BSSE FINAL PROJECT
Design and Test Specification

SportWearXpress

Project Advisor

Anum Mustaqeem

Presented by:
Group ID: F24SE002

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Faculty of Information Technology & Computer Science

University of Central Punjab

Design and Test Specification
SDP Phase III

SportsWearXpress

Advisor: Anum Mustaqeem

F24SE002

Member Name	Primary Responsibility
Muneeb Butt	Implementation + documentation + testing
Qasim Abbas	Implementation + documentation + testing
Awais Akram	Implementation + documentation + testing

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Revision History

Name	Date	Reason For Changes	Version

Previous Phases Feedback

Idea Defence Feedback (Screenshot)

Dear Students,

Following is the feedback regarding your Idea Defence:

Sr. #	SE-25
Project Title	SPORTSWEARXPRESS-AI-ENHANCED SPORTSWEAR CUSTOMIZATION PLATFORM

Similar products are already exist. Their own working is less. The customization prices are not fixed. Not very mature. Very small scope. Integrate chat-bot for customization. Calculate automated prices according to customizations. Scope should be increased. Looking forward to the suggested changes.

Add the features discussed in the presentation. Runtime design customization. Price calculation/ make quotation for better prices to multiple sellers/vendors. Ai for better product hunting on their platform.

Students are not sure about how the innovation is being done. No uniqueness at all. They are not clear about the scope.

Prepare your Proposal Document in the light of comments provided. Last date to submit the Proposal Document is **Thursday, September 12, 2024** not later than **03:00 PM**. The proposal document should be prepared using the template available at http://smrms.ucp.edu.pk/All_Phases_Templates.html. Submit the hard copy to Project Office in F-304 (Main Building).

When submitting the hard copy of the proposal document, use the duly signed Group Allocation Yellow Page (available at http://smrms.ucp.edu.pk/Forms.html) as the first page of the submission document. Also get the proposal tape bind before submission.

Phase 2 (SDS) Feedback (Screenshot)

PO Project Office

To: L1F21BSSE0476 - MUHAMMAD QASIM ABBAS; **+2 others**

Thu 24/04/2025 16:10

Dear Students,

Following is the feedback regarding your phase 2 (SDS):

F24SE002	**SPORTSWEARXPRESS-AI-ENHANCED SPORTSWEAR CUSTOMIZATION PLATFORM**

There is no unique features in the project. A lot of similar projects already exist. Need to improve a lot of things in their project. Average performance. Add some unique features.

Lack of important details. Business use-case are not detailed to reflect in document. Below average documentation.

Your next milestone is phase 3 (i.e. DTS). Prepare your phase 3 (DTS) document in the light of feedback provided.

FoIT&CS Projects Office
F-304
042-35880007 ext: 207
Project Office Website http://smrms.ucp.edu.pk/

Abstract

The **SportswearXpress** project aims to address the challenges of personalized sportswear customization through an AI-enhanced e-commerce platform. Current solutions lack advanced tools for design precision, real-time communication, and dynamic pricing, leading to inefficiencies, miscommunication, and unmet customer expectations. This project is significant as it provides a streamlined, efficient approach to customization, improving both user satisfaction and seller operations.

The platform integrates AI-powered design tools to guide users step-by-step in creating custom designs, ensuring accuracy and reducing errors. Real-time communication features bridge the gap between customers and sellers, enabling seamless collaboration. A dynamic pricing algorithm calculates costs based on design complexity and tool usage, ensuring fair and transparent pricing.

Key knowledge areas include artificial intelligence for personalized design assistance, real-time communication systems for interaction, and database management for handling user data and transactions. The results of this project include a scalable, browser-based solution that optimizes the customization process, enhances user engagement, and sets a new standard for the sportswear industry.

1. Introduction

1.1 Product

SportswearXpress is an AI-powered e-commerce platform designed to solve the challenges associated with customizing sportswear. Traditional customization systems lack intuitive design guidance, real-time communication, and transparent pricing, leading to unmet customer expectations and inefficiencies. SportswearXpress leverages AI to provide users with step-by-step design recommendations, dynamic pricing based on customization complexity, and seamless real-time communication with sellers. This solution aims to enhance user satisfaction and streamline the customization process, setting a new standard for personalized sportswear shopping.

1.2 Background

The sportswear customization domain is rapidly evolving, driven by a growing demand for personalized products. However, current e-commerce platforms in this space often lack sophisticated design tools, dynamic pricing systems, and real-time communication features, resulting in customer dissatisfaction and operational inefficiencies. SportswearXpress aims to address these challenges by providing an AI-enhanced platform that allows for accurate and intuitive customization, improving customer experience and seller efficiency.

1.3 Objective(s)/Aim(s)/Target(s)

The objectives of SportswearXpress are to:

- Develop an AI-driven platform for sportswear customization.
- Integrate AI tools to guide users in personalizing sportswear designs.
- Implement a dynamic pricing model based on design complexity.
- Enable real-time, seamless communication between users and sellers.
- Improve customer satisfaction and operational efficiency.

1.4 Scope

The scope of SportswearXpress includes essential features aimed at enhancing the sportswear customization experience:

- User Customization Interface: A web platform for creating personalized sportswear designs with various options.
- AI-Powered Design Tools: Intelligent tools that guide users through the customization process.
- AI Chatbot: Real-time assistance and recommendations throughout the design journey.
- Dynamic Pricing Model: Automatic adjustments of prices based on customization complexity.
- Real-Time Communication: Direct interaction between customers and sellers for immediate support.
- User Account Management: Secure accounts for saving designs and tracking order history.
- Administrative Dashboard: Tools for sellers to manage products and analyze customer interactions.
- Testing and Deployment: Comprehensive testing before launch and ongoing maintenance for continuous improvement.

1.5 Business Goals

SportswearXpress aims to achieve the following business objectives:
- Enhancing Customer Satisfaction: Elevate customer satisfaction by providing intuitive and precise customization options that cater to individual preferences.
- Minimizing Design Errors: Decrease design errors and miscommunication through the implementation of AI-driven guidance and real-time communication tools.
- Optimizing Operational Efficiency: Streamline operations by automating design assistance and dynamic pricing adjustments, allowing for a more efficient workflow.
- Setting Industry Standards: Establish a competitive benchmark in the sportswear sector by delivering innovative, AI-powered e-commerce solutions that redefine customer engagement.

1.6 Document Conventions

This SRS follows the standard format for software requirements specifications. The document utilizes the following conventions: Font Styles: Section headings are in bold font of 14 **Times**, while subsection headings are in bold of size 12. Regular text is used for descriptions and content. Highlighting: Important terms or concepts may be highlighted using bold or italic font for emphasis. Numbering: Sections organization and reference purposes. and subsections are numbered sequentially Nomenclature: Where applicable, technical terms or acronyms are defined upon first use to ensure clarity and understanding throughout the document.

1.7 Miscellaneous

1. **Team Roles and Responsibilities**
   Clearly define roles for team members (if any), such as project manager, developer, tester, and designer, to ensure smooth collaboration and accountability.

2. **Technological Tools**
   List all the tools and frameworks used in the project, such as:

   - **Front-end Development**: React.js for building user interfaces.
   - **Back-end Development**: Node.js for server-side logic.
   - **AI Tools**: TensorFlow, OpenCV, or other machine learning frameworks for implementing AI functionalities.
   - **Database Management**: MySQL, MongoDB, or Firebase for storing data.
   - **Version Control**: Git and GitHub for source code management.

3. **Project Timelines**
   Define a high-level timeline for project milestones, such as requirement gathering, development, testing, and deployment phases.

4. **Contingency Plans**
   Outline fallback mechanisms in case of system failures or delays. For example:

   - Backup solutions for data.

   - A plan to handle high traffic or server downtime.

5. **Training and User Guides**
   Provide training resources and user manuals for:

   - Admin users to manage the system (e.g., inventory updates, analytics reports).

   - End users to navigate the product customization and order placement processes.

6. **Collaboration Tools**
   Mention tools used for communication and collaboration, such as:

   - Slack, Microsoft Teams, or Discord for team communication.

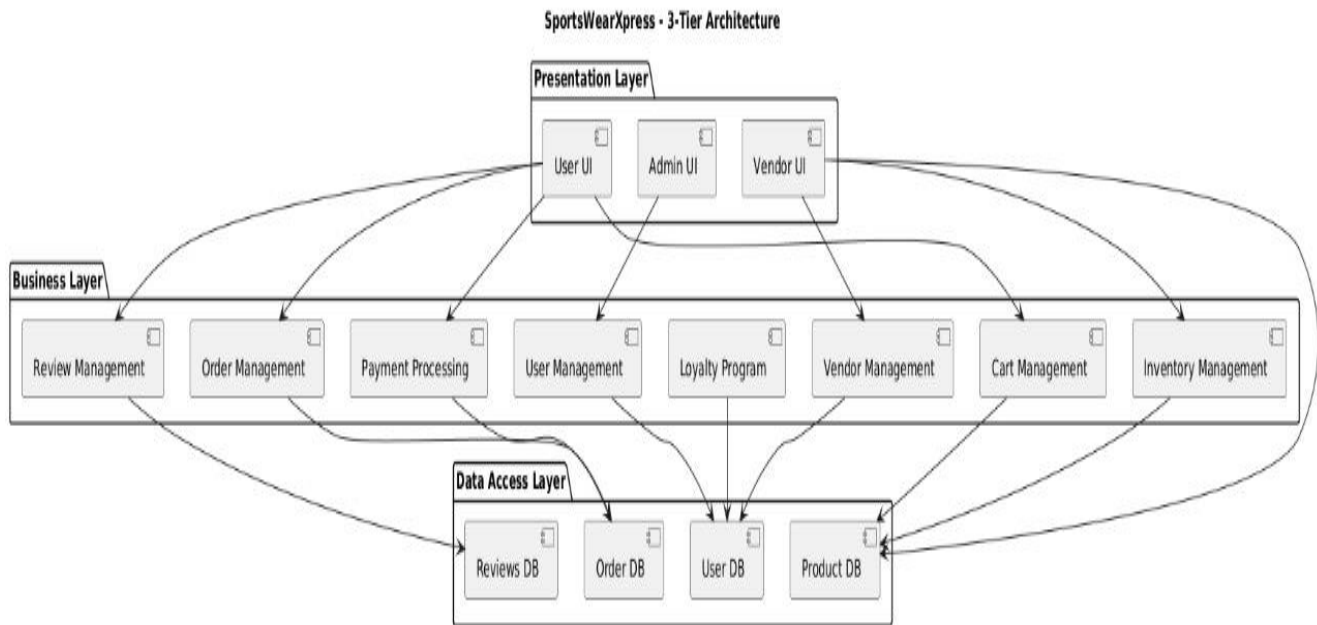   - Project management tools like Jira or Trello for task tracking.

