

Retail Application

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1. Problems Statement

In the rapidly evolving e-commerce landscape, traditional retail systems often struggle to meet the diverse needs of modern consumers and administrators. Customers frequently face challenges with navigating complex and non-intuitive interfaces, leading to a fragmented shopping experience. These issues can result in abandoned carts, decreased customer satisfaction, and lost revenue opportunities. Furthermore, existing administrative tools may lack the flexibility and functionality required to efficiently manage product catalogs, inventory, and promotions, which can hinder operational effectiveness and responsiveness to market changes.

Additionally, many retail applications fall short in delivering high performance and reliability, leading to potential downtime and a suboptimal user experience. Security concerns around data protection and compliance with industry standards also pose significant challenges, as breaches or inadequate safeguards can undermine user trust and result in severe legal and financial repercussions.

2. Challenges Before This Project

Inadequate Scalability: Traditional platforms struggled to handle varying levels of traffic and transaction volumes, resulting in performance degradation during peak times.

Inefficient Manual Processes: Many retail operations relied heavily on manual processes for inventory management, order fulfillment, and reporting, leading to errors and inefficiencies.

Compatibility Issues: Legacy systems often faced compatibility issues with new technologies, leading to additional maintenance challenges and slower innovation.

Responsive Design Issues: Websites often had trouble adjusting to various screen sizes and resolutions, causing usability issues and negatively impacting mobile user engagement.

2. Scope

After completion of project:

Customer-Facing Features

User Registration and Authentication: Enable customers to create accounts, log in securely, and manage their profiles.

Product Catalog Management: Provide an intuitive interface for browsing products, filtering by categories, and viewing detailed product information.

Shopping Cart and Checkout: Implement a user-friendly shopping cart for managing selected items and a streamlined checkout process.

Payment Integration: Integrate with various payment gateways to support multiple payment methods, including credit/debit cards, digital wallets, and alternative payment options.

Order Processing: Facilitate order placement, confirmation, and processing, with automated order tracking and status updates.

Shipping Tracking: Allow customers to track the status and location of their shipments in real-time.

Profile Management: Enable users to manage their personal information, view order history, and maintain Wishlist.

Product Reviews and Ratings: Implement a system for customers to submit reviews and rate products.

ADMINISTRATOR

Product and Inventory Management: Allow administrators to manage product listings, update prices, and track inventory levels.

Category Management: Provide tools for creating and organizing product categories and subcategories.

Discounts and Promotions: Enable administrators to configure and manage discounts, promotional codes, and special offers.

Order Management: Equip administrators with tools to view, process, and manage customer orders, including handling returns and refunds.

User Experience and Design

Intuitive User Interface: Design a user-friendly and responsive interface for both web and mobile platforms to ensure an optimal shopping experience.

Accessibility: Ensure the platform meets accessibility standards to accommodate users with disabilities.

3.Functional Requirements

Account Creation: Users must be able to create an account by providing essential information such as name, email, password, and contact details.

Login/Logout: Users must be able to log in and out securely using their credentials.

Password Recovery: Users must have the ability to reset their passwords through email verification.

Profile Management: Users should be able to update their personal information, change passwords, and manage account settings.

Product Search: Users must be able to search for products using keywords, categories, or filters (e.g., price range, brand, ratings).

Product Browsing: Users should be able to view product listings with images, descriptions, prices, and availability.

Product Details: Users must be able to view detailed information about individual products, including specifications, reviews, and related products.

Add to Cart: Users must be able to add products to their shopping cart with options for quantity and customization.

View Cart: Users should be able to view, modify, and remove items from their shopping cart.

Checkout Process: Users must be able to proceed to checkout, enter shipping and billing information, and review their order before finalizing.

Order Confirmation: Users should receive a confirmation of their order with a summary and estimated delivery date.

Payment Options: Support multiple payment methods, including credit/debit cards, digital wallets and other payment gateways.

Submit Reviews: Users must be able to submit reviews and ratings for products they have purchased.

View Reviews: Users should be able to read reviews and ratings left by other customers.

