

CmpE 352
Spring 2019
Milestone 1

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1 Executive Summary

1.1 Project Introduction

Our project Arken's aim is to establish an environment that users can socialize with each other, get information about any trading equipment, read articles and find out about economic events and also share their ideas about economic events and articles. There are three types of users in this project: Guest user-not registered-, Basic user and Trader.

Guest users can get information about any trading equipment, event or article. They can search users, trading equipment, events or articles. Basic users can make comments, chase events, create portfolios, rate articles, manually enter investments, make predictions about any trading equipment and follow users in addition to guest user's abilities. Their prediction rate for any equipment can be seen by other users. A user's profile can be private. Traders can make investments onsite with the IBAN number that they provide. Every user has profit/loss section and it shows the user's profit based on user's transactions with respect to the chosen trading equipment. Users can make annotations about events, trading equipment, articles etc...

Events have significance levels which represents their importance. Also events can have numeric values about the related trading equipment. Events can be filtered based on their significance level or country that it belongs. Articles can be rated, commented and shared by users.

Trading equipment should have functionalities such as: the previous close, percentage change with the percentage close, amount change with the previous close, day's range and moving averages.

The system provides semantic search and makes recommendations about articles or trading equipment based on their user history.

1.2 Work Done So Far

The first week, before the project description, we got to know each other and created our communication plan, decided on the issue labels, created Slack workspace and searched some repositories that can be good example for our project.

The second week, we started working on the project after meeting with the customer and after that, we spent a few weeks working on specifying the functional and nonfunctional requirements to meet the demands of the customer. However, they may change as we process with the project. To make requirements easier to understand, we added a Glossary part to it.

The third week, we created user scenarios and mockups related to scenarios to give us a sensation about what our project is going to look like and clarify whether our understanding of the project is matched or not with the customer. We created one Web mockup and two Android mockups.

The fourth and fifth weeks, we worked on software design of the project. To do so, we have prepared use case diagram, class diagram and sequence diagrams.

The sixth week, we focused on the customer feedback. We made sure we paid attention to every feedback to continue the project so that our group and the customer are in the same mindset. That's why we had the customer meeting in the first place.

The seventh week, we decided on our project name, revised what has been done each week and discussed whether there is anything to change in our project plans. Our team has completed every assignment that we were given:

- Explore and document Favorite GitHub Repositories.
- Creating Communication Plan
- Project Requirements(Functional and Nonfunctional)
- Updating README.md after every project progress
- Personas and User Stories
- User Scenarios
- Mockups
- Project Name

1.3 Planned Changes

In the next weeks of our project, we are going to create a plan according to estimated periods of each task. We have decided on the name: It'll be "Arken" so we'll create a logo that is related to it. We are going to decide which environment do we use during the implementation until the end of May to study and become comfortable with it till the end of August. Since we keep our project updated after every assignment and meeting, we make sure not to grow away from the customer's point of view. After the planning part is done, with the help of lectures and assignments, we can move on to implementation of the trading platform. In our team, there are members who are experienced in Web/Android development. With the contribution of every team member, we believe we can create a platform which suits the requirements and also pleases our customer. That's the main plan we have going forward.

2 List and status of deliverables

Deliverable	Deadline	Status
Project repository	16.02.2019	Done
Requirements Analysis	23.02.2019	Done
User Personas & Stories	03.03.2019	Done
User Scenarios	03.03.2019	Done
Mockups	03.03.2019	Done
Use Case Diagram	18.03.2019	Done
Class Diagram	18.03.2019	Done
Sequence Diagrams	18.03.2019	Done

Table 1: List and status of deliverables

3 Evaluation of the status of deliverables and its impact on project

The project development have been very well so far. We have discussed how to accomplish every assignment and feedback to arrive at a better consensus and handle tasks better. We have delivered all items listed above in time. Several iterations have been done over each deliverable, both before and after submitting them. We have revised every deliverable after we received feedback on them, and started from scratch if necessary, in order to satisfy our customer's demands.

Project repository: We created our project repository to keep our progress intact and well organized. Each week, our team members added the documents of the current week's progress to inform the community about where we are. Without major changes in our repository, we've finished several structures in our project preparations and uploaded our work in our repository.

Requirements: Our project started with the task of creating the requirements to make a stable background for our further improvements. With a several feedback and recreating process, we have reached our first key point to finalize our requirements. Without a doubt, uncertainty in requirements would be a huge burden on our shoulders to go forward. Also, it would be a disaster if the need to review the requirements appeared in the middle of our second phase of our project, which is the coding part.

User personas & stories: User personas and stories are several tiny examples to make our clients understand what tasks can be done with our application. To make understanding process clear, we preferred to create personas with precise goals in their life and make them do exact things. And giving names to these personas are the fundamental part of creating personas and stories. We preferred simple names to make it easily remembered by our customers while

elucidating our project's functionality in the customer meeting.

User scenarios & mockups: With user personas and stories, we narrated user scenarios and created our mockups with those scenarios. Illustrating core functions of our app supported with crystal clear user scenarios is the goal we want to achieve. Using simple yet strong colors such as black and white while composing the mockups is the essence to make customer focus on functionality rather than user interface. In our project mockups, we were mindful of these points.

Design diagrams: All three diagrams have been analyzed and reviewed by team members thoroughly. We have studied every cases to make those diagrams complete. We have done some mistakes regarding how to draw the use case diagram, how to connect classes with each other in class diagram, and how to express the communication between different parties in sequence diagrams. But, these diagrams are reviewed by our customer and upon the customer's feedback, we have revised all diagrams, fixed erroneous sides of them and made them more functional. They are now in a good shape. We will be actively using those diagrams when we implement the project in actual code. Those diagrams are the guide showing us the way how everything in the project should interact. We may have to change some parts of them if we encounter any requirements change.

4 Summary of work done

Member Name	Work Done
Bahadir Hocamoğlu	Enlarged and detailed non-functional requirements. Worked on use case diagram and revised after the corresponding feedback, with İbrahim Özgürcan Öztaş and Taha Eyüp Korkmaz. Created one of the sequence diagrams. Arranged meeting locations and topics to discuss in each meeting.
Baturalp Yörük	Created personal wiki page. Created communication plan of our group. Added my favourite repository to wiki. Participated to a customer meeting. Created the scenarios page and documented the user stories. Worked on preparing class diagram draft with Emre and Elif. Created Sign Up sequence diagram. Contributed to Executive Summary part of the Milestone.
Elif Çalışkan	Took meeting notes of meetings except the 6th one. Took notes of questions for requirements. According to the scenarios draft, I created two Android mockups using Balsamiq3. First one is about filtering & reading events and making an investment. Second one is about manually adding investments, checking Profit/Loss and making a comment. Worked on preparing class diagram draft with Emre and Baturalp. Created Manual Addition to Profit/Loss sequence diagram draft. Contributed to Executive Summary in Milestone.
Ege Başural	Created my personal wiki page and added my favourite github pages. Created first draft of requirements page. After the feedback rearranged Glossary part of the requirements. Drawn class diagram and sequence diagrams in LucidChart.

Emre Demircioğlu	Created first "readme.md" file. Divided requirements into two parts as functional and nonfunctional requirements. Attended one of the customer meeting. Worked on preparing class diagram draft with Elif and Baturalp. Reviewed and prepared final version of the class diagram. Created AddStopLoss sequence diagram. Contributed to Executive Summary in Milestone.
Gürkan Demir	Created personal wiki page. Each week, according to discussed actions in meetings I created issues and assigned them to related individuals. I created one mockup for web which is about searching and following a user which has public profile. With group, we created usecase diagram and I contributed to make progress in class diagram. Also I created sequence diagram about following other users. I prepared this report's draft in LaTeX and added all sections starting from Communication plan.
Ibrahim Özgürçan Öztas	Created personal wiki page and assigned as one of the person responsible for wiki pages of our project. Added briefly described git manual in the wiki page. Then, created the wiki page and added contents of our project constantly every week. Furthermore, the meeting with customer was arranged and executed with first priority. After some time, worked on use case diagram and created edit portfolio sequence diagram. Also participated in milestone documentation process with editing 'Evaluation of the status of Deliverable' part.
Muhammed Bera Kaya	Updated "readme.md" file. Reviewed and drew class diagram with Ege. Created one of the sequence diagrams.
Taha Eyup Korkmaz	Arranged the general wiki page for the whole group with Ege and Özgür, also generated my own wiki page. I added my favorite repos to the wiki and tried to update the general wiki page constantly every week. Furthermore, the meeting with customer was arranged and executed with first priority so we arranged the meeting with Özgür. I was also responsible for personas and stories and I made the personas and later on updated it after feedback. I was one of the people assigned for use-case diagram and search-sort diagram; again I always updated my work according to the feedbacks. Also contributed to Executive Summary in Milestone.