7. **Future Enhancements**
   Outline possible future updates, such as:

   - Introducing new AI-powered features.
   - Expanding to support other sportswear categories.
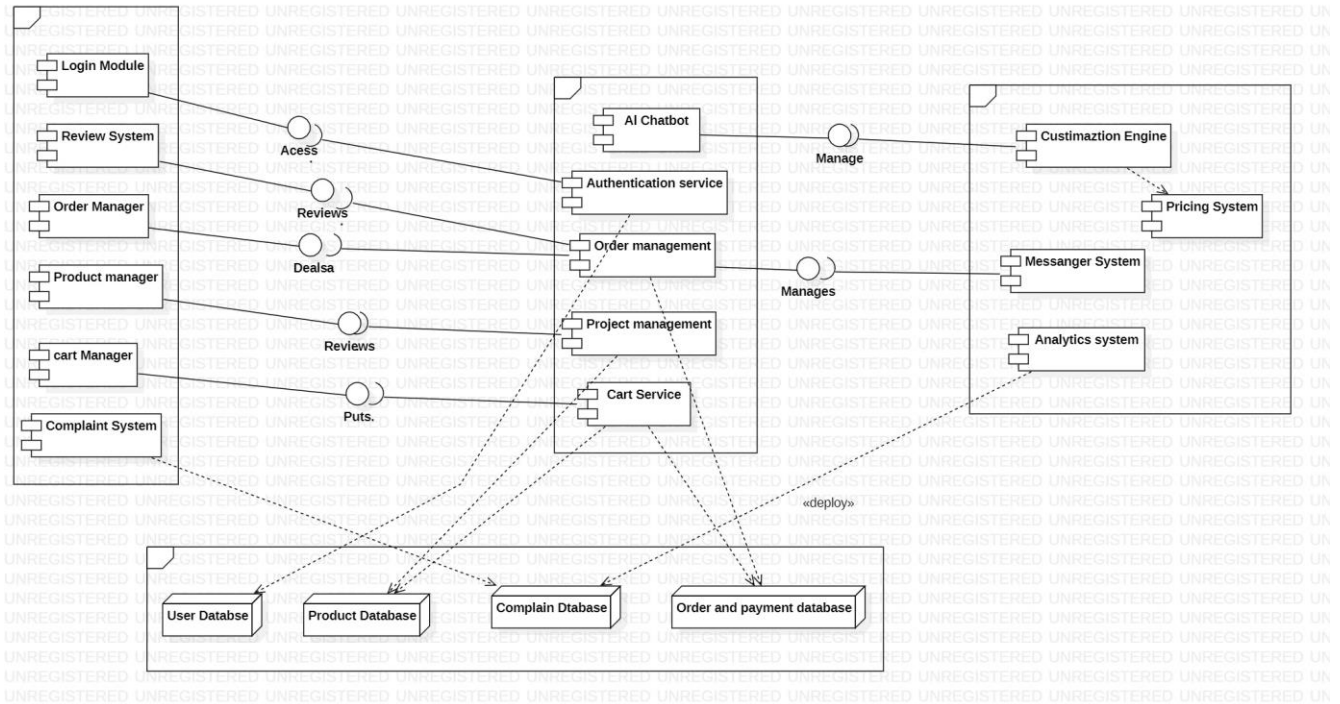   - Integrating augmented reality (AR) for product visualization.
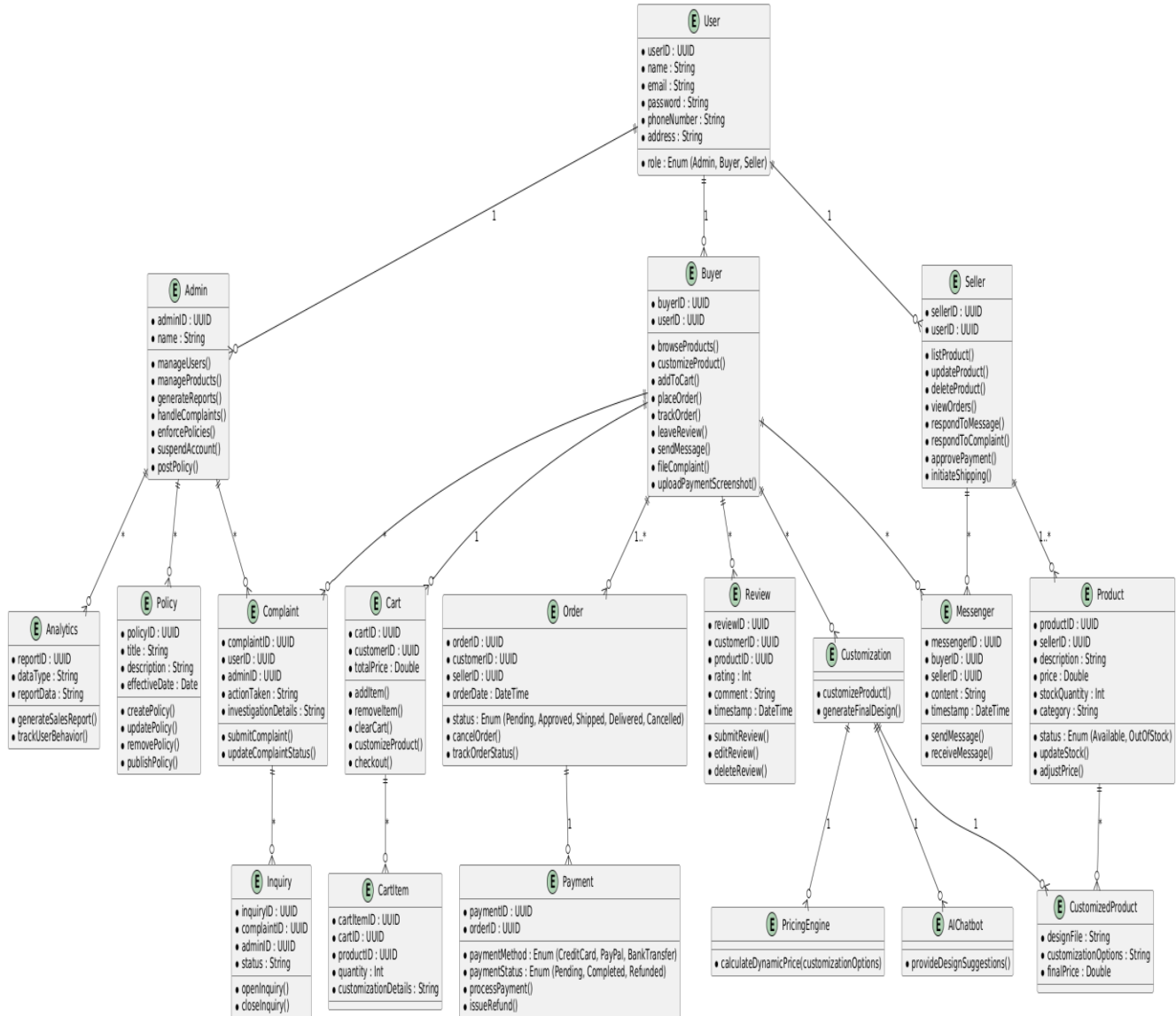
2. Technical Architecture

Architecture Diagram

SportsWearXpress - 3-Tier Architecture

Presentation Layer

User UI   Admin UI   Vendor UI

Business Layer

Review Management | Order Management | Payment Processing | User Management | Loyalty Program | Vendor Management | Cart Management | Inventory Management

