CmpE 352

Milestone 1 Report

Spring 2019

Traders Platform

Group 7

01.04.2019

1 Summary

1.1 Introduction

Traders Platform is an application program that aims to create a functional and an interactive environment for people who want to follow recent trends of major investment tools as well as those investors who want to make an investment in certain trading equipments. This platform support various functionalities including following the instant progress of various trading equipments such as cryptocurrencies, trade indices, commodities and bonds. In addition to that, users will be able to learn more about important economic events so that, their investments will be based on rational choices. Also our application will provide users with an interactive platform such that they will be able to share ideas, comment and rate ideas of other users.

In Traders Platform, there are two main types of users called basic and trader. Both users can access basic functionalities of the platform except that only trading users are able to invest in trading equipment. Besides these users, our program allows guests to use a limited version where they can only view the price of a trading equipment and read user comments about it.

In this documentation, design process of Traders Platform is explained in detail. Until this phase, our goal was to determine the overall design of our project and to create abstractions that will make the implementation phase easier. In order to do that, a requirement analysis with the customer is made and some user stories and mock-ups are created to give concrete examples to the customer. Also, use cases which show the every detailed functionality used by different users are designed and a class diagram that shows the object oriented architecture of the system as well as sequence diagrams that represents how this system works with objects and functions is created.

One can find the detailed explanations regarding these steps in further parts of this documentation.

1.2 Work Done So Far

We have done and learned lots of things in terms of software engineering and project pipeline. First of all, we can say that weekly assignments constitute the main work done so far. Our first assignment was like an introduction. We arranged our first meeting and met with each other. For our project to progress in a regular way, we needed to have a communication plan, therefore we decided on a communication plan, too. We also did some research about git and GitHub, modified our personal pages and the README file of the project. Like I said, this was like an introductory assignment for us to get used to software engineering. Secondly, we prepared our project's requirements. While deciding

the requirements, we considered the project description file given by instructors. For blurry things, we set a customer meeting and asked our questions to get clear answers. After we are done with requirements, we made mock-ups and scenarios. This was necessary to show our customers what we understand from the project and what we plan to do. Eventually, we came to the design part. We prepared three types of diagram which are use case diagram, class diagram and sequence diagram and we used UML notation for the diagrams.

1.3 Road Ahead

The main aim of our team for the future is the clarification of implementation details. We are currently trying to decide on the technologies that we will use. After we agree on them, we will need to improve ourselves on those techs so that we can produce a great product. Also we are planning to use an effort estimation system. For now we did a research on it, after we start implementing the project we will use this estimation system for evaluating the time that a task takes.

Since the beginning of the semester, we had a chance to see the points we should improve. Even though the most of things are going great, there are some points to be improved as well. Since those are in our future plans we would like to include them in this part. The list of things to be improved:

- Reviewing processes should be more detailed so that we can fix things without being warned.
- The communication related to an issue should be done in comments section of the related issue. Sometimes people just direct message each other which reduces ease of communication and makes it harder to keep track of.
- Deadlines will be more strict.

2 List and Status of Deliverables

Name	Delivery Date	Delivery Status
Arrange repository basics	Şub 18, 19	Delivered
Requirements Elicitation	Şub 25, 19	Delivered
User Stories & Mock-Ups	Mar 4, 19	Delivered
Class & Use Case diagrams	Mar 11, 19	Delivered
Sequence Diagrams	Mar 18, 19	Delivered

3 Evaluation of the Status of Deliverables and Their Impact on Project

- **User Stories and Mockups:** We created 3 different personas with corresponding user stories and presented them on mockups of both web and phone applications of our project. We included all 3 users (guest, basic, trading) in our scenarios and tried to show different use cases for our project. We updated them accordingly after receiving feedback.

  User stories and mockups we created act like a script of what is expected to happen while using the applications. They lay out what the users achieve as a result of their actions. So if something different happens during development, we can reiterate and fit it into the script. Thus, they are of immense importance to our project.

- **Requirements:** Initially, we prepared our requirements in terms of given information from advisor. Then we made some changes after P.S.'s Q/A parts. After the feedback of requirements, we corrected our faults.

  Requirements has very big impact on our project. This is because, project is constructed as according to our requirements. In other words, requirements like a pathfinder, because when we didn't be sure something, we looked at the requirements.

- **Design Diagrams:** Design diagrams are made via task sharing. Firstly, we prepared Use Case Diagram. Afterwards, Class Diagram was prepared with respect to Use Case Diagram. Finally, Sequence Diagrams were done appropriate for Class Diagram. The group member who didn't any task gave review to diagrams. Afterwards, we corrected our faults in order to

feedback. Thanks to Design Diagrams, we can more clearly guess how we should design the “Traders Platform” in terms of software development.

4 Work Done Individually

Alperen Bağ	• First week's meeting report. • Research about git. • Requirements about investing, trading equipments and prediction system. • Requirements wiki page. • Updating the requirements according to feedback. • Review of the mockups, scenarios and use case diagram. • Design of the class diagram (with Kutay, Esra and Ahmet Emir). • Design of 2 sequence diagram (with Ahmet Emir). • Updating the class diagram according to the feedback.
Alican Şafak Özdek	• Created personal space in wiki. • Designed the communication plan in wiki. • Designed a custom sidebar in wiki. • Conducted research on git. • Added new labels for issues. • Wrote a subpart in requirements. • Moderated the second meeting, uploaded meeting notes and opened related issues. • Added acceptance criterias for all user stories.(with Merve İlik) • Designed the use case diagram. (with Muhammed Emir Gökdemir) • Prepared a sequence diagram. • Redesigned the homepage of wiki. • Reviewed the all feedbacks and assigned tasks to individuals for fixing errors. • Wrote Road Ahead(1.3) part of milestone report.

Muhammed EmirGökdemir	• Research about git. • Investigation on some Repos for Favourite Git Repos. • Creation personal wiki page. • Requirements about recommendation system. • Fourth week's meeting report. • Preparation of persona, story and mock-up of guest (with Kemal Duru),(also updating). • Preparation of Use Case Diagram (with Şafak Özdek),(also updating). • Precondition of users and guest. • Preparation of Requirement and Design Diagram of Milestone's Evaluation part.
Merve İlik	• Creation of personal wiki page. • Deciding which tags will be used for issues with some other members. • Some design updates on wiki sidebar. • Decision and elicitation of non-functional requirements. • Obtaining acceptance criteria for user scenarios. • Reviewing use case diagram. • Preparation of 2 sequence diagrams. • Sixth week's meeting report. • Listing deliverables and their status for first Milestone report.

Ahmet Emir Kocaağa	• Creation of personal wiki page. • Creation of first weeks issues. • Research about git version control system and determined favorite git repos. • Elicitation of requirements about “Users”, “Events” and “Comments”. • Moderator of the 3rd weeks meeting, created meeting report and issues. • Made a research about review mechanism. • Created the project page on GitHub. • Design of the class diagram (with Kutay, Merve and Alperen). • Design of 2 sequence diagram (with Alperen). • General review of the work we have done. • “Project Management” section of the report.
Esra Yılmaz	• Tags for the issues are selected. • Research about Git version control system. • Research about Github terms for Github tutorial. • Reorganization of the label colors. • Creation of personal wiki page. • Elicitation of requirements about ‘Searching’. • Preparation of persona, scenario, mockups for Trading User. (with Kutay) • Design of the Class Diagram. (with Alperen, Kutay, Ahmet Emir) • Determination of 12 sequence diagram scenarios. (with Kutay)

Seyfi Kutay Kılıç	• Created my personal wiki page • Wrote information about OpenCV in favorite repos page. • Discussed and created new tags for issues with my friends. • Added "What is Version Control System?" part to Github Tutorial wiki page. • Defined the sub-categories of the functional requirements. Distributed them to my teammates. • Wrote the requirements about notifications, follower system, and database. • Prepared a mockup for a trader named "Mahmut Eryaman" using NinjaMock, with Esra Yılmaz. • Wrote the persona of the trader "Mahmut Eryaman". • Set a slack bot to notificate the team members to remind the personal effort document. • Prepared the class diagram with Esra, Alperen, and Ahmet Emir. • Moderated 5th week's meeting, wrote meeting notes, and distributed the tasks to people. • Updated the trading user's persona, scenario, mockups according to the given feedback, with a friend in the team. • Determined 12 scenarios for the sequence diagrams, with Esra. • Updated the class diagram with the other 3 friends in the team, to fix the wrongs that we learned from the feedback. • Organized the deliverables then merged them into this document, using latex.
Alihan Çelikcan	• Communicator of the group • Hosted first week's meeting (pre-moderator) • Created personal wiki page • Did research about effort estimation • Reviewed use case diagram • Designed a sequence diagram • Prepared user stories and mock-ups sections of the evaluation part

Kemal Duru	• A research about W3C Web Annotation Protocol/Data Model is made • Persona, user story and mock-up of guest is prepared (with Emir Gökdemir) • 6 sequence diagrams are designed (with Berke Metin) • Mock-up and some sequence diagrams are updated according to given feedback • Personal wiki page is created • Favorite git repo is selected. • Tags for the issues are selected with a group of the team. • "Introduction" part of the Milestone is written.
Nazım Berke Metin	• Created personal wiki page. • Made communication plan. • Wrote glossary. • Wrote persona and mockup 3. • Wrote 3 sequence diagram • Wrote 7th week meeting report

5 Project Management

One of the strongest parts of our team is the communication we have established. Every week, a different person was the moderator of the meeting and leaded the conversation. So, both everyone and no one played the leadership in our team. We had naturally some problems such as passing the deadline of a particular issue, but we managed to solve them.

Giving feedback was an important part of our project management. When someone was done with her work, we always did a review. We payed attention to giving positive feedback rather than giving only negative feedback, so this helped us to keep our enthusiasm high.

Also, in every meeting, we talked about the work we have done last

week and how can we do it better. In one of that conversations, we decided to do a research about project management and as a result of that research we were the first group that started to use "Project" section of GitHub. Using that section was really efficient and helped us to manage our project.

5.1 Tools

GitHub: We had the chance to see how useful is Github for project management. We used issues for the works we need to do, project section for managing them and wiki for documentation.

LucidChart: LucidChart is a chart creation tool and free for students. We used it for creating our use case, class and sequence diagrams.

NinjaMock: A free mockup creation tool. We used it for creating our mockups.

Slack: We used slack for communication.

5.2 Communication Plan

Audience	Objective	Channel	Where	Frequency
All team members	Review of last week and planning of current week's tasks	Face to face meeting	CMPE Lounge	Every Tuesday at 17:00
All team members	Discussions on tasks that need input from multiple team member	Online	Slack	When needed
All team members	Communicate instantly for short notice situations	Online	WhatsApp	When needed
Members of a task-oriented team	Conduct a meeting for a specific task	Online / In-Person meeting	Slack, CMPE Lounge , Github(Issues)	Always
All team members	Weekly tasks deadline	Online	Github(Issues)	Every Friday at 23:59

6 Requirements

6.1 Glossary

- **All Users:** It can be a basic user or a trading user.
- **Annotation:** A term refer to documentation and comments that may be found on code logic.
- **Basic Users:** A person who is registered and able to access the basic functionalities of the platform.
- **Economic Event:** Events having impact on trading equipments. (e.g., Meetings of the Central Bank of the Republic of Turkey or a speech of the president of Federal Reserve Bank of New York.)

- **My Investments:** The section which users be able to invest on any trading equipment, make a buy order for a specified rate, and set stop/loss limits.
- **Prediction Success Rate:** The success rate of the predictions made by users on trading equipment's values which can be seen in the user profile.
- **Portfolio:** A range of investments held by a user.
- **Profile:** The page which contains user information such as personal information, prediction success rate and portfolios.
- **Profit/Loss:** Amount whether the user lose or gain in any trading equipment.
- **Profit/Loss Section:** The section provided by the system for all users to view profit/loss value of their investments.
- **Recommendation System:** It recommends articles or trading equipment to the users based on their histories.
- **Semantic Search:** It tries to find semantically similar users and trading equipment based on the context information provided in the semantic tags.
- **Traders Platform:** Lets people follow and trade indices, stocks, ETFs, commodities, currencies, funds, bonds, and cryptocurrencies.
- **Trading Equipment:** Indices, stocks, ETFs, commodities, currencies, funds, bonds, cryptocurrencies etc.
- **Trading Users (Registered Users):** A person who is registered and addition to basic user trading users should be able to invest in any trading equipment.

6.2 Functional Requirements

6.2.1 User Requirements

6.2.1.1. User Types: 6.2.1.1.1. All Users (Except Guests):

- 6.2.1.1.1.1. All users shall have a "Profit/Loss" and an "Events" section.
- 6.2.1.1.1.2. All users shall have at least one Portfolio.
- 6.2.1.1.1.3. All users shall be able to follow other users.
- 6.2.1.1.1.4. All users shall be able to share ideas as an article.
- 6.2.1.1.1.5. All users shall be able to comment about trading equipments and articles.

- 6.2.1.1.1.6. All users shall be able to follow the values related to any trading equipment that is available.
- 6.2.1.1.1.7. The followers of a user and the followed users by that user shall be seen on the profile of that user.
- 6.2.1.1.1.8. A private user profile shall be seen only by it's followers.

6.2.1.1.2. Only Trading Users:

- 6.2.1.1.2.1. Trading Users shall have a "My Investments" section.
- 6.2.1.1.2.2. Trading users shall be able to invest on any trading equipment, make a buy order for a specified rate, and set stop/loss limits.
- 6.2.1.1.2.3. Trading users shall have different success rates for each trading equipment on which they made prediction.

6.2.1.1.3. Guests:

- 6.2.1.1.3.1. Guests shall be able to view the price of a trading equipment and view the economic events, but shall not be able to follow them.
- 6.2.1.1.3.2. Guests shall be able to read user comments about trading equipment and articles.

6.2.1.2. Authentication 6.2.1.2.1 Sign Up:

- 6.2.1.2.1.1. Basic Users shall provide their name, surname, e-mail address, and location (by specifying it on Google Maps).
- 6.2.1.2.1.2. Trading Users shall provide their name, surname, e-mail address, location (by specifying it on Google Maps), IBAN and TR Identity Number.
- 6.2.1.2.1.3. Users should be able to use Google account to retrieve necessary information for signing up.
- 6.2.1.2.1.4. All users shall choose a password.

6.2.1.2.2. Sign In:

- 6.2.1.2.2.1. All users shall be able to sign in by providing their e-mail and password.
- 6.2.1.2.2.2. All users should be able to use Google account to retrieve necessary information for signing in.

6.2.1.2.3. Profile:

- 6.2.1.2.3.1. Profile can be either public or private to other users.

- 6.2.1.2.3.2. In order to see the contents in a private user profile, user should be followed.
- 6.2.1.2.3.3. Basic users and trading users' prediction success rate shall be visible in their profile page.

6.2.1.2.4. Portfolio:

- 6.2.1.2.4.1. Basic users and trading users shall be able to rename their portfolio.
- 6.2.1.2.4.2. Basic users and trading users shall be able to add any trading equipment to their portfolio.
- 6.2.1.2.4.3. Basic users and trading users shall be able to share their portfolio in their profile page and follow other users' shared portfolio.

6.2.1.2.5. Profit/Loss Section:

- 6.2.1.2.5.1. Profit/Loss section shall be private to user.
- 6.2.1.2.5.2. All users shall be able to use the Profit/Loss Section by providing the type and the amount of their investment, the exact time at when that investment made by the user and the currency which they eventually want to see the profit/loss value in terms of.
- 6.2.1.2.5.3. Trading users shall also be able to use the Profit/Loss Section using the investments that they made in the Traders Platform.

6.2.2 System Requirements

6.2.2.1. Notifications:

- 6.2.2.1.1. The system shall notify users in accordance with alerts.

6.2.2.2. Predictions:

- 6.2.2.2.1. Each trading equipment shall be available for the prediction.

6.2.2.3. Searching:

- 6.2.2.3.1. The application shall support location-based search.
- 6.2.2.3.2. The application shall allow semantic search.
- 6.2.2.3.3. Searching process shall consider all the information available in user profiles and trading equipment.

6.2.2.4. Trading Equipment:

- 6.2.2.4.1. The trading equipments shall be available on the site in the form of trade indices, stocks, ETFs, commodities, currencies, funds, bonds, and cryptocurrencies. (e.g., Trade Indices: SP 500 Futures, SP 500 and Nasdaq 100. Stocks: Deutsche Bank AG, Apple, Turkish Airlines. ETFs: SPDR SP 500, iShares Russell 2000, United States Oil. Commodities: Gold, Silver, Brent Oil. Currencies: EUR/USD, TRY/EUR, TRY/USD. Funds: Vanguard 500 Index Admiral, PrivatFonds: Kontrolliert, Fidelity Contrafund. Bonds: U.S. 10Y, U.S. 5Y, U.S. 2Y. Cryptocurrencies: BTC/USD, ETH/USD, XRP/USD.)
- 6.2.2.4.2. Each trading equipment shall include the information of the previous close, percentage change with the previous close, amount change with the previous close, day's range, and moving averages.

6.2.2.5. Recommendation System:

- 6.2.2.5.1. The system shall be able to recommend people and trading equipments to follow.
- 6.2.2.5.2. The system shall be able to recommend articles to read.

6.2.2.6. Economic Events:

- 6.2.2.6.1. Economic events shall have different significance levels.
- 6.2.2.6.2. Each economic event shall have a numeric result which shows the actual value, the forecast value and the previous value of the related trading equipment.
- 6.2.2.6.3. Basic users and trading users shall be able to filter economic events by considering their significance level and country base.
- 6.2.2.6.4. Basic users and trading users shall be able to search economic events.