Table 2: Summary of work done by each team member

5 Communication plan

Group plans to communicate through Face-to-face meetings at Campus area on Tuesdays 17:00. We also have a Slack and WhatsApp groups but main online communication will be on Slack.

Where	Purpose	Frequency	Audience	Channel
Slack	Keeping each other informed about progress	Anytime	All members	Online
GitHub	Following overall progress	Anytime	All members	Online
BM Classes	Team meeting	Every Tuesday @5.00 PM	All members	Face-to-Face
BM Classes	Customer meeting	When needed	Some members	Face-to-Face
Whatsapp	Urgent communication	Anytime	All members	Online

Table 3: Communication plan for Group4

6 Requirements

6.1 Glossary

- **Application:** The whole project as seen by guests, members and users.
- **Article:** Text written by user about trading equipment.
- **Basic User:** Signed up user who can't perform investments inside the application, can be chosen during sign up.
- **Comment:** A body of text, image or links shared in response to an article.
- **Database:** An organized collection of data.
- **Day's Range:** The range in which a trading equipment traded. For example, a day's range that reads "48.50-51.25" means that the lowest price the trading equipment reached that day was \$48.50/share and the highest price was \$51.25.
- **Economic Event:** Events about economy that occurred and posted inside the application, will have a numeric result.
- **Followed User:** A user who accepted other users following request.
- **Following User:** A user who's following request has been accepted by other user.
- **Guest:** Unregistered person.
- **Moving Average:** A succession of averages derived from successive segments (typically of constant size and overlapping) of a series of values.
- **Profile Page:** A page where user can see information about user and additionally change the information if it's their own profile page.

- **Prediction Rate:** A rate showed on user's profile page, calculated by their past predictions.
- **Previous Close:** What the price of a trading equipment was when the market closed on the previous trading day.
- **Semantic Search:** A prediction system to improve search accuracy by understanding the searcher's intent and the contextual meaning of terms as they appear in the searchable dataspace.
- **Significance Level:** A rating system that describes the importance of an event.
- **System:** The whole project, including design and functionalities.
- **Trading Equipment:** Indices, stocks, ETFs, commodities, currencies, funds, bonds and cryptocurrencies.
- **Trading User:** Signed up user who can make investments inside the application, can be chosen during sign up.
- **User:** Registered basic user or trading user.

6.2 Functional Requirements

6.2.1 User Requirements

6.2.1.1 Guests

- **6.2.1.1.1** Guests shall be able to search economic events, articles and trading equipment.
- **6.2.1.1.2** Guests shall view the price of trading equipment.
- **6.2.1.1.3** Guests shall read comments about trading equipment.

6.2.1.2 Login & Registration

6.2.1.2.1 Registration

- **6.2.1.2.1.1** User shall be able to choose between basic user and trading user.
- **6.2.1.2.1.2** Basic user shall provide name, surname, email and password.
- **6.2.1.2.1.3** Trading user shall additionally provide IBAN and TC identification number.
- **6.2.1.2.1.4** User shall provide location with Google Maps.
- **6.2.1.2.1.5** User shall validate account via e-mail.

6.2.1.2.2 Login

- **6.2.1.2.2.1** User shall login via email and password provided upon registration.

6.2.1.3 User Follow System

- **6.2.1.3.1** User shall be able to follow other users.
- **6.2.1.3.2** User shall be able to send following request to other users who have private profile.
- **6.2.1.3.3** User shall be able to accept following requests.
- **6.2.1.3.4** User shall be followed user upon accepting following request.

6.2.1.4 Trading Equipment

- **6.2.1.4.1** User shall be able to follow trading equipment.
- **6.2.1.4.2** User shall be able to set alerts for certain levels of trading equipment.
- **6.2.1.4.3** User shall be able to comment on trading equipment.
- **6.2.1.4.4** Trading user shall be able to invest in trading equipment.

6.2.1.5 Profile

- **6.2.1.5.1** User shall have a profile page.
- **6.2.1.5.2** Profile page shall have the prediction rate of user.
- **6.2.1.5.3** User shall be able to choose to be public user or private user.
- **6.2.1.5.4** Private users profile page content other than prediction rate shall be seen only by following users.
- **6.2.1.5.5** Public users profile page content shall be able to be seen by all other users.
- **6.2.1.5.6** Users shall see and edit their personal information in profile page.
- **6.2.1.5.7** Users shall view their old actions on their profile page.

6.2.1.6 Articles

- **6.2.1.6.1** User shall be able to share ideas about trading equipment as articles.
- **6.2.1.6.2** User shall be able to comment on articles.
- **6.2.1.6.3** User shall be able to rate articles.

6.2.1.7 Portfolio

- **6.2.1.7.1** User shall have at least one portfolio.
- **6.2.1.7.2** User shall be able to have different portfolios.
- **6.2.1.7.3** User shall be able to rename portfolio.
- **6.2.1.7.4** User shall be able to add trading equipment to portfolio.
- **6.2.1.7.5** User shall be able to share portfolio in profile page.
- **6.2.1.7.6** Other users shall be able to follow other user's portfolio.

6.2.1.8 My Investments Page

- **6.2.1.8.1** Trading users shall have my investments page.
- **6.2.1.8.2** Basic users shall not have my investments page.
- **6.2.1.8.3** Trading users shall be able to invest on trading equipment in my investments page.
- **6.2.1.8.4** Trading users shall be able to create a buy order for a trading equipment for a specified rate in my investments page.
- **6.2.1.8.5** Trading users shall be able to set stop/loss limits on trading equipment in my investments page.

6.2.1.9 Profit/Loss Section

- **6.2.1.9.1** Users shall have a profit/loss section.
- **6.2.1.9.2** Profit/loss section shall be private to each user.
- **6.2.1.9.3** User shall be able to see profit/loss in terms of currency chosen by user.
- **6.2.1.9.4** Users shall be able to manually enter investments to see calculated profit/loss.
- **6.2.1.9.5** Profit/loss section should include investments made in the platform by a trading user when calculating profit/loss.

6.2.2 System Requirements

6.2.2.1 Trading Equipment

- **6.2.2.1.1** System shall provide following functionalities for a trading equipment:
 - **6.2.2.1.1.1** Previous close
 - **6.2.2.1.1.2** Percentage change compared with previous close
 - **6.2.2.1.1.3** Amount change compared with previous close
 - **6.2.2.1.1.4** Day's range
 - **6.2.2.1.1.5** Moving averages

6.2.2.2 Recommendation & Notification

- **6.2.2.2.1** System shall recommend users, portfolios, articles and trading equipment to users based on their history in the system.
- **6.2.2.2.2** System shall send notification to users according to their alerts.
- **6.2.2.2.3** System shall notify trading users according to a transaction which is made because of stop/loss limit.

6.2.2.3 Search

- **6.2.2.3.1** System shall provide searching for users, trading equipment and economic events.
- **6.2.2.3.2** System shall support semantic search.
- **6.2.2.3.3** System shall sort search results by their significance level and location.
- **6.2.2.3.4** System shall also sort users according to their prediction success rate.

6.2.2.4 Events

- **6.2.2.4.1** System shall have events page which contains economic events.
- **6.2.2.4.2** Events shall be able to have different significance levels
- **6.2.2.4.3** Events shall have numerical results.

6.3 Nonfunctional Requirements

6.3.1 Security and Reliability

- **6.3.1.1** User data shall be processed according to 'Law on the Protection of Personal Data'.
- **6.3.1.2** User's password shall be stored with encryption in the database.
- **6.3.1.3** User shall get notification emails when changing their password.
- **6.3.1.4** Weekly backups shall be taken in order to ensure data is safe and sound.
- **6.3.1.5** In any case of server failure or any other need, the system shall be restored with any backup.

6.3.2 Performance

- **6.3.2.1** The system should be able to respond to requests within 3 seconds.
- **6.3.2.2** At least 150 requests per second should be responded.
- **6.3.2.3** The system shall be able to serve at least 100000 members.

6.3.3 Availability

- **6.3.3.1** The system shall be accessible on both native Android and web platform.
- **6.3.3.2** The system shall support English language
- **6.3.3.3** The system should be available 99% of the time.
- **6.3.3.4** In the case of failure, the system should recover in at most 30 minutes.
- **6.3.3.5** The system shall support Turkish characters.