Data Access Layer

Reviews DB   Order DB   User DB   Product DB

2.1 Application and Data Architecture
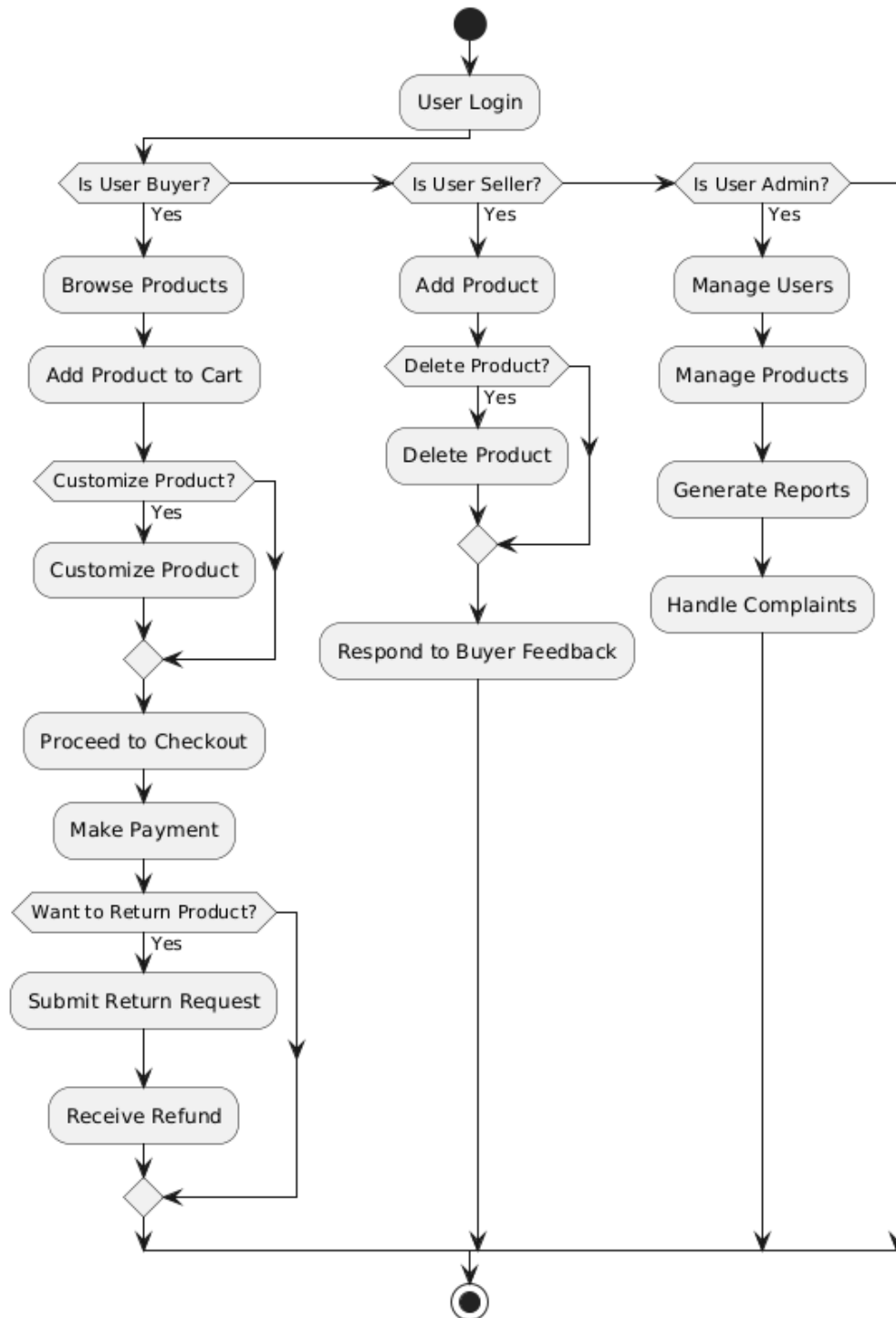
Component Diagram
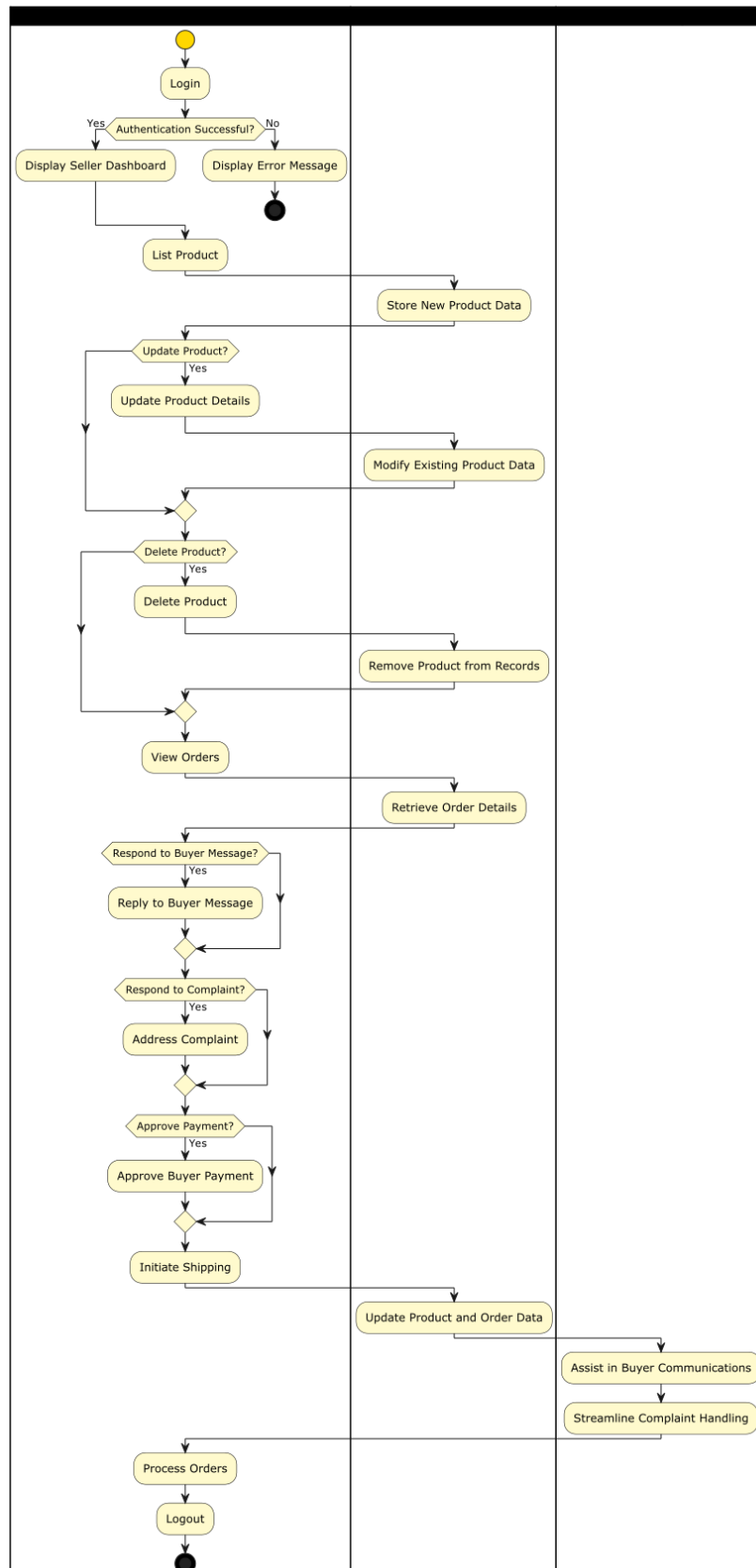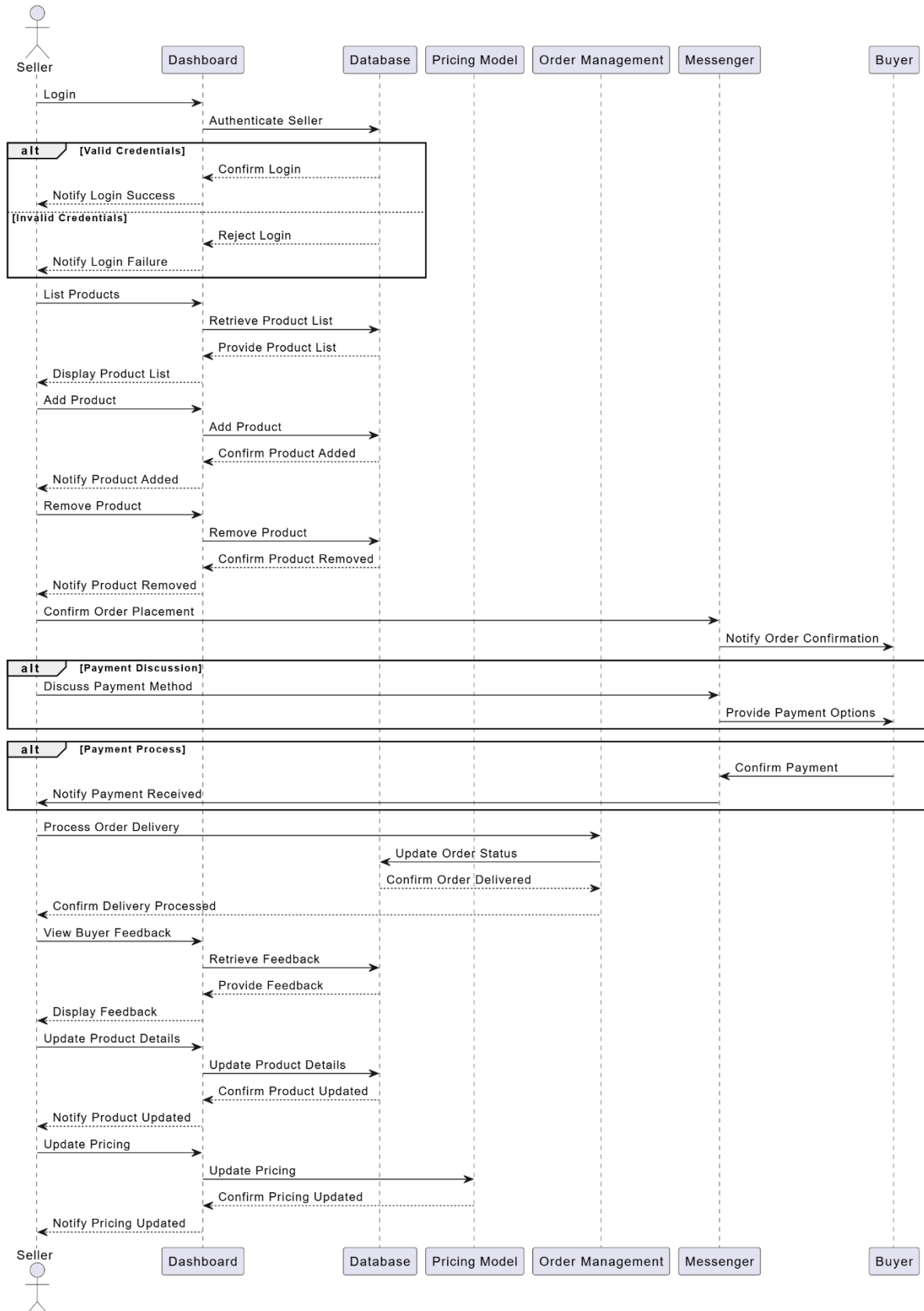
Erd Diagram
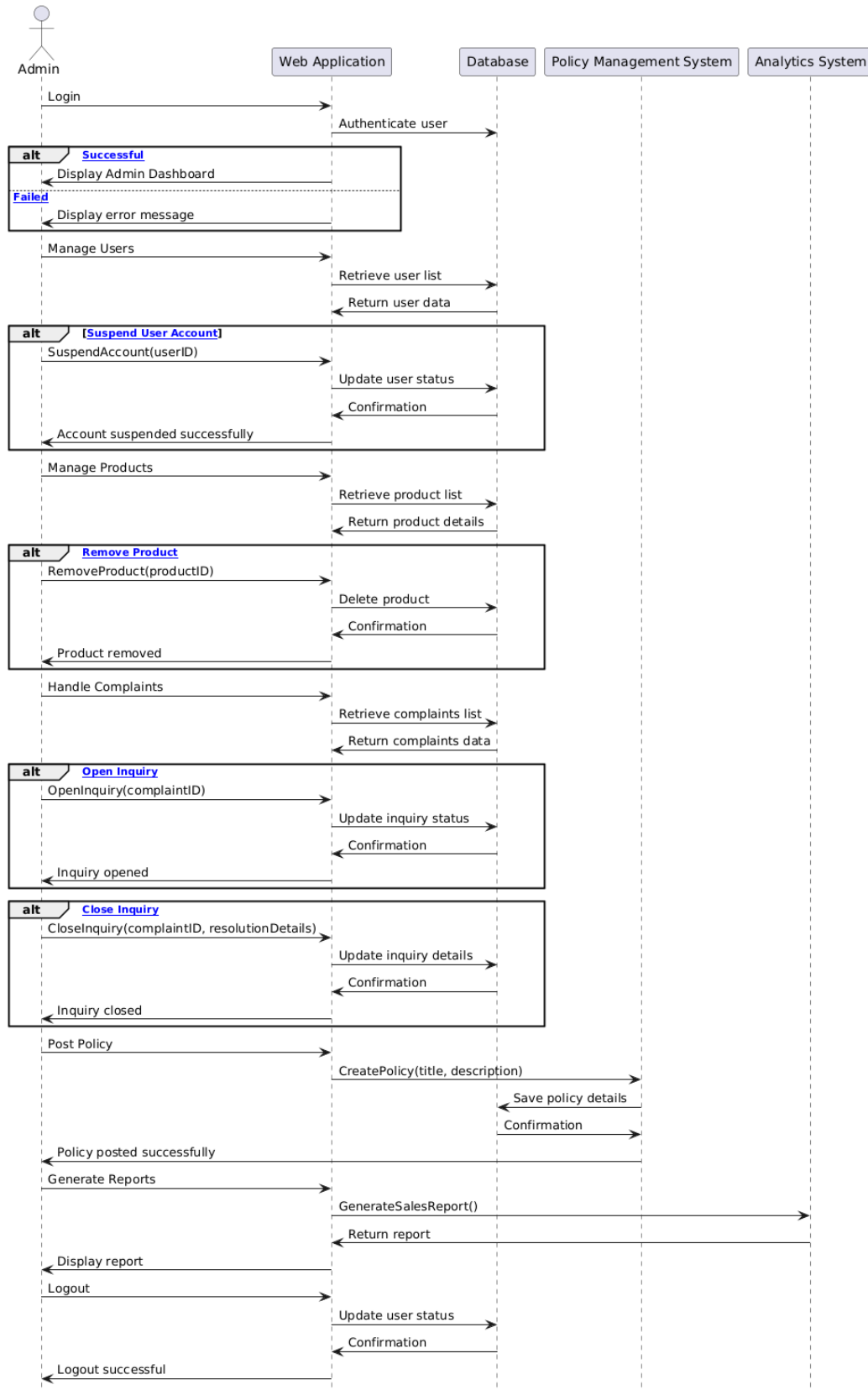
< SportWearXpress>

