COMP 354 Intro to Software Development
Fall 2023

Assignment #1
Software Requirements Specification Document
Shopping Cart App

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Introduction:

The purpose of this document is to design a higher quality e-commerce program and apply it to a shopping website. This website allows users to purchase books, learning tools or other goods. The e-commerce program is designed to provide users with a better shopping experience. Experience can recommend relevant products based on the items users usually search and browse, thereby greatly improving consumers' shopping experience and consumption desire. Currently, shopping websites lack personalized product recommendations and insufficient promotion of stranded products. This e-commerce program the application is intended to achieve a benign consumption cycle relationship between consumers and products. The details of how the software meets these requirements are elaborated in use cases and supplementary specifications to influence organizational strategy.

1.1 Scope

The goal behind creating the My Books web app is to enable users to effortlessly discover books that align with their interests and requirements. Additionally, it offers users enhanced and more tailored tools for managing their reading lists. These three new functionalities will empower users to refine their search and locate a book that suits them more effectively. Furthermore, these added features will streamline the search process, ultimately saving users time and making their search efforts more efficient.

1.2 Definition and Acronyms

Terms	Definitions
MUI	Material User Interface
SQL	Structured Query language
GPL	General public license
UI	User Interface

API	Application programming Interface
ISBN	International Standard Book Number

1.3 References

Reference ID	Title	Reference
1.	Designing systems and software applications by using models [IBM]	https://www.ibm.com/docs/en/rational-soft-arch/9.5?topic=modeling-designing-systems-software-applications-by-using-models
2.	System: Online Shopping Cart (E-commerce website)	https://github.com/shashirajraja/shopping-cart

2.Positioning

2.1 Problem Statement

The problem of	What is the problem? At present, the shopping system only allows users to display targeted products, and the practicality and personalization of functions are very lacking.
Affects	Who is getting affected and how ? When consumers use this website to shop, they will be pushed to products that are frequently viewed and related.
The impact of which is	What is the impact of the current system?

	The current system will greatly reduce consumers' shopping experience and desire to shop.
A successful solution would be	What is the successful solution/system- to be? We hope that the system can push relevant products by analyzing the products that users have previously browsed or retrieved, and push discounted products based on the personal information provided by users to improve consumers' shopping experience and promote website revenue.

2.2 Product Position Statement

For	The user of system People who need to purchase goods from this website
Who	What is their need? They need to develop an e-commerce program to facilitate consumers to browse related products of interest more quickly when shopping.
System(name of the System	Website/webapp/apk/etc
That	How does the system help the user? Push relevant products and recommend discounted products by analyzing users' browsing and purchasing preferences.
Unlike	What is lacking in the existing system? The existing system has the problem of single product display
Our product	What is provided in our product and how is it beneficial?

	Allow consumers to view the items and quantities in the shopping cart and change the desired quantity at will, as well as related products they like will be pushed by the system

3. Stakeholder Description

3.1 Stakeholder Summary

By understanding the roles and interests of each stakeholder group, the Concordia Cart team can ensure that the platform meets the needs of all parties involved and contributes to its overall success.

Name	Description	Responsibilities
Customer	These are the primary users of the Concordia Cart application. They will use the application to browse, search, and purchase books, learning tools, and other goods.	Provide genuine feedback for improvements, Report bugs or malfunctions in the system, and ensure that they use the platform ethically and responsibly.
Product Owner	The individuals or groups who have a vested interest in the financial success of the Concordia Cart. They typically decide on features and prioritize them based on business needs.	Ensure the app meets business objectives, prioritize features and fixes and allocate resources for the development and maintenance of the application.
Developer	This group is responsible for building, testing, and maintaining the Concordia Cart application.	Develop and deploy new features, fix bugs, improve performance and ensure the security and stability of the application.
Tester	Tests the scenario according to customer requirements and suggests required changes to the developer.	Test the application against its functional requirements, ensure that features like product search, adding items to the cart, checkout process, etc., work as intended and report defects or discrepancies between the actual behavior and expected

		behavior.

3.2 User Summary

The detailed interaction and collaboration between these users, as well as their specific requirements, can be further detailed in use cases, user stories, and supplementary specifications.

Name	Description	Responsibilities
End Consumer	Individuals who visit the Concordia Cart website to search, browse, and purchase books, learning tools, or other goods.	Search and browse products, add desired products to the shopping cart, place orders and complete transactions, provide feedback and ratings on products, maintain their user profiles with accurate information.
Administrator	Individuals responsible for managing and overseeing the operations of the Concordia Cart website.	Handle user inquiries, complaints, and feedback. Monitor and manage transactions. Update website content and banners. Oversee promotional campaigns and strategies.
System Developer and Tester	Technical personnel responsible for the design, development, maintenance, and support of the e-commerce program and website.	Develop, test, and deploy updates and features for the website. Ensure the security and stability of the platform. Address technical issues and bugs reported by users or administrators. Backup and restore data as necessary.

3.3 User Environment

To ensure that the users of Concordia Cart have an optimal experience, it's crucial to define the environment in which the software will run efficiently. The following are the software, server, hardware, and network requirements necessary for the smooth operation of the Concordia Cart e-commerce application.

1.Customers will need a smartphone, laptop or desktop computer with a stable internet connection and browser support in order to connect and access the Concordia Cart.

2.The Concordia Cart for users is designed to be responsive and accessible across a variety of devices including: Desktops, Laptops, Tablets, Smartphones.

3.System Administrator, Tester and System Developer need to be connected to the server environment using their laptop or desktop with an updated browser to perform their task.

4. Product Overview

4.1 Product Perspective

The Concordia Cart system is a stand-alone application, but it's placed within the larger ecosystem of e-commerce. When users interact with the system, they are not just browsing products; they are interacting with a smart platform that learns from their interactions, searches, and past purchases.

Contextual Representation of Concordia Cart:

Users: These are individuals who come to the Concordia Cart website or app with the intent of browsing or purchasing goods. They can search products, add to cart, browse recommendations, and make purchases.

