

CMPE 451

FINAL

MILESTONE

PROJECT DEVELOPMENT IN SOFTWARE ENGINEERING

CMPE 451

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Suzan Üsküdarlı

eyeTrade Trading Platform

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1. Final Project Assessment

Project management is an essential process for a software development team to be efficient and to satisfy the requirements of the customer. For this purpose, throughout our implementation process, we tried to establish a healthy communication within our team and with our customer so that we assure that we are on the same page with the customer while developing a new feature. Also, we have made regular meetings almost every week with participation of sub-teams to decide which functionalities will be implemented and which parts need to be updated by that as a team we stayed synchronized. So, in terms of communication we did a good job. During the project management, planning both short and long terms is also crucial. Our short term planning strategy including weekly decisions of which functionalities should be implemented, was adequate. But to achieve long term goals, planning future in a more organized way is necessary. During this project, we learned how to initialize short term and long term goals and keep track of the work done to achieve these goals. All in all, it was a nice experience to work with a real team that has lots of members with different backgrounds and a customer that has real requirements. We had a chance to see how a software development team should be organized, how different parties should operate so that a mutual work can be done, how the software management tools should be used to keep track of the development process and how the relations between the team and the customer should be established so that the requirements are satisfied.

1.1. Summary Subpart for Backend

- **Articles:** We developed a backend module for articles. The users are able to create, delete, update, and retrieve articles. Also they can list the articles or top articles of themselves or another user. Furthermore, they can give a rating to an article.
- **Comments:** We developed a backend module for comments. The users are able to post comments to an article or event. Also, they can retrieve the comments of a user or themselves.
- **Currencies:** We extended the currencies module. Now, the users are able to retrieve the currency rates of the last day, or last x days, or a day interval.

- **Events:** We developed a backend module for events. The users are able to get the events which are taken from an external api. Also, they can get the full details of an event and give a rating to an event.
- **Main Page Feed:** We developed a backend module for main page feeds. The users can retrieve the suggested users, articles, events, and portfolios in their main page.
- **Notifications:** We developed a backend module for notifications. When a user follows another user, a notification is created automatically. Users are able to retrieve their notifications and can mark or delete them if they want.
- **Portfolios:** We developed a backend module for portfolios. The users are able to create portfolios as much as they want and put the currencies which they are interested in to those portfolios. Also, a user is able to retrieve all of the currency pair rates that can be generated from a specific portfolio.
- **Transactions and Exchanges:** We developed a backend module for transactions and exchanges. The users are able to buy a currency and exchange between currencies.
- **User Account:** We developed account mechanism of users. Thanks to these accounts they can see their transactions and fund status. They can operate transactions and exchanges and tracks their footprints.
- **User Following:** We developed a backend module for user following. The users are able to follow each other. Also, the users can monitor their or another user's follower and following lists and counts. However, we should add unfollowing user feature.
- **User Profiles:** We developed a backend module for user profiles. The users are able to monitor their their information and update them if they want. Also, they can see the profiles of the other users in a limited manner if those profiles are public. Moreover, they can update their private/public status easily.
- **Annotations:** We developed a backend module for annotations. Users can annotate the articles and events so that they and the other users can see those annotations later.
- **Buy sell orders:** We developed a backend module for buy/sell orders. Users can set orders to buy or sell some trading equipment under some conditions. For example, a user can set an order to buy 1000 dollars using Turkish Liras when USD/TRY becomes smaller than 5.
- **Crypto Currencies:** We developed a backend module for crypto currencies. Users can also do transactions with crypto currencies. Then, integrated that module to our currency module.

- **Predictions:** We developed a backend module for predictions. Users can set predictions for a specific date with a rate interval. Also, the success rate is stored with a user so that they can see their success/fail statistics later.
- **Search:** We developed a backend module for search. Users can search in the articles and events with a word so that they can retrieve the related ones. Also, we have an advanced search option that the users can search for a content with writer email or name/surname. Furthermore, the users can also search for the other users with name, surname, city, country, email, etc.

1.2. Summary Subpart for Android

- **Google Maps implementation:** We implemented Google Maps feature. Now users are able to set their location via Google Maps. This feature will be used to implement location based search in the future.
- **Events and Articles Page:** We began to use real data for events and articles. Writing an article and score them are also available now.
- **Profile Page:** We implemented profile page for users, showing their name, followers and followings.
- **Follow:** We implemented following feature. Users now can follow each other.
- **Update Profile:** We implemented update profile feature as well. Users can change their personal information.
- **Currency Charts:** We implemented “Currencies” page shows a parity chart between selected two parity. To chose the same currencies is not possible.

1.3. Summary Subpart for Frontend

- **Articles:** Article related operations are implemented on the web including creating, modifying, deleting and rating an article. Also, a user is able to sort articles of himself or other users based on the rate of the article. Precision of the rating system is fixed according to customer feedback and profile page routing is added so that author profile page can be viewed via an article.

- **Currencies:** Users are able to view the daily and weekly progress of parity with a currency chart.
- **Events:** Economic events page which is drafted in first milestone is improved and reformatted to a table view. Now, users are able to see live economic events with time and significance information.
- **Main Page Feed:** A home page feed is implemented which consists of information of important currencies, major economic events and suggested articles.
- **Notifications:** Notification functionality is implemented. Now, users are able to see a notification on the top right side of the web page when another user followed or unfollowed them.
- **Portfolios:** Users are able to create a new portfolio, add a trading equipment to their portfolios and view their portfolios by using portfolio page. Portfolio feature is updated according to customer feedback such that users are now able to add parities to their portfolios and delete a trading equipment from the portfolio or delete entire portfolio.
- **User Following/Unfollowing:** A user is now able to follow or unfollow other users and see the followers/followings list of any users who have a public profile.
- **User Profiles:** Users can view their profile page as well as other users' profile pages. In profile page, a user is able to view his articles, create a new article, see his portfolios and update profile information. Also, users may switch their accounts to public or private and update their information.
- **Comments:** Comment feature is implemented for articles. Users are able to make a comment to an article or delete their comments. Also owners' profile page can be accessed via comments.
- **Predictions:** Prediction feature is implemented so that a user can make a new prediction for a currency rate and see his or other users' future/successful/failed predictions.
- **Search:** Search functionality is implemented such that users are able to search for other users, events or articles by providing a keyword.
- **Crypto Currencies:** Currencies page is updated with the addition of cryptocurrencies so that users are able to make conversion between any currency including crypto currencies.
- **User Account/Transactions/Exchanges:** For trading users, a user account can be created now. Also, users are able to load money to their accounts using credit cards and make transactions including buy and sell between any currencies.