6.3 Non-Functional Requirements

6.3.1 Security and Privacy:

- 6.3.1.1. E-mails for registration shall be valid and unique for each user.
- 6.3.1.2. Passwords shall be 8 characters long at least and contain at least one uppercase letter, one lower case letter and a digit.
- 6.3.1.3. All passwords shall be encrypted using PBKDF2 and stored on database.
- 6.3.1.4. Data of the users shall be protected according to Law on the Protection of Personal Data.

6.3.2 Performance:

- 6.3.2.1. Response time for any request shall be 5 seconds at most.

6.3.3 Availability:

- 6.3.3.1. The application shall have web and mobile (Android) versions.
- 6.3.3.2. The system shall be compatible with the latest main versions of Google Chrome and Android.
- 6.3.3.3. The language of the system shall be English but it shall also support Turkish characters.

6.3.4 Annotations:

- 6.3.4.1. The application shall support W3C Web Annotation Data Model and follow W3C Web Annotation Protocol.

6.3.5 Database

- 6.3.5.1. System shall store user information, trade equipments, follower relations, portfolios, user histories and user preferences on database.
- 6.3.5.2. Information in the database shall be able to be updated.

7)Mockups:

7.1)Personas and User Stories

7.1.1. Mahmut Eryaman - A Building Contractor

Preconditions

- Mahmut has been already a user of the platform. He signed up 2 years ago.
- He has been tracking currencies and stocks these days to invest.
- He uses Web Browser while he invests online.

User Scenario

Mahmut Eryaman is a passionate building contractor who funds great building projects every year. Since he has lots of money, he wants to protect the value of his money by investing the true trading equipments. When he was researching for a proper trading platform, he saw traders.com then he becomes very excited. Then, he immediately sign up to the platform for investing to the true eqipments periodically and become a succesful trader. Also, he started to read articles about the trading equipments and global economics so he becomes wiser and wiser. Now, he wants began to gaining money from the dealing spread using traders.com.

User Story

As a trader, he can buy and sell currencies and stocks very frequently so that he can gain money from the dealing spread. Also, he can follow the successful traders and make comments to their posts. Furthermore, he can follow specific trading equipments and set alarms for them so that he miss nothing.

Demographics

- Interested in constructural projects.
- His biggest passion is money.
- 48 years old.
- Registered to the system as a trader.

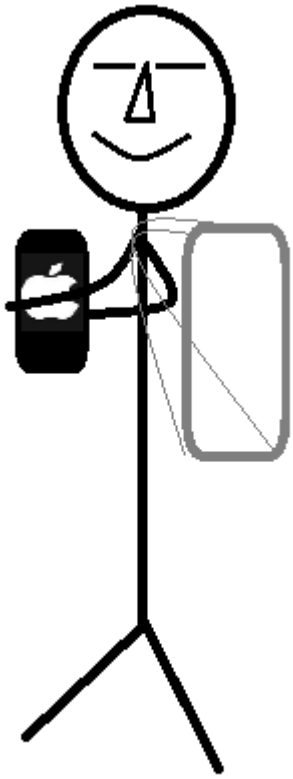
Goals

- Wants to gain money from day trading.
- Wants to stalk richer people's investments.

Acceptance Criteria

- Users shall be able to follow the values related to any trading equipment that is available. (1.1.1.1.6.)
- Trading users shall be able to invest on any trading equipment, make a buy order for a specified rate, and set stop/loss limits. (1.1.1.2.2.)
- Trading users shall provide their name, surname, e-mail address, location (by specifying it on Google Maps), IBAN and TR Identity Number. (1.1.2.1.2.)
- All users shall be able to sign in by providing their e-mail and password.(1.1.2.2.1)
- Trading users shall also be able to use the Profit/Loss Section using the investments that they made in the Traders Platform. (1.1.5.3.)
- Profit/Loss section shall be private to user. (1.1.5.1.)
- The trading equipments shall be available on the site in the form of trade indices, stocks, ETFs, commodities, currencies, funds, bonds, and cryptocurrencies. (e.g., Trade Indices: S&P 500 Futures, S&P 500 and Nasdaq 100. Stocks: Deutsche Bank AG, Apple, Turkish Airlines. ETFs: SPDR S&P 500, iShares Russell 2000, United States Oil. Commodities: Gold, Silver, Brent Oil. Currencies: EUR/USD, TRY/EUR, TRY/USD. Funds: Vanguard 500 Index Admiral, PrivatFonds: Kontrolliert, Fidelity Contrafund. Bonds: U.S. 10Y, U.S. 5Y, U.S. 2Y. Cryptocurrencies: BTC/USD, ETH/USD, XRP/USD.)(1.2.4.1.)
- The application shall have a web version.(2.3.1.)

7.1.2. Kemal – A Student



Preconditions

- Kemal is in seeking a platform to track last events and currencies.
- He didn't signed up the platform. It is the first time of entering.
- He don't want to register to anywhere.
- He used his phone when he was seeking.

User Scenario

Kemal wants to track currencies, stocks and commodities. Also, he wishes to know the successful traders' acts. Then he searches by a searching engine in his phone. He finds the website. This website meets his wishes. Additionally, he finds comments of traders about events and articles written by traders. By these ways, he knows the ideas of people who are closely related trading and he easily tracks economic movements. Therefore, Kemal would be happy.

User Story

Kemal searches an application in order to satisfy his wishes. He finds our application in a search engine then opens our application. Because he wants to explore the new app he continues as a guest. In the homepage, daily progress of some selected markets like popular stocks, currencies and commodities can be seen. Kemal opens the menu by clicking the menu bar. In the menu, there are

many sections including events,articles and various trading equipments. Since Kemal is curious about economic news, he chooses "Events" section. In the "Events" section, Kemal reads some of the major economic events and news of the day. Kemal is deeply interested in blockchain and he wants to improve his knowledge on this subject. Especially he is curious about the future of cryptocurrencies. So he goes cryptocurrencies page and examine the cryptocurrencies' weekly states. After then, he goes to "Articles" section and discovers some articles that is written by expert investors. Kemal chooses an article about his interests, he likes and enjoys it!

Demographics

- Bogazici University MIS Senior Student
- Loves economics
- Tracks trading issues, economic current events
- 22 years old
- Checks the currency exchange rates, stocks regularly
- Reads news and events about trading equipment.

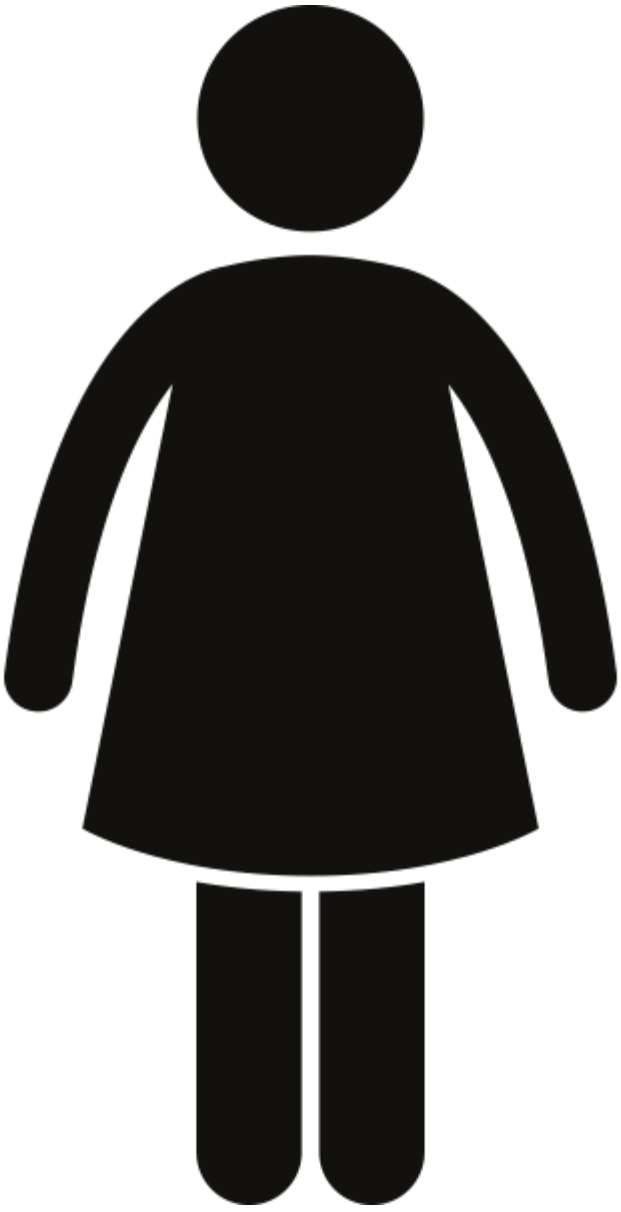
Goals

- Wants to be informed about economic situations.
- Wants to learn people’s ideas (comments) about future of trading.
- Wants to be informed about price of trading equipment.
- Wants to learn the investment options after graduation.

Acceptance Criteria

- A private user profile shall be seen only by it’s followers. (1.1.1.1.8.)
- All users shall be able to share ideas as an article.(1.1.1.1.4.)
- Guests shall be able to view the price of a trading equipment and view the economic events, but shall not be able to follow them. (1.1.1.3.1.)
- Guests shall be able to read user comments about trading equipment and articles.(1.1.1.3.2.)
- Profile can be either public or private to other users.(1.1.3.1.)
- In order to see the contents in a private user profile, user should be followed.(1.1.3.2.)
- Users shall be able to comment about trading equipments and articles. (1.1.1.1.5.)
- The application shall have a mobile (Android) version.(2.3.1.)

7.1.3. Didem Aksoy - A new graduated student



Preconditions

- She didn't signed up the platform. It is the first time of entering.
- She was curious about cryptocurrencies.
- She heard the some users' success in the platform from her friend.
- She was using Web Browser when she registered.

User Story

As a new graduated student, Didem is curious about cryptocurrencies. She has just learned the platform from social media phenomena who have knowledge about this new trending exchange tool. She is seeking for a role model. Thus, she hears Bill Rashford and his successful experience. She signs up to the website and checks his portfolios.

Demographics

- Interested in politics.
- Her biggest passion is to gain easy money.
- 24 years old.
- Registered to the system as a basic user.
- Follows cryptocurrency news from social media day and night.

Goals

- Wants to gain money from short-term trading.
- Wants to stalk successful people's investments.
- Wants to get notified in accordance with alerts.

Acceptance Criteria

- All users shall have a “Profit/Loss” and an "Events" section. (1.1.1.1.1)
- All users shall have at least one Portfolio. (1.1.1.1.2)
- All user should be able to follow other users. (1.1.1.1.3)
- All users shall be able to sign in by providing their e-mail and password. (1.1.2.2.1.)
- Basic users and trading users shall be able to share their portfolio in their profile page and follow other users' shared portfolio. (1.1.4.3.)
- The system shall notify users in accordance with alerts. (1.2.1.1)

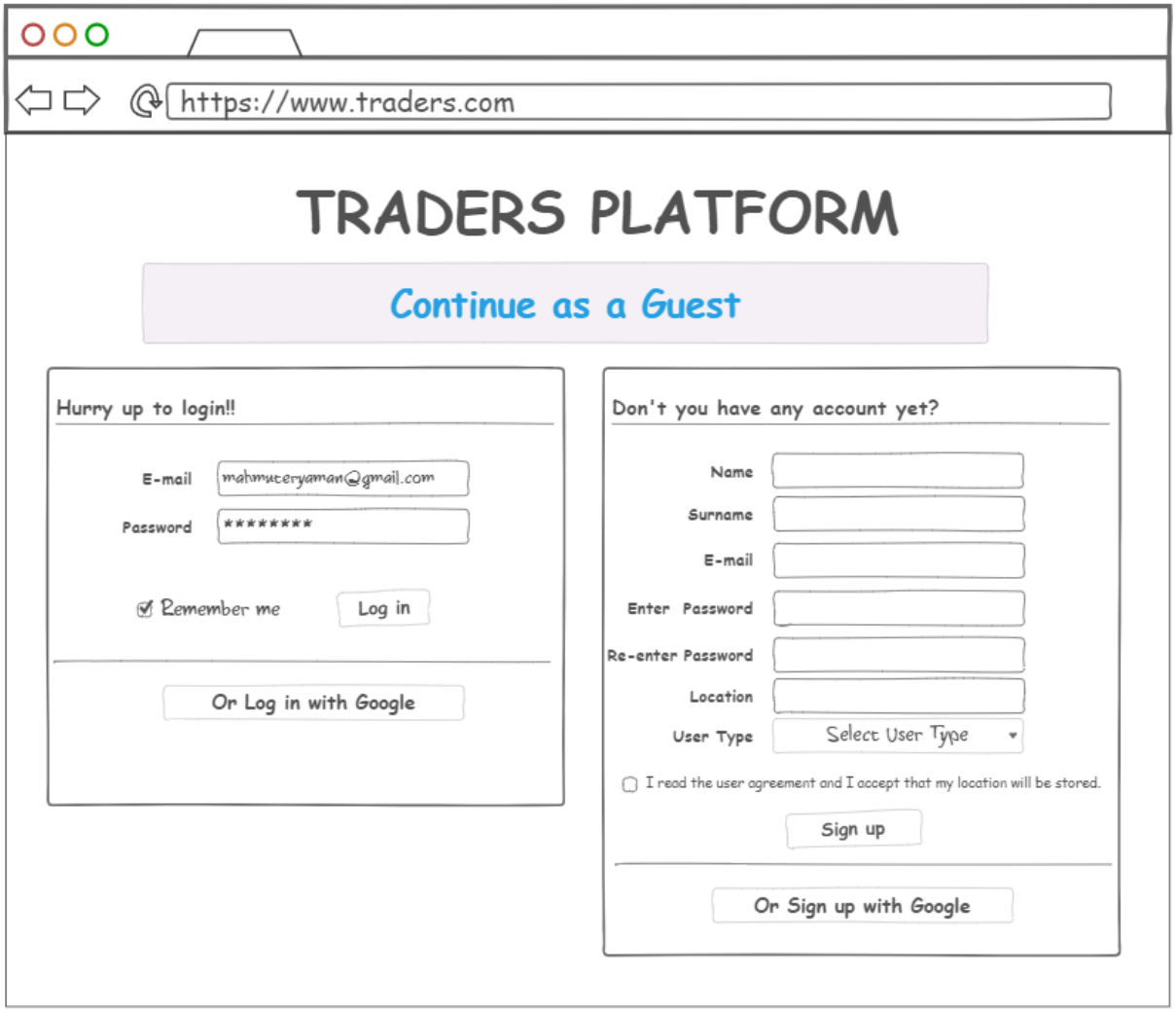
7.2)Scenarios/Mock-ups

7.2.1 Story #1

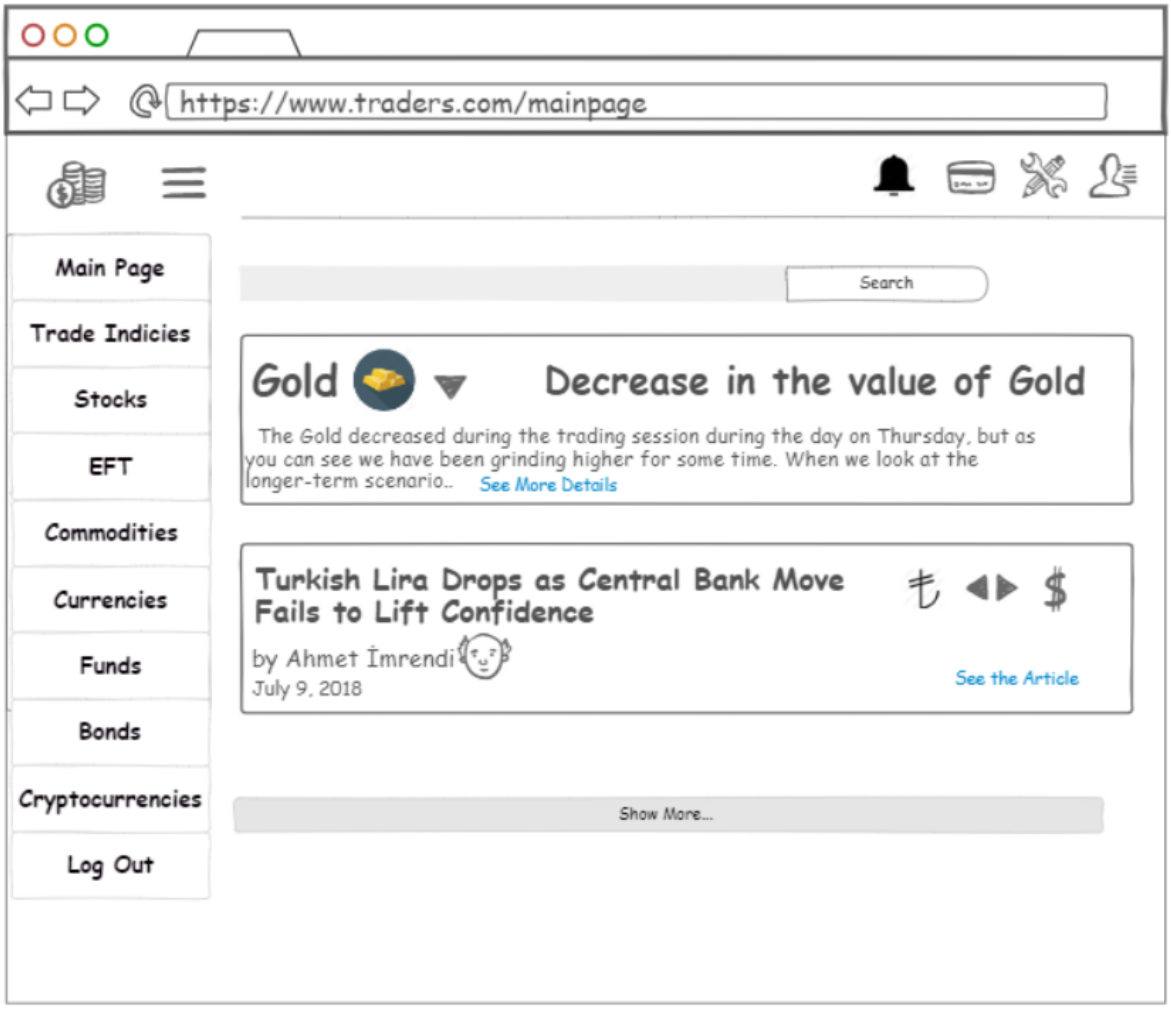
Mahmut Eryaman is a trader. He wants to invest in Trader Platform.