Admin: Responsible for managing product listings, handling disputes, and ensuring smooth operation of the platform.

Sellers: Individuals or businesses who list their products on the platform. They can monitor their sales, get insights on popular products, and benefit from the advanced recommendation system which highlights their products to potential buyers.

Recommendation Engine: An underlying AI system that tracks user behavior, analyzes patterns, and suggests products based on user preferences, searches, and browsing history.

Checkout System: Handles user transactions, ensuring smooth and secure payment processes.

Interactions with the System:

Search & Browse: Users can search for specific items or browse through categories, and the system will display relevant products.

Personalized Recommendations: As users interact more with the platform, Concordia Cart's recommendation engine will suggest products tailored to their interests, improving their shopping experience.

Cart & Checkout: Users can add products to their cart and proceed to a secure checkout, completing their purchase.

Feedback & Reviews: Post-purchase, users can leave feedback or review products, influencing future buyers and assisting in refining the recommendation engine.

Admin & Seller Dashboards: Advanced interfaces for sellers to manage their listings and for admins to oversee platform operations.

4.2 Assumptions and Dependencies

This table outlines the basic assumptions made about the software and its corresponding dependencies. It's essential for all stakeholders to understand these points, ensuring alignment on expectations and clear communication on dependencies.

Users have access to stable internet connections.	Stable internet service providers.
Users are familiar with basic e-commerce functions like searching and checking out.	Proper user documentation and onboarding tutorials.
All products in the store have correct and updated descriptions and images.	A reliable content management system (CMS) for product information.
The recommendation system operates with minimum latency for real-time suggestions.	Efficient algorithms and server infrastructure.
The platform adheres to data protection laws and ensures users' privacy.	Legal counsel to ensure compliance with GDPR, CCPA, etc.
The website can integrate with major payment gateways for smooth transaction processes.	Partnerships or APIs from major payment providers like Stripe, PayPal.
The website is expected to function seamlessly on various devices (desktop, mobile, tablets).	Responsive web design and regular testing on different devices.

5. Features

ID	Features	Description
1.	Register /Create an account	Record user information and use a combination of email address and password to use website service.
2.	Login	Users have to login with their credentials (email address and password) and username to access web-apps.
3.	View available items in stock	Webpage displays all available items that are able to be purchased by users. It has all product details for users who might be interested in them.
4.	Search and filter item available items	Searching tools to help users find their wanted electronic products. Filters help users quickly find corresponding products, such as product prices, and so on

5.	Display most and least selling products	Users can see all the information about which product is most and least popular.
6.	Discount and promotion for users	Users could see which product is on sale. And Details of products on sale.
7.	Second Hand product	Users could check which product is used with lower cost compared with the new product. This is only available for students.
8.	Add/Remove items to shopping cart	Users may remove or add as many as products they wish to purchase and put them into the shopping cart to prepare for the payment process.
9.	Update items in Cart	Every time users add or remove a new product into their shopping cart. The numbers, price, name will automatically update and refresh at the same time.
10.	Payment method register	Users need to provide all required payment information to place their orders such as name, living address, credit card number, expiry date etc. Shopping app will retain the user's payment information for direct use next time.
11.	Place orders	Users confirm the products they wish to buy. Then, the system receives orders and is ready to ship the products to users.
12.	Check order history	Users can use it to find which products they bought in chronological order.
13.	Receipt email	Users can obtain a receipt of their orders. It contains all necessary information to their orders.
14.	Tracking shipment status	This allows users to track whether their product has been shipped or not. And estimation of time they are expected to receive it.
15.	User profile	Users can edit their username, email, zip code, address, and personal photo through it.

16.	Add/Remove product into stock	Admin can use product update form to add new or remove existing products available in online website such as price, product description, name etc. It will update the website products after adding or removing.
17.	Discount and sale	Website could generate a report of sale information. So, the admin could implement a discount strategy to promote the products based on most and least selling data.
18.	Reminder email to users	Admin could send emails to remind users that the out-of-stock product is available again on this website.
19.	Restocking alert	Admin will automatically receive a reminder about the product which is in low stocking (less than 3). It reminds the admin to restock as soon as possible.
20.	Comment/ Feedback for admin	Users can write down feedback after using this website. It allows users to contact the admin to provide their opinions about this using experience or the technical issue that they encountered when visiting. the website.

6. Quality Requirements

Requirement	Explanation
Compatibility	This shopping app can run on various web browsers such as Safari, Firefox, Chrome. It should allow users access this website through their installed browsers.
Performance	This shopping app should run at average speed at least. It is supposed to give back a response within 1 to 2 seconds when users search to implement all features in this website.
Security	Users will store their private information on this website such as personal information, banking information. It is necessary for them to prevent data breach and protect their accounts with a strong password.
User Interface	A good UI will help users use shopping app easily. They can be clearly navigated to respect pages by using simple searching tools.
Efficiency	The shopping app should give me accurate and exact products when users and admin try to find them.
Hardware Requirement	This shopping app should be able to run on pad, phones, laptop, and desktop.

Reliability	This shopping app is supposed to be reliable when users are using it. It cannot be crashed, and it should accept a large number of users shopping at the same time. There are not supposed to have many bugs when users or admin try to implement all the features in this website.

7. Use-Cases

User:
Id: UC-01
Use Case: Login to customer account
Description:
This use case occurs when the customer wants to log in to their account.
Level: User Goal
Primary Actor: Customer
Supporting Actors: System
Stakeholders and Interests:
Customer: Users want to access their account for shopping.
System Administrator: Admin checks users' information and grants access to the account.
Developer: Develops login operation on branch employees scenarios for the branch employees and performs unit testing.
Tester: Tests the scenario according to user requirements and suggests required changes to the developer.
Pre-Conditions:
Customers must connect to the internet and provide valid information.
Post-Conditions:
Success end condition: Customer logs into their account successfully and views account information.
Failure end condition: Customer fails to log into their account if the username or password is not correct.
Main Success Scenario:

1. Users click on the "Login" button.
2. Users enter their email and password.
3. If the information is correct, the dashboard of the user will be displayed.
4. View information (user profile and previous orders)
5. logout

Extensions

Update user profile

1. Customer goes to the "Profile" tab.
2. System displays a window with the user's profile information (email, address, phone number, and password).
3. Customer changes the information.
4. Customer presses the "confirm" button.

