Bilkent University

Department of Computer Engineering

Senior Design Project

Project short-name: BidIt

Analysis Report

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Progress Report
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This report is submitted to the Department of Computer Engineering of Bilkent University in partial fulfillment of the requirements of the Senior Design Project course CS491/2.

1.Introduction

Auction is a process of buying or selling products based on biddings. It is a good alternative for fixed-price selling mechanisms. The word comes from Latin word "augere" which means "to increase" [1]. One of the most common forms of auction is open ascending price auction where participants bid openly and every bid must be higher than the previous bid. As long as there are at least two bidders, the auction continues. The other form is the sealed-bid first-price auction where bidders submit their bids privately in sealed envelopes and the highest bidder wins [1]. The popular goods taking place in auctions are antiques and rare collectibles.

When it comes to online auctions, some conditions mentioned above change. The time is limited and the highest bidder at the end of the time buys the product. Also, nowadays, auctions do not have to be about antiques or rare objects. People can sell their second-handed products to get rid of them which makes it reasonable to have a marketplace in order to meet the demands of these people.

Online shopping is very in demand these days. Either it is a brand new product or a second-hand product. We aim to introduce a bidding system for these online shopping platforms. Our platform, BidIt, will be an easy to use auction platform where users can buy and sell products online.

This report explains the details of the proposed system in terms of System Overview, Requirements, Constraints, and Similar Products to further explain the purpose and the innovativeness of the project.

2.Current System

Currently, there is a website called eBay [2]. On eBay, users can buy and sell their products with a bidding system online. However, it is not being used in Turkey. Firstly, our design and target audience will be different. Our aim is to make people in Turkey adapt to an online shopping system based on bidding. Also, BidIt will have extra features that are not offered on eBay. We will make predictions about the price and the categorization for helping the seller to choose the most appropriate price and the category.

3.Proposed System

3.1 Overview

In our senior project, BidIt, we aim to develop an easy-to-use auction platform where users can sell their products. It will be a mobile application that is cross-platform adaptable for both Android and iOS. We will have two different use cases for users which give them an option to buy and sell. For selling items, users will define their items by writing a caption and adding images. For categorization, the best-suited category will be suggested by using the image and the description of the item but the user can manually change the category specification later. Users can select the time for their advert by determining the publish time and the length of the advert. Users are not allowed to remove the product from the marketplace after it got a bid or bought. Users will define an initial start price where other users can bid to buy this item and the highest bidder at the end of the auction can buy the item. Also, users can optionally define a buy now price where other users can buy the item instantaneously. When publishing an item, the platform will suggest optional pricing for the item from the description. This platform will automatically take the payment from the auction winner, and after the consolation of both buyers and sellers for the transaction, the seller will receive the payment. Buyers can review the sellers. Users can not bid on their own adverts in any manner. Users will get notifications about the auction dates, prices, etc. about their interested items and subscriptions. When a user is out-bidded, the user will be informed with a notification instantly.

3.2 Functional Requirements

These following functions will be available for the users.

- Users can sell their products by indicating their caption, description and images. They will also initialize the start price and optionally a buy-now price. The expiration time of an advertisement will be indicated by the user and it can be at most 15 days.

- Users can bid on the items to join the auction for the product or use the buy-now option to acquire the item directly.

- Users can rate previously interacted users.

- Users can monitor other user's reviews.

- Users can search for an item by name or category.

- Users can have different lists. They can add an item to personalize their lists.

- Users can browse the marketplace for the currently open sales.

- BidIt will notify buyers when someone out-bid their bid. Also, sellers will be notified when someone bids their product.

- Users can see the previously sold products of any user.

- BidIt will estimate the price by using previous related items for an item so that users can roughly have an understanding of the price of their items before publishing their advertisements .

- Users can purchase an item with their own credit cards or virtual payments.

- BidIt will automatically categorize the product. The category subtree of the product will be generated automatically according to the title and the image.

- BidIt will do the authentication of the users provided their usernames and passwords.

- Users can report other users due to neglect of the term of usage of the app.

- Users can update their account information

- Users can delete their accounts

3.3 Non-Functional Requirements

In the following subsections, the non-functional requirements are divided into subsections as reliability, usability, extensibility, compatibility and security.

3.3.1 Reliability

- The application must not randomly crash. It must be able to recover quickly from any errors that occur during application usage.

3.3.2 Usability

- The BidIt application should have a user-friendly interface that will allow all types of users to be able to easily adapt.

3.3.3 Extendibility

- Design of the application should be written following the Object Oriented Programming paradigms in order to add new functionalities easily.
- The storage in the system should be designed in a way that it can be extended.

3.3.4 Compatibility

- The application will be cross-platform and it will be adaptable for Android and iOS.

3.3.5 Security

- Personal data of the user such as name, surname, and phone number must be protected by the application to maintain security.
- The money transactions are all covered with an API.

3.4 Pseudo Requirements

3.4.1 Language Constraints

● Our application will support both Turkish and English languages.

3.4.2 Economic Constraints

● The webpage is on the Github domain which is free to use.

● Github will be used for Version Control and code sharing which is free to use.

● Free APIs will be used.

● Open-source libraries will be used.

3.4.3 Implementation Constraints

● The application will be working on mobile operating systems which are Android and IOS.

● Client-Server model will be used as application structure.

● React Native will be used in order to provide cross-platform application development.

● Version control will be sustained via Git and the source code will be hosted on Github.

● Ebay Taxonomy API is planned to be utilized for automatic categorization, taxonomy of the product [3].

● Object Oriented Design principles will be adapted in the design steps and appropriate design patterns will be used as necessary.

● Sign in with Facebook authentications can be used to spend less time in registration according to the users preferences [4].

3.4.4 Social Constraints

● The application can be used by anyone who has a smartphone.

3.4.5 Ethical Constraints

● The personal information of users will not be shared.

● User data will be encrypted.

- Code of Ethics [5] will be followed.

- Any external software or library used will be properly referenced.

3.4.6 Timeline Constraints

Development of our product will be parallel with the following schedule [6],

- Project Specifications: **Monday, October 12, 2020**

- Analysis Report: **Monday, November 9, 2020**

- High-Level Design Report: **Monday, December 21, 2020**

- Low-Level Design Report: **Monday, February 8, 2021**

- Final Report: **Friday, April 30, 2021**

3.4.7 Sustainability Constraints

- We will closely follow and consider user feedback in order to improve the product.

- Bugs will be followed and updated from the initial release until the deadline.

