



Project Title: Essenza - A Clothing eCommerce Store

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This Project report has been submitted in fulfillment of the requirements for the Degree of Bachelor of Science in Software Engineering.

APPROVAL

APPROVAL

This project titled on "Eszenza:Online clothing brand", submitted by Student Name: Omar Faruq Fahim (ID:213-35-797) to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.

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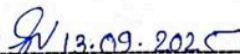
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DECLARATION

Declaration

I acknowledge that I have done this Project under the supervision of Omar Faruq Fahim, Senior Lecturer Fatama Binte Rafiq, Department of Software Engineering, Daffodil International University. I also assert that this Project is my original work for the degree of B.Sc. in Software Engineering and that neither the whole work nor any part has been submitted for another degree in this or any other university.

Submitted by:

fahim
.....

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Certified by:

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Fatama Binta Rafiq

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I want to begin by thanking Almighty God for His divine Favor and for enabling me to finish my undergraduate thesis.

My supervisor, **Fatama Binta Rafiq**, senior lecturer in the "**Department of Software Engineering**" at "**Daffodil International University**" in Dhaka, deserves my sincere appreciation and respect. His extensive expertise and advice in the section on "Machine Learning" greatly assisted me in finishing this entire thesis. He has made it possible by his unwavering empathy, academic leadership, constant inspiration, diligent monitoring, constructive criticism, useful advice, and the reading of several poor papers that he has corrected at every level.

I would like to express my sincere gratitude to **Dr. Imran Mahmud**, Head of the "**Software Engineering**" Department, Faculty of Science and Information Technology, as well as to the other professors, faculties, and staff of the SWE Department of "Daffodil International University" for their thoughtful assistance in completing my work.

Last but not least, I would like to sincerely thank my parents for their everlasting support and affection.

ABSTRACT

This project, *Essenza – A Clothing eCommerce Store*, is an online shopping platform designed to sell clothing and related products with a focus on user-friendly design and automated bundle offers. The system provides essential e-commerce features such as user registration, product browsing, cart management, secure checkout, multiple payment methods, and order tracking. It also includes an admin panel for product and sales management, as well as real-time discount offers to encourage bulk purchases.

The platform has been developed using **React.js** for the frontend, **Node.js** for the backend, and **MongoDB** for the database. Agile methodology and the Software Release Life Cycle (SRLC) have been followed for development and deployment. Comprehensive testing strategies, including functional, performance, and security testing, ensured system reliability, scalability, and compliance with privacy standards.

Essenza successfully supports up to 2,000 concurrent users with fast response times and achieved positive results in usability and performance. Future enhancements include AI-based personalized product recommendations, augmented reality (AR) try-on features, and multilingual support to reach a wider audience.

Table of Contents

APPROVAL.....	ii
DECLARATION.....	iii
ACKNOWLEDGEMENT.....	iv
ABSTRACT.....	v
Chapter 1: Introduction.....	1
1.1 Project Planning and Initiation.....	1
1.2. Target User Profile and Tentative Elicitation Process.....	2
1.3. System Requirements.....	3
1.4. Project Scheduling.....	4
Chapter 2: Design and Implementation.....	6
2.1. Functional requirements.....	6
2.2. Non-Functional Requirements.....	11
2.3. Object-oriented System design using UML.....	13
a) Use Case Diagram.....	13
b) Case Description.....	14
c) Activity diagram.....	31
d) Sequence Diagram.....	45
e) Entity relationship diagram.....	54
Chapter 3: Software Testing.....	55
3.1. Testing Features.....	55
3.2. Testing Strategies.....	55
3.3. System Testing.....	57
3.3.1. Types of System Testing Performed.....	57
3.3.2. Test Cases and Results.....	58
Chapter 4: Deployment and Maintenance.....	60
4.1. Deployment Approach (Agile + SRLC).....	60
4.2. Agile Deployment Cycle.....	61
4.3. Maintenance Types.....	61
Chapter 5: User Manual.....	62
5.1. Accessing the System.....	62

5.2. User Roles, MongoDB.....	62
5.3. Key Functions and How to Use Them.....	64
Chapter 6: Project Summary.....	69
6.1. Overview.....	69
6.2. Key Features.....	69
6.3. Development Process.....	69
6.4. Results.....	70
6.5. Future Improvements.....	70
<i>Plagiarism Report.....</i>	<i>71</i>
<i>Account Clearance.....</i>	<i>73</i>
<i>Library clearance.....</i>	<i>74</i>

Table of figure

Figure 1—1 : Gantt Chart	4
Figure 2—1: Use Case Diagram	13
Figure 2—2 : Registration	31
Figure 2—3 : Sign in	32
Figure 2—4 : View product	33
Figure 2—5 : Add Product	34
Figure 2—6 : Update product	35
Figure 2—7 : Delete product	36
Figure 2—8 : Order list	36
Figure 2—9 : View invoice	37
Figure 2—10 : View product list	38
Figure 2—11 : My Wishlist	39
Figure 2—12 : Product Filtering	39
Figure 2—13 : Forget password	40
Figure 2—14 : Update price	41
Figure 2—15 : Add to cart	42
Figure 2—16 : Checkout	42
Figure 2—17 : Payment method	43
Figure 2—18 : Get notification	44
Figure 2—19 : Registration	45
Figure 2—20 : Sign in	45
Figure 2—21 : View product	46
Figure 2—22 : Add product	46
Figure 2—23 : Update product	47
Figure 2—24 : Delete product	47
Figure 2—25 : Order List	48
Figure 2—26 : View invoice	48
Figure 2—27 : View product list	49
Figure 2—28 : My Wishlist	49
Figure 2—29 : Product Filtering	50
Figure 2—30 : Forgot password	50
Figure 2—31 : Update price	51
Figure 2—32 : Add to cart	51
Figure 2—33 : Check out	52
Figure 2—34 : Payment method	52
Figure 2—35 : Get notification	53
Figure 2—36 : Entity relationship diagram	54
Figure 5—1 : Run Backend	62
Figure 5—2 : Run Frontend	62

Figure 5—3 : User Data	63
Figure 5—4 : Admin Data	63
Figure 5—5 : Login	64
Figure 5—6 : Registration	64
Figure 5—7 : Browsing Products	65
Figure 5—8 : Adding to Cart	65
Figure 5—9 : Bundle Offers	66
Figure 5—10 : Checkout	66
Figure 5—11 : Order Tracking	67
Figure 5—12 : Add Data	67
Figure 5—13 : update and delete products	68
Figure 5—14 : View sales reports	68

Table of Table

Table 1-1 : Time Frame	4
Table 2-1 : Registration	6
Table 2-2 : Sign in	6
Table 2-3 : View product	6
Table 2-4 : Add product	7
Table 2-5 : Update product	7
Table 2-6 : Delete product	7
Table 2-7 : Order list	8
Table 2-8 : View invoice	8
Table 2-9 : View product list	8
Table 2-10 : My Wishlist	9
Table 2-11 : Product filtering	9
Table 2-12 : Forget password	9
Table 2-13 : Update price	10
Table 2-14 : Add to cart	10
Table 2-15 : Checkout	10
Table 2-16 : Payment method	11
Table 2-17 : Get notification	11
Table 2-18 : Non-Functional Requirements	11
Table 2-19 : Registration	14
Table 2-20 : Sign In	15
Table 2-21 : View product	16
Table 2-22 : Add product	17
Table 2-23 : Update product	18
Table 2-24 : Delete product	19
Table 2-25 : Order list	20
Table 2-26 : Order list	21
Table 2-27 : View product list	22
Table 2-28 : View product list	23
Table 2-29 : Product filtering	24
Table 2-30 : Product filtering	25
Table 2-31 : Update price	26
Table 2-32 : Add to cart	27
Table 2-33 : Checkout	28
Table 2-34 : Payment Method	29
Table 2-35 : Get notification	30
Table 3-1 : Test Cases and Results	58

Chapter 1: Introduction

1.1 Project Planning and Initiation

Phase 1: Preliminary Analysis & Project Scope Definition

Project Name: Essenza

Essenza is an online platform which is dedicated to the sales of products of various types such as clothes, shoes, t-shirts and other items. The unique characteristic is that it offers bundle deals once the clients put products in their cart, and entices bulk-buying with the visuals of discounts like Buy 2, 20% off or Buy 3, 30% off.

Scope Definition:

- Design user friendly and scalable e-commerce platform.
- Introduce functionality such as registration, browsing products, management of the cart, secure payment system, and order tracking.
- Add product management, offers and sales tracking administration.
- Add in-time offers display boards depending on the cart activity.

Phase 2: Market Feasibility Analysis (or Market Research)

Key Findings:

- Develop an easy to use and expandable online shopping platform.
- Introduce such functions as registration, product viewing, carts, safe payment tools and tracking orders.
- Including product management, offers, and sales tracking administrative tools.
- Add real-time bundle offer display functionality with cart activity.

Phase 3: Technical Feasibility Analysis

Technology Stack:

- Develop a convenient and expandable online shop.
- Introduce such features as registration, product browsing, cart management, secure payment methods, and order tracking.
- Add product management, offer and sales tracking application.
- Add real-time displays of bundles offers by cart.

Key Features:

- Automated bundle offers are engine-based.
- Strong authentication of users and encryption of data.
- Responsive mobile friendly design.

Phase 4: Financial Feasibility Analysis

Budget Estimation:

- Development: \$1200
- Hosting and Maintenance: \$250 annually
- Marketing and Promotion: \$350

Revenue Streams:

- Sale of products that focus on large sales.
- Possible strategic alliances with suppliers to do special deals.
- Placements of adverts in the platform.

1.2. Target User Profile and Tentative Elicitation Process

1.2.1. Target User Profile

1. **Customers:** Final consumers who buy goods and services and use them either personally or within a family.
2. **Admins:** Manage operations, handle products and users as well as offers.

Elicitation Process

- Carry out surveys and focus groups in order to know the needs of the customers.
- Monitor competitor platforms to determine the gaps and opportunities.
- Ask potential users regarding their expectations in regards to bundle offers and discounts.

1.3. System Requirements

Functional Requirements

- Registering of users and safety of logging in.
- Filtering and categorization of products.
- Add-to-cart features with real time bundle offer suggestions.
- Integrative systems and order tracking.
- Offer management and reporting administration panel.

Non-Functional Requirements

- Scalability to scale to 50000 users at any given time.
- Availability of 99.9% and high availability.
- Adherence to privacy laws such as GDPR.

1.4. Project Scheduling

a) Time Frame

Table 1-1 : Time Frame

Task	Duration	Start Date	End Date
Requirement Analysis	3 weeks	01-Jan-2025	21-Jan-2025
Design	5 weeks	22-Jan-2025	04-Apr-2025
Development	8 weeks	05-Apr-2025	31-May-2025
Testing	4 weeks	01-Jun-2025	28-Jun-2025
Deployment	2 weeks	29-Jun-2025	12-Jul-2025

b) Gantt Chart

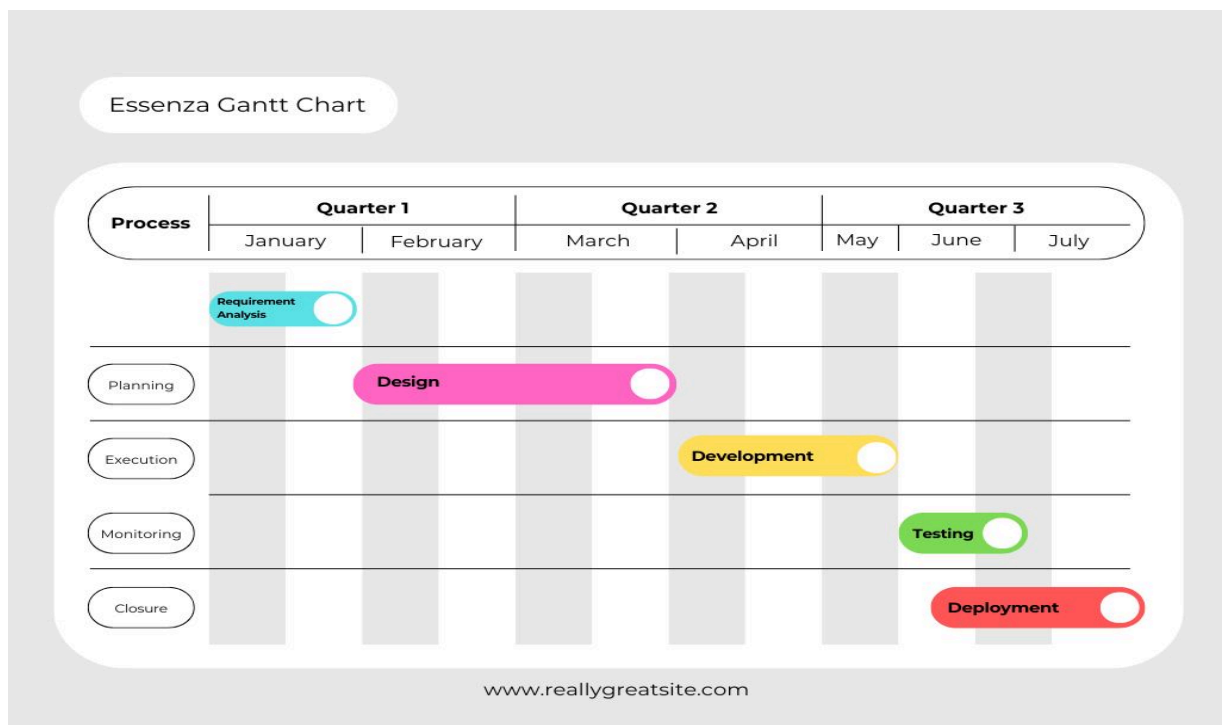


Figure 1-1 : Gantt Chart

c) Risk Management

Table 1-3: Risk management

Risk	Likelihood	Impact	Mitigation Strategy
Scope Creep	High	Project Delay	Clearly define requirements and milestones.
Security Vulnerabilities	Medium	Data Breach	Regular security audits and encryption.
Technical Challenges	Medium	Delayed Features	Hire experienced developers.

Chapter 2: Design and Implementation

2.1. Functional requirements

Table 2-1 : Registration

FR01	Registration
Description	To use this system every user must register their account with their name, mobile number or email address. After that they can enter into this system.
Stakeholder	Admin, Salesperson, Customer

Table 2-2 : Sign in

FR02	Sign in
Description	After registering the users need to login with username & password. Otherwise the user can't use it.
Stakeholder	Admin, Salesperson, Customer

Table 2-3: View product

Table 2-3 : View product

FR03	View product
Description	Users can view product details, including type (child, adult), price, and specifications.

Stakeholder	Admin,Salesperson,Customer
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Table 2-4 : Add product

FR04	Add product
Description	The products are a must needed for this shop. For adding the products items this system is needed & when new arrival comes then also needed this system.
Stakeholder	Admin,Salesperson

Table 2-5 : Update product

FR05	Update product
Description	Everyday the product is sold and sometimes new products are coming so we need to keep updated. Then this system is needed.
Stakeholder	Admin,Salesperson

Table 2-6 : Delete product

FR06	Delete product
Description	Provides functionality for admins to remove a product from the catalog.

Stakeholder	Admin,Salesperson
--------------------	-------------------

Table 2-7 : Order list

FR07	Order list
Description	Admin and salesperson can view all the order history and give order exact time and place
Stakeholder	Admin,Salesperson

Table 2-8 : View invoice

FR08	View invoice
Description	Generates a detailed invoice for users after purchase or for admins to verify.
Stakeholder	Admin,Salesperson

Table 2-9 : View product list

FR09	View product list
Description	A shop has different types of products like boys, girls,kids etc.This system is used to distinguish them.

Stakeholder	Admin,Salesperson
--------------------	-------------------

Table 2-10 : My Wishlist

FR10	My Wishlist
Description	Customers can add products to a Wishlist for future reference.
Stakeholder	Admin, Customer

Table 2-11 : Product filtering

FR11	Product filtering
Description	Users can filter products by size, category, price range, or brand.
Stakeholder	Admin, Customer

Table 2-12 : Forget password

FR12	Forget password
Description	User can reset their password if they forgot their password
Stakeholder	Admin, Salesperson, Customer

Table 2-13 : Update price

FR13	Update price
Description	This system is used to keep the price updated when the price of a product increases or decreases.
Stakeholder	Admin, Salesperson

Table 2-14 : Add to cart

FR14	Add to cart
Description	Users can add their selected product into that cart & get a token from the salesperson.
Stakeholder	Admin, Customer

Table 2-15 : Checkout

FR15	Checkout
Description	Users can confirm their cart items, provide payment and shipping details, and place the order.
Stakeholder	Admin, salesperson, Customer

Table 2-16 : Payment method

FR16	Payment method
Description	There are different types of payment options like bkaash, nagad, rocket , card payment , cash on delivery etc. To ensure this we need this system.
Stakeholder	Admin,Salesperson,Customer

Table 2-17 : Get notification

FR17	Get notification
Description	This system is used to notify the users of new updates, products , discounts , etc.
Stakeholder	Admin,Salesperson,Customer

2.2. Non-Functional Requirements

Table 2-18 : Non-Functional Requirements

ID	Category	Description
NFR1	Performance	The system shall support 2,000 simultaneous users and the page load time shall be less than 2 seconds at the peak time.

