Dropshipping Based E-Commerce Web App with AI Recommender System

Final Year Project

Session 2019-2023

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Project Group Members

Sr.#	Reg. #	Student Name	Email ID	*Signature
(i)	F19-262	Sabir Hussain	bcsm-f19-262@superior.edu.pk	
(ii)	F19-274	Ch. Muhammad Hafeezullah	bcsm-f19-274@superior.edu.pk	
(iii)	F19-276	Hafiz Muhammad Abdullah	bcsm-f19-276@superior.edu.pk	

*The candidates confirm that the work submitted is their own and appropriate credit has been given where reference has been made to work of others

Plagiarism Free Certificate

This is to certify that, I **Sabir Hussain** S/D of **Ashfaq Ahmad**, group leader of FYP under registration no **BCSM-F19-262** at Computer Science Department, The Superior College, Lahore. I declare that my FYP report is checked by my supervisor.

Date: Name of Group Leader: Sabir Hussain Signature: _____

Name of Supervisor: Ms. Arshia Naeem

Designation: Senior Lecturer

Signature: _____

HoD: Dr. Irfan Ud Din

Signature: _____

Project Report

Dropshipping Based E-Commerce Web App with AI Recommender System

Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
	1.0			

APPROVAL

PROJECT SUPERVISOR

Comments: _____

_____

Name: _____

Date: _____ Signature: _____

PROJECT MANAGER

Comments: _____

_____

Date: _____ Signature: _____

HEAD OF THE DEPARTMENT

Comments: _____

_____

Date: _____ Signature: _____

Dedication

This work is dedicated to our parents who provide us with the opportunities and support us to learn and do everything we want. Moreover, we want to dedicate our work to our supervisor, Ma'am Arshia Naeem, who taught us well in the semester and enabled us to do this project. Also, we want to dedicate this work to our institute (Superior College Gold Campus, Lahore), which is providing us so many opportunities to polish our skills.

Acknowledgements

It is by the Grace of Allah Almighty, the Lord, and Creature of this Universe. Whose power and Glory all things are accomplished and his Prophet (P.B.U.H) who is, forever, a torch of guidance and knowledge for humanity. We would like to express our thanks to our project supervisor **Ms. Arshia Naeem** Senior Lecturer at Superior University for specialist advice and support. Her kind, accommodating, Suggestions, Constant Encouragement and generous supervision made this project easy for us.

Finally, we would like to thank my friends for their cooperation in completing this project.

Executive Summary

E-commerce has become one of the most popular methods of making money online. Our FYP project would be based on the model of Dropshipping. We would design a web app that has the following features: Manage stock of wholesaler for reseller. We intend to develop a software system for managing stores. The software and data of the products customers and store employees will manage all the details. The Point-of-Sale system will handle all orders placed through the online store. The user can search for and modify all the product details in the store to get the item they need. Manage Order of reseller for Wholesaler and Manage Shipment details. The name of the project is Dropsourcing. It aims to provide a platform for new wholesalers and resellers to collaborate with each other. Wholesalers would have e-shops everywhere and resellers would have their own business with zero or less investment.

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Chapter 1

Introduction

Chapter 1: Introduction

E-commerce has changed the way society sells goods and services. E-commerce is one of the most popular ways to make money online, making it an attractive opportunity for investors [1]. A new wholesaler wants to have stores or branches in as many locations as possible to reach as many customers as possible. However, this required a lot of investment, management, and time. Today, especially in Pakistan, most people are unemployed or do not have the job they want. They also can't afford to start a business because it requires an investment they don't have. However, they are passionate about business and know how to communicate, use the internet, social media, serve customers, and find products. have skills such as sales [2]. But they need a platform to show off their skills and start a business with little to no investment.

The FYP 1 project is based on the Dropshipping model, and the name of the project is Dropsourcing Design an application with the following features:

- Provide a platform for new wholesalers and resellers to collaborate with each other.
- Wholesalers list their products to increase sales.
- Resellers will sales the products of wholesalers to consumers to earn money.
- Manage Stock of Wholesaler for reseller
- Manage Order of reseller for Wholesaler
- AI base recommended system for product promotion.
- Manage Shipment details.

So, by doing this wholesaler would have e-shops everywhere and resellers have their own business with zero or less investment.

Our competitors in market are:

Daraz first made waves in Pakistan's e-commerce market after its introduction in 2012. provide users with the best online shopping experience and value for their purchases. (Mikkelsen, 2012)

HHC Dropshipping Importing products and being in the wholesale industry for a decade have made us realize the potential behind online industry and problems every startup faces and the struggle it needs.

1.1. Background

When covid-19 started most of the people became jobless as well all the business and companies shifted to online. This becomes a hand to mouth problem for the middle class and lower middle-class people. All they must do is to wait for covid-19 to end but after it ends there is a shortage of jobs in the market. Some also want to start their business but that requires a lot of investment that they don't have. Also, the wholesalers have a shortage of customers due to no physical shop opening during covid-19. What they require is a huge customer base so their products will sell more and more often [3]. But there is no online platform for wholesalers to sell their products.

1.2. Motivations and Challenges

Nowadays, many e-commerce websites provide online shopping for their customers. But the problem is they don't offer to open e-shops as a reseller. Also managing stock is done by e-shop owners. What we are going to do is to provide a platform for the wholesaler to list his products and an e-shop for resellers. Resellers will pick the products from wholesalers and sell them on its own without the hustle of shipping. To develop E-Commerce Website and Point of Sale system combined. To develop the easy management of the Departmental store [4]. To handle the inventory details like sales details, purchase details and balance stock details by connecting with one database of both website and POS.

1.3. Goals and Objectives

In today's era new wholesalers want to sell their products on e-commerce platform but they face lot of issues like

- Increase their sells with no or less investment in marketing.
- Approach maximum number of shopkeepers and resellers in minimum time
- Can't manage Shipping.
- Invest their wealth to increase products rather than open new Shops. Because this thing needs a lot of time, management, and investment.

- On the other hand, most of the jobless & Educated Person want to build their own ecommerce business but they can't run their e-commerce business due to some reasons.
- Start with zero/less Investment.
- Can't manage Stock.
- Can't manage Shipping.

1.4. Literature Review/Existing Solutions

Daraz:

Daraz first made waves in Pakistan's e-commerce market after its introduction in 2012. We have since grown to become Pakistan's largest platform for online shopping with a network spread across Asia in Pakistan, Bangladesh, Sri Lanka, Myanmar, and Daraz.com.np. Our vision was to provide a safe, efficient online marketplace platform for vendors and customers across the country to come together [5]. We started off exclusively as an online fashion retail platform and over the years expanded to become a complete one-stop solution for all your buying needs. Daraz prides itself on not being just another ecommerce venture in Asia. We work tirelessly to make sure that we provide users with the best online shopping experience and value for their purchases [6]. Whether you shop online through our website or our online shopping mobile App, you can expect easy navigation, customized recommendations, and a smooth online shopping experience guaranteed. (Mikkelsen, 2012)

HHC Dropshipping

Importing products and being in the wholesale industry for a decade have made us realize the potential behind the online industry and problems every startup face and the struggle it needs. We've seen it all and now we do our best to make your goal of running an ecommerce business as easy as possible.

1.5. Gap Analysis

A gap analysis is a tool that helps businesses identify the gap between their current performance and their desired performance. In the context of Dropshipping, a gap analysis could be used to

identify any potential issues or inefficiencies in the Dropshipping process, and to develop a plan to address them [7].

Some areas that might be analyzed in a gap analysis for Dropshipping include:

1. Product sourcing: Identifying any issues with finding reliable suppliers or sourcing high-quality products.
2. Fulfillment: Examining the efficiency of the order fulfillment process, including shipping and handling times.
3. Customer service: Evaluating the effectiveness of customer service practices, including handling returns and handling customer inquiries.
4. Marketing and sales: Analyzing marketing and sales strategies to ensure that they are effectively driving traffic to the website and converting visitors into customers.
5. Financial management: Assessing financial practices, including pricing, budgeting, and profit margins.

By conducting a gap analysis, businesses can identify any areas that need improvement and develop a plan to address them. This can help ensure the success and profitability of the Dropshipping business.

1.6. Proposed Solution

There are many different approaches that businesses can take to address any issues or inefficiencies identified through a gap analysis of their Dropshipping operations. Here are a few potential solutions that could be implemented:

1. Improve product sourcing: This could involve finding new, reliable suppliers or negotiating better terms with existing suppliers. It could also involve implementing quality control measures to ensure that the products being sourced are of high quality.
2. Streamline fulfillment: This could involve identifying bottlenecks in the fulfillment process and implementing solutions to address them. For example, a business could invest in automated order processing systems or use a fulfillment service to handle shipping and handling.

3. Enhance customer service: This could involve training customer service staff to handle common issues and inquiries more effectively or implementing self-service options such as a knowledge base or FAQ section on the website [8].
4. Optimize marketing and sales: This could involve testing different marketing channels and tactics to identify which ones are most effective or implementing conversion optimization strategies to improve the website's conversion rate.
5. Implement financial management best practices: This could involve implementing budgeting and forecasting processes, identifying opportunities to reduce costs, and optimizing pricing strategies.

Ultimately, the specific solutions that a business implements will depend on the specific issues and challenges identified through the gap analysis process.

1.7. Project Plan

Our FYP 1 project would be based on the model of Dropshipping, and the name of project is Dropsourcing. We would design a Mobile app that has the following features.

- Provide a platform for new wholesalers and resellers to collaborate with each other.
- Wholesalers list their products to increase sales.
- Resellers will sales the products of wholesalers to consumers to earn money.
- Manage Stock of Wholesaler for reseller
- Manage Order of reseller for Wholesaler
- AI base recommended system for product promotion
- Manage Shipment details.

So, proposing this project the wholesaler would have e-shops everywhere and resellers have their own business with zero or less investment. The core purpose of this project will be to enhance the ecommerce market by adding an AI based recommendation mechanism which will not only promote this business but also bring lots of vendors and customers on one single virtually intelligent platform.

1.7.1. Work Breakdown Structure

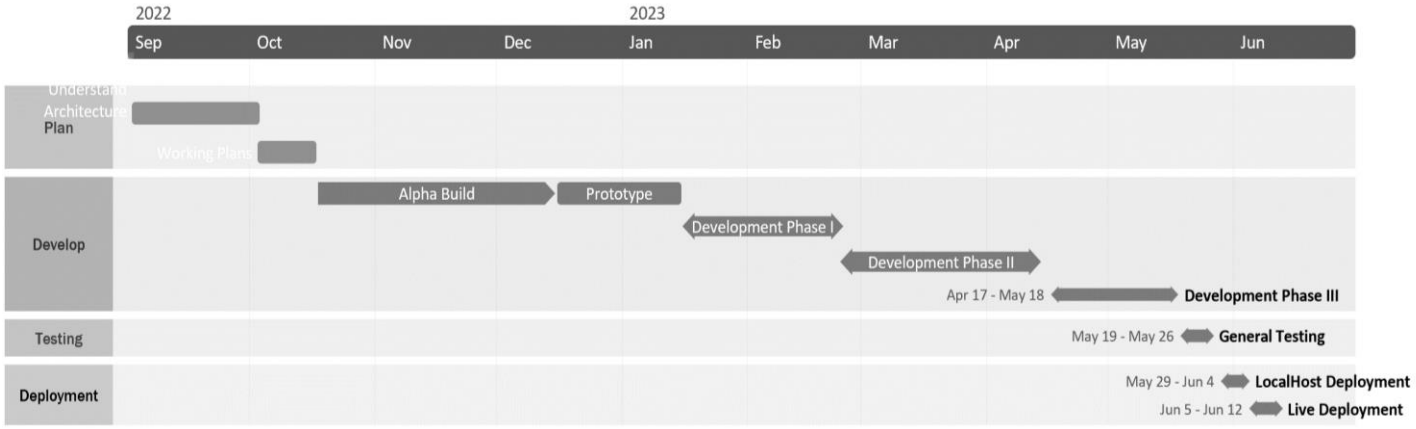
WBS #	WBS Deliverable	Activity #	Duration (# of Days)	Responsible Team Member(s) & Role(s)
01	REQUIREMENT	1	7	Sabir Hussain
02	PROTOTYPE PREPRATION	2	45	WHOLE TEAM
03	PLANNING AND DESIGNING	3	15	WHOLE TEAM
04	PROPOSAL PREPRATION	4	7	WHOLE TEAM
05	FRONT-END DEPLOYMENT	5	45	H. M. Abdullah
06	BACK-END DEPLOYMENT	6	45	Sabir & Hafeezullah
07	SERVER-END DEPLOYMENT	7	60	H. M. Abdullah
08	TEST AND DEBBUGING	8	20	WHOLE TEAM
09	DEPLOYMENT	9	15	WHOLE TEAM
10	FINAL PRESENTATION	10	7	WHOLE TEAM

1.7.2. Roles & Responsibility Matrix

The purpose of roles & responsibility matrix is to identify who will do what.