Flow:

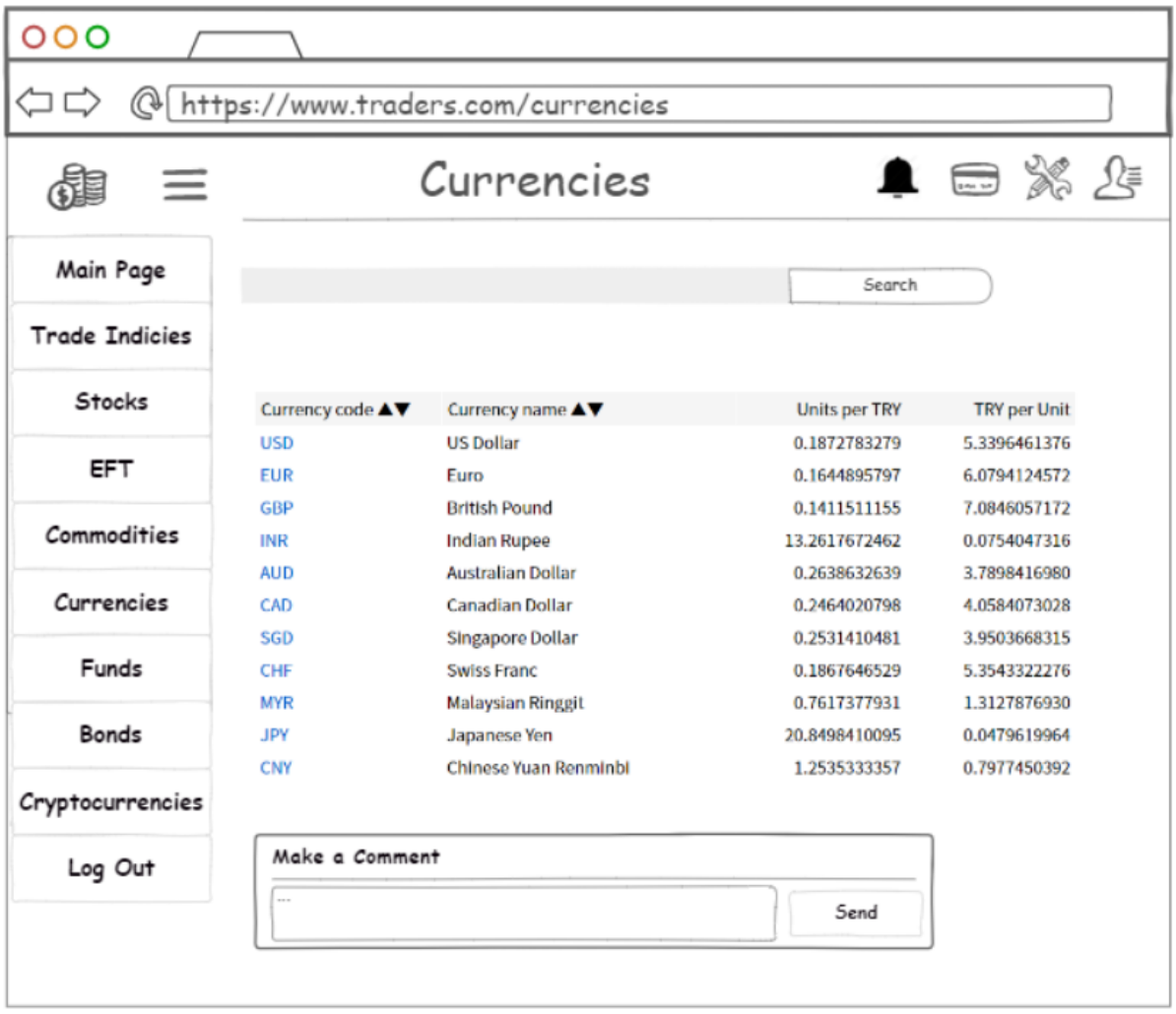
1) Mahmut enters to the website and log in.



2) Main page displays on the screen.
Initially, Mahmut wants to invest on gold because there is a decrease in its value but suddenly he sees that a followed person, named Ahmet İmrendi, had written an article about TRY vs USD. Therefore, he clicked the **Currencies** on the left to get information about USD.

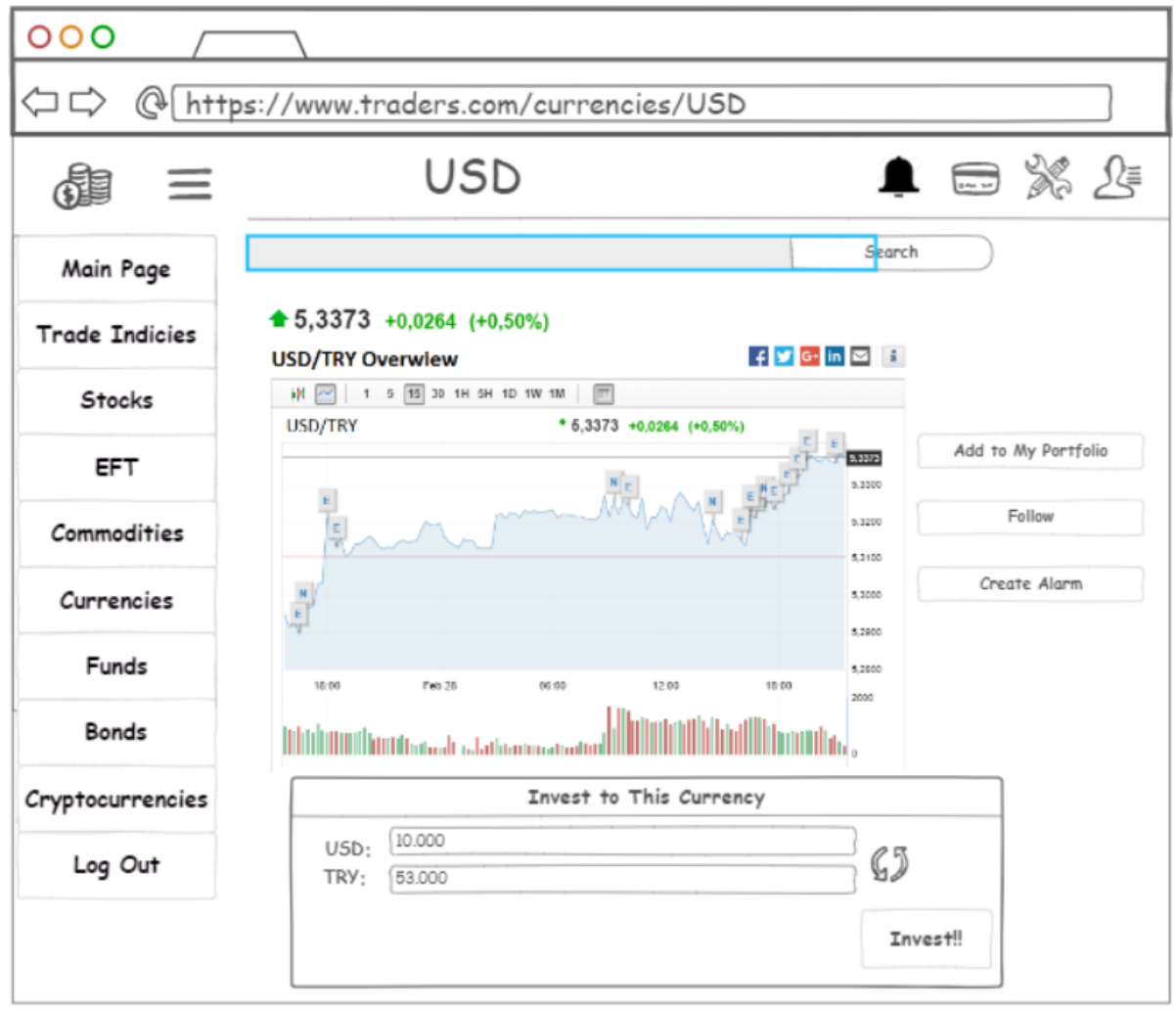

https://www.traders.com/mainpage
Main Page
Trade Indicies
Stocks
EFT
Commodities
Currencies
Funds
Bonds
Cryptocurrencies
Log Out
Search
Gold
Decrease in the value of Gold
The Gold decreased during the trading session during the day on Thursday, but as you can see we have been grinding higher for some time. When we look at the longer-term scenario..
See More Details
Turkish Lira Drops as Central Bank Move Fails to Lift Confidence
by Ahmet İmrendi
July 9, 2018
See the Article
Show More...

3) On the **Currencies** page, there is a table showing the value of TRY against other currencies. Mahmut clicked the USD link on the table.

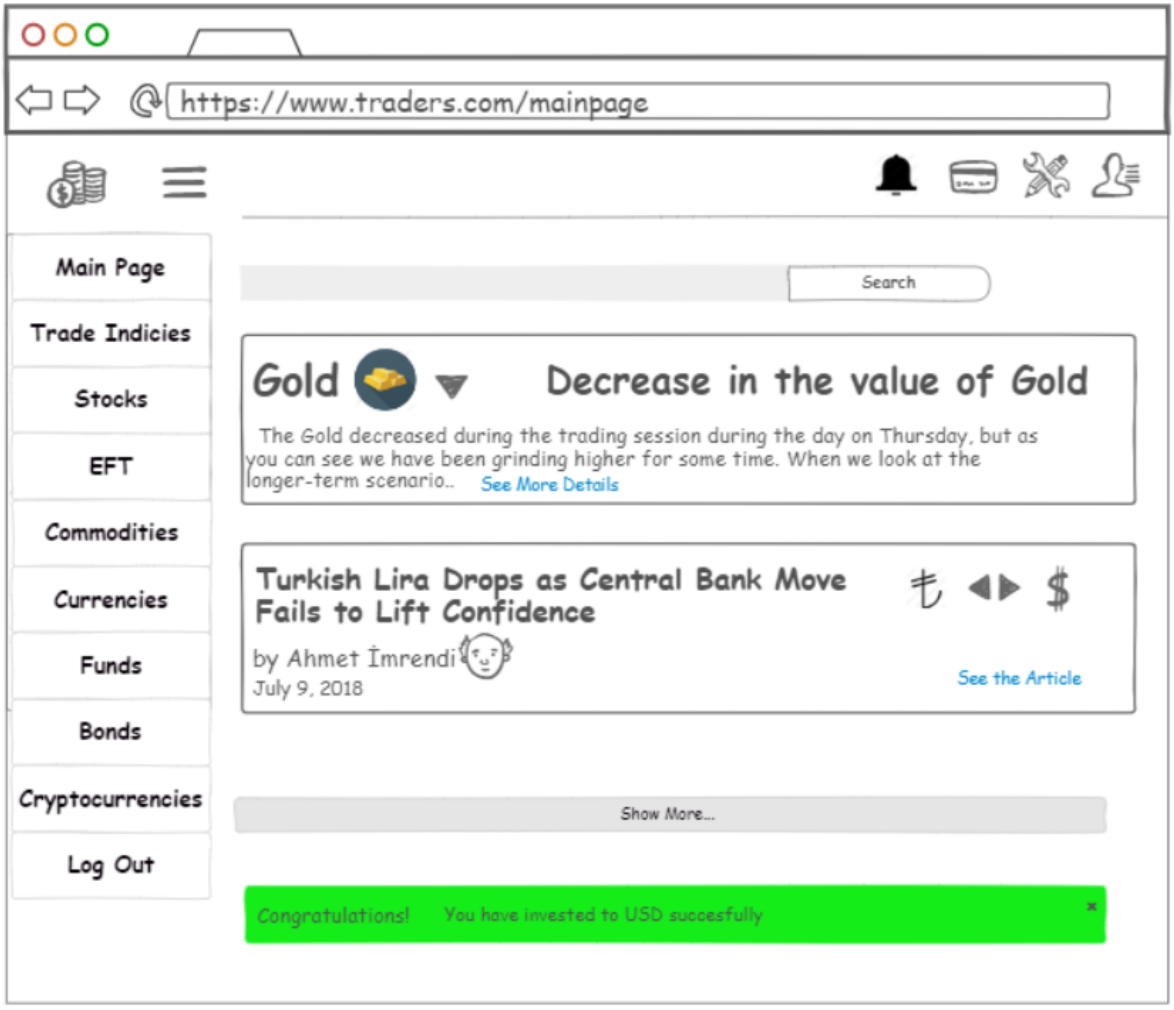


4) On the **Currencies >> USD** page, there are some charts about USD/TRY like 'USD/TRY Overview'. At the bottom part, there is an investment section for this equipment. When Mahmut enters the quantity of US Dollars to buy, he automatically get the quantity of Turkish Liras in return.

Mahmut enters the quantity of USD and he clicked the 'Invest' button.



5) When he clicked the 'Invest' button, the platform redirects him to the main page and there is an alert for notifying the accomplishment of the investment operation.

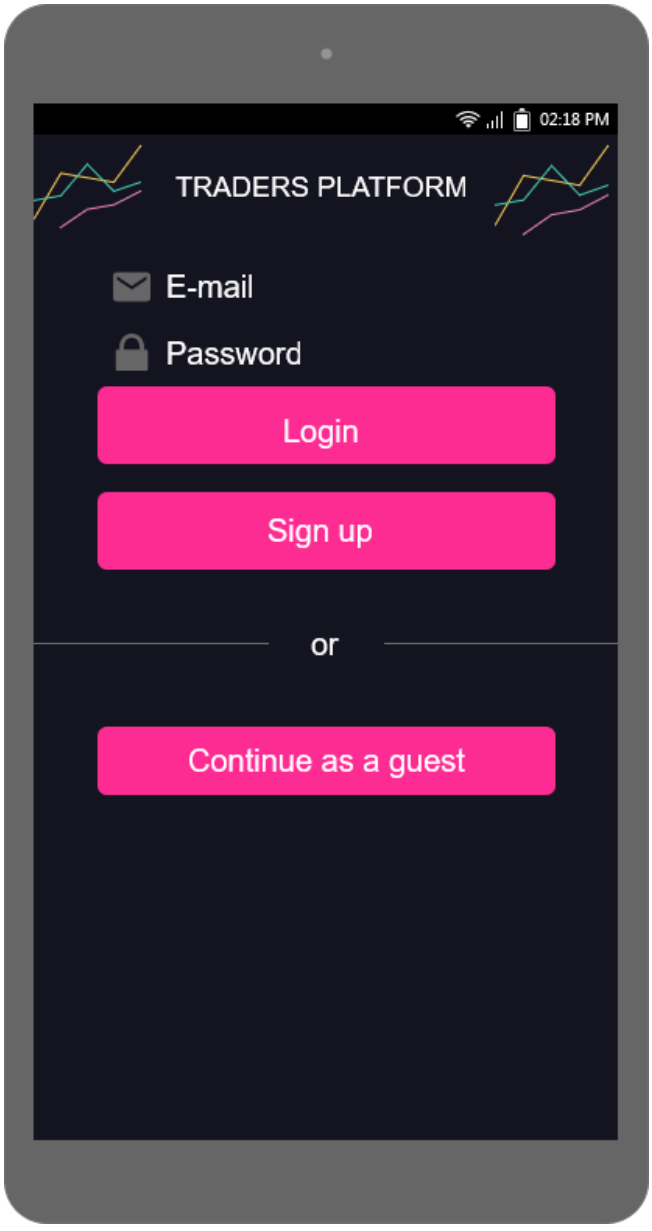


7.2.2 Story #2

As a student, I can track currencies, stocks and commodities. Also, I can learn traders' opinions regularly by this app. I can have idea about investment on this usable website for after the my graduation.

Flow:

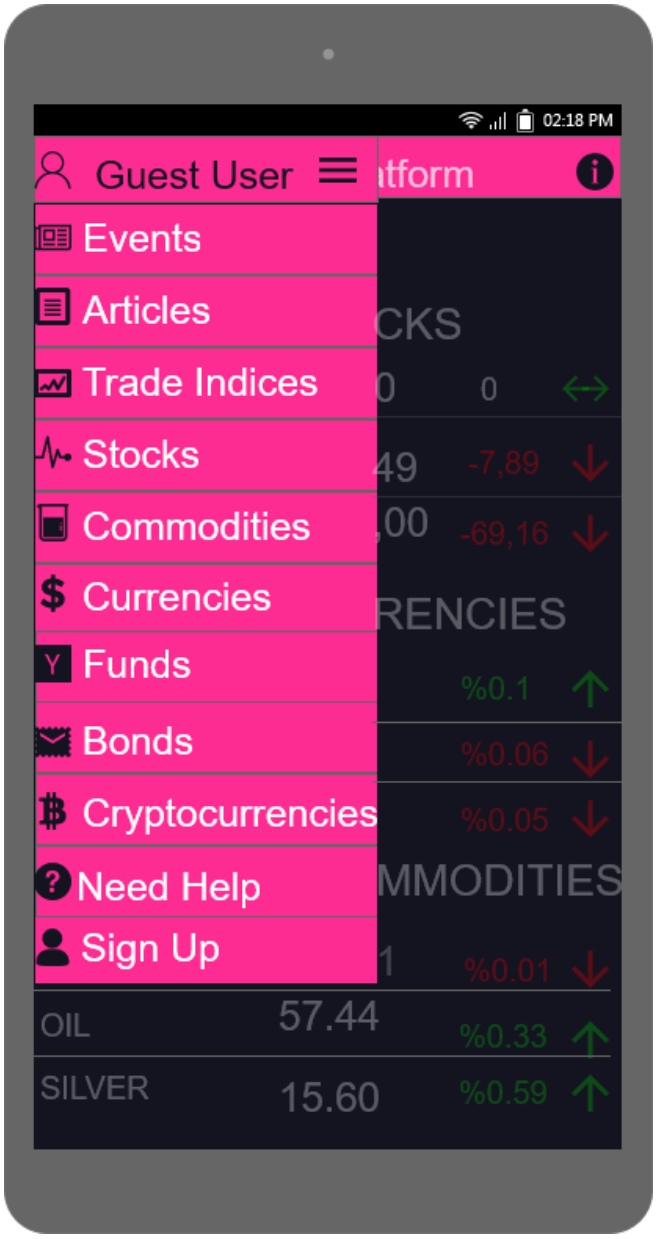
1. Kemal opens our application and because he wants to explore the new app he continues as a guest.