Activity Diagram for User

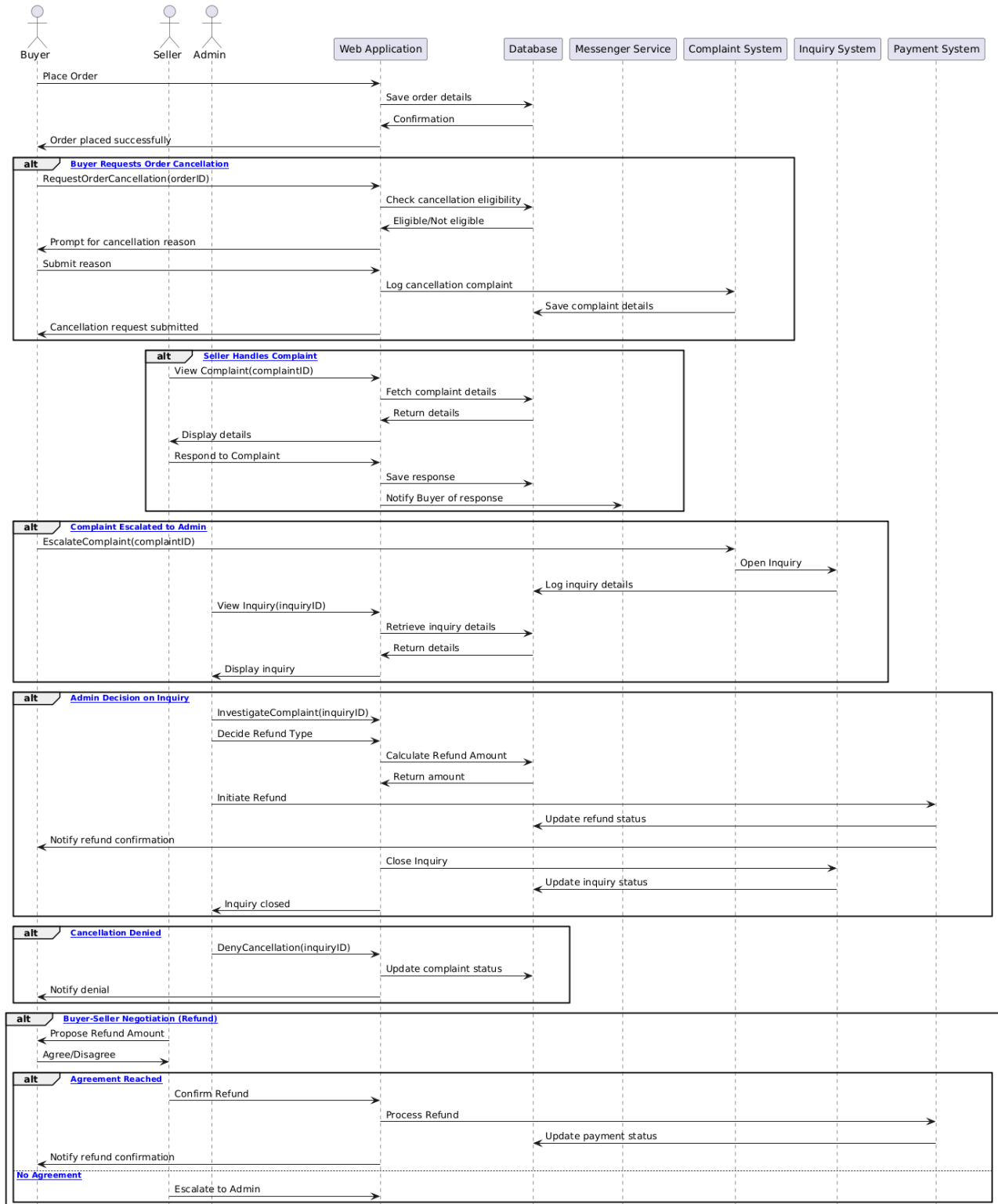# Activity Diagram for Seller

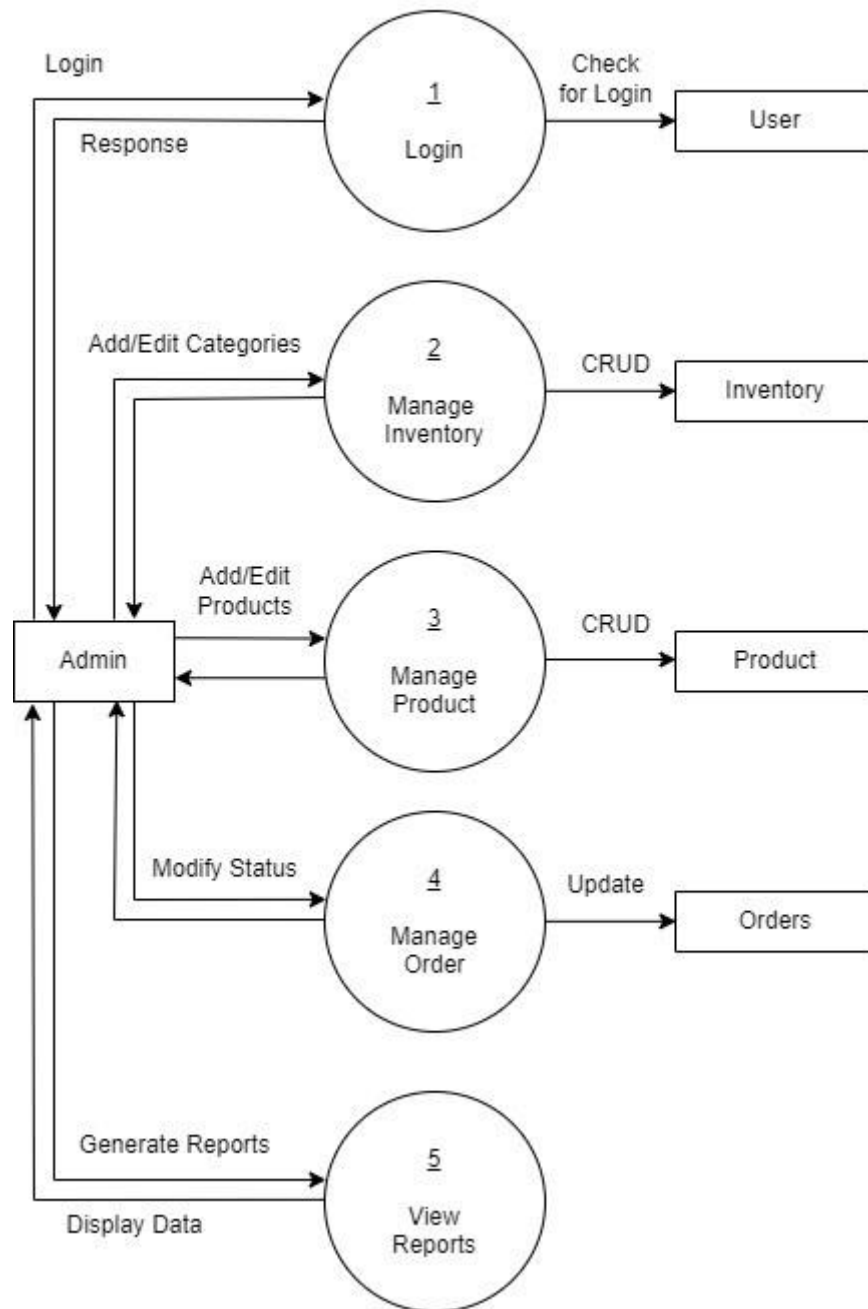# Sequence Diagram for Seller

Sequence Diagram of Admin

2.2 Component Interactions and Collaborations

Sequence Diagram order cancellation

Dfd Diagram

Level 1 - Admin

Dfd Diagram

Level 2 - User

Order Process

User | Admin | User Management | Order Management | Product Customization | Inventory Management | Analytics Management | Centralized Database

- Login/Register
- Authenticate User
- User Authenticated
- Login Successful
- Request Product List
- Fetch Product Data
- Product Data
- Display Product List
- Place Order
- Validate Product Availability
- Check Stock Levels
- Stock Available
- Product Validated
- Save Order Details
- Order Saved
- Order Confirmed
- Submit Customization Request
- Save Customization Data
- Customization Saved
- Customization Confirmed
- Update Stock
- Modify Stock Levels
- Stock Updated
- Stock Update Confirmed
- Request Analytics Data
- Fetch Analytics Data
- Provide Analytics Data
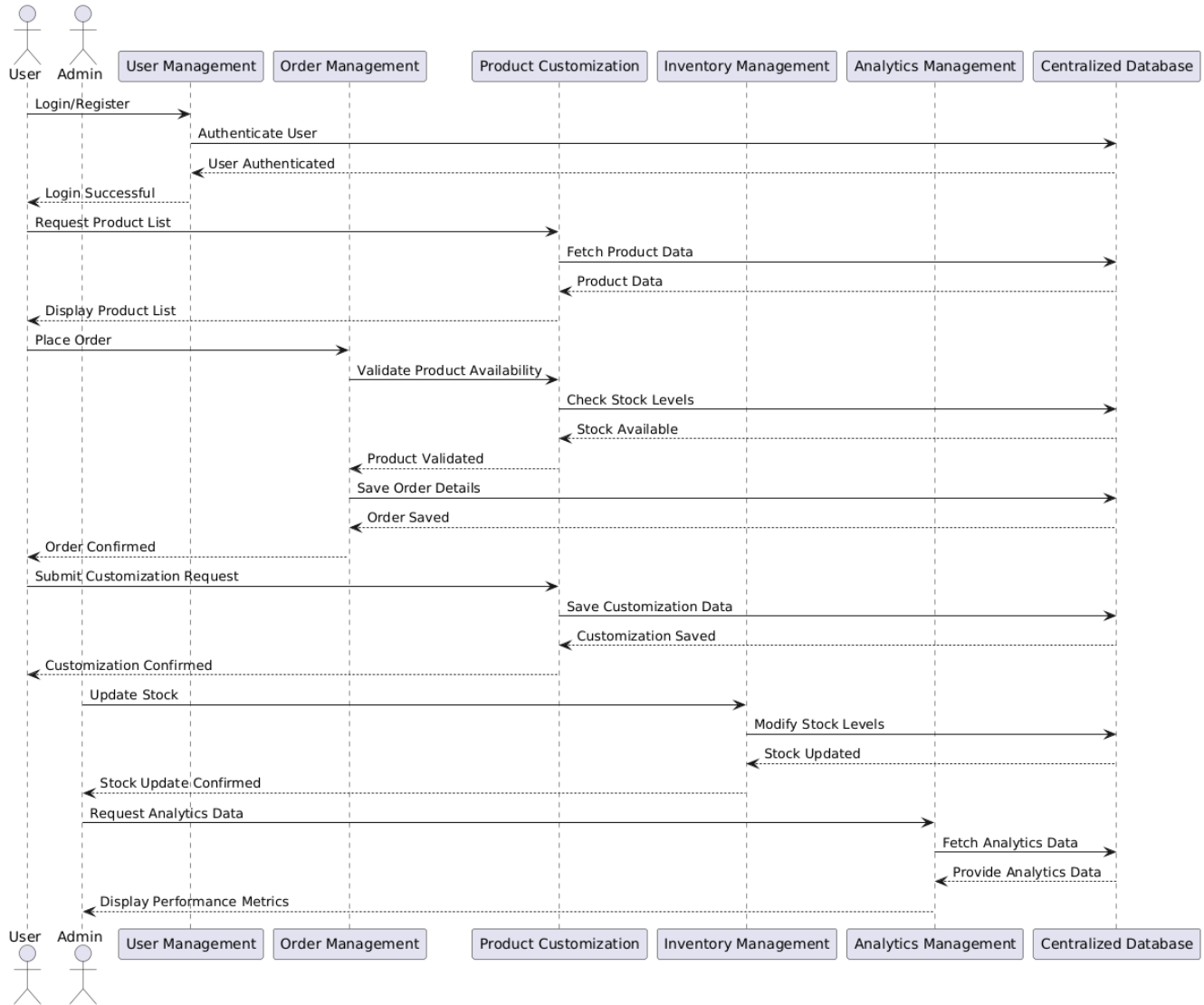- Display Performance Metrics

2.3 Design Reuse and Design Patterns

2.4 Technology Architecture

The technology architecture of SportswearXpress is designed to support real-time interaction, AI-driven customization, and scalable e-commerce features. While cloud hosting is a common option, this project will be hosted on a non-cloud infrastructure, possibly on a university server or a local deployment setup for demonstration and testing purposes.

1. Platform
Frontend: Built using React.js, HTML5, CSS3, and JavaScript for a modern, responsive user interface accessible via web browsers.

Backend: Developed using Node.js with the Express.js framework, which provides fast, event-driven server operations ideal for handling user interactions and real-time updates.

AI Functionality: Powered by TensorFlow.js and OpenCV.js to deliver client-side AI recommendations for product customization without relying on cloud-based AI services.

2. System Hosting
Local Hosting / On-Premise Server:
The system will be hosted on a local server (e.g., a university-managed environment or standalone deployment on physical hardware).
This setup supports local access for development and testing.
Suitable for prototype or proof-of-concept phases.
Simplifies infrastructure management during early-stage development.

