Product Requirements Document

Submission 1 Specification

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SWEN90007 SM2 2023 Project

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1. Introduction

1.1 Proposal

This document specifies the SWEN90007 share trading system project **use case lists**, **the use case diagram and** the **system's domain model**.

1.2 Target Users

This **application** is mainly intended for **customers to buy the shares they want, for the administrator to manage the system and for company users to sell their shares**.

1.3 Notice

This document is mainly focused on the important use case functionalities that are described in the specification. The least important use case, like login, register, and logout, is not considered as it is the basic functionality for every software system.

1.4 Assumptions

In this project, we have made the following assumptions:

- Each company will have a certain amount of shares that could be listed.
- The share that the customer sold to the company will be the share that is available for the company user to list for trading.
- The listing stores only one type of share, but it can support many different types.
- Customers can buy only one type of share at a time.

2. Actors

Actor	Description
Administrator	The administrator is a role that is responsible for managing the entire trading system. Its responsibility includes managing all customers and company listings. The administrator is considered an actor because it directly impacts the system's functionality.
Customer	The customer uses the system to invest shares to gain profit from their investments. They manage their own investment portfolio when buying or selling the shares. The customer is the core user of the system and interacts with the system a lot, so the customer is considered as an actor.
Company User	The company user is the share provider of the market, they use the system to sell their company's share, repurchase back their company's share and adjust the listing prices. The company user is the actor because they contribute to the core functionality of the system.

3. Use Cases

3.1 Administrator Functionality

[UC001] View the current portfolio of all system customers

Actors

Administrator.

Pre-conditions

The administrator must log in to view the customers' portfolio listing.

Basic Flow

1. The administrator presses the "Customers" button on the slide menu.
2. The administrator navigates to the Customers page.
3. The system displays the customers' portfolio listing on the Customer page.

Alternative Flow

There is no alternative flow since the administrator only can view the customers' listings without any other process.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and provides a refresh button to retry the access.

Post Condition

The administrator should view the customers' portfolio listing when he navigates to the Customers page.

[UC002] View all Company listings

Actors:

Administrator.

Pre-conditions:

The administrator must log in to view the company listing.

Basic Flow

1. The administrator presses the "Companies" button on the slide menu.
2. The administrator navigates to the Companies page.
3. The system displays the company listing on the Companies page.

Alternative Flow

There is no alternative flow since the administrator only can view the company listing without any other process.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and provides a refresh button to retry the access.

Post Condition:

The administrator should view the company listing when he navigates to the Companies page.

3.2 Company User Functionality

[UC003] Create new listing

Actors

Company user

Pre-conditions

The system must be logged in with company access.

Basic Flow

1. The company clicked on the button "create new listing", and the system brought the user to the "create new listing" page.
2. The company user puts in all information, including share, amount, type and then press submit button. - [AF01] - [EF01]
3. The system confirms the action and redirects to the home page.

Alternative Flow

[AF01] Invalid share, type or amount

1. The company user puts in a share name or type that cannot be identified by the system or an amount greater than the total amount.
2. The system should return an error message.
3. The company user puts in the correct information.
4. The system confirms the action and redirects to the home page.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and provides a refresh button to retry the access.

Post Condition

The company user received a confirmation dialogue, and the listing is shown on the trading centre.

[UC004] Company users manage the listings

Actors:

Company User

Pre-conditions:

The system must be logged in with company access.

Basic Flow

1. The company user pressed the edit button of a listing. - [AF01]
2. The system redirects to the "create new listing" page with all data shown.
3. The company user changes what he wants to edit. - [AF02]
4. The system confirms his action and redirects him to the company home page.

Alternative Flow

[AF01] The company user pressed the delete button

1. The company user pressed the delete button and confirmed this action.
2. The system deleted the listing and refreshed the page.

[AF02] The company user entered the wrong amount

1. The company user entered a share amount exceeding the company's share.
2. The system presents an error message and refreshes the page.
3. The company user entered the correct amount.
4. The system confirms the information and returns to the home page.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and provides a refresh button to retry the access.

Post Condition:

The listing is edited or deleted based on the action of the company user.

3.3 Customer Functionality

[UC005] View all the selling shares in the central exchange for each company

Actors:

Customers

Pre-conditions:

There is at least one company listed for selling.

Basic Flow

1. The user navigates to the dashboard page.
2. The user-end will require the data from the server.
3. The system will present all the listed shares in a table form with configurable pagination. Each row represents a list of shares, including the number of shares, price of shares, class of shares and industry of the company.

Alternative Flow

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and returns the error message to let the actor retry the action later.

[EF02] Data missing Exception

1. The system fails to acquire the data of the share lists several times.
2. The system will pop the error message about the possible network connection failure.