Manage Personal Information: Users should be able to update their profile information, including contact details and payment methods.

Maintain Wishlist: Users must have the ability to create and manage Wishlist of desired products.

Add/Edit/Delete Products: Administrators must be able to add, update, and remove products from the catalog.

Manage Inventory: Admins should be able to track and update inventory levels for each product.

Product Categorization: Allow administrators to create and manage product categories and subcategories.

Create Discounts: Administrators must be able to configure and apply discounts and promotional codes to products or orders.

Manage Promotions: Admins should be able to set up, modify, and track the effectiveness of promotional campaigns.

View and Process Orders: Administrators must have the ability to view and process customer orders, including updating order statuses and managing returns and refunds.

Order Fulfillment: Provide tools for managing order fulfillment processes, including generating shipping labels and coordinating with shipping carriers.

Shipping Information: Customers should receive updates on shipping status, including tracking numbers and estimated delivery dates

Non Functional Requirements

Response Time: The system should provide a response time of less than 2 seconds for user interactions such as product searches, page loads, and order processing under normal load conditions.

Throughput: The application must handle a minimum of 1000 concurrent users without significant degradation in performance.

Scalability: The system should be able to scale horizontally to accommodate increased user load and transaction volumes.

Data Encryption: All sensitive data, including user information and payment details, must be encrypted both in transit and at rest.

User Interface: The application must have an intuitive and user-friendly interface, with a consistent design across all pages and devices.

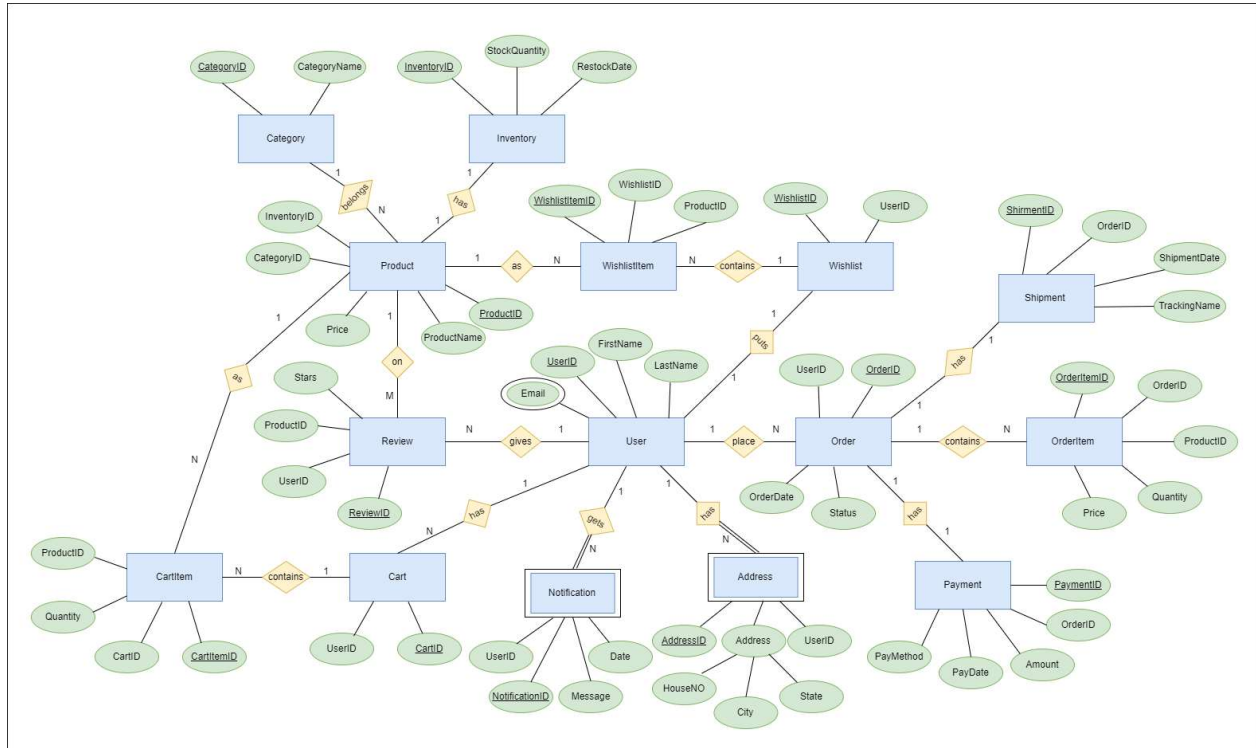
Accessibility: Ensure the application meets accessibility standards to accommodate users with disabilities.