NFR2	Security	Adopt PCI DSS compliance on payment, encrypt sensitive data and avoid SQL injection/XSS attacks.
NFR3	Availability	Guarantee 99.9% uptime with automated failover for servers.
NFR4	Usability	Attain 85 per cent or more success on user testing of core functions (registration, checkout) which are accessible.
NFR5	Scalability	Respond to 10 x traffic spikes (e.g. sale of holidays) with auto-scale on the cloud.

2.3. Object-oriented System design using UML

a) Use Case Diagram

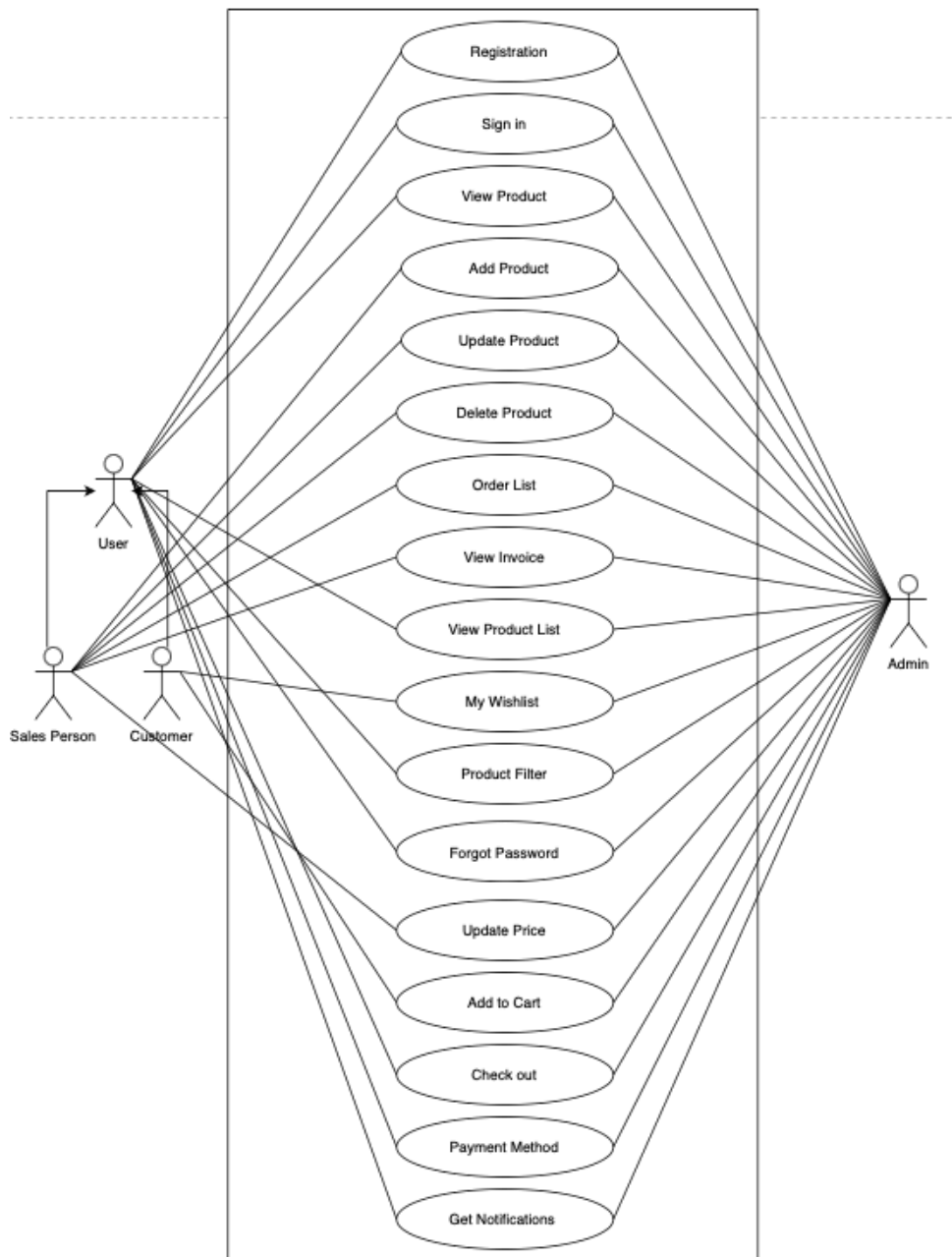


Figure 2—1: Use Case Diagram

b) Case Description

Table 2-19 : Registration

Use Case	Registration	
Goal	Create a new user account	
Precondition	User accesses registration page	
Success End Condition	Account created successfully	
Failed End Condition	Registration fails	
Primary Actors	Customer, Admin, Salesperson	
Trigger	Subscriber clicks on the "Register/Login" tab.	
Description/ Main success scenario	1.	Subscriber navigates to the registration or login page.
	2.	Subscriber provides necessary information (email, password) registration or enters credentials for login.
	3.	Subscriber clicks on "Login" to complete the process.
Alternative Flows	1.1	User does not have an account
		1.1.a. "Account not found. Please create an account" notification prompted to register
	3.1	Invalid credentials or incomplete information provided.
		3.1.a. Subscriber receives an error message and is prompted correct information.

Quality Requirements	This process should be user-friendly, ensuring data security and smooth interaction.
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Table 2-20 : Sign In

Use Case	Sign In
Goal	User login
Precondition	Valid account exists
Success End Condition	Subscriber account is successfully logged in.
Failed End Condition	Account login fails.
Primary Actors	Customer ,Admin, Salesperson
Trigger	Subscriber clicks on the "Sign In".
Description/ Main success scenario	1. Enter credentials
	2. System verifies
	3. Redirect to dashboard.
Alternative Flows	2.1 Wrong password
	1.1.a. 3 attempts limit
	2.2 Unverified account
	2.2.a. OTP resend option
Quality Requirements	Brute-force protection; Session timeout

Table 2-21 : View product

Use Case	View product	
Goal	View product details	
Precondition	None (guest access allowed)	
Success End Condition	Product details displayed	
Failed End Condition	Product unavailable	
Primary Actors	Customer, Admin, Salesperson	
Trigger	User searches/clicks product	
Description/ Main success scenario	1.	Select product
	2.	System loads details (price, specs, images)
Alternative Flows	2.	Out-of-stock
	1	
		2.1.a. "Notify when available" option
Quality Requirements	Fast loading ; Mobile-responsive	

Table 2-22 : Add product

Use Case	Add product						
Goal	Expand product catalog						
Precondition	Admin logged in						
Success End Condition	Product added to DB						
Failed End Condition	Upload fails						
Primary Actors	Admin						
Trigger	Clicks "Add Product"						
Description/Main success scenario	<table border="1"> <tr> <td>1.</td> <td>Fill from(name,price ,stock)</td> </tr> <tr> <td>2.</td> <td>Upload images</td> </tr> <tr> <td>3.</td> <td>Submit</td> </tr> </table>	1.	Fill from(name,price ,stock)	2.	Upload images	3.	Submit
1.	Fill from(name,price ,stock)						
2.	Upload images						
3.	Submit						
Alternative Flows	<table border="1"> <tr> <td>2.1</td> <td>Invalid image</td> </tr> <tr> <td></td> <td>2.1.a. Invalid image "Upload JPG/PNG" warning</td> </tr> </table>	2.1	Invalid image		2.1.a. Invalid image "Upload JPG/PNG" warning		
2.1	Invalid image						
	2.1.a. Invalid image "Upload JPG/PNG" warning						
Quality Requirements	Bulk upload support; Auto-thumbnail generation						

Table 2-23 : Update product

Use Case	Update product								
Goal	Edit product info								
Precondition	Product exists								
Success End Condition	Change saved								
Failed End Condition	Upload fails								
Primary Actors	Admin								
Trigger	Clicks "Edit" on product								
Description/Main success scenario	<table border="1"> <tr> <td>1</td> <td>Modify fields</td> </tr> <tr> <td>.</td> <td></td> </tr> <tr> <td>2</td> <td>Save changes</td> </tr> <tr> <td>.</td> <td></td> </tr> </table>	1	Modify fields	.		2	Save changes	.	
1	Modify fields								
.									
2	Save changes								
.									
Alternative Flows	<table border="1"> <tr> <td>1.</td> <td>Invalid price</td> </tr> <tr> <td>1</td> <td></td> </tr> <tr> <td></td> <td>1.1.a. "Must be error"</td> </tr> </table>	1.	Invalid price	1			1.1.a. "Must be error"		
1.	Invalid price								
1									
	1.1.a. "Must be error"								
Quality Requirements	Version history; Audit logging								

Table 2-24 : Delete product

Use Case	Delete product								
Goal	Remove product catalog								
Precondition	Product exists								
Success End Condition	Product deleted								
Failed End Condition	Deletion fails								
Primary Actors	Admin								
Trigger	Clicks "Delete"								
Description/Main success scenario	<table border="1"> <tr> <td>1</td> <td>Confirm deletion</td> </tr> <tr> <td>.</td> <td></td> </tr> <tr> <td>2</td> <td>System removes record</td> </tr> <tr> <td>.</td> <td></td> </tr> </table>	1	Confirm deletion	.		2	System removes record	.	
1	Confirm deletion								
.									
2	System removes record								
.									
Alternative Flows	<table border="1"> <tr> <td>1.</td> <td>Products in orders</td> </tr> <tr> <td>1</td> <td></td> </tr> <tr> <td></td> <td>1.1.a. "Archive instead" suggestion</td> </tr> </table>	1.	Products in orders	1			1.1.a. "Archive instead" suggestion		
1.	Products in orders								
1									
	1.1.a. "Archive instead" suggestion								
Quality Requirements	Soft-delete option ;Backup system								

Table 2-25 : Order list

Use Case	Order list								
Goal	Track past/pending orders								
Precondition	User logged in; orders exist								
Success End Condition	Order list displayed								
Failed End Condition	No order found								
Primary Actors	Admin ,salesperson								
Trigger	Clicks "My Orders"								
Description/Main success scenario	<table border="1"> <tr> <td>1</td> <td>System fetches orders</td> </tr> <tr> <td>.</td> <td></td> </tr> <tr> <td>2</td> <td>Displays list (date ,status,total)</td> </tr> <tr> <td>.</td> <td></td> </tr> </table>	1	System fetches orders	.		2	Displays list (date ,status,total)	.	
1	System fetches orders								
.									
2	Displays list (date ,status,total)								
.									
Alternative Flows	<table border="1"> <tr> <td>2.</td> <td>No orders</td> </tr> <tr> <td>1</td> <td></td> </tr> <tr> <td></td> <td>2.1.a. "Star Shopping" CTA</td> </tr> </table>	2.	No orders	1			2.1.a. "Star Shopping" CTA		
2.	No orders								
1									
	2.1.a. "Star Shopping" CTA								
Quality Requirements	Pagination for 10 orders ;Export to CSV								

Table 2-26 : Order list

Use Case	View Invoice
Goal	Download order receipt
Precondition	Orders exist
Success End Condition	Invoice PDF generated
Failed End Condition	Invoice generation fails
Primary Actors	Admin ,Salesperson
Trigger	Clicks "View Invoice"
Description/Main success scenario	1 System order .
	2 System generates PDF .
	3 auto-downloads .
Alternative Flows	2.1 PDF error
	2.1.a. "Retry" button
Quality Requirements	Tax-compliant formatting ; Email delivery option

Table 2-27 : View product list

Use Case	View product list
Goal	Explore product categories
Precondition	none
Success End Condition	Filtered list displayed
Failed End Condition	No product found
Primary Actors	Admin ,salesperson
Trigger	Clicks "categories"
Description/Main success scenario	1 Select category .
	2 System shows products .
Alternative Flows	2. Empty category 1
	2.1.a. "Coming Soon" placeholder
Quality Requirements	Lazy-load images; Sort by price/rating

Table 2-28 : View product list

Use Case	My Wishlist								
Goal	Save favorite products								
Precondition	User logged in								
Success End Condition	Item added/removed								
Failed End Condition	Action fails								
Primary Actors	Customer								
Trigger	Clicks "Wishlist"								
Description/Main success scenario	<table border="1"> <tr> <td>1</td> <td>Add product</td> </tr> <tr> <td>.</td> <td></td> </tr> <tr> <td>2</td> <td>System updates list</td> </tr> <tr> <td>.</td> <td></td> </tr> </table>	1	Add product	.		2	System updates list	.	
1	Add product								
.									
2	System updates list								
.									
Alternative Flows	<table border="1"> <tr> <td>1.</td> <td>Out of stock</td> </tr> <tr> <td>1</td> <td></td> </tr> <tr> <td></td> <td>1.1.a. "Notify when available" toggle</td> </tr> </table>	1.	Out of stock	1			1.1.a. "Notify when available" toggle		
1.	Out of stock								
1									
	1.1.a. "Notify when available" toggle								
Quality Requirements	Sync across devices ; Share via email								

Table 2-29 : Product filtering

Use Case	Product filtering								
Goal	Narrow search results								
Precondition	Products exist								
Success End Condition	Filtered results shown								
Failed End Condition	No matches found								
Primary Actors	Customer								
Trigger	Applies filters price,size								
Description/Main success scenario	<table border="1"> <tr> <td>1</td> <td>Set filters</td> </tr> <tr> <td>.</td> <td></td> </tr> <tr> <td>2</td> <td>System refreshes list</td> </tr> <tr> <td>.</td> <td></td> </tr> </table>	1	Set filters	.		2	System refreshes list	.	
1	Set filters								
.									
2	System refreshes list								
.									
Alternative Flows	<table border="1"> <tr> <td>2.</td> <td>No results</td> </tr> <tr> <td>1</td> <td></td> </tr> <tr> <td></td> <td>2.1.a. "Clear filters" suggestion</td> </tr> </table>	2.	No results	1			2.1.a. "Clear filters" suggestion		
2.	No results								
1									
	2.1.a. "Clear filters" suggestion								
Quality Requirements	Instant AJAX updates; Save filter presets								

Table 2-30 : Product filtering

Use Case	Forget password				
Goal	Recover account access				
Precondition	Valid email registered				
Success End Condition	Password reset link sent				
Failed End Condition	Email not found				
Primary Actors	Admin ,salesperson,customer				
Trigger	Clicks "Forgot Password"				
Description/Main success scenario	<table border="1"> <tr> <td>1</td> <td>Enter email</td> </tr> <tr> <td>2</td> <td>System sends reset link</td> </tr> </table>	1	Enter email	2	System sends reset link
1	Enter email				
2	System sends reset link				
Alternative Flows	<table border="1"> <tr> <td>2.1</td> <td>Invalid email</td> </tr> <tr> <td></td> <td>2.1.a. "Not registered" alert</td> </tr> </table>	2.1	Invalid email		2.1.a. "Not registered" alert
2.1	Invalid email				
	2.1.a. "Not registered" alert				
Quality Requirements	1-hour expiry ; Rate-limiting (3 attempts/hr)				

Table 2-31 : Update price

Use Case	Update price
Goal	Adjust product cost
Precondition	Product exists
Success End Condition	Price updated
Failed End Condition	Update rejected
Primary Actors	Admin
Trigger	Edits price field
Description/Main success scenario	1 Enter new price .
	2 System validates .
	3 Saves changes .
Alternative Flows	2. Price
	1
	2.1.a. "Must be positive" error
Quality Requirements	Audit trail ; Bulk price updates

Table 2-32 : Add to cart

Use Case	Add to cart
Goal	Collect items for purchase
Precondition	Product available
Success End Condition	Item added to cart
Failed End Condition	Out of stock
Primary Actors	Customer
Trigger	Clicks "Add to cart"
Description/Main success scenario	1 System quantity .
	2 System updates cart .
Alternative Flows	2. Insufficient stock 1
	2.1.a. "Max available" notice
Quality Requirements	Real-time stock checks ; Cart saved for 7 days

Table 2-33 : Checkout

Use Case	Checkout	
Goal	Complete purchase	
Precondition	Items in cart	
Success End Condition	Order confirmed	
Failed End Condition	Payment declined	
Primary Actors	Customer,Salesperson	
Trigger	Clicks "Checkout"	
Description/Main success scenario	1.	Enter shipping/payment
	2.	System processes order
	3.	Confirmation page
Alternative Flows	2.1	Payment failed
		2.1.a. "Try another method" prompt
Quality Requirements	PCI-DSS compliance ; Guest checkout option	

Table 2-34 : Payment Method

Use Case	Payment Method
Goal	Choose payment option
Precondition	Checkout started
Success End Condition	Method selected
Failed End Condition	Unsupported method
Primary Actors	Customer
Trigger	Select payment type
Description/Main success scenario	1 Pick method(COD/card) .
	2 System enables proceed .
Alternative Flows	1. Card declined 1
	1.1.a. "Enter valid details"
Quality Requirements	Tokenization for cards; Localized options (bkash/COD)

Table 2-35 : Get notification

Use Case	Get notification
Goal	Notify users
Precondition	User opted in
Success End Condition	Notification delivered
Failed End Condition	Notification failed
Primary Actors	Customer , Admin
Trigger	Event (order update,discout)
Description/Main success scenario	1 System detects trigger .
	2 Sends email/app alert .
Alternative Flows	2. Email bounced 1
	2.1.a. "Fallback SMS"
Quality Requirements	Unsubscribe link ; Throttle to 5 alerts/day

c) Activity diagram

Activity diagram (Registration):