5. System validates information and notifies the customer with a success message.

Customer is new on the website

1. Customer clicks on the "Register" button.
2. Customer provides required details in the registration form
3. Customer chooses their interests and preferences (products and brands).
4. System validates the provided information.
5. Customer account is created, and the customer receives the confirmation email.

Special Requirements:

1. Ease of Use
2. Responsiveness

Id: UC-02

Use Case: Search products from the website

Description:

This use case occurs when the customer wants to search items available on the shopping website.

Level: User Goal

Primary Actor: Customer

Supporting Actors: System

Stakeholders and Interests:

Customer: User wants to find available items.

Branch Employee: manages and maintains the available items.

Developer: Develops searching operation on branch employees scenarios for the branch employees and performs unit testing.

Tester: Tests the scenario according to user requirements and suggests required changes to the developer.

Pre-Conditions:

1. The product's status must be correctly maintained by the website manager.
2. Customer must connect to internet

Post-Conditions:

1. Success end condition: If the product status is precisely reflected on the website, then the customer is successfully able to check availability of an item.
2. Failure end condition: If the product status is not precisely reflected on the website, then the customer is not able to check availability of an item.

Main Success Scenario:

1. Customer enters the item information in the search bar.
2. System searches the item in inventory and displays the results.
3. Customer views the details by clicking on items
4. Customer adds the item into the shopping cart.

Extensions

Customer searches an item using filter

1. Customer selects a category from the navigation bar.

2. The website displays search results with the available filters (category, price, and brand).
3. Customer applies the filter to narrow down the search result
4. Customer selects the item and adds it into the shopping cart.

Special Requirements:

1. Ease of Use
2. Responsiveness
3. Availability

Id: UC-03
Use Case: View recommended products
Description:
This use case occurs when the customer wants to view recommended items (most selling and least selling items, promotions, and used items) available on the shopping website.
Level: User Goal
Primary Actor: Customer
Supporting Actors: System
Stakeholders and Interests:
Customer: User wants to find items recommended based on their interests and preferences.
Branch Employee: manages and maintains the available items.
Developer: Develops display operation on branch employees scenarios for the branch employees and performs unit testing.
Tester: Tests the scenario according to user requirements and suggests required changes to the developer.
Pre-Conditions:

1. Customer must have an account
2. The product's status must be correctly maintained by the website manager.
3. Browsing and purchase history or customer preferences are available in the website database.

Post-Conditions:

1. Success end condition: If the product status is precisely reflected on the website, and customer interests are available in the database, the customer is successfully able to view the recommended products.
2. Failure end condition: If the product status is not precisely reflected on the website or customer interests are not available in the database, the customer is unable to view the recommended products.

Main Success Scenario:

1. Customer logs into their account.
2. Customer goes to the website main page.
3. System displays the three recommended categories (most selling and least selling item, promotions, and used items).
4. Customer selects one of the categories and views a list of items.
5. Customer adds the items into the shopping cart.

Special Requirements:

1. Ease of Use
2. Responsiveness
3. Availability

Id: UC-04
Use Case: Fulfill and track orders
Description:
This use case occurs when the customer wants to complete and track the order.
Level: User Goal
Primary Actor: Customer
Supporting Actors: System
Stakeholders and Interests:
Customer: User wants to complete the order.
Branch Employee: manages and maintains the customer orders.
Developer: Develops order operation on branch employees scenarios for the branch employees and performs unit testing.
Tester: Tests the scenario according to user requirements and suggests required changes to the developer.
Pre-Conditions:

1. Customer must be logged into their account.
2. Customer must have items in the shopping cart
3. Customer must have valid payment information (credit card or gift card and address).

Post-Conditions:

1. Success end condition: If the payment information is valid, the order is completed successfully.
2. Failure end condition: If the payment information is invalid, the order cannot be completed.

Main Success Scenario:

1. Customer goes to the shopping cart and presses the “check out” button.
2. Customer enters the payment information and shipping address.
3. System transfer payment into payment gateway.
4. Payment gateway processes the transaction and provides a payment confirmation.
5. User receives the summation of the order.

Extensions:

Customer tracks their orders.

1. Customer logs into their account
2. Customer selects the order history and clicks the order they want to track
3. Website displays the order status.

Special Requirements:

1. Ease of Use
2. Responsiveness
3. Availability

Admin:
Id: UC-01
Use Case: Update website products
Description:
This use case occurs when the admin updates product information.
Level: User Goal
Primary Actor: Admin
Supporting Actors: System
Stakeholders and Interests:
Customer: Search product available on the website.
System Administrator: updates website products.
Branch Employee: manages and maintains the product information.
Developer: Develops update operation on branch employees scenarios for the branch employees and performs unit testing.
Tester: Tests the scenario according to user requirements and suggests required changes to the developer.
Pre-Conditions:

1. Admin has an account and logged in.
2. Admin has accurate product information.

Post-Conditions:

1. Success end condition: Admin modifies the information successfully.
2. Failure end condition: Admin fails to modify the information.

Main Success Scenario:

1. Admin logs into the account and goes to the “update product” tab.
2. Admin adds new products or changes the information for the existing product.
3. Admin clicks the “save” button.
4. Website notifies the admin with a success message.

Special Requirements:

1. Responsive.
2. Ease of Use.
3. Accuracy.

Id: UC-02
Use Case: verify and complete customer orders
Description:
This use case occurs when the admin wants to verify and complete customer orders.
Level: User Goal
Primary Actor: Admin
Supporting Actors: System
Stakeholders and Interests:
Customer: Search product available on the website
System Administrator: verifies and completes customer orders
Branch Employee: manages and maintains the product information.
Developer: Develops complete orders operation on branch employees scenarios for the branch employees and performs unit testing.

