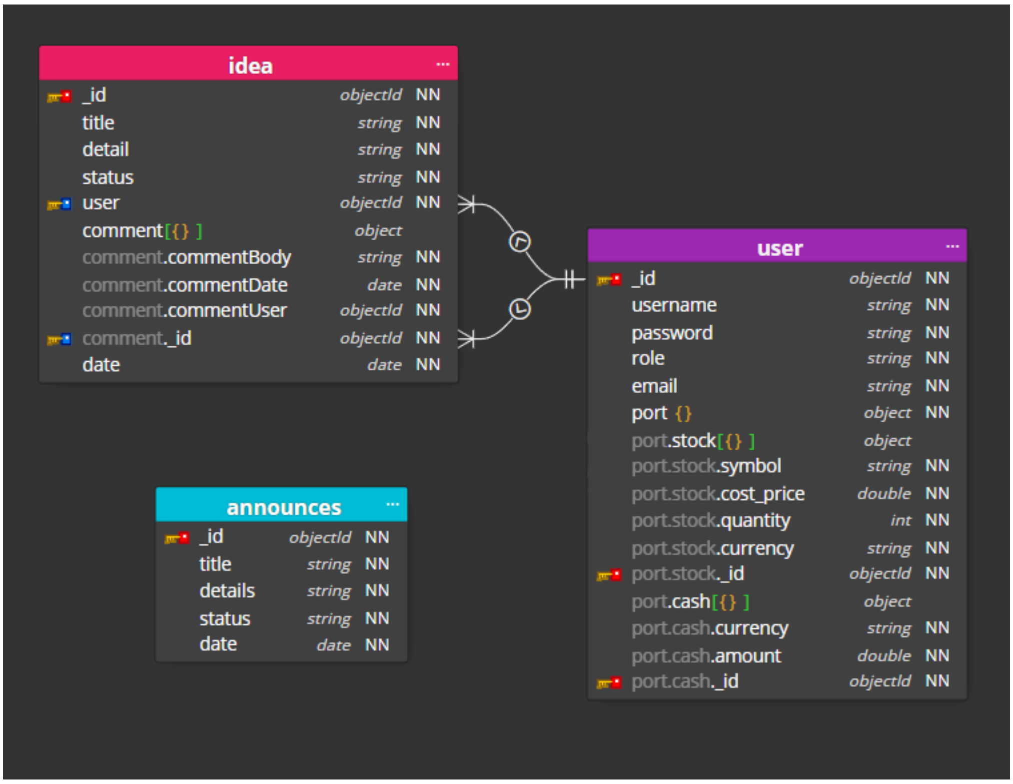


Figure 3.3.1 ER diagram

3.4 Sequence Diagram

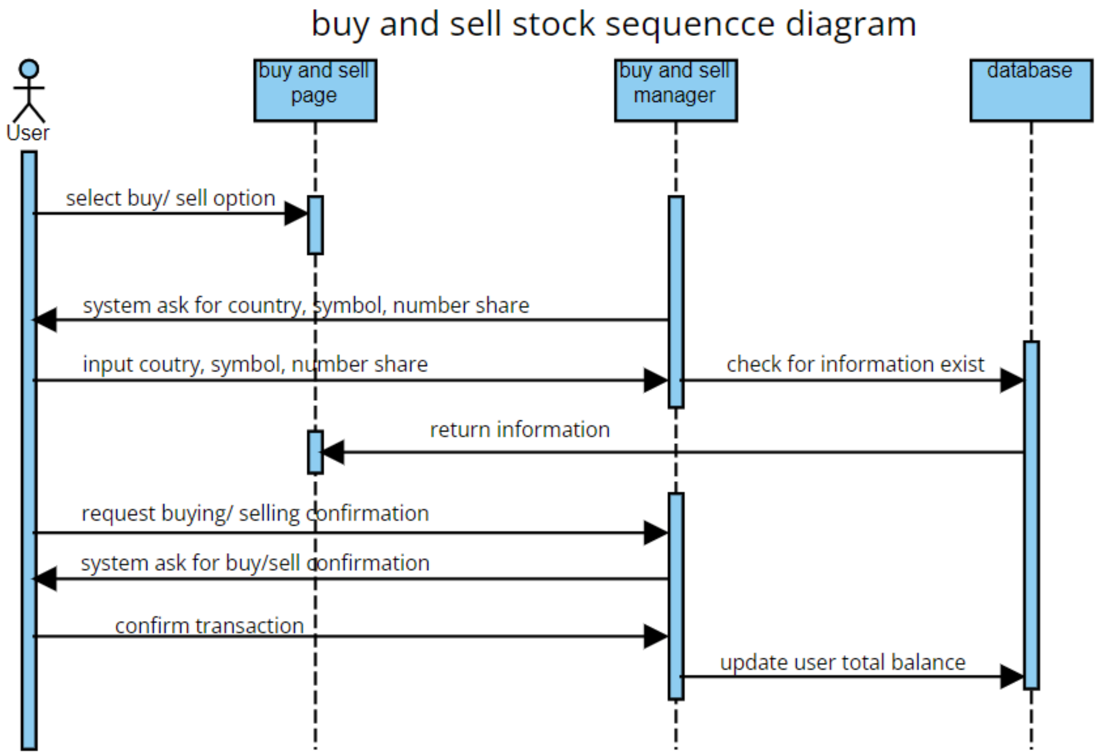

buy and sell stock sequencce diagram
User
buy and sell page
buy and sell manager
database
select buy/ sell option
system ask for country, symbol, number share
input coutry, symbol, number share
check for information exist
return information
request buying/ selling confirmation
system ask for buy/sell confirmation
confirm transaction
update user total balance

Figure 3.4.1 buy and sell stock sequence diagram on The SPFNA system

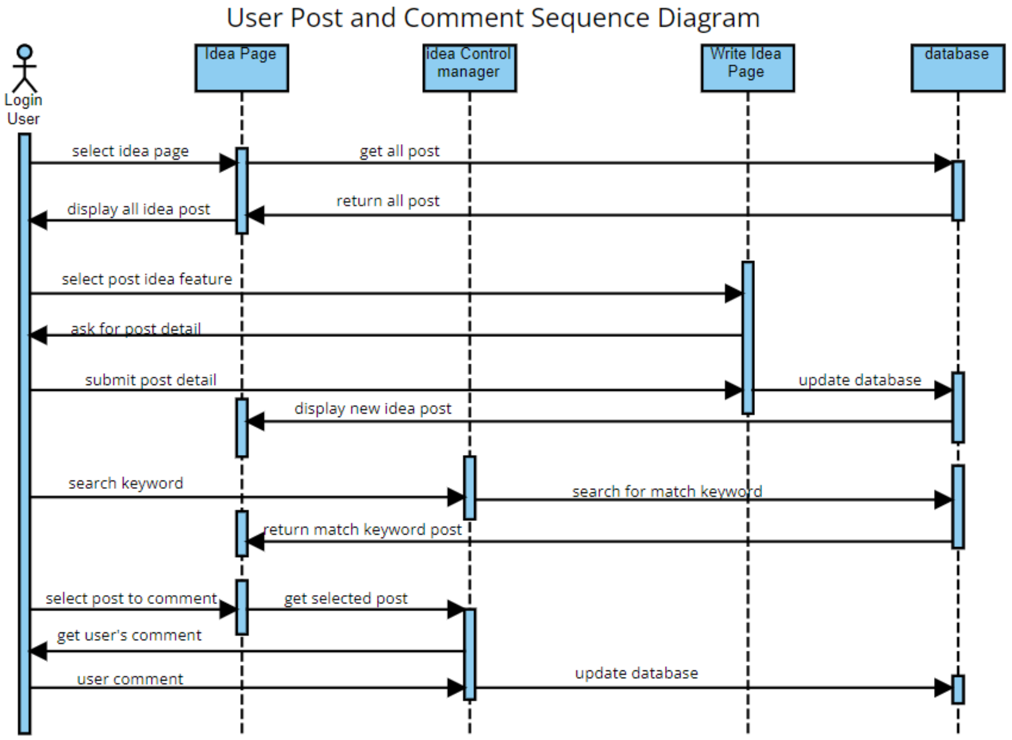


Figure 3.4.2 User Post and Comment Sequence Diagram on The SPFNA system

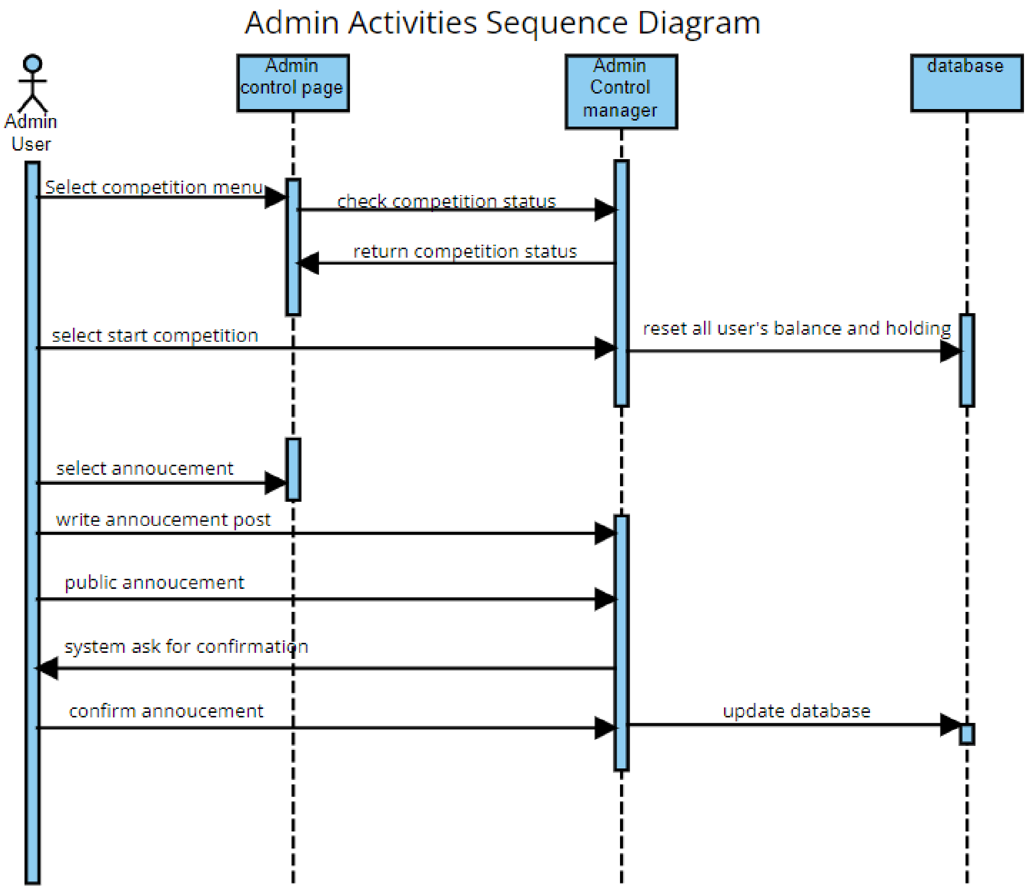
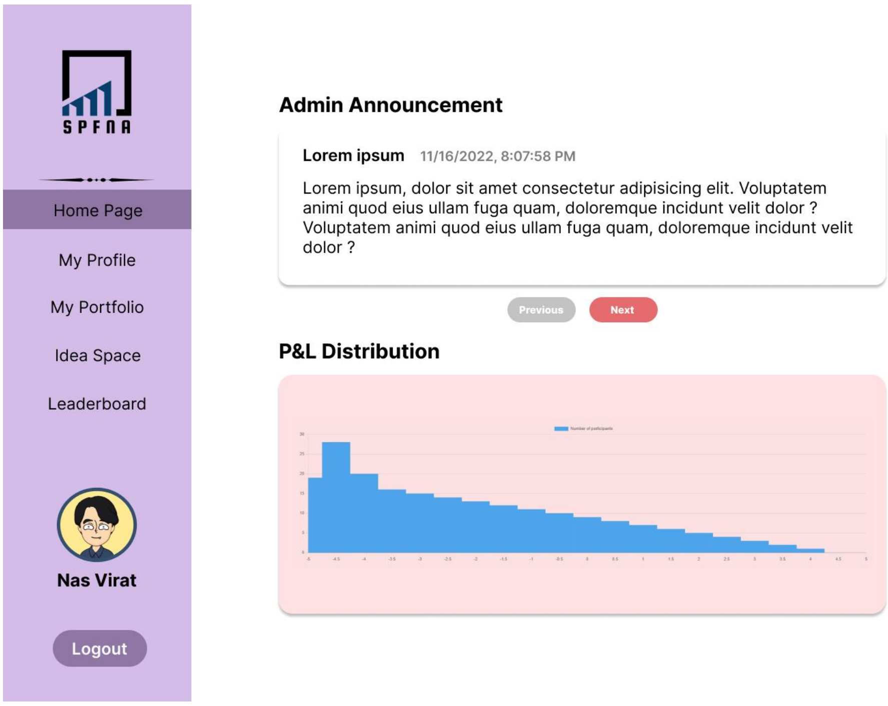