3. Connectivity Requirements

Stable Local Network / Internet: Required to facilitate:
User login and session management.
Real-time messaging between buyer and seller via Socket.io.
AI interaction through in-browser computation.
API Connections (Optional): If needed, payment gateways like Stripe or PayPal can be integrated through external APIs, even in local setups.

4. Modes of Operation

Buyer Interface: Provides a customization UI, AI assistant, cart, and order management.
Seller Interface: Enables product upload, order tracking, and buyer communication.
Admin Panel: Facilitates system governance, analytics access, and user control.

5. Security
Local SSL (if applicable): Self-signed certificates may be used for encrypted communication in a local/test environment.
User Authentication: Implemented using OAuth 2.0 or session-based security models.
Data Management: Managed via MongoDB, with local database storage and access control.

2.5 Architecture Evaluation

Component	Chosen Technology	Reason for Selection
Frontend	React.js	Offers a component-based architecture, excellent state management, and fast UI rendering.
Backend	Node.js with Express.js	Non-blocking I/O, high performance, scalable for handling multiple real-time requests.
Database	MongoDB	NoSQL flexibility for storing varied product and customization data structures.
AI Customization	TensorFlow.js, OpenCV.js	Enables AI in-browser with fast performance and seamless integration into frontend.
Real-time Messaging	Socket.io	Enables bidirectional real-time communication between users (buyers, sellers).
Version Control	Git & GitHub	Industry standard for collaboration, version tracking, and code review.
Hosting	AWS (EC2, S3) / Vercel	Scalable, secure cloud infrastructure with deployment automation.

### 2.5.1.1 Pros of Selected Technologies

- **React.js**: Fast rendering, reusable components, vibrant ecosystem (e.g., Redux, Hooks).

- **Node.js** + **Express**: Handles asynchronous operations well, wide support for middleware.

- **MongoDB**: Schema-less flexibility supports varied and dynamic product customization formats.

- **TensorFlow.js**: In-browser AI processing avoids latency of server-based AI.

- **Socket.io**: Reliable real-time data transmission for messaging and status updates.

- **AWS/Vercel**: Highly available, scalable, and globally distributed infrastructure.

2.5.1.2 Cons and Challenges

- **Node.js**: Callback-heavy nature may lead to messy code if not properly structured (mitigated using async/await).

- **MongoDB**: Lacks complex joins and transactions compared to relational databases.

- **TensorFlow.js**: May have performance limitations on low-end devices.

- **Socket.io**: Real-time implementation requires careful resource management and security handling.

3. Detailed/Component Design

3.1 Component-Component Interface
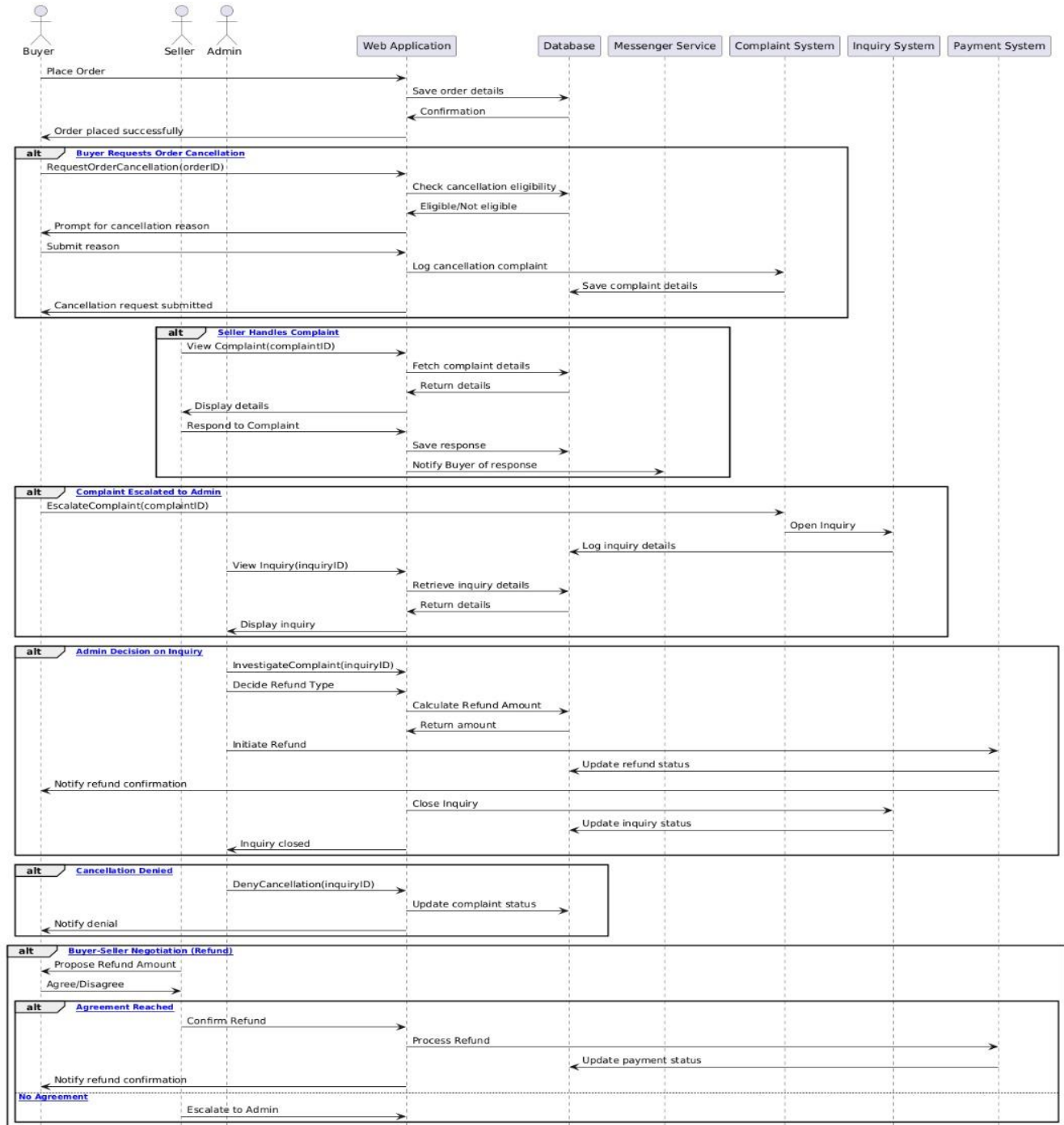
3.2 Component-External Entities Interface

Sign Up Page

Add New Product

Home	About Us	Blog	Products	Trending ▼

Add New Product

Product Image

No image   Choose File   No file chosen

Product Name

Price

Description

Colors

Add color   Add

Sizes
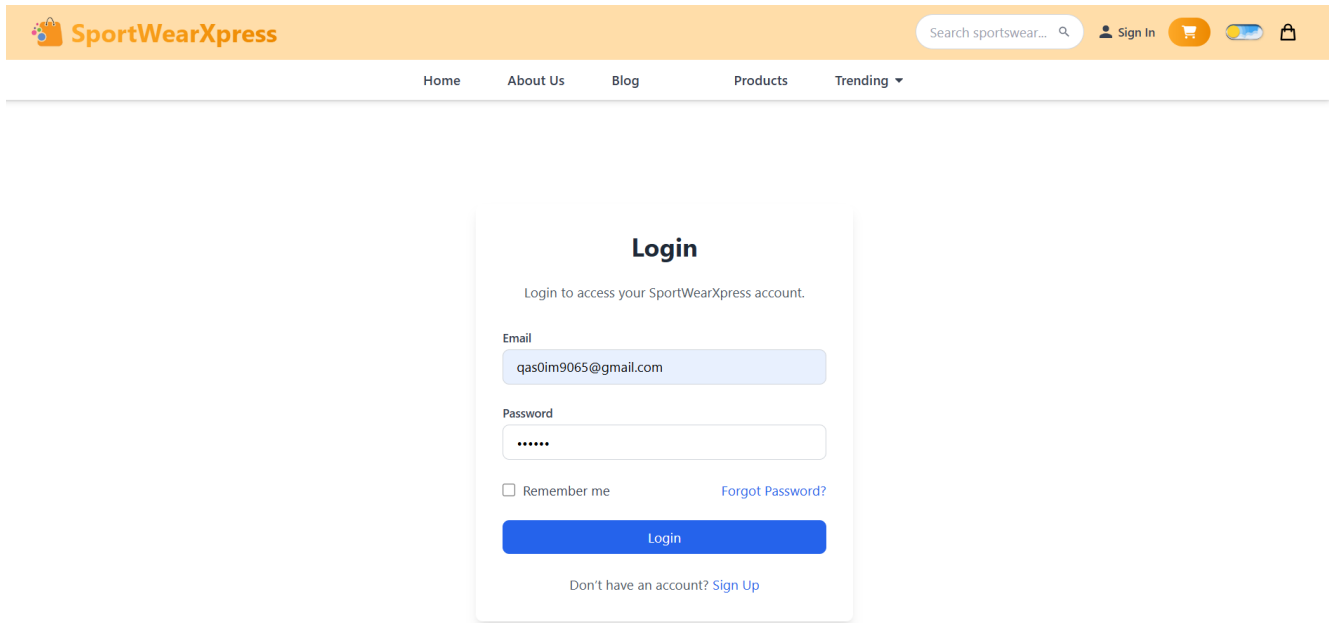
Add size   Add

Cancel   Add Product

3.3 Component-Human Interface

SignIn Page:

SportWearXpress

Home   About Us   Blog   Products   Trending ▼

Search sportswear...   🔍   👤 Sign In

Login

Login to access your SportWearXpress account.

Email

qas0im9065@gmail.com

Password

••••••

☐ Remember me   Forgot Password?

Login

Don't have an account? Sign Up

Checkout Page:

Checkout

Contact Information

First Name
| Muneeb |

Last Name
| |

Email
| |

Phone Number
| |

Shipping Address

Address
| |

City
| |

Country
| Select Country ⌄ |

ZIP Code
| |

Shipping Method

◉ Standard Shipping (Free)   5-7 business days

○ Express Shipping ($9.99)   2-3 business days

Payment Method

◉ Credit Card

Card Number
| 1234 5678 9012 3456 |

Expiration Date
| MM/YY |

CVC
| CVC |

○ PayPal

☐ I agree to the Terms of Service and Privacy Policy

| Pay $84.55 |

Order Summary

	Product 2	$84.55
	blue / XS	
	Qty: 1	

Subtotal $84.55

Shipping   Free

Total   **$84.55**

4. Screenshots/Prototype

4.1 Workflow

Buyer	AI Chatbot	Pricing Engine	Messenger	Seller	Admin	System

- Sign up / Login
- Browse Products
- Customize Product
- Assist with customization
- Calculate price dynamically
- Add to cart
- Proceed to checkout
- Upload payment proof
- Notify Seller
- Verify payment
- Confirm order
- Start order processing
- Track order status
- Ship product
- Receive order
- Submit review
- Monitor transactions
- Resolve complaints
- Generate reports
- Save order data
- Update inventory
- Notify users

4.2 Screens

About us

Blog Page

Design Your Sportswear $29.99   [Add to Cart]

Design Tools

T Text	⊡ Image
✛ Move	✂ Cut
▧ Layer	↻ Rotate
↔ Flip	🗑 Delete

(HOTEL)

Product Options

Color

Size

XS	S	M
L	XL	XXL
3XL		

Quantity

[-] 1 [+]

[Add to Cart - $29.99]

[⬇ Save Design]

Cart Page

Your Cart (1)