Project Acme	Sabir Hussain	Ch. M. Hafeez Ullah	H. M. Abdullah
Deliverable 1	✓		
Deliverable 2	✓	✓	✓
Deliverable 3	✓	✓	✓
Deliverable 4	✓	✓	✓
Deliverable 5			✓
Deliverable 6	✓	✓	
Deliverable 7			✓
Deliverable 8	✓	✓	✓
Deliverable 9	✓	✓	✓
Deliverable 10	✓	✓	✓

1.7.3. Gantt Chart



1.8. Empathy Map

Say:	**Think:**
• Where should I start? • Want something reliable. • Zero investment business? • No stock management? • E-shops everywhere?	• Waste of time • Maybe this isn't the best. • What would be best for me?
Feel:	**Does:**
• Fear • Excited • Over-whelmed • Anxious	• Asking friends • List pros and cons • Compare competitors. • Compare their price

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

2.1. Introduction

2.1.1. Purpose

The web application is expected to give total package for wholesaler as well as reseller through a solitary entryway involving the web as the sole medium. It will empower sellers to set up internet-based shops, clients to peruse the shop and buy them online without visiting the shop. The organization module will empower a framework director to support and reject demands for new shops and keep up with different arrangements of shop classifications [9].

2.1.2. Document Conventions

1. Entire document should be justified.
2. Convention for main title:
    i. Font Face: Calibri.
    ii. Font Style: Bold.
    iii. Font Size: 16.
3. Convention for subtitle:
    i. Font Face: Calibri.
    ii. Font Style: Bold.
    iii. Font Size: 14.
4. Convention for body:
    i. Font Face: Calibri (Body).
    ii. Font Style: Normal.
    iii. Font Size: 12.
    iv. Line spacing: 1.5.

2.1.3. Intended Audience and Reading Suggestions

- ✓ Consumer
- ✓ Web developers
- ✓ Designers
- ✓ Backend Developer
- ✓ All user

2.1.4. Product Scope

- ✓ Secure enlistment and profile set up for wholesaler and reseller.
- ✓ Sufficient scanning components for simple and speedy admittance to specific items and offered services.
- ✓ Making a Shopping cart so clients can shop 'n' no. of things and checkout at last with the whole shopping baskets. Clients can add or erase things in the selected cart.
- ✓ Customary updates to enlisted clients regarding the OFS (Offer for Sale) about fresh stock.
- ✓ Transferring 'Most Purchased' Items in every class of items in the Shop. o Vital information and diagrams for Administrators and Shop proprietors about the things that are bestselling in every classification and age bunch.
- ✓ Keeping up with data set of normal clients of various necessities.
- ✓ Shop representatives are liable for inner matters like handling orders, confirming home delivery of the products, getting client's feedback regarding order processing time, refreshing request's status, and noting client's inquiries on the web [10].
- ✓ Client feedback component, so clients can express their experience for the item or administration which they have bought. Additionally, monitor the rating of individual items by significant clients. o Sufficient payment system and gateway for all famous Visas, and other pertinent choices for payments, as accessible over time.

2.1.5. References

W3school (html, CSS, Java, Java Spring Boot)

React JS: (reactjs.org)

Java: (javatpoint.com)

MySQL: (dev.mysql.com)

2.2. Overall Description

2.2.1. Product Perspective

E-Commerce Store is pointed towards the whole sellers who need to connect with the greatest cross segment of resellers and average folks who can be possible clients. This task imagines overcoming any issues between the wholesaler, the reseller, and the client. OFS ought to be easy to use, 'speedy to learn' and solid programming for the above reason. OFS is planned to be an independent item and shouldn't rely upon the accessibility of other programming. It ought to run on both browser stages.

2.2.2. User Classes and Characteristics

- ✓ The user ought to know all about the shopping mall related working like Shopping cart/Checking out/Transaction and so on.
- ✓ The client ought to know about the Internet.

2.2.3. Operating Environment

The item will be working in windows climate. E-commerce Store is a site which will work in every renowned program, for a model we are talking Microsoft Internet Explorer, Google Chrome, and Mozilla Firefox. Most of the elements will be viable with the Chrome Mozilla Firefox and Opera 7.0 or higher variant. The main prerequisite to utilize this web-based item would be the web association. The hardware configuration includes Hard Disk: 20GB, Monitor: 15-inch Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are monitor etc.

2.2.4. Design and Implementation Constraints

A web-based store is a virtual store on the Internet where clients can peruse the index and select results of interest. The chose things might be gathered in a shopping basket. At checkout time, the things in the shopping basket will be introduced as a request. Around then, more data will be expected to finish the exchange. Typically, the client will be approached to fill or choose a charging address, a transportation address, a delivery choice, and payment data, for example, Visa number. An email warning is shipped off to the client when the request is set.

2.2.5. Assumptions and Dependencies

The assumptions are:

- ✓ The coding ought to be sans mistake.
- ✓ The framework ought to be easy to understand so it is not difficult to use for the clients.
- ✓ The framework ought to have greater limits and give quick admittance to the data set.
- ✓ The framework ought to give search office and backing speedy exchanges.
- ✓ Clients might access from any PC that has web perusing capacities and a web association.
- ✓ Clients should have the right usernames and passwords to go into their internet-based accounts and do activities.

The dependencies are:

- ✓ The equipment and programming because of which the item will be run.
- ✓ Based on posting necessities and determination the task will be created and run.
- ✓ The end clients (administrator) ought to have appropriate comprehension to the item.
- ✓ The framework ought to have a general report store.
- ✓ The data, everything being equal, should be put away in a data set that is open by the ECommerce Store

2.3. External Interface Requirements

2.3.1. User Interfaces

- ✓ Administrators can View, Edit and Delete everything related to the item.
- ✓ Clients can see the entire site.
- ✓ Likewise add the item in their cart
- ✓ Can add and remove wholesalers and resellers.

2.3.2. Hardware Interfaces

Working framework:

- ✓ Windows, MacOS, Linux
- ✓ Hard circle :10 GB
- ✓ RAM: 512 MB.
- ✓ Processor: Pentium(R)Dual-center CPU

2.3.3. Software Interfaces

- ✓ PgAdmin
- ✓ VS Code
- ✓ PyCharm
- ✓ STS

2.3.4. Communications Interfaces

The Customer should associate with the Internet to get to the Website:

- ✓ Dialup Modem of 52 kbps
- ✓ Broadband Internet
- ✓ Dialup or Broadband Connection with an Internet Provider

2.4. System Features

Functional requirements are specific actions or capabilities that a system must have to meet the needs of its users. Here are a few examples of functional requirements that might be relevant for a Dropshipping website.

2.4.1. Product catalog

The website should allow customers to browse and search for products, view product details and images, and add items to their shopping cart.

2.4.2. Order processing

The website should have a system in place for accepting and processing orders, including payment processing, order fulfillment, and tracking.

2.4.3. Customer account management:

The website should allow customers to create an account and save their shipping and payment information for future purchases.

2.4.4. Inventory management:

The website should have a system in place for tracking inventory levels and availability to ensure that orders can be fulfilled in a timely manner.

2.4.5. Marketing and promotions:

The website should include features such as email marketing tools, coupons and discounts, and referral programs to help drive sales and promote the business.

2.4.6. Analytics and reporting:

The website should include tools for tracking key performance metrics, such as website traffic, sales, and customer acquisition, to help the business understand its performance and identify areas for improvement.

2.4.7. Security:

The website should have measures in place to protect customer data and ensure the security of online transactions.

By identifying and prioritizing functional requirements, a drop shipping business can ensure that its website is able to meet the needs of its customers and support the overall success of the business.

2.5. Nonfunctional Requirements

Non-functional requirements are characteristics of a system that do not relate to specific functions or actions, but rather to the overall performance, reliability, and usability of the system. Here are a few examples of non-functional requirements that might be relevant for a Dropshipping website:

2.5.1. Performance:

The website should be able to handle a high volume of traffic and process orders efficiently, with minimal delays or errors.

2.5.2. Scalability:

The website should be able to handle growth in traffic and order volume without experiencing performance issues.

2.5.3. Reliability:

The website should always be available to users and should not experience frequent downtime or errors.

2.5.4. Usability:

The website should be easy for users to navigate and use, with a clear and intuitive interface.

2.5.5. Accessibility:

The website should be accessible to users with disabilities, in compliance with relevant accessibility standards.

By considering non-functional requirements during the development and maintenance of a drop shipping website, a business can ensure that the website can meet the needs of its users and support the overall success of the business.

2.6. Other Requirements

No other requirements are needed till now.

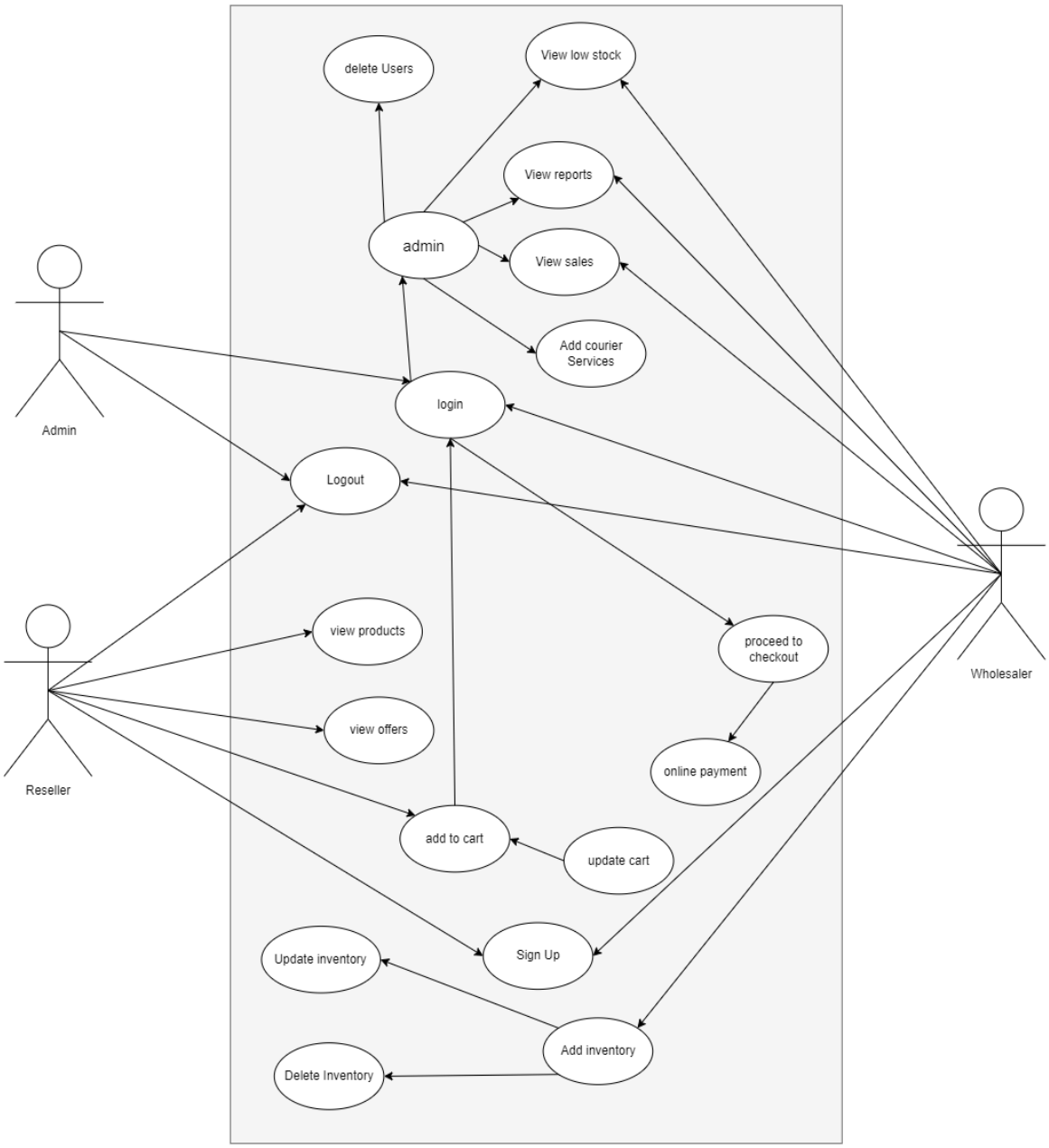
Chapter 3

Use Case Analysis

Chapter 3: Use Case Analysis

This chapter consists of use cases and fully dressed usage of case modeling, that is frequently utilized to model interactions between a system and external actors like users (wholesalers & resellers) or other systems.

3.1. Use Case Model



3.2. Use Cases Description

3.2.1. Register New User

Use Case Name	Register New User	
Description	This use case describes the process of registering a new user (wholesaler & Reseller) for more options on web application.	
Primary Actor	User (wholesaler & Reseller)	
Secondary Actor	System	
Pre-Condition	User should have a little knowledge of web application.	
Post-Condition	New user or customer registered successfully.	
Basic Flow	Actor Action	System Action
	Step1: Click on the signupbutton. Step2: Fill in the form fields. Step3: Click on submitbutton.	Step1: Signup page will bedisplayed. Step2: Fetch data from formfields. Step3: Register new usersuccessfully.
Alternative Flow	Step1: The user is already registered. Step2: The user is with incomplete information.	Step1: Show the message error. Step2: Ask the user to completethe missing information

3.2.2. Login

Use Case Name	Login	
Description	A user can login in web application by entering username and password.	
Primary Actor	Users (admin, wholesalers & resellers)	
Secondary Actor	System	
Pre-Condition	Customer has opened the site successfully or admin has opened the site successfully.	
Post-Condition	User logs in successfully to web application Admin login successfully to admin panel of website.	
Basic Flow	Actor Action	System Action
	Step1: This use case is initiated when the admin opens site or user clicks on sign in button. Step2: User or admin enter the password and username. Step3: User then click sign in button	Step1: Sign in page will be displayed. Step2: Validate the data. Step3: User record shown to user.
Alternative Flow	Wrong username or password.	Invalid user.