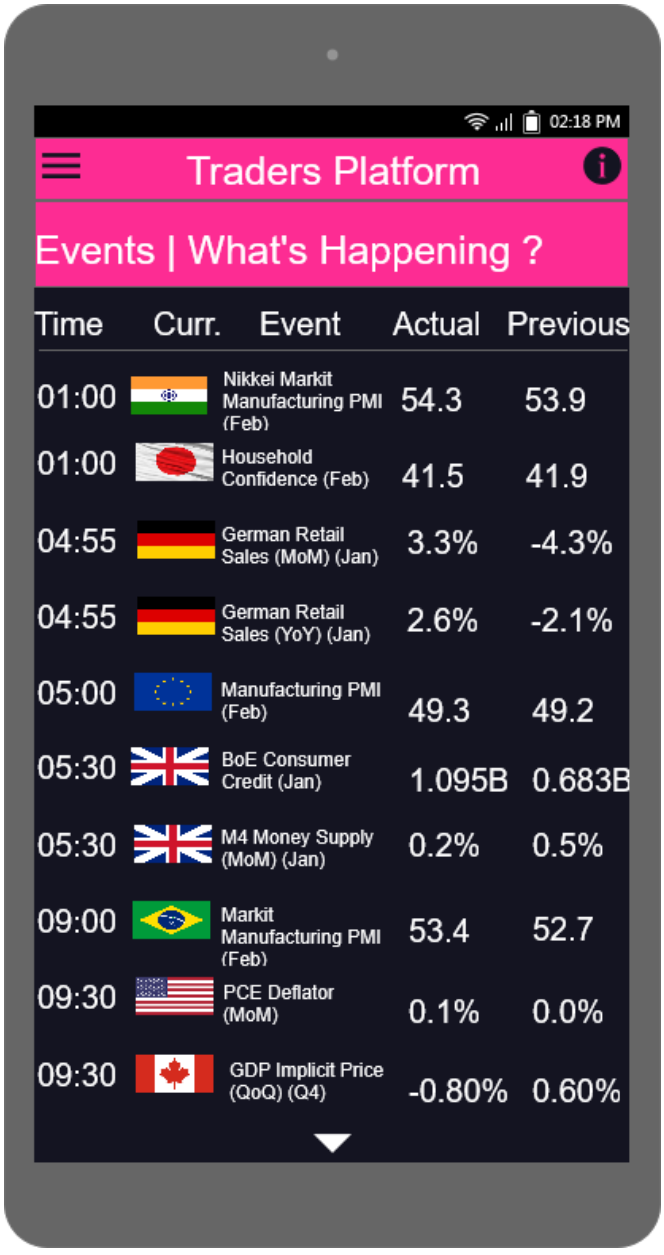
2. In the homepage, daily progress of some selected markets like popular stocks, currencies and commodities can be seen.

3. Kemal opens the menu by clicking the menu bar. In the menu, there are many sections including events,articles and various trading equipments. Since Kemal is curious about

economic news, he chooses **"Events"** section.

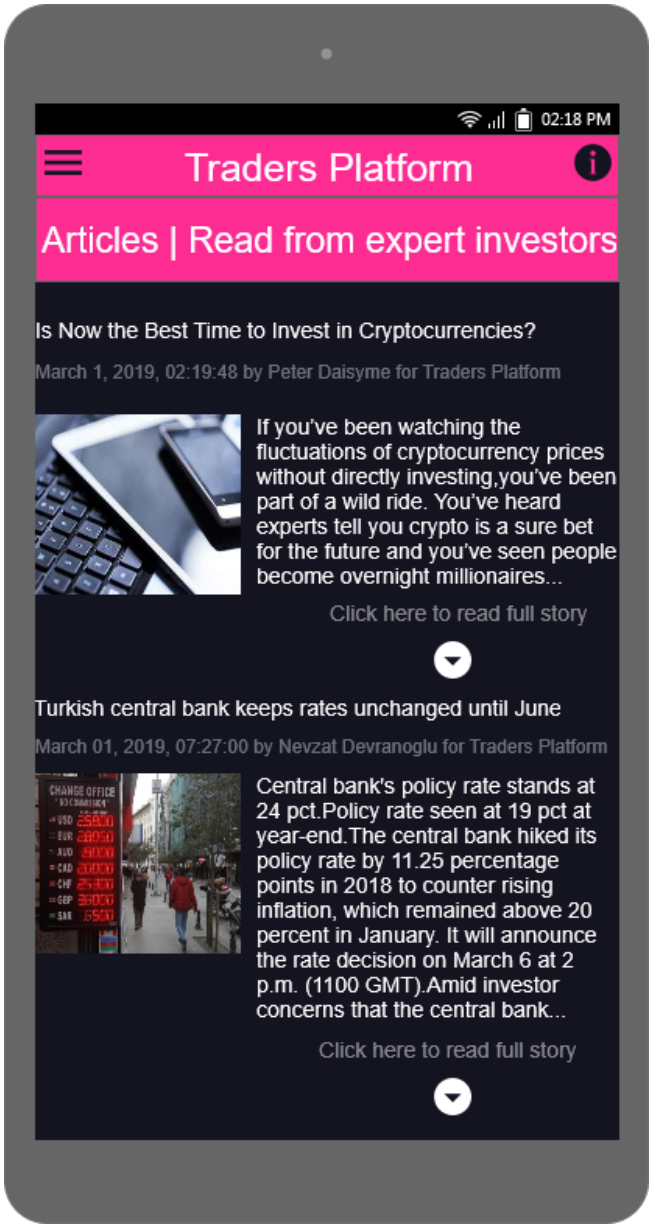


4. In the **"Events"** section, Kemal reads some of the major economic events and news of the day.



5. Kemal is deeply interested in blockchain and he wants to improve his knowledge on this subject. Especially he is curious about the future of cryptocurrencies. So he goes to

"Articles"section and discovers some articles that is written by expert investors.



6. Kemal chooses an article he likes and enjoys it!

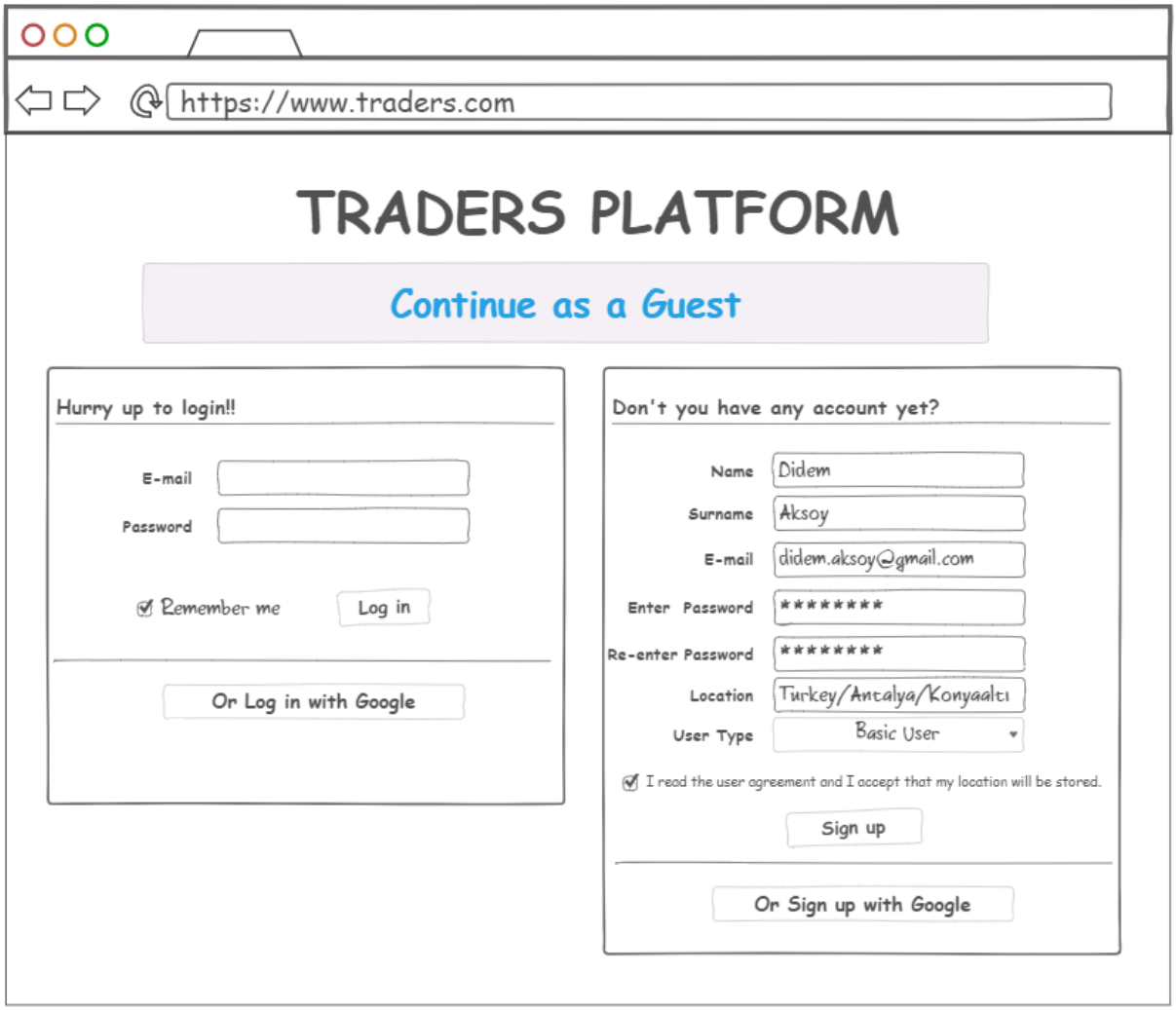
***Comment section of the article is not seen because of the length of the article. Guest users can see the comments made by trading and basic users.*

7.2.3 Story #3

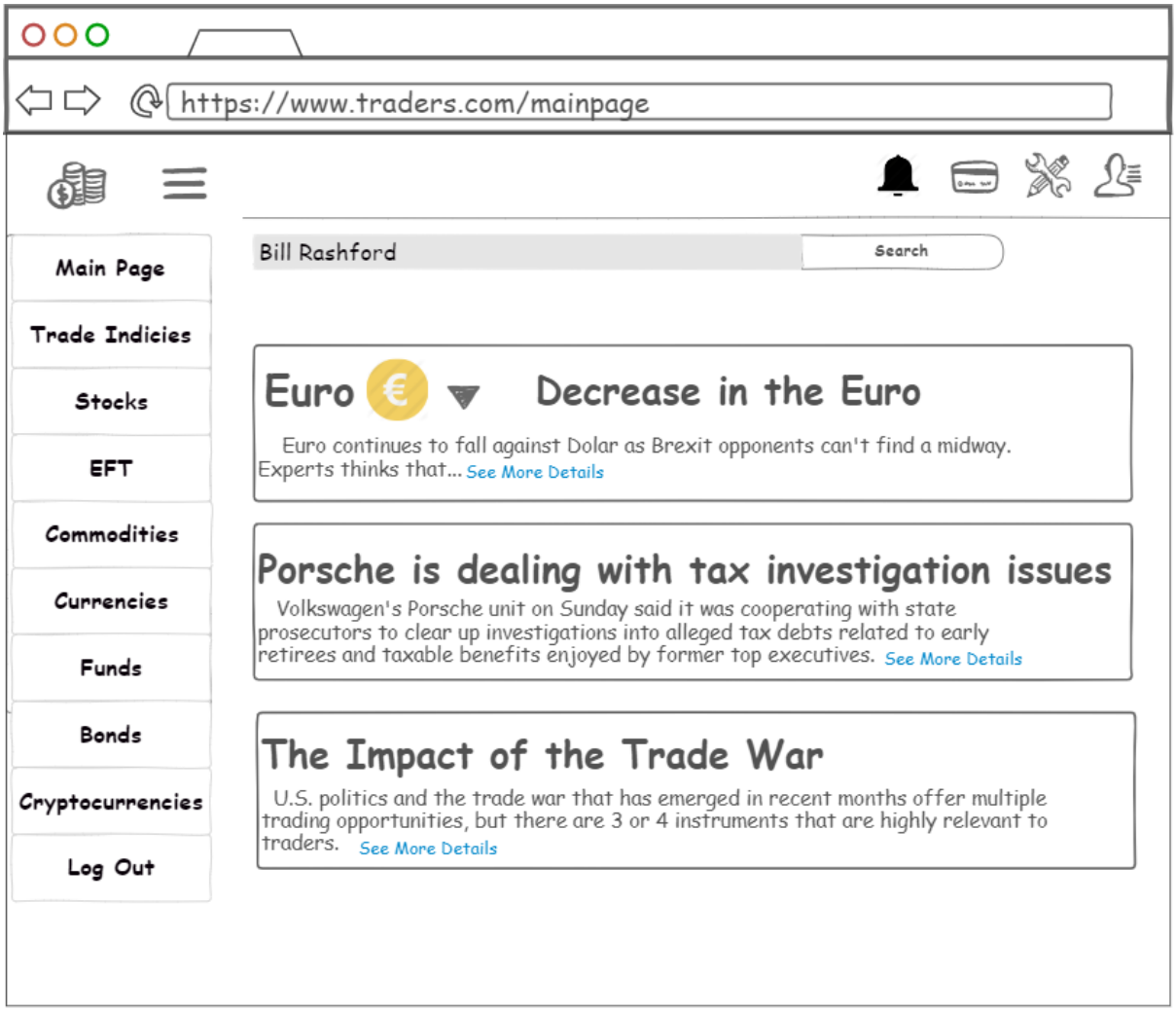
Didem Aksoy is a basic user. She wants to see another user's portfolio.

Flow:

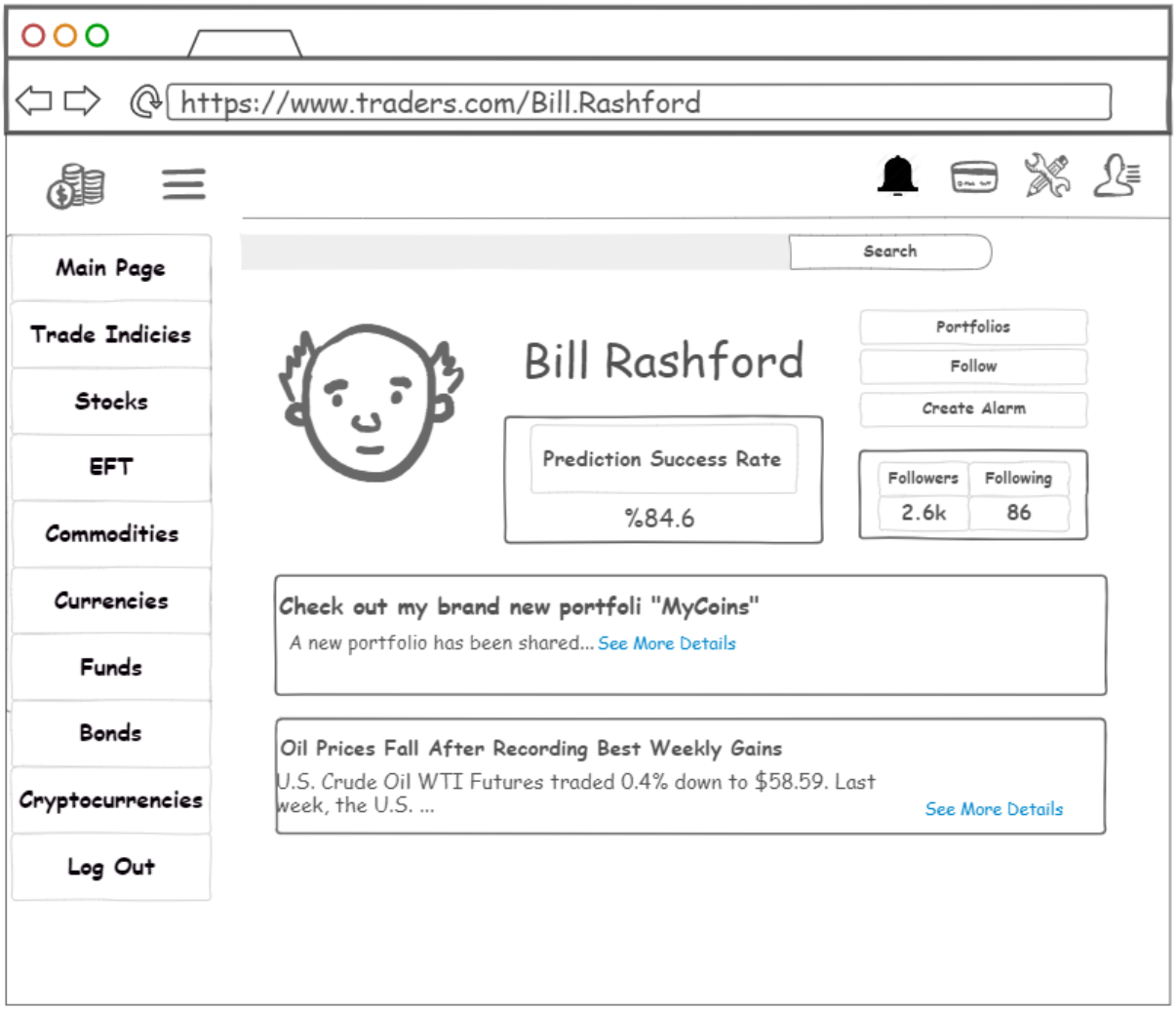
1. Didem enters to the website and signs up.