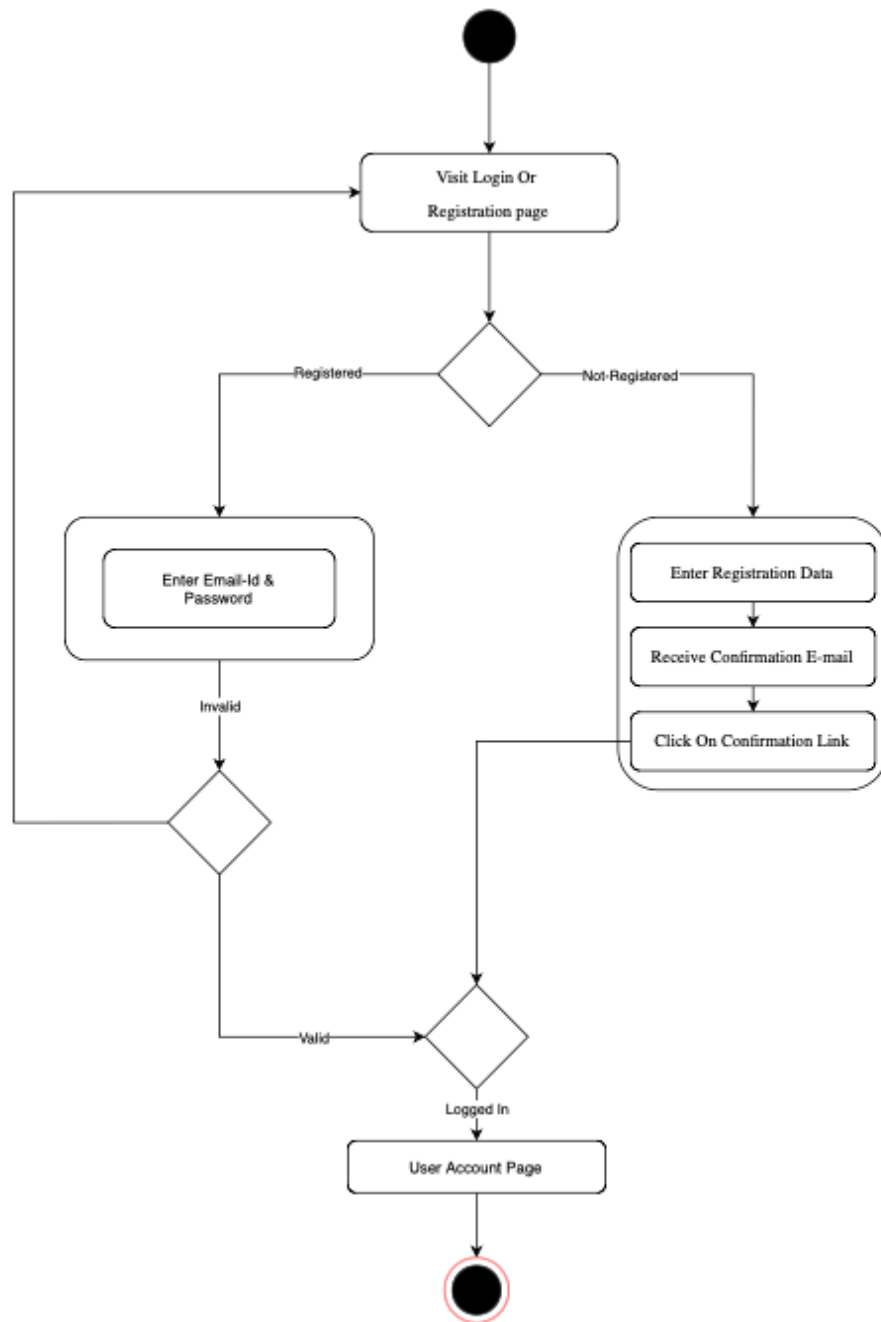


Figure 2—2 : Registration

Activity diagram (Sign in):

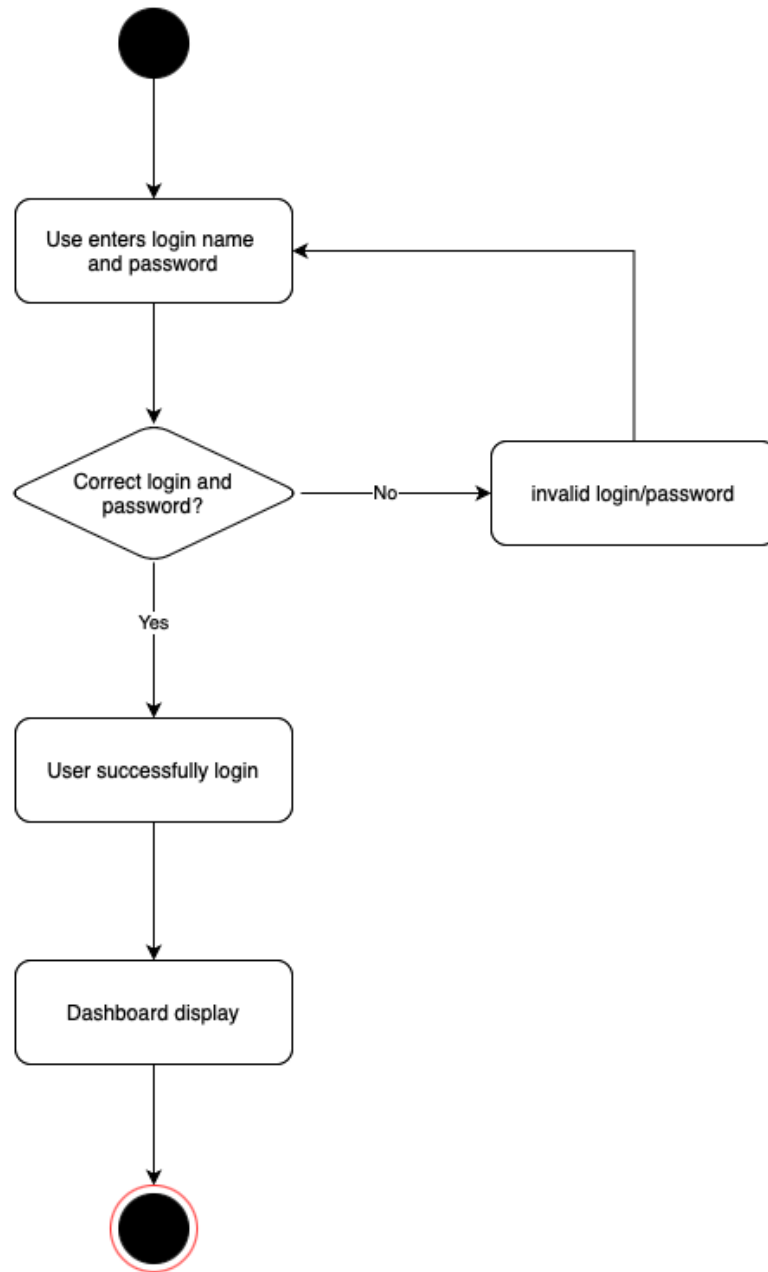


Figure 2—3 : Sign in

Activity diagram (View product):

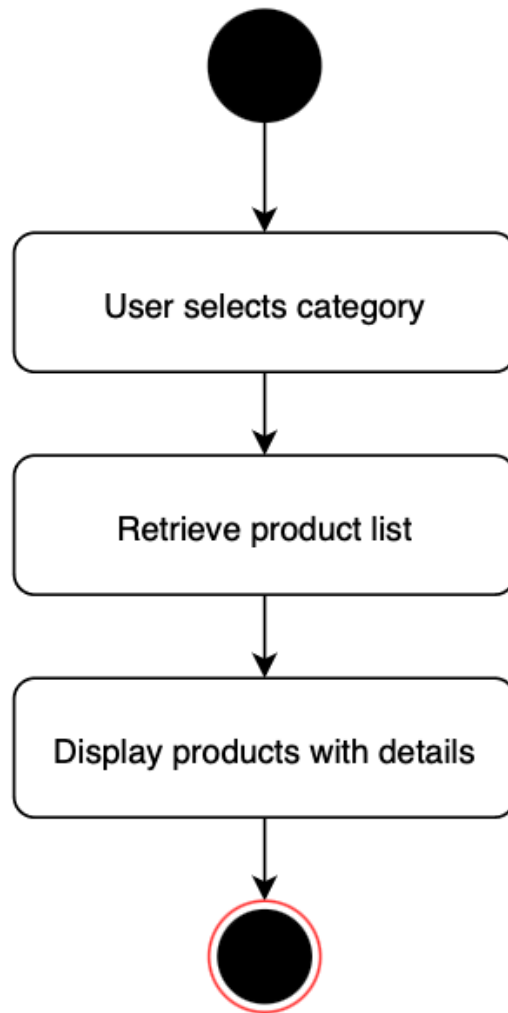


Figure 2—4 : View product

Activity diagram (Add Product):

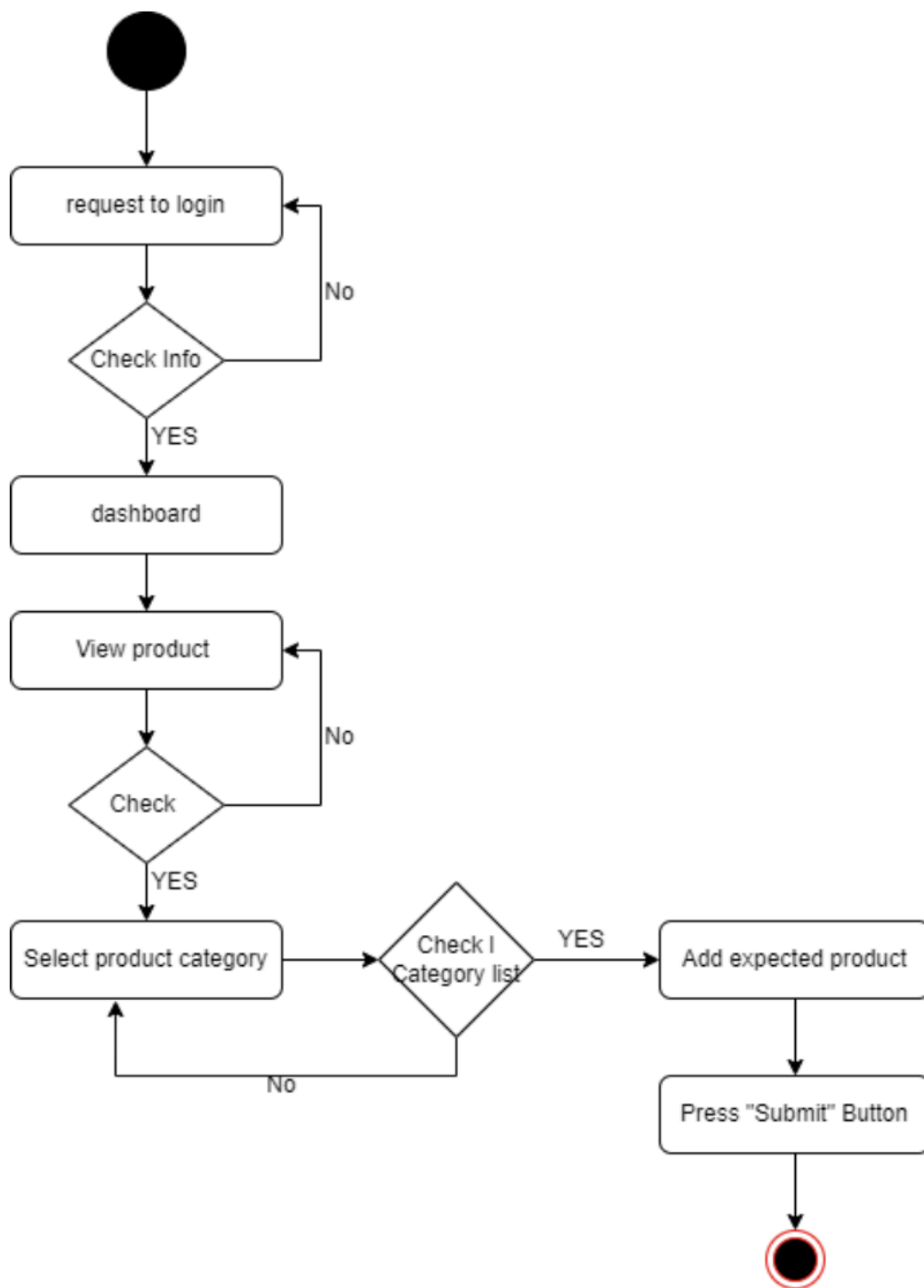


Figure 2—5 : Add Product

Activity diagram (Update product):

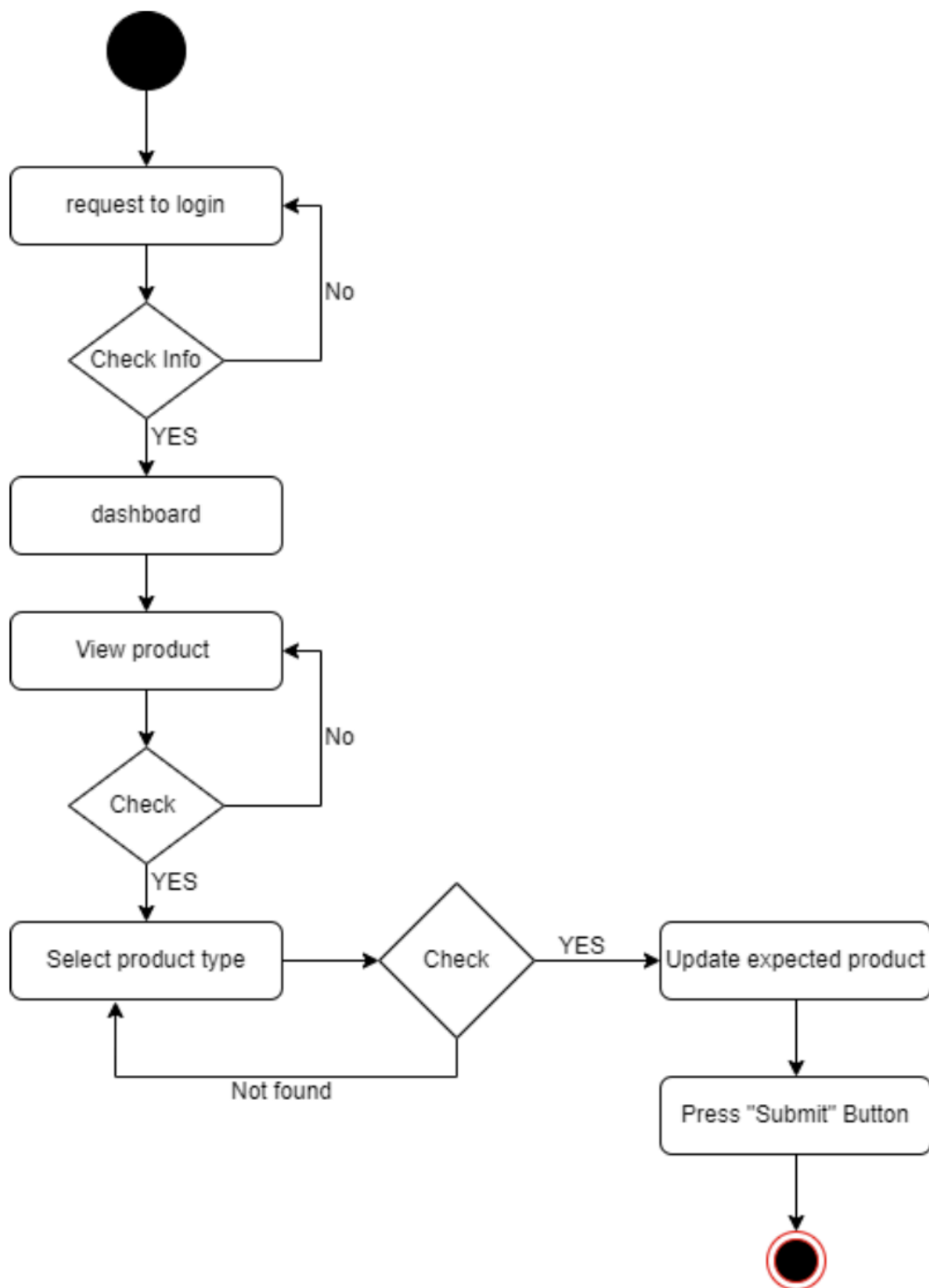


Figure 2—6 : Update product

Activity diagram (Delete product):

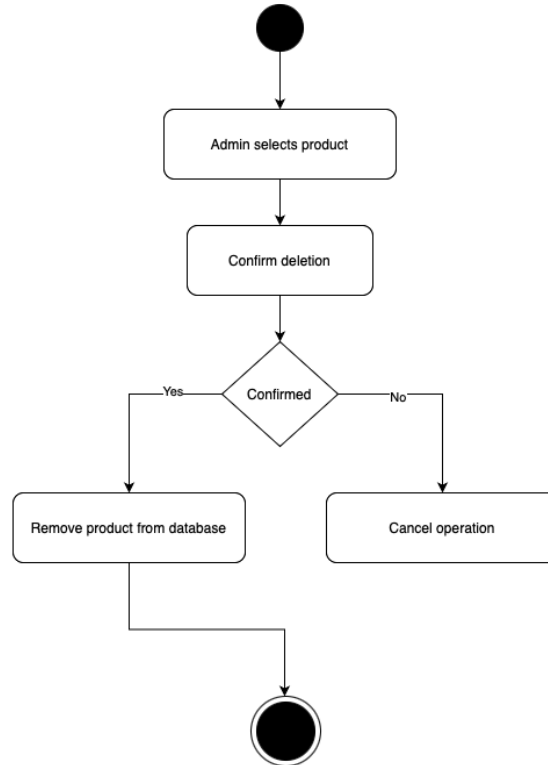


Figure 2—7 : Delete product

Activity diagram (Order list):