3.2.3. Add to Cart

Use Case Name	Add to Cart	
Description	The user can add their favorite products to their shopping cart.	
Primary Actor	User (resellers)	
Secondary Actor	System	
Pre-Condition	User should have internet connectivity to visit the website and add items to cart	
Post-Condition	Item added to shopping cart successfully.	
Basic Flow	Actor Action	System Action
	Step1: Click on the shop button. Step2: Click on the add to cart button. Step3: View your product on shopping cart.	Step1: The shop page is loaded. Step2: Favorite product is added to cart. Step3: Cart is loaded, and item is shown to user.
Alternative Flow	User don't have internet connectivity.	No shopping cart will be displayed.

3.2.4. Remove Product from Cart

Use Case Name	Remove Product form cart.

Description	The user can remove added product from cart.	
Primary Actor	User (resellers)	
Secondary Actor	System	
Pre-Condition	User should have internet access to open the website and the user added the product in the cart.	
Post-Condition	The item is deleted from the cart.	
Basic Flow	Actor Action	System Action
	Step1: the user selects the item. Step2: Click on delete button	Step1: Item selected. Step2: Successfully deleted the selected item.
Alternative Flow	Wrong username or password.	Invalid user.

3.2.5. View Product:

Use Case Name	View Products
Description	The user can view the products of their choice.
Primary Actor	User
Secondary Actor	System
Pre-Condition	The user has internet access to open the website.
Post-Condition	The products list is shown to the user.

Basic Flow	Actor Action	System Action
	Step1: The website is opened on the computer. Step2: The customer clickson the shop button. Step3: The drop-down menuwith new products and usedproducts option is showed to user.	Step1: Website loaded to customer's computer. Step2: A dropdown menu is shown to the user. Step3: The system waits for user's choice for the drop-down list.
Alternative Flow	No Internet Access	Website name is not entered correctly.

3.2.6. Logout:

Use Case Name	Logout	
Description	The user can close their account by simply clicking on sign-out button.	
Primary Actor	User	
Secondary Actor	System	
Pre-Condition	User should be logged in before to use this option.	
Post-Condition	Logged out from the system successfully.	
Basic Flow	Actor Action	System Action
	Step1: Click on sign-out button.	Step1: Hide user details immediately.
Alternative Flow	User is not logged in	Tell user you are not logged in.

3.2.7. Payment

Use Case Name	Payment selection	
Description	User selects the payment selection method to pay the company	
Primary Actor	User	
Secondary Actor	System	
Pre-Condition	User must be logged into the website	
Post-Condition	Payment of cart is paid to the company and order number is sent via email to the customer.	
Basic Flow	Actor Action	System Action
	Step1: Open the website. Step2: Completes shoppingon the website and then provides billing informationto the company. Step3: Selects the payment method to pay company for checkout completion.	Step1: Website home pageis shown. Step2: Billing information saved to the database of the company. Step3: Payment received confirmation email sent to customer for verifying the payment and order is sent via SMS to the customer.
Alternative Flow	Checkout selection.	Cash on delivery confirmed.

3.2.8. Add Product

Use Case Name	Add New product	
Description	Wholesaler or seller can add new product to the website.	
Primary Actor	Wholesaler or seller	
Secondary Actor	System.	
Pre-Condition	user is logged into the website.	
Post-Condition	user successfully adds new product in the stock.	
Basic Flow	Actor Action	System Action
	Step1: Login to the dashboard using Seller credentials. Step2: Click on Products. Step3: Click on Add new product. Step4: Save Product.	Step1: Dashboard returnedto the user. Step2: Products dropdown menu is displayed. Step3: create a new product page displayed. Step4: Show success message.
Alternative Flow	Invalid	Invalid.

3.2.9. Update Product

Use Case Name	Edit Product	
Description	Wholesaler or Seller can edit information of the product.	
Primary Actor	Wholesaler or Seller	
Secondary Actor	System	
Pre-Condition	Logged in as Wholesaler or Seller	
Post-Condition	Product information is updated successfully.	
Basic Flow	Actor Action	System Action
	Step1: login to admin panel. Step2: Click on view products. Step3: Click on Edit	Step1: Verify the user andreturn the dashboard. Step2: Products are displayed on the screen. Step3: Editable product information is displayed onscreen.
Alternative Flow	User not Authenticated	Error 404 not found.

3.2.10. Delete Product

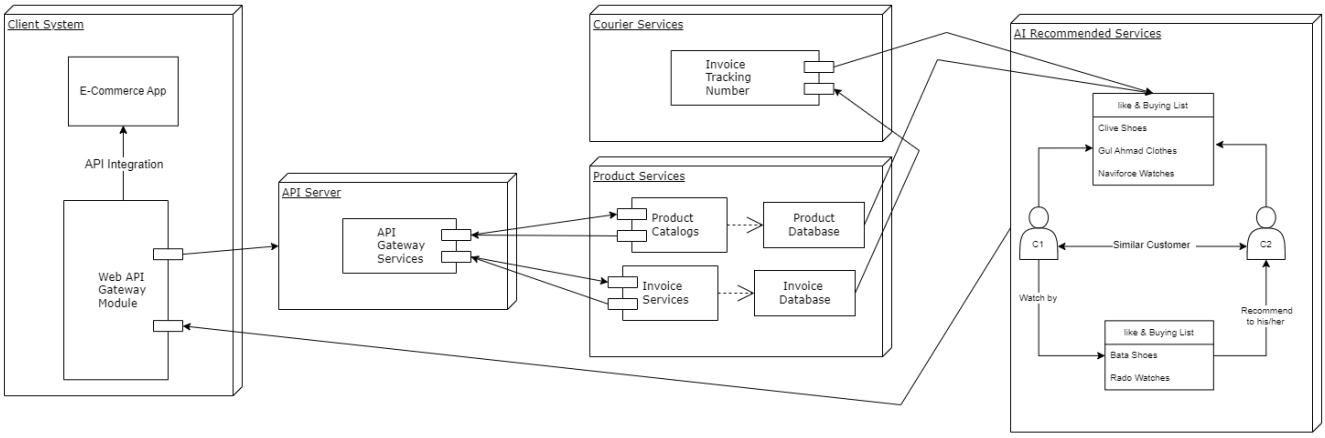
Use Case Name	Delete Product	
Description	Wholesaler or Seller logs into the system to delete the product.	
Primary Actor	Wholesaler or Seller	
Secondary Actor	System	
Pre-Condition	Wholesaler or Seller logs into the website successfully.	
Post-Condition	Product Deleted from the website.	
Basic Flow	Actor Action	System Action
	Step1: Login to the systemusing Seller credentials. Step2: Click on Products. Step3: Click on view products. Step4: Click on delete product.	Step1: Verify if the user is Seller or not and prompt itto dashboard. Step2: Products dropdownmenu showed. Step3: All products in stockare displayed. Step4: Product removedfrom the stock.
Alternative Flow	Wrong username or password.	Invalid user.