[EF03] Pagination data missing exception

1. The system fails to acquire the pagination data several times.
2. The system will pop the error message about the possible network connection failure.

Post Condition:

- The table is displayed properly, the user can view more listing shares by altering the pages.

[UC006] Customers can search for shares

Actors:

Customers

Pre-conditions:

There is at least one company listed for selling.

Basic Flow

1. The user navigates to the page with searching functionality.
2. The user could config the search criteria by company name, price range and selected industry.
3. The system will acquire the data according to the search criteria defined by the customer.
4. The system will present all the listed shares in a table form, with configurable pagination. Each row represents a list of shares, including the number of shares, price of shares, class of shares and industry of the company.

Alternative Flow

[AF01] No result found

1. The system will present an empty list, showing nothing found.

Exception Flow

[EF01] Data missing Exception

1. The system fails to acquire the data of the share lists several times.
2. The system will pop the error message about the possible network connection failure.

Post Condition:

- The table is displayed properly, and the user can view more listing shares by altering the pages.

[UC007] Customer can purchase shares of companies

Actors:

Customers

Pre-conditions:

Customer is logged in.

There is at least one purchasable share in the central exchange.

Basic Flow

1. The customer selects the share they want to purchase.
2. The system displays the available amount of shares and the price of the share.
3. The customer enters the amount of share and type of share.
4. The system verifies if the amount and type are valid for purchasing.
5. System displays the total cost and displays it to the customer.
6. The customer confirms the purchase.
7. The system processes the purchase, updates the user’s portfolio and sends the confirmation message.

Alternative Flow

[AF01] Not enough Found

1. The customer did not have sufficient funds.
2. The system cancels the purchase and releases the locked share.
3. The system will pop the message about purchasing failure about the insufficient funds.

[AF02] Invalid amount of share

1. The customer enters an amount larger than the available amount.

2. The system stops the purchasing process.
3. The system pops the message about an invalid amount and displays the available amount of shares.

[AF03] Not enough share available when confirm purchase

1. The amount of shares that customers entered is not available when they confirm the purchasing.
2. The system stops the purchasing process.
3. The system pops the message about the available amount and displays the available amount of shares.

[AF04] Customer cancel the purchase

1. The customer clicks the cancel button.
2. The system stops the purchasing process.
3. The system pops the message about a cancelled transaction.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and returns the error message to let the actor retry the action later.

Post Condition:

- The customer's portfolio is updated.
- The available amount of the share of the purchased company's share is reduced by the corresponding amount.
- The customer's balance is updated.
- The newly purchased share is included in the customer's profit and loss calculation.

[UC008] Viewing the portfolio

Actors:

Customers

Pre-conditions:

Customer is logged in.

Basic Flow

1. The customer navigates to a personal portfolio page.
2. The system acquires the customer's personal portfolio data.
3. The system displays the portfolio data in a table, where each row corresponds to one company's share, including the amount, purchasing price, market price, purchasing time, company name and profit or loss of this particular share.

Alternative Flow

[AF01] No shares in portfolio

1. The customer has no shares in their portfolio.
2. The system displays an empty table and a message for no purchased shares.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and returns the error message to let the actor retry the action later.

[EF02] Data missing Exception

1. The system fails to acquire the data, several times.
2. The system will pop the error message about the possible network connection failure.

Post Condition:

- The customer's portfolio is updated.
- The available amount of the share of the purchased company's share is reduced by the corresponding amount.
- The customer's balance is updated.
- The new purchased share includes the customer's profit and loss calculation.

[UC009] Sell the shares anytime

Actors:

Customers

Pre-conditions:

Customer is logged in.

The customers obtain the share they want to sell.

Basic Flow

1. The customer navigates to their personal portfolio page.
2. The customer selects the share they want to sell.
3. The customer enters the amount they want to sell.
4. The system verifies the amount, then displays the total revenue of this transaction.
5. The customer confims the transaction.
6. The system updates the customer's balance, portfolio, total profit and loss.
7. The system updates the company's avaliable shares.

Alternative Flow

[AF01] Invalid amount

1. The customer enters the amount more than the amount in the portfolio.
2. The system stops the selling process, pops an error message for invalid amount and asks for customer's correction.

[AF02] Customer cancel the sell

4. The customer clicks the cancel button.
5. The system stops the selling process.
6. The system pops the message about a cancelled transaction.

Exception Flow

[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and returns the error message to let the actor retry the action later.

Post Condition:

- The customer's portfolio is updated, with sold shares removed.
- The company's share available for listing is increased by the corresponding amount.
- The customer's balance is updated.
- The profit or loss of this transaction share will be calculated in the total profit and loss.

[UC010] Customer can view current net profit and loss

Actors:

Customers

Pre-conditions:

Customer is logged in.