6.3.4 Annotations

- **6.3.4.1** The annotations shall be designed according to W3C web annotation data model.
- **6.3.4.2** The annotations shall be tested by the test team to ensure that they work correctly.

6.3.5 Database

- **6.3.5.1** User data shall be held in a secure database.
- **6.3.5.2** Database hierarchy shall be well-constructed so that it shall be efficient and protect the user's privacy.
- **6.3.5.3** All changes shall be logged in a database.

7 Mockups

7.1 User Personas & Stories

7.1.1 Irem Soysal - The Ambitious Management Graduate



1. Demographics

- Bogazici University Management 2018 Graduate
- 23 Years old
- Works at P&G company
- Registered to system as a Basic User

2. Goals

- Wants to gain more money
- Tries to mimic the successful users who has high prediction rate

3. Story

As a new business graduate, Irem wants to put her economy knowledge and her money to use. She's not really experienced at investing. Because she's really ambitious, she didn't stop when she bested the competition that they were in to get a job at one of the "Big Four". Now she wants to win at the big boyz' hood at trading.

4. Acceptance Criteria

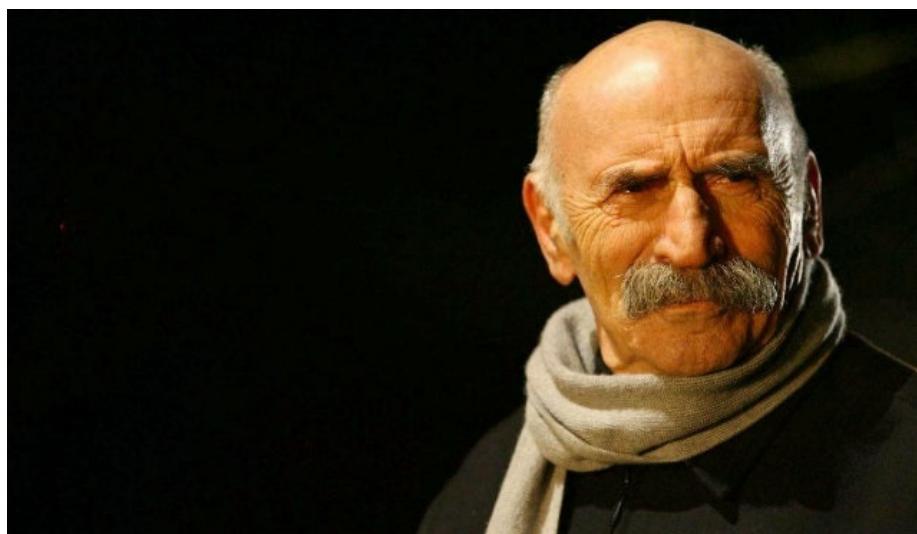
- As a client she can login.
- As a client she can search other users.
- As a client she can filter her searches by prediction rates and other things.
- As a client she can follow users which she thinks who had been on point with their predictions.

5. Scenario - Search, Filter and Follow Other Users

As a basic user, she can search and follow other users who are on point with their predictions, so that she save much money by looking their portfolios before making an investment.

Irem Soysal enters to the website and enters her credentials to login. Irem Soysal is greeted by the home page. Irem Soysal searches for the users with high prediction rates for EURO. Irem Soysal clicks on an user named Kenneth Arrow. Irem Soysal now started to follow Kenneth. Since she wanted to learn more on investing, now she'll follow closely how Kenneth invests or now to learn the tricks.

7.1.2 Ramiz Karaeski - The Expert



1. Demographics

- Self Employed, has his own mafia
- 63 years old
- Registered to system as a Trader User
- Has 23 years of trading experience

2. Goals

- Wants to make investments as a trader
- Wants to follow the events and make trades accordingly

3. Story

Ramiz Dayı is a mafia don at İstanbul. He succeeded even when everybody told him he wouldn't come top of the world. He started everything when he first came to İstanbul with his luggage and his knife in his pocket, that was all he had. Now he operates a business worth millions coming from black market and he wants to use these black money at trading.

4. Acceptance Criteria

- As a client he can login.
- As a client he can manage his funds by adding or withdrawing money to his account.
- As a client he can follow the economic events.
- As a client he can filter the economic events that he's interested in.
- As a client and make investments by buying or selling the equipment he wants.

5. Scenario - Manage Funds, Follow Economic Events and Make Investments

As a trading user, he can manage my funds, follow the economic events and make investments.

Ramiz Karaeski enters to the website and surfs the home page. Ramiz Karaeski looks at the economic events. He filters which are related to his country(Turkey) with significance level 2-3. After seeing the recent news Ramiz Karaeski decides to invest after reading the event and goes to his own profile. Ramiz Karaeski decides to buy a currency(EURO) which is going to increase in his opinion.

7.1.3 Halil PeanutButter - The Military Service Postponer



1. Demographics

- Bogazici University Computer Engineering Student
- 26 years old
- Works as a backend developer
- Loves Java and Node.js
- Registered to system as a Basic user

2. Goals

- Wants to track if he's gaining money from buying cryptocurrencies
- Wants to gain enough money for military service pardon money

3. Story

Halil didn't graduate because he liked the money he earned as a pseudo full time programmer and didn't want to go to military service. He also wants to marry with his girlfriend that he's been together since the high school. He really needs money for the marriage too. So he decided to give it a try on the new hot website that he can invest he heard at the job from his co-workers to achieve all of these.

4. Acceptance Criteria

- As a client he can sign up.
- As a client he can login.
- As a client he can manually add his own investments(buy or sell moves) to his profile.

- As a client he can check his profit&loss rate.
- As a client he can make comments on trading equipment.

5. Scenario - Manually add investments, Check Profit&Loss and Make Comments

As a basic user, Halil can manually add his own investments, check his profit/loss and make comments on trading equipment.

Halil PeanutButter enters to the website and greeted with home page. Halil PeanutButter searches for a cryptocurrency named "Bitcoin". Halil PeanutButter clicks on the currency(BTC) that he has bought and sees that it was decreased a lot, also makes a prediction. Halil PeanutButter decides to go to the page that he will manually add how much he has bought. Halil PeanutButter can now observe how much he has lost. Halil PeanutButter decides to make a comment on that cryptocurrency.