- **Logout:** Users may log out from their account by using logout button.

2. List and Status of Deliverables

2.1. Web:

- Homepage: Works fine.
- Login/Sign-up/Logout: Works fine except login/sign-up with Google option is not functional.
- Currency Page: Works fine.
- Events Page: Works fine.
- Currency Chart: Just available for USD-TRY for last 7 days.
- Profile Page: Works fine.
- Portfolio Page: Works fine.
- Article Page: Works fine.
- Homepage: Works fine.
- Notifications: Works fine.
- Search: Works fine.
- Annotations: Missing.
- Predictions: Works fine.
- Follow/Unfollow User: Works fine.
- Investments: Works fine.
- Advanced Search: Missing.
- Set Buy-Sell-Exchange Order: Missing.

2.2. Mobile(Android):

- Homepage: Works fine.
- Login/Sign-up: Works fine.
- Currency Page: Works fine.
- Events Page: Works fine.
- Currency Chart: Works fine.
- Profile Page: Works fine.
- Profile Update: Works fine.
- Following Users: Works fine.

- Article Page: Works fine.
- Article Creation: Works fine.
- Rating Articles: Works fine.
- Annotations: Works fine.
- Investments: Works fine.
- Predictions: Missing.
- Search: Missing.
- Set Buy-Sell-Exchange Order: Missing.

2.3. Backend:

- Registration: Works fine.
- Authentication: Works fine.
- Login: Works fine.
- Privacy of Users: Works fine.
- Password Reset: Works fine.
- Currency Converter: Works fine.
- Currency Recorder: Works fine
- Currency Rates Between Specific Dates: Works fine
- Email confirmation: Works fine.
- Events: Works fine.
- Comments on Events: Works fine.
- Profile: Works fine.
- Article: Works fine.
- Comments on Articles: Works fine.
- Rating Articles and Comments: Works fine.
- Following User: Works fine
- Following Currency: Works fine.
- Portfolio Creation: Works fine.
- Homepage: Works fine.
- Trading User Account: Works fine
- Trading on Currencies: Works fine.
- Trading on CryptoCurrencies: Works fine.
- Basic search: Works fine.
- Advanced Search: Works fine.

- Annotations: Works fine.
- Predictions: Works fine.
- Set Buy Order: Works fine.
- Set Sell Order: Works fine.
- Set Exchange Order: Works fine.

3. Evaluation of the Status of Deliverables and Its Impact on Plan:

3.1. Milestone Report 1

- **Homepage**

We now have a basic home feed that shows suggested articles, events and users for users to get engaged more easily. Delivering curated content like this makes for a more personal and satisfying experience.

- **Login/Sign Up**

Users can now choose their locations on a map and this information is stored on the database and not shared with anyone except the user themselves (privacy concerns). This data will be used to suggest users close to each other in the future.

- **Currency**

We have added more currencies and parities. Users can now view a plot of the parity they select in the last few days. We record the rates each day and we can access any rate data between two dates.

- **Events/Articles**

Events are now pulled from an RSS feed and displayed to the user. Users can now create articles and rate them out of 5. The ratings are displayed next to the articles. Some suggested events and articles are sent in the home feed to create a faster way for the user to digest the content.

- **Email Confirmation**

Not confirming one's email does not limit access right now. No significant progress is made.

- **Password Reset**

No significant progress is made.

3.2. Milestone Report 2

- **Profile**

Users can view their own and each other's profiles. They can follow other users and see who follows them. Articles written by a user can also be accessed from their profile. A user's profile will not be displayed if that user's profile is private, unless someone follows them and they accept the follow request

- **Portfolio**

We have implemented the portfolio feature for the web. Users can create new portfolios and add their desired parities in order to easily follow them without having to go through each of them every single time.

- **Notifications**

A list of notifications is generated as the user receives followers. Then the notifications are displayed to the user when they use the application. This lets the user receive feedback and see if their articles are generating enough buzz and gauge the interest of people in their articles.

3.3. Final Report

- **Trading/Funds**

Trader Users can set up a trading account and buy/sell/exchange funds on their accounts. The credit card and bank info entered are not processed but the system can be connected to a bank and retrieve actual money in the future.

- **Search**

Users can now search for specific words and find relevant articles. Advanced search is only implemented on the backend for now but standard search implemented on the web interface meets the immediate needs.

- **Prediction**

It is possible to predict the range of an asset on a given date. This appears on a user's profile as their prediction rate as a measure of their success. Other users can view this value and use it to decide if they will follow the said user.

- **Comments**

Users can leave comments on articles and express their thoughts, letting the author know their opinions and engage in conversation with other users.

- **Annotations**

Users can highlight a specific piece of an article and annotate that part of the text. This enables the users to comment on specific parts of the text, as opposed to a simple comment.

4. Work Done by Each Member

Oğuzhan Kırlar	<ul style="list-style-type: none"> • Advanced search in backend is implemented (with Emir). • CryptoCurrencies are injected to Currencies in backend (with Emir). • Error codes are fixed. • Comment mechanism is updated. • Reviewed codes in pull requests for backend. • Bug fixed
Alican Şafak Özdek	<ul style="list-style-type: none"> • Reviewed codes in pull requests for web. • Conducted research on annotations. • Implemented search part in web. • Added cryptocurrencies to currency converter in web. • Added readme file for web. • UI design improved for web. • A few bug/error fixed in web (comments, ratings, code structure etc.). • Deployed web server on AWS.
Anıl Can Kara	<ul style="list-style-type: none"> • Annotations (addition, deletion) on Android • Comments (addition, deletion, update) on Android • Cryptocurrencies on Android • Profile privacy on Android • Unfollow on Android • Bug fixes regarding following feature on Android