3.4.8 Professional and Ethical Constraints

Code of Ethics proposed by National Society of Professional Engineers [5] will be followed during the implementation,

- Since the users have to sign up in order to sell or bid the products, we need to keep their usernames and passwords. In order to manage this in a safe manner, we are going to store the hash values of the passwords in our database. Also, the personal information of the users such as phone number, name, and surname will not be shared by other users or third parties without getting permission.

- The camera or storage permission will be needed when a buyer is uploading or taking pictures of the products. Before accessing the phone's camera and storage, required permissions will be taken from users.

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3.5 System Models

3.5.1 Scenarios

Scenario 1	Sign Up
Actor	Client
Entry Conditions:	1- Client opens the app and clicks on the Sign Up button.
Exit Conditions:	1- Clients can turn back to the main page of the app by the back button. 2- After Client Sign Up , the app redirects the client to the sign in page. 3- Client fills the username and password then sign in.
Main Flow of Events:	1- Clients give their information that the app needs, then sign up for the app.
Alternative Flow of Events:	1- Clients can go back to the main page. 2- Clients can exit the app.

Scenario 2	Sign In
Actor	Client
Entry Conditions:	1- Actor opens the app and clicks on the Sign In button.
Exit Conditions:	1- Actor can turn back to the main page of the app by the back button. 2- After Sign In , the app redirects the client to the home page.
Main Flow of Events:	1-Clients fill the username and password area and sign in the app.
Alternative Flow of Events:	1- Clients can go back to the main page. 2- Clients can exit the app.

Scenario 3	Forgot Password
Actor	Client
Entry Conditions:	1-Clients clicks on the Forgot Password button.
Exit Conditions:	1- Actor can turn back to the main page of the app by the back button. 2- After Sign In , the app redirects the client to the home page.
Main Flow of Events:	1- Client enters the mail addresses that have already entered while sign up, then the app resets the password and leads the client to entering a new one.
Alternative Flow of Events:	1- Client remembers its password.

Scenario 4	Logout
Actor	Client
Entry Conditions:	1- Client clicks on the Logout button.
Exit Conditions:	1- Client logged out.
Main Flow of Events:	1- Client logout from the app.

Scenario 5	View Products
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can see randomly distributed products on the home page or can filter it to see specific one.
Exit Conditions:	1-Client presses the back button to exit the app.
Main Flow of Events:	1-Clients see the products that are listed on the home page.

Scenario 6	View Products to be Sold
Actor	Client
Entry Conditions:	1- Client login to the app. 2- Client presses the profile page. 3- Client sees items pressing the sell tab in profile.
Exit Conditions:	1- Client presses the back button to exit the app. 2- Client turns back to home page with click turn back.
Main Flow of Events:	1- Client login the app then press the profile page to see own products that selling

Scenario 7	View Client Profile
Actor	Client
Entry Conditions:	1- Client login to the app. 2- Client presses the profile page.
Exit Conditions:	1- Client presses the back button to exit the app. 2- Client turns back to home page with click turn back.
Main Flow of Events:	1-Client login the app then click on profile button to see profile.
Alternative Flow of Events:	1- Client login to the app. 2- Client presses one of the products. 3-Client presses profile picture on products description

Scenario 8	View Product Description
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client selects a product to see further details.
Exit Conditions:	1- Client presses the back button to exit the app. 2- Client turns back to home page with click turn back.
Main Flow of Events:	1- Client login to the app then click on one products to see its description.
Alternative Flow of Events:	1- User filters the products then finds a specific products. 2- User enters the message part then presses one message, then pressing the profile that message parts person to enter its profile, then see its products.

Scenario 9	Filter Products
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can filter products with some options like category and current price, to see specific one.
Exit Conditions:	1-Client press back button to exit app. 2- Client turns back to home page with click turn back.
Main Flow of Events:	1-Client login the app then filter the products to see desired products on the page.
Alternative Flow of Events:	1- Client searches with a keyword in products.

Scenario 10	View Notifications
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client press on notification button to see them.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login app and press notification button to see its notifications.

Scenario 11	View Messages
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client press on messages button. 3-Client press one of the messages to see.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login app and press the messages button then click one of the messages to see it.

Scenario 12	View Main Screen
Actor	Client
Entry Conditions:	1-Client opens the app.
Exit Conditions:	1-Client press back button to exit app.
Main Flow of Events:	1-Client opens the app.
Alternative Flow of Events:	1- Client logout the app.

Scenario 13	Share Products
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can see randomly distributed products on the home page or can filter it to see specific one. 3- Clients press the share button to share products with social media.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client logins to the app then, in the product page with the share button client choose a product and share it.

Scenario 14	View Favorite Products
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client press on profile button 3-Client press the favorites to see products.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login the app then press the profile button, in profile pressing favorites button to see products.

Scenario 15	Add Products to Favorites
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can see randomly distributed products on the home page or can filter it to see specific one. 3- Click on add favorite button to add favorites
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login to the app then click on one product to see the products, then click add favorite button the add.
Alternative Flow of Events:	1- User filters the products then finds a specific product. 2- User enters the message part then presses one message, then pressing the profile that message parts person to enter its profile, then see its products.

Scenario 16	Report Products
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can see randomly distributed products on the home page or can filter it to see specific one. 3- Click on report products button 4- Select specific reasons to report products then click report.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login app then opens a product , if the product is not appropriate for clients, can report it with reason.

Scenario 17	Add Products to Sell
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client press the profile button 3- Client press the add products button 4- Client upload photos and fill the product description then click the sell button.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1-Client login to the app then go to the profile, with the add products button user can create a new products page to sell the products.

Scenario 18	Send Message to Product Seller Client
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can see randomly distributed products on the home page or can filter it to see specific one. 3-Client enter an product 4- Clients click on the send message button for talk.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login to the app then click on one product to see its description.
Alternative Flow of Events:	1- User can enter message part then press one message, then can continue talk

Scenario 19	Edit Product
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client press the profile button 3- Client presses the desired products to edit. 4- Client upload or delete photos and fill the products description again then click update button.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.

Main Flow of Events:	1-Client login to the app then go to the profile, then click on one product to edit.

Scenario 20	Make bid to an Product
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client can see randomly distributed products on the home page or can filter it to see specific one. 3-Make a bid to an product
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client login to the app then click on one product to see it, then make a bid.

Scenario 21	Contact With Help Center Support
Actor	Client
Entry Conditions:	1-Client click on Help Center Button 2- Client press create new ticket button 3- Fill the information that the app needs then create a button to send a support ticket to the system.
Exit Conditions:	1-Client press back button to exit app.
Main Flow of Events:	1- Clients can create tickets for problems in the app.
Alternative Flow of Events:	1- Clients can create tickets also while login to the app and go to the profile part then click the support button.