Figure 3.4.3 Admin Activities on The SPFNA system

3.5 UI Design

3.5.1 Home page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=36%3A8&t=wiNUasaSijxAdWpl-0



Admin Announcement

Lorem ipsum 11/16/2022, 8:07:58 PM

Lorem ipsum, dolor sit amet consectetur adipisicing elit. Voluptatem animi quod eius ullam fuga quam, doloremque incidunt velit dolor ? Voluptatem animi quod eius ullam fuga quam, doloremque incidunt velit dolor ?

Figure 3.5.1 Home Page of Website SPFNA

Home page contains 3 main parts.The first part is Navbar. The Navbar will display differently depending on the role of the user. The second part is Admin Announcement. Admin Announcement displays all of the announcements that admin have posted. The Third part is P&L Distribution. This part we plan to display the distribution of all user profit and Loss on The platform, But We haven’t finished due to the limit of time and the complexity of algorithm. SPFNA platform allows any user to view this page.

3.5.2 Login page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=33%3A5&t=wiNUasaSijxAdWpl-0

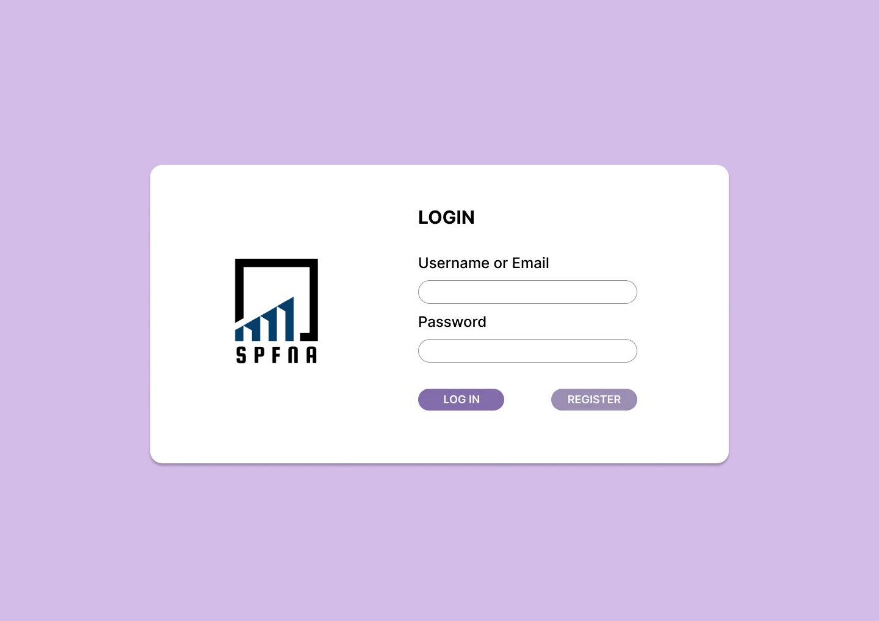


Figure 3.5.2 Login Page of Website SPFNA

Login Page has the option for users to login to the page or register to be a member of The SPFNA. After user login successfully the website will navigate to the home page but if user login unsuccessfully the website will pop up the error. If the user clicks the register button, The website will navigate to the Register page.

3.5.3 Register page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=36%3A31&t=wiNUasaSijxAdWpl-0

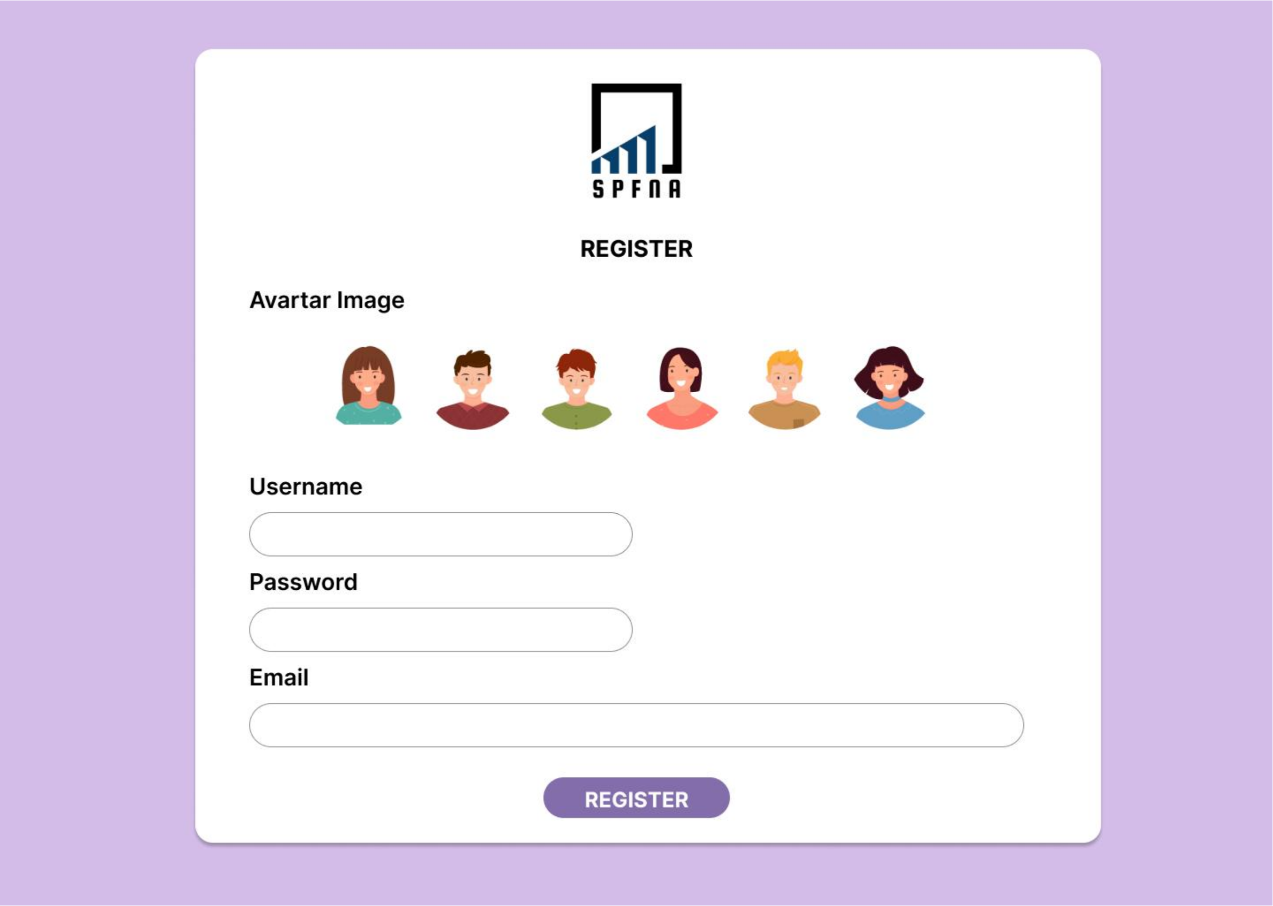
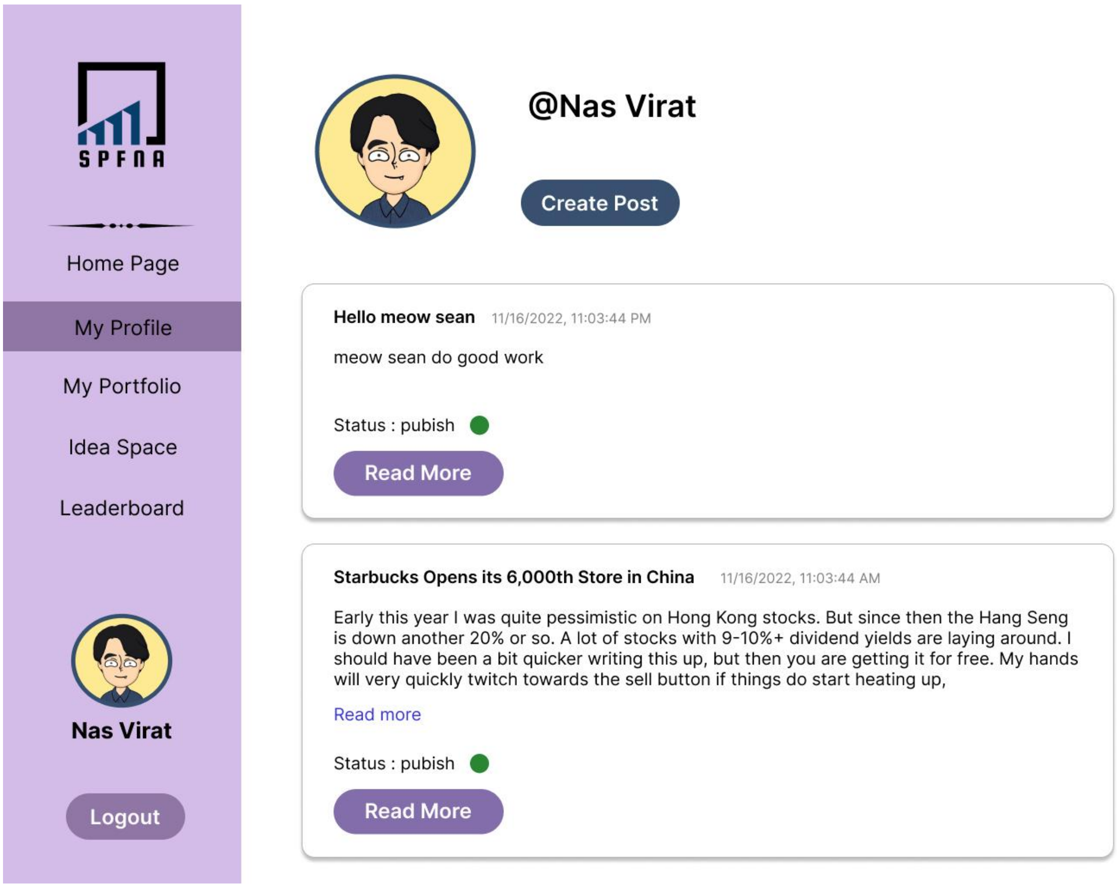