Basic Flow

1. The customer navigates to their personal portfolio page.
2. The system calculates the current value of each share in the portfolio, then subtract the value of each share when purchasing it.
3. The system calculates the net profit and loss in consideration of all shares purchased, including all the shares that are already sold.
4. The system displays the net profit or loss.

Alternative Flow

None

Exception Flow

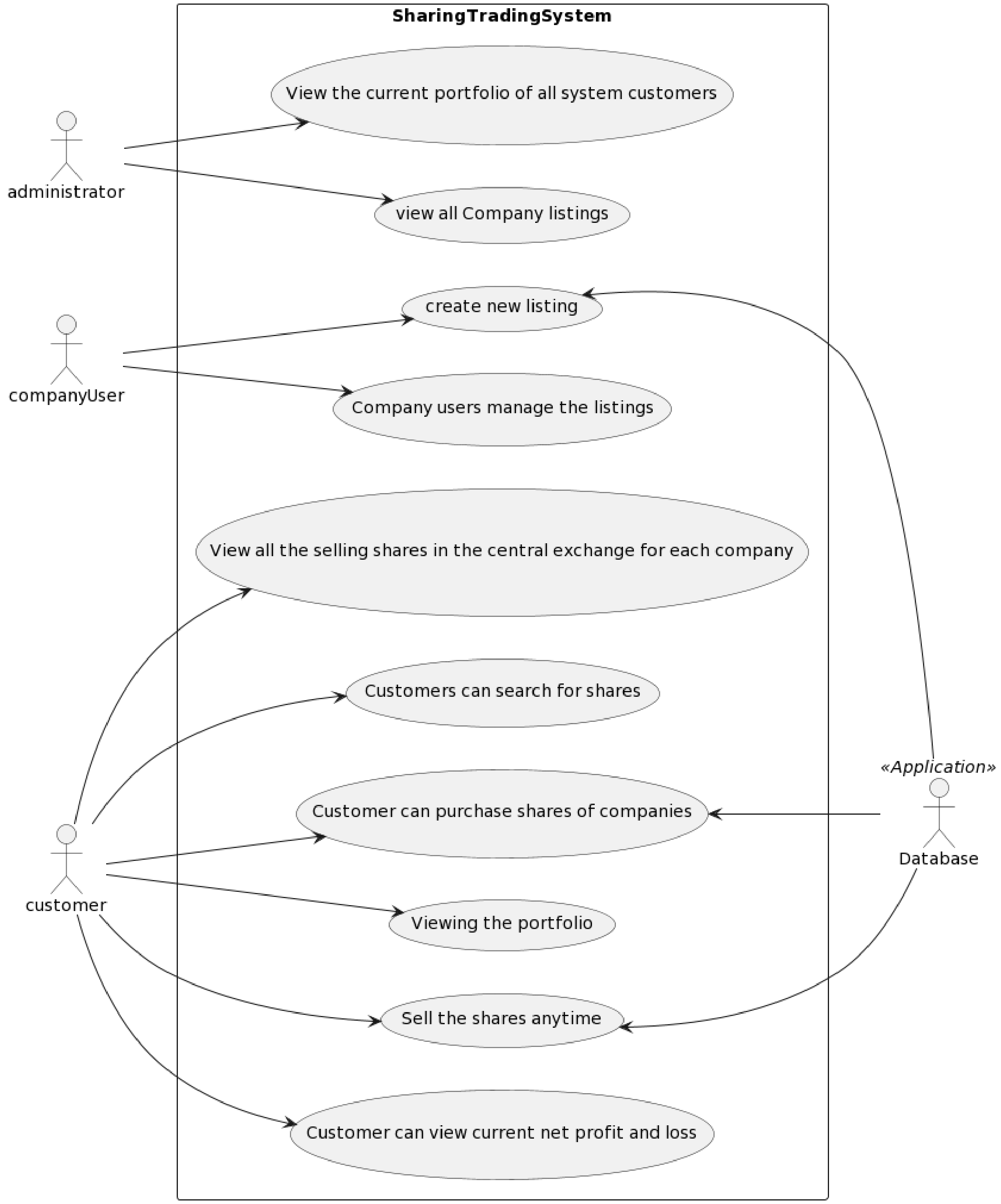
[EF01] Runtime exception

1. The system fails to access the database due to network or other reasons.
2. The system identifies the runtime exception and returns the error message to let the actor retry the action later.

Post Condition:

- Customers have access to up-to-date and accurate information about their net profit and loss.