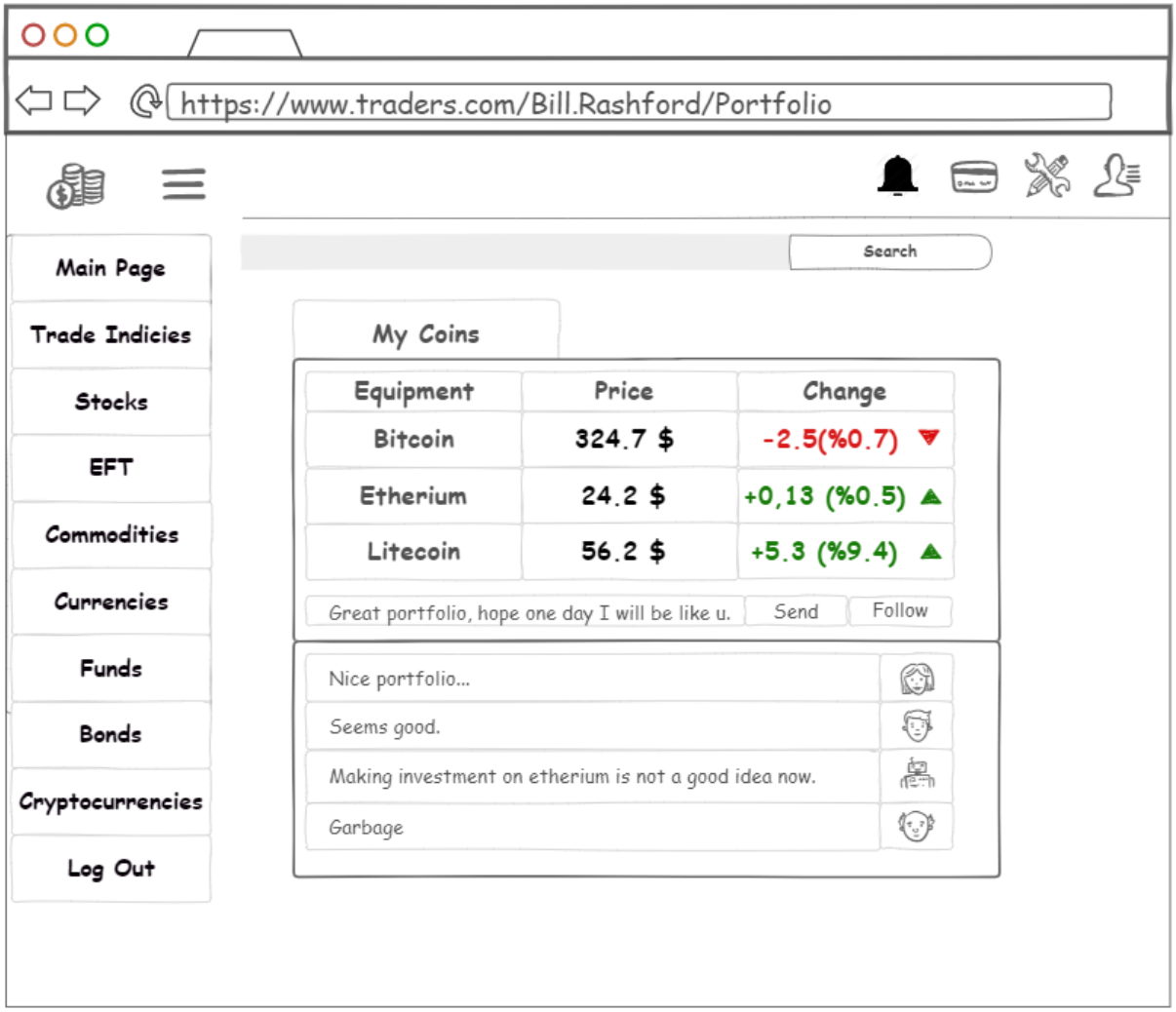
2. Main page displays on the screen. Initially, Didem wants to go Bill Rashford's profile so she writes it to the search box and goes to the Bill Rashford's profile.


https://www.traders.com/mainpage
Main Page
Trade Indicies
Stocks
EFT
Commodities
Currencies
Funds
Bonds
Cryptocurrencies
Log Out
Bill Rashford
Search
Euro
Decrease in the Euro
Euro continues to fall against Dolar as Brexit opponents can't find a midway. Experts thinks that... See More Details
Porsche is dealing with tax investigation issues
Volkswagen's Porsche unit on Sunday said it was cooperating with state prosecutors to clear up investigations into alleged tax debts related to early retirees and taxable benefits enjoyed by former top executives. See More Details
The Impact of the Trade War
U.S. politics and the trade war that has emerged in recent months offer multiple trading opportunities, but there are 3 or 4 instruments that are highly relevant to traders. See More Details

3. When she goes to his page, she sees the portfolio shared new. Didem clicks to the see more details button to check portfolio.

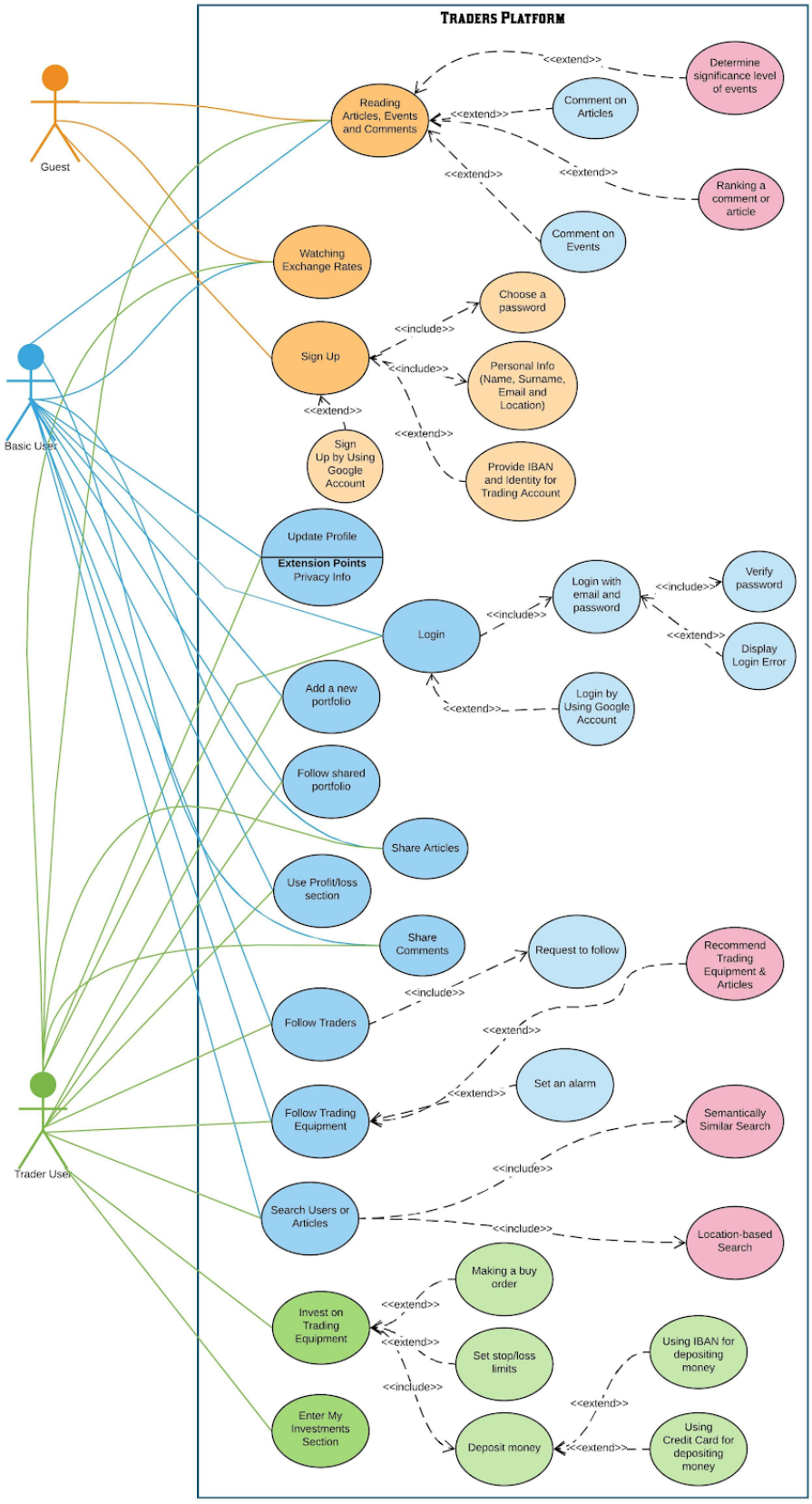


4. Portfolio page is on the screen. She inspects the portfolio and its comments. Then she decides to leave a comment also.