Scenario 22	Verify Account
Actor	Client
Entry Conditions:	1-Client Sign Up then the system sends verification code to email. 2- Client enters code to app.
Exit Conditions:	1-Client press back button to exit app.
Main Flow of Events:	1-Client successfully signs up then the system sends a

	verification code to make the client verified.
Alternative Flow of Events:	1-Client can verify its account with another app like facebook or phone number.

Scenario 23	Delete Products That In Won Sell List
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client press the profile button 3- Client presses the desired product to edit. 4- Client press delete product.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1-Client login to the app then go to the profile, then click on one product to delete.
Alternative Flow of Events:	1-Client login to the app. 2-Client press the profile button 3- Client presses the desired products to delete. 4- Client press delete button.

Scenario 24	Make Comment a Client Profile for an products
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client buy a product. 3-Client complete the payment and get the product. 4-Client go to bought products page 5- Clients make comments about the product.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1-Client buys a product and gets feedback about the product and seller.

Scenario 25	Search Product
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client write keyword to search bar then click search button.
Exit Conditions:	1-Client press back button to exit app.
Main Flow of Events:	1-Clients see the products that are listed on the home page with the selected keyword contained.

Scenario 26	Confirm Order
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client wants to buy a product and click on the product. 3- Client makes bids on a product. 4- Client won the auction and confirmed the order.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Client wants to buy one product and make a bid, then if won the auction it confirms the order.

| Scenario 27	Make Payment
Actor	Client
Entry Conditions:	1-Client login to the app. 2-Client wants to buy a product and click on the product. 3- Client makes bids on a product. 4- Client won the auction and confirmed the order. 5-Client makes payment for a product.
Exit Conditions:	1-Client press back button to exit app. 2- Clients can turn back to home page with click turn back.
Main Flow of Events:	1- Clients want to buy one item and make a bid, then if they won the auction it confirms the order,lastly make payment for the item.