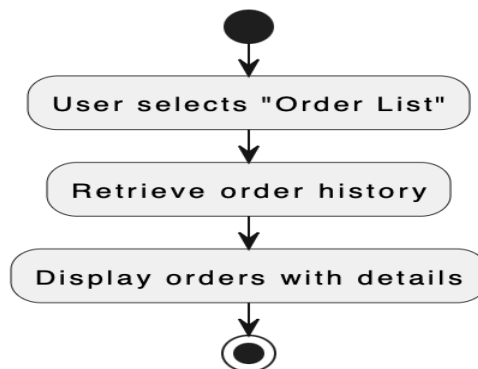


Figure 2—8 : Order list

Activity diagram (View invoice):

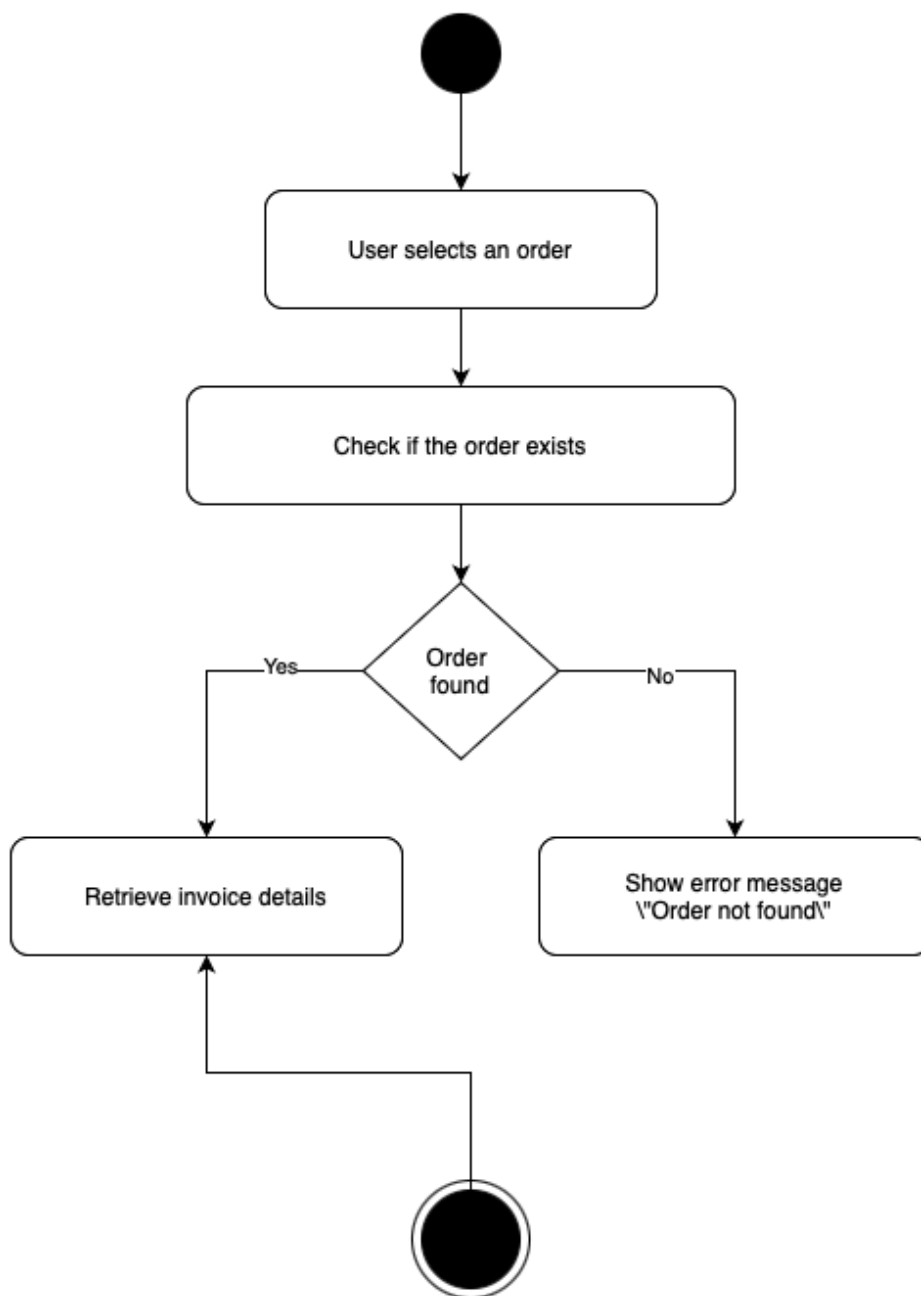


Figure 2—9 : View invoice

Activity diagram (View product list):

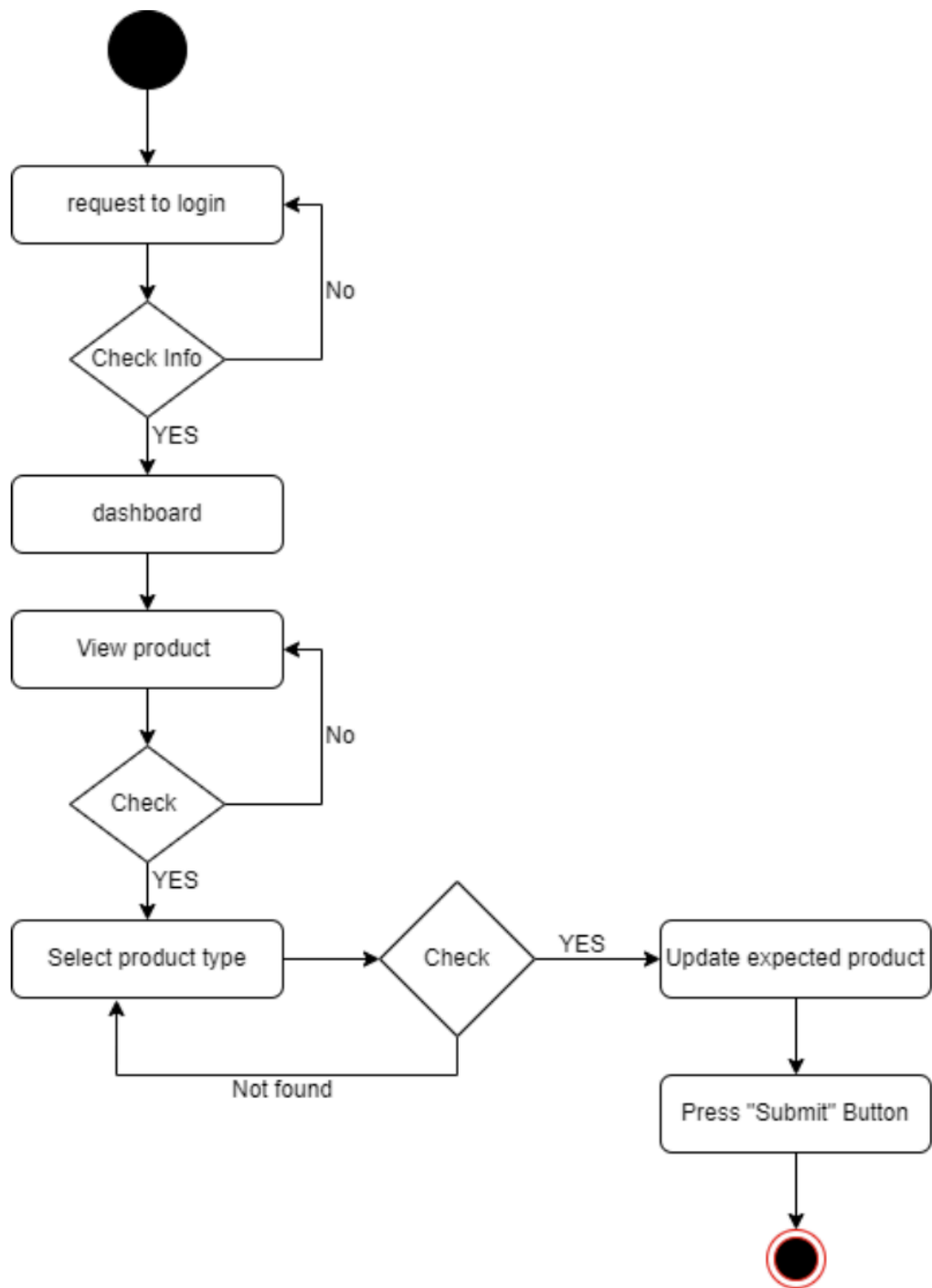


Figure 2—10 : View product list

Activity diagram (My Wishlist):

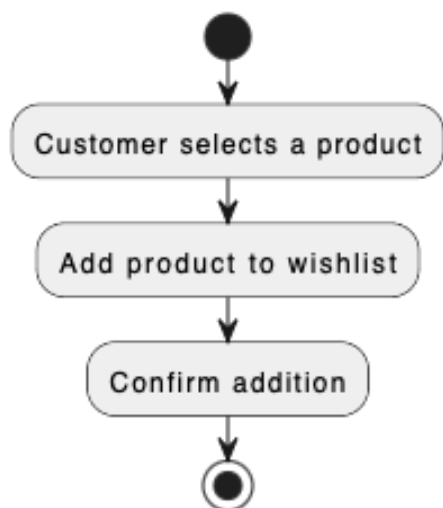


Figure 2—11 : My Wishlist

Activity diagram (Product Filtering):

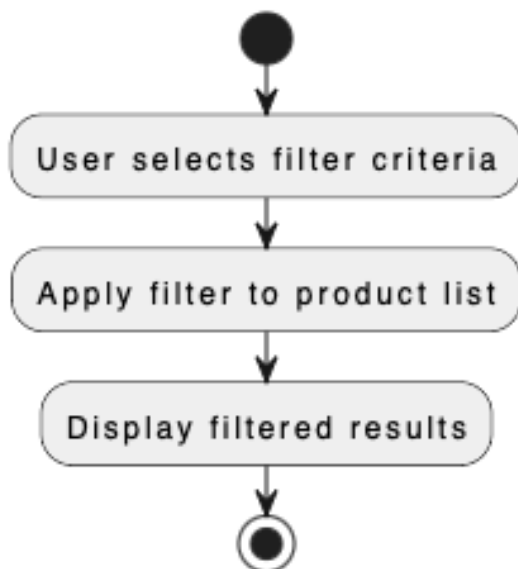


Figure 2—12 : Product Filtering

Activity diagram (Forget password):

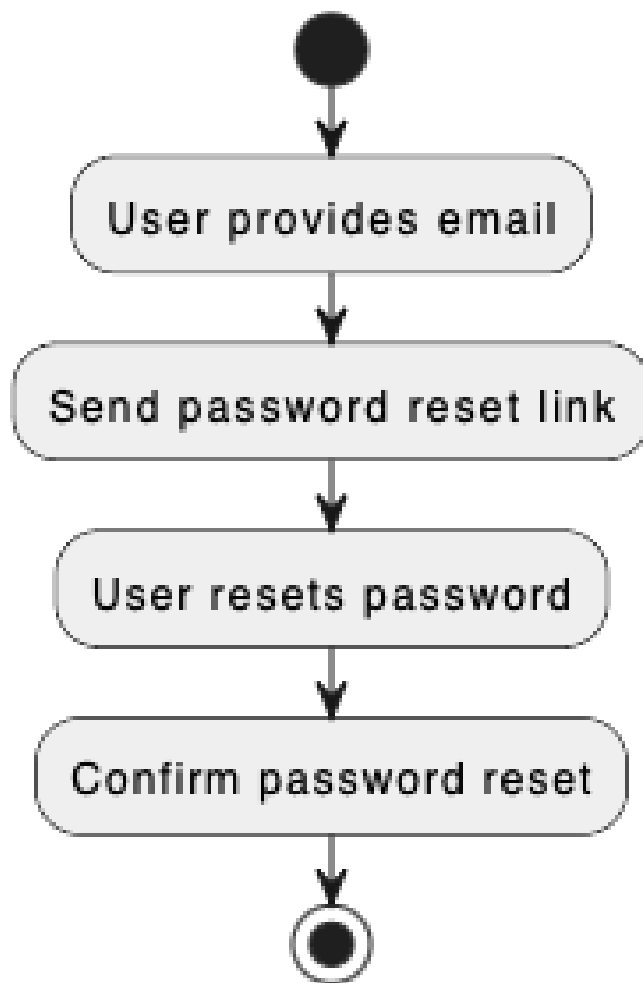


Figure 2—13 : Forget password

Activity diagram (Update price):

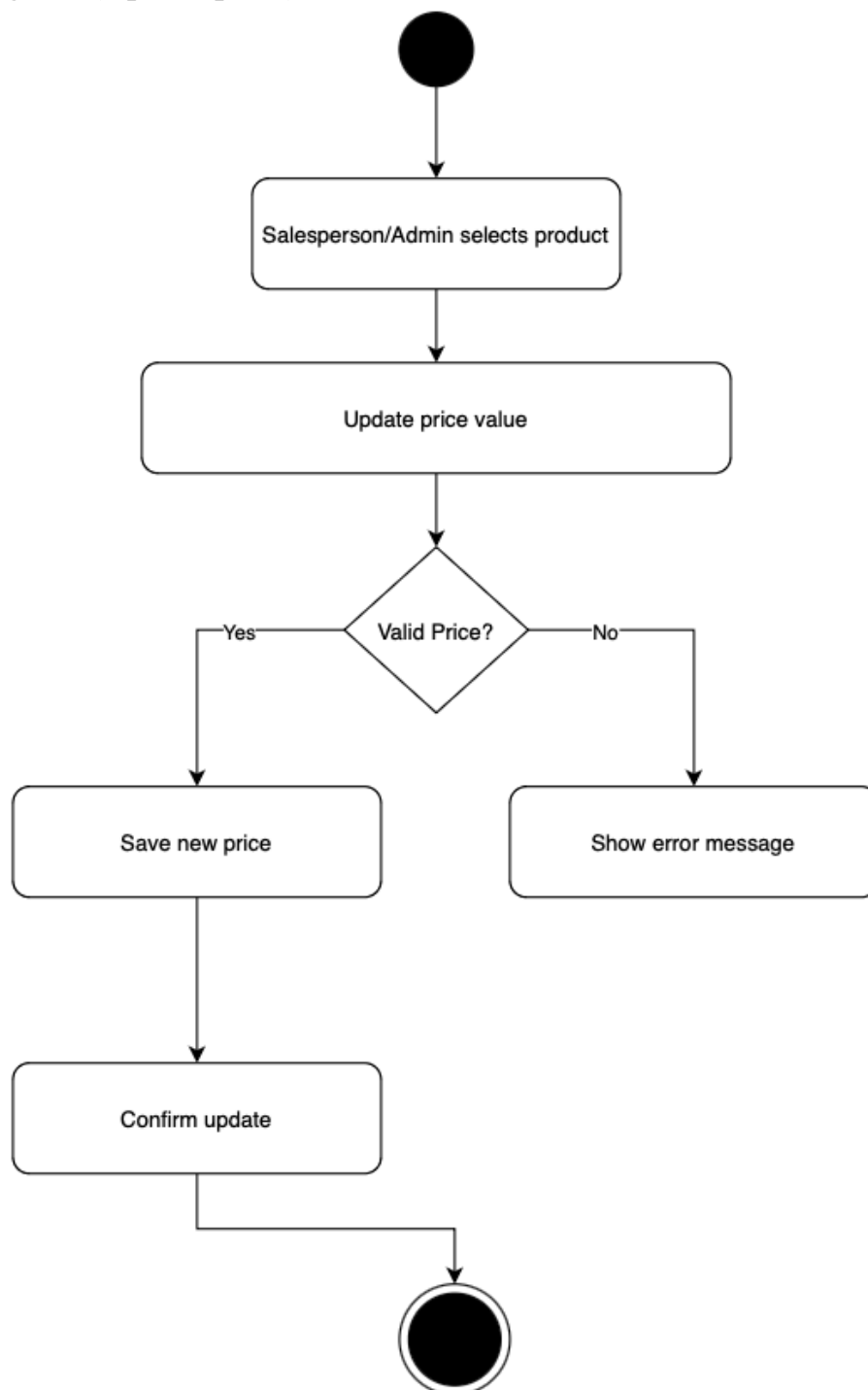


Figure 2—14 : Update price

Activity diagram (Add to cart):

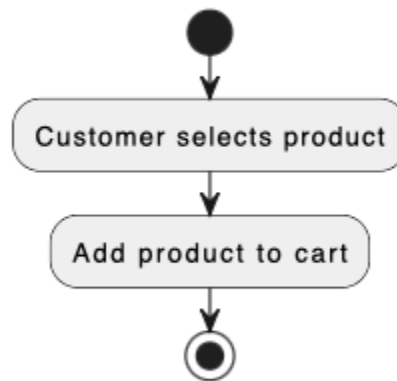


Figure 2—15 : Add to cart

Activity diagram (Checkout):