Cross-Platform Support: The application should be compatible with major web browsers (e.g., Chrome, Firefox, Edge) and mobile devices (iOS and Android).

Resource Utilization: Optimize resource usage to minimize operational costs, including efficient use of cloud services and database resources.

Monitoring and Logging: Implement comprehensive monitoring and logging to detect, diagnose, and address performance or operational issues proactively.

5. Entities-Relational Diagram



6. Database Design

Software Requirement Specification

	CartID	UserID
1	1	100
2	2	101
3	3	102
4	4	103
5	5	104
6	6	105

	CartItemID	CartID	ProductID	Quantity
1	1	1	1	1
2	2	2	2	2
3	3	3	3	1
4	4	4	4	1
5	5	5	5	1
6	6	6	6	1

	WishlistID	UserID
1	1	100
2	2	101
3	3	102
4	4	103
5	5	104
6	6	105

	WishlistItemID	WishlistID	ProductID
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6

	ProductID	ProductName	Price	CategoryID	InventoryID
1	1	Laptop	999.99	1	1
2	2	Novel	19.99	2	2
3	3	T-shirt	9.99	3	3
4	4	Blender	49.99	4	4
5	5	Action Figure	14.99	5	5
6	6	Basketball	29.99	6	6

Software Requirement Specification

	UserID	Firstname	Lastname	Email	
1	100	John	Doe	john.doe@example.com	
2	101	Jane	Smith	jane.smith@example.com	
3	102	Alice	Johnson	alice.johnson@example.com	
4	103	Bob	Brown	bob.brown@example.com	
5	104	Charlie	Davis	charlie.davis@example.com	
6	105	Eve	Wilson	eve.wilson@example.com	