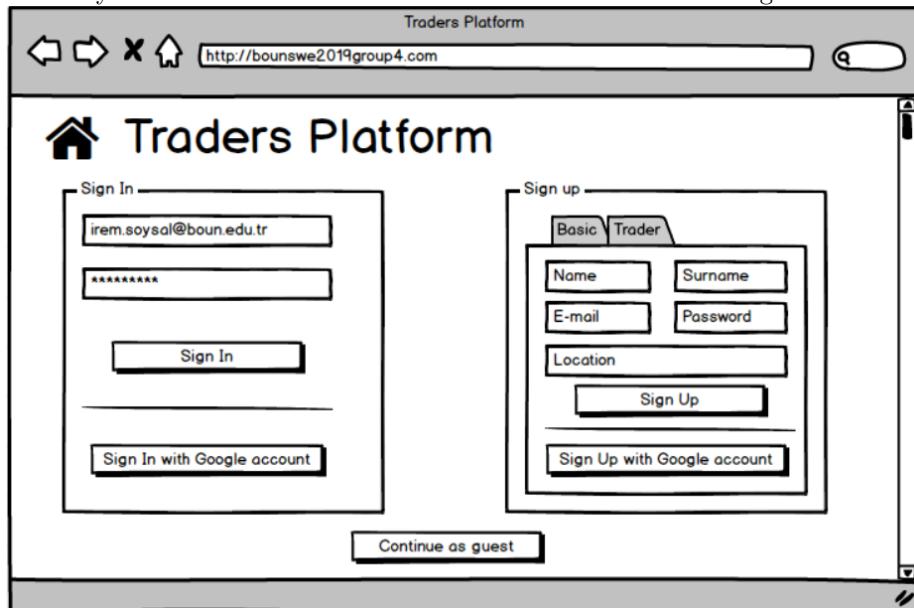
7.2 User Scenarios & Mockups

7.2.1 Search and Follow Other User

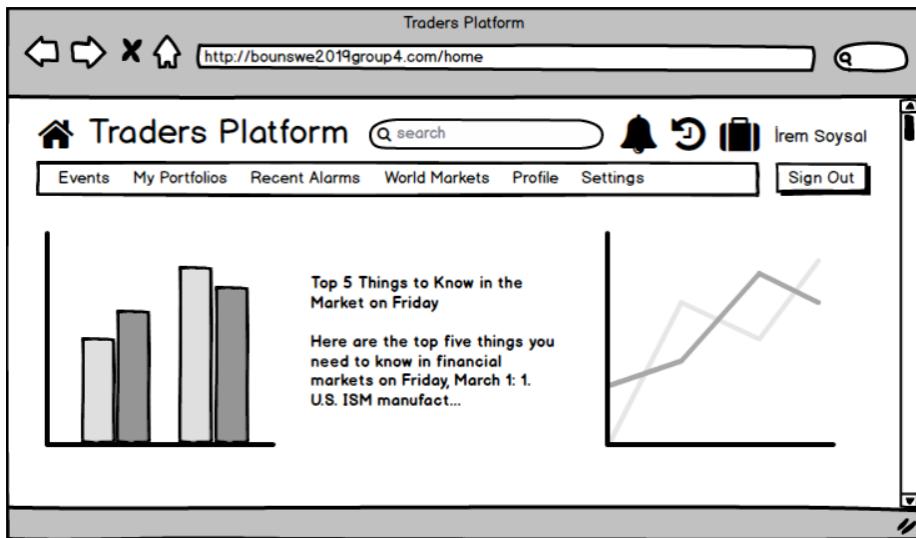
As a basic user, I can search and follow other users who are on point with their predictions, so that I save much money by looking their portfolios.

Flow

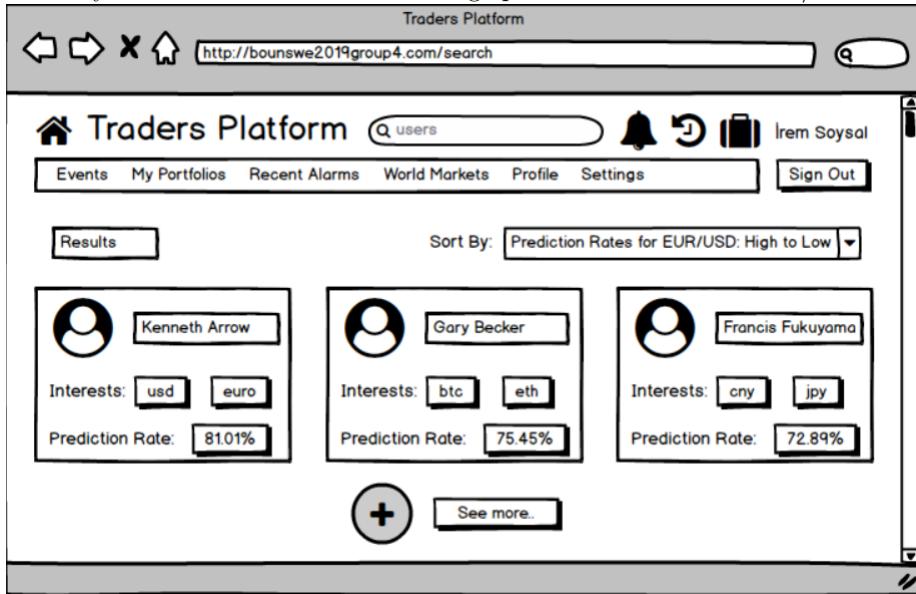
- Irem Soysal enters to the website and enters her credentials to login.



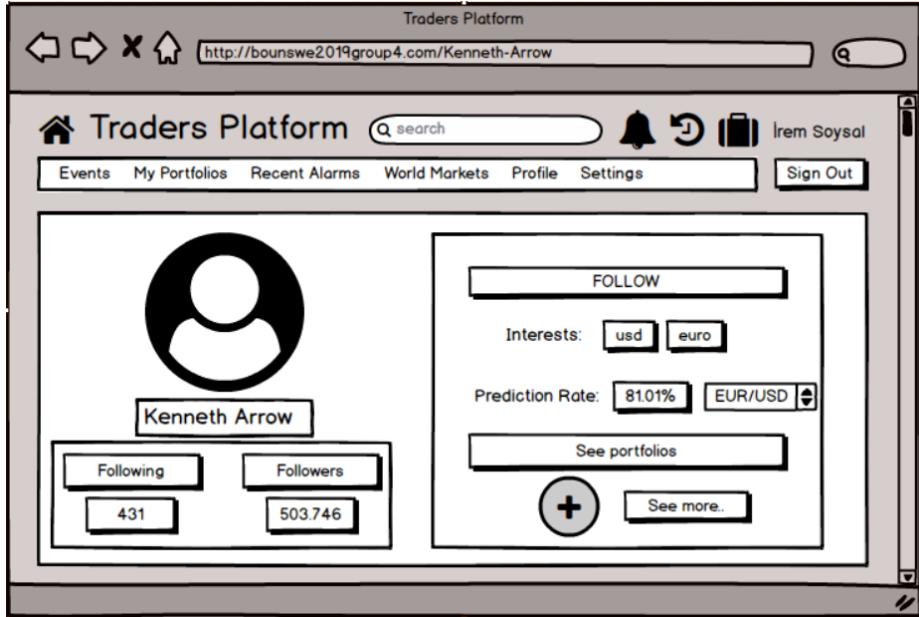
- Irem Soysal is greeted by the home page.



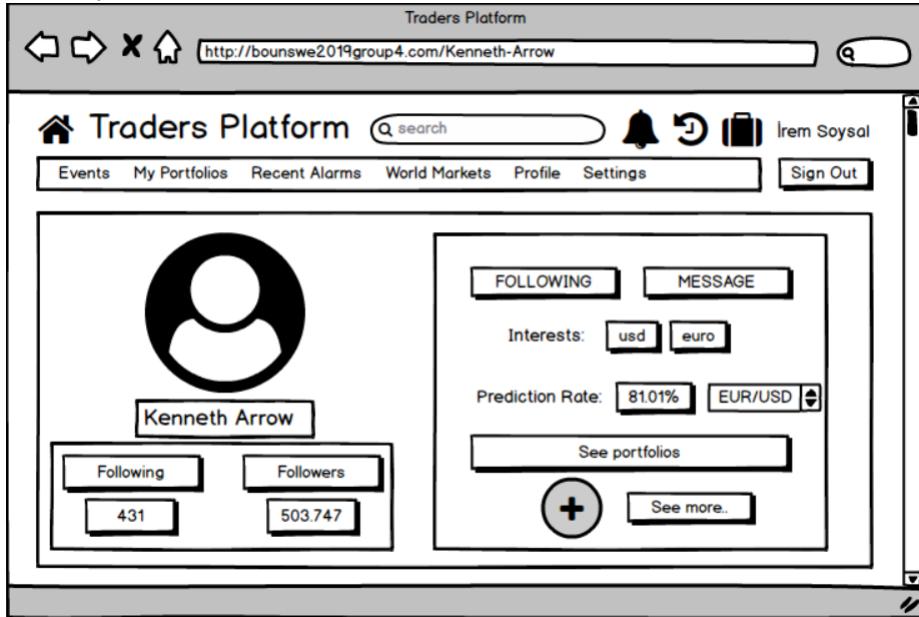
- Irem Soysal searches for the users with high prediction rates for EURO/USD.



- Irem Soysal clicks on an user named Kenneth Arrow.



- Irem Soysal now started to follow Kenneth.