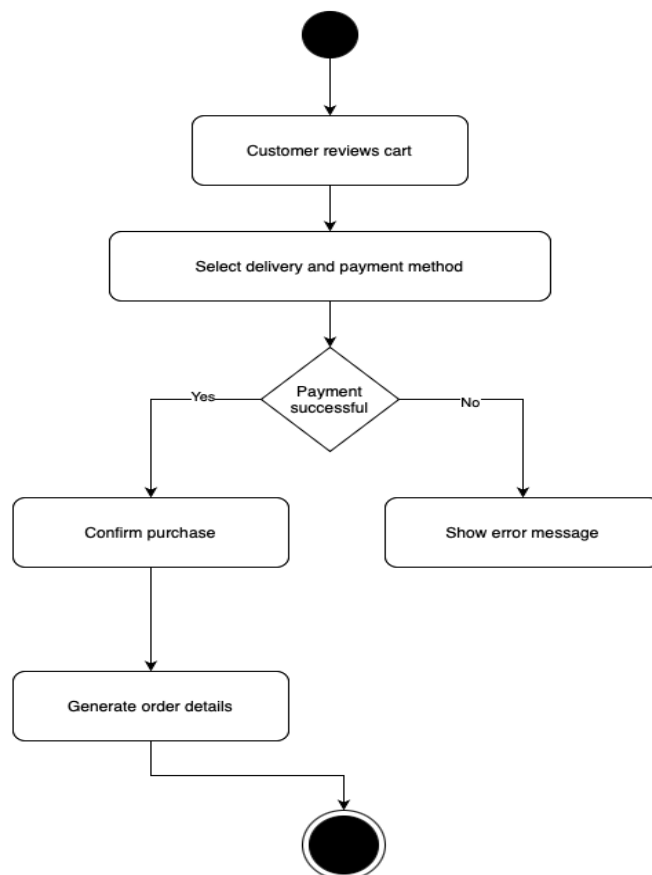


Figure 2—16 : Checkout

Activity diagram (Payment method):

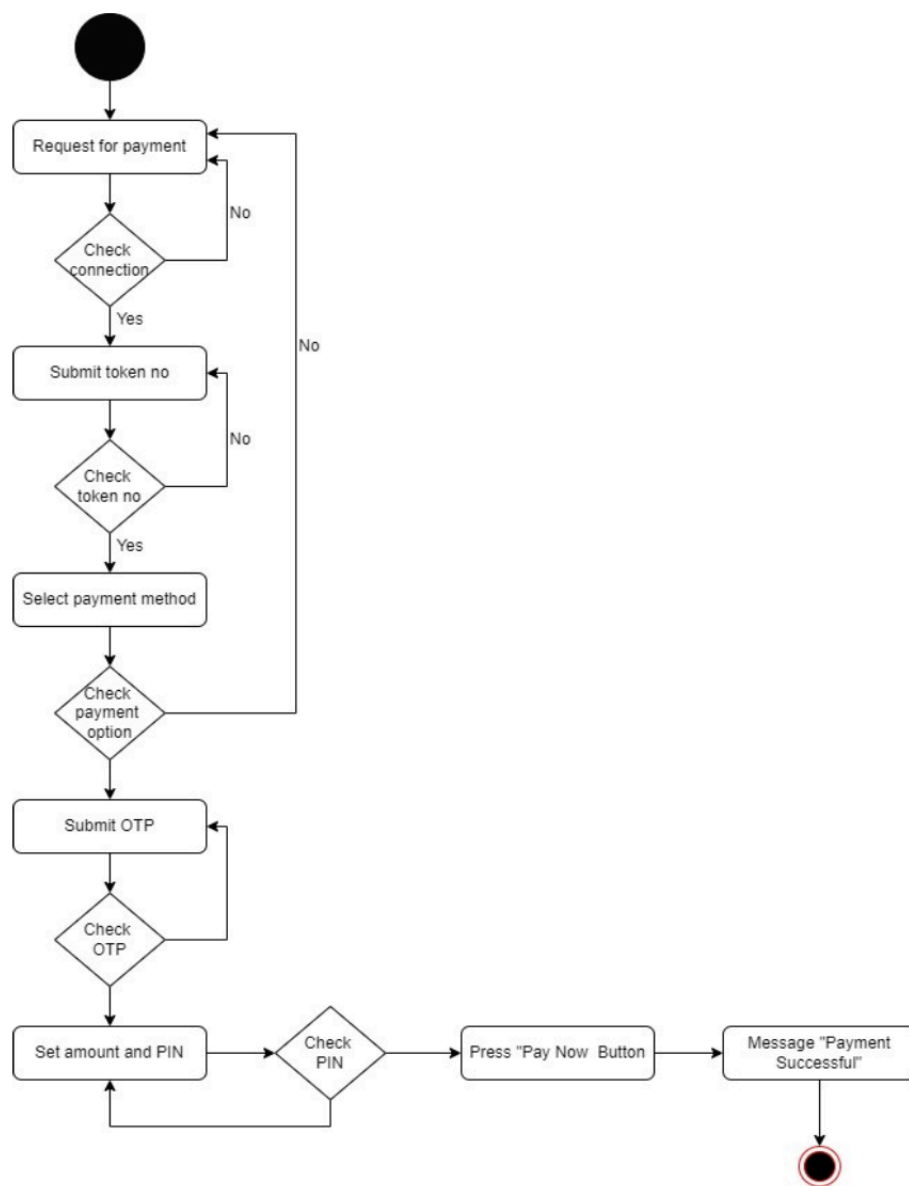


Figure 2—17 : Payment method

Activity diagram (Get notification):

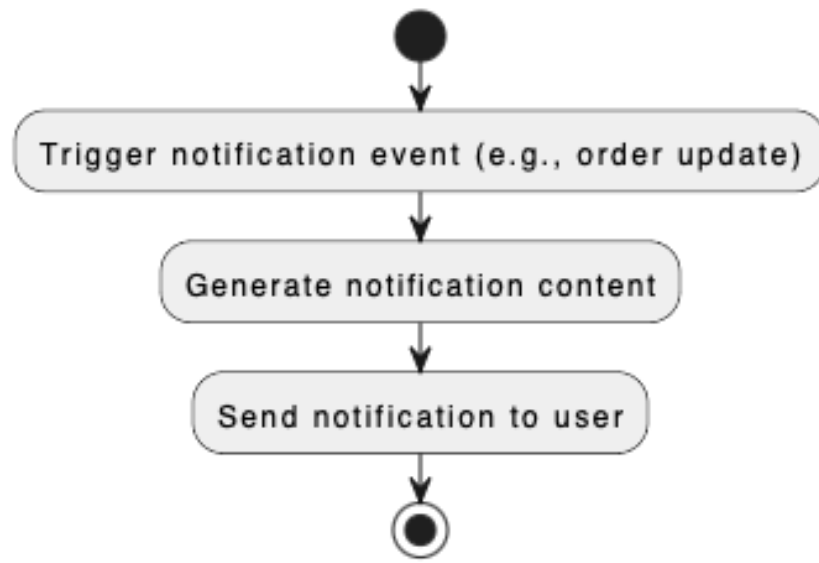


Figure 2—18 : Get notification

d) Sequence Diagram

Sequence diagram (Registration):

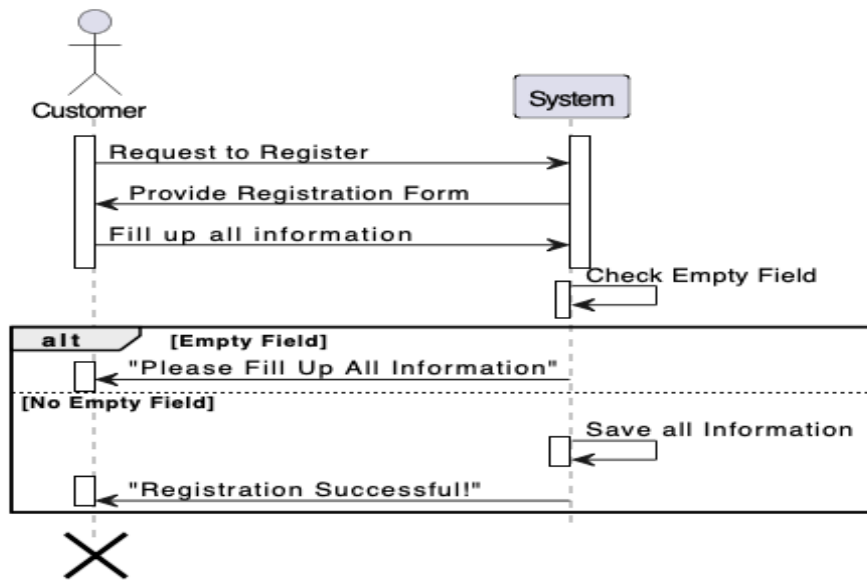


Figure 2—19 : Registration

Sequence diagram (Sign in):

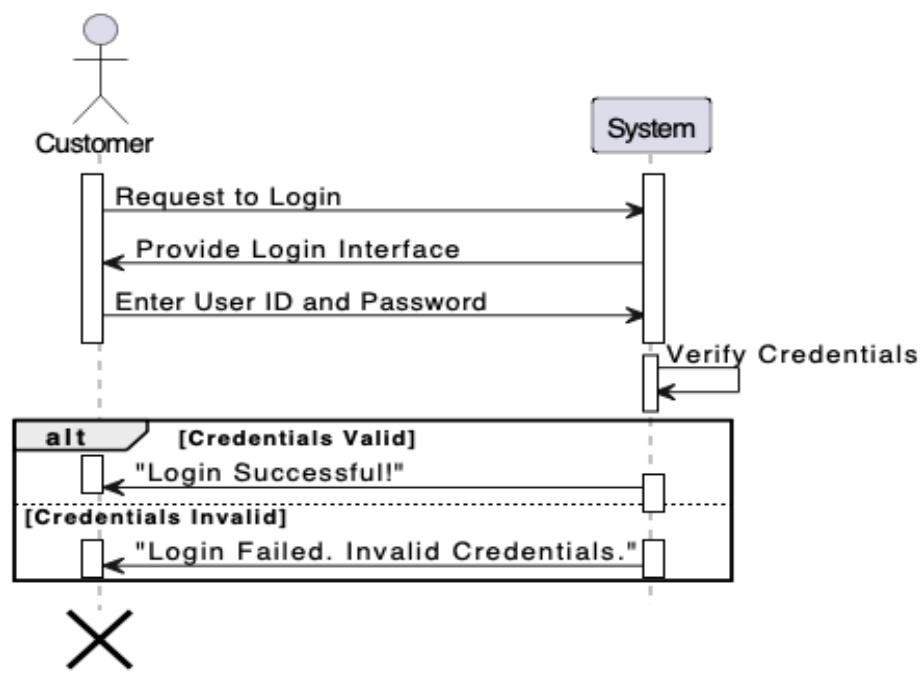


Figure 2—20 : Sign in

Sequence diagram (View product):

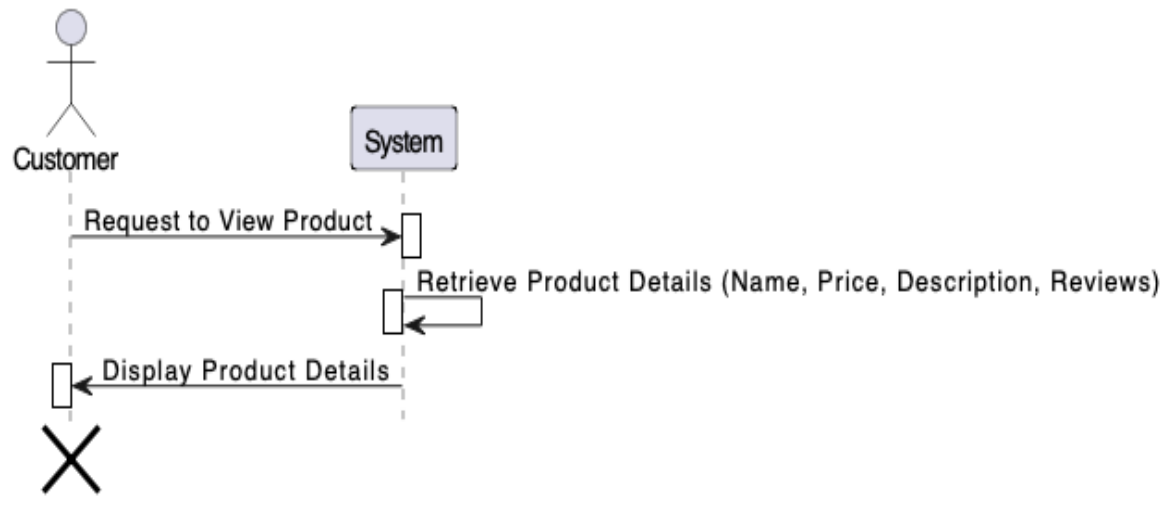


Figure 2—21 : View product

Sequence diagram (Add product):

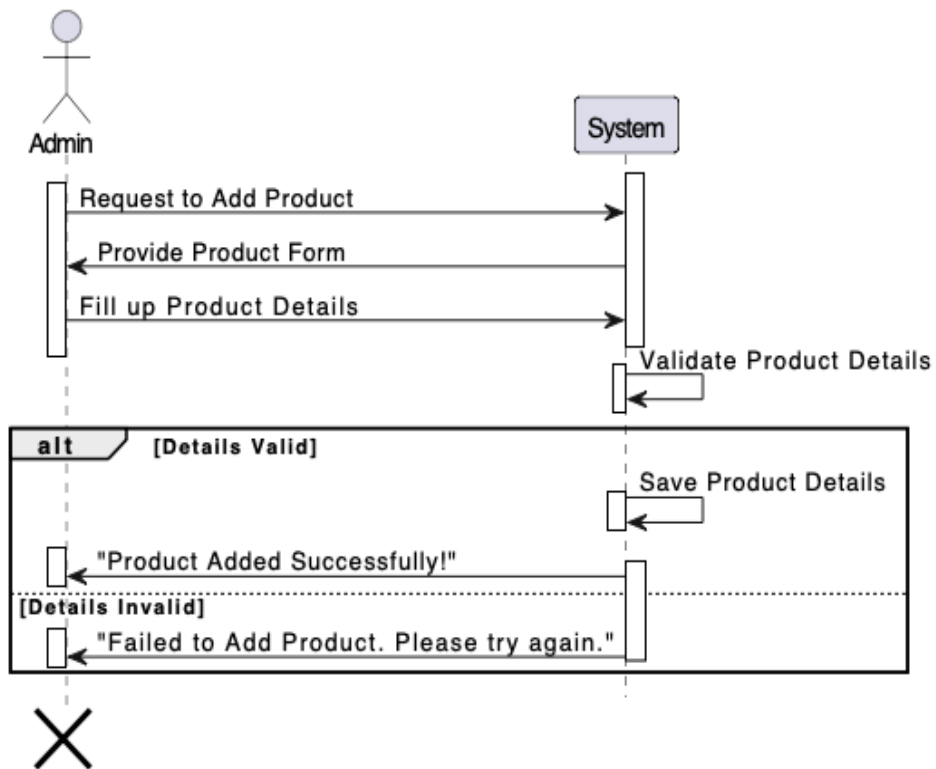


Figure 2—22 : Add product

Sequence diagram (Update product):

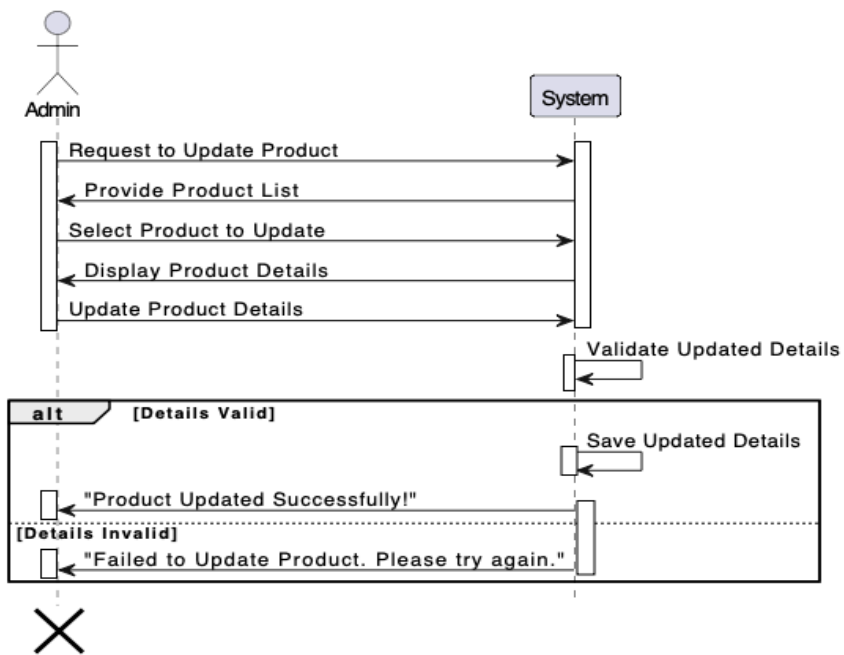


Figure 2—23 : Update product

Sequence diagram (Delete product):