Chapter 4

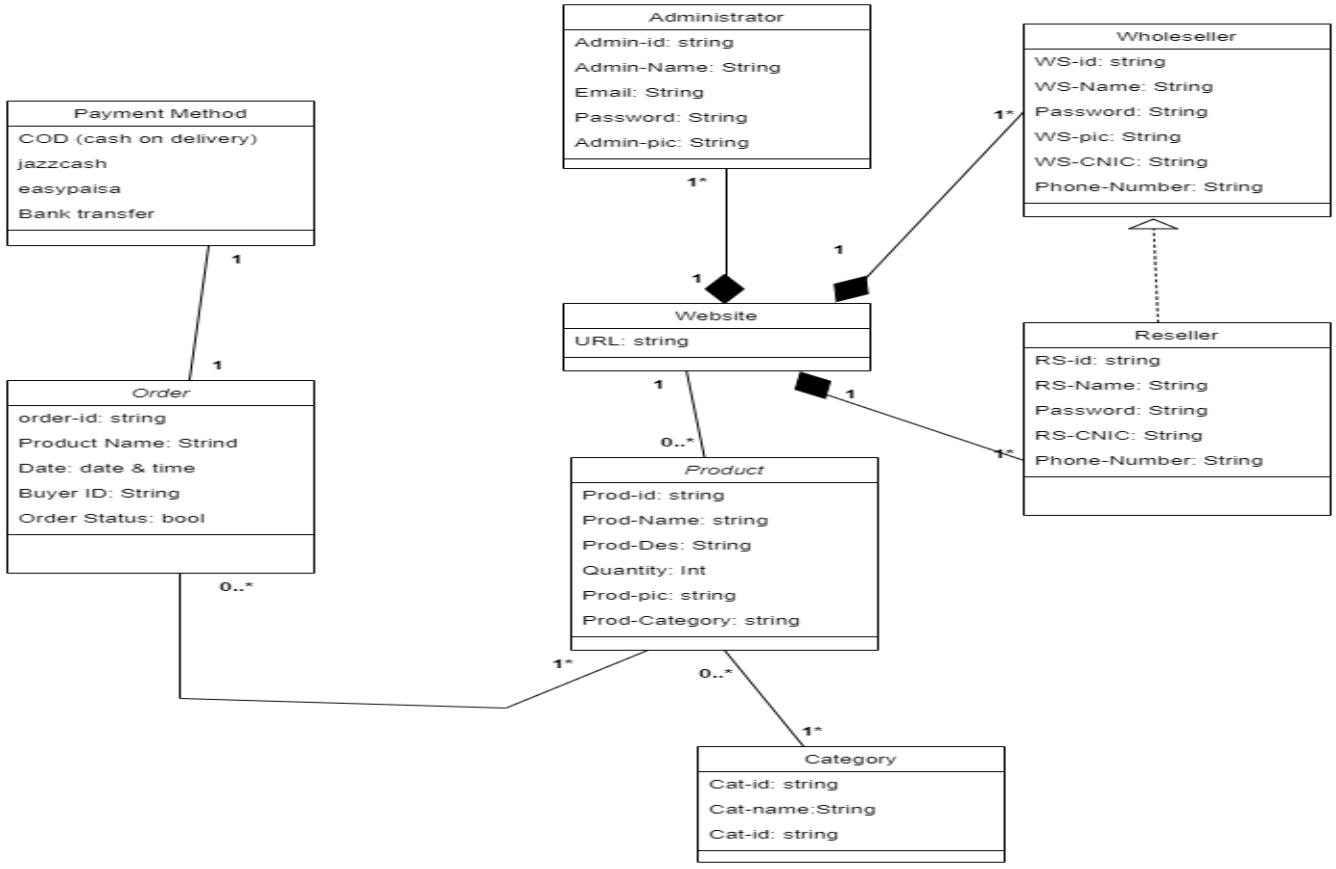
System Design

Chapter 4: System Design

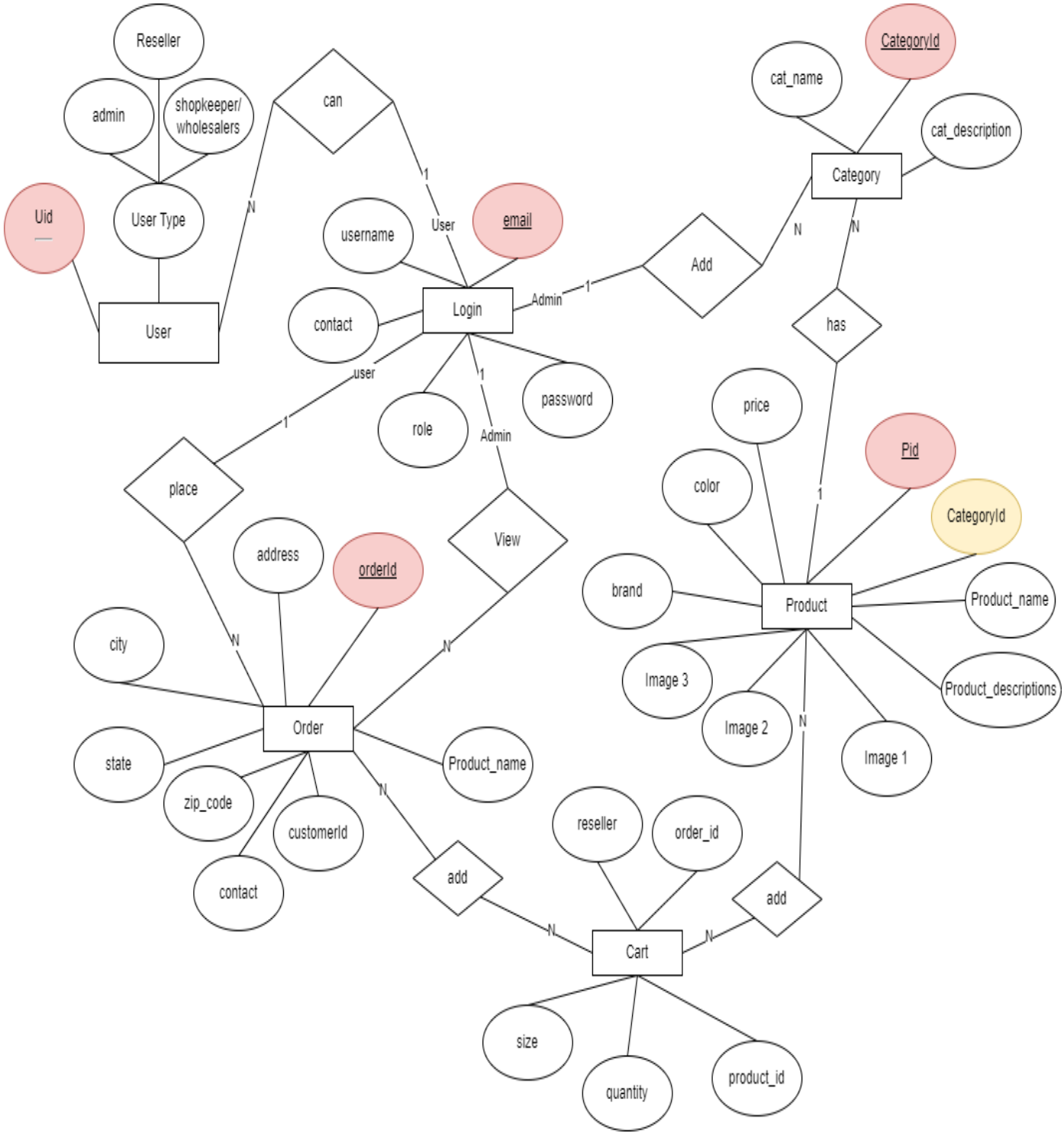
4.1. Architecture Diagram



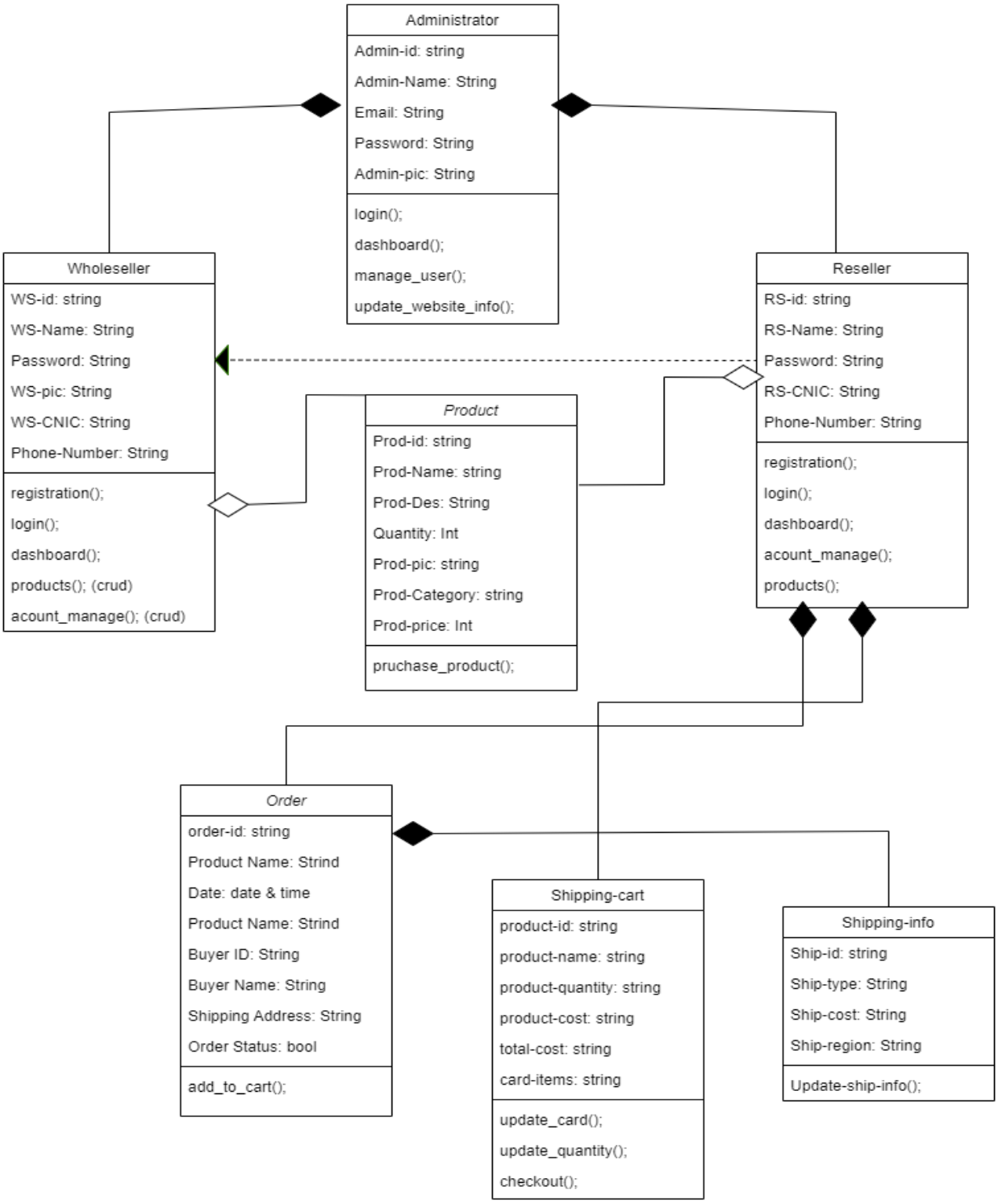
4.2. Domain Model



4.3. Entity Relationship Diagram with data dictionary

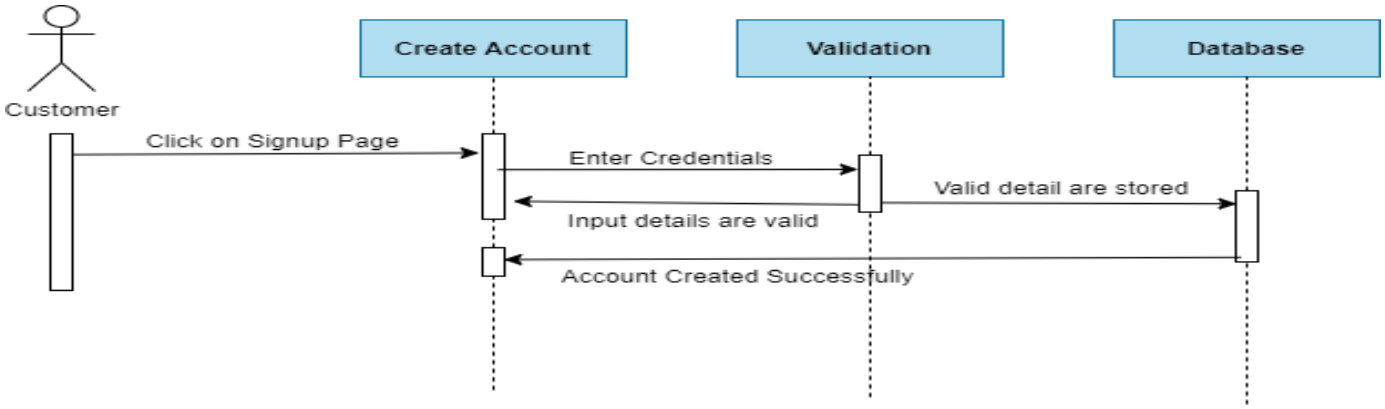


4.4. Class Diagram

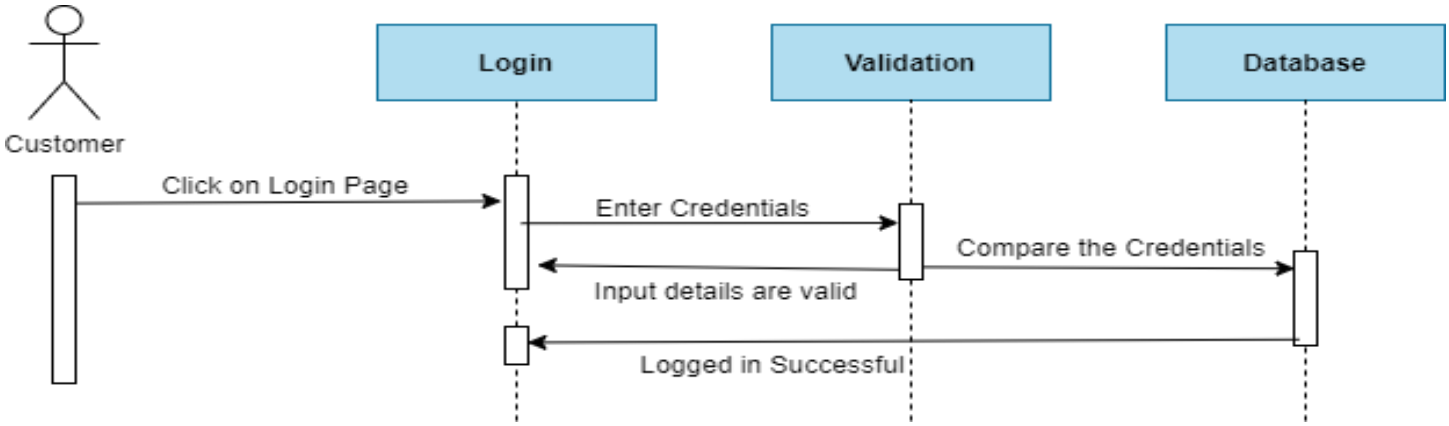


4.5. Sequence / Collaboration Diagram

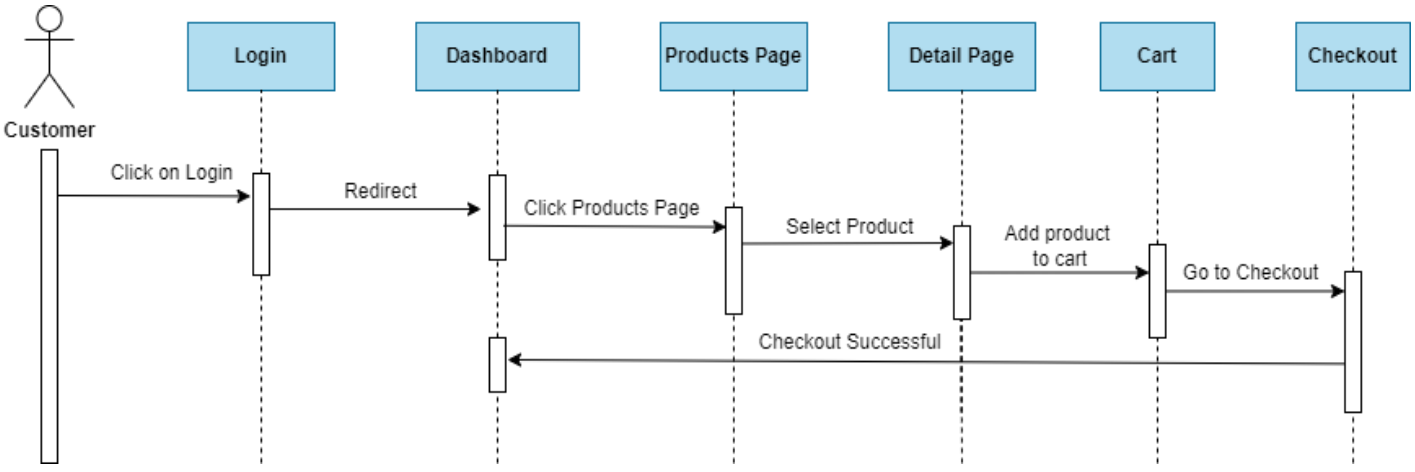
4.5.1. Registration



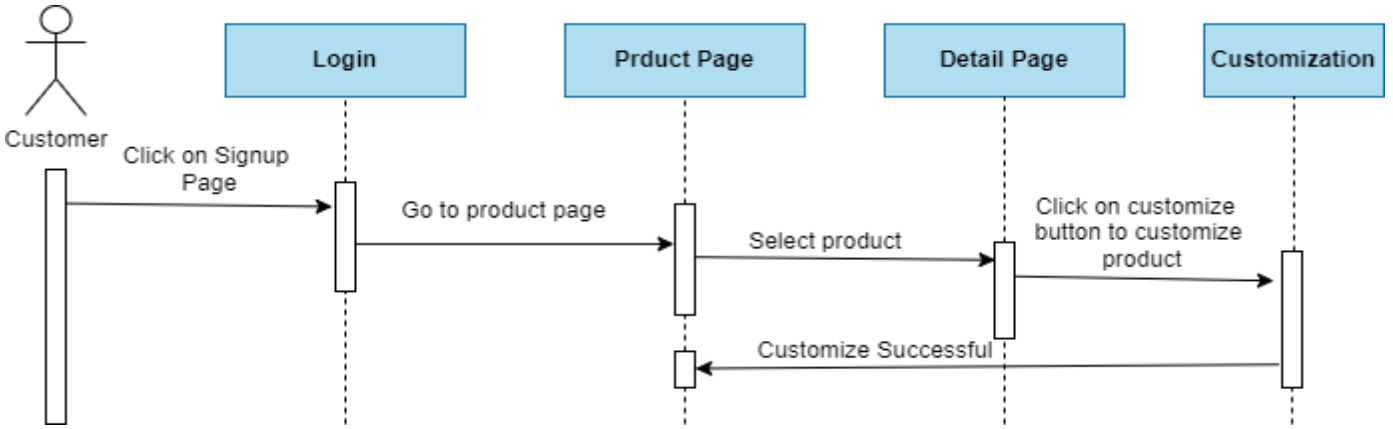
4.5.2. Login



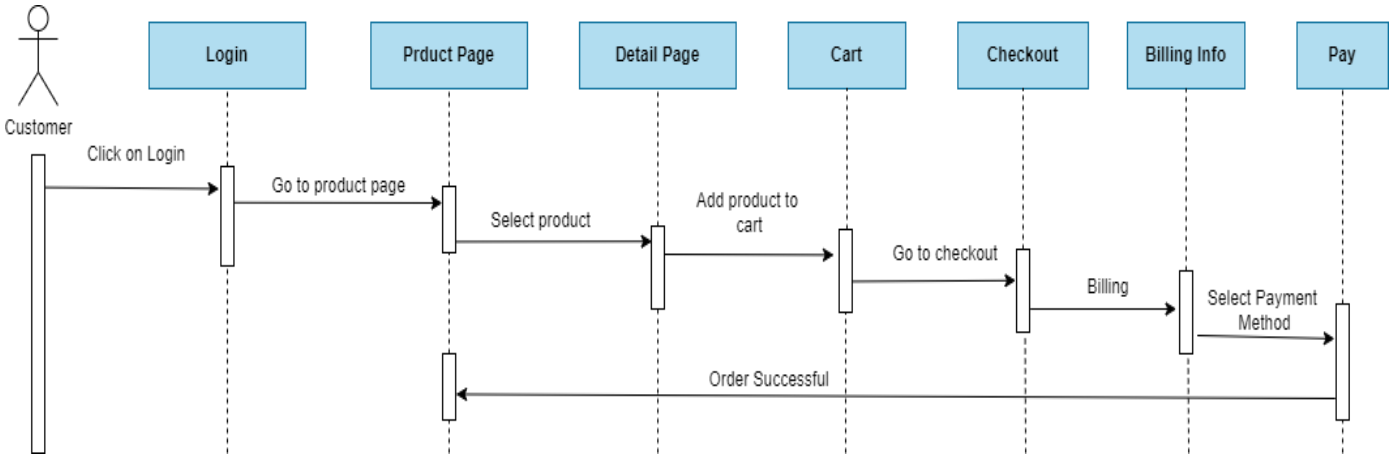
4.5.3. Place Order



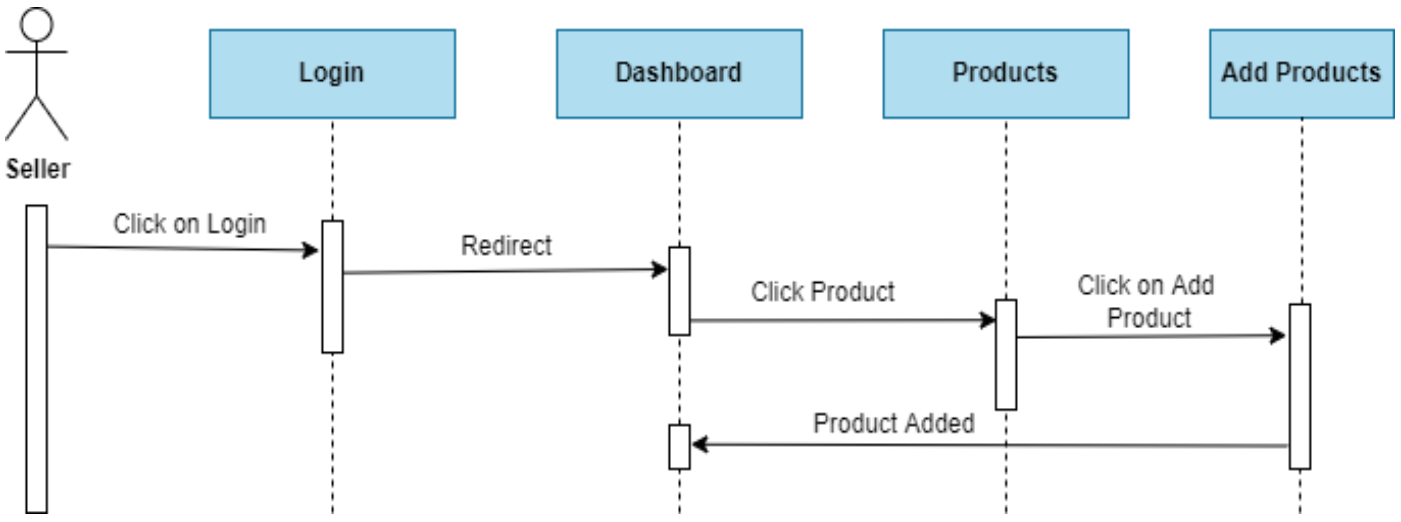
4.5.4. Order Customization



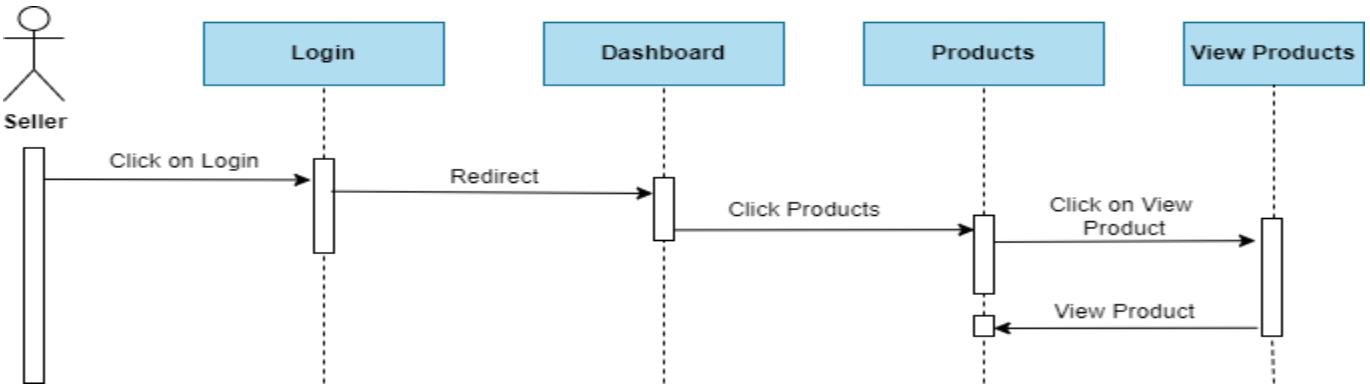
4.5.5. Payment



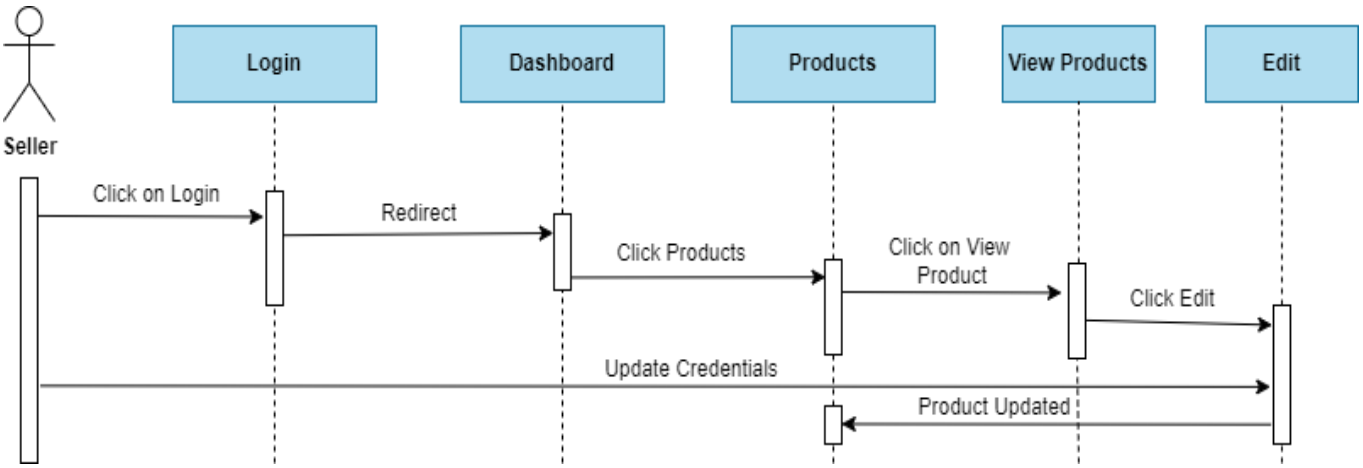
4.5.6. Add Product



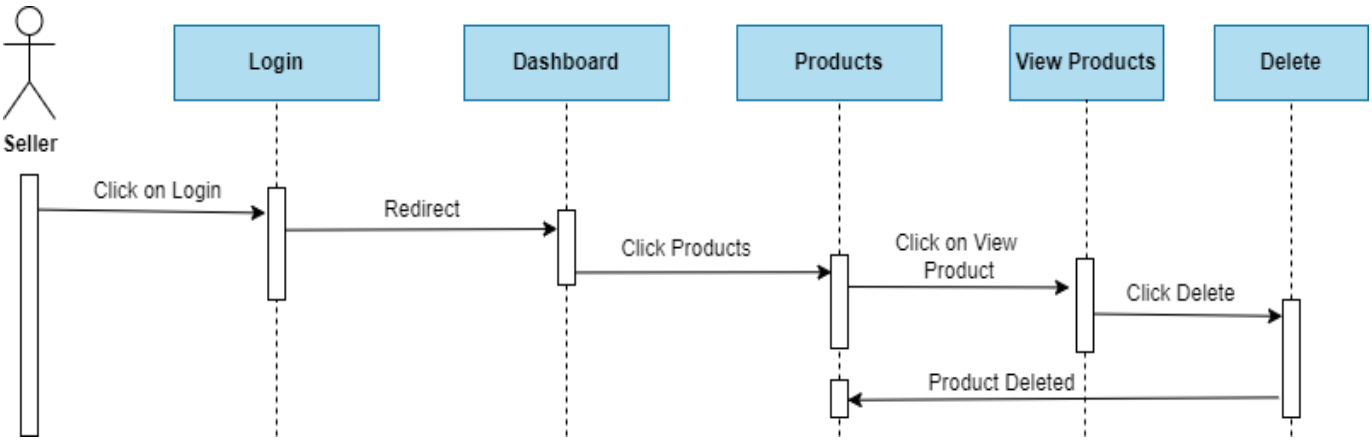