Tester: Tests the scenario according to user requirements and suggests required changes to the developer.

Pre-Conditions:

1. Admin has an account and logged in.
2. Customer placed an order successfully.

Post-Conditions:

1. Success end condition: Order is sent to the distribution center for shipping.
2. Failure end condition: Order is canceled if there is no stock or the payment information is invalid.

Main Success Scenario:

1. Admin logs into the account and goes to the “Orders” tab.
2. Admin clicks the “Ship now” button.
3. Website notifies the admin with a success message, and orders are moved to “Shipped” tab.
4. System sends an email confirmation to the customers.

Extension:

Admin modifies orders as requested by customers.

1. Admin clicks the “Modify” button
2. Admin edits the quantity.
3. Website notifies the admin with a success message.
4. System sends an email confirmation to the customers.

Special Requirements:

1. Responsive.
2. Ease of Use.
3. Accuracy.

Id: UC-03

Use Case: Manage stocks

Description:

This use case occurs when the admin manages the stocks.

Level: User Goal

Primary Actor: Admin

Supporting Actors: System

Stakeholders and Interests:

Customer: Search product available on the website

System Administrator: manages stock information

Branch Employee: manages and maintains the product information.

Developer: Develops manage stock operation on branch employees scenarios for the branch employees and performs unit testing.

Tester: Tests the scenario according to user requirements and suggests required changes to the developer.

Pre-Conditions:

1. Admin has an account and logged in.
2. Admin has accurate stock information.

Post-Conditions:

1. Success end condition: Stock information on the website is accurate.
2. Failure end condition: Stock information on the website is not accurate.

Main Success Scenario:

1. Admin logs into the account and goes to the “Stock” tab.
2. Admin edits the quantity.
3. Website notifies the admin with a success message.

Extensions:

Admin is notified when an item with 3 or fewer quantity

1. Admin goes to the “Stock” tab.
2. Admin views the item with a warning sign.
3. Admin updates the item quantity.
4. Website notifies the admin with a success message.

Special Requirements:

1. Responsive.
2. Ease of Use.
3. Accuracy.
4. Availability

Id: UC-04

Use Case: Generate sales data reports

Description:

This use case occurs when the admin generates the sales reports to identify most-selling and least-selling products within specific categories or across the entire inventory

Level: User Goal

Primary Actor: Admin

Supporting Actors: System

Stakeholders and Interests:

System Administrator: manages sales report

Branch Employee: manages and maintains the product information.

Developer: Develops report operation on branch employees scenarios for the branch employees and performs unit testing.

Tester: Tests the scenario according to user requirements and suggests required changes to the developer.

Pre-Conditions:

1. Admin has an account and logged in.
2. There are completed orders in the database.

Post-Conditions:

1. Success end condition: Reports are generated successfully.
2. Failure end condition: Reports are not generated.

Main Success Scenario:

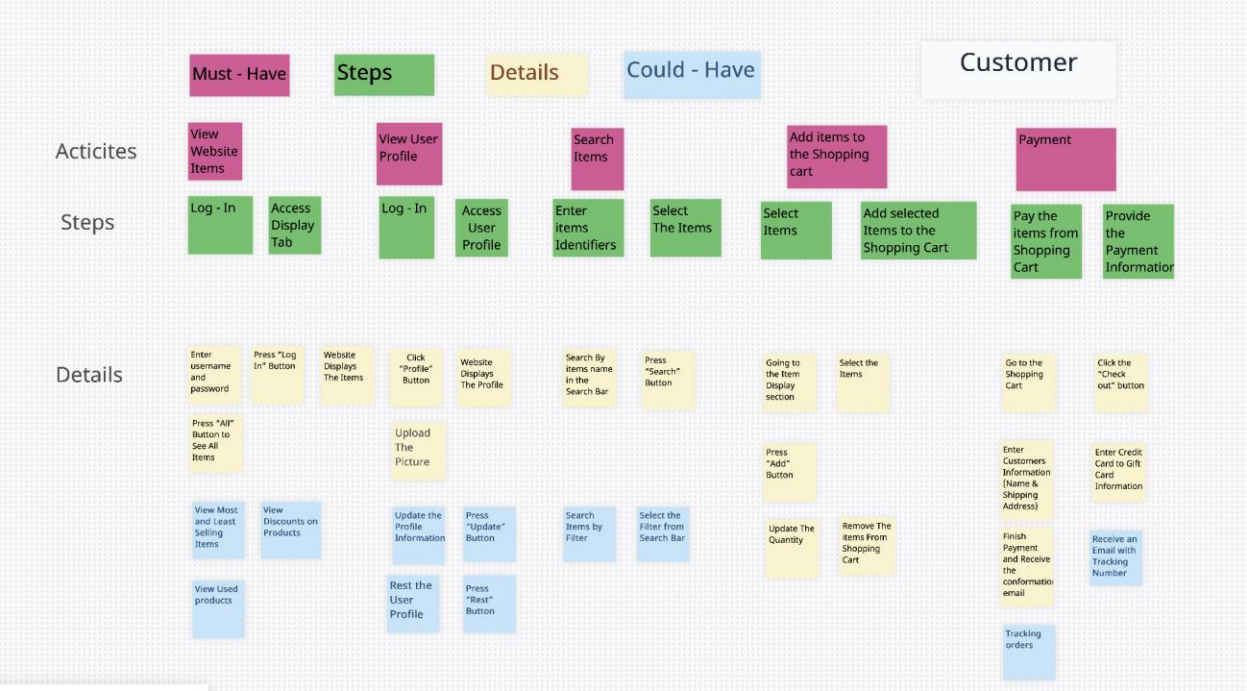
1. Admin logs into the account and goes to the “Report” tab.
2. Admin selects reporting period and category.
3. Website generates a report with most selling and least selling products highlighted.