3.5.2 Use Case Model
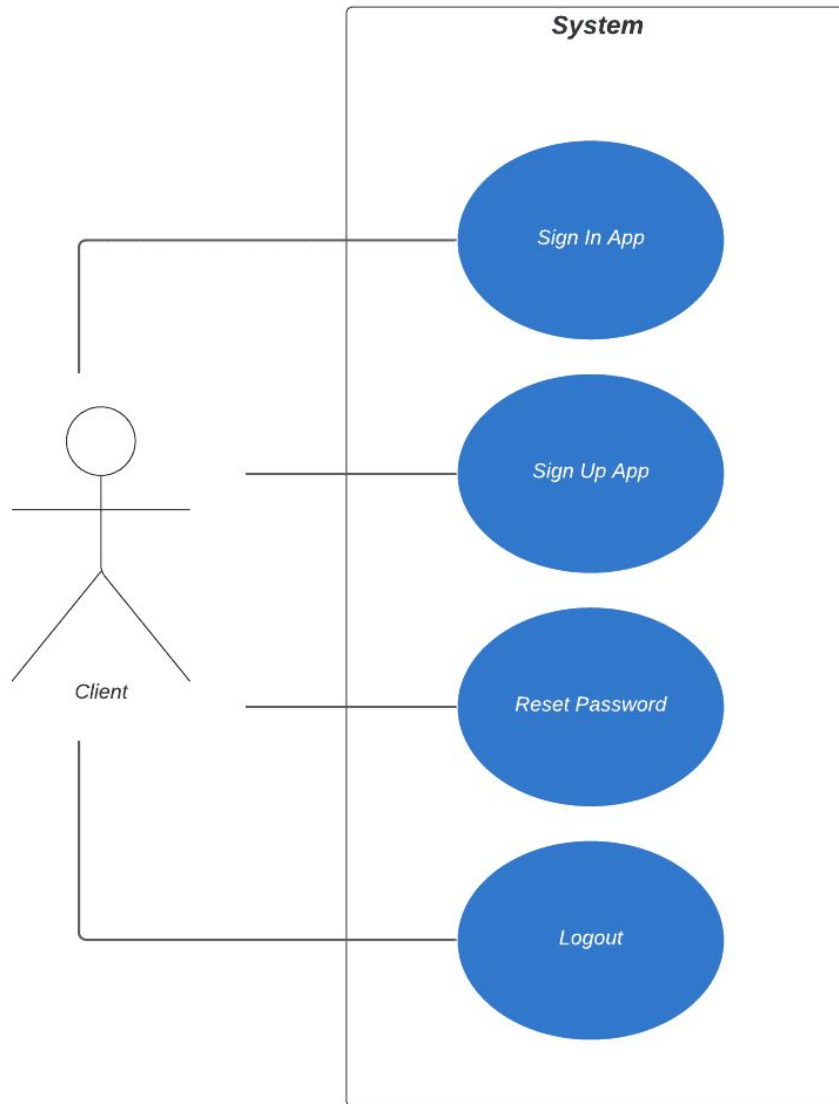
Figure 1: Use Case User Account
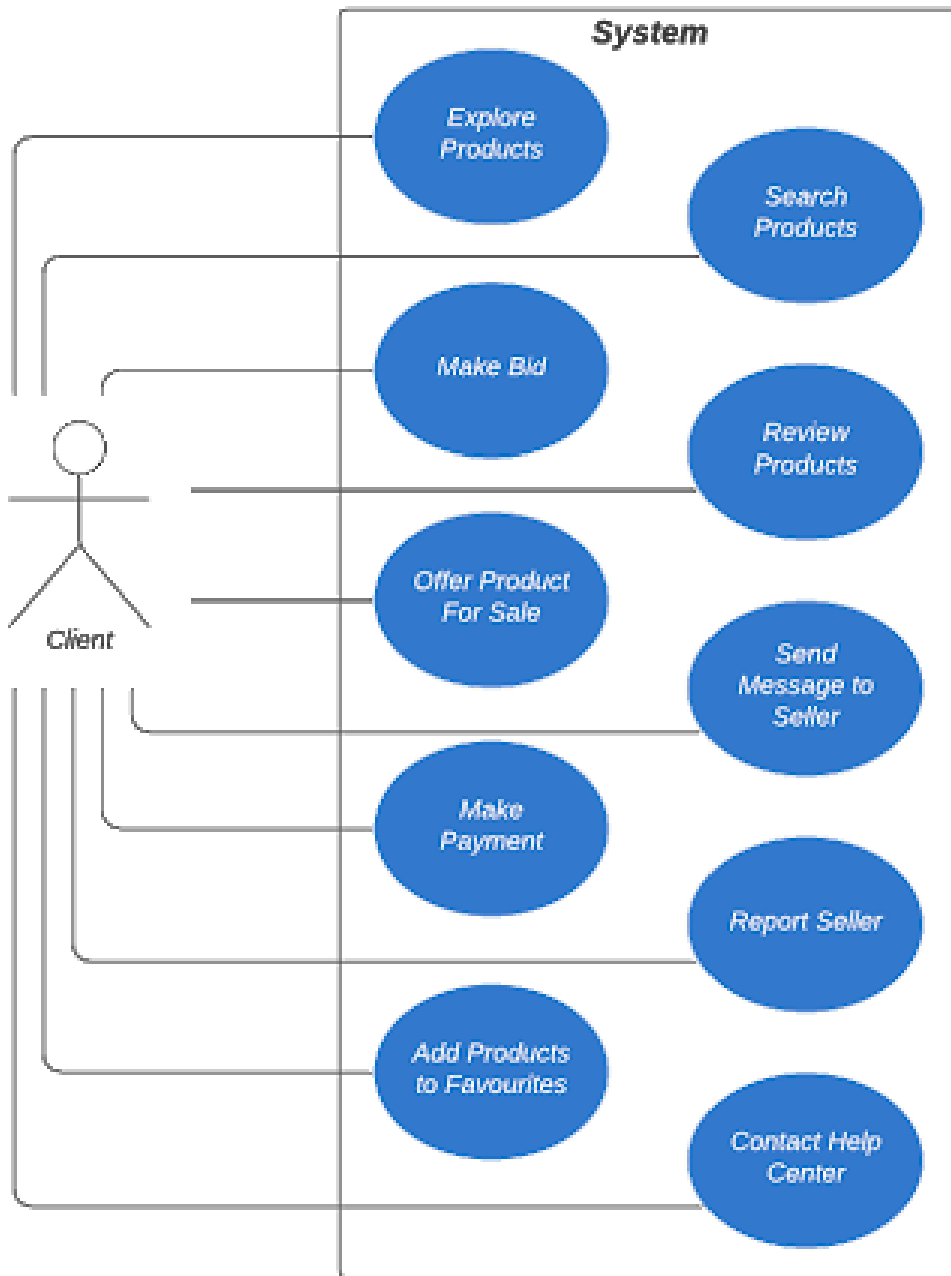
Figure 2: Use Case Client Operations
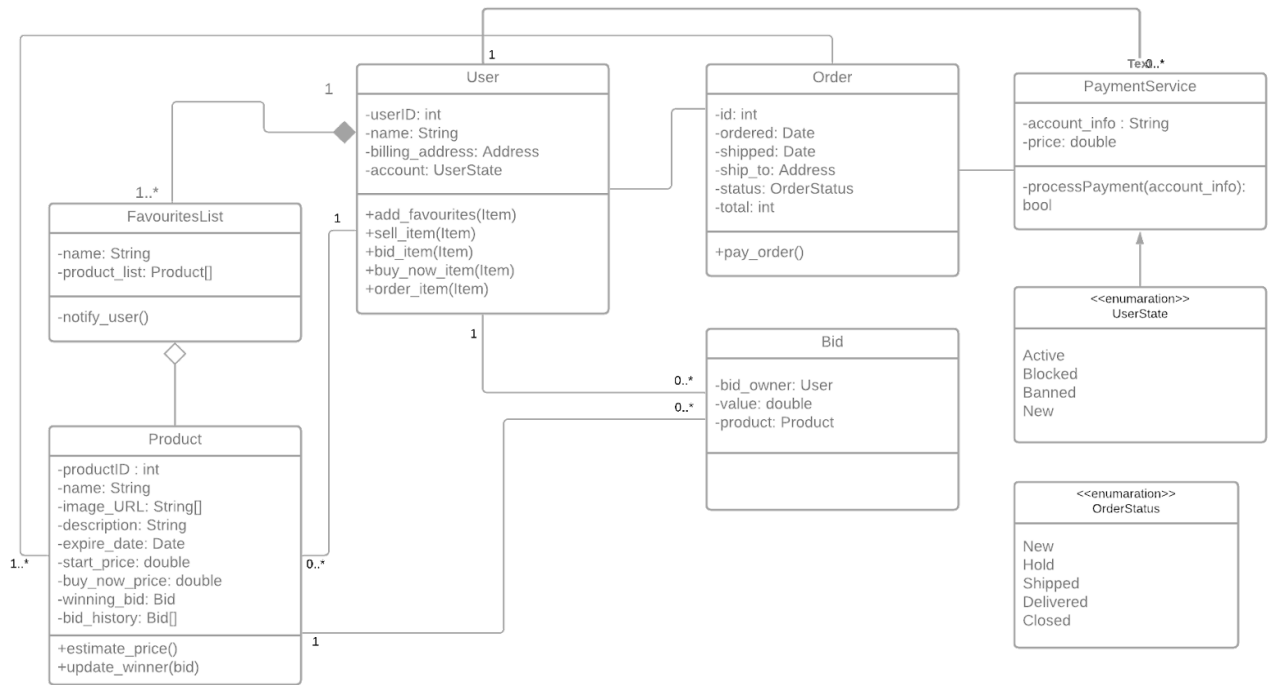
3.5.3 Object and Class Model