Figure 3.5.3 Register Page of Website SPFNA

The Register Page has an option for users to create a new account to the system. If a user creates a new account successfully the website will navigate to the homepage but still haven’t logged in to the website. If a user creates a new account unsuccessfully the error will pop up and the user can register again.

3.5.4 My profile page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=61%3A85&t=wiNUasaSijxAdWpl-0



Hello meow sean 11/16/2022, 11:03:44 PM

meow sean do good work

Status : pubish ●

Starbucks Opens its 6,000th Store in China 11/16/2022, 11:03:44 AM

Early this year I was quite pessimistic on Hong Kong stocks. But since then the Hang Seng is down another 20% or so. A lot of stocks with 9-10%+ dividend yields are laying around. I should have been a bit quicker writing this up, but then you are getting it for free. My hands will very quickly twitch towards the sell button if things do start heating up,

Read more

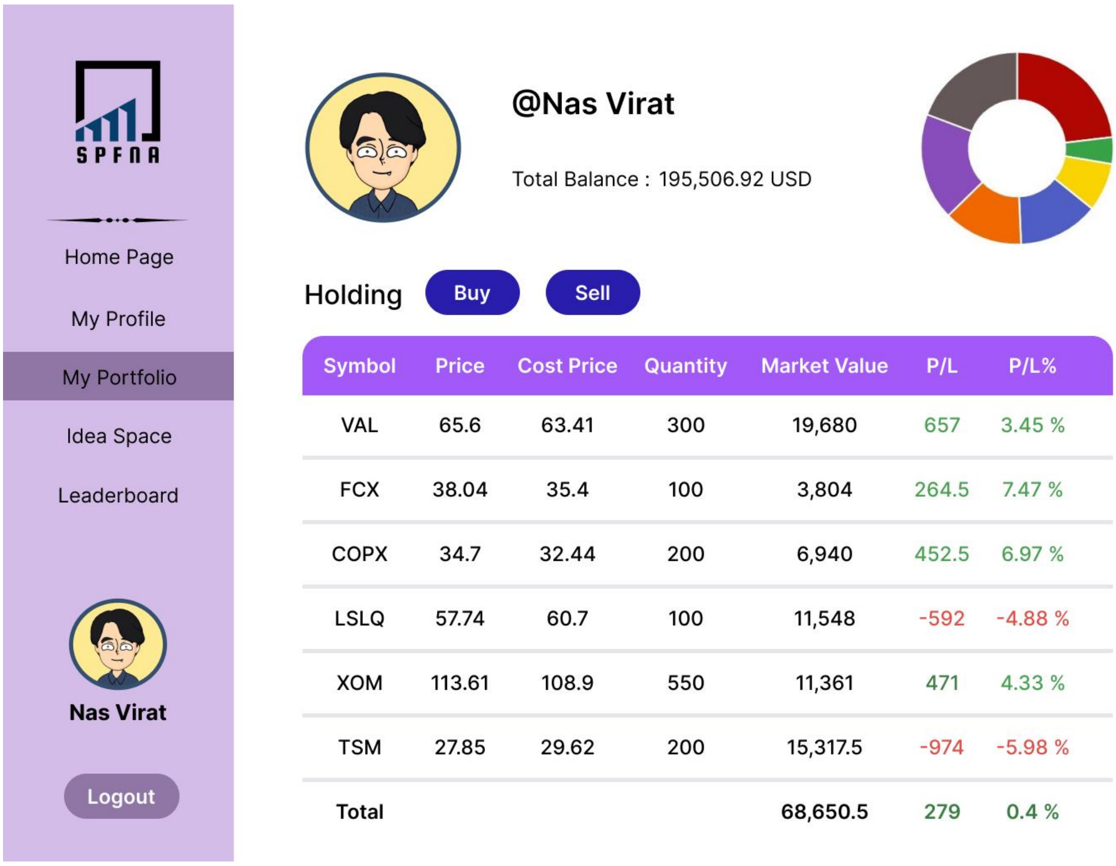
Status : pubish ●

Figure 3.5.4 My Profile Page of Website SPFNA

My profile contains 2 main parts. The first part is the username and userprofile. The second part is the post history, this will show both the user's published post and the draft post. This page also allows users to create a new post which will navigate to the writing idea page. After the user finishes writing the post the post will be posted to the idea space.

3.5.5 My portfolio page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=33%3A7&t=wiNUasaSijxAdWpl-0



@Nas Virat

Total Balance : 195,506.92 USD

Holding

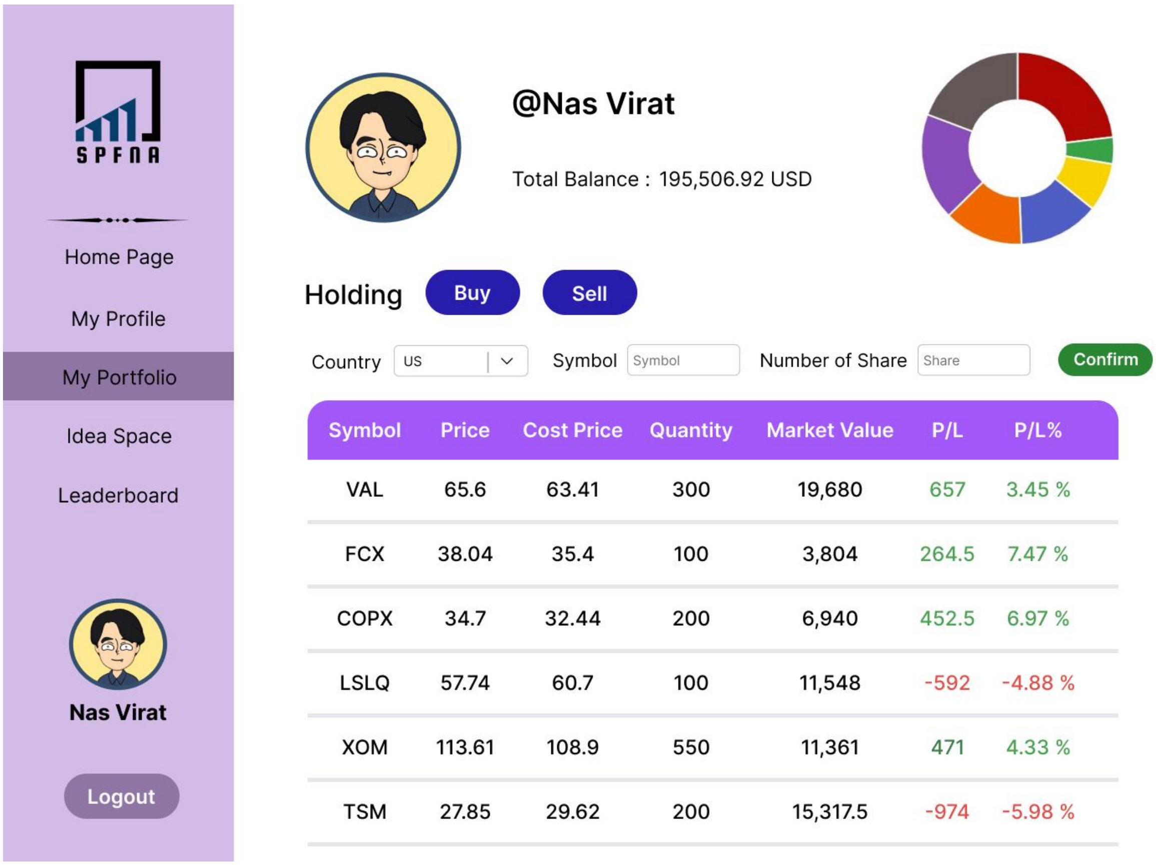
Symbol	Price	Cost Price	Quantity	Market Value	P/L	P/L%
VAL	65.6	63.41	300	19,680	657	3.45 %
FCX	38.04	35.4	100	3,804	264.5	7.47 %
COPX	34.7	32.44	200	6,940	452.5	6.97 %
LSLQ	57.74	60.7	100	11,548	-592	-4.88 %
XOM	113.61	108.9	550	11,361	471	4.33 %
TSM	27.85	29.62	200	15,317.5	-974	-5.98 %
Total				68,650.5	279	0.4 %

Figure 3.5.5 My Profile Page of Website SPFNA

The my portfolio page shows the user's total balance, all the stock the user owns and a pie chart visualization of stock proportion. This page has an option for users to buy from the system or sell in the portfolio. If the user has buy/sell a stock the holding chart and pie chart will be updated.