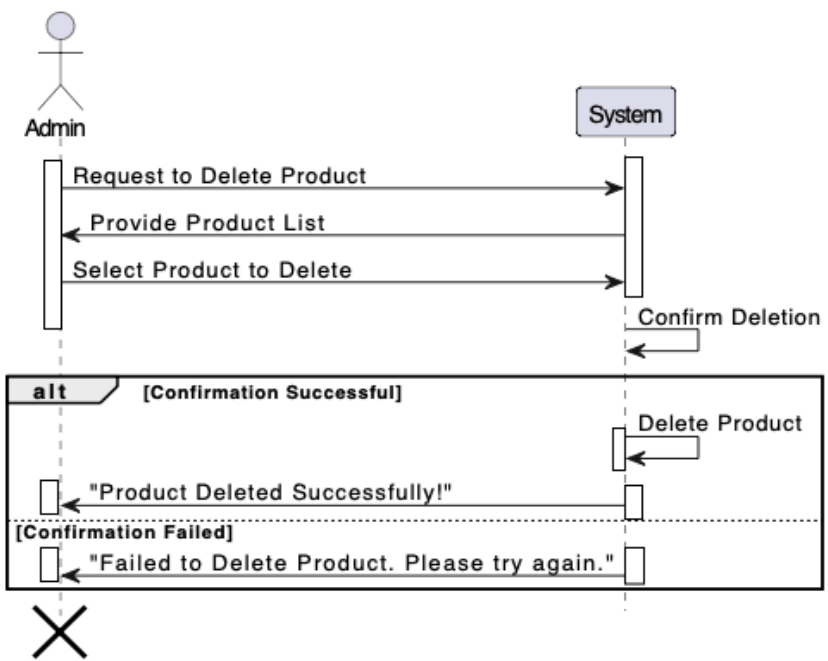


Figure 2—24 : Delete product

Sequence diagram (Order List):

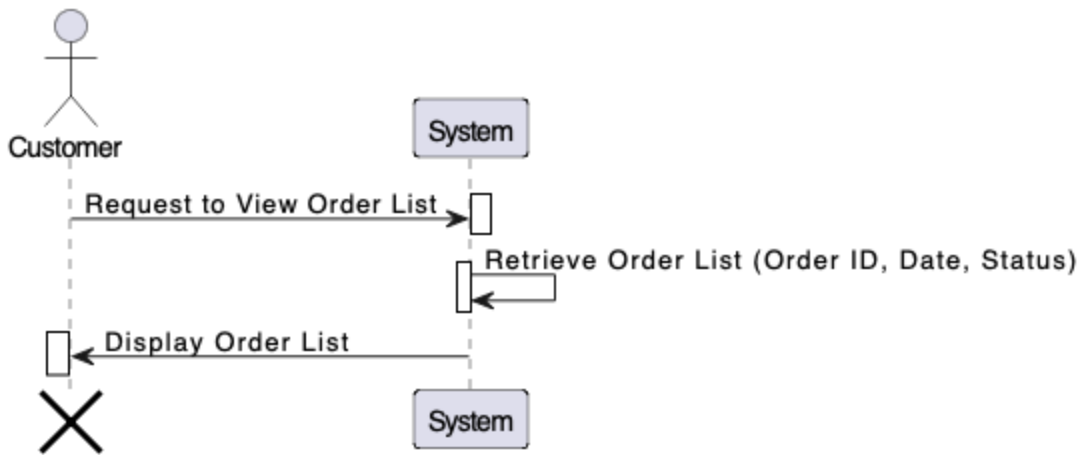


Figure 2—25 : Order List

Sequence diagram (View invoice):

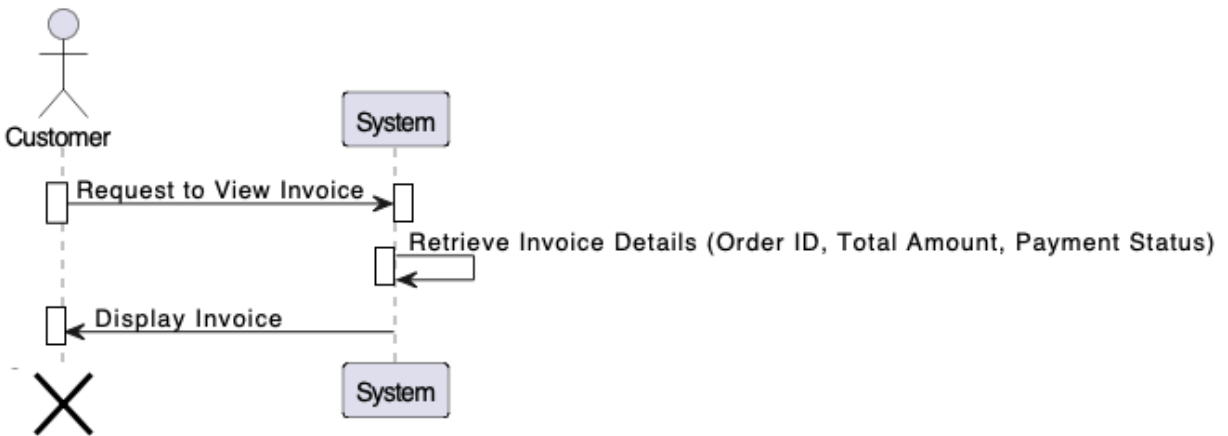


Figure 2—26 : View invoice

Sequence diagram (View product list):

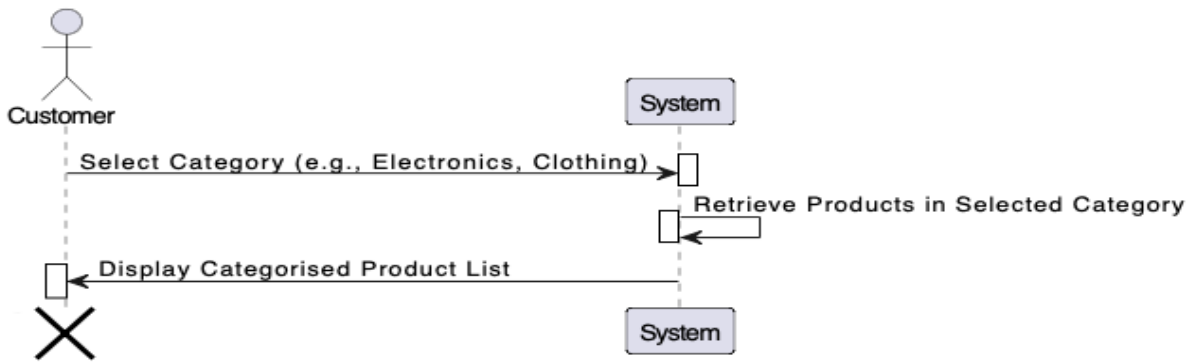


Figure 2—27 : View product list

Sequence diagram (My Wishlist):

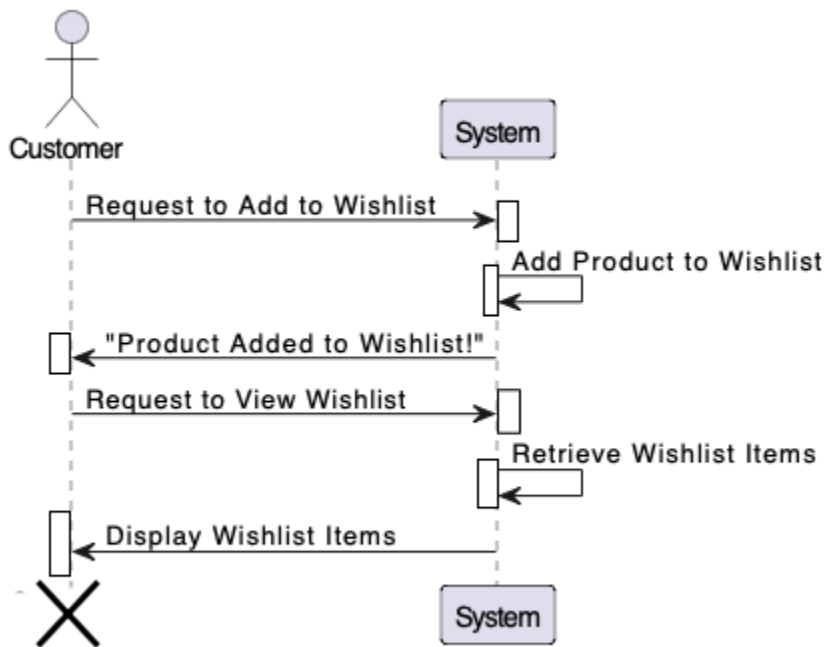


Figure 2—28 : My Wishlist

Sequence diagram (Product Filtering):

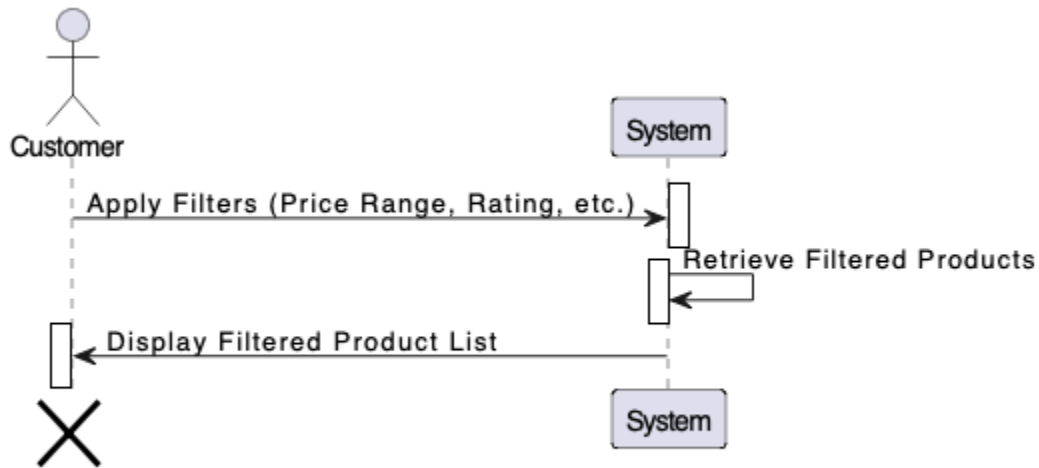


Figure 2—29 : Product Filtering

Sequence diagram (Forgot password):

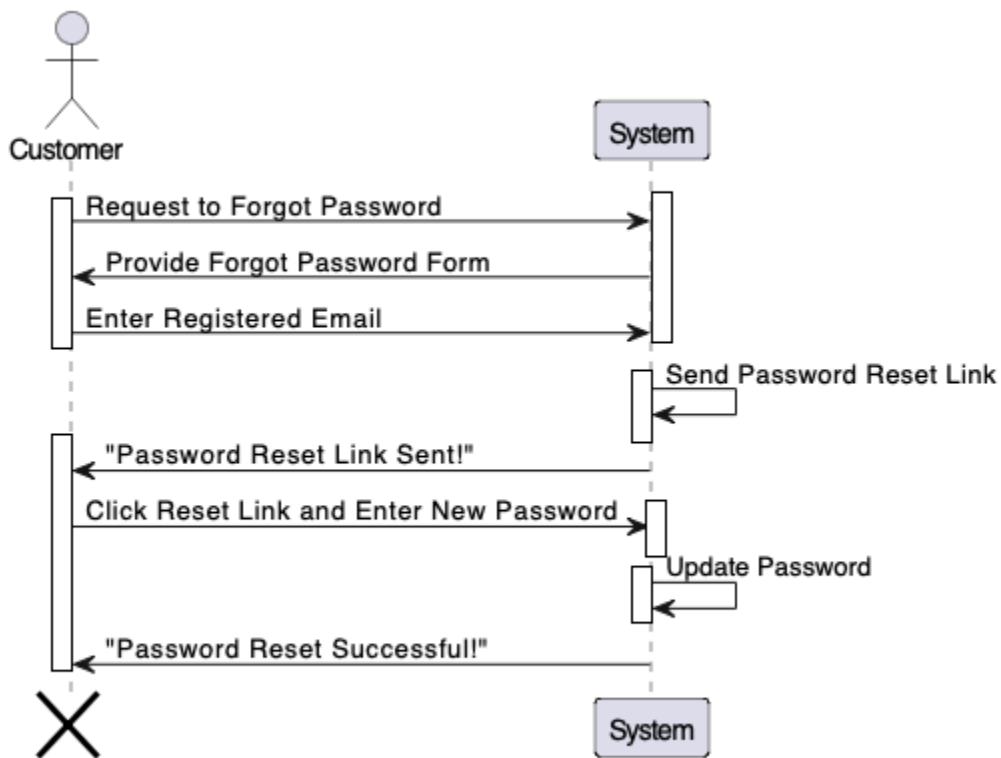


Figure 2—30 : Forgot password

Sequence diagram (Update price):

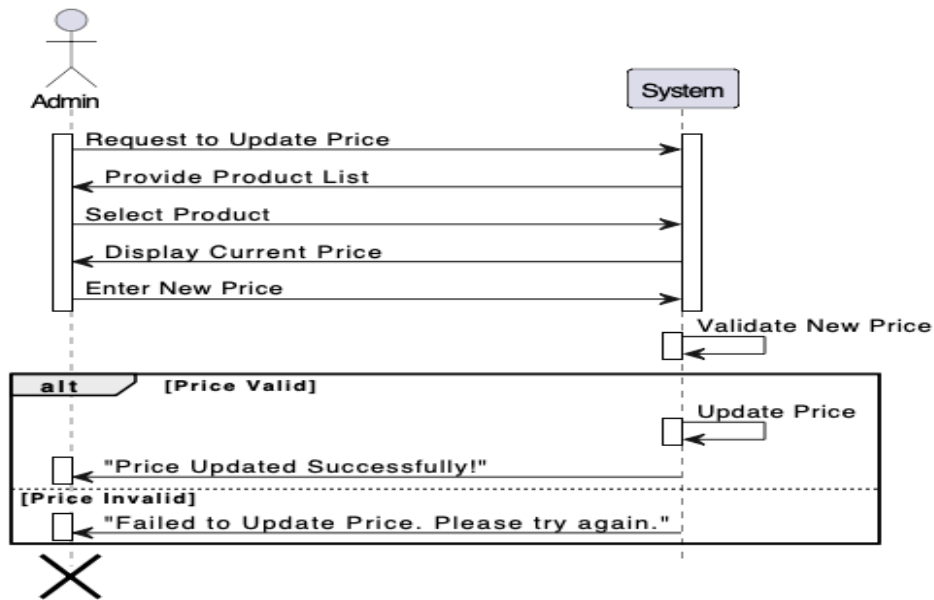


Figure 2—31 : Update price

Sequence diagram (Add to cart):

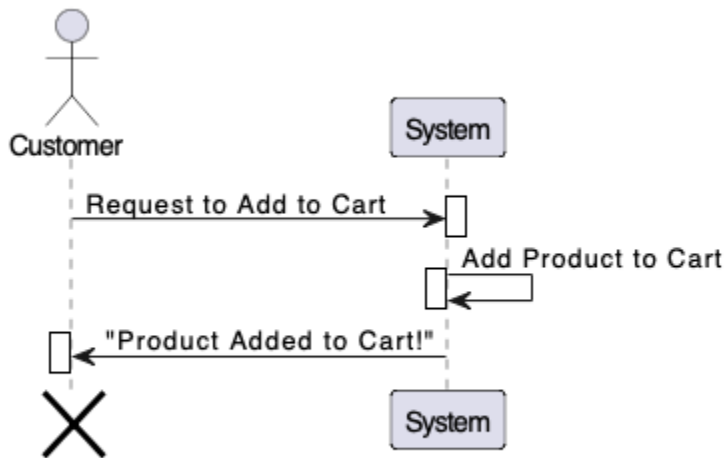


Figure 2—32 : Add to cart

Sequence diagram (Check out):

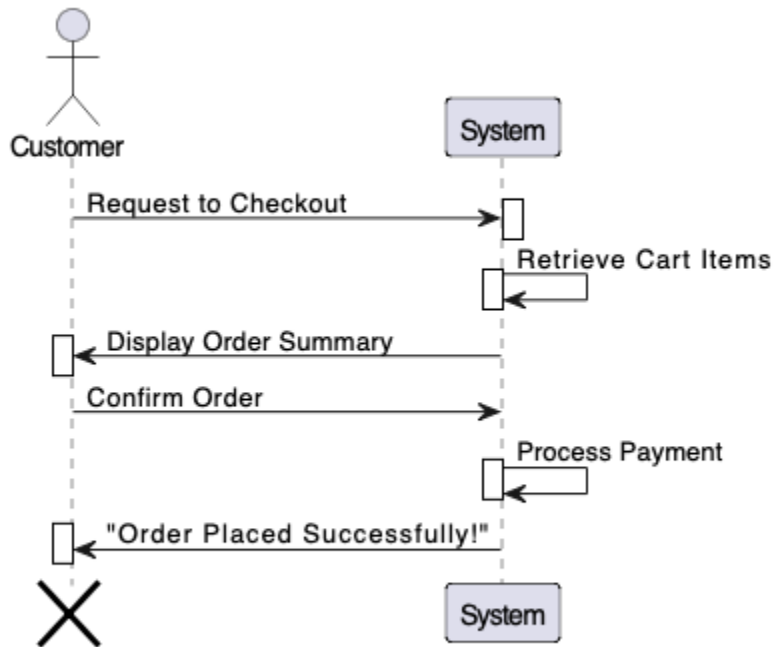


Figure 2—33 : Check out

Sequence diagram (Payment method):