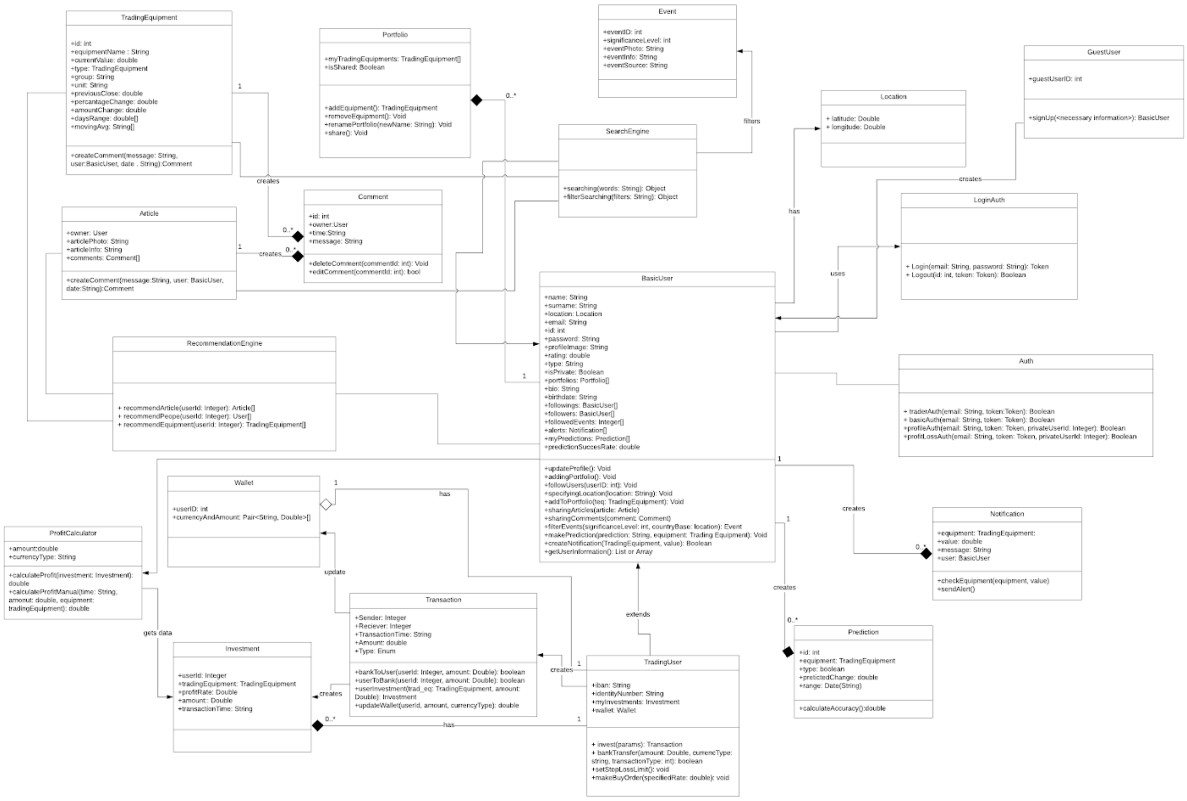


8 Software Design

8.1 Use Case Diagram

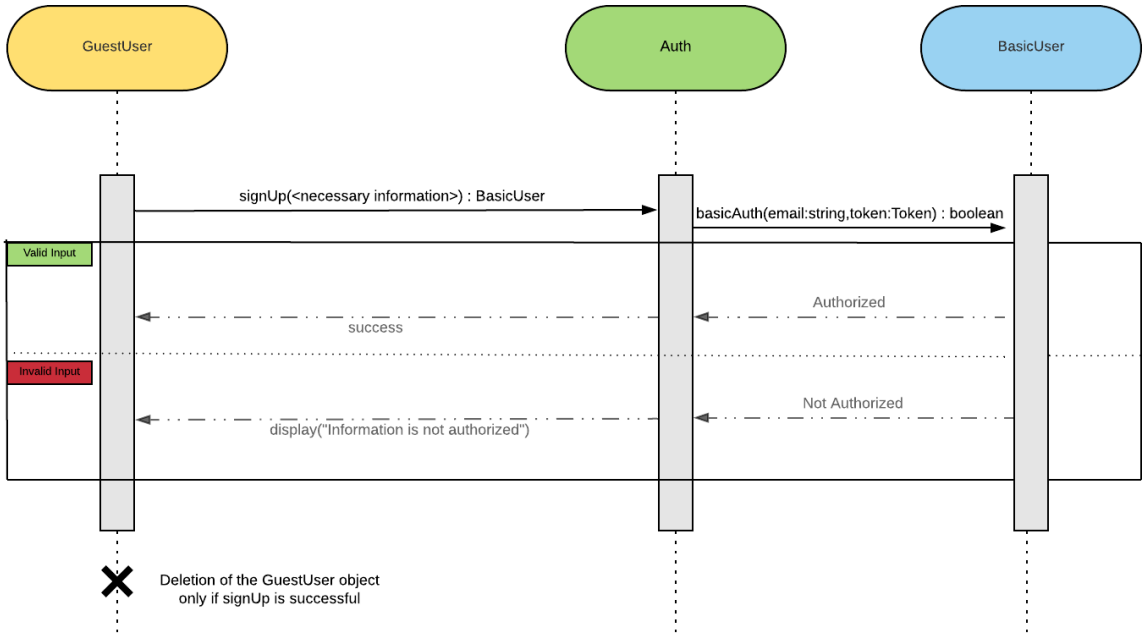


8.2 Class Diagram

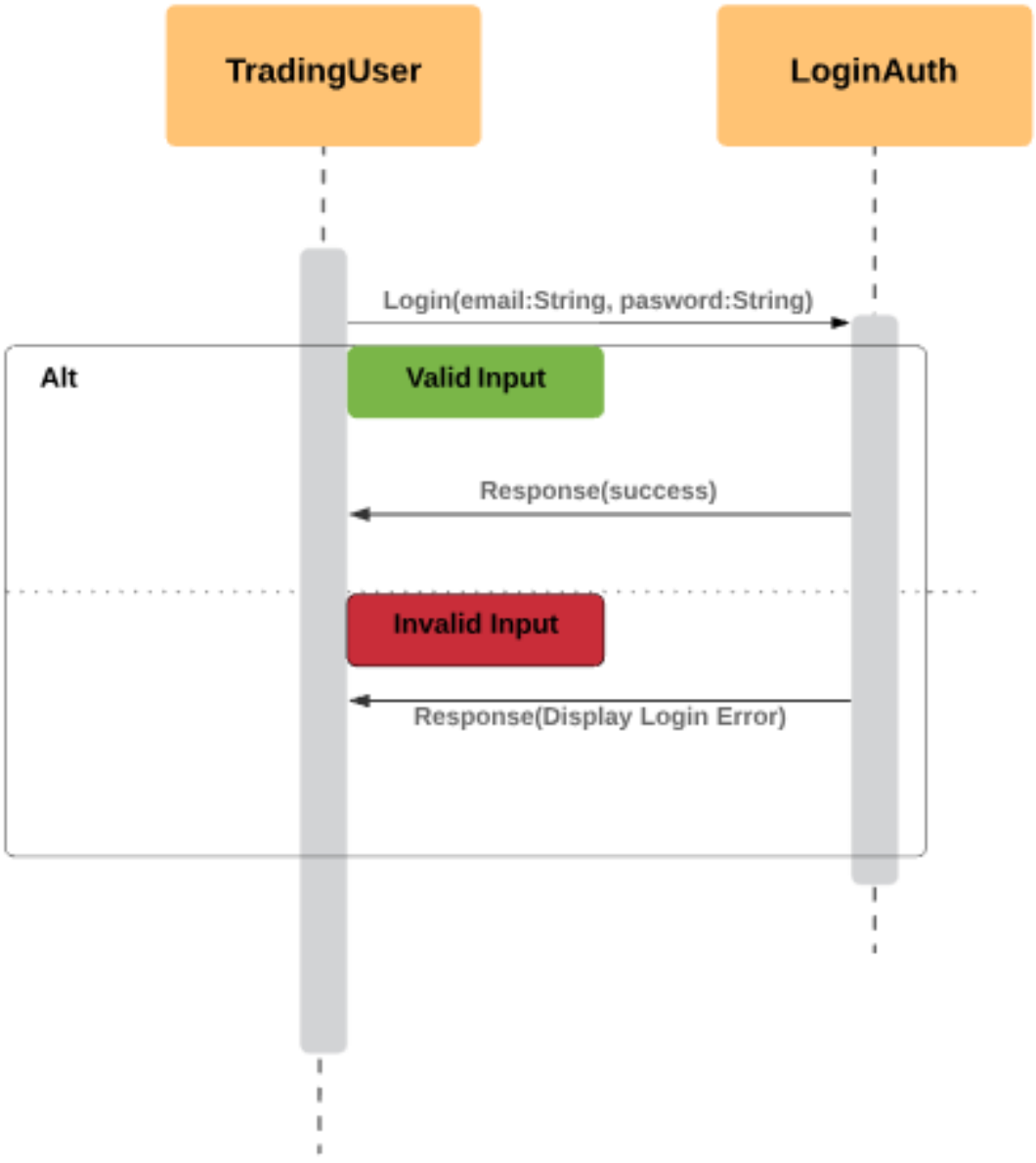


8.3 Sequence Diagrams

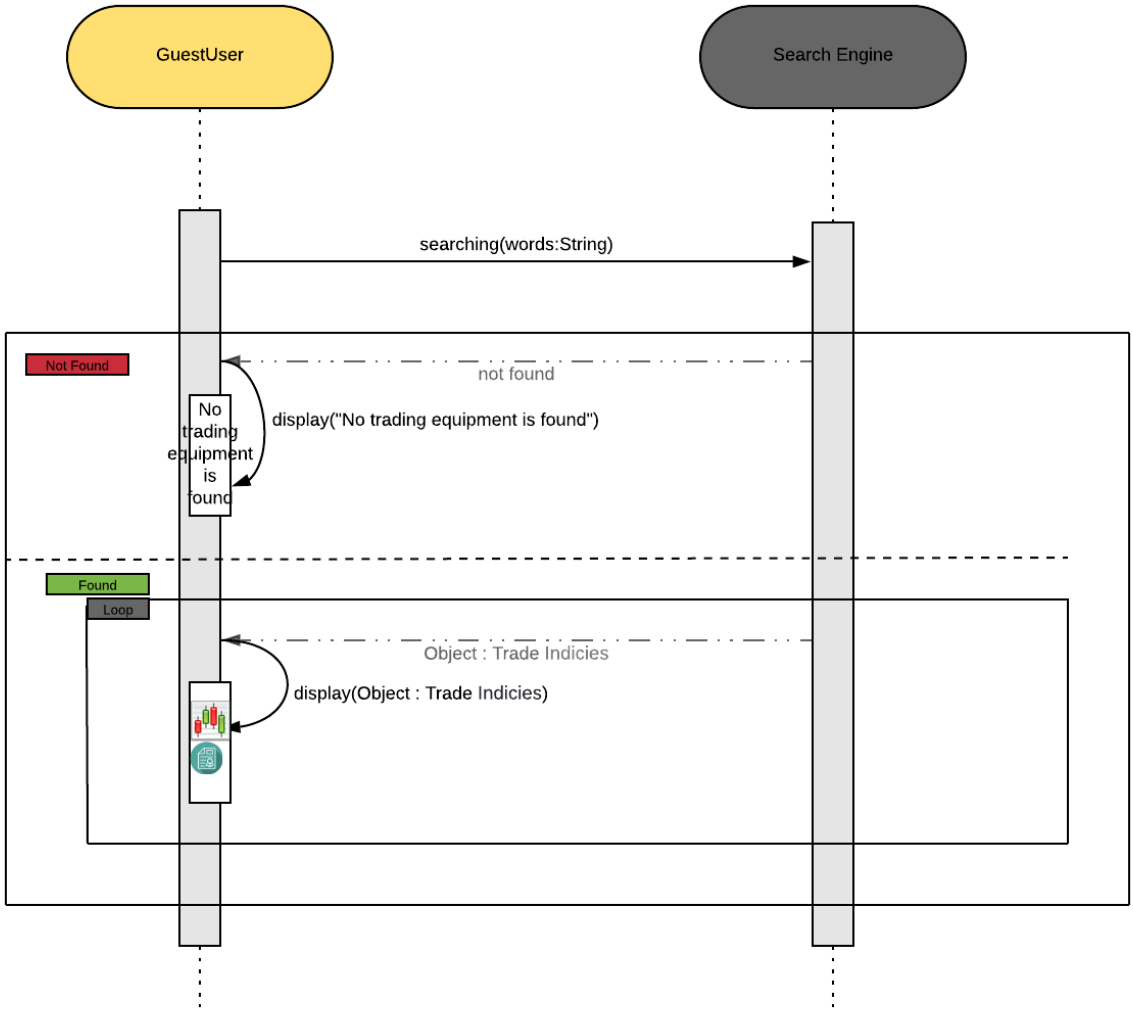
Sign up (Guest User, by using Google account)



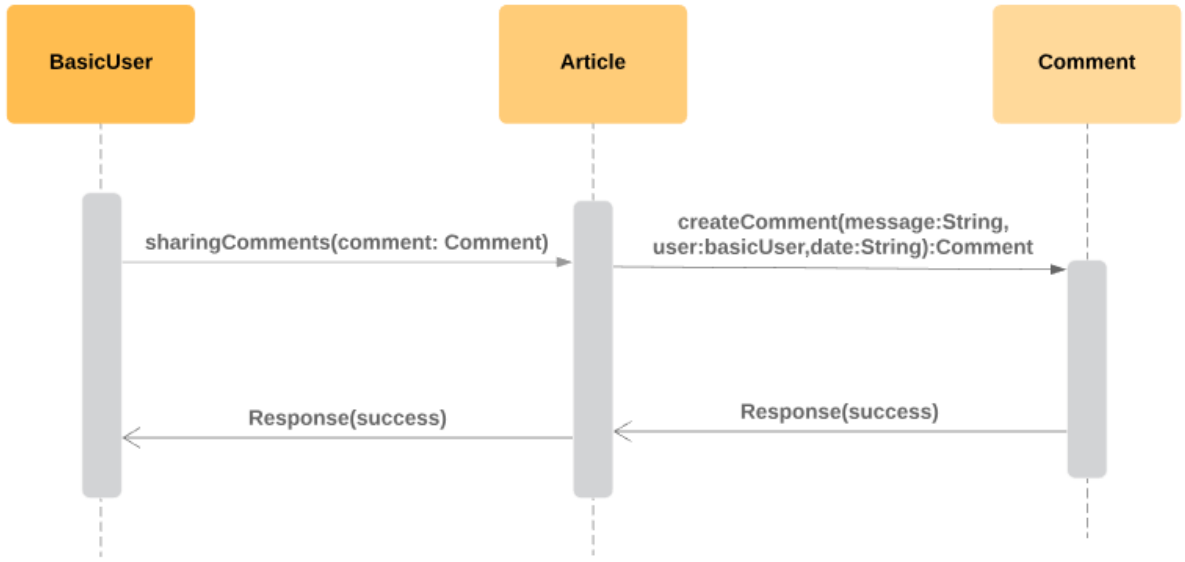
Login (Trader, by using email and password)



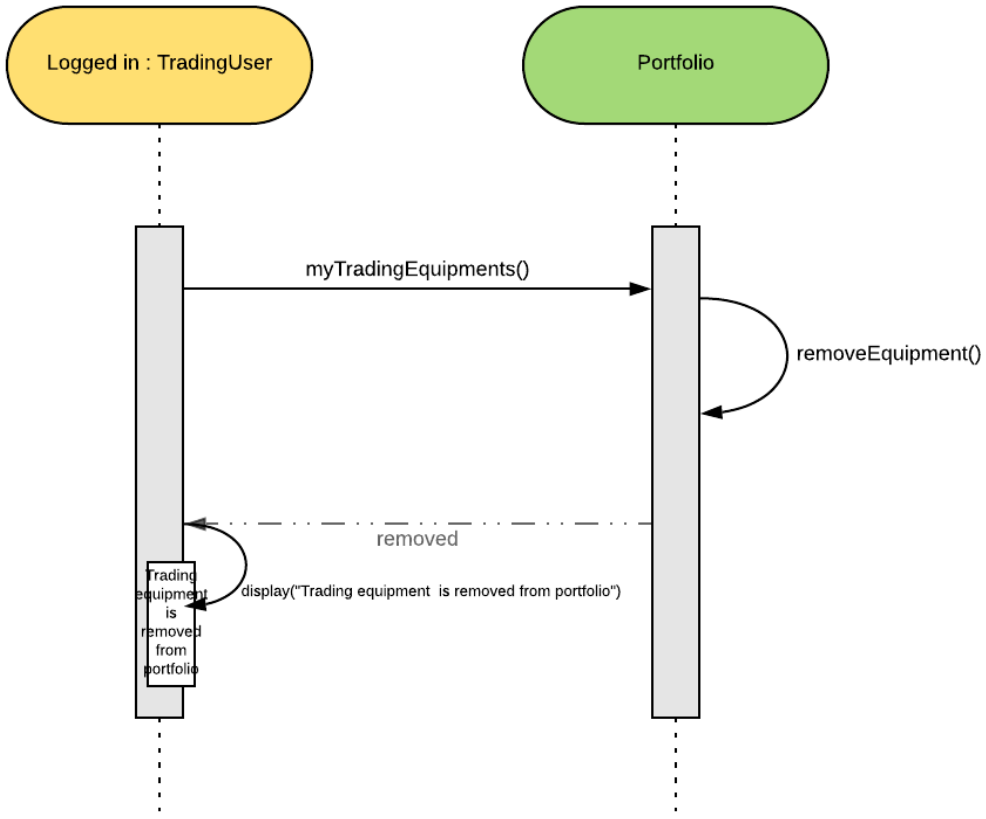
Search a Trading Equipment (Guest, Trade Indicies)



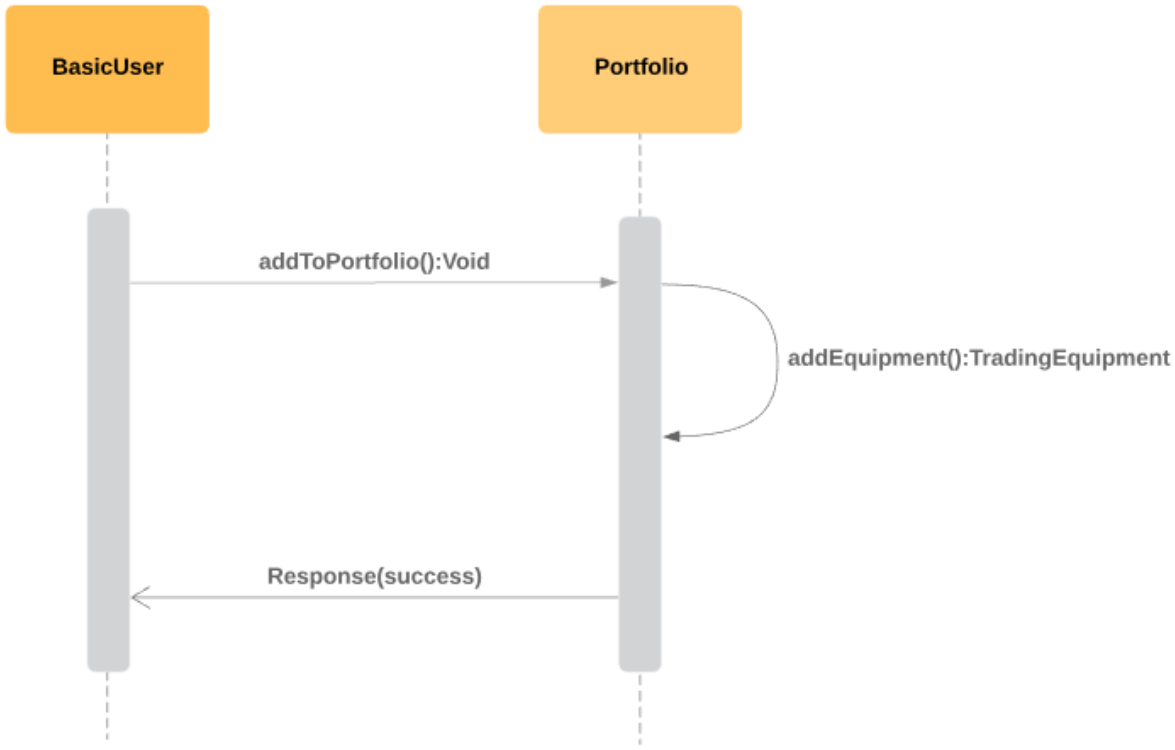
Create Comment to Article (Basic User)



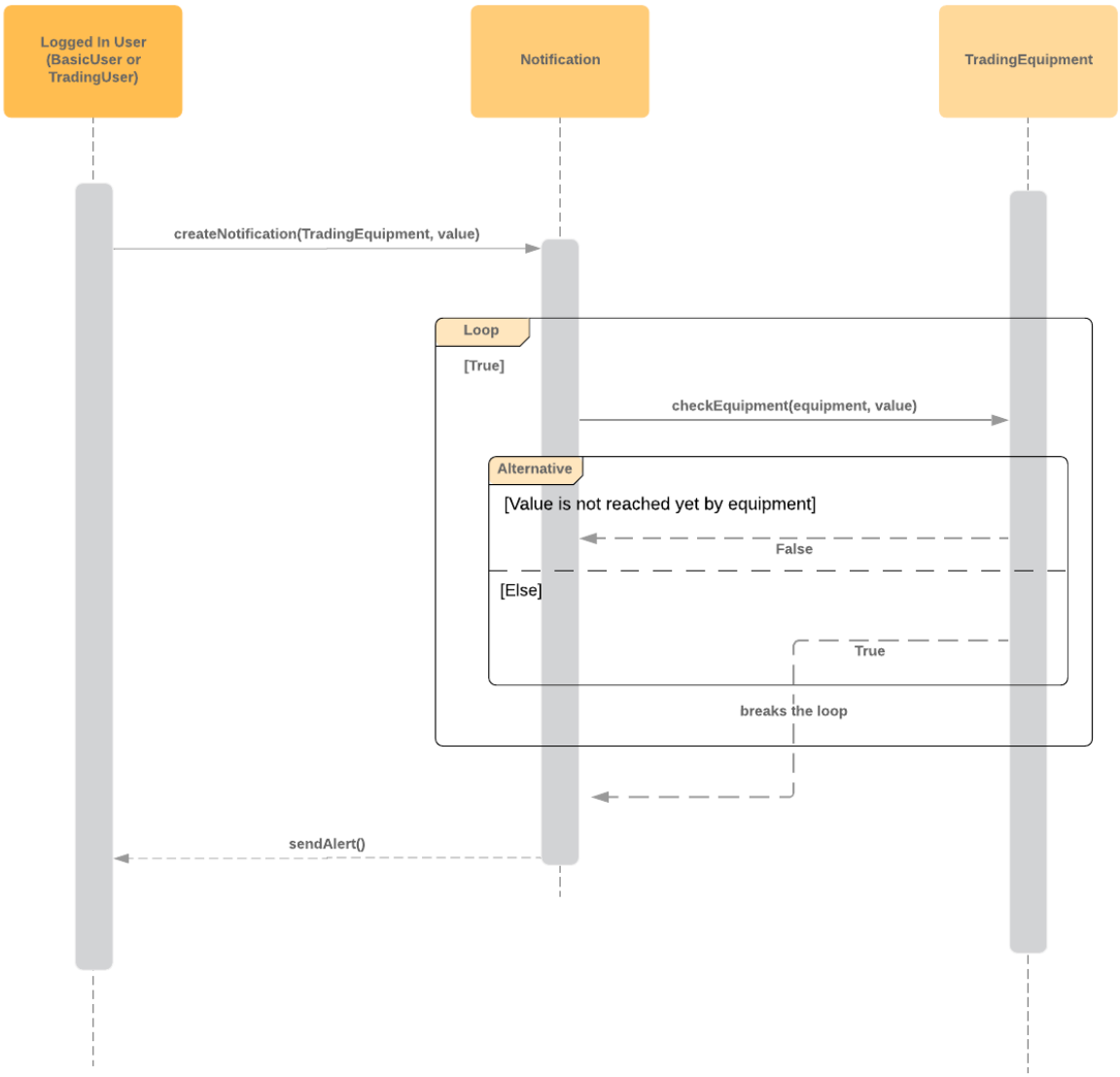
Remove Equipment from Portfolio (Trader)