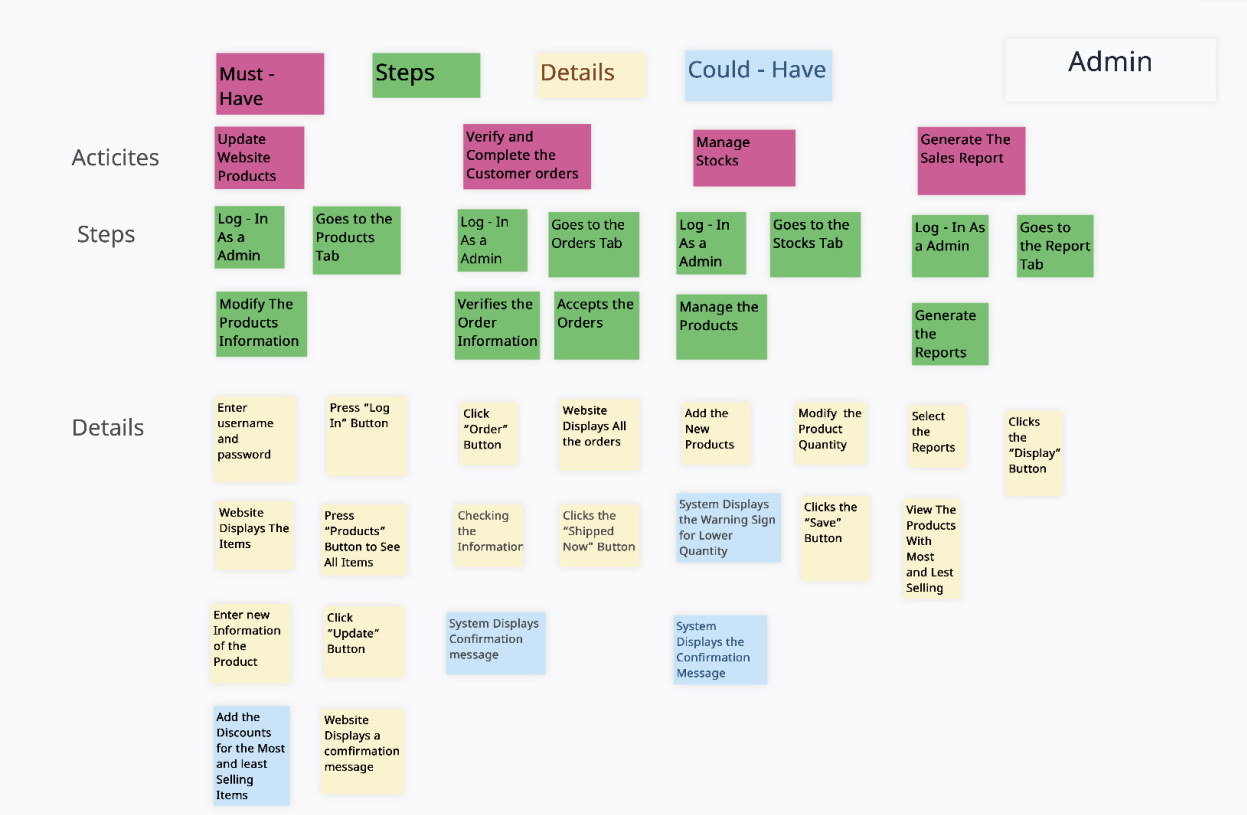
Extensions:

Admin is notified an item with most and least selling

1. Admin checks the sales report
2. Admin views the items with most and least selling
3. Admin adds the discounts for these items
4. Website notifies the admin with a success message.