3.5.6 My portfolio page - Buy and Sell

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=101%3A97&t=wiNUasaSijxAdWpl-0



@Nas Virat

Total Balance : 195,506.92 USD

Holding

Country US Symbol Symbol Number of Share Share

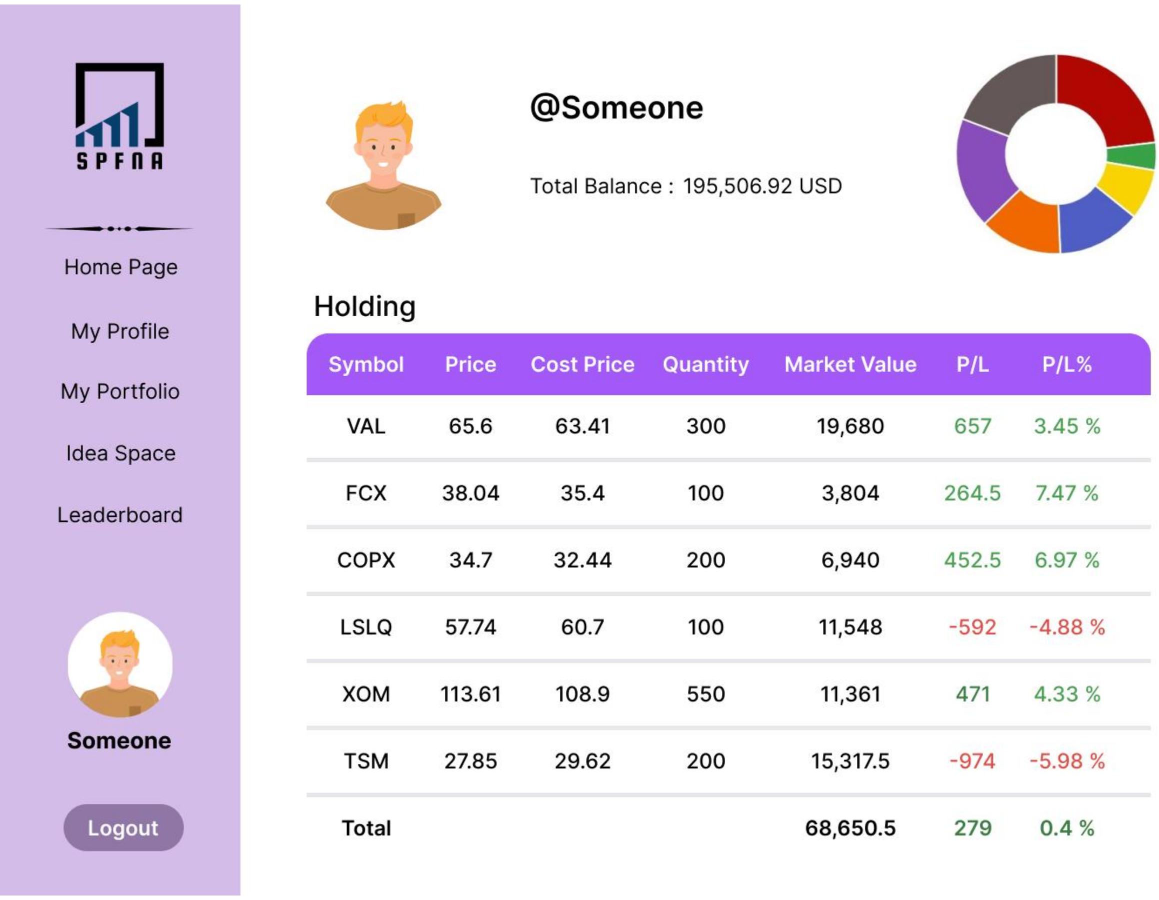
Symbol	Price	Cost Price	Quantity	Market Value	P/L	P/L%
VAL	65.6	63.41	300	19,680	657	3.45 %
FCX	38.04	35.4	100	3,804	264.5	7.47 %
COPX	34.7	32.44	200	6,940	452.5	6.97 %
LSLQ	57.74	60.7	100	11,548	-592	-4.88 %
XOM	113.61	108.9	550	11,361	471	4.33 %
TSM	27.85	29.62	200	15,317.5	-974	-5.98 %

Figure 3.5.6 My portfolio page - Buy and Sell of Website SPFNA

The My portfolio page has a buying option and selling option. If the user wants to sell/buy the stock system will ask the user to input stock country, symbol and number of shares. After the user confirms the sell/buy the holding portfolio will update. If the user input invalid input or didn't input all the information, the system will pop up an error.

3.5.7 Other portfolio page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=110%3A352&t=wiNUasaSijxAdWpl-0



@Someone

Total Balance : 195,506.92 USD

Holding

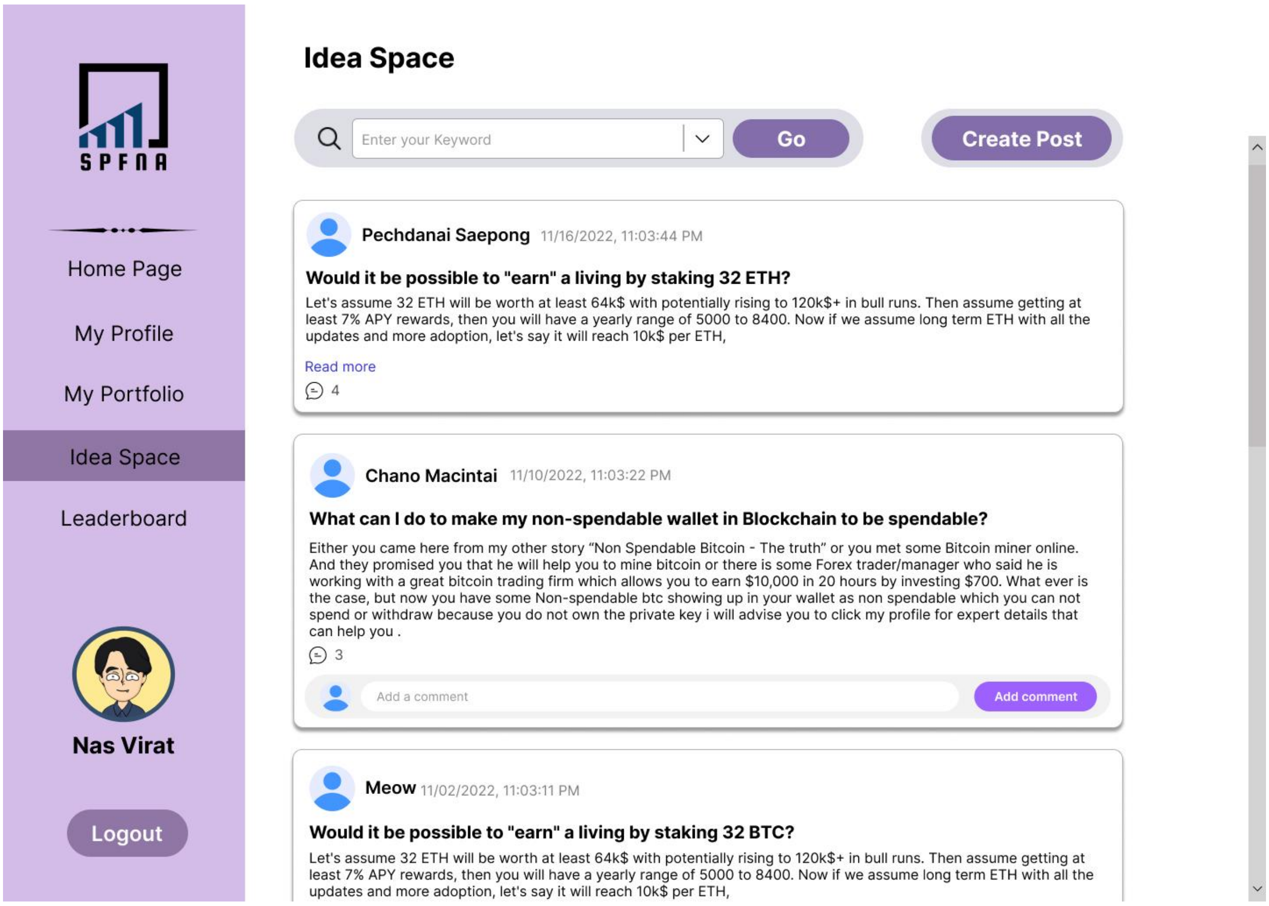
Symbol	Price	Cost Price	Quantity	Market Value	P/L	P/L%
VAL	65.6	63.41	300	19,680	657	3.45 %
FCX	38.04	35.4	100	3,804	264.5	7.47 %
COPX	34.7	32.44	200	6,940	452.5	6.97 %
LSLQ	57.74	60.7	100	11,548	-592	-4.88 %
XOM	113.61	108.9	550	11,361	471	4.33 %
TSM	27.85	29.62	200	15,317.5	-974	-5.98 %
Total				68,650.5	279	0.4 %

Figure 3.5.7 Other portfolio page of Website SPFNA

The other portfolio page is similar to the user portfolio page which displays username, total balance, donut pie chart portfolio summary, and all stock that user holds. This page is navigated from the leaderboard page when the user clicks on another username that the user wants to see information.

3.5.8 All idea page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=36%3A28&t=wiNUasaSijxAdWpl-0



Pechdanai Saepong 11/16/2022, 11:03:44 PM

Would it be possible to "earn" a living by staking 32 ETH?

Let's assume 32 ETH will be worth at least 64k$ with potentially rising to 120k$+ in bull runs. Then assume getting at least 7% APY rewards, then you will have a yearly range of 5000 to 8400. Now if we assume long term ETH with all the updates and more adoption, let's say it will reach 10k$ per ETH,

Read more

4

Chano Macintai 11/10/2022, 11:03:22 PM

What can I do to make my non-spendable wallet in Blockchain to be spendable?

Either you came here from my other story "Non Spendable Bitcoin - The truth" or you met some Bitcoin miner online. And they promised you that he will help you to mine bitcoin or there is some Forex trader/manager who said he is working with a great bitcoin trading firm which allows you to earn $10,000 in 20 hours by investing $700. What ever is the case, but now you have some Non-spendable btc showing up in your wallet as non spendable which you can not spend or withdraw because you do not own the private key i will advise you to click my profile for expert details that can help you .

3

Add a comment
Add comment

Meow 11/02/2022, 11:03:11 PM

Would it be possible to "earn" a living by staking 32 BTC?