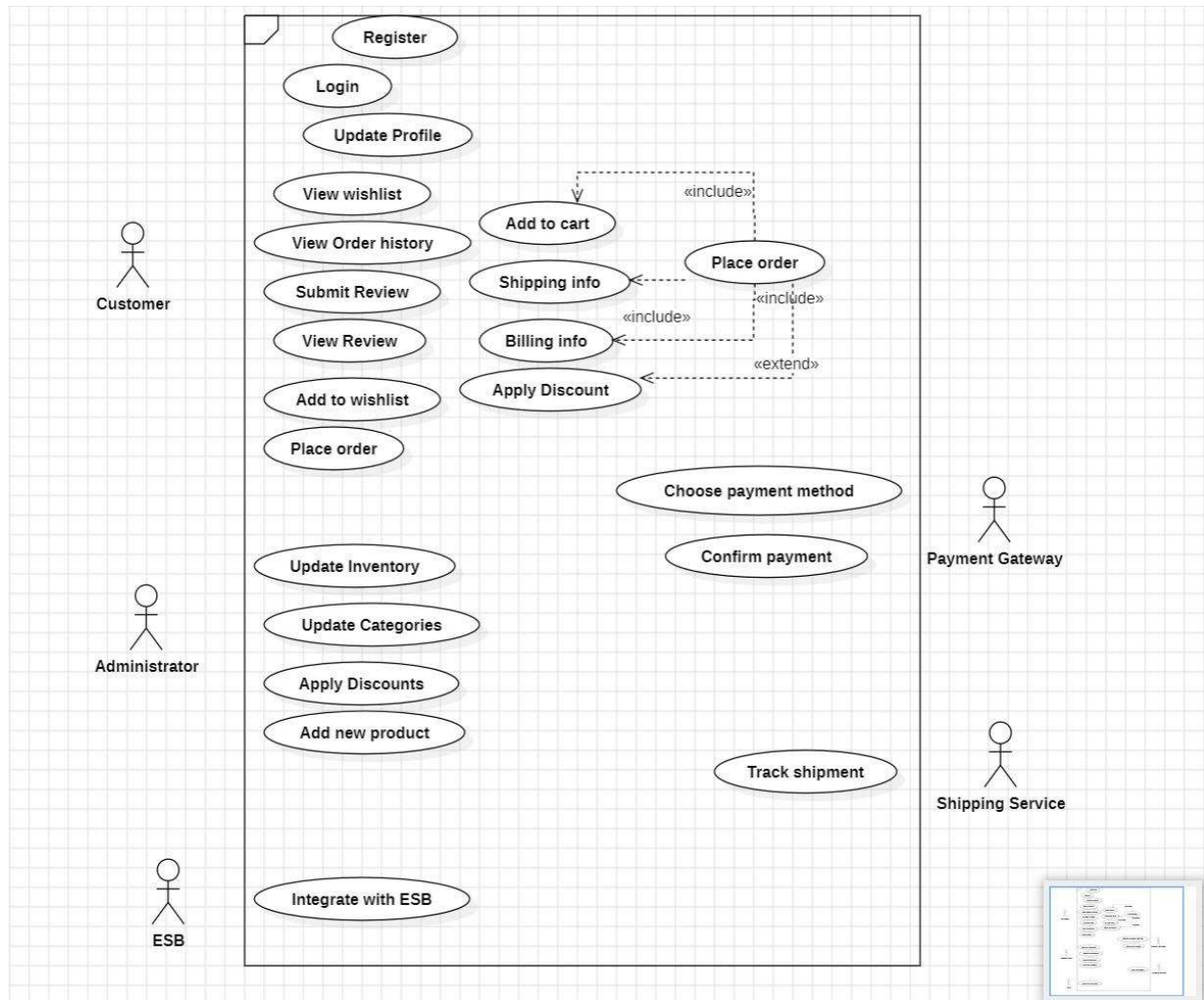
	OrderID	UserID	OrderDate	Status	
1	100	100	2024-08-01 00:00:00.000	Shipped	
2	101	101	2024-08-02 00:00:00.000	Processing	
3	102	102	2024-08-03 00:00:00.000	Delivered	
4	103	103	2024-08-04 00:00:00.000	Cancelled	
5	104	104	2024-08-05 00:00:00.000	Processing	
6	105	105	2024-08-06 00:00:00.000	Shipped	

	OrderItemID	OrderID	ProductID	Quantity	Price	
1	1	100	1	1	999.99	
2	2	101	2	2	39.98	
3	3	102	3	3	29.97	
4	4	103	4	1	49.99	
5	5	104	5	2	29.98	
6	6	105	6	1	29.99	