Figure 3: Object and Class Model

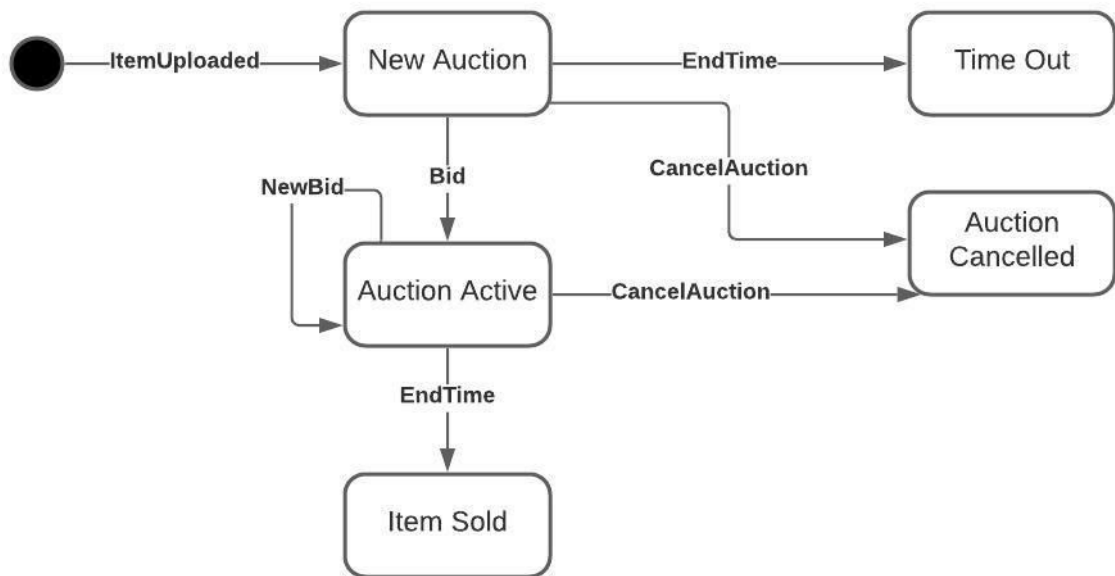### 3.5.4 Dynamic Model

3.5.4.1 State Diagram

Figure 4:State Diagram

3.5.4.2 Sequence Diagram
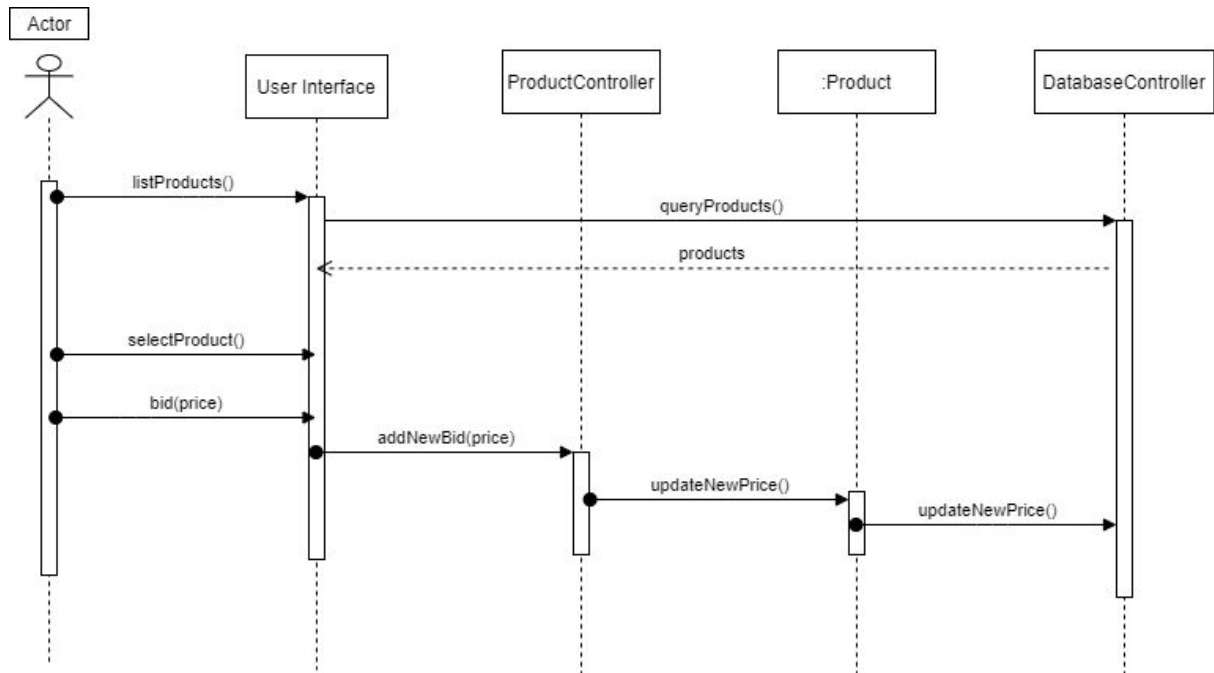
3.5.4.2.1 Sequence Diagram for Bidding a Product

Figure 5: Bidding Sequence Diagram

Users list all the products with the chosen parameters by getting data from the database. After selecting a specific product, the user can bid a price for the chosen product. Then, the current price of the product is updated via ProductController.