	<ul style="list-style-type: none"> • Unit tests on Android • User interface improvements on Android • User experience improvements regarding navigation and plots on Android • Code review on other pull requests
Merve İlik	<ul style="list-style-type: none"> • Initialize portfolios page on Android • New follower notification on Android • Design notifications page on Android • Delete notifications function • Bug fixes • UI improvements
M.Emir Gökdemir	<ul style="list-style-type: none"> • Basic search in backend implemented • Advanced search in backend is implemented (with Oğuzhan) • Annotation of events in backend is implemented • Annotation of articles in backend is implemented • Delete option of comment and edition of comments in backend are implemented • CryptoCurrencies are injected to Currencies in backend (with Oğuzhan) • Exception codes and messages are edited.. • Set buy/sell order in backend is implemented • Set exchange order in backend is implemented • User Resources are edited for using in frontend • Comment mechanism is updated. • Test endpoint for events is created • Test endpoint for currencies is implemented • Fund give back to user mechanism is implemented in backend side. • Unit tests on Backend • Deployed the backend application to AWS, once a week on average.

Alihan Çelikcan	<ul style="list-style-type: none"> • Implemented viewing all funds on Android • Implemented adding, withdrawing and exchanging funds on Android • Evaluation of the status of deliverables on final milestone report
Seyfi Kutay Kılıç	<ul style="list-style-type: none"> • Developed the features related with cryptocurrencies such as conversion, retrieval, and statistics of cryptocurrencies. • Implemented unfollowing user and unfollowing currency functionalities. • Implemented removal of articles and portfolios. • Updated the portfolio feature so that they store ordered pairs of currencies rather than single currencies. • Developed prediction feature. • Integrated prediction statistics to user resources so that frontend can also retrieve those information. • Deployed the backend application to AWS, once a week on average.
Kemal Duru	<ul style="list-style-type: none"> • Implementation of comment feature on web with additional routings. • Portfolio feature is updated on web such that users are able to add parities and delete parities from the portfolio or delete whole portfolio. • Follow and unfollow features are implemented on frontend. • Prediction feature is implemented on web. • Profile and article pages are updated according to new features • Frontend related pull requests are reviewed.
M. Hakan Kurtoğlu	<ul style="list-style-type: none"> • Implemented user profile feature in backend • Implemented user and profile functionalities • Implemented article entity and its related functionalities • Implemented initial version of portfolio entity and its related features with currencies

Esra Yılmaz	<ul style="list-style-type: none"> ● Implementing a page for displaying ‘Trading Account’, in frontend ● Designing the dropdown menu of web in order to show ‘Trading Account’ section only to traders ● Implementing javascript code for buying Currencies ● Implementing javascript code for selling Currencies ● Implementing javascript code for creating Trading Account ● Implementing javascript code for exchanging the currencies ● Validation for buying currencies ● Implementing javascript code for when trading on a trading account page, perform the transaction without changing the page ● Preparing the Final Milestone and converting to PDF format
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5. Annotation Implementation & W3C Standard Compliance

Annotation functionality was one of the most important features that we wanted to implement since the beginning of the semester. Although we did not have a chance to implement them in our web application, we managed to do it for our mobile app. During the implementation phase, the annotation data model which was specified by the World Wide Web Consortium was a very helpful starting point, because it shows us how to approach to the problem clearly. For example, as suggested in the W3C Annotation Data Model, there are two main resources which are Targets and Bodies. In our approach, we store annotations in our database in a way that this target body relationship is established. In addition, the data classes in our mobile app also complies with W3C Annotation Data Model in that sense. Therefore, although there can always be some room for improvement, we can safely conclude that annotations in eyeTrade are based on W3C Protocol and highly conforms to it.

6. API Documentation

You can find the API documentation in the below link:

<http://100.26.202.213:8080/swagger-ui.html#/>

[Please click here for api documentation.](#)

7. Requirements

7.1. GLOSSARY

- **All Users:** It can be a basic user or a trading user.
- **Annotation:** A term referring 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 an impact on trading equipment. (e.g., Meetings of the Central Bank of the Republic of Turkey or a speech by the president of the Federal Reserve Bank of New York.)
- **My Investments:** The section in which users are 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 grouping of financial assets such as stocks, bonds, commodities, currencies etc.
- **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 equipments to the users based on their histories.
- **Semantic Search:** It tries to find semantically similar users and trading equipments 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, in addition to basic user, is able to invest in any trading equipment.

7.2. FUNCTIONAL REQUIREMENTS

7.2.1. User Requirements

7.2.1.1. User Types

7.2.1.1.1. All Users (except guests)

- All users shall have a “Profit/Loss” and an "Events" section.
- All users shall have at least one Portfolio.
- All users shall be able to follow other users.
- All users shall be able to share ideas as an article.
- All users shall be able to comment about trading equipments and articles.
- All users shall be able to follow the values related to any trading equipment that is available.
- The followers of a user and the followed users by that user shall be seen on the profile of that user.
- A private user profile shall be seen only by its followers.

7.2.1.1.2. Only Trading Users

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

7.2.1.1.3. Guests

- 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.
- Guests shall be able to read user comments about trading equipment and articles.

7.2.1.2. Authentication

7.2.1.2.1. Sign Up

- Basic users shall provide their name, surname, email address, and location (by specifying it on Google Maps).
- Trading users shall provide their name, surname, email address, location (by specifying it on Google Maps), IBAN and TR Identity Number.
- Users should be able to use Google account to retrieve necessary information for signing up.
- All users shall choose a password.(see 2.1.2)

7.2.1.2.2. Sign In

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

7.2.1.3. Profile

- Profile can be either public or private to other users.
- In order to see the contents in a private user profile, user should be followed.
- Basic users and trading users' prediction success rate shall be visible on their profile page.

7.2.1.4. Portfolio

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

7.2.1.5. Profit/Loss Section

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

7.2.2. System Requirements

7.2.2.1. Notifications

- The system shall notify users in accordance with alerts.

7.2.2.2. Predictions

- Each trading equipment shall be available for the prediction.

7.2.2.3. Searching

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

7.2.2.4. Trading Equipment

- The trading equipment 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.)

- 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.

7.2.2.5. Recommendation System

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

7.2.2.6. Economic Events

- Economic events shall have different significance levels.
- 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.
- Basic users and trading users shall be able to filter economic events by considering their significance level and country base.
- Basic users and trading users shall be able to search economic events.