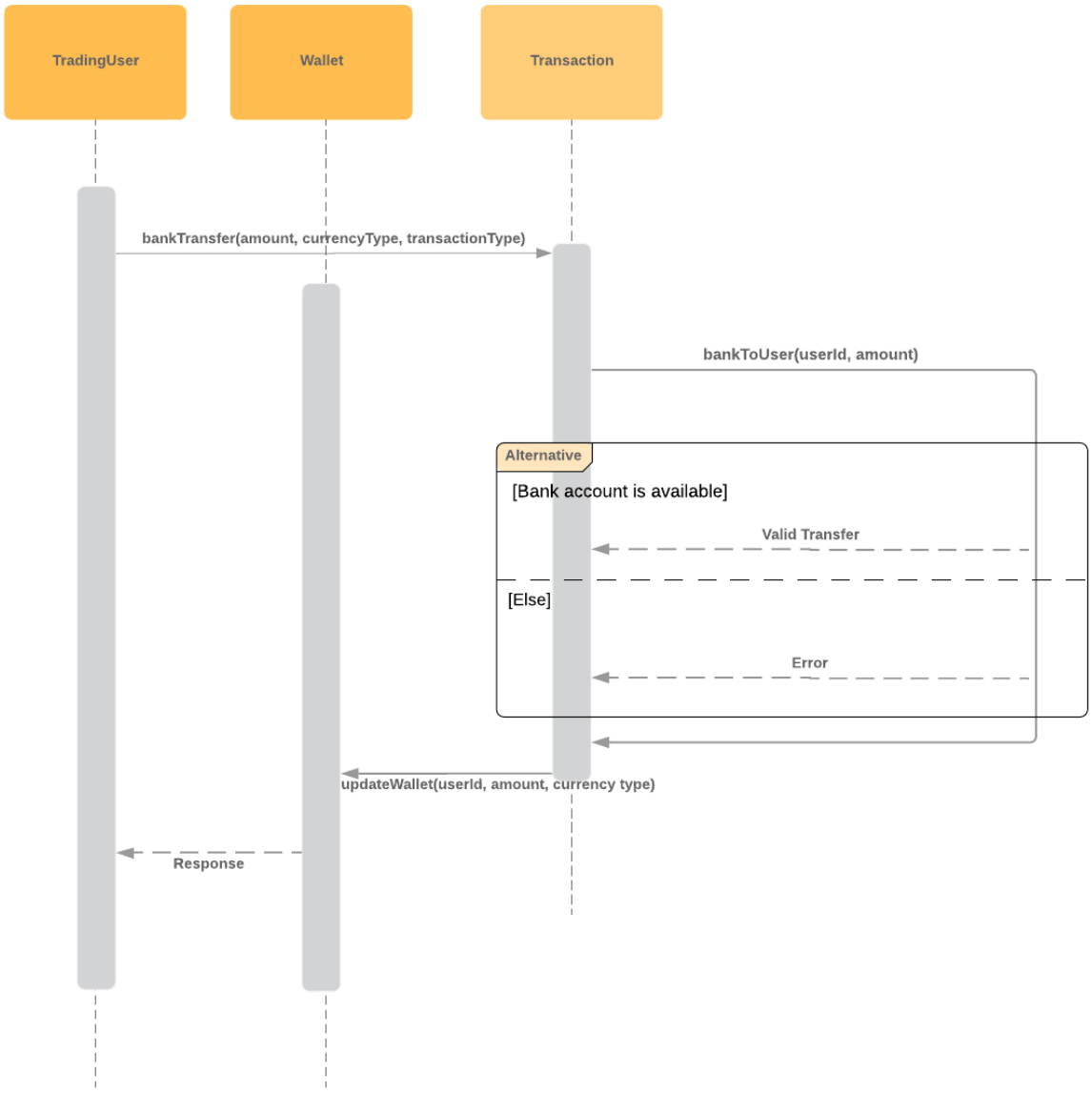
Add Equipment to Portfolio (Basic User)



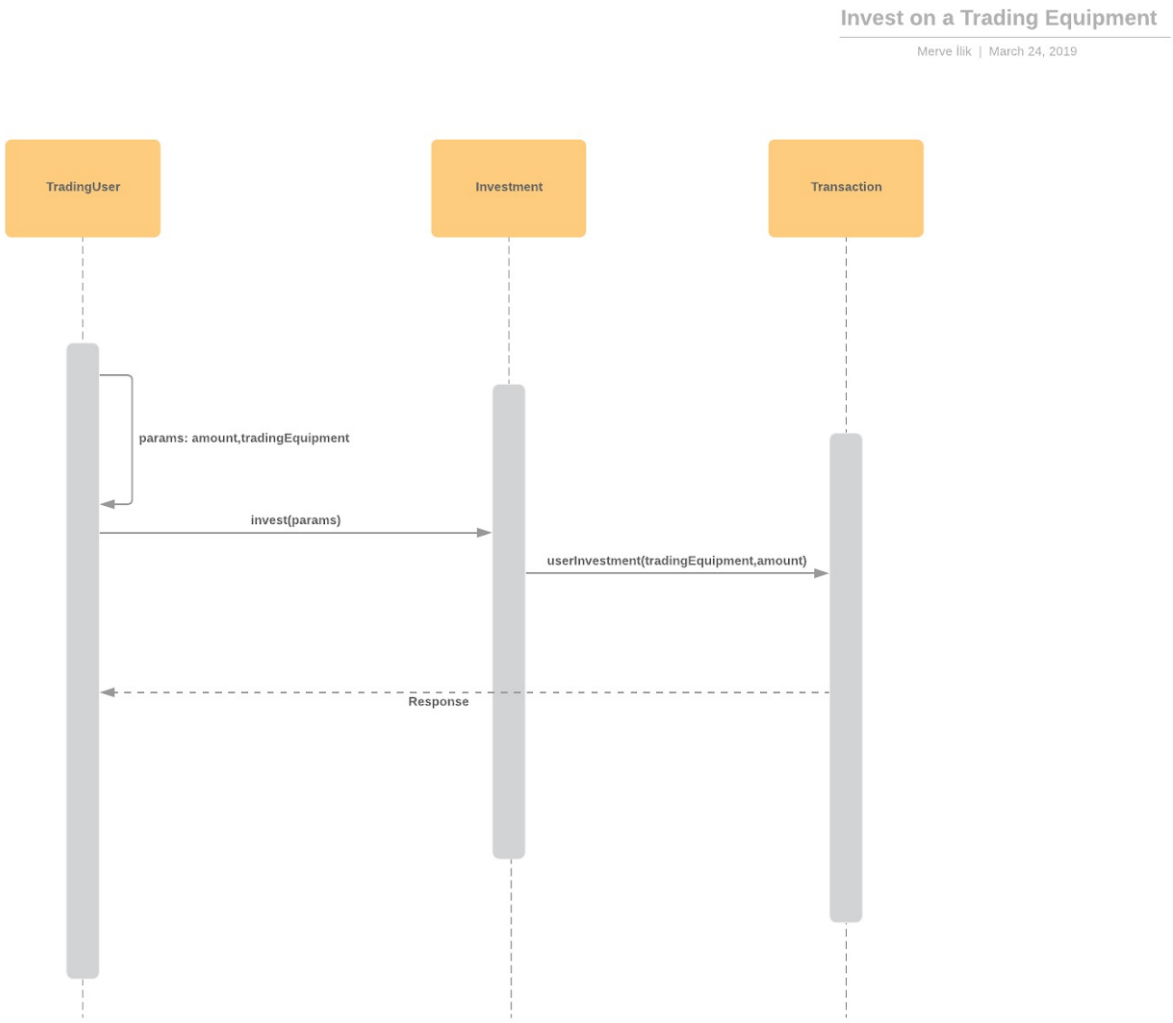
Create an Alert for a Trading Equipment (Trader)



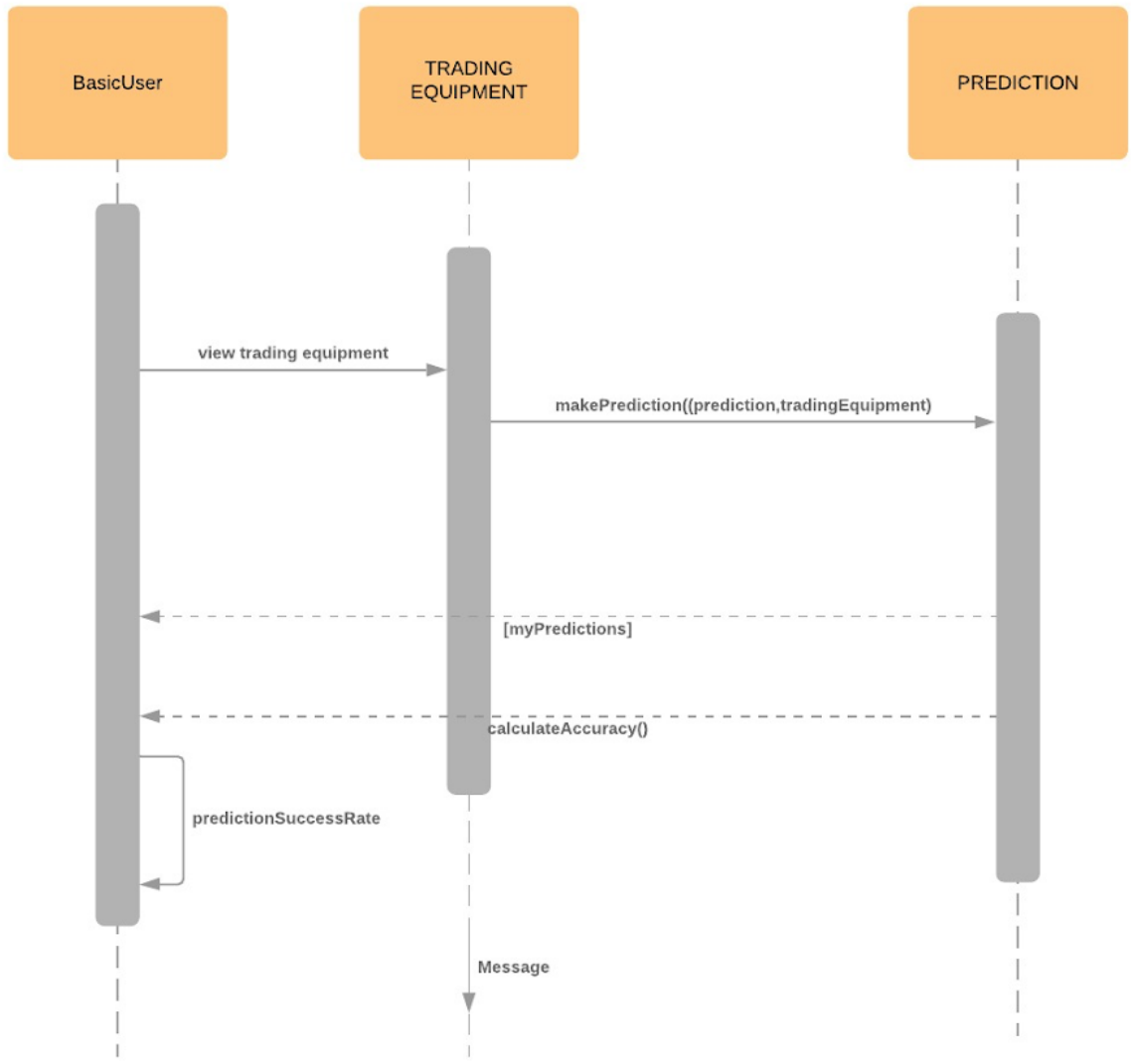
Transaction from Bank to User (System to Trader)



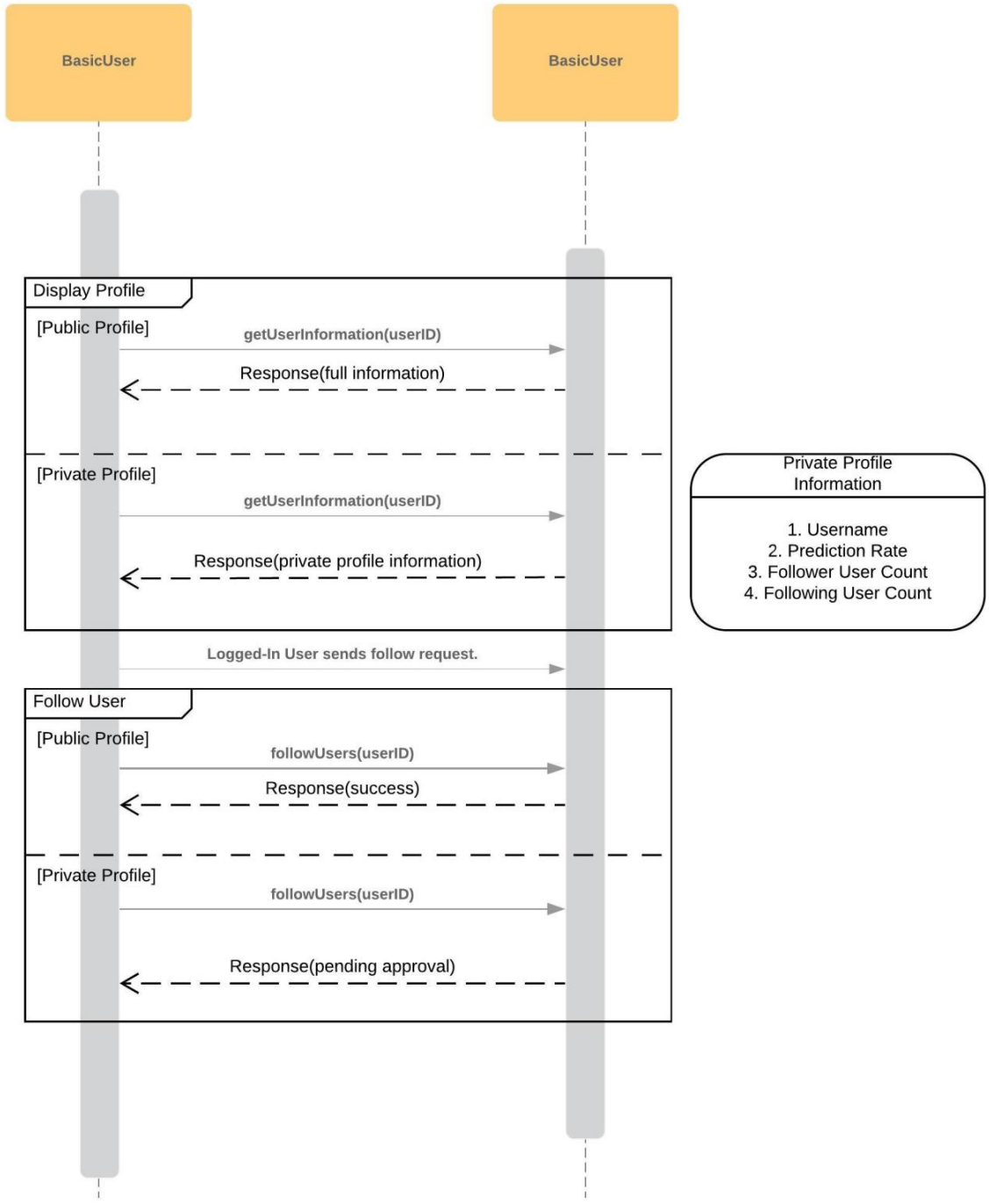
Invest to a Trading Equipment (Trader, Gold)



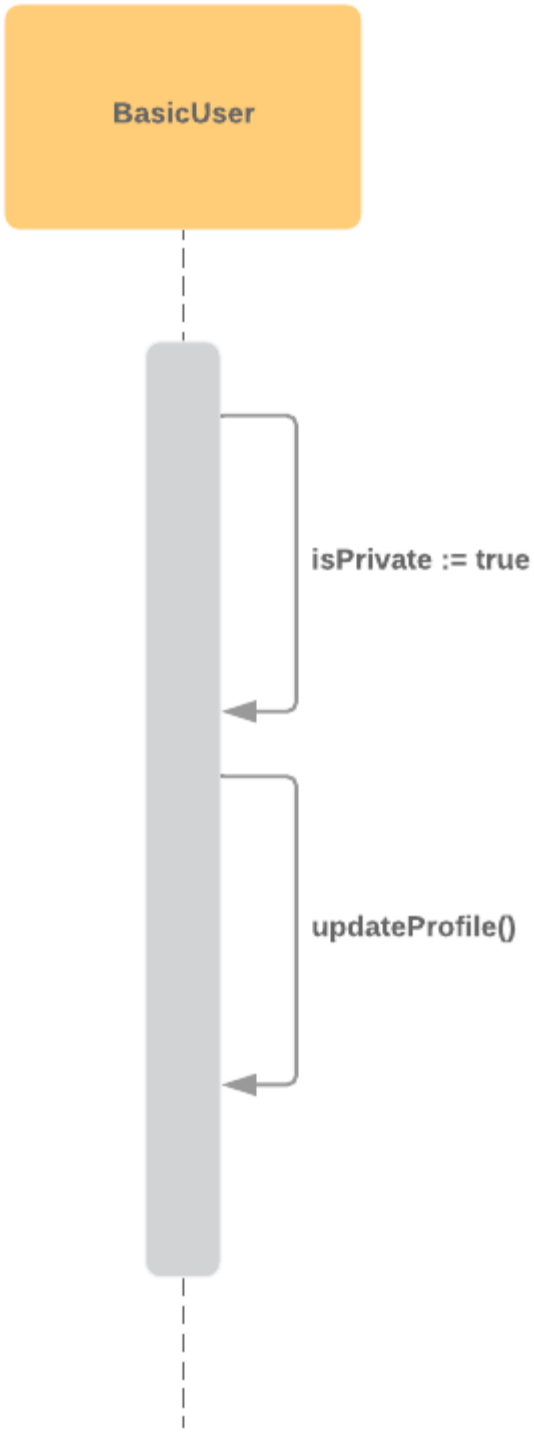
Predict on a Trading Equipment (System)



Follow a User (Trader)



Make a profile public to private



9 Researches

9.1 GitHub Tutorial

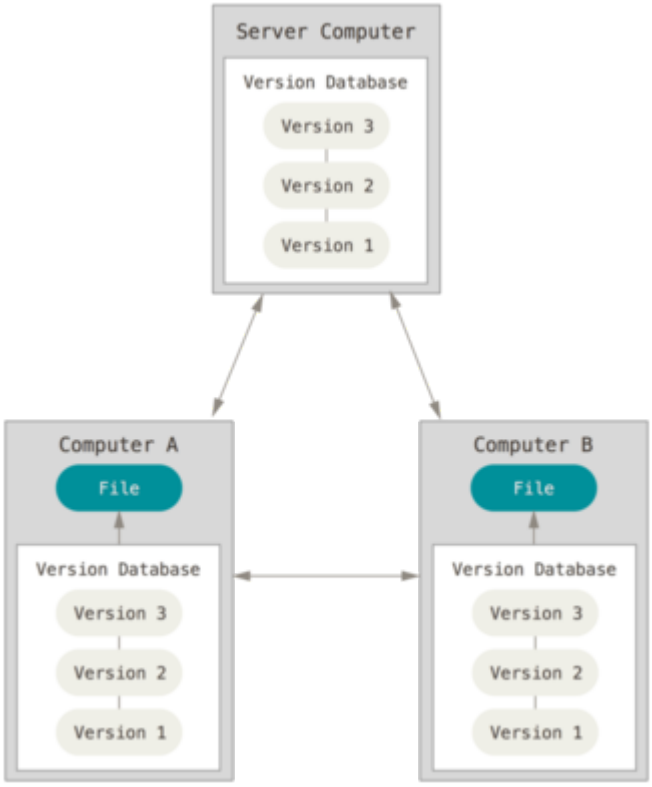
What is Git?