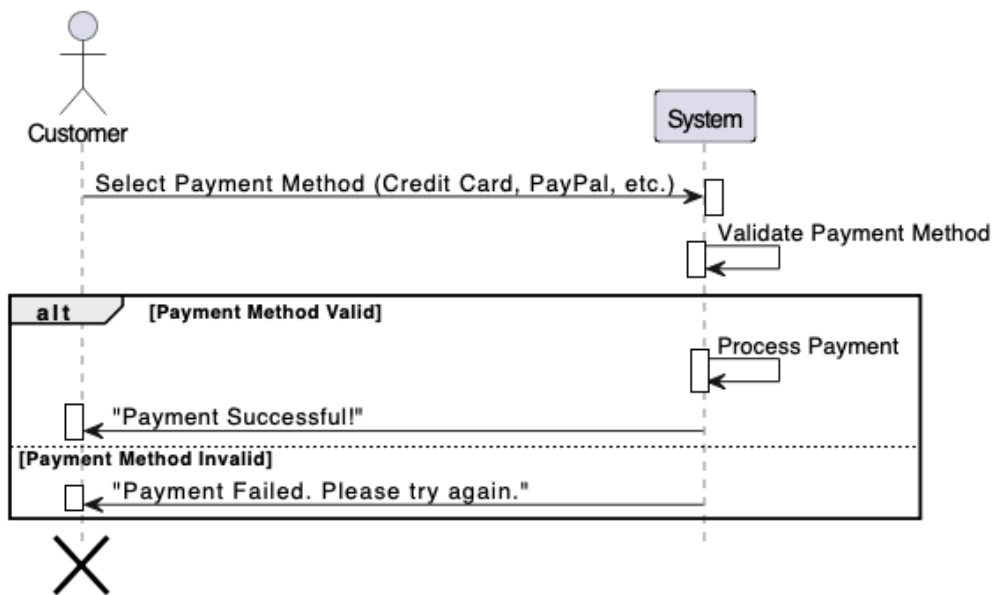


Figure 2—34 : Payment method

Sequence diagram (Get notification):

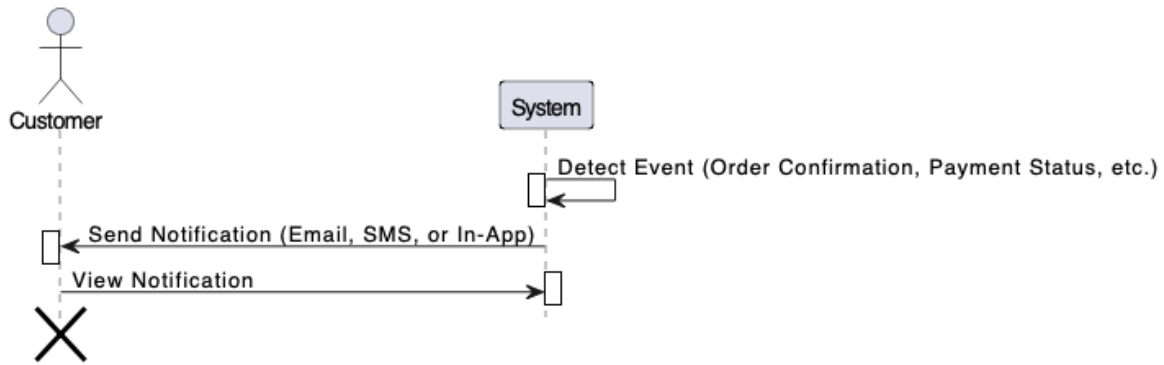


Figure 2—35 : Get notification

e) Entity relationship diagram

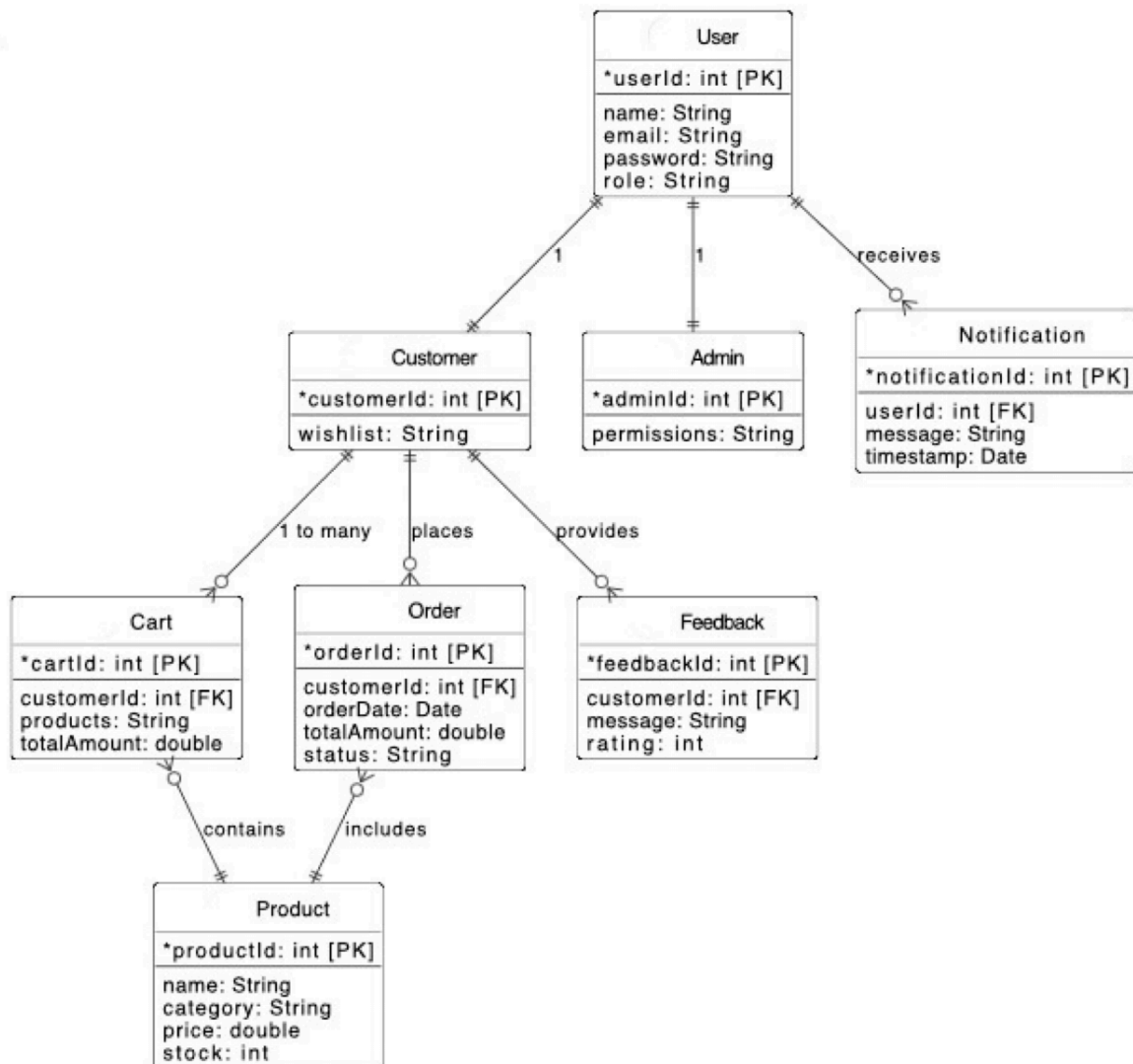


Figure 2—36 : Entity relationship diagram

Chapter 3: Software Testing

3.1. Testing Features

Essenza the platform testing is aimed at testing the reliability , security and efficiency of the e commerce system in all modules.

Key features include:

Verification and Validation – Making sure that Essenza can satisfy the business requirements (bundle offers, order tracking) as well as the technical ones.

Defect Detection - To detect bugs in such features as product browsing, cart, payment, and bundle offers prior to the deployment.

Performance Measurement- Checking the load times, system responsiveness, and managing concurrent users.

Security Compliance -SQL injection and XSS testing, and compliance of PCI DSS of payment data.

User Experience Testing- Making sure the platform is mobile, easy to navigate, and accessible.

Regression Testing -Re-testing of features that have been added after developing new features or fixing bugs.

3.2. Testing Strategies

For Essenza, a **hybrid testing strategy** combining manual and automated methods is applied:

1. Unit Testing

- Parts that were tested separately (e.g., cart calculations, bundle offer engine).

2. Integration Testing

- Make sure that there is a seamless interaction between the frontend (React.js), backend (Node.js), and the database MongoDB.

3. System Testing

- Full platform validation including all requirements functional and non-functional.

4. Acceptance Testing

- Involving stakeholders to verify real-world usability.

5. Performance Testing

- Load and stress testing to ensure the system handles up to 2,000 concurrent users.

6. Security Testing

- Testing encryption, payment gateway security, and account protection.

7. Cross-Browser & Device Compatibility Testing

- Ensuring the platform works seamlessly across devices and browsers.

3.3. System Testing

3.3.1. Types of System Testing Performed

- **Functional Testing** – Registration, login, product viewing, cart, checkout, payment, notifications.
- **Usability Testing** – Navigation, search filtering, and bundle offer clarity.
- **Performance Testing** – Load testing with simulated traffic.
- **Security Testing** – SQL injection prevention, encrypted data storage.
- **Compatibility Testing** – Across Chrome, Firefox, Edge, Safari; mobile and desktop views.

3.3.2. Test Cases and Results

Table 3-1 : Test Cases and Results

Test Case ID	Test Scenario	Test Steps	Expected Result	Actual Result	Status
TC-01	User Registration	1. Open registration page → 2. Enter valid details → 3. Submit	Account created successfully	As expected	Pass
TC-02	Login (Valid)	1. Go to login page → 2. Enter valid email & password → 3. Click login	Redirect to dashboard	As expected	Pass
TC-03	Login (Invalid)	Enter wrong password	Show error "Invalid credentials"	As expected	Pass
TC-04	View Product	1. Click product → 2. Load details	Product details shown	As expected	Pass
TC-05	Add Product (Admin)	1. Login as admin → 2. Add product details → 3. Save	Product added to database	As expected	Pass

TC-06	Add to Cart	Select product → Click "Add to Cart"	Product appears in cart	As expected	Pass
TC-07	Bundle Offer Trigger	Add 2 items to cart	Show "Buy 2, get 20% off"	As expected	Pass
TC-08	Checkout & Payment	Select payment method → Confirm	Payment processed, order confirmed	As expected	Pass
TC-09	Payment Failure	Use invalid card	Show "Payment declined"	As expected	Pass
TC-10	Load Testing	Simulate 2000 users browsing	Response < 2s	1.8s	Pass
TC-11	SQL Injection Test	Input ' OR '1'='1 in search	Input rejected	As expected	Pass
TC-12	Password Reset	Click "Forgot Password" → Submit email	Reset link sent	As expected	Pass

Chapter 4: Deployment and Maintenance

4.1. Deployment Approach (Agile + SRLC)

Essenza is grounded on Agile approach as the initial and steps of deployment and maintenance are encircled within the repetitive procedure. The phases of Software Release Life Cycle (SRLC) are:

1. **Pre-Alpha** –The first stage of development; only basic features are developed (user registration, product browsing, cart).Internal testing by developers.
2. **Alpha** – Feature and bug-free, internal testing, deals with bundle options, and administration panel.
3. **Beta** – Near released to a limited number of users to test in the real world.Feedback on usability, performance and compatibility.
4. **Release Candidate (RC)** – Version is stable with all big bugs corrected; final testing is done before it is released into production.
5. **Production/Stable Release** – Publicly available , customer ready.
6. **Maintenance and Updates** – Routine patches on bugs fixes, security, and feature additions.

4.2. Agile Deployment Cycle

- **Sprint Planning** – Define features and fixes for the next 2-week sprint.
- **Development** – Code in short iterations, prioritizing high-value features.
- **Testing** – Continuous integration testing after each commit.
- **Release** – Deploy incremental updates to staging, then production.
- **Review & Retrospective** – Gather feedback to improve the next sprint.

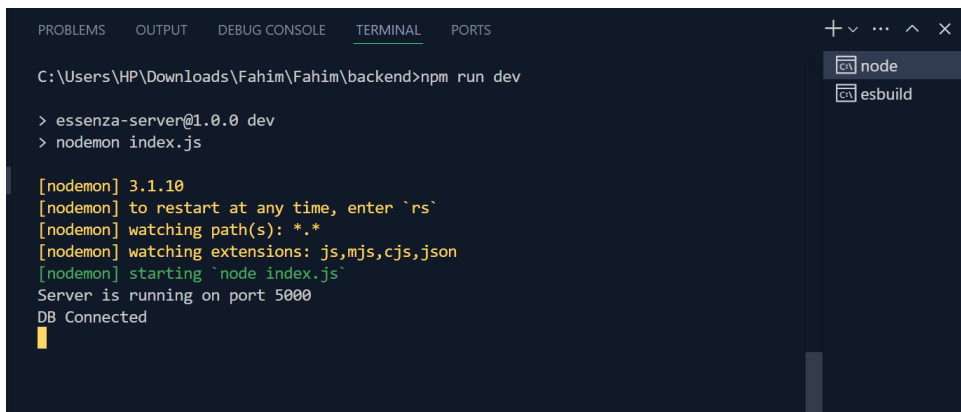
4.3. Maintenance Types

1. **Corrective Maintenance** – Fix defects found in production
2. **Adaptive Maintenance** – MOD- System to support new browsers, payment APIs.
3. **Perfective Maintenance** – improve performance, introduce new bundle offer options.
4. **Preventive Maintenance** – Preventive code refactoring and security patching to avert problems.

Chapter 5: User Manual

5.1. Accessing the System

Backend:

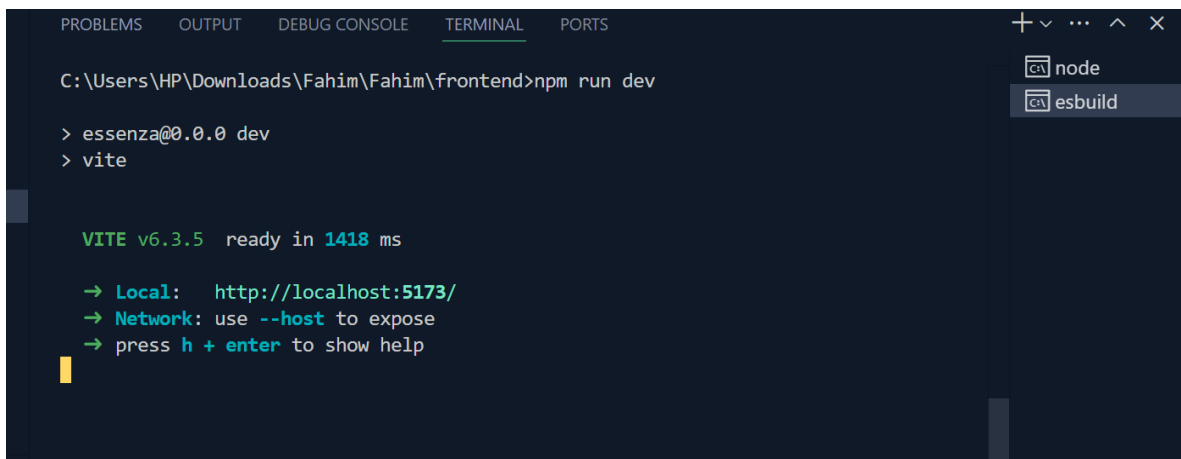


```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
C:\Users\HP\Downloads\Fahim\Fahim\backend>npm run dev
> essenza-server@1.0.0 dev
> nodemon index.js

[nodemon] 3.1.10
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): *.*
[nodemon] watching extensions: js,mjs,cjs,json
[nodemon] starting `node index.js`
Server is running on port 5000
DB Connected
```

Figure 5—1 : Run Backend

Frontend:



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
C:\Users\HP\Downloads\Fahim\Fahim\frontend>npm run dev
> essenza@0.0.0 dev
> vite

VITE v6.3.5 ready in 1418 ms
→ Local: http://localhost:5173/
→ Network: use --host to expose
→ press h + enter to show help
```

Figure 5—2 : Run Frontend

5.2. User Roles, MongoDB

User

```

    _id: ObjectId('689762733a6c4fe82503a838')
    firstName: "Fahim"
    lastName: "Baagh"
    email: "user1@gmail.com"
    password: "$2b$10$.PMRr0kYig51UZVpfws.s.ZMltIo1gI9ksl2/GBlfd1i5/KYJSWj6"
    role: "user"
    ▶ cartData: Object
    __v: 0

```

Figure 5—3 : User Data

Admin



The screenshot shows a search interface with a filter bar at the top containing a search query: "Type a query: { field: 'value' }". Below the filter bar, the query results are displayed as "QUERY RESULTS: 1-2 OF 2". The results show a single user profile for an admin user with the following details:

