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TECHNOLOGY PROJECT NAME :

IBM-NJ-E-COMMERCE CART SYSTEM

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1.Problem Statement:

In today's digital marketplace, customers expect a seamless and efficient shopping experience. However, many e-commerce platforms face challenges in managing their shopping cart systems effectively. Common issues include difficulty in adding/removing products, inaccurate calculation of prices, lack of real-time inventory updates, poor handling of multiple payment options, and absence of features such as saving items for later or applying discount coupons.

These challenges lead to cart abandonment, customer dissatisfaction, and ultimately loss of sales revenue. Businesses need a robust cart management system that can handle multiple users simultaneously, ensure data consistency, provide secure transactions, and deliver a smooth checkout process.

The main problem is:

How can we design and implement a reliable, scalable, and user-friendly e-commerce cart system that improves the customer shopping experience while ensuring accurate order management and secure checkout?

2.Users and Stakeholders:

Users of the Cart System

1. Customers / End-users

- Browse products, add/remove items from the cart.
- Apply coupons, select quantities, and proceed to checkout.
- Expect secure payments and a smooth experience.

2. Guest Users

- Shoppers who don't create an account but still want to use the cart and checkout quickly.

3. Registered Users

- Can save carts, view order history, and manage wishlists.

4. Administrators

- Manage the overall platform, configure cart rules (e.g., discounts, offers), and ensure the system is functioning.

Stakeholders of the Cart System:

1. Business Owners / E-commerce Company

- Want higher conversion rates, reduced cart abandonment, and increased sales.

2. Vendors / Sellers

- Need accurate inventory updates when items are added/removed from carts.
- Expect timely order confirmations.

3. Payment Gateway Providers

- Ensure secure and reliable payment processing.

4. Delivery/Logistics Partners

- Depend on correct order and cart details for shipping.

5. Marketing & Sales Teams

- Use cart data for promotions, abandoned cart recovery campaigns, and personalized recommendations.

3.Users Stories:

Customer/User Stories:

Add to Cart

- As a customer, I want to add products to my cart, so that I can purchase multiple items at once.

View Cart

- As a customer, I want to view all items in my cart, so that I can review my selections before checkout.

Update Cart Quantity

- As a customer, I want to update the quantity of items in my cart, so that I can adjust my order easily.

Remove Items

- As a customer, I want to remove items from my cart, so that I don't purchase unwanted products.

Save Cart for Later

- As a customer, I want to save items in my cart for later, so that I can return and purchase them another time.

Apply Discounts/Coupons

- As a customer, I want to apply discount codes, so that I can save money on my purchase.

Checkout & Payment User Stories:

Save Payment Information

- As a returning customer, I want to securely save my payment details, so that I can checkout faster next time.

Order Confirmation

- As a customer, I want to receive an order confirmation email, so that I know my purchase was successful.

Admin/Business User Stories:

Manage Cart Rules

- As an admin, I want to set up cart rules (e.g., free shipping above \$50), so that I can encourage higher purchases.

Discount & Coupon Management

- As an admin, I want to create and manage coupons, so that I can run promotions effectively.

4.MVP Features

1. User Authentication (Login/Register)

Purpose: Allow customers to securely create an account and log in to use the cart system.

Register: Users provide details like name, email, password → stored securely (hashed password).

Login: Validates user credentials → returns a JWT token (JSON Web Token) for session management.

2. Product Listing with Details (Name, Price, Stock, Image)

Purpose: Display available products from the database.

Details shown:

Product name, Price (per unit), Stock (availability status), Product image (for UI)

Example: “Lenovo Laptop – ₹65,000 – Stock: 5” with an image and an Add to Cart button.

3. Add/Remove/Update Cart Items

Add: User selects a product → added to their cart (with quantity = 1 by default).

Update: User can increase/decrease item quantity.

Remove: User deletes an item completely from the cart.

4. Cart Summary (Items, Subtotal, Total Price)

Purpose: Display a clear summary of the cart.

Details shown:

List of selected items

Individual item quantity × price = item subtotal

Total price (sum of all subtotals)

5. Checkout Process (Address, Payment Simulation)

Steps:

User enters delivery address.

System validates stock availability again.

5. Wireframes / API Endpoint List

Wireframes:

- Home Page → Product list with "Add to Cart" button
- Cart Page → List of selected items, quantity input, total cost
- Checkout Page → Address + Payment form

Example REST API Endpoints:

- POST /api/auth/register → Create new user
- POST /api/auth/login → Authenticate user
- GET /api/products → Fetch product list
- POST /api/cart/add → Add item to cart
- PUT /api/cart/update/:itemId → Update item quantity
- DELETE /api/cart/remove/:itemId → Remove item from cart
- GET /api/cart → View current cart
- POST /api/order/checkout → Checkout and place order

6. Acceptance Criteria

1. Add Item to Cart

- User can add a product to the cart from the product listing or product details page.
- If the product already exists in the cart, its quantity is incremented.
- Success message is displayed after the item is added.

2. View Cart

User can view cart contents via the cart icon or "View Cart" page.

Cart shows:

- Product image, name, price, quantity, selected variant.
- Subtotal per item and total price.
- User can proceed to checkout from the cart.

3. Update Quantity

- User can change the quantity of each item in the cart.
- Cart total updates dynamically based on quantity.
- Quantity cannot exceed available stock or go below 1.

4. Remove Item from Cart

- User can remove an item from the cart.
- Cart total updates immediately after removal.

5. Accessibility

- All cart interactions are keyboard-navigable.
- Proper ARIA labels for screen readers are present.