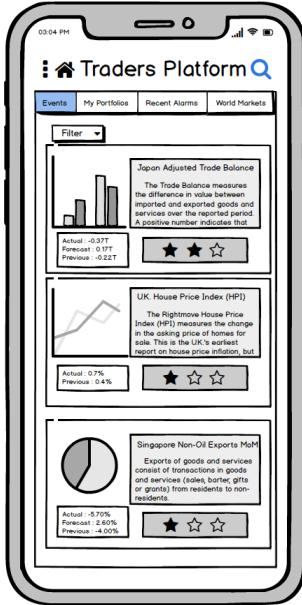


7.2.2 Manage Funds, Follow Economic Events, Make Investments

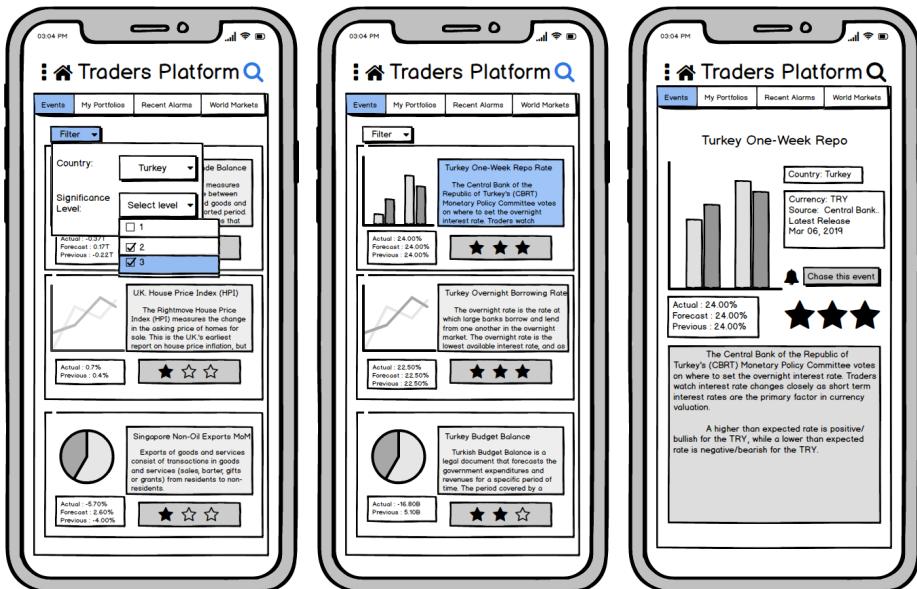
As a trading user, I can manage my funds, follow the economic events and make investments.

Flow

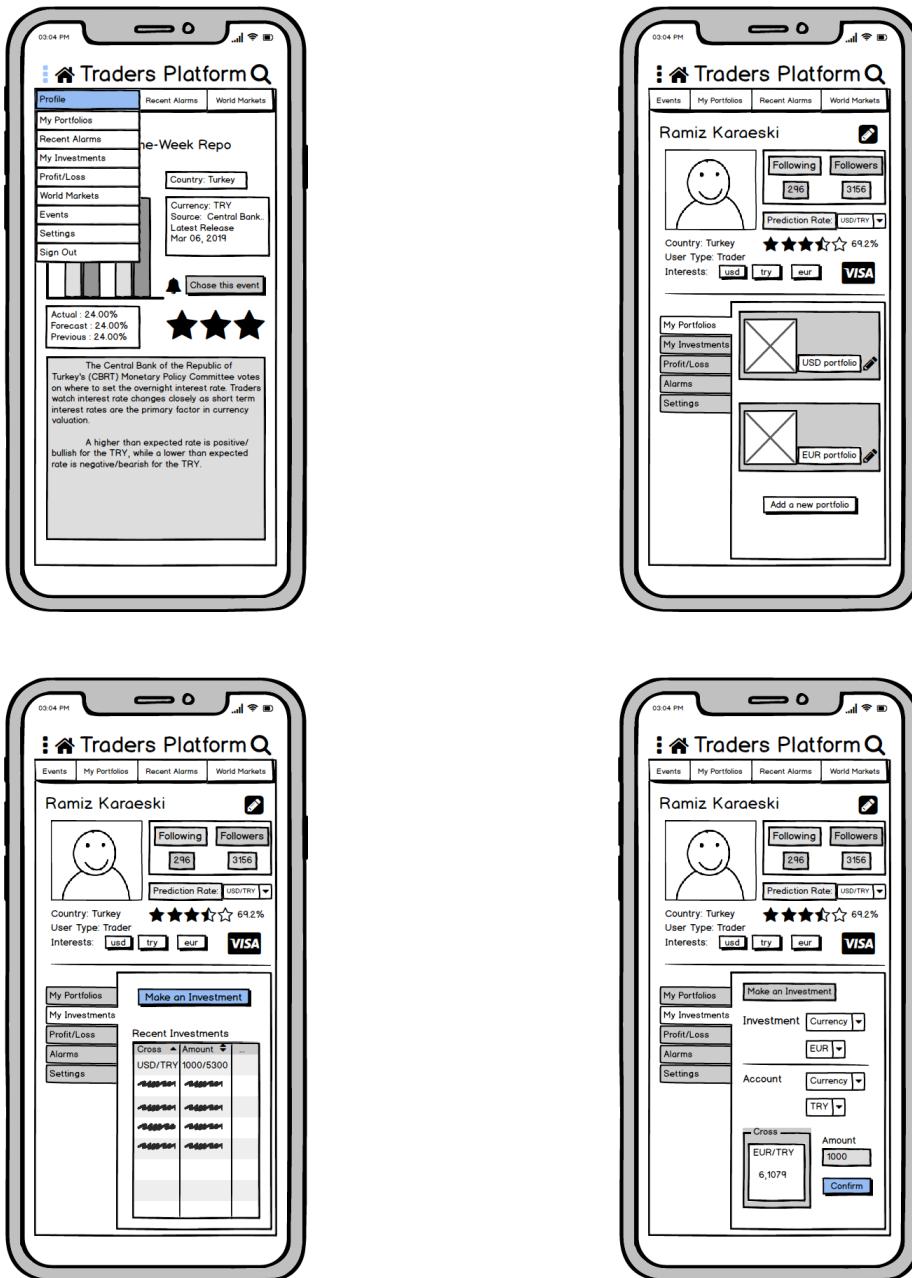
- Ramiz Karaeski enters to the website and surfs the home page.



- Ramiz Karaeski looks at the economic events which are related to his country(Turkey) with significance level 2-3.



- Ramiz Karaeski decides to invest after reading the event and goes to his own profile.

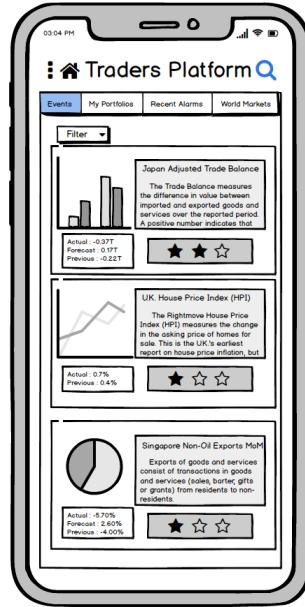


7.2.3 Manually add investments, Check Profit and Make Comments

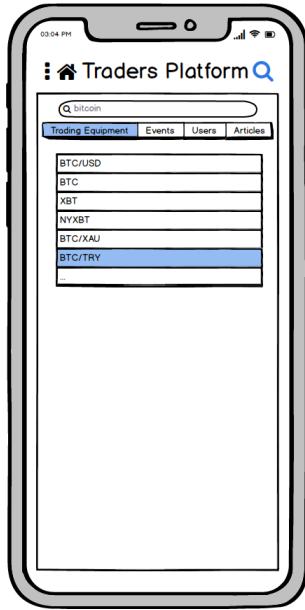
As a basic user, I can manually add my own investments, check my profit/loss and make comments on trading equipment.

Flow

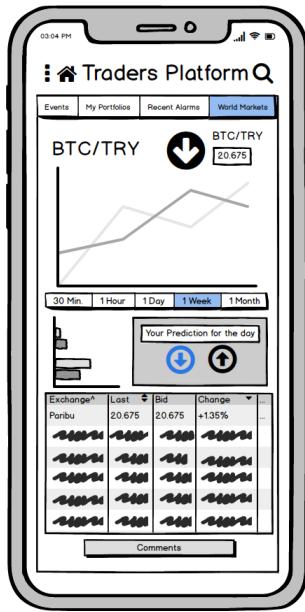
- Halil PeanutButter enters to the website and greeted with home page.