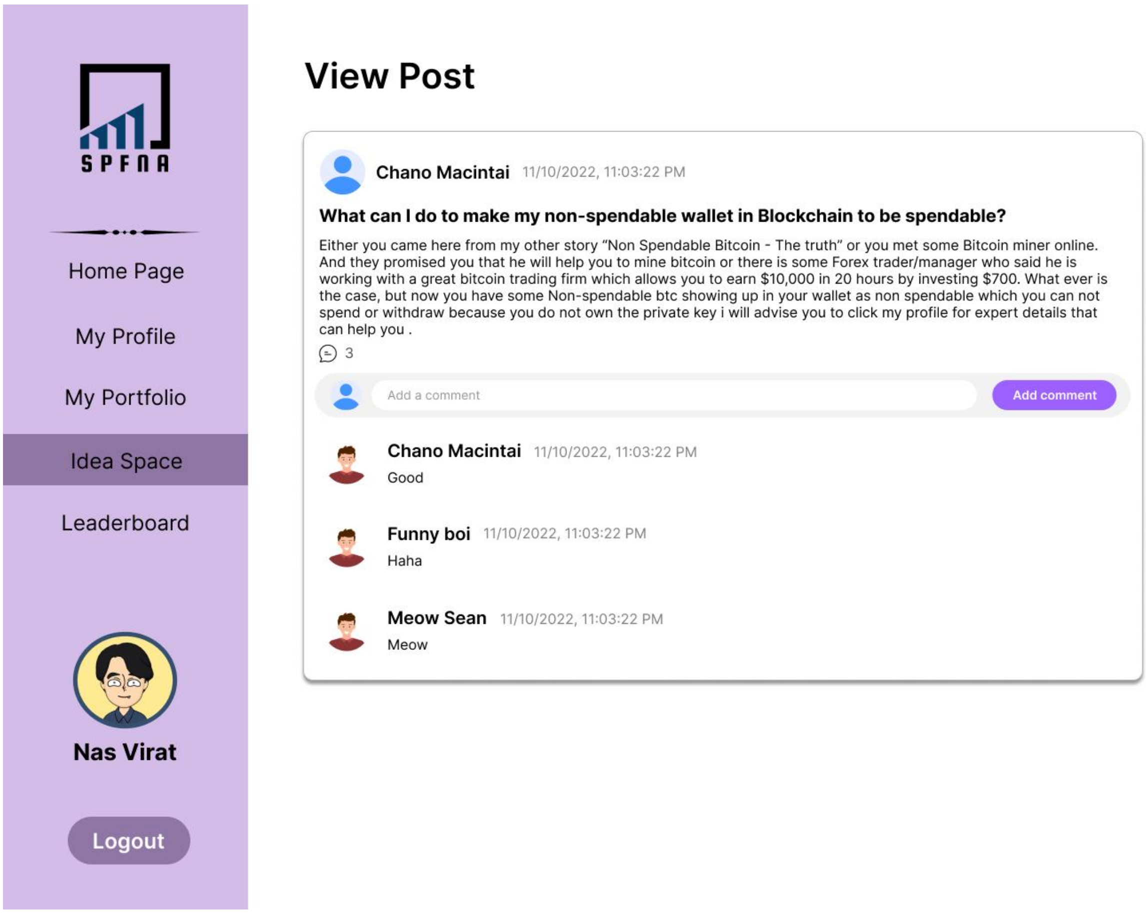
Let's assume 32 ETH will be worth at least 64k$ with potentially rising to 120k$+ in bull runs. Then assume getting at least 7% APY rewards, then you will have a yearly range of 5000 to 8400. Now if we assume long term ETH with all the updates and more adoption, let's say it will reach 10k$ per ETH,

Figure 3.5.8 All idea page of Website SPFNA

The all idea page allows login users to share and view information about the stock idea with other users. This page also has a create post option for posing an idea, and a search bar to search a post by keyword (post topic). It first needs to load the page when navigating in the first time but then it cache data so the next time it is navigated it takes much less time.

3.5.9 View post (comments) page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=433%3A1131&t=wiNUasaSijxAdWpl-0



View Post

Chano Macintai 11/10/2022, 11:03:22 PM

What can I do to make my non-spendable wallet in Blockchain to be spendable?

Either you came here from my other story "Non Spendable Bitcoin - The truth" or you met some Bitcoin miner online. And they promised you that he will help you to mine bitcoin or there is some Forex trader/manager who said he is working with a great bitcoin trading firm which allows you to earn $10,000 in 20 hours by investing $700. What ever is the case, but now you have some Non-spendable btc showing up in your wallet as non spendable which you can not spend or withdraw because you do not own the private key i will advise you to click my profile for expert details that can help you .

Chano Macintai 11/10/2022, 11:03:22 PM
Good

Funny boi 11/10/2022, 11:03:22 PM
Haha

Meow Sean 11/10/2022, 11:03:22 PM
Meow

Figure 3.5.9 View post (comments) page of Website SPFNA

The view post page contains all comments of the post and this page has an option for users to comment on that post. After users comment successfully that comment will be shown on the top of the comment field.

3.5.10 Write idea page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=165%3A306&t=wiNUasaSijxAdWpl-0

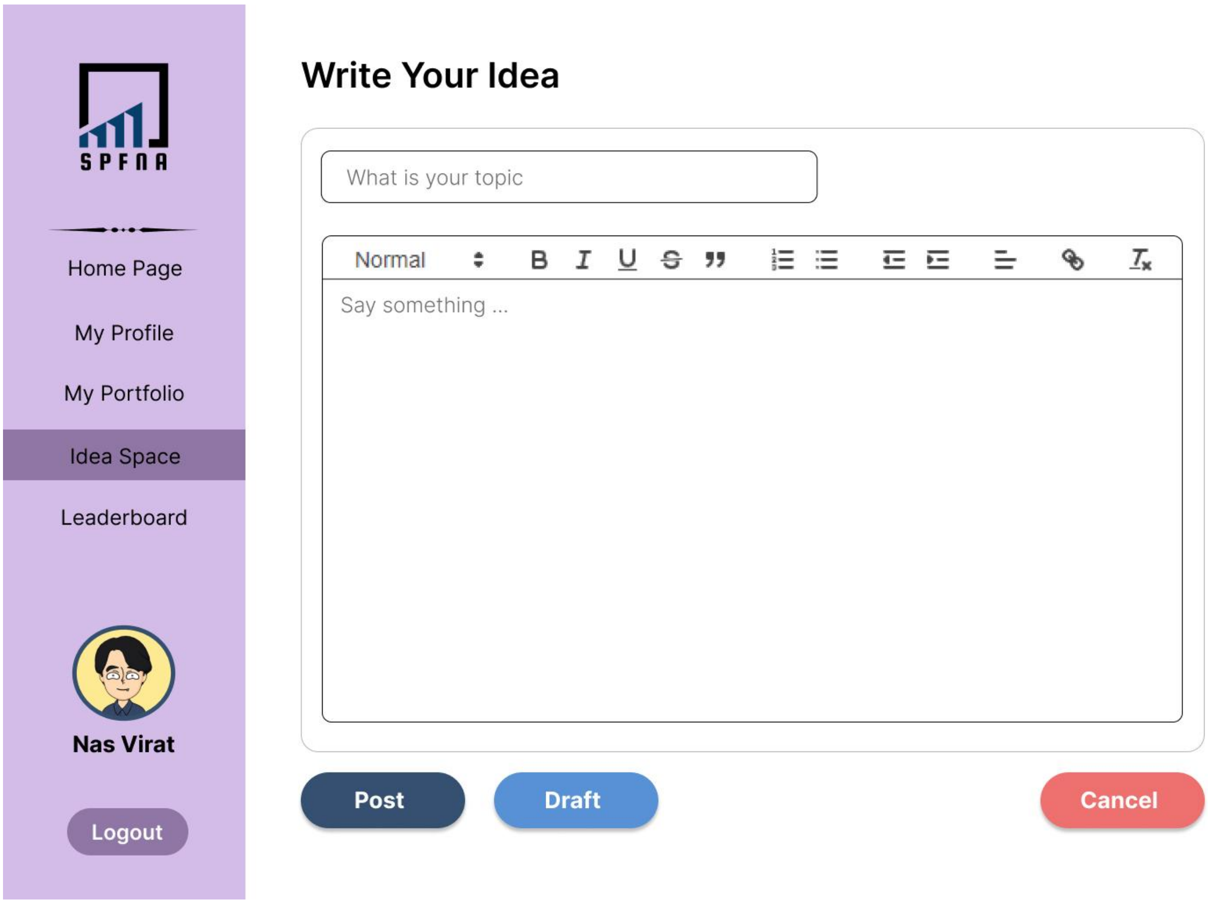


Figure 3.5.10 Write idea page of Website SPFNA

The write idea page has an option for users to create a new idea. After clicking on the post button, that idea will be posted on idea space and displayed at the user profile also and the website will navigate to the idea space page. When clicking on the draft button, that idea will be shown at the user profile and the website will navigate to the user profile page. And if clicking on the cancel button, that writing will be canceled and the website will navigate to the idea space page (the all idea page).