	Product 2	$84.55
	Color: Blue	Size: XS	$83.55 base
	[-] 1 [+]	Remove

Clear Cart   Continue Shopping

Order Summary

Subtotal (1 items)	$84.55
Customization Fees	$1.00
Shipping	Free
Total	**$84.55**

[Proceed to Checkout]

Checkout Page

Checkout

Contact Information

First Name
Muneeb

Last Name

Email

Phone Number

Shipping Address

Address

City

Country
Select Country

ZIP Code

Shipping Method

◉ Standard Shipping (Free) 5-7 business days
○ Express Shipping ($9.99) 2-3 business days

Payment Method

◉ Credit Card

Card Number
1234 5678 9012 3456
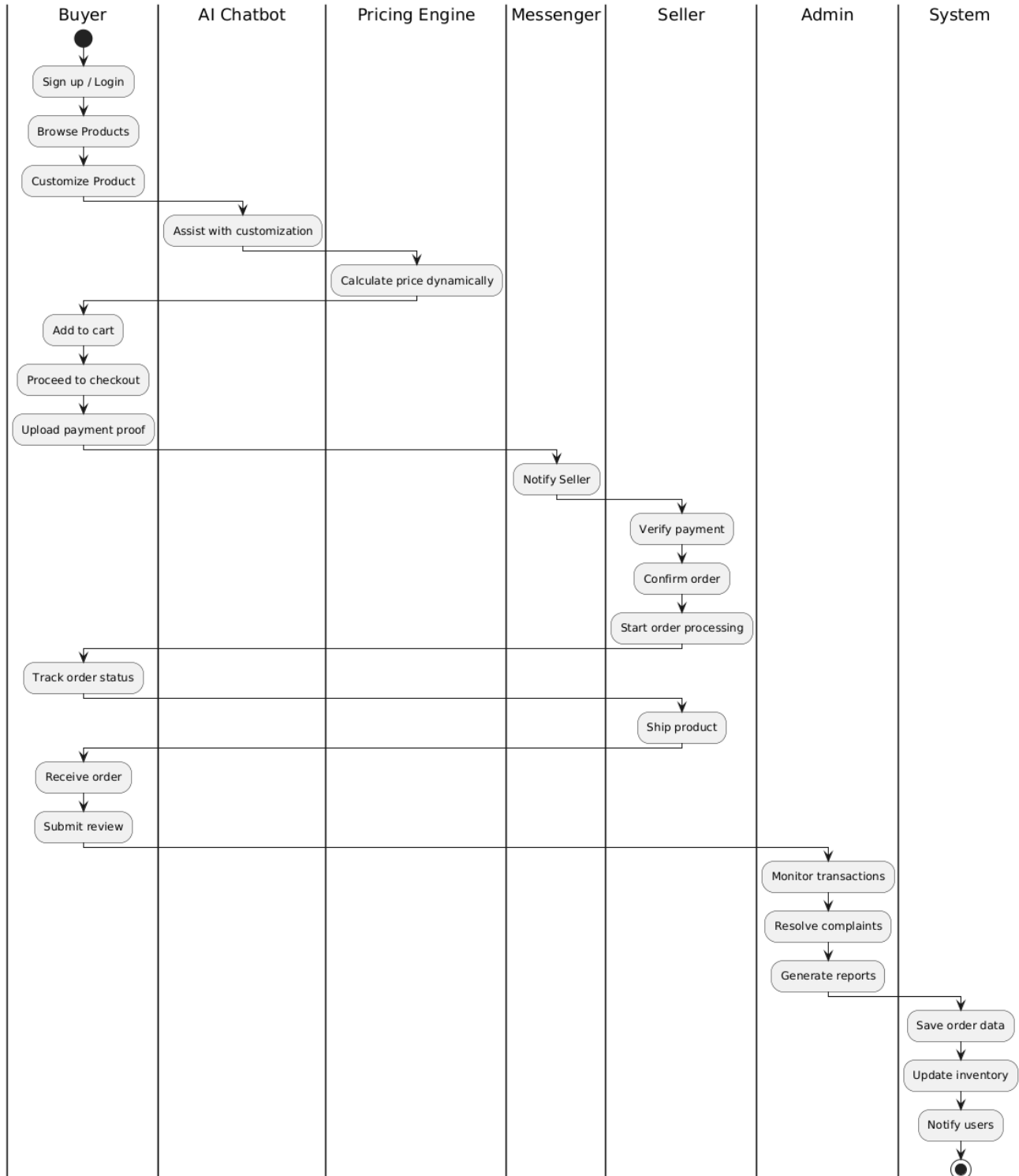
Expiration Date
MM/YY

CVC
CVC

○ PayPal

☐ I agree to the Terms of Service and Privacy Policy

Pay $84.55

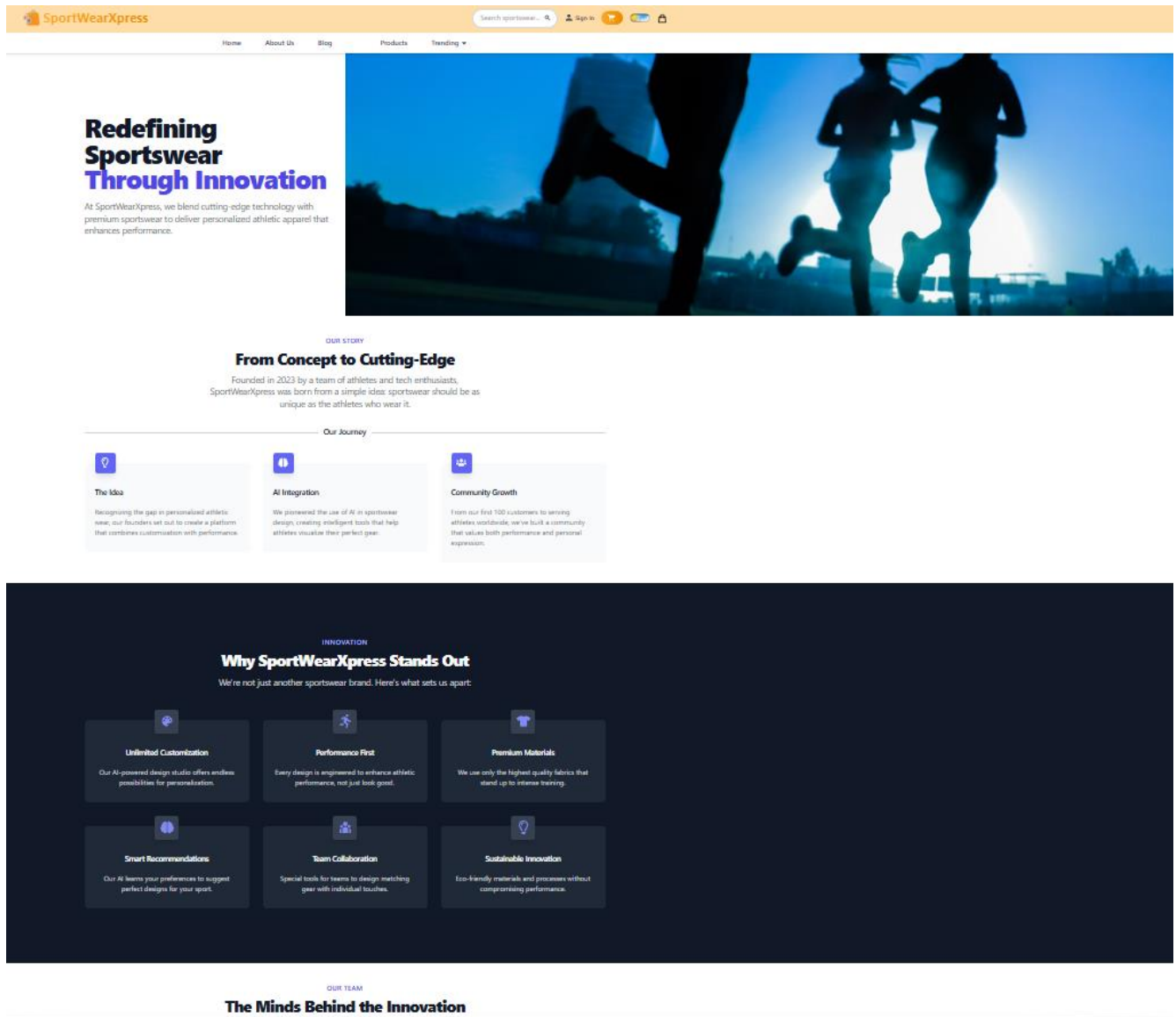### Order Summary

	Product 2	$84.55
	blue / XS	
	Qty: 1	

Subtotal	$84.55
Shipping	Free
Total	**$84.55**

Dynamic Price Page

Customize Your Product 7

Design Preview

Total: $39.69
Includes Team Spirit

Drag logo to reposition

Product Details
Color: 🔴 red
Size: XS
Base Price: $33.70
Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Select Color
🔵 🔴 🟢
Selected: red

Select Size
XS   S   M   L   XL   2XL

Add Logo

SportsX Logo	Team Spirit	Athletic Star	Custom Upload
SportsX Logo +$5.99	Team Spirit +$4.99	Athletic Star +$6.99	Custom Upload +$8.99

Upload Your Own Logo
Choose File   No file chosen

Logo Size
Medium (+$1.00)

Add Custom Text
Enter your custom text (max 30 chars)

Quantity
-   1   +   1 × $33.70

Back   Add to Cart - $39.69

4.3 Additional Information

Seller DashBoard
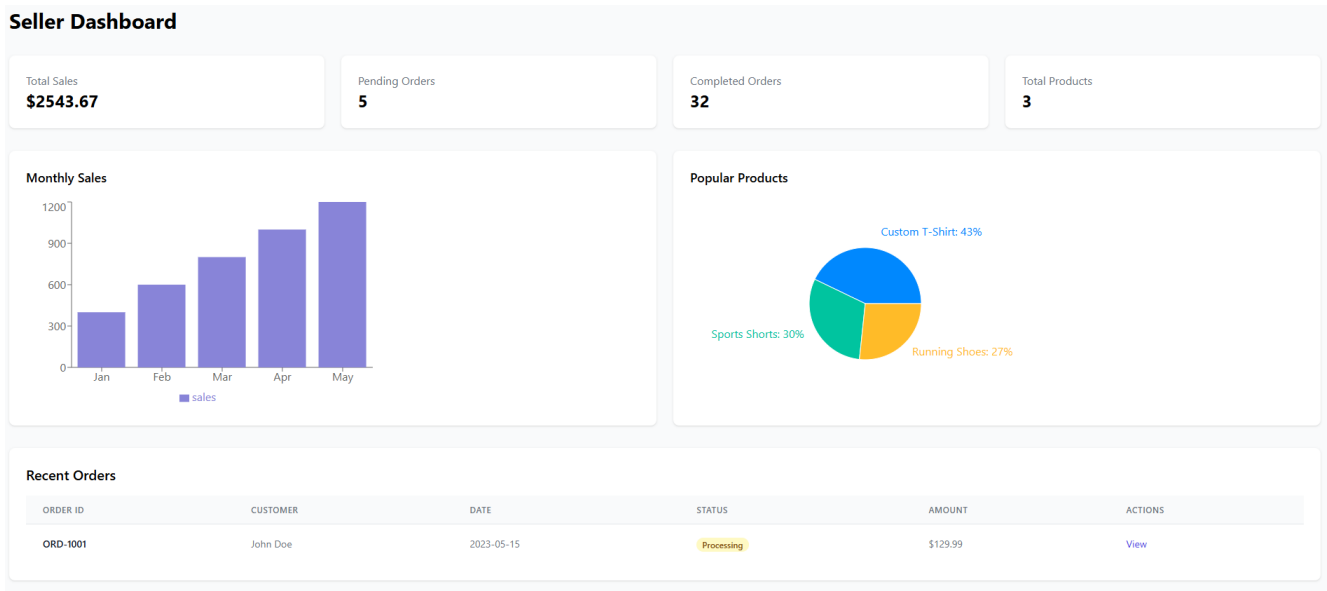
5. Other Design Details