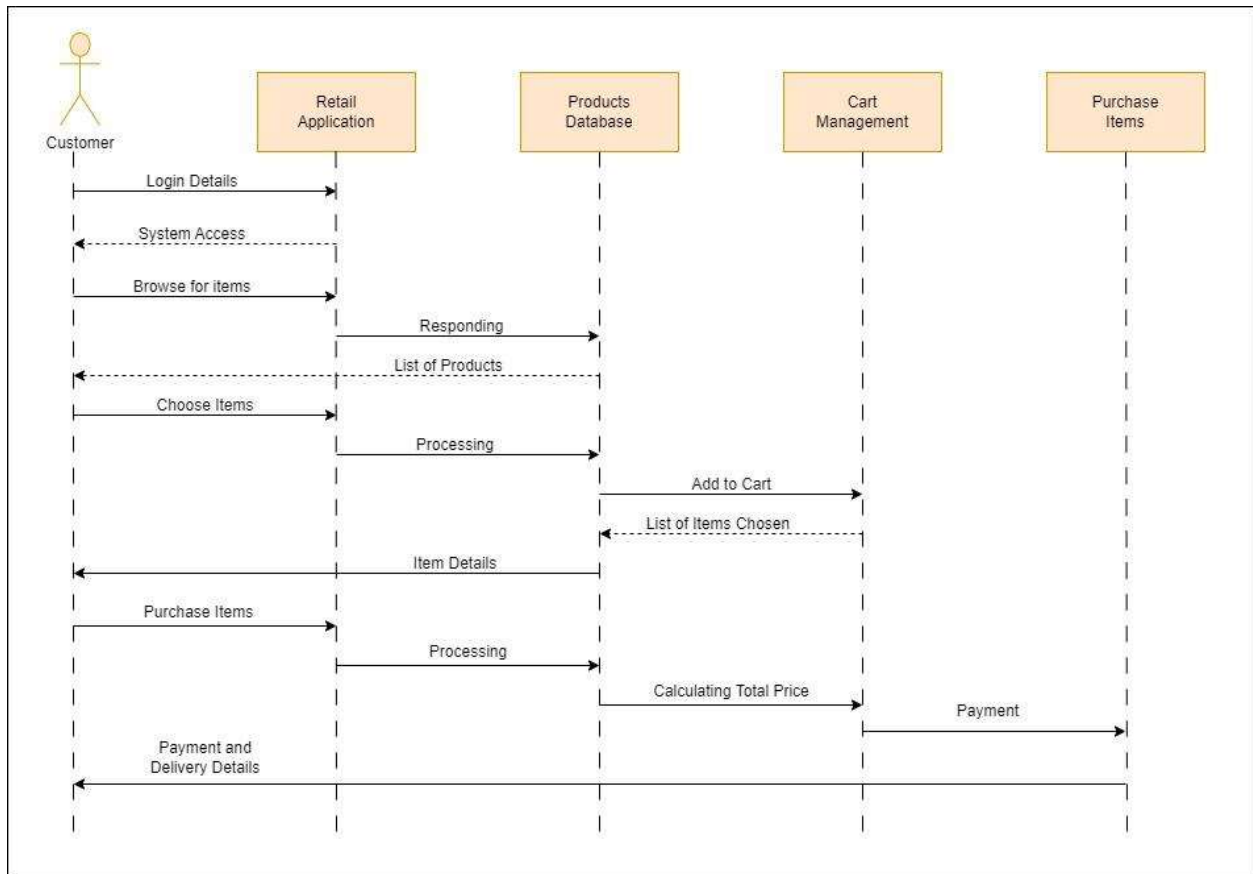
	PaymentID	OrderID	Amount	PaymentDate	PaymentMethod	
1	1	100	999.99	2024-08-01 00:00:00.000	Credit Card	
2	2	101	39.98	2024-08-02 00:00:00.000	PayPal	
3	3	102	29.97	2024-08-03 00:00:00.000	Debit Card	
4	4	103	49.99	2024-08-04 00:00:00.000	Credit Card	
5	5	104	29.98	2024-08-05 00:00:00.000	PayPal	
6	6	105	29.99	2024-08-06 00:00:00.000	Debit Card	

	ShipmentID	OrderID	ShipmentDate	TrackingNumber	
1	1	100	2024-08-02 00:00:00.000	TRACK123	
2	2	101	2024-08-03 00:00:00.000	TRACK124	
3	3	102	2024-08-04 00:00:00.000	TRACK125	
4	4	103	2024-08-05 00:00:00.000	TRACK126	
5	5	104	2024-08-06 00:00:00.000	TRACK127	
6	6	105	2024-08-07 00:00:00.000	TRACK128	

7. Use case diagram



8. Sequence diagram



9. Software Requirement

9.1 Visual Studio 2022

Visual studio 2022 Microsoft application is used for developing this web application.

9.2 Frontend Technologies Used

A)ReactJs

9.3 Backend Technologies

- a) Entity Framework
- b) C#
- c) WebAPICore

9.4 Database Used

Microsoft SQL Server Management Studio (SSMS)

10. Hardware Requirement

Intel(R) Core(TM) i7

64 bit Operating System

8.0 GB Ram