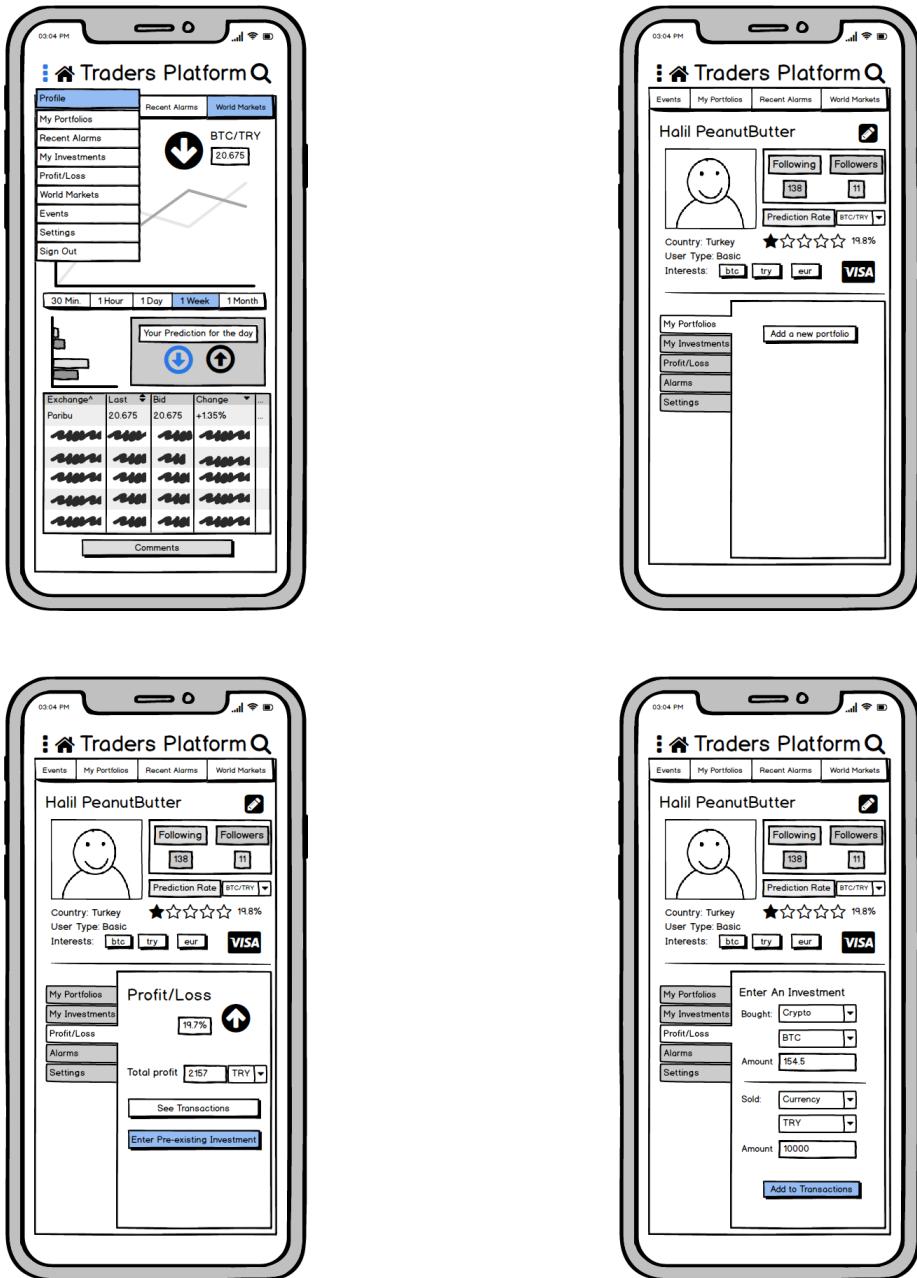
- Halil PeanutButter searches for a cryptocurrency named "Bitcoin".



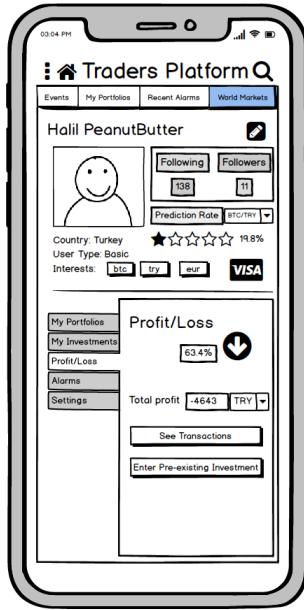
- Halil PeanutButter clicks on the currency(BTC) that he has bought and sees that it was decreased a lot, also makes a prediction.



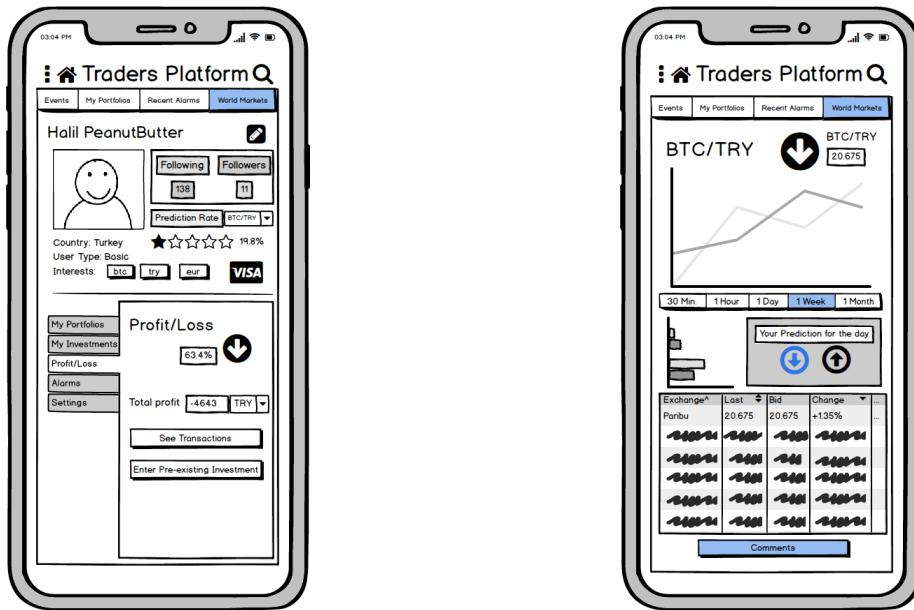
- Halil PeanutButter decides to go to the page that he will manually add how much he has bought.

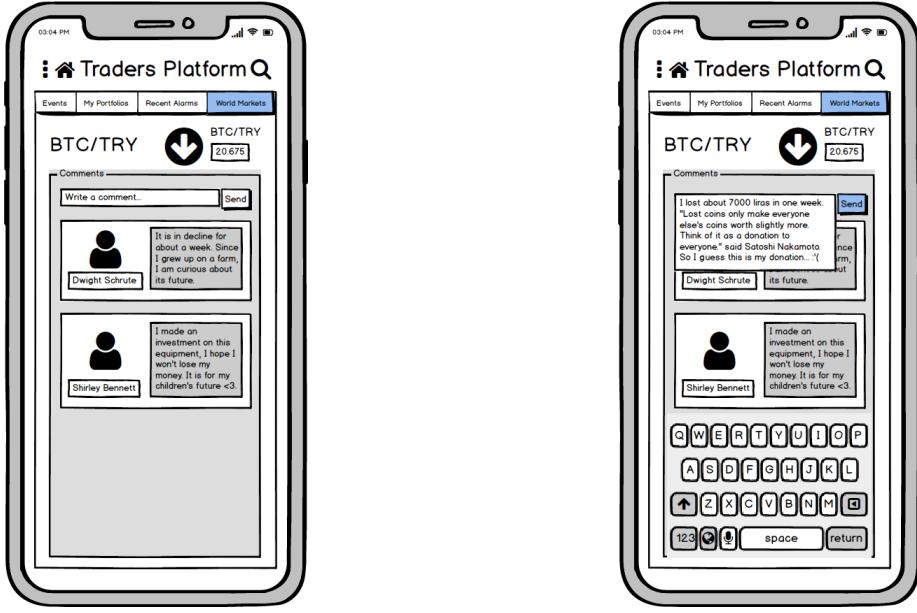


- Halil PeanutButter can now observe how much he has lost.



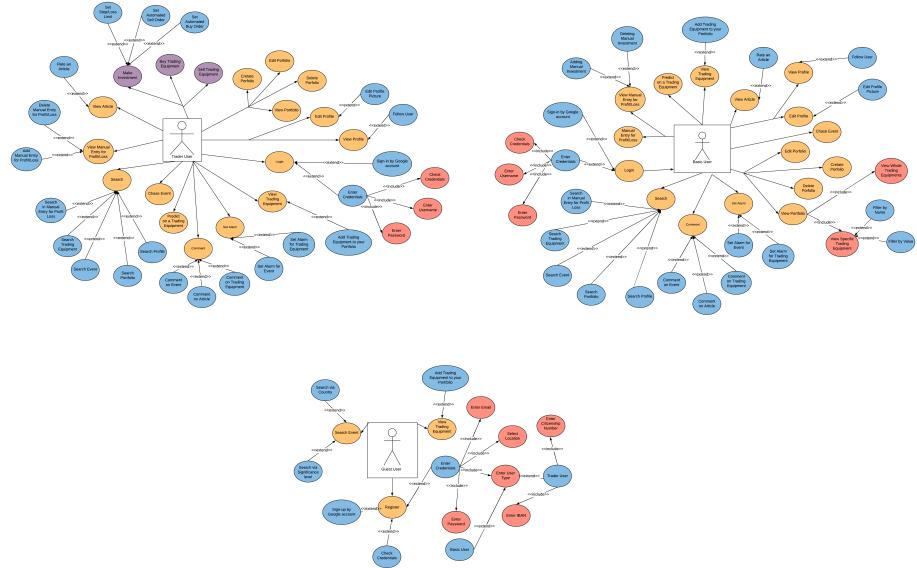
- Halil PeanutButter decides to make a comment on that cryptocurrency.