3.5.4.2.2 Sequence Diagram for Payment
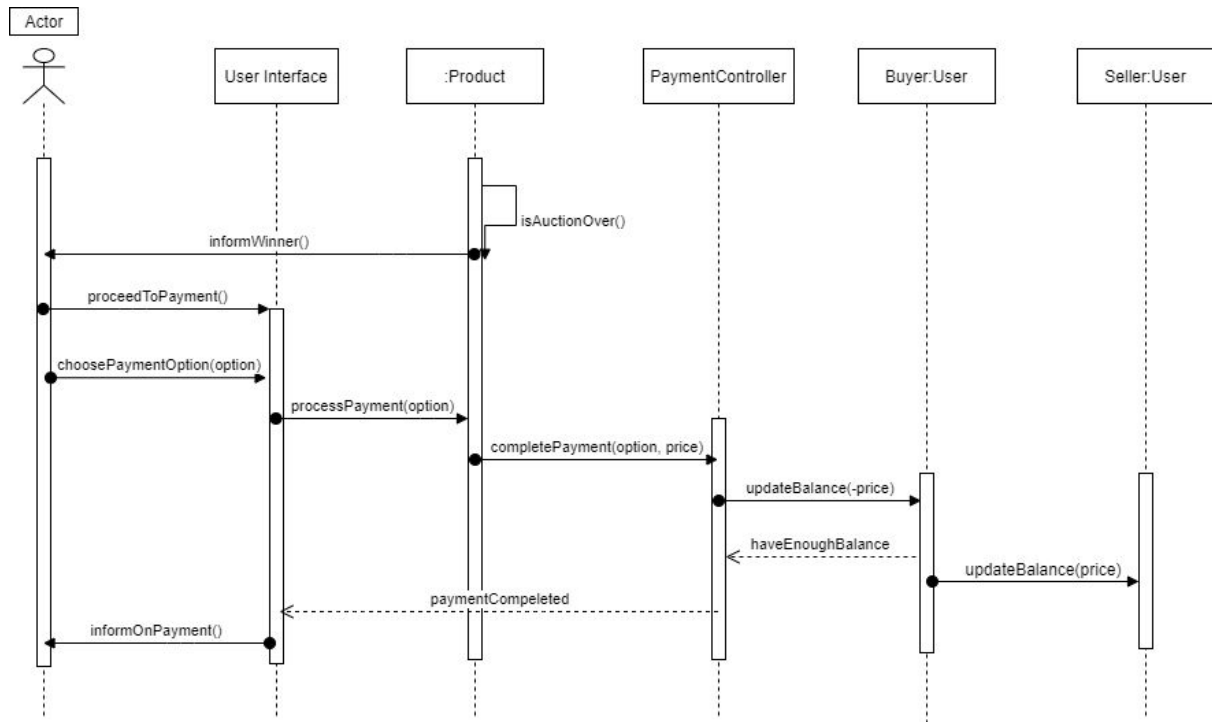
Figure 6: Payment Sequence Diagram

When the auction is over, the winning user is informed with a notification. Then, the user proceeds to the payment by choosing the payment option. If the buyer has enough balance to buy the product, balances of the buyer and the seller is updated and the payment is completed.
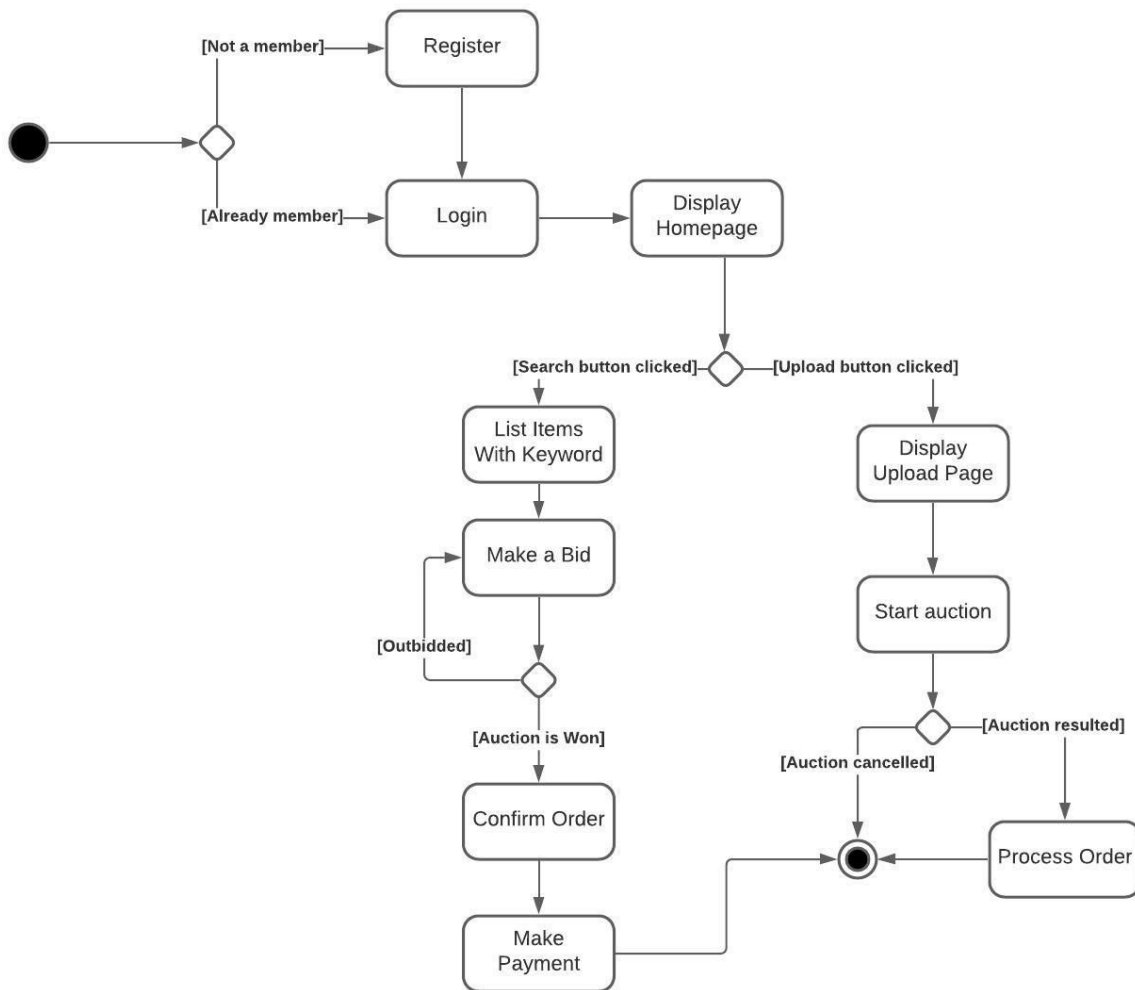
3.5.4.3 Activity Diagram