Git is a version control system. It is used for tracking changes in source code during software development and enables coordination between software developers.

What is Version Control System?

A version control system tracks the history of changes as people and teams collaborate on projects together. It records changes to a file or set of files over time so that developers can recall specific versions later. Developers can review project history to find out:

- Which changes were made?
- Who made the changes?
- When were the changes made?
- Why were changes needed?



Why is Git useful?

- If developers accidentally delete or change their code, using git can help them to get it back.
- Git lets developers share and exchange code with other developers easily.
- Git lets everybody track recent changes in a software project.
- Git lets developers backup their code easily to a remote server.

GitHub Terms:

Watch: GitHub has always made it easy to "watch" a project, which means you're notified whenever there are any updates.

Stars: Stars are a new way to keep track of repositories that you find interesting. When you star a project you can keep track of it, but you won't be notified of every change.

Fork: A fork is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project.

Pull requests: Pull requests let you tell others about changes you've pushed to a GitHub repository. Once a pull request is sent, interested parties can review the set of changes, discuss potential modifications, and even push follow-up commits if necessary.

Merge: Merging takes the changes from one branch (in the same repository or from a fork), and applies them into another.

Pull: Pull refers to when you are fetching in changes and merging them.

Branch: A branch is a parallel version of a repository. It is contained within the repository, but does not affect the primary or master branch allowing you to work freely without disrupting the "live" version. When you've made the changes you want to make, you can merge your branch back into the master branch to publish your changes.

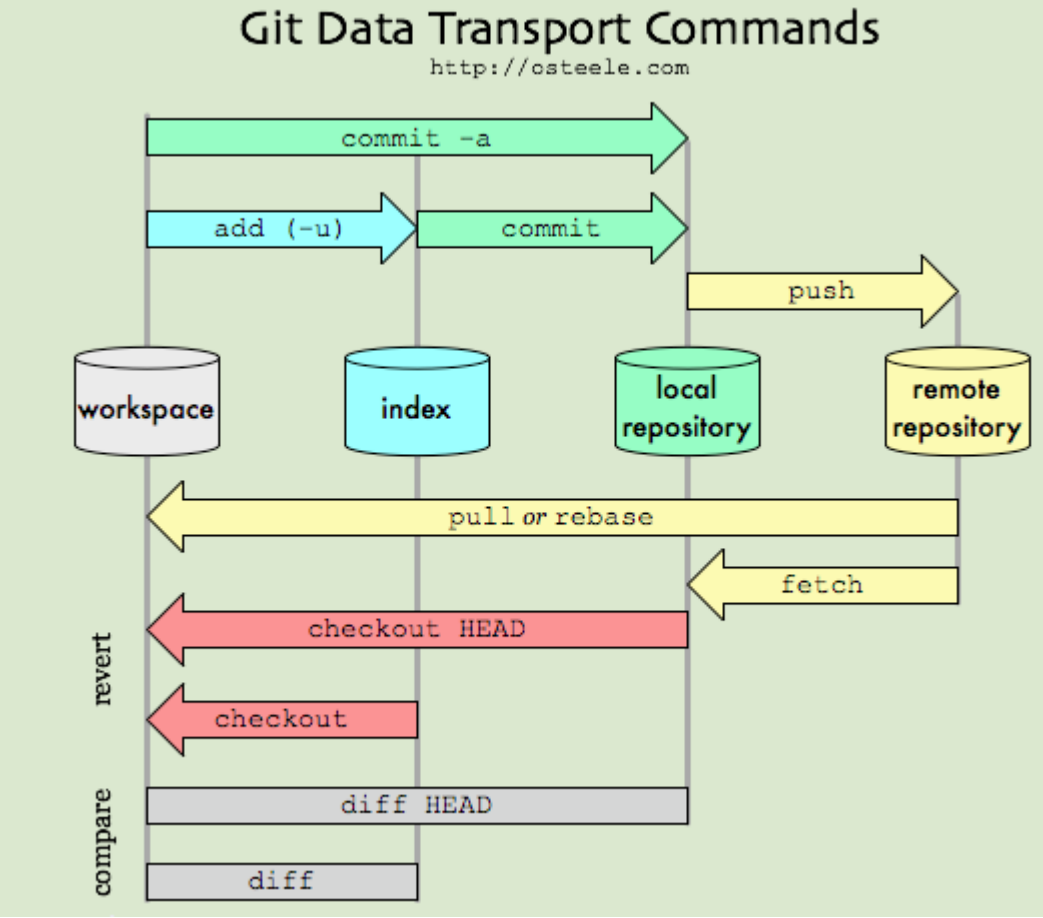
Commit: A commit, or "revision", is an individual change to a file (or set of files).

Fetch: Fetching refers to getting the latest changes from an online repository without merging them in.

Status and Status Check: A status is a type of status check on GitHub. Status checks are external processes, such as continuous integration builds, which run for each commit you make in a repository.

Some Common Git Commands

- git init [repo name] = This command creates new repo.
- git clone [url] = This command clones a repo from an URL into a local directory.
- git add [filename] = This command adds a file to the staging area.
- git commit -m "[message]" = This command records changes to the local repository.
- git pull = This command gets the changes from the remote repo and updates the local repo.
- git status = This command prints the files that can be committed.
- git merge [branch] = This command merges the specified branch into current branch.
- git push = This command sends changes of master branch to remote repo.



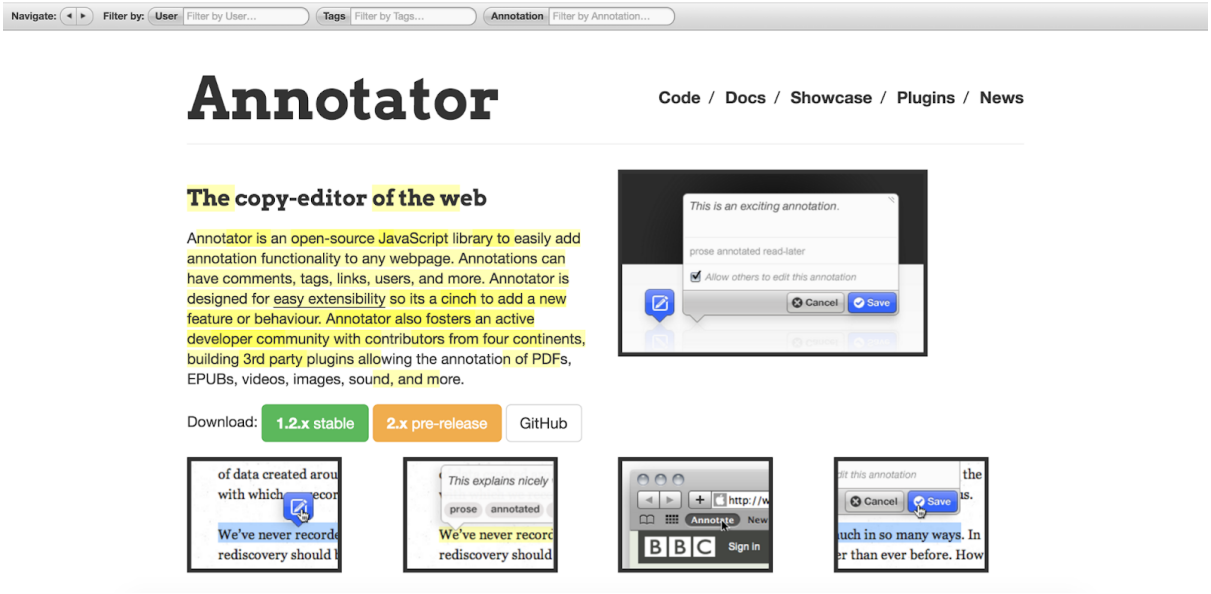
Resources:

1. http://blog.robertelder.org/what-is-git/
2. https://guides.github.com/introduction/git-handbook/
3. https://danielkummer.github.io/git-flow-cheatsheet/
4. https://www.edureka.co/blog/git-commands-with-example/#git%20init
5. https://help.github.com/articles/github-glossary/
6. https://services.github.com/on-demand/downloads/github-git-cheat-sheet.pdf
7. https://git-scm.com/book/en/v2/Getting-Started-About-Version-Control

9.2 W3C Web Annotation Protocol and Data Model

What is Annotation?

Annotation is a way to create associations between distinct pieces of information. Annotations are generally used to convey information about a resource or associations between resources. In traditional sense, it is a common practice among readers to highlight important sections of a text or to write comments in the margins of a book. These kind of annotations allows readers to express their opinions. In the context of the Web, a simple example of such an annotation would include a comment or a tag on a single web page, image or a blog post about a news article.

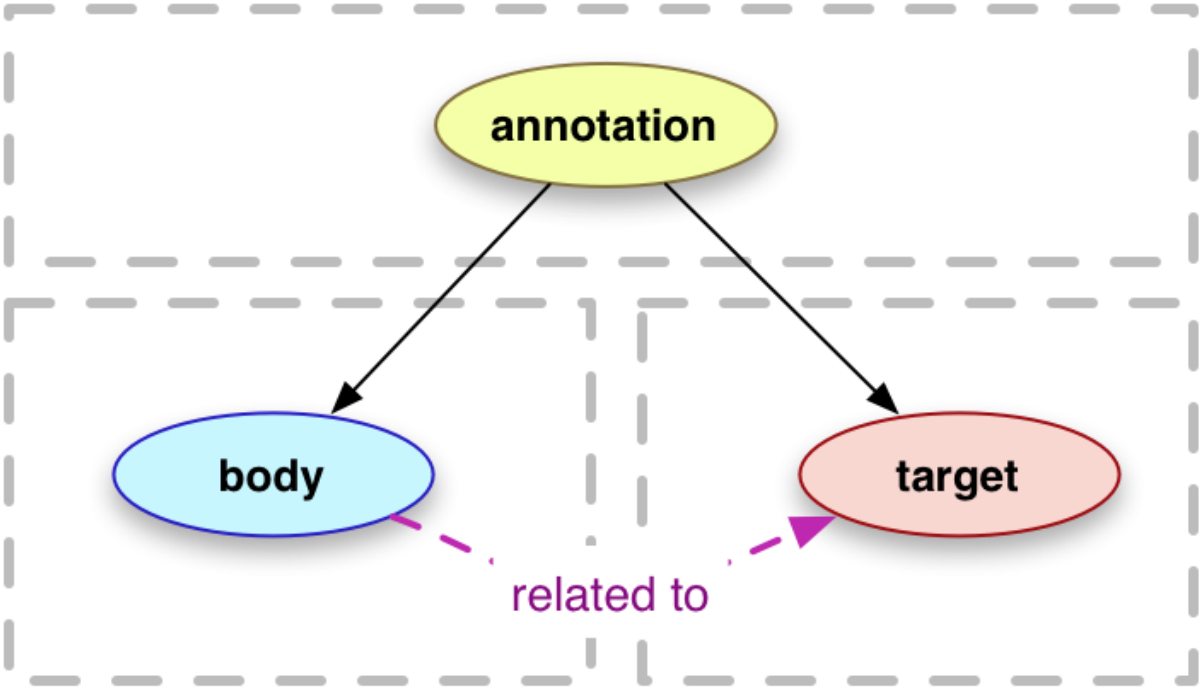


About W3C Web Annotation Protocol

Currently, most of popular websites or applications use different forms of annotations. For example, Twitter uses tagging and Facebook uses comments. PDF format allow users to highlight or add comment to existing texts. The problem with these examples is that they are not shareable. W3C Web Annotation Data Model and Protocol defines a framework to design shareable and expressive annotations to solve this problem. The Web Annotation Protocol gives a structured way of the transport mechanisms for formatting and managing annotations so that they are compatible with the Web Architecture. Web Annotation Protocol can be described simply as an HTTP API for publishing and distributing Web Annotation. The main purpose of this protocol is to define a standard that enables annotation clients and servers to operate smoothly. By being able to know this standardization and how to interact with it, annotations can be stored in any compatible system without being locked in a single remote system.

About W3C Web Annotation Data Model

Objective of the Web Annotation Data Model is to bring a general form to annotations in consistent with Web Annotation Protocol so that they can be interoperable. This model offers a data model, vocabulary, specification to organize and share annotations across different hardware and software platforms. An annotation in a digital content is a Web Resource. Typcically, it is a directed graph that creates associations among resources. Annotation has a Body field, which is a descriptive resource about the target and a single Target that the Body is somehow related to. Also annotation can have other properties such as motivation when annotating a target, creator,creation time of annotation etc. The specification of the model provides a specific JSON format for ease of creation and consumption of annotations based on the conceptual model that accommodates use cases.



Simple Use Cases of Web Annotation Data Model

Example 1: A Simple Page Annotation Model

Annotation:

```
{
 **"@context":** "http://www.w3.org/ns/anno.jsonld",
 "id": "http://example.org/anno1",
 "type": "Annotation",
 "body": "http://example.org/post1",
 "target": "http://example.com/page1"
}
```

Example 2: Mehmet wants to comment about a car picture that he found on internet

Annotation:

```
{
 "@context": "http://www.w3.org/ns/anno.jsonld",
 "id": "http://example.org/anno1",
 "type": "Annotation",
 “motivation”: “Commenting”,
 “creator” :{
     “id”: http://example.com/users/147 ,
     “type”: “Person”,
     “name”: “Mehmet” ,
     “nickname” : “Mehmet123456” ,
},
 “created”: “2019-02-24T21:00:00Z”
 "body":{
    “value”: “I love this car. “,
    “type”: “TextualBody”
},
 "http://example.com/post1",
 "target": {
    “id”: http://example.com/page1/x86knw4.jpg
    “type”:  “Image
 }
}
```

Example 3: Select a rectangular region of an image

Annotation:

```
{
 "@context": "http://www.w3.org/ns/anno.jsonld",
 "id": "http://example.org/anno4",
 "type": "Annotation",
 "body": "http://example.org/description1",
 "target": {
   "id": "http://example.com/image1#xywh=100,100,300,300",
   "type": "Image",
   "format": "image/jpeg"
 }
}
```

Resources

1. https://web.hypothes.is/blog/annotation-is-now-a-web-standard/
2. https://www.w3.org/TR/annotation-model/
3. https://devopedia.org/web-annotation
4. https://www.youtube.com/watch?v=m2cJNDs7y2Y
5. https://www.w3.org/TR/annotation-protocol/

9.3 Effort Estimation

What is Effort Estimation?

Effort estimation is the process of assigning an estimated amount of effort to tasks to be done in the development of a software product. It is important in order to help manage resources (time, money, people, etc.). Effort estimations are usually over-optimistic, therefore it is crucial to use a proper method to predict the effort.

Effort Estimation Methods

There are various methods used in effort estimation processes. A few of them are as follows:

Formulaic Effort Estimation Methods

A set of formulae is used to estimate the amount of effort.

Analogous Estimation

The estimated effort is calculated by comparing to past data on similar previous tasks. The relationship is usually linear and typically one dimensional. For example, if it takes 1 minute to write 10 lines of code, then a similar task that would require 30 lines of code should take 3 minutes.

Parametric Estimation

The estimated effort is calculated using various parameters. The relationship between the parameters and historical data is analyzed to come up with a formula. The formula can then be fine-tuned to match the development environment if need be.

Expert-Based Effort Estimation Methods

Knowledge and experience of experts (people who are knowledgeable about the task at hand) is used to estimate the amount of effort.

Affinity Grouping

Tasks are compared to other tasks available. They are then sorted or grouped together if they are different or similar respectively. In the end all tasks are sorted by effort in groups. For example, if there are 3 tasks considered so far, each having a different estimated effort, then the next task to be considered which is similar to another in sense of effort would be grouped together, creating different classes of effort.

Planning Poker

The effort is estimated by playing "planning poker". The Fibonacci sequence is used because of its exponential growth rate (to show how difficult it is to estimate tasks that would require more effort), though it is mostly simplified and rounded to an arbitrary number sequence. The estimated effort by each expert is revealed at the same time to avoid getting affected by the opinions of others. If all values revealed are not the same, highest and lowest estimates explain their reasoning and this process repeats until the values become one.

Conclusion

Since we do not have much historical data, I believe we should use an expert-based effort estimation method, specifically affinity grouping since we have numerous tasks available at a given time, and then estimate the effort of tasks as groups using the Fibonacci sequence to utilize both methods at once.

Resources

1. http://www.acqnotes.com/Attachments/GAO%20Cost%20Estimating%20Guide%2009.pdf
2. https://www.pmi.org/learning/library/agile-project-estimation-techniques-6110

9.4 Tracking Issues and Review Mechanism

In order to track issues, we will use project boards of GitHub. Project boards help you to organize and prioritize your work.

For more information about project boards:
https://help.github.com/en/articles/about-project-boards

Our project board "Traders Platform" consist of 4 columns: To Do, In Progress, Needs Review, Done.

Routine usage of our project board is explained below;

1. After issues are created by the moderator of the week, she will add the cards of issues to the "To Do" column.
2. Assignee of the issue will move the card to the In Progress column and label it with In Progress label when she starts to work on the issue.
3. Assignee of the issue will move the card to the Needs Review column and label it with Needs Review label when she completes to work on the issue. Also she will notify the group members that she needs a review and will give a deadline for reviews by using slack.
4. Needs Review column should be checked by group members regularly in order to contribute to the refinement of the work. Discussions and suggestions will be made by writing comments to the issue.
5. When the deadline for the reviews passed, the issue card will be moved to Done section by assignee.
6. Moderator of the week will track the usage of board and remind the assignees if needed.
7. A reviewer, who has participated in PS, will be selected weekly and responsible for general review.