```

    _id: ObjectId('68975e3e80e1f4b31d2781b4')
    firstName: "Md Mohi"
    lastName: "Uddin"
    email: "admin@fluffy-buds.com"
    password: "$2b$10$8KX6xviw/YQdZweFnXK8p.I0eLhyp15SJA7FjLjhX63uFCm.vBf8y"
    role: "admin"
    ▶ cartData: Object
    __v: 0

```

Figure 5—4 : Admin Data

5.3. Key Functions and How to Use Them

5.3.1. Registration & Login

Logo

Log in

Sign in to your account to continue

Email

Password

Log in

Demo User **Demo Admin**

Don't have an account? [Sign Up](#)

Figure 5—5 : Login

Logo

Register

Create your account to get started

First Name **Last Name**

Email

Password

Confirm Password

Register

Figure 5—6 : Registration

5.3.2. Browsing Products

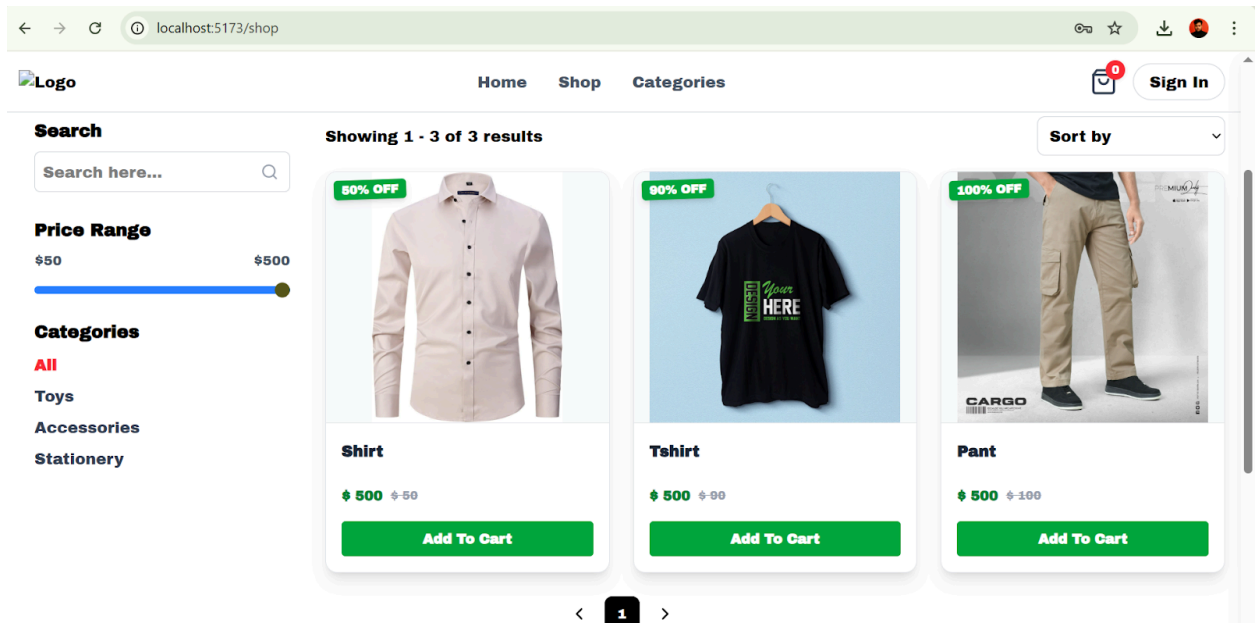


Figure 5—7 : Browsing Products

5.3.3. Adding to Cart

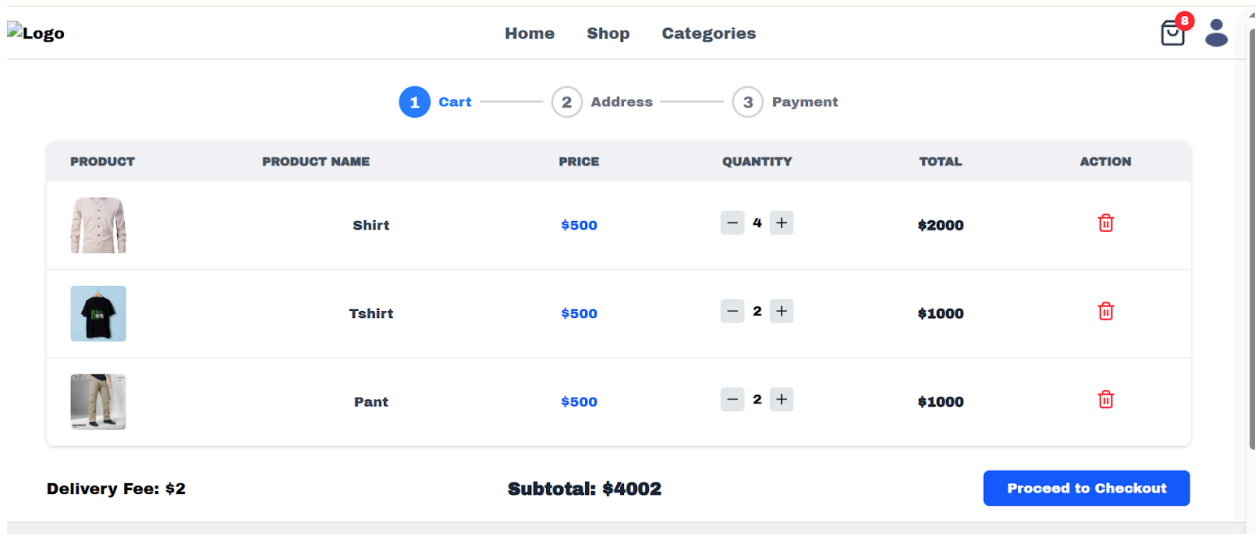


Figure 5—8 : Adding to Cart

5.3.4. Bundle Offers

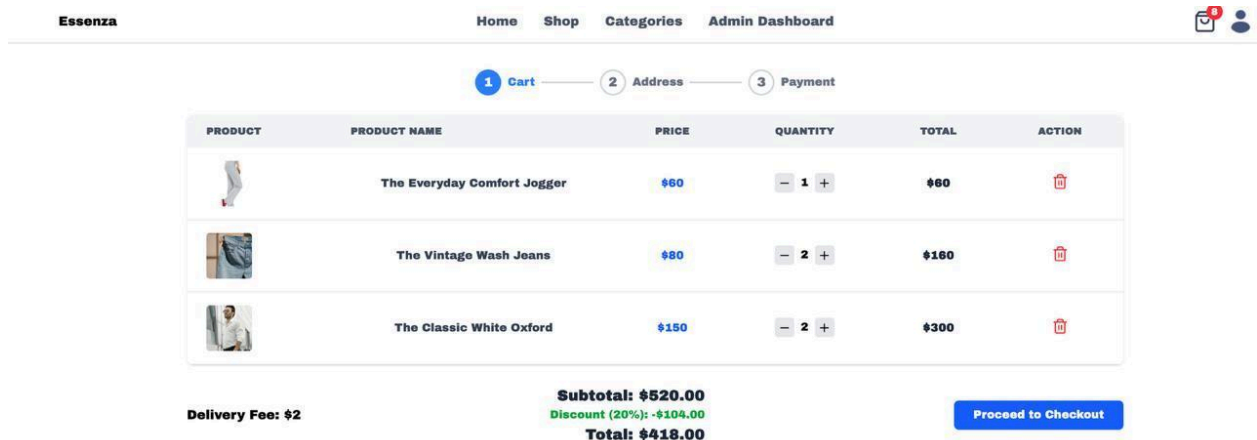


Figure 5—9 : Bundle Offers

5.3.5. Checkout

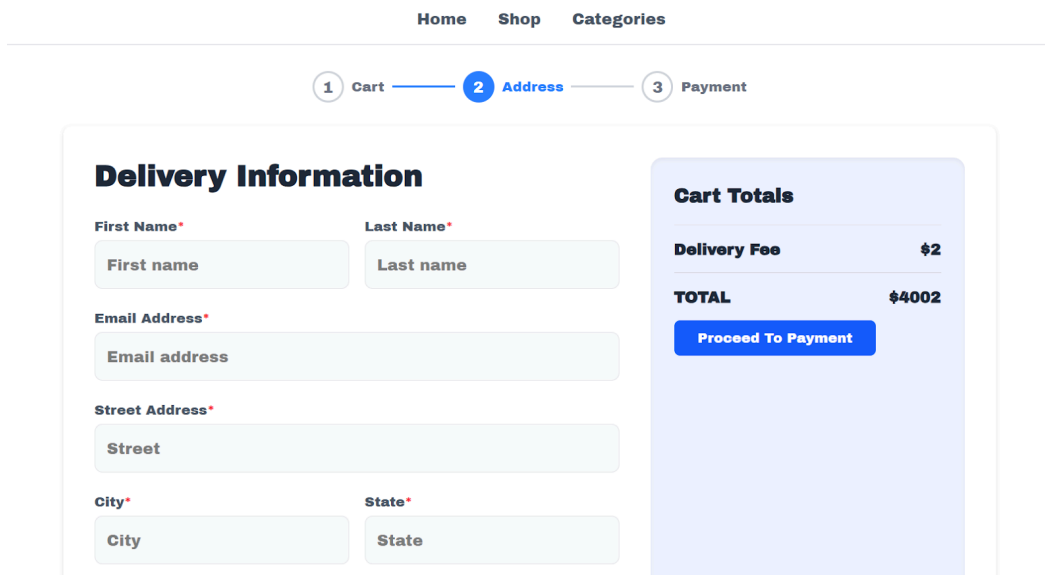


Figure 5—10 : Checkout

5.3.6. Order Tracking

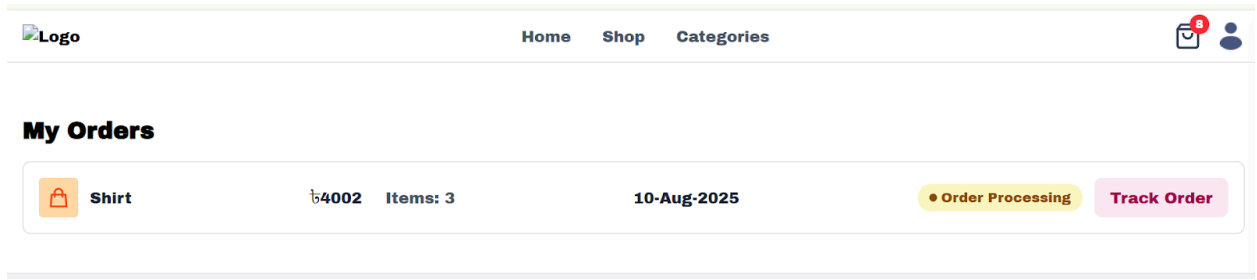


Figure 5—11 : Order Tracking

5.3.7. Admin Panel (Admins only)

- Add, update, or delete products.

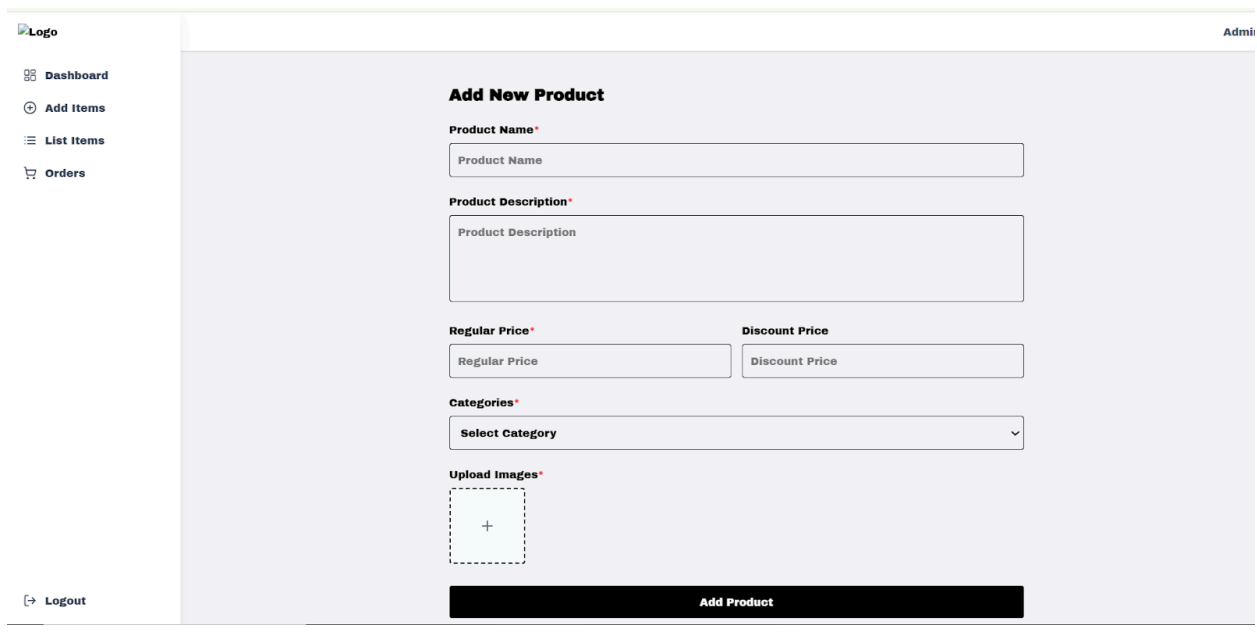


Figure 5—12 : Add Data

Product List

Image	Name	Description	Category	Price	Actions
	Shirt	Shirt for boys high quality	Accessories	\$500	Edit Delete
	Tshirt	Tshirt for boys , high quality	Stationery	\$500	Edit Delete
	Pant	High quality pants for boys	Toys	\$500	Edit Delete

Logout

Figure 5—13 : update and delete products

- View sales reports.

Orders

Order ID	Customer	Items	Amount	Date	Payment	Status
ORD-68984	Md Mohi Uddin mohluddln.swe@gmail.com	Pant x 1	\$502.00	10-Aug-2025	Unpaid	Delivered
ORD-68984	Md Mohi Uddin mohluddln.swe@gmail.com	Tshirt x 1 Pant x 2	\$1502.00	10-Aug-2025	Unpaid	Cancelled

Figure 5—14 : View sales reports

Chapter 6: Project Summary

6.1. Overview

Essenza is a user-friendly e-commerce clothing store, which is scalable with a specific focus on automated offerings to encourage sales. It is developed using React.js (frontend), Node.js (backend), and MongoDB and it is safe to make payments and has a responsive design.

6.2. Key Features

- Real-time offer engine bundle.
- Authenticate and payment integration.
- Responsive design which is mobile friendly.
- Product and offer management administration tools.
- Multiple payment options.

6.3. Development Process

- **Technique:** Agile (sprints of 2 weeks, constant feedback).
- **SRLC Life cycles:** Pre-Alpha/ Alpha / Beta/ RC/ Stable/ Maintenance.
- **Testing:** Integration, System, Performance, Security, and Unit testing.

6.4. Results

- Succeeded in all significant functional and non-functional examinations.
- Handled 2,000 concurrent users successfully and with response time of less than 2s.
- Favourable user satisfaction on usability and proposes system.

6.5. Future Improvements

- Personalized product suggestions developed using AI.
- AR try on feature integration.
- Multilingual to reach the entire world.

Plagiarism Report

213-35-797

ORIGINALITY REPORT

14%	6%	1%	12%
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5	Submitted to Universiti Selangor Student Paper	1%
6	Submitted to Asia Pacific University College of Technology and Innovation (UCTI) Student Paper	1%
7	Submitted to INTI Universal Holdings SDM BHD Student Paper	1%
8	Submitted to University of Nottingham Student Paper	1%
9	Submitted to The University of Wolverhampton Student Paper	1%
10	Submitted to CSU, San Jose State University Student Paper	1%

11	Submitted to School of Business and Management ITB Student Paper	<1 %
12	Submitted to Sydney Institute of Technology and Commerce Student Paper	<1 %
13	Submitted to Ain Shams University Student Paper	<1 %
14	Submitted to ADA University Student Paper	<1 %
15	Submitted to National School of Business Management NSBM, Sri Lanka Student Paper	<1 %
16	Submitted to University of Technology, Sydney Student Paper	<1 %
17	Submitted to Kuwait University Student Paper	<1 %
18	Submitted to Macquarie University Student Paper	<1 %
19	Submitted to Asia Pacific Institute of Information Technology Student Paper	<1 %
20	Submitted to University of Liverpool Student Paper	<1 %
21	Submitted to Kingston University Student Paper	<1 %
22	Submitted to Canterbury Christ Church University Student Paper	<1 %

Account Clearance

Dashboard Omar Faruq Fahim
213-35-797

Dashboard
Student Portal

Total Payable	Total Paid	Total Due	Total Other
753,200.00	753,200.00	0.00	2,420.00

Today's Routine - Monday
No routine available for today.

Semester Wise Result

Semester-wise SGPA Performance

Semester	SGPA
Fall, 2021	3.27
Spring, 2022	3.48
Summer, 2022	3.43
Fall, 2022	2.50
Spring, 2023	3.03
Fall, 2023	3.14
Spring, 2024	3.36
Fall, 2024	3.41
Spring, 2025	3.38
Summer, 2025	3.50

Library clearance