4. Use Case Diagram


SharingTradingSystem
administrator
companyUser
customer
«Application»
Database
View the current portfolio of all system customers
view all Company listings
create new listing
Company users manage the listings
View all the selling shares in the central exchange for each company
Customers can search for shares
Customer can purchase shares of companies
Viewing the portfolio
Sell the shares anytime
Customer can view current net profit and loss

5. Domain Model

5.1 Domain Model Description

Based on the specifications provided for the **Sharing Trading System**, the system entities, attributes, and business rules can be **summarized** as:

- **Users** can be either an **Administrator**, **CompanyUser** or **Customer**;
- Only Customers have **Portfolio** and Customer only has *exactly one* Portofolio;
- *Each* Portofolio belongs to *exactly one* Customer;
- Only CompanyUser belongs to **Company** and CompanyUser only belongs to *exactly one* Company;
- Company can have *one or more* CompanyUsers;
- **Listings** *are either* **InvestListing** or **CompanyListing**
- **Exchange** can have *one or more* CompanyListings;
- There is *exactly one* Exchange;
- Portofolio can have *zero or one* InvestListing;
- *Each* InvestListing only belongs to *one* Portofolio;
- *Each* Listing stores *one* Company information; and
- Company can have *zero or more* Listings;
- Customer can buy shares from *zero or more* Listings; and
- Shares of each Listing can be bought from *zero or more* customers.

Entities have been bolded; attributes have been underlined; and important *associations* have been italicized.

5.1.1 Entity explanation

Users: We have three types of users in the system, Administrator, CompanyUser, Customer.

InvestListing: The listing storing all the shares that each customer invests.

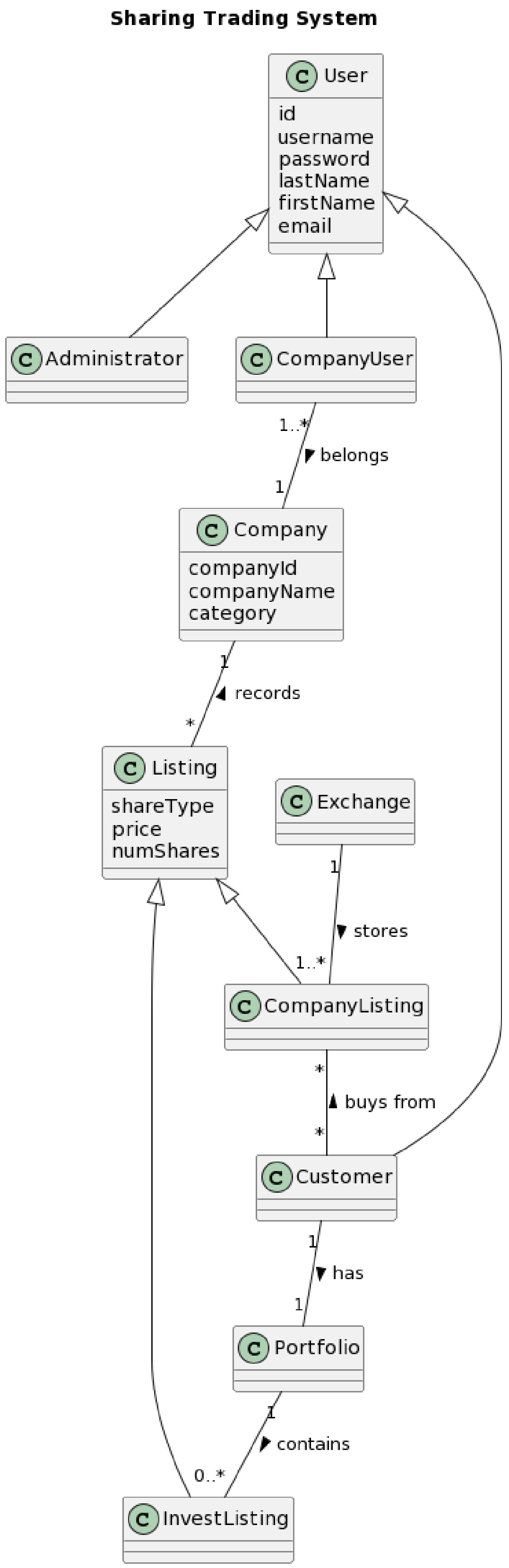
CompanyListing: The listing created by the CompanyUser storing the shares they want to sell.

Portfolio: Storing the listing information for each customer.

Exchange: The central exchange display all the CompanyListing for customer to buy the shares

Company: Store the information of the company.

5.2 Domain Model Diagram


Sharing Trading System
User
id
username
password
lastName
firstName
email
Administrator
CompanyUser
1..*
belongs
1
Company
companyId
companyName
category
1
records
*
Listing
shareType
price
numShares
Exchange
1
stores
1..*
CompanyListing
*
buys from
*
Customer
1
has
1
Portfolio
1
contains
0..*
InvestListing