3.5.11 Leaderboard page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=36%3A30&t=wiNUasaSijxAdWpl-0

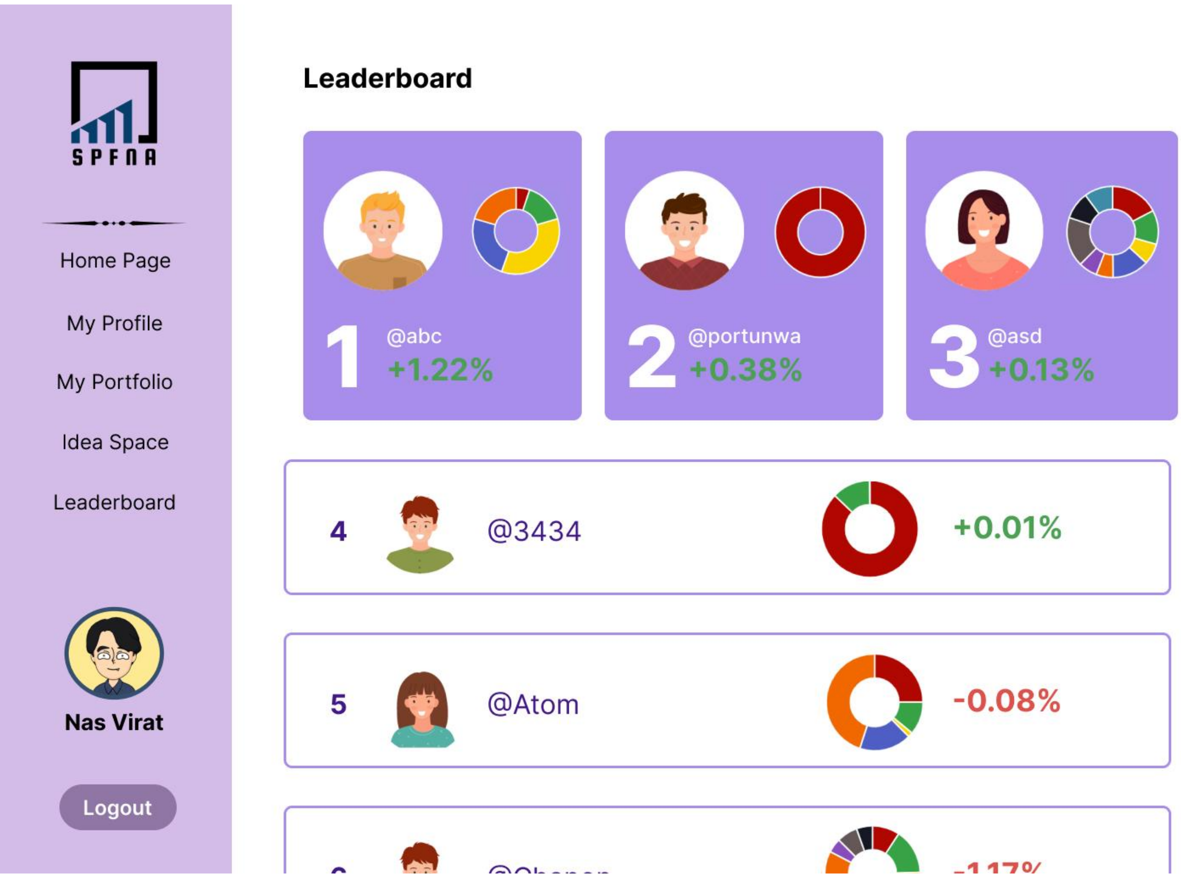
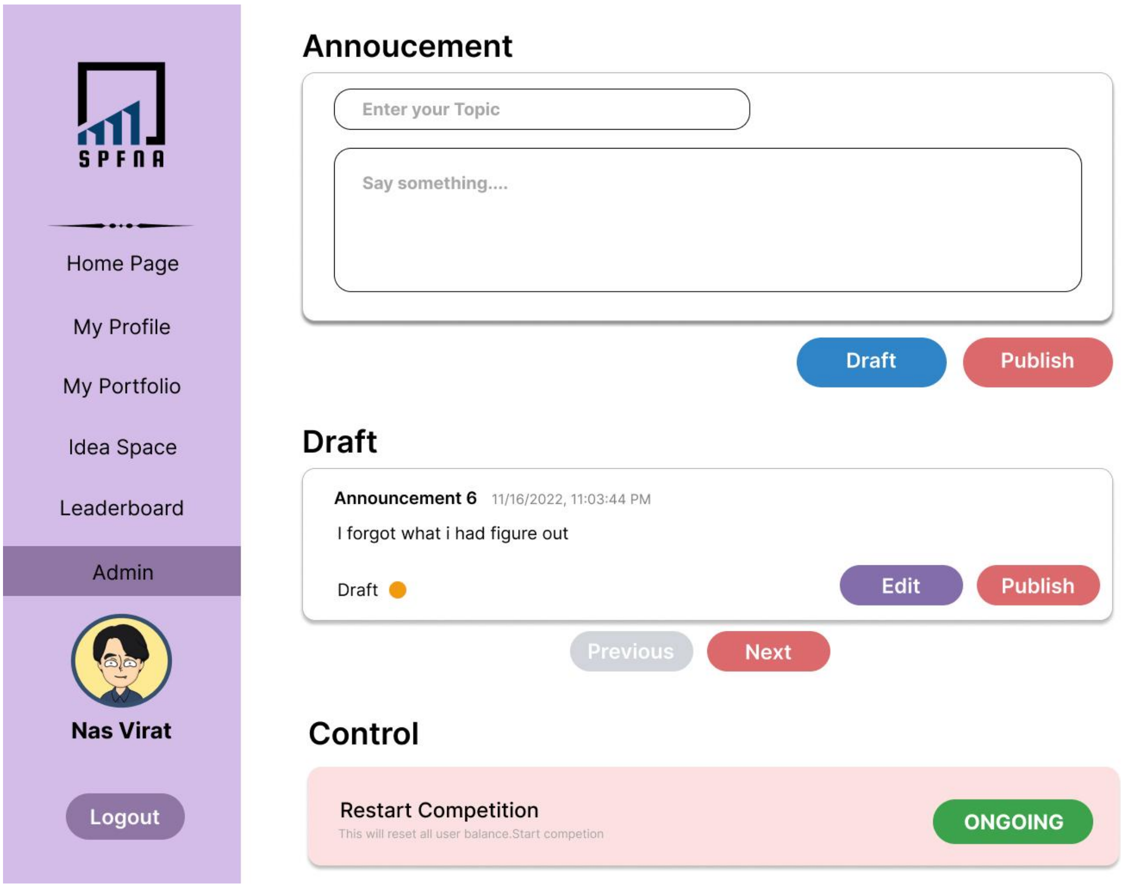


Figure 3.5.11 Leaderboard page of Website SPFNA

The leaderboard page shows the ranking of users who have the best profit. Users can click on another username then the website will navigate to that user portfolio. It first needs to load the page when navigating in the first time but then it cache data so the next time it is navigated it takes much less time.

3.5.12 Admin control page (admin role only)

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=36%3A9&t=wiNUasaSijxAdWpl-0



Announcement 6 11/16/2022, 11:03:44 PM

I forgot what i had figure out

Draft ●

Restart Competition

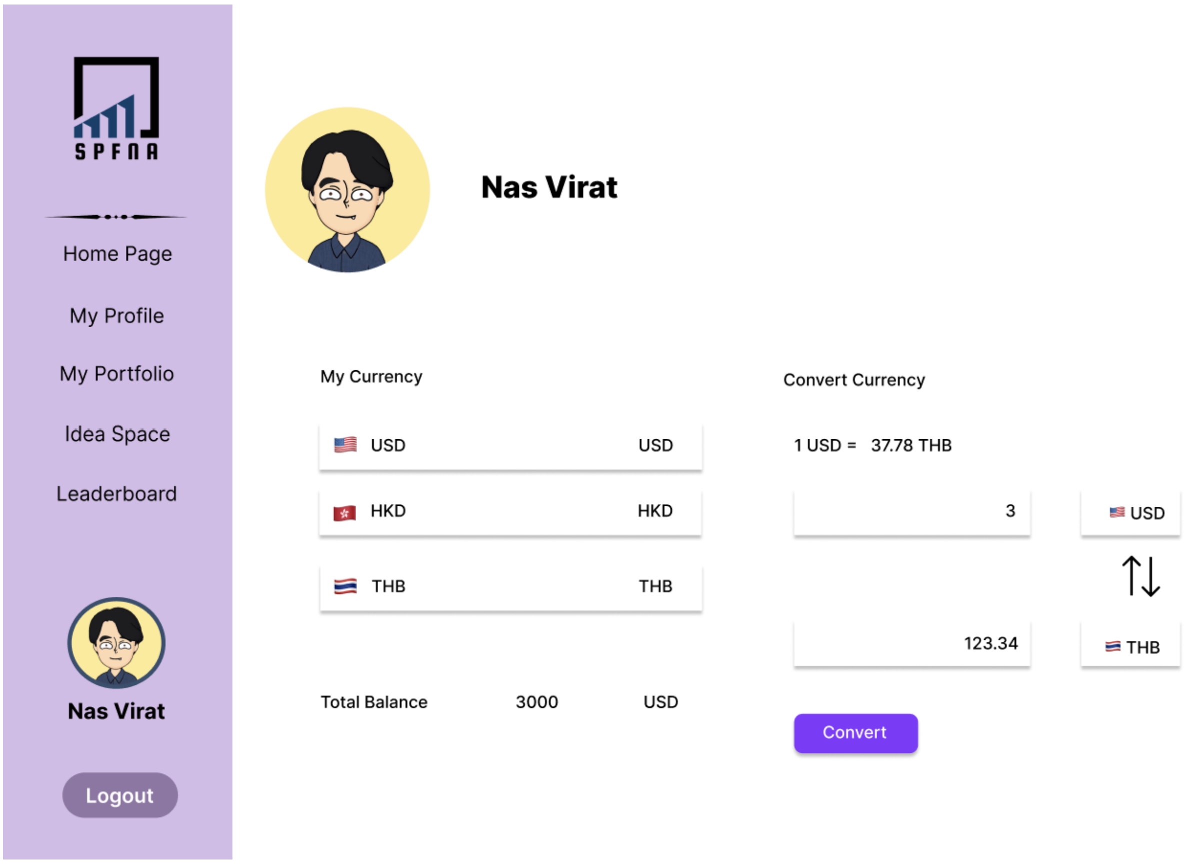
This will reset all user balance.Start competion

Figure 3.5.12 Admin control page of Website SPFNA

The admin control page has an option for users who are admin to create announcements and control the competition. For announcement, admin can save it to draft or publish. After the admin publishes or saves a draft successfully the website will pop up “successful” and it will show on the homepage. And this page also has options for the admin to edit or publish all announcement drafts.

3.5.13 Convert currency page

https://www.figma.com/file/1CqPojuwy5iMFcQDBEAo5Y/Stock-UI?node-id=36%3A7&t=bABpZiRyREgesymm-0



Nas Virat

My Currency

USD	USD
HKD	HKD
THB	THB

Total Balance 3000 USD

Convert Currency

1 USD = 37.78 THB

3 USD

123.34 THB

Figure 3.5.12 Convert Currency page of Website SPFNA

The convert currency page has an option for users to convert between different currencies. This page shows all the currency the user has in the system with the total balance in USD. This page we haven't finished implementing them due to the limitation of the API feature.

4. Development process description

The development process is based on the waterfall Process. At first, our group preferred to use the Scrum process, but after consultation, we realized that we misunderstand the software framework process. We have done the work based on the waterfall Process at first, but we thought it was Scrum. So, some practices are similar to Scrum for example, using Jira to keep track of what has been done in each phase, daily meeting every time a work period has ended in order to summarize.We have discussed on our team to continue work on the process of waterfall.

The process that we plan include the following

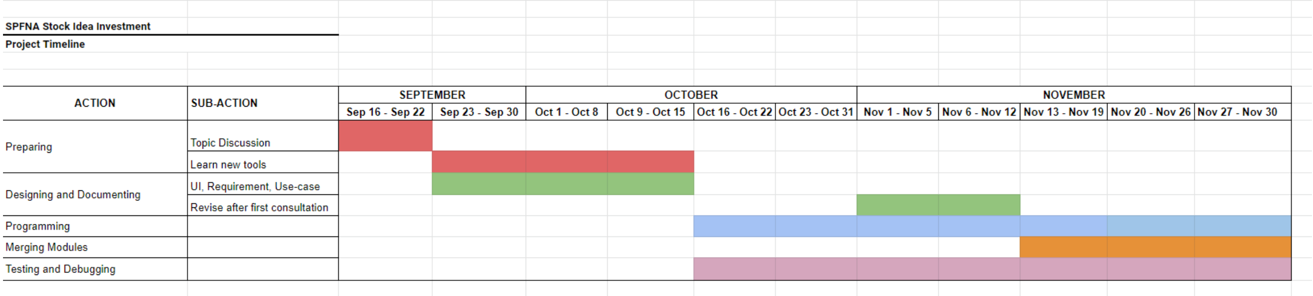
1. Have meetings every time the work period has ended in each phase.
2. Use Jira software to manage and keep track of the process.
3. The code is stored in github and local machines.