4.5.7. View Product



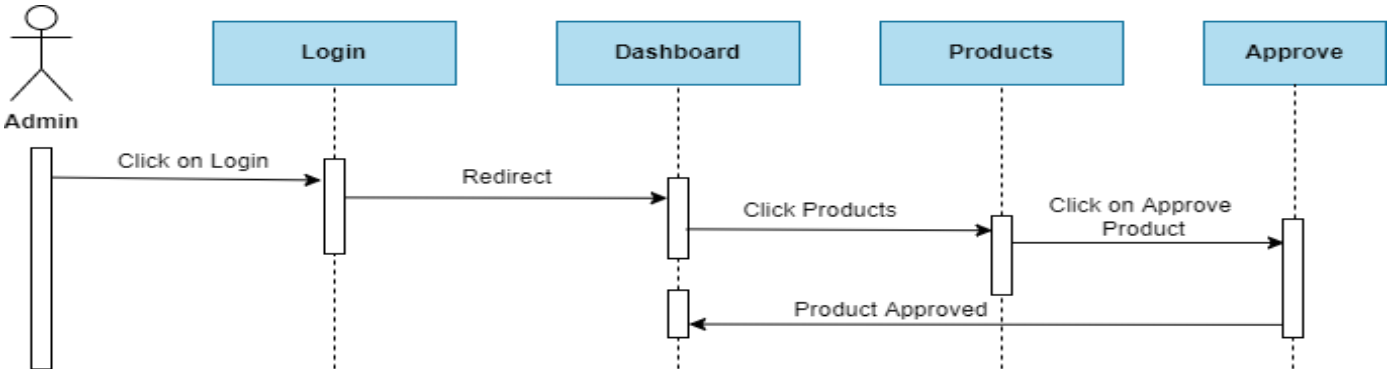
4.5.8. Update Product



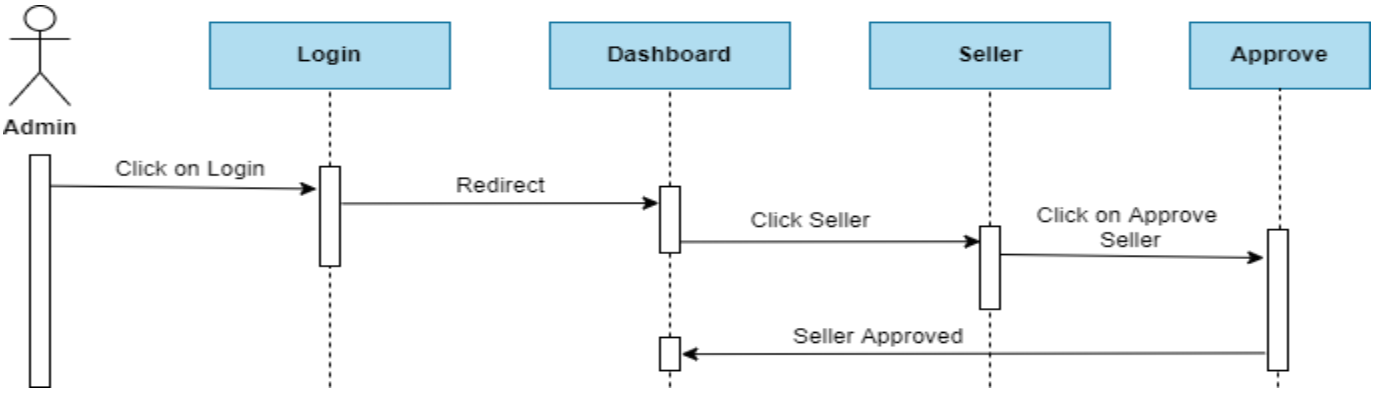
4.5.9. Delete Product



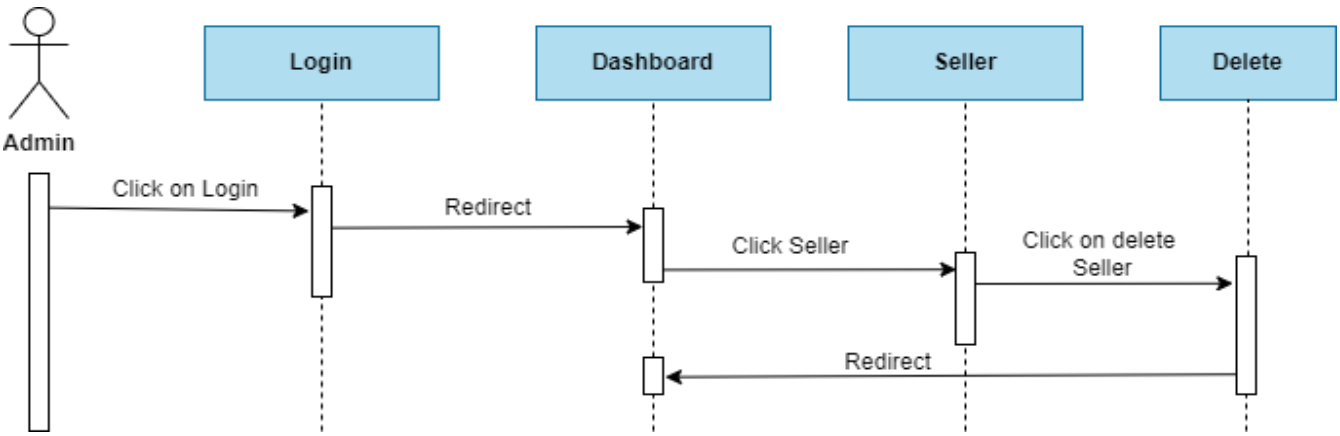
4.5.10. Approved Product



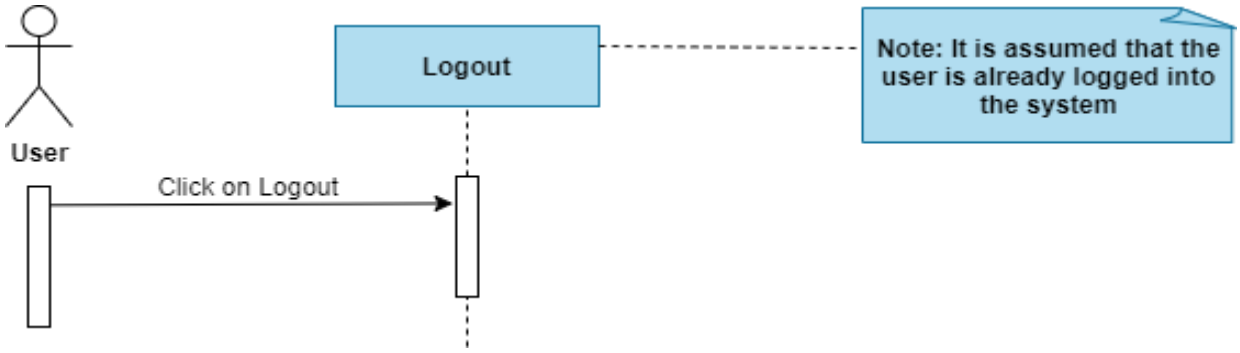
4.5.11. Approved Seller



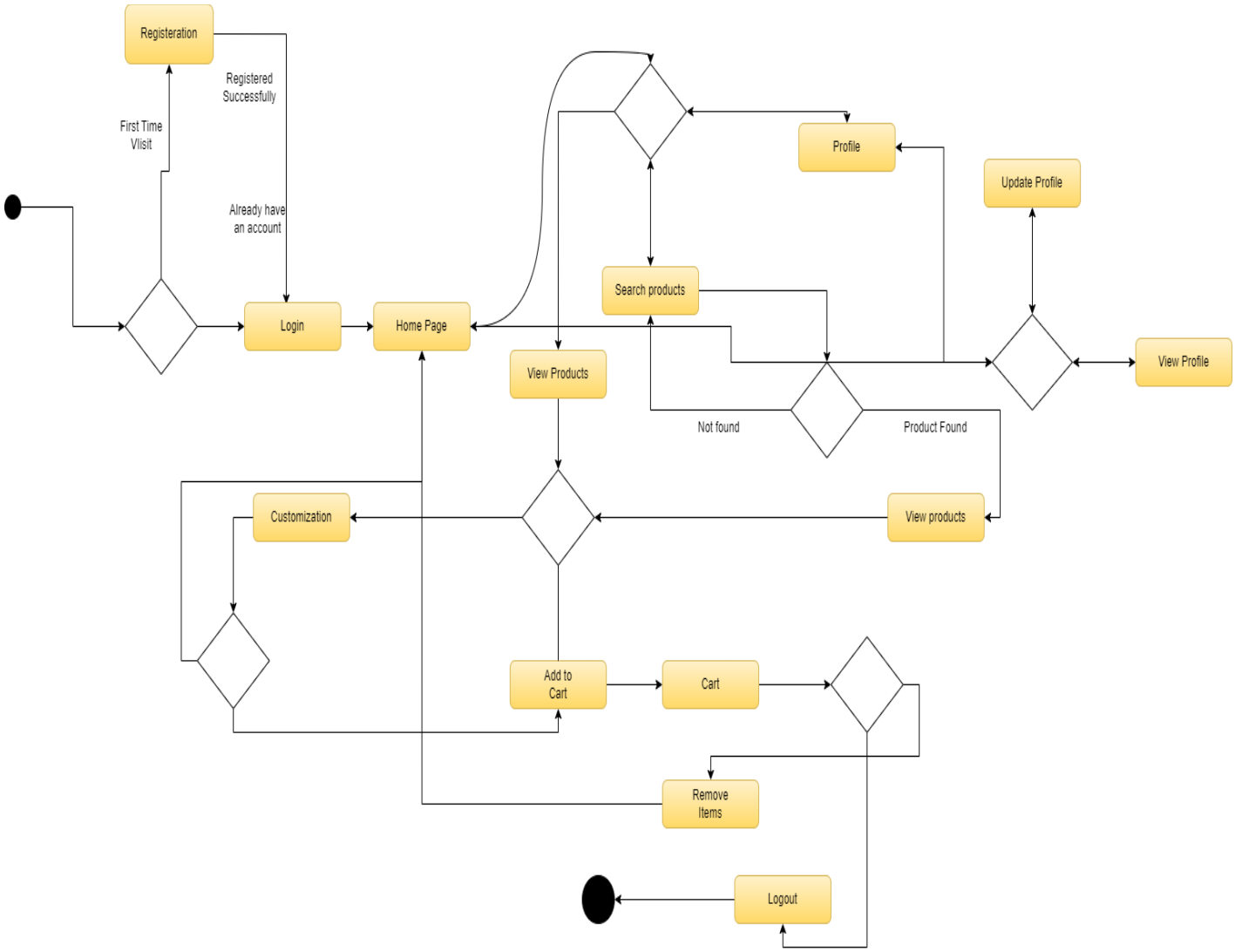
4.5.12. Delete Seller



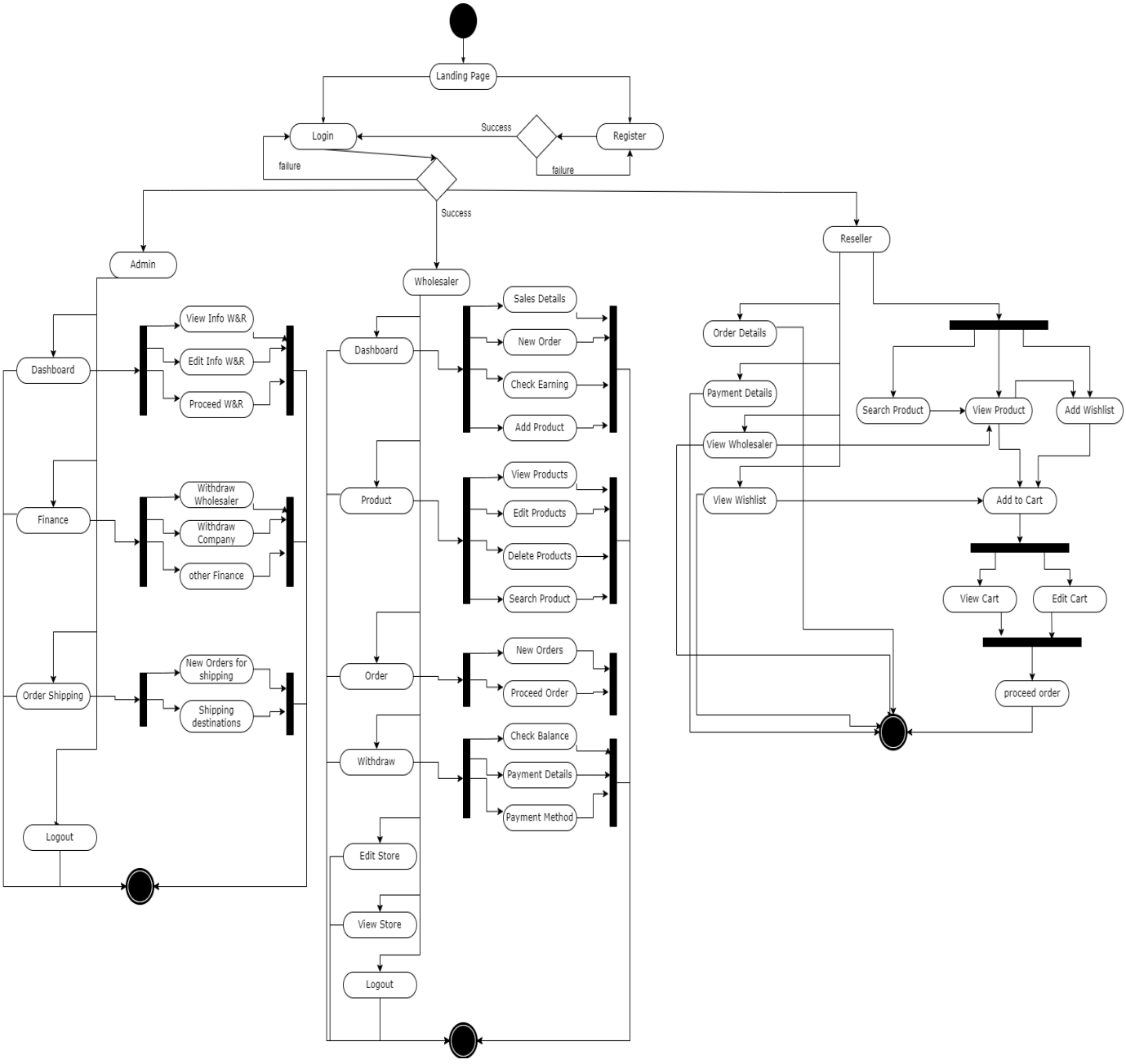
4.5.13. Logout



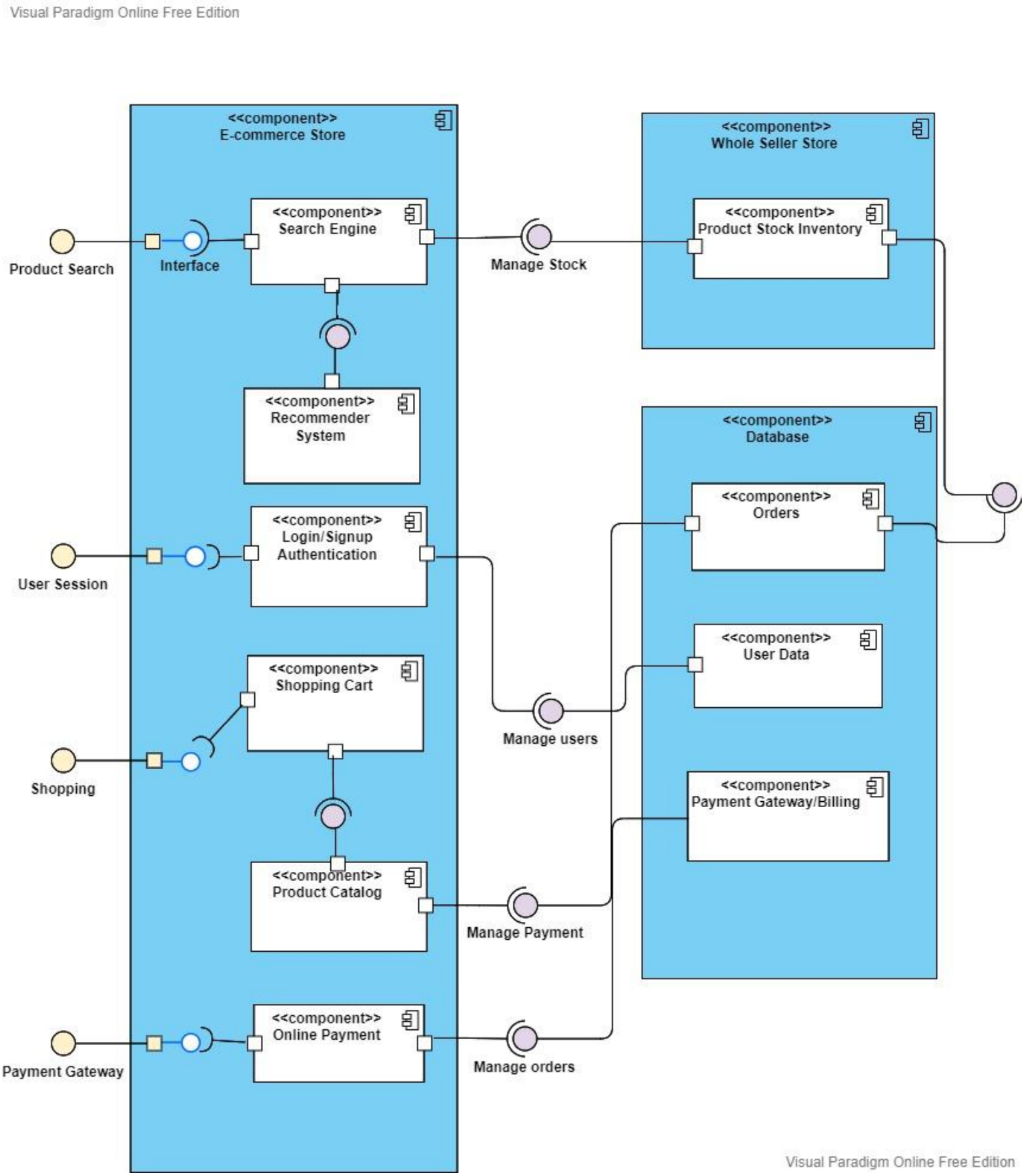
4.6. State Transition Diagram



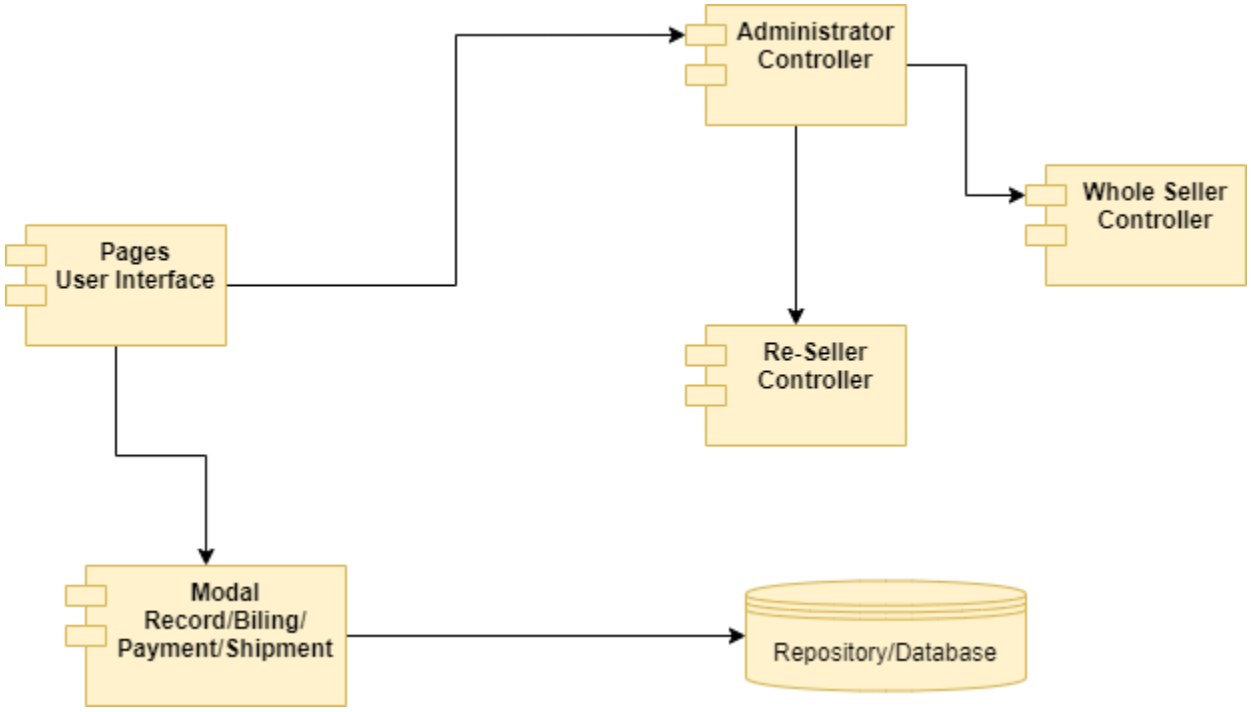
4.7. Activity Diagram



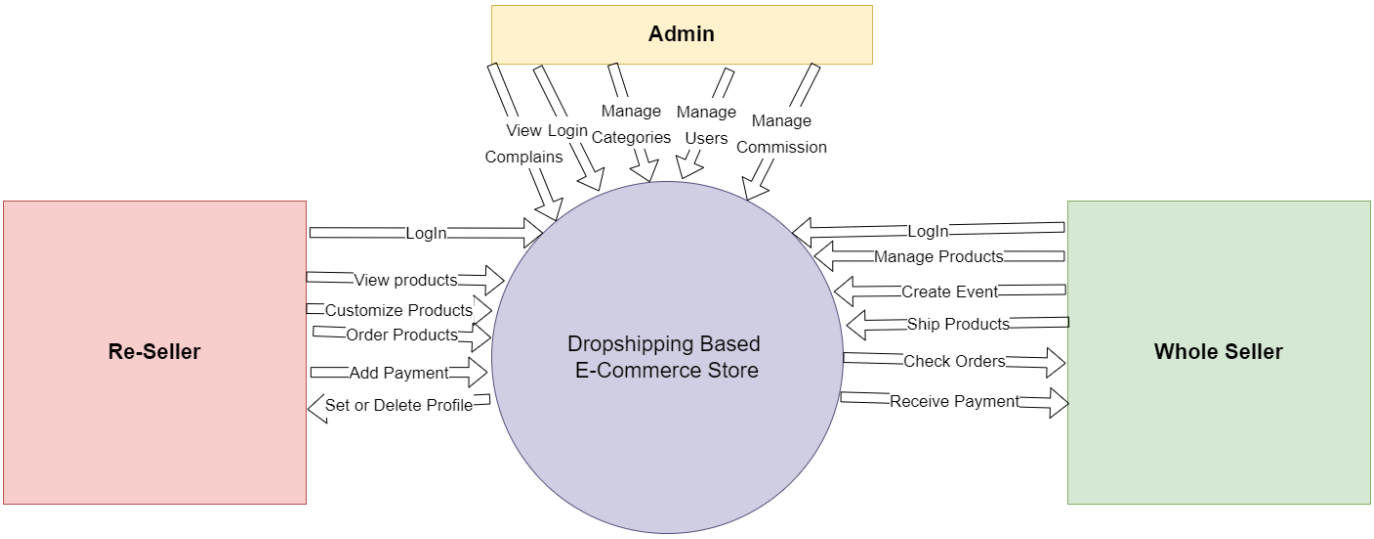
4.8. Component Diagram



4.9. Deployment Diagram



4.10. Data Flow diagram



Chapter 5

Implementation

Chapter 5: Implementation

This chapter is all about implementation of tools and techniques, coding standards, flow of program. It should help us to understand how this system is efficient and sufficient to meet functional requirements.