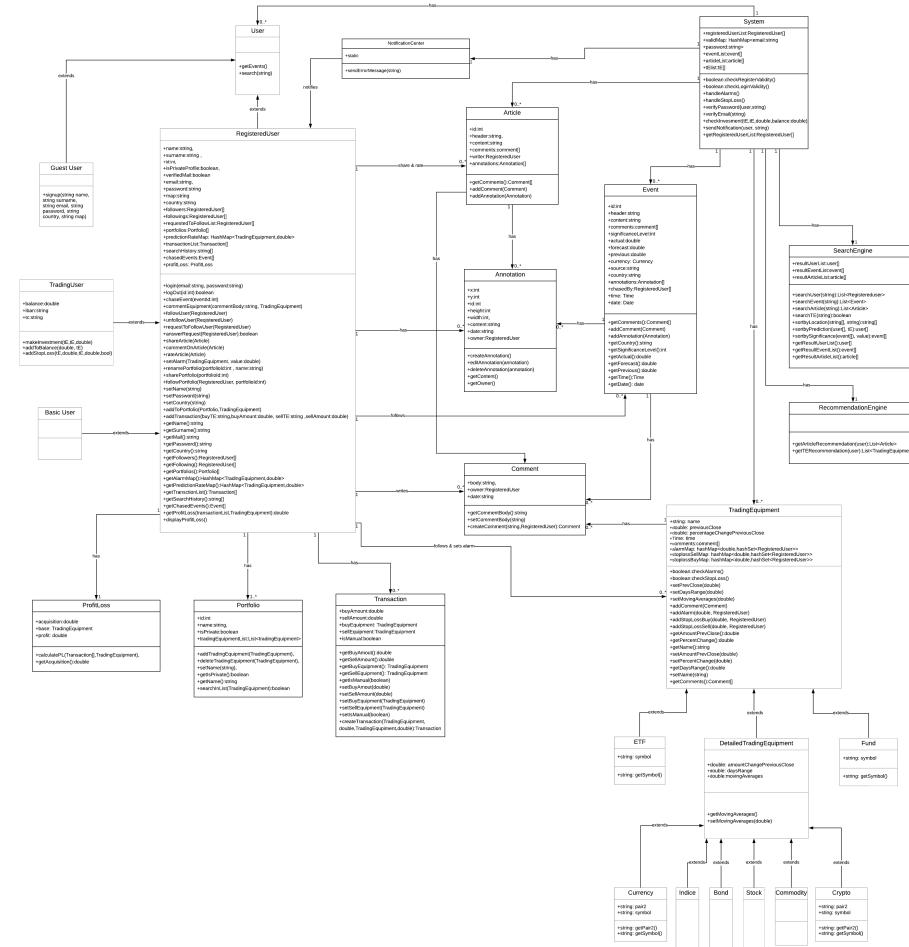


8 Design

8.1 Use Case Diagram

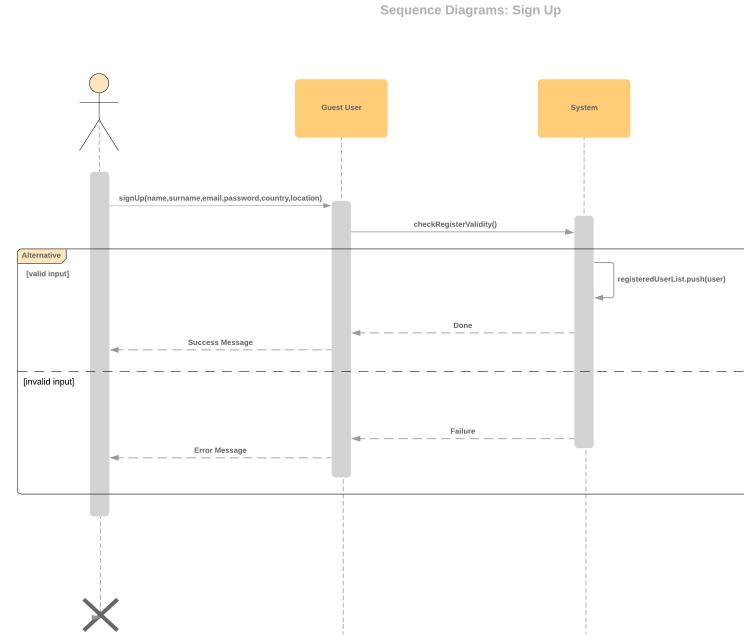


8.2 Class Diagram

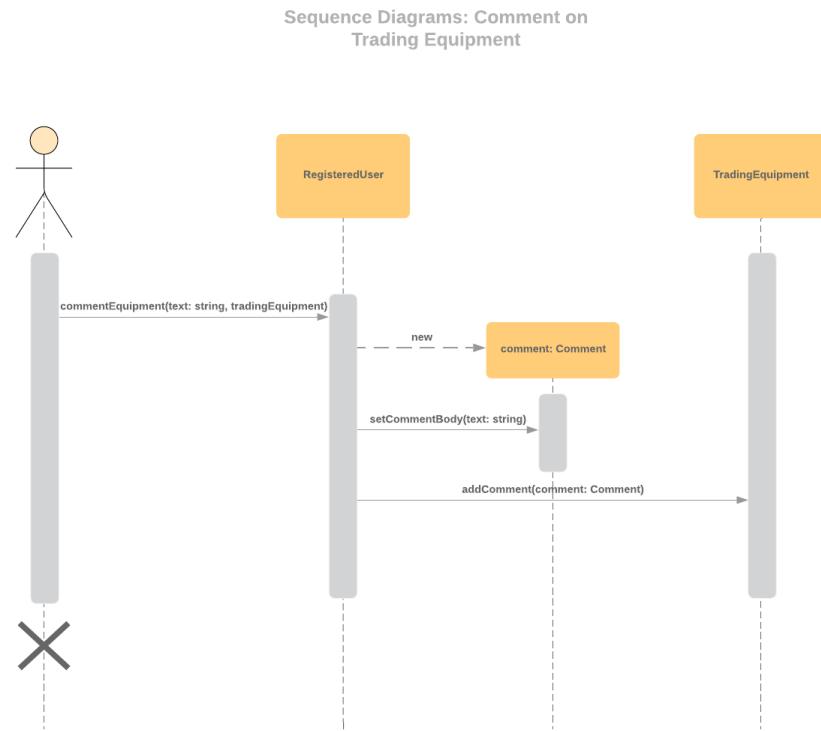


8.3 Sequence Diagrams

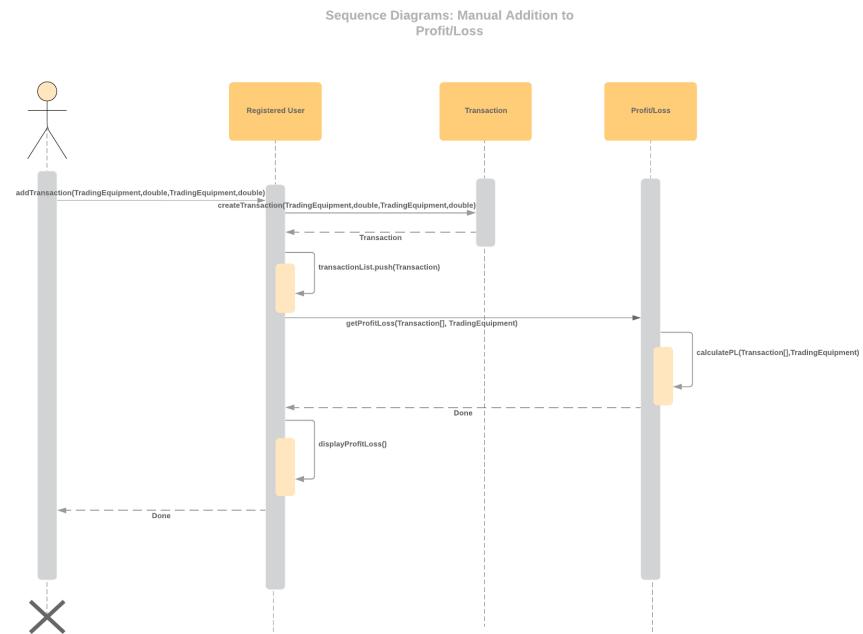
8.3.1 Sign up



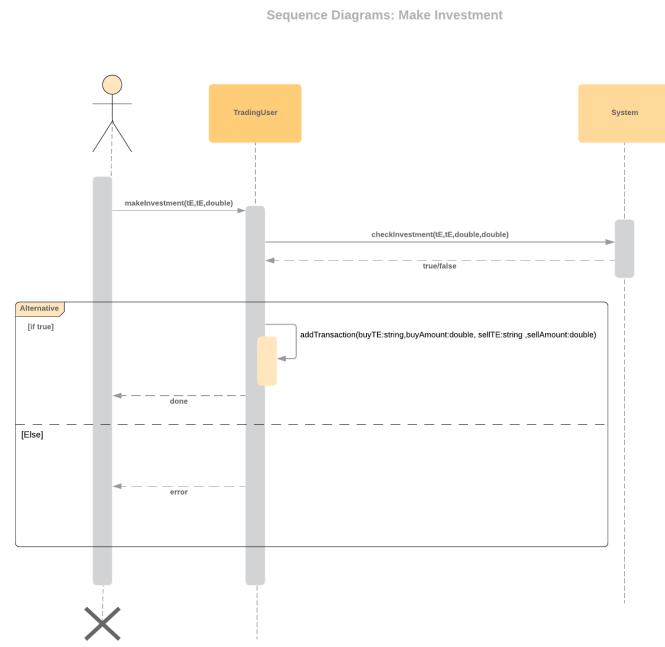