8. User-Stories





9. UML Diagrams

1. Use Case Diagram

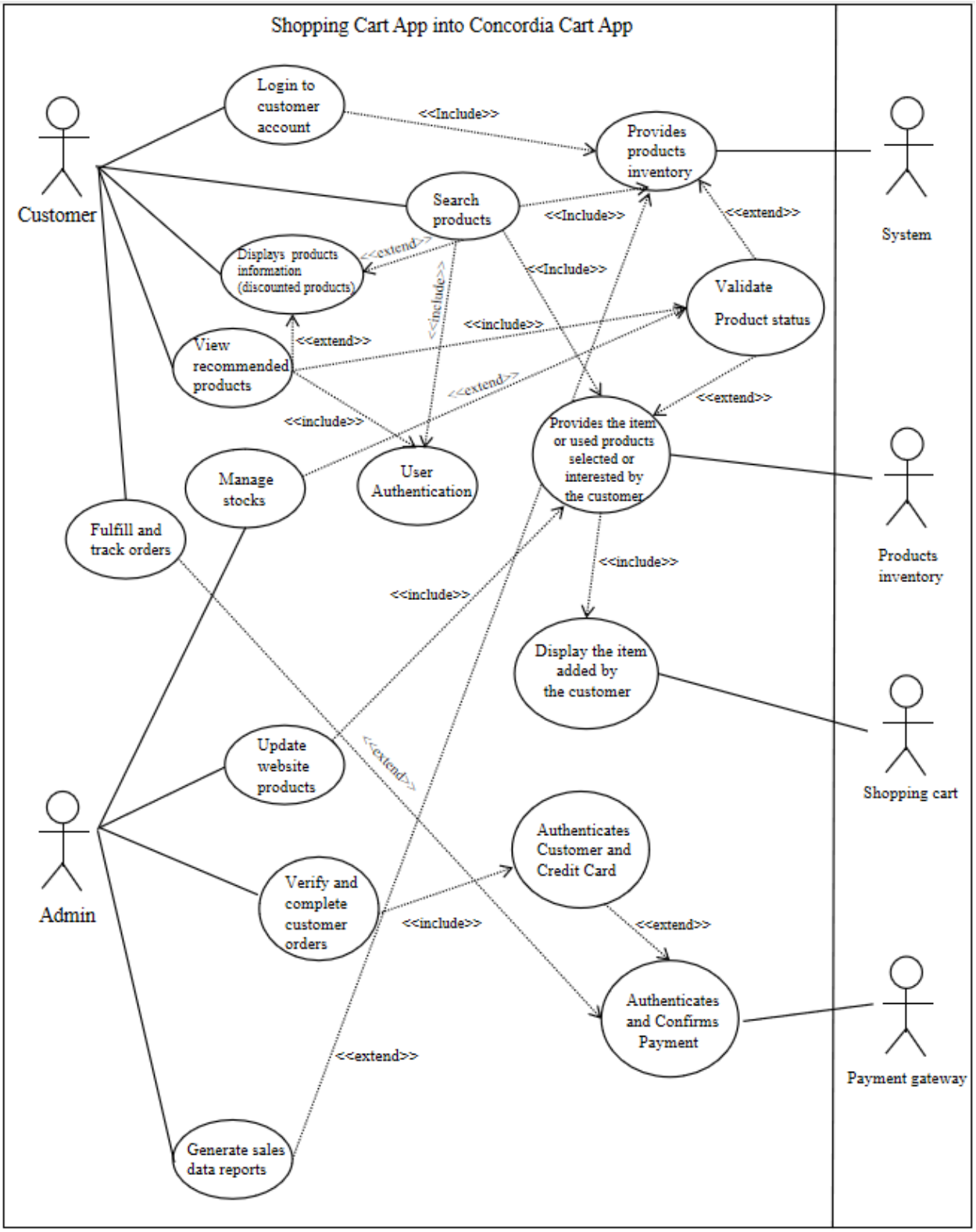


Figure 1. Shopping Cart App System Use Case Diagram

2. Sequence Diagram

2.1 Making order

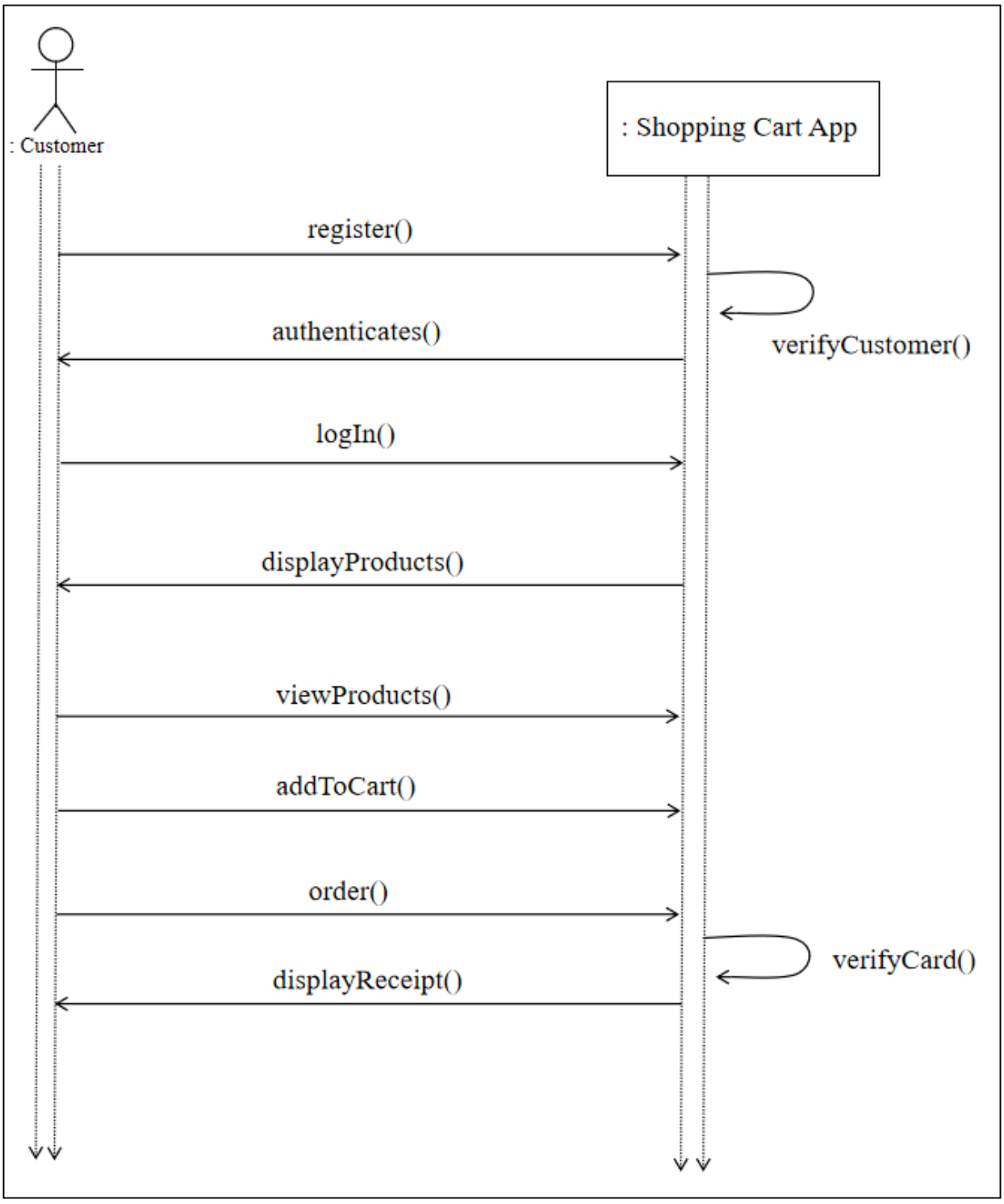


Figure 2. Sequence Diagram of Making Order

2.2. Check Shopping Cart

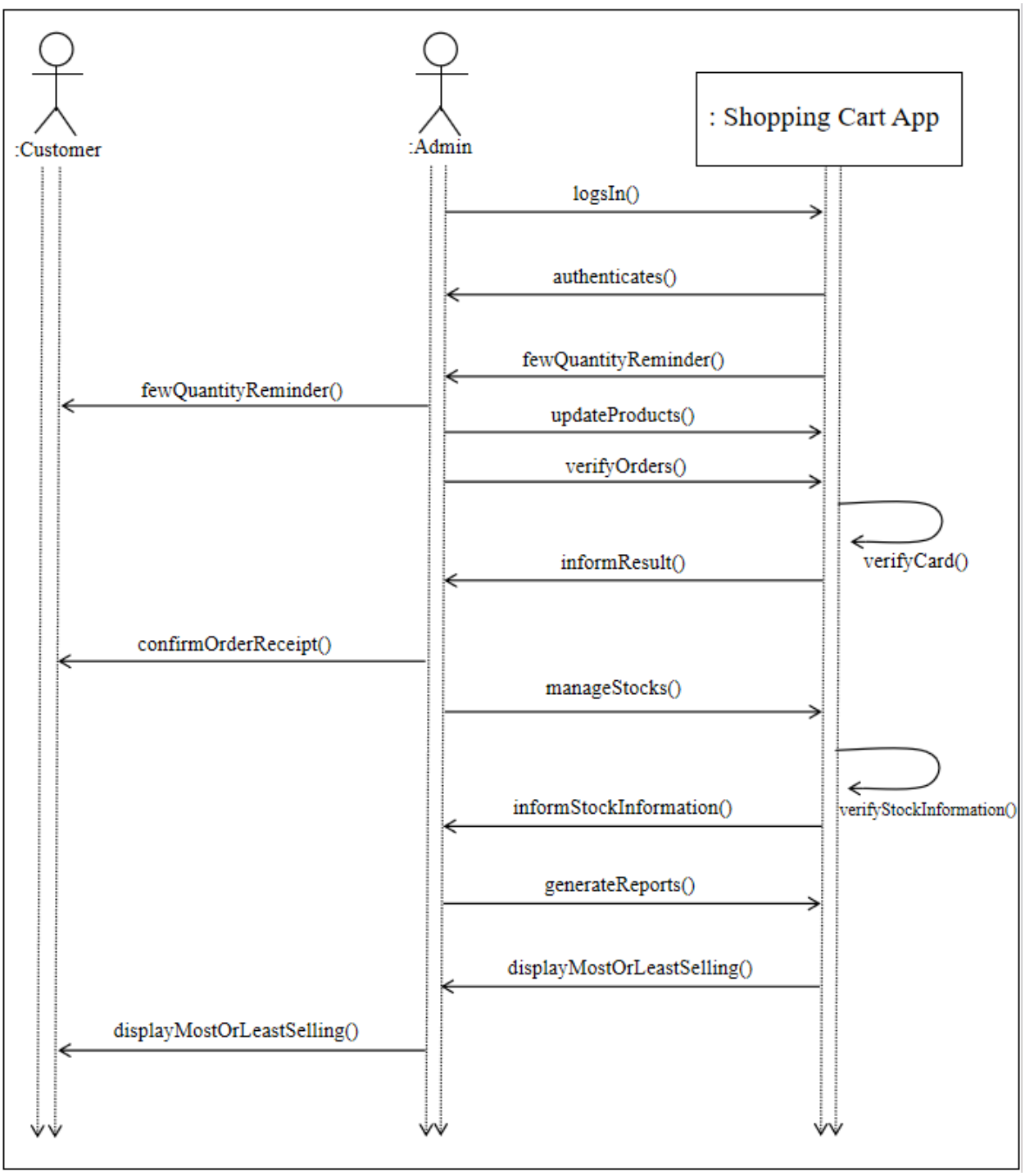


Figure 3. Sequence Diagram of Checking Shopping Cart

3. Activity-diagram

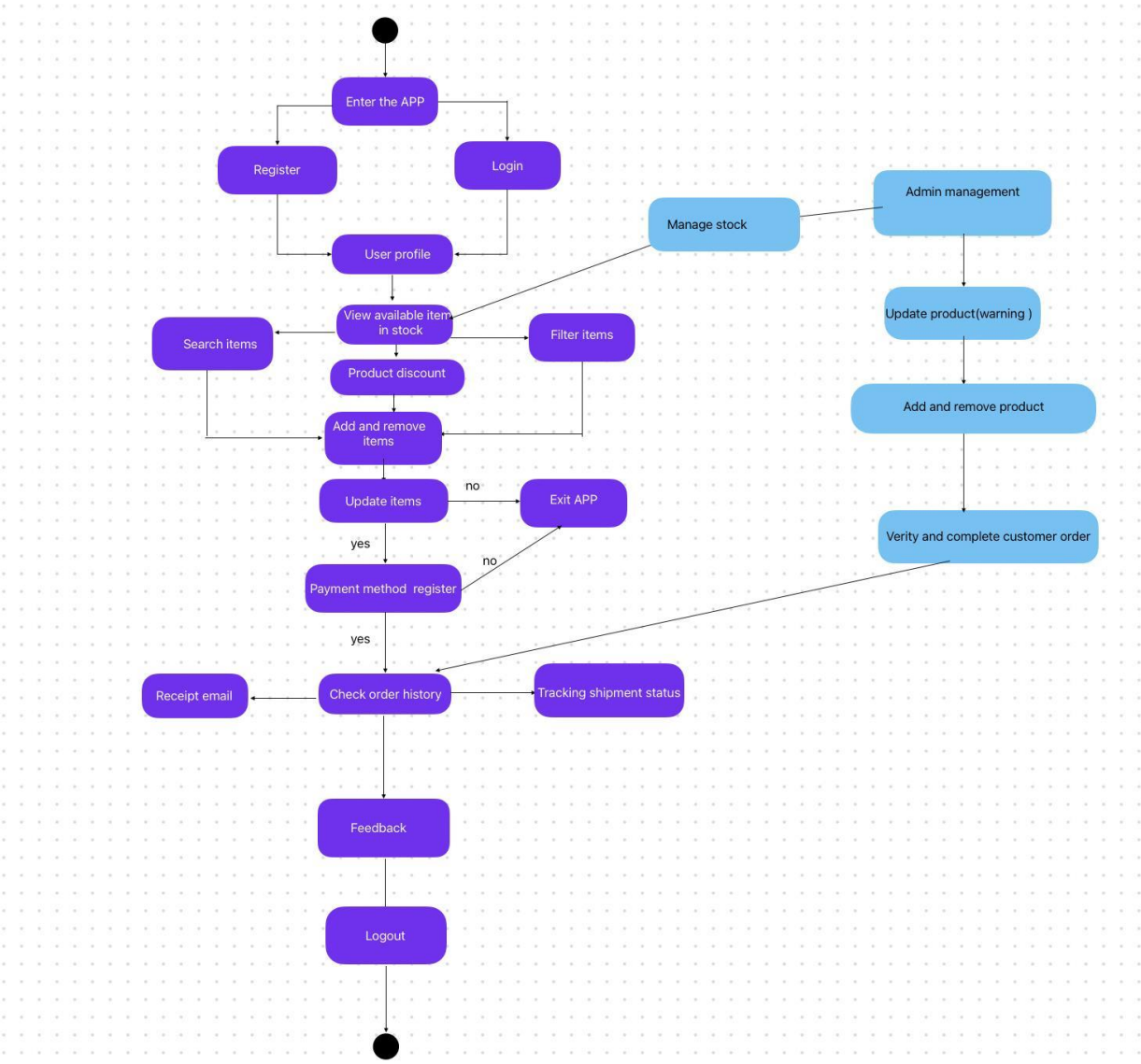
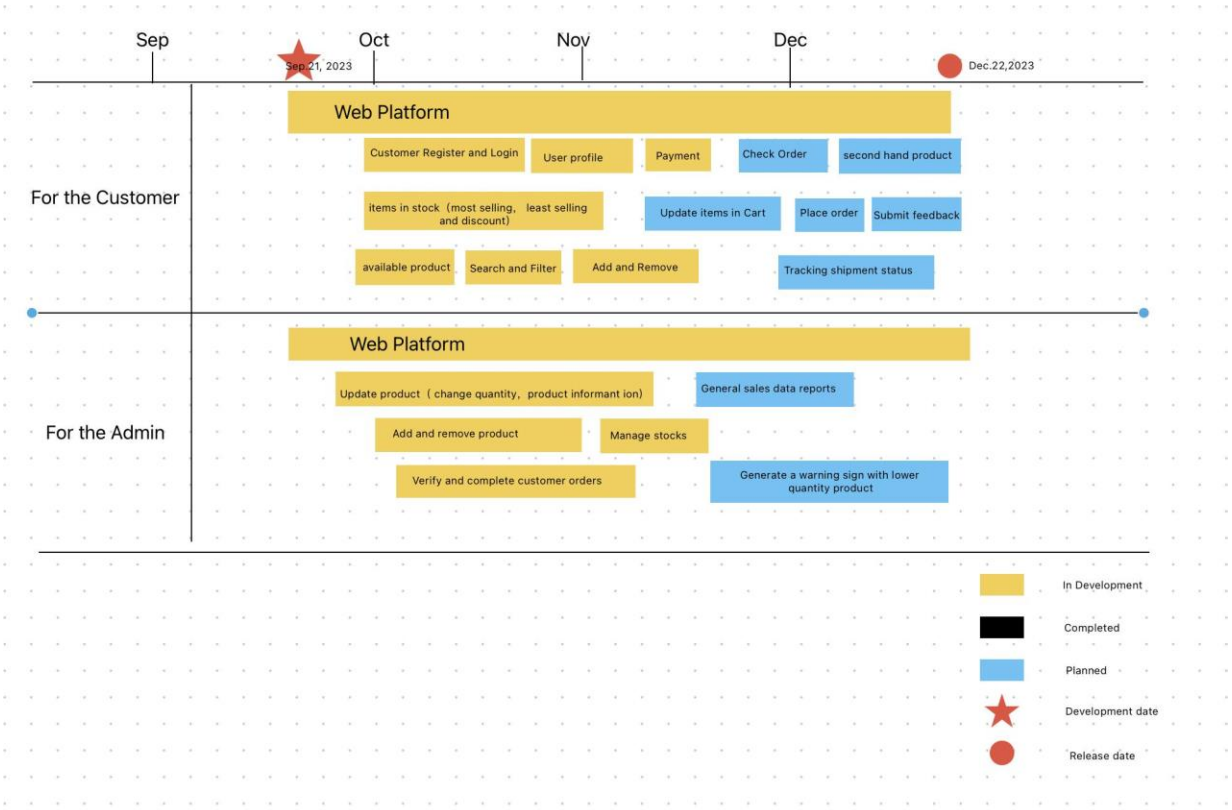


Figure 4. Shopping Cart App Activity Diagram

10. Road-Map


Sep
Oct
Nov
Dec
Sep 21, 2023
Dec.22,2023
For the Customer
Web Platform
Customer Register and Login
User profile
Payment
Check Order
second hand product
items in stock (most selling, least selling and discount)
Update items in Cart
Place order
Submit feedback
available product
Search and Filter
Add and Remove
Tracking shipment status
For the Admin
Web Platform
Update product (change quantity, product informant ion)
General sales data reports
Add and remove product
Manage stocks
Verify and complete customer orders
Generate a warning sign with lower quantity product
In Development
Completed
Planned
Development date
Release date

11. Appendix
Link to Comp354 Assignment 1:

https://github.com/8inversed/Comp354-Project

Individual contributions

Name	Responsibilities
Weilun Zhang	7. Use-Cases and 8. User-Stories
Xu Zhang	3.Stakeholder Description and 4. Product Overview
Haoran Sun	1.Introduction AND 2. Positioning
Qianrui Tao	9. UML (Activity Diagram) 10. Road Map
Jingchao Song	9. UML (Use Case Diagram, Sequence Diagrams)
Zhaoyang Liu	5.Features an 6. Requirement