Admin Dashboard
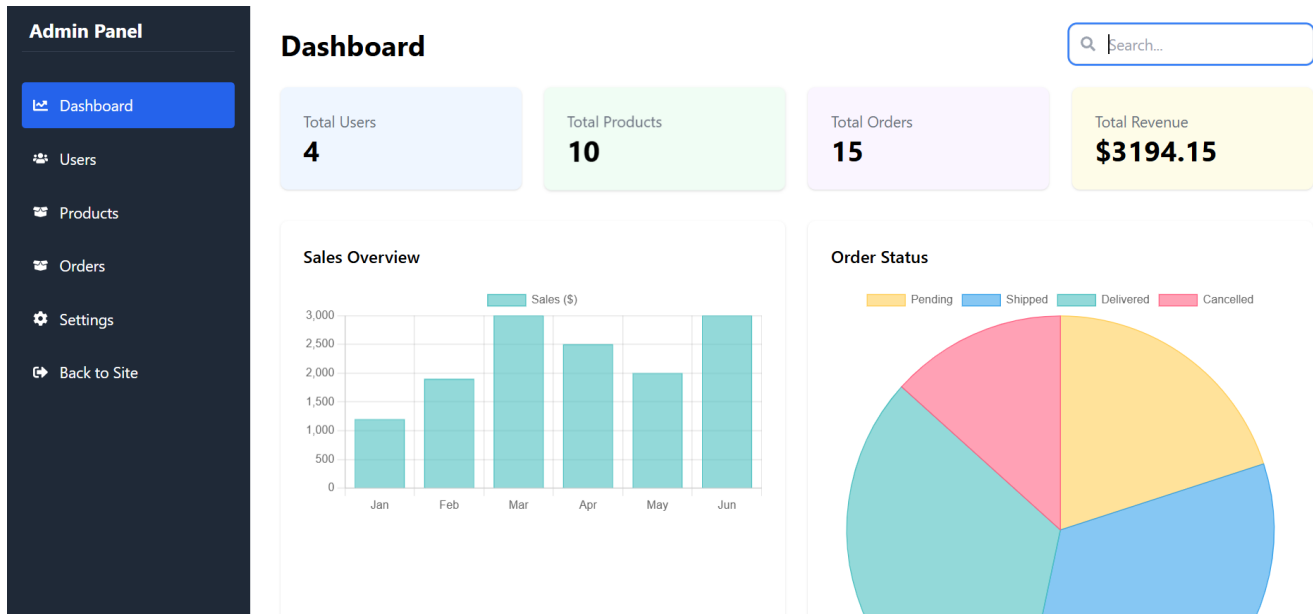
Verify Code

Verify Your Email

Enter the 4-digit code sent to
Muneebbutt438@gmail.com

Verify Code

Resend code in 55 seconds

Forget Password

Forgot Password

Email Address

Muneebbutt438@gmail.com

Send Verification Code

Back to Login

6. Test Specification and Results

6.1 Test Case Specification

Table 6.1: TC-1

Identifier	TC-1
Related requirements(s)	Use Case: User Authentication and Profile Management (UC-1)
Short description	Verify successful user login with valid credentials
Pre-condition(s)	User has a registered account
Input data	Email: validuser@example.com, Password: validPass123
Detailed steps	1. Navigate to login page. 2. Enter valid credentials. 3. Click login button.
Expected result(s)	User is successfully logged in and redirected to profile page
Post-condition(s)	User session is created
Actual result(s)	Account is created
Test Case Result	pass

Table 6.2: TC-2

Identifier	TC-2
Related requirements(s)	Use Case: User Authentication and Profile Management (UC-1)
Short description	Verify login failure with wrong password
Pre-condition(s)	User has a registered account
Input data	Email: validuser@example.com, Password: wrongPass
Detailed steps	1. Navigate to login page. 2. Enter invalid credentials. 3. Click login button.
Expected result(s)	Error message "Incorrect credentials" displayed
Post-condition(s)	User remains on login page
Actual result(s)	User remains on login page
Test Case Result	Pass

Table 6.3: TC-3

Identifier	TC-3
Related requirements(s)	Use Case: Add to Cart (UC-2)
Short description	Add an available item to cart
Pre-condition(s)	Item is in stock, user logged in
Input data	Item ID: 101, Quantity: 1
Detailed steps	1. Select item. 2. Click "Add to Cart".
Expected result(s)	Item added to cart successfully
Post-condition(s)	Cart updated
Actual result(s)	Product Add to cart
Test Case Result	Pass

Table 6.4: TC-4

Identifier	TC-4
Related requirements(s)	Use Case: Add to Cart (UC-2)
Short description	Attempt to add an out-of-stock item
Pre-condition(s)	Item is out of stock
Input data	Item ID: 102
Detailed steps	1. Select item. 2. Click "Add to Cart".
Expected result(s)	Error message "Item out of stock"
Post-condition(s)	No item added
Actual result(s)	Item is no added to cart
Test Case Result	Pass

Table 6.5: TC-5

Identifier	TC-5
Related requirements(s)	Use Case: Product Customization (UC-3)
Short description	Successfully customize a product
Pre-condition(s)	User logged in, product supports customization
Input data	Color: Red, Text: "Champion"
Detailed steps	1. Open customization. 2. Set color and text. 3. Save.
Expected result(s)	Customized product preview saved
Post-condition(s)	Customized design linked
Actual result(s)	Product is successfully Customize
Test Case Result	Pass

Table 6.6: TC-6

Identifier	TC-6
Related requirements(s)	Use Case: Product Customization (UC-3)
Short description	Upload invalid file format during customization
Pre-condition(s)	Customization tool open
Input data	File format: .exe
Detailed steps	1. Upload invalid file.
Expected result(s)	Error "Invalid file format"
Post-condition(s)	File not accepted
Actual result(s)	File has not been Accepted
Test Case Result	Pass

Table 6.7: TC-7

Identifier	TC-7
Related requirements(s)	Use Case: Save Product Design (UC-4)
Short description	Successfully save completed product design
Pre-condition(s)	Design completed
Input data	Design Name: "Summer Edition"
Detailed steps	1. Complete design. 2. Click "Save Design".
Expected result(s)	Design saved successfully
Post-condition(s)	Design stored
Actual result(s)	Design have been saved
Test Case Result	Pass

Table 6.8: TC-8

Identifier	TC-8
Related requirements(s)	Use Case: Save Product Design (UC-4)
Short description	Save attempt without completing customization
Pre-condition(s)	Incomplete design
Input data	None
Detailed steps	1. Open design. 2. Click "Save" prematurely.
Expected result(s)	Error "Customization incomplete"
Post-condition(s)	No design saved
Actual result(s)	Design has not been Saved
Test Case Result	Pass

Table 6.9: TC-9

Identifier	TC-9
Related requirements(s)	Use Case: Adjust Pricing (UC-5)
Short description	Successfully apply a valid discount
Pre-condition(s)	Admin logged in
Input data	Discount: 15%
Detailed steps	1. Select product. 2. Apply 15% discount. 3. Save changes.
Expected result(s)	Discount applied successfully
Post-condition(s)	New price displayed
Actual result(s)	New Price has been displayed
Test Case Result	Pass

Table 6.10: TC-10

Identifier	TC-10
Related requirements(s)	Use Case: Adjust Pricing (UC-5)
Short description	Attempt to set invalid discount below minimum
Pre-condition(s)	Admin logged in
Input data	New Price: 0
Detailed steps	1. Select product. 2. Set price to 0. 3. Save changes.
Expected result(s)	Error "Invalid price value"
Post-condition(s)	Price remains unchanged
Actual result(s)	Price doesn't change
Test Case Result	Pass

Table 6.11: TC-11

Identifier	TC-11
Related requirements(s)	Use Case: Track Design Changes (UC-6)
Short description	Track saved product design changes successfully
Pre-condition(s)	Saved changes available
Input data	Design ID: 001
Detailed steps	1. Open saved designs. 2. View change history.
Expected result(s)	List of design changes displayed
Post-condition(s)	Changes available for review
Actual result(s)	Track saved product design changes successfully
Test Case Result	Pass

Table 6.12: TC-12

Identifier	TC-12
Related requirements(s)	Use Case: Track Design Changes (UC-6)
Short description	Attempt to track changes without any saved designs
Pre-condition(s)	No saved designs available
Input data	-
Detailed steps	1. Open track changes section.
Expected result(s)	Error "No design changes available"
Post-condition(s)	No change history shown
Actual result(s)	Error "No design changes available"
Test Case Result	Pass

Table 6.13: TC-13

Identifier	TC-13
Related requirements(s)	Use Case: Place Order (UC-7)
Short description	Successfully place an order
Pre-condition(s)	Cart has at least one item
Input data	Shipping address and payment info
Detailed steps	1. Proceed to checkout. 2. Enter shipping and payment. 3. Confirm order.
Expected result(s)	Order placed successfully with order ID generated
Post-condition(s)	New order created
Actual result(s)	Order have been placed successfully and order ID is generated
Test Case Result	Pass

Table 6.14: TC-14

Identifier	TC-14
Related requirements(s)	Use Case: Place Order (UC-7)
Short description	Attempt to checkout with empty cart
Pre-condition(s)	Cart is empty
Input data	-
Detailed steps	1. Proceed to checkout without adding any item.
Expected result(s)	Error "Cart is empty"
Post-condition(s)	No order placed
Actual result(s)	Cart is empty
Test Case Result	Pass

Table 6.15: TC-15

Identifier	TC-15
Related requirements(s)	Use Case: Track Order (UC-8)
Short description	Successfully track an existing order
Pre-condition(s)	Order placed
Input data	Order ID: 1234
Detailed steps	1. Open "Track Order". 2. Enter valid Order ID.
Expected result(s)	Order status and tracking info displayed
Post-condition(s)	Order information shown
Actual result(s)	Order information has been shown
Test Case Result	Pass

Table 6.16: TC-16

Identifier	TC-16
Related requirements(s)	Use Case: Track Order (UC-8)
Short description	Attempt to track an invalid/non-existent order
Pre-condition(s)	No such order exists
Input data	Invalid Order ID
Detailed steps	1. Open "Track Order". 2. Enter invalid ID.
Expected result(s)	Error "Order not found"
Post-condition(s)	No tracking shown
Actual result(s)	Order is not found
Test Case Result	Pass

Table 6.17: TC-17

Identifier	TC-17
Related requirements(s)	Use Case: Interact with Seller (UC-9)
Short description	Successfully send a message to seller
Pre-condition(s)	Buyer logged in, seller messaging enabled
Input data	Message: "Need size details"
Detailed steps	1. Open seller chat. 2. Type and send message.
Expected result(s)	Message delivered successfully
Post-condition(s)	Message received by seller
Actual result(s)	Message have been delivered successfully
Test Case Result	Pass

Table 6.18: TC-18

Identifier	TC-18
Related requirements(s)	Use Case: Interact with Seller (UC-9)
Short description	Failed to send message due to system error
Pre-condition(s)	System issue
Input data	Message
Detailed steps	1. Open chat. 2. Attempt to send message during outage.
Expected result(s)	Error "Message could not be sent"
Post-condition(s)	Message not delivered
Actual result(s)	Message could not be sent
Test Case Result	Pass