5.1. Important Flow Control/Pseudo codes

1. Admin, wholesalers, and Resellers can login to the system
2. Admin & shopkeeper/Wholesalers can add the products records and later he can edit those records.
3. Admin & wholesalers can have the responsibility to make a record of the sales.
4. Admin & wholesalers can add salesperson and his information about the product.
5. Admin can update Logo, updating Website content, updating themes and appearance.
6. Resellers can place orders for their customers.
7. Resellers can view their own dashboard which consists of all details like profit, loss, total place orders, total completed order etc.
8. All users of the application can log out their accounts.

5.2. Components, Libraries, Web Services, and stubs

Dropsourcing is a Dropshipping E-Commerce app based on Web Development Java, Java Spring Boot, ReactJS and NodeJS Frameworks including MySQL Database.

5.3. Deployment Environment

Our system requires a Web environment to work fully functional. It also can work on mobiles, tablets, and all other devices.

5.4. Tools and Techniques

Following tools and techniques which are used:

- ✓ HTML
- ✓ CSS
- ✓ ReactJS
- ✓ java
- ✓ PgAdmin
- ✓ MySQL
- ✓ VS Code.
- ✓ Java Spring Boot
- ✓ STS (Spring Tool Suit)

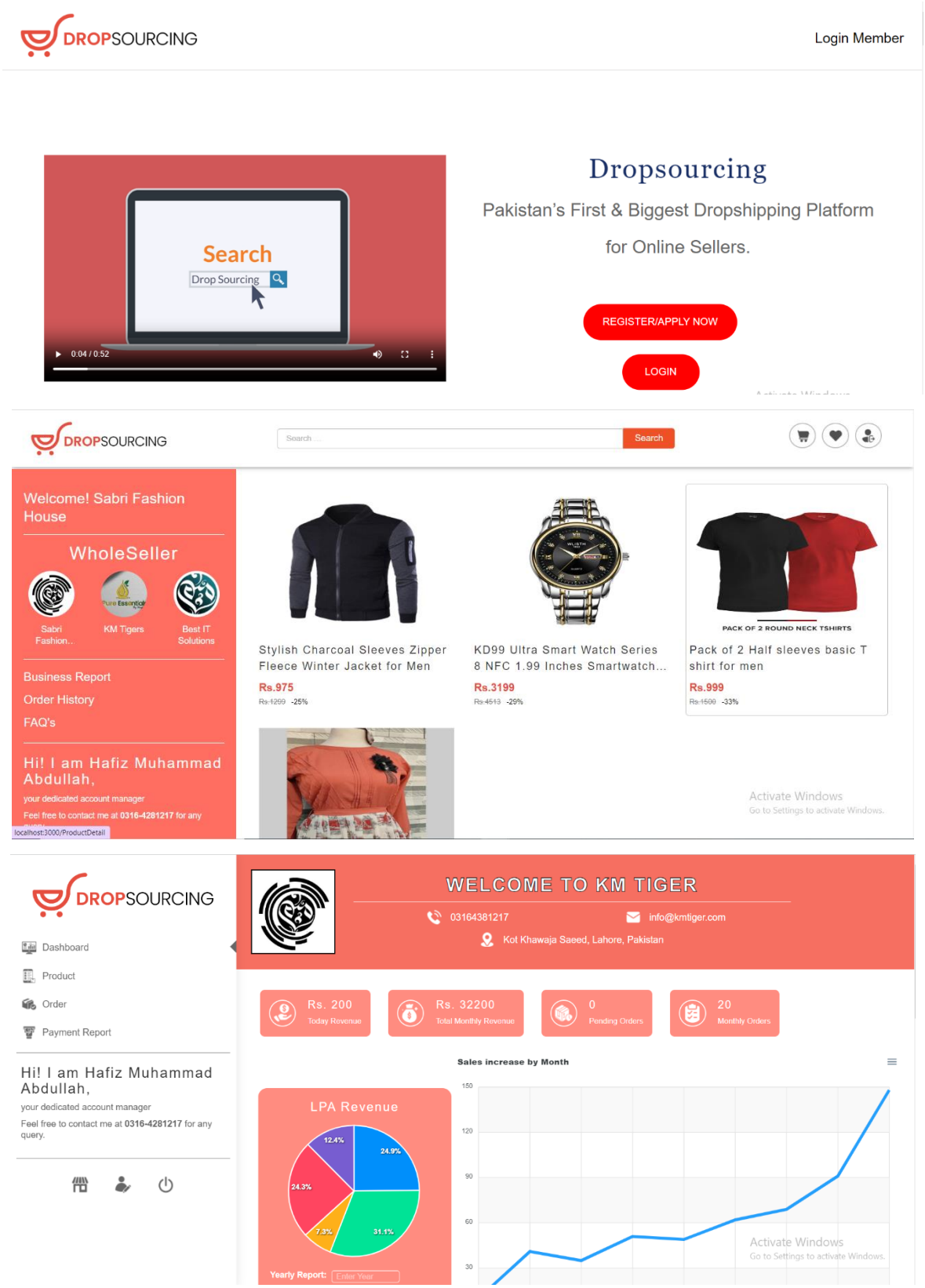
5.5. Best Practices / Coding Standards

MySQL Database, ReactJS and Java Spring Boot coding standards are used to implement E-Commerce Store. ReactJS and Java Spring Boot Framework have some constraints that should fulfill to acquire the accurate results. Code is efficient and can be reused.