7.3. NON-FUNCTIONAL REQUIREMENTS

7.3.1. Security and Privacy

- Emails for registration shall be valid and unique for each user.
- Passwords shall be at least 8 characters long and contain at least one uppercase letter, one lower case letter and a digit.
- All passwords shall be encrypted using [PBKDF2](#) and stored in the database.
- Data of the users shall be protected according to Law on the Protection of Personal Data.

7.3.2. Performance

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

7.3.3. Availability

- The application shall have web and mobile (Android) versions.
- The system shall be compatible with the latest main versions of Google Chrome and Android.

- The language of the system shall be English but it shall also support Turkish characters.

7.3.4. Annotations

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

7.3.5. Database

- System shall store user information, trade equipments, follower relations, portfolios, user history and user preferences in the database.
- Information in the database shall be able to be updated.
- Database structure shall be as efficient as possible, avoiding unnecessary tables and duplicate columns.

8. User Manual

8.1. Web

- Go to [this link](http://35.174.165.69:8080) (<http://35.174.165.69:8080>) in order to login or sign-up to eyeTrade.

The image displays two screenshots of the eyeTrade web application interface. The left screenshot shows the 'Login' and 'Sign up' options. The 'Login' section has fields for 'Username' and 'Password' with a 'Login' button and a 'Forgot password?' link. The 'Sign up' section has a 'Register Now' button and a 'Continue as a guest' button. The right screenshot shows the 'Register' form. It includes fields for 'Name', 'Surname', 'Email', 'Password', 'Repeat password', and 'Location'. Below these is a 'User Type' section with radio buttons for 'Trader' (selected) and 'Basic User'. Further down are fields for 'IBAN' and 'Identity Number', followed by a 'Create Account' button and a 'Sign up with Google' button.

- Once you log in you can see the homepage with full of recent economic events and some suggested articles about economics. You can also check different parity pairs above.

The screenshot shows the eyeTrade homepage dashboard. On the left is a dark sidebar menu with options: Home, Events (marked NEW), Articles, My Portfolios, My Predictions, Trade Indices, Stocks, Commodities, Currency, Currency Charts, Funds, Search, and Help. The main content area has a top bar with 'Home / Dashboard' and a user profile icon. Below this is a row of six dark boxes displaying currency pairs and their values: USD/TRY (5.9493), EUR/TRY (6.6667), EUR/USD (1.1206), GBP/TRY (7.8106), USD/JPY (108.6451), and EUR/GBP (0.8535). The central section is titled 'Economic Events' and contains a table with columns: Time, Significance, and Event. The table lists several events with their dates, significance levels (4/5), and descriptions. To the right of the table is a 'Suggested Articles' section with two article cards. The first card is titled 'Economic Incentives Don't Always Do What We Want Them To' by Emir Gokdemir, and the second is 'An Underdog in Tourism: Turkey' by Sarah Smith. Both cards provide a brief summary of the article's content.

Time	Significance	Event
22:12 30/12/2019	4/5	USD/JPY: Bears lining up to give some punishment for overly committed bulls
00:12 31/12/2019	4/5	WTI Technical Analysis: Doji on 4H challenges further upside
00:12 31/12/2019	4/5	GBP/USD bulls lapping up US dollar weakness to a 38.2% Fibi target
00:12 31/12/2019	4/5	US Treasury yield curve is steepest in over a year
02:12 31/12/2019	4/5	USD/JPY hits 19-day low despite steepening of US yield curve
04:12 31/12/2019	4/5	USD/IDR Technical Analysis: Three-year-old rising trendline in focus
04:12 31/12/2019	4/5	Indian Rupee Price News and Forecast: USD/INR under pressure amid Indian govt/banking measures

- From the menu on the left side of the screen you can view your portfolios or create a new one. Make predictions about feature values of trading equipments. Lower/upper bound and targetted day can be arranged by the user and user will be informed about the status of her/his prediction when the targetted day comes.

The screenshot shows the 'Make a new Prediction' form in the eyeTrade application. The form is titled 'Make a new Prediction' and includes the following fields: 'Select a base Trading Equipment:' (a dropdown menu with 'USD' selected), 'Select a target Trading Equipment:' (a dropdown menu with 'USD' selected), 'Lower Bound For Prediction' (a text input field), 'Upper Bound For Prediction' (a text input field), and 'Targetted Day' (a text input field). A blue 'Make a Prediction' button is located at the bottom right of the form. Below the form is a section titled 'My Predictions' which contains a table with columns: Prediction For, Prediction Time, Lower Bound, Upper Bound, Target Date, Status, and Edit. The table is currently empty. The footer of the page shows 'eyeTrade © 2019'.

- You can view all articles by clicking “Articles” tab, view a specific article and enjoy it! You can also rate this article, read other users’ comments about it and post comments by yourself.