Table 6.19: TC-19

Identifier	TC-19
Related requirements(s)	Use Case: Product Reviews and Ratings (UC-10)
Short description	Successfully leave a review for a purchased product
Pre-condition(s)	Product purchased
Input data	Rating: 5 Stars, Review Text: "Excellent quality"
Detailed steps	1. Select purchased product. 2. Write review. 3. Submit.
Expected result(s)	Review saved and displayed
Post-condition(s)	Review listed under product
Actual result(s)	Review have been saved and displayed
Test Case Result	Pass

Table 6.20: TC-20

Identifier	TC-20
Related requirements(s)	Use Case: Product Reviews and Ratings (UC-10)
Short description	Attempt to review a non-purchased product
Pre-condition(s)	No purchase record
Input data	Review
Detailed steps	1. Select product not bought. 2. Try writing review.
Expected result(s)	Error "Only purchased products can be reviewed"
Post-condition(s)	No review submitted
Actual result(s)	Error "Only purchased products can be reviewed"
Test Case Result	Pass

Table 6.21: TC-21

Identifier	TC-21
Related requirements(s)	Use Case: Analytics and Reporting (UC-11)
Short description	Successfully view a sales report
Pre-condition(s)	Admin logged in
Input data	Report Type: Sales Report
Detailed steps	1. Open Admin Dashboard. 2. Click Analytics. 3. Select "Sales Report".
Expected result(s)	Sales report data displayed
Post-condition(s)	Admin views report
Actual result(s)	Sales report data have been displayed
Test Case Result	Pass

Table 6.22: TC-22

Identifier	TC-22
Related requirements(s)	Use Case: Analytics and Reporting (UC-11)
Short description	Try viewing report with invalid date range
Pre-condition(s)	Admin logged in
Input data	Start Date: 01/01/2026, End Date: 01/01/2025
Detailed steps	1. Open Analytics. 2. Set invalid dates. 3. Click Generate Report.
Expected result(s)	Error "Invalid date range selected"
Post-condition(s)	Report not generated
Actual result(s)	Invalid date range have been selected.Error!
Test Case Result	Pass

Table 6.23: TC-23

Identifier	TC-23
Related requirements(s)	Use Case: Cancel Order (UC-12)
Short description	Successfully cancel an order before shipping
Pre-condition(s)	Order placed but not shipped
Input data	Order ID: 5555
Detailed steps	1. Open Orders. 2. Select cancellable order. 3. Click "Cancel Order".
Expected result(s)	Order status changed to "Cancelled"
Post-condition(s)	Order cancelled
Actual result(s)	Order have been Cancelled
Test Case Result	Pass

Table 6.24: TC-24

Identifier	TC-24
Related requirements(s)	Use Case: Cancel Order (UC-12)
Short description	Attempt to cancel a shipped order
Pre-condition(s)	Order already shipped
Input data	Order ID: 9999
Detailed steps	1. Open Orders. 2. Try cancelling a shipped order.
Expected result(s)	Error "Order cannot be cancelled after shipping"
Post-condition(s)	Order remains active
Actual result(s)	Order cannot be cancelled after shipping. Error!
Test Case Result	Pass

Table 6.25: TC-25

Identifier	TC-25
Related requirements(s)	Use Case: Edit Profile (UC-13)
Short description	Successfully edit profile with valid data
Pre-condition(s)	User logged in
Input data	New Email: user_new@example.com
Detailed steps	1. Open Edit Profile. 2. Update email. 3. Save changes.
Expected result(s)	Profile updated successfully
Post-condition(s)	Updated user profile
Actual result(s)	
Test Case Result	Pass

Table 6.26: TC-26

Identifier	TC-26
Related requirements(s)	Use Case: Edit Profile (UC-13)
Short description	Attempt to save profile with invalid email
Pre-condition(s)	User logged in
Input data	Email: invalidemail.com
Detailed steps	1. Open Edit Profile. 2. Enter invalid email. 3. Save.
Expected result(s)	Error "Invalid email format"
Post-condition(s)	Profile not updated
Actual result(s)	email format Is Invalid
Test Case Result	Pass

Table 6.27: TC-27

Identifier	TC-27
Related requirements(s)	Use Case: Remove From Cart (UC-14)
Short description	Successfully remove item from cart
Pre-condition(s)	Cart contains items
Input data	Item ID: 4567
Detailed steps	1. Open Cart. 2. Click "Remove" next to item.
Expected result(s)	Item removed from cart
Post-condition(s)	Cart updated
Actual result(s)	Item have been removed from cart
Test Case Result	Pass

Table 6.28: TC-28

Identifier	TC-28
Related requirements(s)	Use Case: Remove From Cart (UC-14)
Short description	Attempt to remove from empty cart
Pre-condition(s)	Cart empty
Input data	-
Detailed steps	1. Open Cart. 2. Try removing any item.
Expected result(s)	Error "Your cart is empty"
Post-condition(s)	No change
Actual result(s)	Your cart is empty. Error!
Test Case Result	Pass

Table 6.29: TC-29

Identifier	TC-29
Related requirements(s)	Use Case: Create Profile (UC-15)
Short description	Successfully create a new user profile
Pre-condition(s)	User not registered
Input data	Name: Sarah Khan, Email: sarahkhan@example.com, Password: SafePass123
Detailed steps	1. Open Sign Up. 2. Enter valid details. 3. Submit form.
Expected result(s)	Profile created successfully
Post-condition(s)	User registered and logged in
Actual result(s)	new user profile have been created
Test Case Result	Pass

Table 6.30: TC-30

Identifier	TC-30
Related requirements(s)	Use Case: Create Profile (UC-15)
Short description	Attempt to create profile with duplicate email
Pre-condition(s)	Email already registered
Input data	Email: alreadyregistered@example.com
Detailed steps	1. Open Sign Up. 2. Enter duplicate email. 3. Submit form.
Expected result(s)	Error "Email already in use"
Post-condition(s)	No new account created
Actual result(s)	Email already in use. Error!
Test Case Result	Pass

Table 6.31: TC-31

Identifier	TC-31
Related requirements(s)	Use Case: Send Refund (UC-16)
Short description	Successfully issue a refund for eligible order
Pre-condition(s)	Order eligible for refund
Input data	Order ID: 3333, Refund Amount: PKR 5000
Detailed steps	1. Open Refund Section. 2. Select eligible order. 3. Confirm refund.
Expected result(s)	Refund processed successfully
Post-condition(s)	Refund status updated
Actual result(s)	issue have been refund for eligible order
Test Case Result	Pass

Table 6.32: TC-32

Identifier	TC-32
Related requirements(s)	Use Case: Send Refund (UC-16)
Short description	Attempt to issue refund for ineligible order
Pre-condition(s)	Order not eligible for refund
Input data	Order ID: 7777
Detailed steps	1. Open Refund Section. 2. Select ineligible order. 3. Try confirming refund.
Expected result(s)	Error "Refund not applicable for this order"
Post-condition(s)	No refund processed
Actual result(s)	Refund is not applicable for this order
Test Case Result	Pass

6.2 Summary of Test Results

Table 6.2: Summary of Test Results

Module Name	Test cases run	Number of defects found	Number of defects corrected so far	Number of defects still need to be corrected
User Authentication and Profile Management	TC-1, TC-2	1	1	0
Add to Cart	TC-3, TC-4	1	1	0
Product Customization	TC-5, TC-6	1	1	0
Save Product Design	TC-7, TC-8	1	1	0
Adjust Pricing	TC-9, TC-10	1	1	0
Track Design Changes	TC-11, TC-12	1	1	0
Place Order	TC-13, TC-14	1	1	0
Track Order	TC-15, TC-16	1	1	0
Interact with Seller	TC-17, TC-18	1	1	0
Product Reviews and Ratings	TC-19, TC-20	1	1	0
Analytics and Reporting	TC-21, TC-22	1	1	0
Cancel Order	TC-23, TC-24	1	1	0
Edit Profile	TC-25, TC-26	1	1	0
Remove From Cart	TC-27, TC-28	1	1	0
Create Profile	TC-29, TC-30	1	1	0
	TC-31, TC-32	1	1	0

Send Refund				
Complete System	TC-1 to TC-32	16	16	0

Table 6.2: Project Completion Status

Module Name	Status
	(Complete, Partially Implemented, Not Implemented)
Module 1: User Authentication & Profile Management	*Complete*
Module 2: Add to Cart	*Complete*
Module 3: Product Customization	*Complete*
Module 4: Save Product Design	*Complete*
Module 5: Adjust Pricing	*Complete*
Module 6: Track Design Changes	*Complete*
Module 7: Place Order	*Complete*
Module 8: Track Order	*Complete*
Module 9: Interact with Seller (Messenger)	*Complete*
Module 10: Product Reviews and Ratings	*Complete*
Module 11: Analytics and Reporting	*Complete*
Module 12: Cancel Order	*Complete*
Module 13: Edit Profile	*Complete*
Module 14: Remove from Cart	*Complete*
Module 15: Create Profile	*Complete*
Module 16: Send Refund	*Complete*
Complete System	Completed

7. Revised Project Plan
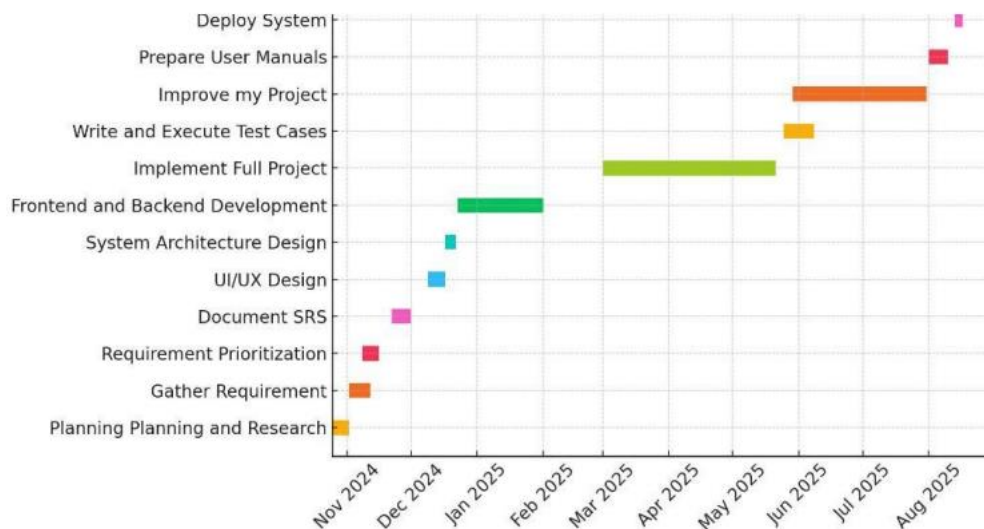
8. References

[1] Zazzle, "Zazzle - Customize Anything," [Online]. Available: https://www.zazzle.com/. [Accessed: 26-

Nov-2024].

[2] Custom Ink, "Custom Ink - Custom T-shirts and More," [Online]. Available:

https://www.customink.com/.   [Accessed: 26-Nov-2024].

Appendix A: Glossary

Terms	Definition
AI	Artificial Intelligence
API	Application Programming Interface
AR	Augmented Reality
DB	Database
UI	User Interface
UX	User Experience
SDS	Software Design Specification
NLP	Natural Language Processing
IDE	Integrated Development Environment
AWS	Amazon Web Services
EC2	Elastic Compute Cloud
S3	Simple Storage Service
SQL	Structured Query Language

Appendix B: IV & V Report

(Independent verification & validation)
IV & V Resource

Name   Signature

S#	Defect Description	Origin Stage	Status	Fix Time	
				Hours	**Minutes**
1					
2					
3					
…					

Table 1: List of non-trivial defects

This document has been adapted from the following:

- Previous project templates at UCP

- High-level Technical Design, Centers for Medicare & Medicaid Services. (www.cms.gov)