Figure 7: Activity Diagram

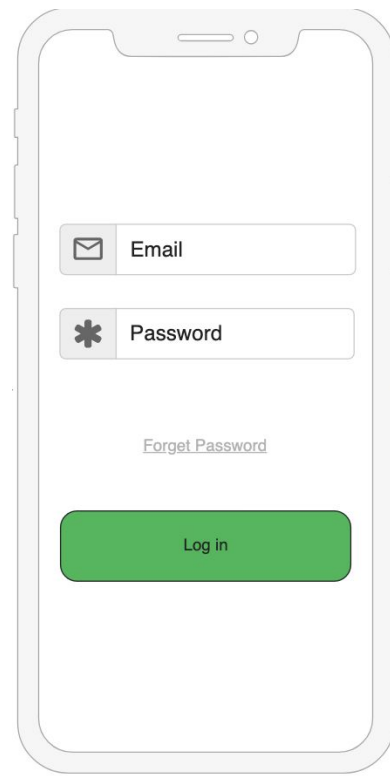## 3.5.5 User Interface

Figure 8: Sign In & Up Page
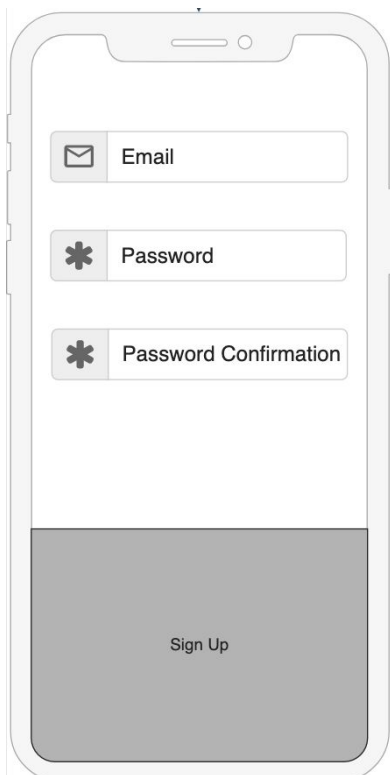

Figure 9: Login Page with Credentials
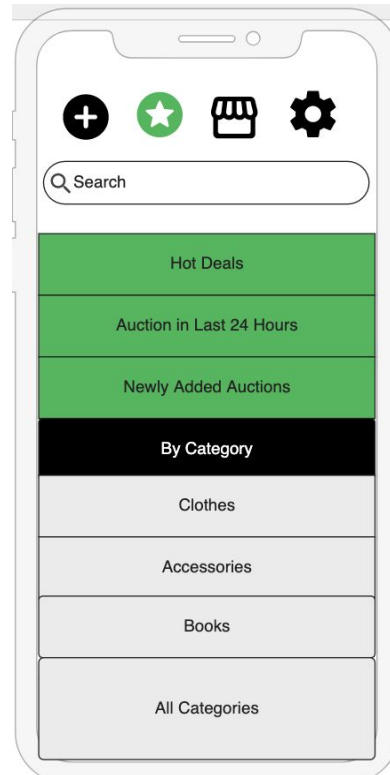

Figure 10: Sign Up Page Credentials
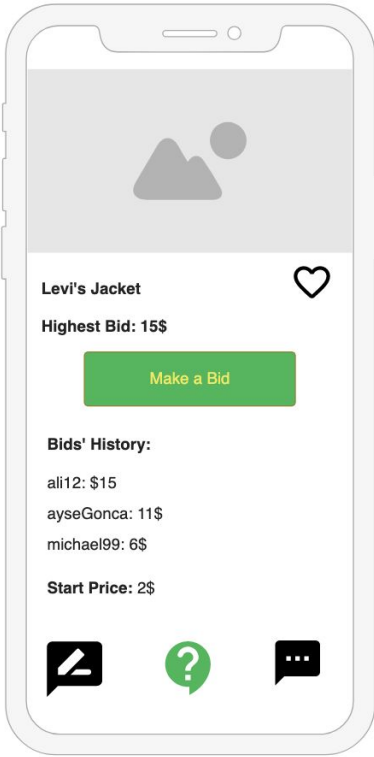

Figure11: Main Page of Categories

Figure 12: Page for Making Bid for a Product
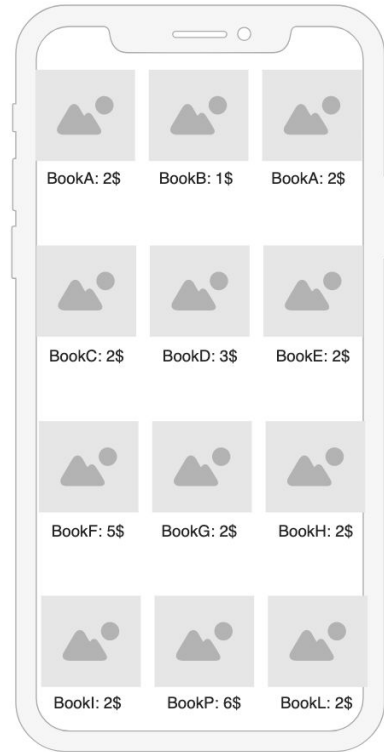

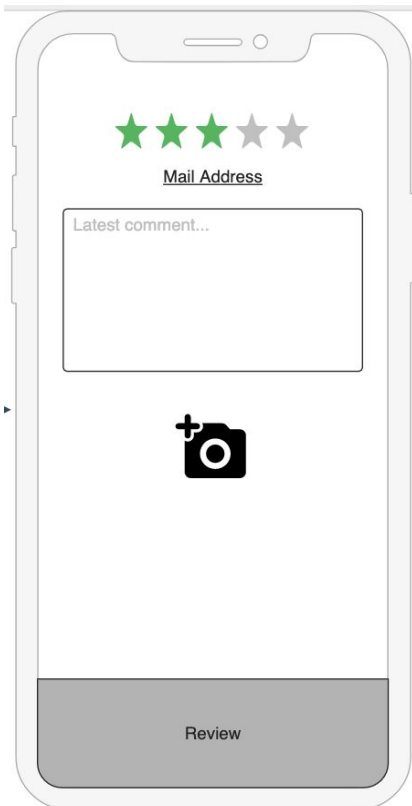Figure 13: Product List View Page

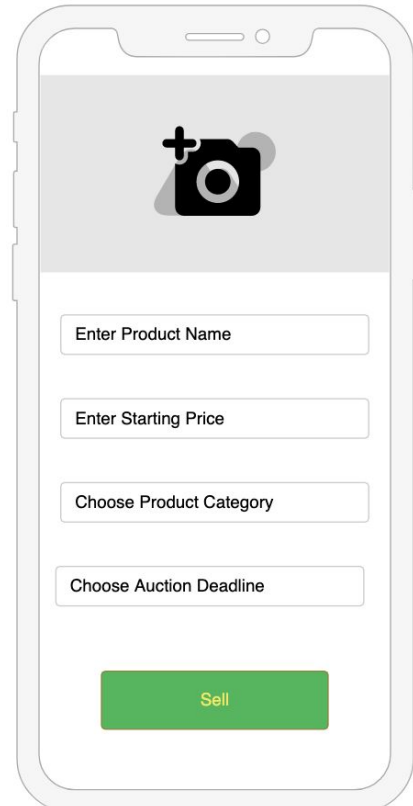
Figure 14: Making review for a product

Figure 15: Adding specifications for selling a product

4. Other Analysis Elements

4.1 Consideration of Various Factors

The brief discussions about the various factors affecting the design phase of the project can be found below in the subsections.

4.1.1 Public Health Considerations

The System will not have any feature that might affect the user's health. Thus, BidIt will not get affected by public health factors.

4.1.2 Public Safety Considerations

The system will store personal information about the user such as their names, numbers, credit cards, address etc. The safety of this information will be considered. Also, the platform will have a positive effect on public safety because before, some auctions were being done in Facebook comments, which can be harmful to share delivery information with other people.

4.1.3 Public Welfare Considerations

BidIt is a non-profit application which does not demand any kind of fees from user to download and or requires any commission. Firstly, It will be a platform where users can find affordable second-hand products. Secondly, users will be able to sell their unwanted products and gain money. In addition, shopping and getting rid of the stuff that is no longer needed have a positive effect on people's happiness. Since public welfare is the collection of happiness, fortune, and health, BidIt will aim to make the app so that it will affect all these factors positively.