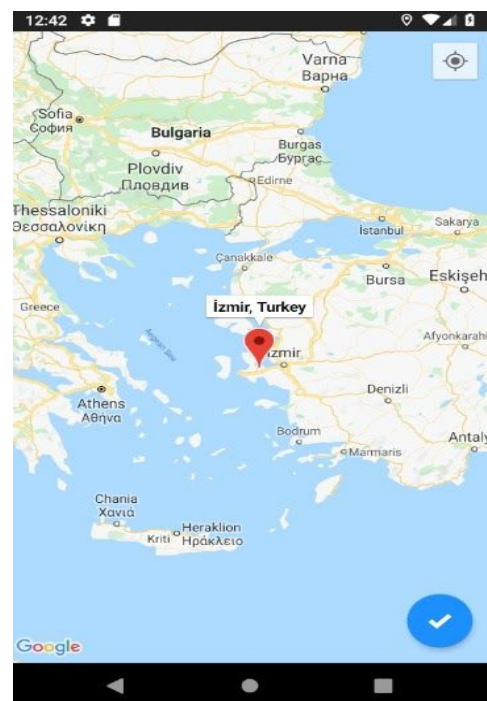
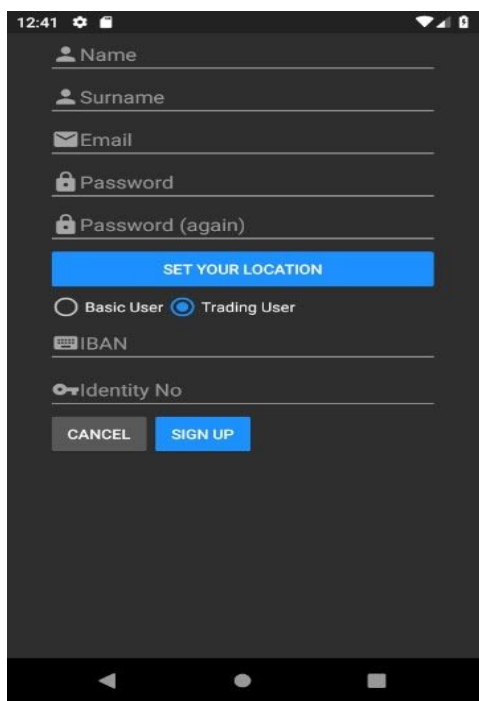
The screenshot shows the eyeTrade application interface. On the left is a dark sidebar with navigation links: Home, Events (marked NEW), Articles, My Portfolios, My Predictions, Trade Indices, Stocks, Commodities, Currency, Currency Charts, Funds, Search, and Help. The main content area is titled "Home / Article". It displays an article titled "Japan's inflation up 0.5% in November, as tax boosts cost of dining out" with a 4-star rating. The article details include the title, author (Jose Gragera), author email (josegragera96@gmail.com), publish date (2019-12-24 18:01:43.306), score (4), and an abstract. The content section describes how core consumer prices rose 0.5 percent in November. Below the article is a "Comments" section with one comment from Jose Gragera dated 2019/12/24 18:48, stating "I'll keep posting if you like my articles."

- If you are searching for an article or events about a specific keyword you can make a search with this keyword and articles/events containing it will be listed for you.

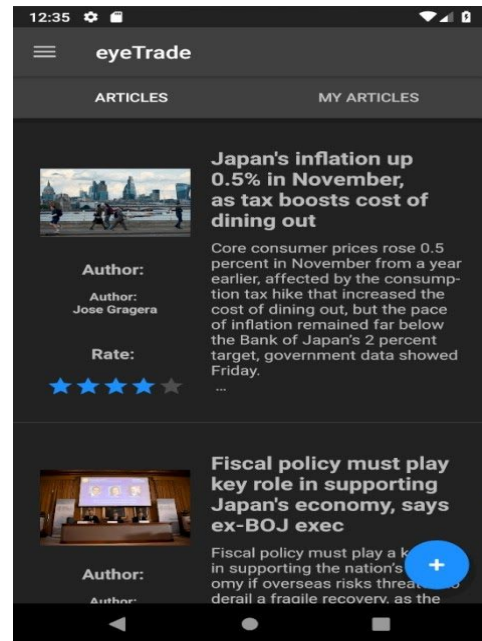
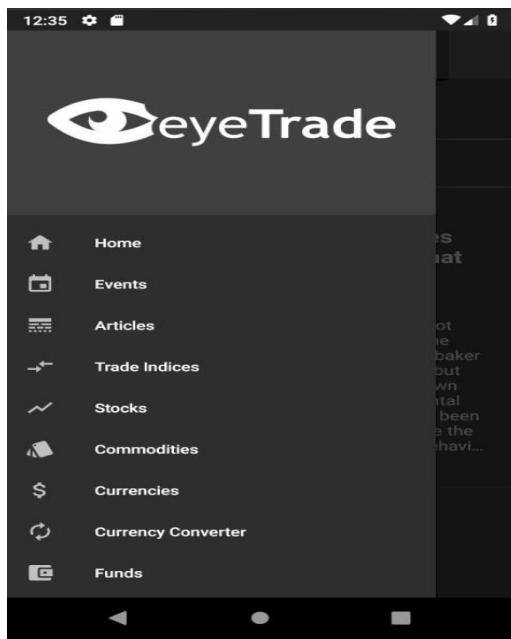
The screenshot shows the eyeTrade application interface with the search function active. The sidebar is identical to the previous screenshot. The main content area is titled "Home / Search". A search bar contains the keyword "crisis" with a "Search" button. Below the search bar, the results are categorized into "Articles", "Events", and "Users". Under "Articles", there is one result titled "Tackling climate crisis is what we should be doing" by Anil Can Kara, dated 2019-12-01 17:14:53.287. The article text discusses Kristalina Georgieva's research on climate change. Under "Events", there is a table with headers "Time", "Significance", and "Event", but it is currently empty. The "Users" section is also empty. The footer shows "eyeTrade © 2019".

8.2. Android

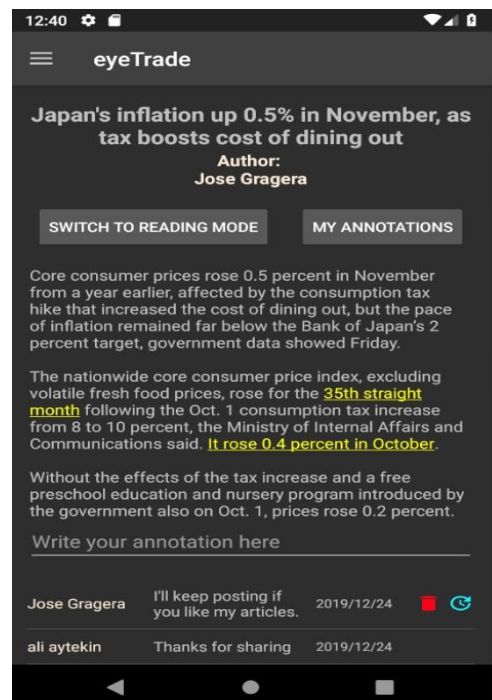
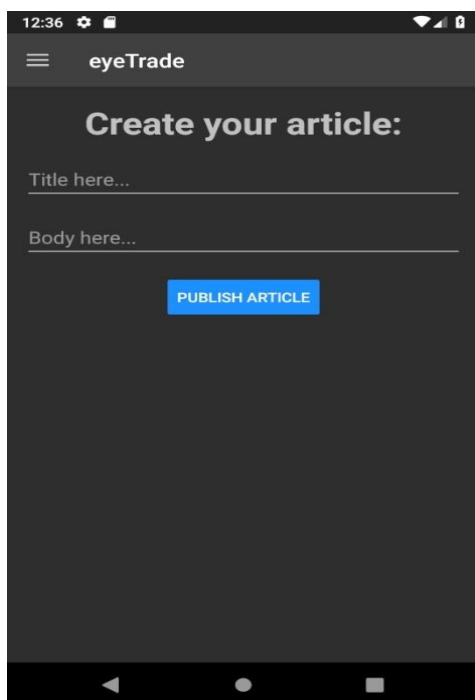
- You can register to eyeTrade mobile application by providing some information, also set your location using Google Maps. It is necessary to give suggestions based on your location. If you want to register as a trading user you additionally need to provide your IBAN and Identity number.



