# E-Commerce Database Schema and Relationships

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## 1. Database Relationships Overview

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| Entity 1 → Entity 2 | Relationship Type | Description |
| Users → Orders | One-to-Many | A user places multiple orders, but an order belongs to one user. |
| Users → Addresses | One-to-Many (Embedded) | A user has multiple addresses stored in their profile. |
| Users → Wishlist | One-to-One (Many-to-Many with Products) | A user has a single wishlist, containing multiple products. |
| Users → Cart | One-to-One (One-to-Many with Products) | A user has one cart containing multiple products. |
| Users → Reviews & Ratings | One-to-Many with Products | A user can review multiple products. |
| Users → Payments | One-to-Many | A user can make multiple payments. |
| Users → Coupons & Discounts | Many-to-Many | A user can apply multiple coupons, and a coupon can be used by multiple users. |
| Products → Sellers | Many-to-One | A seller lists multiple products, but a product has only one seller. |
| Products → Inventory | One-to-One | Each product has a unique inventory record. |
| Products → Reviews & Ratings | One-to-Many | A product has multiple reviews from different users. |
| Orders → Products | Many-to-Many (Embedded) | An order contains multiple products, and a product can be in multiple orders. |
| Orders → Payments | One-to-One | Each order has a single payment transaction. |
| Orders → Shipments | One-to-One | Each order has one shipment tracking record. |
| Orders → Coupons & Discounts | Many-to-Many | A user can apply different coupons to different orders. |
| Shipments → Orders | One-to-One | Each order has one shipment, and a shipment belongs to one order. |

## 2. Users Collection Schema

This collection stores details of consumers, sellers, and admins.

Example Schema:

{  
 "\_id": ObjectId("user123"),  
 "name": "John Doe",  
 "email": "john.doe@example.com",  
 "phone": "+919876543210",  
 "role": "Consumer",  
 "addresses": [  
 {  
 "type": "Home",  
 "street": "123 Street Name",  
 "city": "New York",  
 "state": "NY",  
 "zip": "10001",  
 "country": "USA",  
 "status": "default"  
 }  
 ],  
 "wishlist": ["wishlist1", "wishlist2"],  
 "cart": ["prod123", "prod789"],  
 "orders": ["order001", "order002"],  
 "createdAt": ISODate("2025-03-11T10:00:00Z"),  
 "updatedAt": ISODate("2025-03-11T10:00:00Z")  
}

## 3. Products Collection Schema

Example Schema:

{  
 "\_id": ObjectId("prod123"),  
 "name": "Samsung Galaxy S24 Ultra",  
 "description": "Latest Samsung flagship with a 200MP camera and AI-powered features.",  
 "category": "Smartphones",  
 "price": 129999,  
 "discount": {  
 "percentage": 10,  
 "finalPrice": 116999  
 },  
 "brand": "Samsung",  
 "sellerId": ObjectId("seller001"),  
 "inventory": {  
 "stock": 50,  
 "threshold": 5  
 },  
 "images": ["https://example.com/images/s24-front.jpg"],  
 "ratings": {  
 "average": 4.8,  
 "totalReviews": 1500  
 },  
 "specifications": {  
 "RAM": "12GB",  
 "Storage": "512GB",  
 "Processor": "Snapdragon 8 Gen 3",  
 "Battery": "5000mAh"  
 },  
 "createdAt": ISODate("2025-03-11T10:30:00Z"),  
 "updatedAt": ISODate("2025-03-11T10:30:00Z")  
}

## 4. Orders Collection Schema

Example Schema:

{  
 "\_id": ObjectId("order123"),  
 "userId": ObjectId("user001"),  
 "products": [  
 {  
 "productId": ObjectId("prod123"),  
 "quantity": 2,  
 "priceAtPurchase": 116999,  
 "totalPrice": 233998  
 }  
 ],  
 "totalAmount": 288997,  
 "paymentStatus": "Paid",  
 "orderStatus": "Shipped",  
 "shippingAddress": {  
 "fullName": "Rahul Sharma",  
 "city": "Bangalore",  
 "state": "Karnataka",  
 "pincode": "560001",  
 "contact": "+91 9876543210"  
 },  
 "trackingDetails": {  
 "carrier": "BlueDart",  
 "trackingId": "BD123456789",  
 "estimatedDelivery": ISODate("2025-03-15T12:00:00Z")  
 },  
 "createdAt": ISODate("2025-03-11T10:30:00Z")  
}