At the beginning of the project, our group started by writing up requirements of the program that have to be done, then draft the simple diagrams to visualize how components and the contents interacted in the software. For example, models, schema, business rules, and use-case narrative. Unfortunately, due to our lack of experience with the public API usage, we found that there is a limited number of requests to use for free. It caused us to revise and change some business rules (The convert-currency module API from node package is limited to use). At the beginning we designed this feature to be available for many markets but due to the API constraint we can't convert from one currency to other currency, So login users can hold only one currency. In this case we select USD. And in the P&L part, at the beginning, we plan to achieve it in time. But after doing this project for a long time, we encountered quite a few problems along the way. It took us more time to do other parts, which is why we canceled doing P&L because there was not enough time to do it. We also spend some time learning new technology that we never used before like TypeScript and MongoDB (NoSQL). We need to spend some time reading the documentation and experimenting with them while coding.

From the scope of our project, all of us agreed that the server part is the most difficult part and three members in our group are full-stack to do both server and client side. So, we decided to split our team into two smaller teams of three full-stacks who are responsible for most likely on the client side, but be able to help to fix some server side problems, and the other two members are working on only server side.

Microsoft Visual Studio Code is the application that our team prefers due to its Liveshare feature which enables all members to see and edit the code together in real time and some extensions like the intellisense to help us write some syntax easily when coding. Our group uses GitHub as a software configuration management tool and uses the main branch as the latest update. When doing new features, we will change the branch before to avoid conflict and then merge into the main after that feature finishes. Then, deleted the no longer updated branch. For communication software, we use Discord due to simplicity and important provided features like screen sharing and unexpired upload documents.

4.1 Project Timeline



SPFNA Stock Idea Investment
Project Timeline

ACTION	SUB-ACTION	SEPTEMBER		OCTOBER				NOVEMBER				
		Sep 16 - Sep 22	Sep 23 - Sep 30	Oct 1 - Oct 8	Oct 9 - Oct 15	Oct 16 - Oct 22	Oct 23 - Oct 31	Nov 1 - Nov 5	Nov 6 - Nov 12	Nov 13 - Nov 19	Nov 20 - Nov 26	Nov 27 - Nov 30
Preparing	Topic Discussion	🟥										
	Learn new tools		🟥	🟥	🟥							
Designing and Documenting	UI, Requirement, Use-case		🟩	🟩	🟩							
	Revise after first consultation							🟩	🟩			
Programming						🟦	🟦	🟦	🟦	🟦	🟦	🟦
Merging Modules										🟧	🟧	🟧
Testing and Debugging						🟪	🟪	🟪	🟪	🟪	🟪	🟪

https://docs.google.com/spreadsheets/d/1VBvs9MTNzsGjO9pqRXsoAOhWdAsM1-Oijm2_hqOoo_M/edit#gid=704464086

4.1.1 Preparing

We discussed the topic for this project and decided to do a web application project. So, we decided on the technology MERN (Mongo, Express, React, Node.js) Stack with TypeScript. Then, we chose Tailwind Css as a utility for the front-end.

4.1.2 Designing and documenting

We wrote the requirements that have to be done. Then, we planned to do the user interface design. The design is created by figma. We discuss color themes that should be used in design, then we separate tasks to each person based on personal preference. Also, we draft the project diagram by using Lucid. After consulting and testing the API, we revise together and change some design and visualization to the final one.

4.1.3 Programming

We started to set up the project for both client and server side. Then, start coding on the front-end and back-end part, but it is not connected to each other.

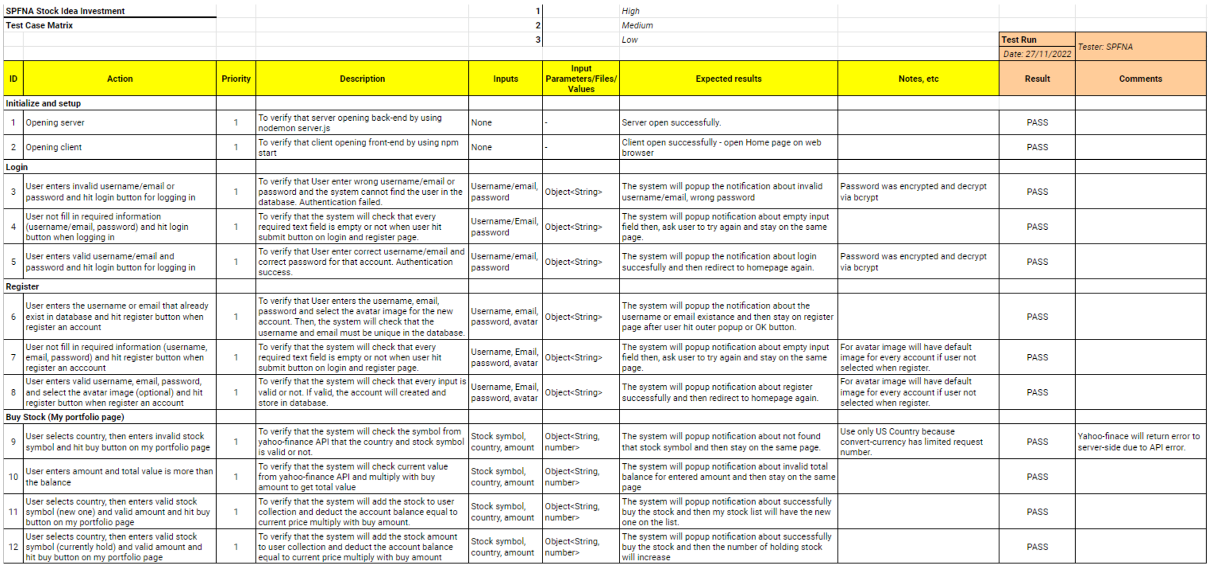
4.1.4 Merging

Connect the REST API from server side to the front-end or client side.

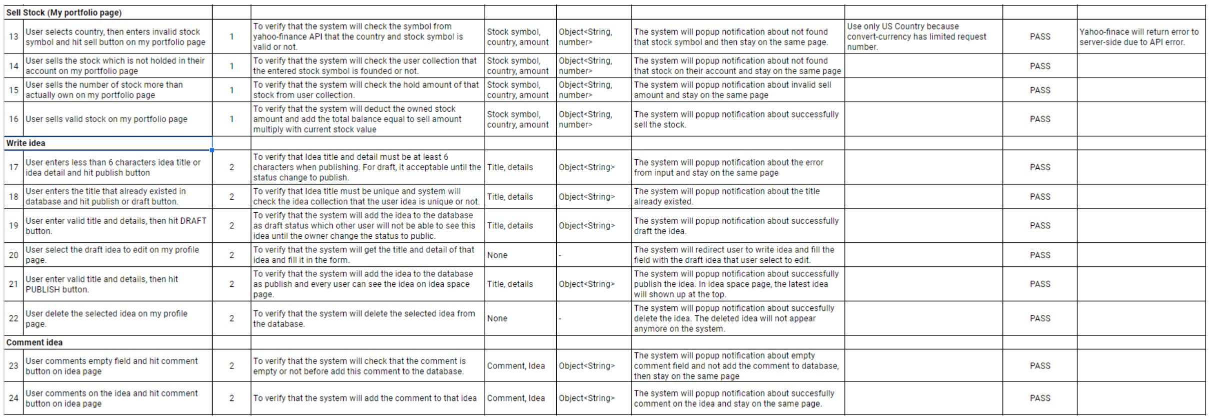
4.1.5 Testing and debugging

For server-side, tested that the REST API was working well as we expected and got the error for debugging furthermore. Some APIs had limitations. For client-side, we tested the logic and improved the user experience.