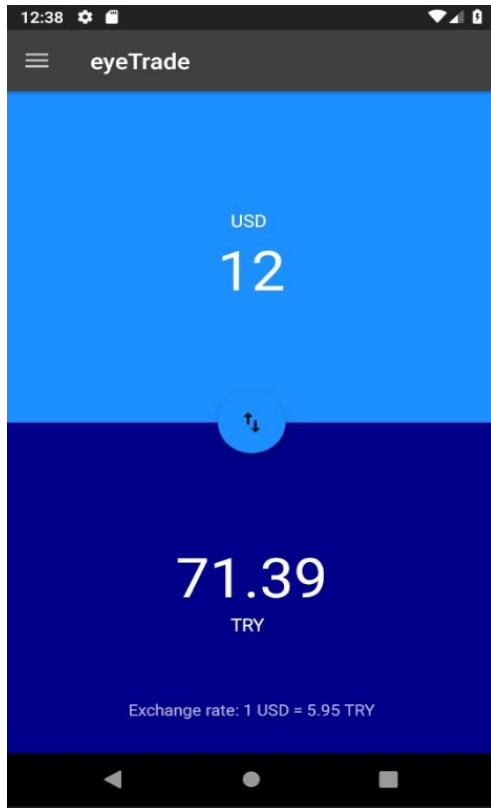
-
- There is a navigation drawer which you can switch between different functionalities through the application. You can view all articles about economics and publish your own by clicking the icon on the right bottom of the page.



- There are annotations on the articles in our app. To see all of them you need to switch to 'annotation mode' and annotation will be highlighted. When you are in annotation mode you can select a text and add your own annotation to it. 'My Annotations' tab will only display annotations added by you.
- User can also read other users' comments and add your own to an article. You can update or completely delete your comments if you wish.



- You can convert two different currencies with amount you type by using currency converter and also there is a page you can view changes in parities in last day. On ‘Currencies’ tab you can choose two different currencies and see the currency chart.



9. System Manual

9.1. System Requirements

- Operating System
 - Windows Vista or newer
 - Mac OS X 10.8.3+
 - Linux 13.x or newer
- Ram: 1 GB
- Disk space: 1 GB
- Processor: Minimum Intel Pentium 4 3.2 GHz or similar
- Browsers:

- Google Chrome
- Firefox
- Microsoft Edge
- Android 8.x+

9.2. Installation

9.2.1. Web & Backend

- First of all, JRE (Java Runtime Environment) is downloaded from [here](#).
- Under Java Platform, Standard Edition, select either the current release, or click **Previous Releases** to install an earlier supported version. You can use JRE 8 version.
- Follow the navigation aids to download the JRE that is appropriate for your operating system.
- Follow the installation instructions that are provided with the JRE.
- Save the path to the JRE executable file. You will need it later.
- Proceed to the instructions in [Verifying the JRE Environment](#) at [here](#).
- Install maven to your computer. You can follow the steps at [the link](#).
- You should configure your database, email by changing the configuration file at the “.\backend\src\main\resources\application.properties”. Change and save it.
- Then, you should go to path “.\backend” and run that command: “mvn clean install -DskipTests”
- Then you should go to “.\backend\target\” address and copy “backend-0.0.1-SNAPSHOT.jar” file to where you want to run your program. Change copied file name as backend.jar.
- After that, open your computer’s terminal where backend.jar file exists. You can run backend.jar file by entering “nohup java -jar backend.jar > backend.log”. “backend.log” file consists of logs of running jar file.
- Then, wait a minute and you can shut down your terminal without killing the process. It’s ready for usage.
- For any problem, please contact us by eyetrade451@gmail.com

9.2.2. Android

- You need to have an Android development environment that supports Kotlin to be able to configure EyeTrade Android project. Suggested IDE is Android Studio 3.0 and up.
- Open the project and Android Studio. You need to download additional Kotlin packages if you do not have them.
- No additional setup necessary to build and run EyeTrade app.

- All operations are common to usual Android project operations.
- For any problem, please contact us by eyetrade451@gmail.com