5.6. Version Control

- ✓ We are working on these versions.
- ✓ ReactJS 17.0
- ✓ Java 17.0
- ✓ MySQL 8.0

5.7. Prototype Images



Chapter 6

Testing and Evaluation

Chapter 6: Testing and Evaluation

The chapter on "Testing and Evaluation" in a project report focuses on the activities and processes related to testing and evaluating the project's deliverables. It provides an overview of the testing methodologies, strategies, and techniques employed to ensure the quality and reliability of the project outcomes. This chapter describes the objectives of testing, the test plan, test cases, and test execution procedures followed during the project's development lifecycle. It also discusses the tools and technologies utilized for testing purposes.

6.1. Use Case Testing

Use Case 1: User Registration and Login

- Test user registration by providing valid input and ensuring successful registration.
- Test login functionality using valid credentials and verify successful login.
- Test various scenarios such as invalid credentials, incorrect passwords, and error handling.

Use Case 2: Product Search and Browsing

- Test product search functionality by entering keywords, categories, or filters and verifying accurate search results.
- Test navigation through product listings, sorting options, and product details.
- Validate that the search and browse functionality is responsive and user-friendly.

Use Case 3: Adding Products to Cart and Checkout

- Test adding products to the cart and verify that the cart updates correctly.
- Validate the checkout process by entering shipping and billing information, selecting payment methods, and ensuring accurate order total calculations.
- Test scenarios such as applying discount codes, removing items from the cart, and handling out-of-stock products.

6.2. Equivalence partitioning

By applying equivalence partitioning to the search functionality in an e-commerce web project, you can identify various representative input values and scenarios for testing. This approach helps ensure that different classes of inputs are adequately tested, minimizing the number of test cases while still covering relevant scenarios.

1. Valid Equivalence Partition:
    a. Search keyword: a valid and existing product name (e.g., "iPhone 12 Pro")
2. Invalid Equivalence Partitions:
3. Invalid or non-existent product name:
    a. Empty search keyword
    b. Search keywords with fewer characters than the minimum allowed.
    c. Search keywords with more characters than the maximum allowed.
    d. Search keyword with special characters or invalid characters
4. Invalid input types:
    a. Numeric input as the search keyword
    b. Alphabetic input as the search keyword for a field that expects numeric input (e.g., searching for a product by its price)
5. Invalid search scenarios:
    a. Searching for a discontinued product
    b. Searching for a product that is out of stock.
    c. Searching for a product in a non-existent category or invalid category ID

6.3. Boundary value analysis

By applying boundary value analysis to the product pricing functionality in an e-commerce store based on Dropshipping, you can ensure that critical boundary conditions and edge cases are tested. This helps uncover potential issues related to price calculations, quantity limits, and shipping cost validations.

Valid Boundary Values:

- Product Price: Minimum allowed price (e.g., 1.00)

- Product Quantity: Minimum allowed quantity (e.g., 1)
- Shipping Cost: Minimum allowed shipping cost (e.g., 0.00)

Invalid Boundary Values:

a. Product Price:

- Price less than the minimum allowed (e.g., 0.99)
- Price greater than the maximum allowed or unrealistic high price (e.g., 10,000)

b. Product Quantity:

- Quantity less than the minimum allowed (e.g., 0)
- Quantity greater than the maximum allowed or unrealistic high quantity (e.g., 10,000)

c. Shipping Cost:

- Shipping cost less than the minimum allowed (e.g., -5.00)
- Shipping cost greater than the maximum allowed or unrealistic high shipping cost (e.g., 500.00)

Edge/Boundary Values:

a. Product Price:

- Minimum allowed price - 0.01
- Maximum allowed price + 0.01

6.4. Data flow testing

Data flow testing is a software testing technique that focuses on the flow of data within a system. It aims to identify and test different paths through which data is input, processed, and output. In the context of an e-commerce web project based on Dropshipping, here's an example of data flow testing scenarios:

1. User Registration and Login:
   - Test the flow of user registration data from the registration form to the database, ensuring that the data is correctly stored.
   - Test the login process, verifying the flow of user credentials from the login form to the authentication mechanism and validating the access granted or denied based on the data flow.

2. Product Ordering:
    - Test the flow of product order data from the user interface to the order processing system, ensuring that all required information is correctly captured and passed along.
    - Verify the data flow from the order processing system to the external Dropshipping partners, ensuring that the correct products, quantities, and shipping details are transmitted accurately.
3. Inventory Management:
    - Test the flow of inventory data, including stock updates and notifications, to ensure accurate tracking and synchronization between the e-commerce system and the Dropshipping partners.
    - Validate the data flow from the Dropshipping partners to the e-commerce system, ensuring that inventory updates, product availability, and restocking information are correctly received and processed.
4. Reporting and Analytics:
    - Test the flow of data from various parts of the system to reporting and analytics modules, ensuring that data is captured, processed, and presented accurately for generating insights and performance metrics.

6.5. Unit testing

Unit testing is a software testing technique where individual units or components of a system are tested in isolation. In the context of an e-commerce web project based on Dropshipping, here are examples of unit testing scenarios:

1. User Registration:
    - Test the validation of user input fields such as username, password, and email address.
    - Test the functionality of storing user registration data in the database.
    - Test the generation of unique user IDs or tokens during the registration process.
2. Product Catalog:

- Test the retrieval of product information from the database based on product IDs or categories.
- Test the calculation of prices, discounts, and shipping costs for individual products.
- Test the functionality of adding, updating, and deleting products in the catalog.

3. Order Processing:
   - Test the creation and validation of order objects based on user selections and input.
   - Test the calculation of total order amounts, including product prices, quantities, and shipping costs.

6.6. Integration testing

Integration testing is a software testing technique that focuses on testing the interaction and communication between different components or modules of a system. It aims to uncover defects that may arise when integrating these components and ensure their proper functioning. In the context of an e-commerce web project based on Dropshipping, here are examples of integration testing scenarios:

1. User Registration and Login Integration:
   - Test the integration between the user registration module and the login module to ensure that registered users can successfully log in with their credentials.
   - Test the integration with the authentication module to verify that user credentials are correctly validated, and access is granted or denied accordingly.
2. Product Ordering and Inventory Integration:
   - Test the integration between the order processing module and the inventory management module to ensure that product availability is correctly updated, and orders are placed based on the available inventory.
   - Test the integration with the external Dropshipping partners to verify that orders are transmitted accurately, and the inventory is synchronized.

6.7. Performance testing

Performance testing is a type of software testing that evaluates the performance and responsiveness of a system under specific workload conditions. It helps identify potential

bottlenecks, performance issues, and scalability limitations. In the context of an e-commerce web project based on Dropshipping, here are examples of performance testing scenarios:

1. Load Testing:
    - Simulate a high volume of concurrent users accessing the e-commerce website to test its performance under heavy loads.
    - Measure response times for various user interactions such as searching for products, adding items to the cart, and completing the checkout process.
    - Monitor system resource utilization (CPU, memory, disk I/O) during the load test to identify performance bottlenecks.

6.8. Stress Testing

Push the system beyond its normal operational capacity to evaluate its behavior and performance under extreme stress.

Gradually increase the load or number of concurrent users until the system reaches its maximum capacity.

Measure the response times, error rates, and system stability during the stress test to identify the breaking point and understand the system's failure modes.

Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

7.1. Project Summary

The FYP 1 project, called Dropsourcing, is based on the Dropshipping model in the e-commerce industry. The aim is to provide a platform that facilitates collaboration between wholesalers and resellers, allowing them to reach a wide range of customers and start businesses with minimal investment. The project focuses on addressing the challenges faced by wholesalers in finding customers and resellers in starting their own e-commerce businesses.

The application designed for Dropsourcing offers several key features. Wholesalers can list their products on the platform to increase sales, while resellers can sell these products to consumers and earn money. The platform manages stock for wholesalers and handles orders for resellers. Additionally, an AI-based recommendation system is implemented to promote products effectively. Shipment details are also managed within the platform.

The project aims to create an extensive network of e-shops for wholesalers and provide resellers with the opportunity to establish their own businesses with little or no investment. This helps wholesalers expand their customer base and allows resellers to utilize their skills in sales and customer service.

The project's competitors in the market include Daraz, a well-established e-commerce platform in Pakistan, and HHC Dropshipping, which has recognized the potential and challenges in the online industry.

The motivation behind Dropsourcing stems from the impact of the COVID-19 pandemic, which left many people unemployed and struggling to find opportunities. The project aims to address the challenges faced by middle-class and lower-middle-class individuals who lack financial resources to start a business. Additionally, wholesalers faced a shortage of customers during the pandemic due to the closure of physical shops.

The goals and objectives of the project include providing wholesalers with a platform to increase their sales without significant marketing investment, facilitating the rapid approach to many shopkeepers and resellers, and managing shipping processes. On the other hand, the project

aims to enable jobless individuals to start their own e-commerce businesses with minimal investment, manage stock effectively, and handle shipping processes seamlessly.

Overall, Dropsourcing seeks to revolutionize the e-commerce industry by connecting wholesalers and resellers, empowering individuals to start businesses with limited resources, and offering a comprehensive platform for product listing, sales management, and order fulfillment.

7.2. Achievements and Improvements

Increased Opportunities for Wholesalers: Dropsourcing provides wholesalers with a platform to reach a larger customer base and increase their sales. This allows wholesalers to expand their business without the need for significant marketing investments, leading to increased revenue and growth.

Empowering Resellers: The project offers opportunities for individuals who are unemployed or unable to start a business due to financial constraints. By becoming resellers on the Dropsourcing platform, they can leverage their skills in sales and customer service to establish their own e-commerce businesses with little to no investment.

Efficient Stock Management: Dropsourcing enables wholesalers to effectively manage their stock by providing features to track inventory levels and ensure products are available for resellers. This helps wholesalers optimize their stock and reduce the risk of overstocking or stockouts.

Streamlined Order Management: The platform facilitates seamless order management between resellers and wholesalers. Resellers can easily place orders for products, and wholesalers can efficiently process and fulfill these orders. This improves overall operational efficiency and customer satisfaction.

AI-based Product Promotion: The integration of an AI-based recommended system enhances the product promotion process. The system analyzes user behavior and preferences to recommend relevant products to customers, increasing the chances of sales and improving the overall customer experience.

Simplified Shipping Management: Dropsourcing simplifies the shipping process by managing shipment details. This relieves resellers from the burden of shipping logistics, allowing them to focus on sales and customer interactions.

Competition with Established Players: By entering the market with a unique Dropshipping model, Dropsourcing aims to compete with established e-commerce players such as Daraz. The project offers a differentiated approach that benefits both wholesalers and resellers, providing a strong value proposition in the market.

Addressing Market Needs: Dropsourcing addresses the market needs of wholesalers and individuals looking for opportunities in the e-commerce industry. It provides a solution to the challenges faced by wholesalers in finding customers and helps jobless individuals start their own businesses with minimal investment.

7.3. Critical Review

The Dropsourcing project presents a promising concept of connecting wholesalers and resellers in the e-commerce industry through a Dropshipping model. However, several critical aspects need to be addressed. Firstly, thorough market analysis and differentiation strategies are necessary to compete with established players. Technical implementation should focus on scalability, security, and performance. Seamless user experience, effective collaboration mechanisms, and risk management protocols are vital. Marketing efforts and a clear revenue model are crucial for sustainability. Additionally, legal compliance must be considered. By addressing these aspects, Dropsourcing can enhance its potential for success and effectively cater to the needs of wholesalers and resellers in the e-commerce market.

7.4. Future Enhancements/Recommendations

To further enhance Dropsourcing, several recommendations can be considered. Firstly, developing a dedicated mobile application will cater to the increasing number of mobile users and provide a seamless experience. Advanced analytics and reporting features should be implemented to offer valuable insights for wholesalers and resellers. Integrating social media platforms will expand reach and enable effective product promotion. The AI-based recommendation system can be continuously improved to provide more accurate and personalized suggestions. Collaboration tools, such as chat functionalities and real-time inventory updates, will streamline operations. Exploring international expansion opportunities

will tap into new markets. Gathering customer feedback and reviews will build trust and guide improvements. Continuous optimization based on user feedback and market trends will ensure the platform remains competitive. By implementing these enhancements, Dropsourcing can elevate its performance, user experience, and market position in the e-commerce industry.

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Reference and Bibliography

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