

**Context:**

You are designing an online e-commerce platform where customers can browse products, make purchases, and manage their accounts. The system should handle product inventory, user accounts, payment processing, and order management. The platform also supports customer reviews and a recommendation system to suggest products based on customer purchase history.

**Business Rules:**

1. **Product Availability:** A product can only be purchased if it is in stock. If the product is out of stock, the system should notify the customer and prevent the purchase.
2. **User Registration:** A user must have an account to place an order or write a review. Guest users can browse the product catalog but must register before purchasing.
3. **Order Cancellation:** Customers can cancel an order, but only before the product has been shipped. After shipment, cancellations are not allowed.
4. **Payment Processing:** The system supports multiple payment methods, including credit card and PayPal. The payment must be confirmed before the order is processed.
5. **Recommendation System:** Based on the customer's previous purchases, the system recommends similar or related products.
6. **Review System:** Only users who have purchased a product can write a review for it.

**Actors:**

1. **Customer:** Can browse products, place orders, manage their account, and write reviews.
2. **Admin:** Manages the product inventory, views orders, and handles customer inquiries.
3. **Payment Gateway:** Handles payment transactions and confirms whether payments are successful.
4. **Shipping System:** Integrates with the platform to process shipments once an order is confirmed.

**Key Use Cases:**

1. **Browse Products:** Customers can browse products in different categories and search for specific items.
2. **Place Order:** Customers can add products to the shopping cart and proceed to checkout. The system checks product availability and processes the payment.
3. **Manage Account:** Customers can update their personal information, view past orders, and track order status.

4. **Cancel Order:** Customers can cancel an order before the shipping process begins. The system checks the shipment status before allowing the cancellation.
  5. **Write Review:** Customers who have purchased a product can leave a review. The system ensures that only verified customers can post reviews.
  6. **Product Recommendation:** The system recommends products based on the customer's previous purchase history and browsing behavior.
  7. **Manage Inventory:** Admins can add, remove, or update product details and manage stock levels.
  8. **Process Payment:** The payment gateway confirms the transaction and returns the payment status to the system.
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**Task:**

Draw a use case diagram based on the above scenario. Identify the actors and their interactions with the system.