10. Project Plan

TASKS	DURATION	STARTING DATE	COMPLETION DATE	ASSIGNEE
Taking AWS account for server	6 day	04.10.19	09.10.19	Kemal
Create API for backend	4 day	04.10.19	07.10.19	Kutay,Oğuzhan,Hakan,Emir
Send some requests from Mobile to API	4 day	04.10.19	07.10.19	Merve, Anıl,Alihan
Display Response of API and adjust for frontend	5 day	04.10.19	08.10.19	Esra, Safak, Kemal
Creation of the Spring Application	1 day	09.10.19	10.10.19	Kutay
Creation and deployment of a PostgreSQL database	2 day	09.10.19	10.10.19	Kutay
Development of authentication feature of the backend application	2 day	09.10.19	11.10.19	Kutay,Oğuzhan,Hakan,Emir
Development of registration feature on the backend	4 day	09.10.19	12.10.19	Emir
Development of login/logout features on the backend	4 day	09.10.19	12.10.19	Oğuzhan
Development of registration verification(via email) feature on the backend	4 day	09.10.19	12.10.19	Hakan
Integration of swagger to API	5 day	09.10.19	14.10.19	Emir
Deployment of the backend to AWS	5 day	09.10.19	14.10.19	Safak
Development of login page on the frontend	5 day	09.10.19	13.10.19	Safak
Development of home page on the frontend	5 day	09.10.19	13.10.19	Safak, Esra, Kemal
Development of registration page on the frontend	5 day	09.10.19	13.10.19	Safak
Development of email check feature on the frontend	5 day	09.10.19	14.10.19	Safak,Kemal,Esra
Development of login page on android	5 day	09.10.19	13.10.19	Anıl,Merve,Alihan
Development of registration page on Android	5 day	09.10.19	13.10.19	Anıl,Merve,Alihan
Development of home page on Android	5 day	09.10.19	13.10.19	Anıl,Merve,Alihan
Research on Docker containers	2 day	09.10.19	11.10.19	Oğuzhan
Deployment of example API on AWS	2 day	14.10.19	14.10.19	Safak
A new authentication mechanism will be developed	2 day	15.10.19	16.10.19	Emir,Kutay
Development of frontend for currency change function	4 day	16.10.19	20.10.19	Safak
Api requests will be added on login and register page	4 day	16.10.19	20.10.19	Safak
A mock page for events will be implemented	4 day	16.10.19	20.10.19	Kemal
Non-functional parts in CoreUI template will be deleted	4 day	16.10.19	20.10.19	Safak
A mock profile page will be implemented	4 day	16.10.19	20.10.19	Kemal
Implementation of currency converter on Android	5 day	16.10.19	20.10.19	Anıl,Merve,Alihan
Enriching the homepage content	5 day	16.10.19	20.10.19	Merve
Implementation of an api requests sender for an external currency api	3 day	16.10.19	18.10.19	Kutay
Currency converting end point will be created	1 day	19.10.19	20.10.19	Emir
Navigation Drawer will be implemented	2 day	19.10.19	20.10.19	Alihan
Deployment of the frontend AWS	2 day	20.10.19	21.10.19	Safak
CORS issue for web frontend	1 day	20.10.19	21.10.19	Kutay,Oğuzhan,Hakan,Emir
MILESTONE 1	1 day	22.10.19	22.10.19	All Group Members
Milestone Report	5 day	22.10.19	27.10.19	All Group Members
Error handling on backend	4 day	29.10.19	02.11.19	Emir
Development of following trading equipment mechanism on the backend	4 day	29.10.19	02.11.19	Emir
Development of following users feature on the backend	4 day	29.10.19	02.11.19	Kutay
Development of follower and followee users retrieval feature on the backend	3 day	30.10.19	02.11.19	Kutay
Implementation of profile page on android	2 day	02.11.19	04.11.19	Anıl
Extend the models and mappers related with users	2 day	07.11.19	08.11.19	Kutay
Development of follower and following count retrieval feature on backend	2 day	07.11.19	08.11.19	Kutay
Implementation of update user profile status feature in backend	2 day	07.11.19	08.10.19	Kutay
Implement articles feature	5 day	09.11.19	14.11.19	Hakan
Implement portfolio feature	5 day	09.11.19	14.11.19	Hakan
Development of notification system on backend	3 day	14.11.19	17.11.19	Kutay
Notifications on android	10 day	15.11.19	25.11.19	Alihan
Portfolio on android	10 day	15.11.19	25.11.19	Alihan,Merve,Anıl
Currency page on android	10 day	15.11.19	25.11.19	Anıl
Improving android design	10 day	15.11.19	25.11.19	Anıl
Upgrading currency page on frontend	10 day	15.11.19	25.11.19	Safak
Notifications on frontend	10 day	15.11.19	25.11.19	Safak
Deployment of new version of frontend	10 day	15.11.19	25.11.19	Safak
Development of events page on frontend	10 day	15.11.19	25.11.19	Kemal, Esra
Development of homepage on frontend	10 day	15.11.19	25.11.19	Kemal
Update profile end points returns 500	1 day	20.11.19	20.11.19	Oğuzhan,Emir,Kutay,Hakan
Currency converter endpoint returns 500	1 day	20.11.19	20.11.19	Oğuzhan,Emir,Kutay,Hakan
Implementation of comments	2 day	20.11.19	22.11.19	Emir, Oğuzhan
Articles on android	1 day	23.11.19	24.11.19	Anıl
Portfolio related functionalities on frontend	2 day	24.11.19	25.11.19	Kemal, Esra
Get events in backend	2 day	24.11.19	25.11.19	Emir
Point mechanism of events	2 day	24.11.19	25.11.19	Emir
Currency rates between time arrival and last days	2 day	24.11.19	25.11.19	Emir
Comment mechanism	2 day	24.11.19	25.11.19	Oğuzhan
Account implementation	2 day	24.11.19	25.11.19	Emir
Fix the bugs in the profile update feature	2 day	24.11.19	25.11.19	Kutay
Update of features related with articles	2 day	24.11.19	25.11.19	Kutay
Update of portfolio and currency following features	2 day	24.11.19	25.11.19	Kutay
Implementation of main page feed feature	2 day	24.11.19	25.11.19	Kutay
Fix the bugs related with follower and following counts	2 day	24.11.19	25.11.19	Kutay
MILESTONE 2	1 day	26.11.19	26.11.19	All Group Members
Milestone report	5 day	27.11.19	01.12.19	All Group Members
My articles on Android	7 day	03.12.19	10.12.19	Anıl
Adding cryptocurrency conversion to web	7 day	03.12.19	10.12.19	Safak
Implementation of cryptocurrency feature in the backend	7 day	03.12.19	10.12.19	Kutay