4.1.4 Global Scale Considerations

BidIt aims to make people in Turkey adapt and use a shopping system based on bidding. Thus, BidIt will support Turkish language. It will also support English since it is a global language. However, based on demand, other languages can be supported in the future.

4.1.5 Environmental Considerations

The products being sold in BidIt will be mostly second-hand products. Producing new products has a cost in terms of raw materials and energy. Thus, selling and buying second-hand products is a sustainable alternative for the environment.

4.1.6 Cultural Considerations

BidIt won't be affected by cultural factors, since the platform does not have any feature that can affect cultures.

4.1.7 Social Considerations

BidIt will be affected by social constraints because it will be a platform where users interact with each other. Thus, the idea was made such that BidIt will be in full service of the society.

In the table below, the significance of each factor on a scale of 0 (none) to 10 (maximum) can be found:

	Level
Public Health	0
Public Safety	8
Public Welfare	7
Global Scale	2
Environmental Factors	8
Cultural Factor	0
Social Factor	8

Table 1: Factors that have an effect on the design and their significance

4.2 Risks and Alternatives

There will be some implementation risks that could be crucial in the development process. Foreseeing these risks and finding B plans that address these risks is a must for the team. The risks and their alternative plans to overcome these risks can be found below.

- Database system might collapse. It is planned to take regular system backups and start the backup database in the event of a collapse.
- Time may not be long enough to deliver all of the desired requirements. It is planned to keep the significant requirements and remove minor features that have the least impact on the user.
- Ebay Taxonomy API may crash. It is planned to inform users about the problem. It will only affect the automatic categorization of the products.
- Team members might be unfamiliar with the technologies that are going to be used. It is planned for all group members to spare some time to learn the technologies beforehand.
- The initial design and architecture of the project might fail to hold the expectations. It is planned to come up with a more suitable design and architecture in the next phases.

The risks and their information can be found in the table below:

Risk	Possibility of Occurrence	Effect	Alternative Plan
Database collapse	medium	Not being able to reach user data	Backup database
Time Shortage	medium	A shortage in the number of features	Ensuring the implementation of significant requirements
API crash	low	Categorization service won't work	Inform user
Unfamiliarity with the technology	medium	Time delay and more workload	Using individual spare hours to learning needed technologies
Design and architecture inefficiency	medium	Time delay and more workload	Coming up with new design and architecture

Table 2: Risk and their information

4.3 Project Plan

4.3.1 Project Goals

- Proficiency in React Native will be achieved.
- High-Level Design Report will be written.
- Low-Level Design Report will be written.
- Database connection will be provided.
- A cross-platform application will be implemented.
- User Interface will be designed.
- An automatic categorization feature will be added.
- A price prediction feature will be added.
- Wallet system will be added.
- Final Report will be written.
- Presentation and Demo will be made.

4.3.2 Work Packages

WP#	Work Title	Leader	Members Involved
WP1	Analysis and High-Level Design	Rumeysa Özaydın	Everybody
WP2	Database	Hasan Yıldırım	Everybody
WP3	Low-Level Design	Efe Eroğlu	Everybody
WP4	Development-1	Ahmet Serdar Gürbüz	Everybody
WP5	Development-2	Muhammet Kamil Gök	Everybody

Table 3: Work Packages

Work Package 1

- Leader: Rumeysa Özaydın
- Milestone: React Native will be learned and third party libraries will be decided. Skeleton of the app will be created. High Level Design Report will be written. A demo of the project will be done.
- Deliverable: High-Level Design Report.
- Description: Currently, we are not qualified to work with React Native. We will focus on that. In addition, the base of the program will be prepared in this work package.

Work Package 2

- Leader: Hasan Yıldırım
- Milestone: The infrastructure of the database is finished and the frontend and backend are connected to each other.
- Deliverable: Small program that users can log in.
- Description: The Database creation will be based on the information flow. We will gradually test the information being kept. The connection between frontend and backend will be provided.

Work Package 3

- Leader: Efe Eroğlu
- Milestone: Low-Level Design Report is made and ready to be submitted.
- Deliverable: Low-Level Design Report.
- Description: The Low-Level Design will be completed and uploaded to the project website.

Work Package 4

- Leader: Ahmet Serdar Gürbüz
- Milestone: The app is implemented and the user interface is written.
- Deliverable: Demo of BidIt.
- Description: The BidIt with its basic feature will be implemented.

Work Package 5

- Leader: Muhammet Kamil Gök

- Milestone: Price prediction, automatic categorization and wallet system will be added. All tests of the application will be done. The entire project will be completed with the Final Report.

- Deliverable: Final Report and Final app.

- Description: New features described will be added. The tests will prevent the platform from working incorrectly. The final report and the app will be finished.

4.3.2 Project Plan

Figure 16 : Gantt Chart for project plan

4.4 Ensuring Proper Team-work

To ensure teamwork we will use three platforms. These platforms and the ways they were used can be found below,

- Whatsapp: Whatsapp was used in order to select a day to arrange a video call through Google Meets.

- Github: Github was used to set the project website. All team members have a Github account. Everyone can access and contribute to the repository regarding the project website. The same procedure will be followed throughout the semester for the project. Branches will be used in order to work on different work packages at the same time. The proper integration of these branches will be done.

- Google Meets: Google Meets was used firstly during the project selection stage. Also, it is a good way to talk simultaneously with everyone.

Also, all members are assigned as a leader to a different work package. It is important to have leadership skills and by doing this we aim to enhance these skills. The roles of leaders will be empowering the members and maintaining good communication for possible changes and updates. Also, ensuring the deadlines are met.

4.5 Ethics and Professional Responsibilities

As engineers, our most important responsibility is to follow proper ethical values while building products. The National Society of Professional Engineers' Code of Ethics will be followed [5].

All required permissions will be taken from the user before using the application. Also, the user data will not be shared with third-party companies.

4.5 New Knowledge and Learning Strategies

First of all, React Native is going to be used and it is important for each member to be familiar with it by watching tutorials and some hands-on experience. Also, we aim to develop our leadership skills by letting each group member be the leader in some phase of the implementation.

Each group member is obligated to learn the subjects that are related to their project in the workflow.

5.Glossary

API: Application programming interface is an interface for the interaction between two systems.

Gantt Chart: It is a commonly used chart to show the activities against time in a project. The left of the chart contains the list of the activities and the top line contains the time scale. The colored bars show the start and end time of an activity.

6. References

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