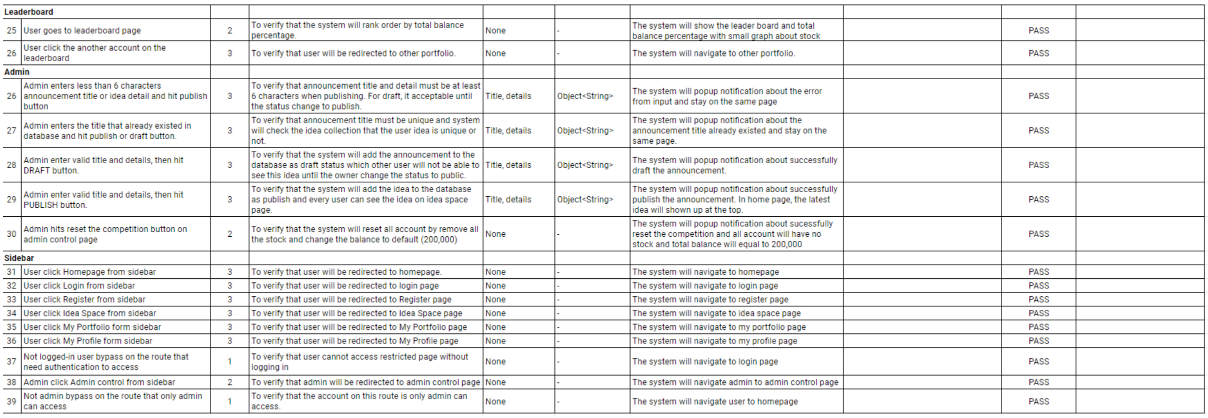
4.2 Test cases



SPFNA Stock Idea Investment				1		*High*			
Test Case Matrix				2		*Medium*			
				3		*Low*		**Test Run**	*Tester: SPFNA*
								Date: 27/11/2022	
ID	**Action**	**Priority**	**Description**	**Inputs**	**Input Parameters/Files/ Values**	**Expected results**	**Notes, etc**	**Result**	**Comments**
Initialize and setup									
1	Opening server	1	To verify that server opening back-end by using nodemon server.js	None	-	Server open successfully.		PASS	
2	Opening client	1	To verify that client opening front-end by using npm start	None	-	Client open successfully - open Home page on web browser		PASS	
Login									
3	User enters invalid username/email or password and hit login button for logging in	1	To verify that User enter wrong username/email or password and the system cannot find the user in the database. Authentication failed.	Username/email, password	Object<String>	The system will popup the notification about invalid username/email, wrong password	Password was encrypted and decrypt via bcrypt	PASS	
4	User not fill in required information (username/email, password) and hit login button when logging in	1	To verify that the system will check that every required text field is empty or not when user hit submit button on login and register page.	Username/Email, password	Object<String>	The system will popup notification about empty input field then, ask user to try again and stay on the same page.		PASS	
5	User enters valid username/email and password and hit login button for logging in	1	To verify that User enter correct username/email and correct password for that account. Authentication success.	Username/email, password	Object<String>	The system will popup the notification about login succesfully and then redirect to homepage again.	Password was encrypted and decrypt via bcrypt	PASS	
Register									
6	User enters the username or email that already exist in database and hit register button when register an account	1	To verify that User enters the username, email, password and select the avatar image for the new account. Then, the system will check that the username and email must be unique in the database.	Username, email, password, avatar	Object<String>	The system will popup the notification about the username or email existance and then stay on register page after user hit outer popup or OK button.		PASS	
7	User not fill in required information (username, email, password) and hit register button when register an acccount	1	To verify that the system will check that every required text field is empty or not when user hit submit button on login and register page.	Username, Email, password, avatar	Object<String>	The system will popup notification about empty input field then, ask user to try again and stay on the same page.	For avatar image will have default image for every account if user not selected when register.	PASS	
8	User enters valid username, email, password, and select the avatar image (optional) and hit register button when register an account	1	To verify that the system will check that every input is valid or not. If valid, the account will created and store in database.	Username, Email, password, avatar	Object<String>	The system will popup notification about register successfully and then redirect to homepage again.	For avatar image will have default image for every account if user not selected when register.	PASS	
Buy Stock (My portfolio page)									
9	User selects country, then enters invalid stock symbol and hit buy button on my portfolio page	1	To verify that the system will check the symbol from yahoo-finance API that the country and stock symbol is valid or not.	Stock symbol, country, amount	Object<String, number>	The system will popup notification about not found that stock symbol and then stay on the same page.	Use only US Country because convert-currency has limited request number.	PASS	Yahoo-finace will return error to server-side due to API error.
10	User enters amount and total value is more than the balance	1	To verify that the system will check current value from yahoo-finance API and multiply with buy amount to get total value	Stock symbol, country, amount	Object<String, number>	The system will popup notification about invalid total balance for entered amount and then stay on the same page		PASS	
11	User selects country, then enters valid stock symbol (new one) and valid amount and hit buy button on my portfolio page	1	To verify that the system will add the stock to user collection and deduct the account balance equal to current price multiply with buy amount.	Stock symbol, country, amount	Object<String, number>	The system will popup notification about successfully buy the stock and then my stock list will have the new one on the list.		PASS	
12	User selects country, then enters valid stock symbol (currently hold) and valid amount and hit buy button on my portfolio page	1	To verify that the system will add the stock amount to user collection and deduct the account balance equal to current price multiply with buy amount	Stock symbol, country, amount	Object<String, number>	The system will popup notification about successfully buy the stock and then the number of holding stock will increase		PASS	



Sell Stock (My portfolio page)									
13	User selects country, then enters invalid stock symbol and hit sell button on my portfolio page	1	To verify that the system will check the symbol from yahoo-finance API that the country and stock symbol is valid or not.	Stock symbol, country, amount	Object<String, number>	The system will popup notification about not found that stock symbol and then stay on the same page.	Use only US Country because convert-currency has limited request number.	PASS	Yahoo-finace will return error to server-side due to API error.
14	User sells the stock which is not holded in their account on my portfolio page	1	To verify that the system will check the user collection that the entered stock symbol is founded or not.	Stock symbol, country, amount	Object<String, number>	The system will popup notification about not found that stock on their account and stay on the same page		PASS	
15	User sells the number of stock more than actually own on my portfolio page	1	To verify that the system will check the hold amount of that stock from user collection.	Stock symbol, country, amount	Object<String, number>	The system will popup notification about invalid sell amount and stay on the same page		PASS	
16	User sells valid stock on my portfolio page	1	To verify that the system will deduct the owned stock amount and add the total balance equal to sell amount multiply with current stock value	Stock symbol, country, amount	Object<String, number>	The system will popup notification about successfully sell the stock.		PASS	
Write idea									
17	User enters less than 6 characters idea title or idea detail and hit publish button	2	To verify that Idea title and detail must be at least 6 characters when publishing. For draft, it acceptable until the status change to publish.	Title, details	Object<String>	The system will popup notification about the error from input and stay on the same page		PASS	
18	User enters the title that already existed in database and hit publish or draft button.	2	To verify that Idea title must be unique and system will check the idea collection that the user idea is unique or not.	Title, details	Object<String>	The system will popup notification about the title already existed.		PASS	
19	User enter valid title and details, then hit DRAFT button.	2	To verify that the system will add the idea to the database as draft status which other user will not be able to see this idea until the owner change the status to public.	Title, details	Object<String>	The system will popup notification about successfully draft the idea.		PASS	
20	User select the draft idea to edit on my profile page.	2	To verify that the system will get the title and detail of that idea and fill it in the form.	None	-	The system will redirect user to write idea and fill the field with the draft idea that user select to edit.		PASS	
21	User enter valid title and details, then hit PUBLISH button.	2	To verify that the system will add the idea to the database as publish and every user can see the idea on idea space page.	Title, details	Object<String>	The system will popup notification about successfully publish the idea. In idea space page, the latest idea will shown up at the top.		PASS	
22	User delete the selected idea on my profile page.	2	To verify that the system will delete the selected idea from the database.	None	-	The system will popup notification about succesfully delete the idea. The deleted idea will not appear anymore on the system.		PASS	
Comment idea									
23	User comments empty field and hit comment button on idea page	2	To verify that the system will check that the comment is empty or not before add this comment to the database.	Comment, Idea	Object<String>	The system will popup notification about empty comment field and not add the comment to database, then stay on the same page		PASS	
24	User comments on the idea and hit comment button on idea page	2	To verify that the system will add the comment to that idea	Comment, Idea	Object<String>	The system will popup notification about succesfully comment on the idea and stay on the same page.		PASS	



Leaderboard									
25	User goes to leaderboard page	2	To verify that the system will rank order by total balance percentage.	None	-	The system will show the leader board and total balance percentage with small graph about stock		PASS	
26	User click the another account on the leaderboard	3	To verify that user will be redirected to other portfolio.	None	-	The system will navigate to other portfolio.		PASS	
Admin									
26	Admin enters less than 6 characters announcement title or idea detail and hit publish button	3	To verify that announcement title and detail must be at least 6 characters when publishing. For draft, it acceptable until the status change to publish.	Title, details	Object<String>	The system will popup notification about the error from input and stay on the same page		PASS	
27	Admin enters the title that already existed in database and hit publish or draft button.	3	To verify that annoucement title must be unique and system will check the idea collection that the user idea is unique or not.	Title, details	Object<String>	The system will popup notification about the announcement title already existed and stay on the same page.		PASS	
28	Admin enter valid title and details, then hit DRAFT button.	3	To verify that the system will add the announcement to the database as draft status which other user will not be able to see this idea until the owner change the status to public.	Title, details	Object<String>	The system will popup notification about successfully draft the announcement.		PASS	
29	Admin enter valid title and details, then hit PUBLISH button.	3	To verify that the system will add the idea to the database as publish and every user can see the idea on idea space page.	Title, details	Object<String>	The system will popup notification about successfully publish the announcement. In home page, the latest idea will shown up at the top.		PASS	
30	Admin hits reset the competition button on admin control page	2	To verify that the system will reset all account by remove all the stock and change the balance to default (200,000)	None	-	The system will popup notification about sucessfully reset the competition and all account will have no stock and total balance will equal to 200,000		PASS	
Sidebar									
31	User click Homepage from sidebar	3	To verify that user will be redirected to homepage.	None	-	The system will navigate to homepage		PASS	
32	User click Login from sidebar	3	To verify that user will be redirected to login page	None	-	The system will navigate to login page		PASS	
33	User click Register from sidebar	3	To verify that user will be redirected to Register page	None	-	The system will navigate to register page		PASS	
34	User click Idea Space from sidebar	3	To verify that user will be redirected to Idea Space page	None	-	The system will navigate to idea space page		PASS	
35	User click My Portfolio form sidebar	3	To verify that user will be redirected to My Portfolio page	None	-	The system will navigate to my portfolio page		PASS	
36	User click My Profile form sidebar	3	To verify that user will be redirected to My Profile page	None	-	The system will navigate to my profile page		PASS	
37	Not logged-in user bypass on the route that need authentication to access	1	To verify that user cannot access restricted page without logging in	None	-	The system will navigate to login page		PASS	
38	Admin click Admin control from sidebar	2	To verify that admin will be redirected to admin control page	None	-	The system will navigate admin to admin control page		PASS	
39	Not admin bypass on the route that only admin can access	1	To verify that the account on this route is only admin can access.	None	-	The system will navigate user to homepage		PASS	

https://docs.google.com/spreadsheets/d/1VBvs9MTNzsGjO9pqRXsoAOhWdAsM1-Oijm2_hqOoo_M/edit#gid=2115592726

5. Self-Evaluation

Overall, our group project can be done in an acceptable state. The software meets all of the feature requirements, allowing users to buy and sell the stock, write the idea, and compete with other users. On buy and sell stock, due to API constraints, we cannot buy or sell other stock except the US because we cannot use convert currency to convert USD to another currency, although the yahoo-finance API can provide other country stock. However, the web application can work without any problems.

During the preparation and documentation, our group didn't have clear visualization and some requirements were not clear about the description that led us to revise again. Also, we misunderstand the framework process.

For the programming part, we use new technology that we have never used before like Mongo, TypeScript, TailwindCss, so we need to learn its syntax and the way to declare type in TypeScript. We have an intellisense extension to help us coding easily and gain more experience of how to use them. Next, we found out that the selected node package name 'convert-currency' has a limited number of requests, that's mean we cannot convert the currency to another, however, the yahoo-finance node package work fine, so we decide to use only USD currency instead for our web application. We agreed that choosing NoSQL was a good decision since it is more flexible than SQL.

In conclusion, our group will improve the software and fix the bugs to make this project satisfied before the final deadline.

Success Goals:

- **Stock Simulation Platform**

  Login users can buy and sell in the US stock market and stock that is listed on the London Stock Exchange International Order Book (LSEIOB) (London Stock Exchange International trade on US Dollar) at any time they want. This feature also includes a donut chart for login users to view that portfolio position easier.

- **Leaderboard**

  Any user can view the current leaderboard which shows who has the highest total balance in our database.

- **IDEA space**

  Login users can write or draft the idea or investment thesis on the space, and can comment on other's ideas.

- **Admin Control**

  Admin can create or draft announcements for the website and can restart the competition any time.

Problems:

- Constraint on API for convert currency
- Learn new development tools such as typescript and mongodb.
- Misunderstand about the framework process.
- Lack of communication in our team.
- Time management is not good enough because of homework and exams in some weeks.
- Unclear documentation on first draft.

Future development:

- Improve UI design such as Home Page. Home page should contain all information about the website, not the admin announcement and P&L Portfolio distribution. It looks a bit strange.
- Make UI responsive that is not just available on desktop but also provided on phone and other devices.
- Add a page about us to let new users understand more what the website is about.
- Add more stock markets such as China stock market, Singapore stock market, Thailand stock market etc.
- P&L Portfolio distribution feature not finished.
- Add more Visualization such as pie chart of sector portfolio so user can see sector distribution
- In the Ideaspace feature , We can add the ability to let login users add the image to post.