Implementation of comment feature on <u>frontend</u>	7 day	03.12.19	10.12.19	Kemal
<u>Cryptocurrencies</u> on Android	7 day	03.12.19	10.12.19	Anıl
Implementation of conversion to trading user to in <u>backend</u>	7 day	03.12.19	10.12.19	Kutay
Implementation of removal functionalities of the <u>backend</u> features	7 day	03.12.19	10.12.19	Kutay
Cryptocurrency page and currency page will be merged	7 day	03.12.19	10.12.19	Safak
UI design for search functionality	7 day	03.12.19	10.12.19	Safak
Annotations will be added to web	7 day	03.12.19	10.12.19	Estra, Safak, Kemal
Implementations of comment on android	7 day	03.12.19	10.12.19	Anıl
Implementations of annotations on android	7 day	03.12.19	10.12.19	Anıl
Deployment of new version of <u>frontend</u>	7 day	03.12.19	10.12.19	Safak
Creating trading account page	7 day	03.12.19	10.12.19	Estra
User self point blocking	7 day	03.12.19	10.12.19	Emir
Currency update method will be created for manually update	7 day	03.12.19	10.12.19	Emir
Comment mechanism	7 day	10.12.19	17.12.19	Oğuzhan, Emir
Delete option will be added to comments	7 day	10.12.19	17.12.19	Emir
Annotations of events and articles implementation	7 day	10.12.19	17.12.19	Emir
Fund get back to user implementation	7 day	10.12.19	17.12.19	Emir
Buy sell and exchange order implementation	7 day	10.12.19	17.12.19	Emir
Basic Search	7 day	10.12.19	17.12.19	Emir
Advanced Search	7 day	10.12.19	17.12.19	Oğuzhan, Emir
Editing error codes in <u>backend</u> side	7 day	10.12.19	17.12.19	Emir
User ID addition to resources	7 day	10.12.19	17.12.19	Emir
Comment addition and update	7 day	10.12.19	17.12.19	Emir
<u>Cryptocurrencies</u> and currencies should be together	7 day	10.12.19	17.12.19	Oğuzhan, Emir
Unfollow option for web	7 day	10.12.19	17.12.19	Estra
Update of UI design for portfolio	7 day	10.12.19	17.12.19	Kemal
Implementation of trading on android	7 day	10.12.19	17.12.19	Alihan
Implementation of notification on android	7 day	17.12.19	24.12.19	Merve
Implementation of portfolio on android	7 day	17.12.19	24.12.19	Alihan
Update of the portfolio feature in <u>backend</u>	7 day	17.12.19	24.12.19	Kutay
Development of prediction feature in <u>backend</u>	7 day	17.12.19	24.12.19	Kutay
Follow/ <u>unfollow</u> operations on <u>frontend</u>	7 day	17.12.19	24.12.19	Kemal
Updates on comment on <u>frontend</u>	7 day	17.12.19	24.12.19	Kemal
Implementation of prediction feature on <u>frontend</u>	7 day	17.12.19	24.12.19	Kemal
FINAL MILESTONE	1 day	24.12.19	24.12.19	All Group Members

11. Presented User Scenarios

11.1. Mobile:

Jose Gragera is a psychology student living in Barcelona, Spain. One day, his friends recommend him to use eyeTrade, but first he refuses to download because he thinks he's not interested in economics at all. However, later, he learns that eyeTrade is more like a social platform where you can interact with people by following them, commenting on some articles and events. In addition, he learns that it is also possible to publish your own content in the app. Therefore, he becomes a very loyal user of eyeTrade in a short while. Again, he opens the app to see if there is anything interesting going on in his account. First, he checks the notifications to see whether there is somebody new following him and he sees that there are 3 people who started to follow him in the last 2 days. He taps on the notifications to take a look at their profile and he decides to follow one of them back. Later, he deletes all the notifications and goes to his profile page to set his profile as private. Then, he lands in the articles section of the app. He switches to my articles tab to check if there are new comments or annotations on his articles, and he sees that somebody has left a comment on his article that he published last week. Since it's a positive comment, he replies it with a positive comment as

well. He also updates his comment because of a typo. Finally, he sees an annotation from Dağhan Çayırgezen on his article and adds a new one to enrich the content.

11.2. Web:

Dağhan Çayırgezen is an enthusiastic trader. Of course, he has a trader account in eyeTrade. First, he logs in by providing his email address and password. Then, he realizes that he wants to exchange some Chinese Yuans with his Turkish Liras. Therefore, from the top right of the page, he goes to his trading account and buys some CNY. He also thinks to buy some JPY as well, but he doesn't want to provide his credit card information and skips it for that moment. Then, he goes to predictions page to make a prediction about CNY. He believes that it will be more valuable in the next one month. Finally, he goes to search section and searches for the keyword "Japan" to read some articles about Japan. He clicks on the first one in the search results which was written by Jose Gragera, but he doesn't like the article. That's why he gives a low rate and leaves a bad comment on that article.

12. Branches and Pull Requests

We have put the code for frontend, backend and mobile in different folders. For each of these, responsible teams have their own branches. Sometimes for swift bug fixes or to meet deadlines special branches may be created. However, in general features are developed in separate branches and those are merged after peer review. For instance, backend features are developed in different branches and merged into backend branch. Again, after peer review branches are merged into master.

13. Evaluation of Tools

Github: We used Github to locate our code base. It was helpful for reviewing our codes and commits. Also, it helped us to manage our project by using issue system.

Git: We used Git as the version control system. It is a really useful tool to manage the different branches of the different teammates.

AWS: We used AWS as the deployment environment; used EC2 to deploy backend and frontend applications and PostgreSQL RDS for the database server. It was a proper choice because of the free credits of AWS Educate accounts.

Java: We used Java as the programming language of the backend application. It was a good choice because of its powerful and mature libraries as well as its nice object oriented structure.

Spring Boot: We used Spring Boot as the backend framework. It is a very useful tool to develop maintainable and scalable server-side applications with its proper architecture and powerful annotations.

Intelij: We used IntelliJ as the IDE for the backend development. It is a user-friendly IDE for Java applications because of its auto-complete, auto-import, auto-refactoring, and git integration features.

Swagger: We used Swagger to document our API. It is a tool which is super easy to integrate to the api. Also, it is very user friendly to be used by the client-side application developers.

Kotlin: We used Kotlin as the programming language for the Android development. We had two options for Android development: Java and Kotlin. We choose Kotlin because it is more concise, safer, and bug-free; also it has a better support for functional programming features.

Retrofit: We used Retrofit to send http requests from our Android application. With Retrofit, it is very easy to send requests to the API's as well as parsing JSON responses.

Android Studio: We used Android Studio as the IDE for Android development. Android Studio is a very beneficial tool with its Android Emulator and its plugins.

Vue.js: We used Vue as the frontend library. It offers Virtual DOM, component base ui development opportunity, and a variety of JavaScript libraries which are very powerful for frontend development.

Visual Studio Code: We used Visual Studio Code as the IDE for frontend development. It is one of the best choices with its auto-complete, auto-fixing features as well as powershell integration.