8.3.2 Comment on a trading equipment



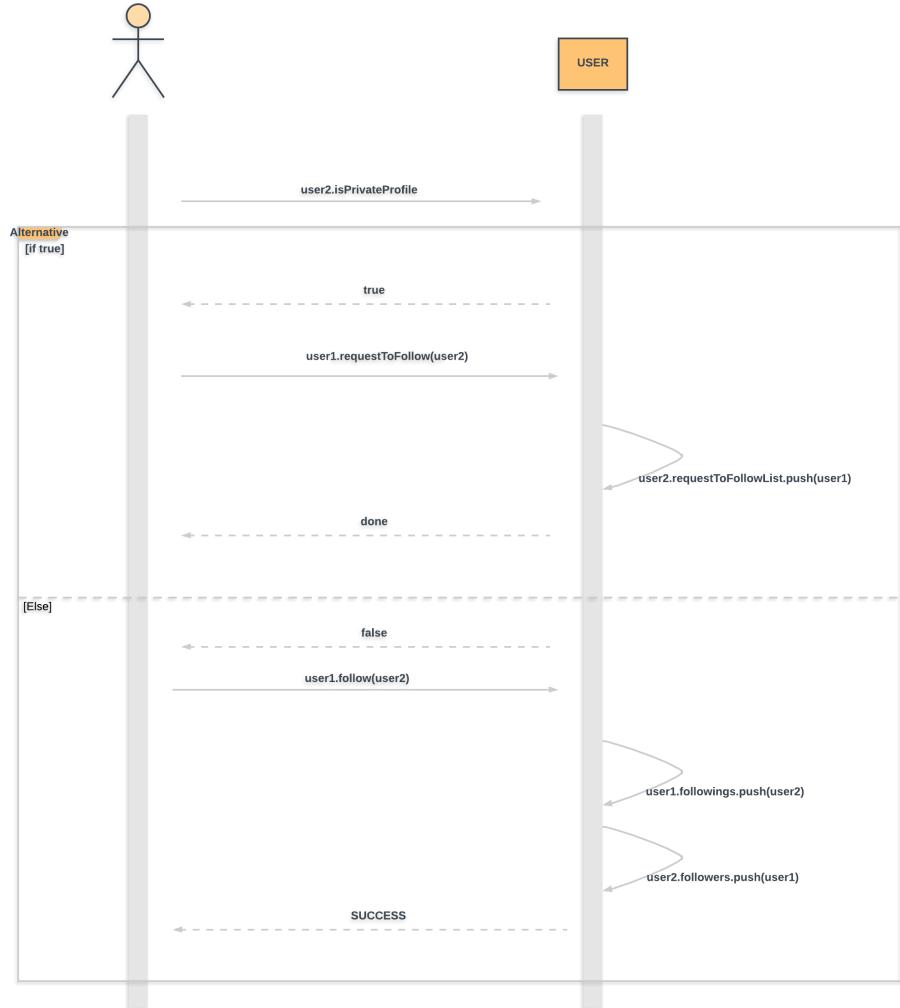
8.3.3 Manual addition to profit/loss



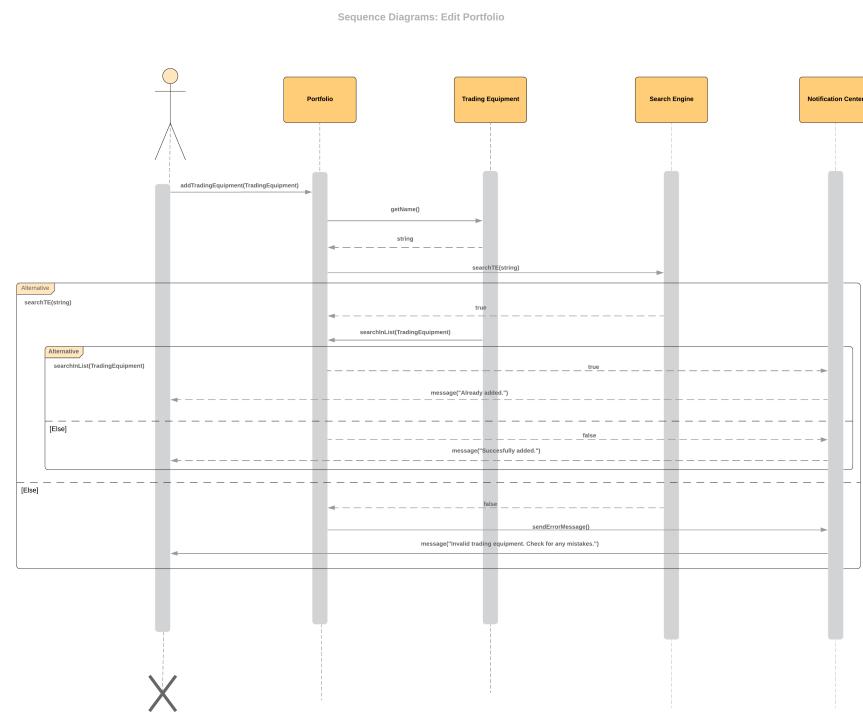
8.3.4 Add stop/loss



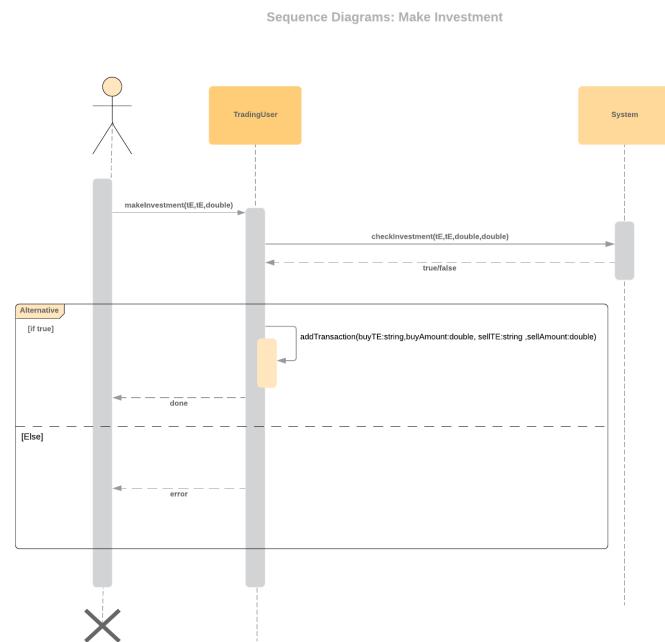
8.3.5 Follow other users



8.3.6 Edit portfolio



8.3.7 Make investment



8.3.8 Search and sort users

