Cases Supporting Customer Design Decisions

The customer entity is central to Amazon’s EDA as it stores critical information about each user, such as contact details and identification. This data is crucial for personalized marketing, tracking user behaviors, and analyzing customer satisfaction.

The design decision of the following customer attributes (ID, Name, Email, Address, and Phone) were selected to support real-time insights into customer interactions and purchasing behaviors. This design enables Amazon to develop targeted marketing, quickly respond to customer support needs, and enable account and order recovery in case of security incidents.

Cases Supporting Order Design Decisions  
 The order entity represents transactions and are essential for tracking Amazon's revenue generation and operational flow. The entity’s design supports real-time order processing, customer order tracking, and inventory management.

The design decision of the following order attributes (ID, Date, Amount, and Status) capture necessary transaction details that allow Amazon to track order fulfillment in almost real-time, analyze purchasing trends which includes peak times and product demand, manage inventory by tracking the relationship between orders and items

Cases Supporting Review Design Decisions

The review entity represents customer reviews, which are critical for Amazon’s recommendation system and help other customers make informed purchasing decisions. Reviews also provide unstructured data, which, when integrated with structured data, enriches Amazon’s insights.

The design decision of the following review attributes (ID, Text, Rating, and Date) provides comprehensive details on customer feedback, enabling Amazon to sentiment analysis on products and services, assess product quality and vendor performance, automated flagging of negative feedback for further investigation, supporting data governance and quality.

Cases Supporting Vendor Design Decisions

The vendor entity represents the vendors that supply the products and services which Amazon sells, and having a well-defined Vendor entity supports supplier management, product sourcing, and supply chain analysis.

The design decision of the following vendor attributes (ID, Name, Contact) allows Amazon to assess vendor reliability and performance by tracking product returns and customer feedback, maintain a contact database to streamline communication with suppliers,

track vendor data for compliance and quality assurance purposes, supporting the data governance framework.

Cases Supporting Item Design Decisions

The item entity represents products available on Amazon. This entity is central to inventory management, customer purchase behavior analysis, and product recommendations.

The design decision of the following item attributes (ID, Name, Description, Price), is designed to facilitate seamless product tracking and categorization for easy searching and recommendations, allow integration with reviews and orders, supporting comprehensive analytics on product performance and customer satisfaction, aid in real-time stock updates and inventory tracking through relationships with stock and category entities.

Cases Supporting Category Design Decisions

The category entity represents the categories found on Amazon when browsing for specific items. Categories allow Amazon to group items, making it easier to organize the vast array of products available on the platform. Categorization also aids in improving the customer browsing experience and supports recommendations.

The design decision of the following category attributes (ID, Name) helps Amazon to implement effective product browsing and filtering options, conduct category-based sales analysis, identify high-demand product groups, streamline inventory management by enabling category-specific insights into demand and stock levels.

Cases Supporting Stock Design Decisions

The stock entity represents Amazon’s inventory levels and storage locations, essential for ensuring that products are available to fulfill customer orders in a timely manner.

The design decision of the following stock attributes (ID, Quantity, Location) to enable Amazon to monitor real-time inventory levels across locations, essential for fast delivery and minimizing stockouts, support warehouse optimization by analyzing item locations and storage capacity, facilitate replenishment alerts based on quantity thresholds, thereby enhancing operational efficiency.

Cases Supporting Payment Design Decisions

The payment entity is crucial in Amazon’s transactional process, capturing the financial aspect of each order. This entity supports tracking payment trends, preferred payment methods, and ensuring seamless transactions between customers and Amazon.

The design decision of the following payment attributes (ID, Amount, Date, and Method) provides necessary details to analyze customer payment behaviors, detect fraud by monitoring unusual patterns, and facilitate refunds and adjustments, ensuring a smooth and secure checkout experience for users.

Cases Supporting Shipment Design Decisions  
 The shipment entity represents the logistics details associated with delivering products to customers. It’s essential for tracking order fulfillment, managing logistics costs, and ensuring customer satisfaction with timely deliveries.  
 The design decision of the following shipment attributes (ID, DateShipped, TrackingNumber, and Carrier) enables Amazon to provide customers with real-time tracking information, optimize carrier selection for cost and efficiency, and analyze shipping durations for continuous improvement of logistics operations.

Cases Supporting Return Design Decisions  
 The return entity captures instances when products are sent back by customers, an important aspect of Amazon's customer satisfaction and quality assurance processes. Tracking returns helps Amazon assess product issues and vendor performance.  
 The design decision of the following return attributes (ID, Date, Reason, and Resolution) supports detailed insights into return reasons, facilitates a quick resolution process for customers, and allows Amazon to analyze trends in returns to improve product quality and vendor compliance.

Cases Supporting Refund Design Decisions  
 The refund entity records cases where customers receive financial compensation, typically related to returns or order issues. Refunds are critical for maintaining customer satisfaction and trust.  
 The design decision of the following refund attributes (ID, Amount, and Date) enables Amazon to track refund expenses, analyze common refund triggers to improve the customer experience, and integrate with returns and payments to ensure accurate financial records and accountability.

Cases Supporting ShoppingCart Design Decisions  
 The shopping cart entity holds information on items customers intend to purchase, supporting an intuitive and dynamic shopping experience. This entity is key for analyzing customer intent and improving sales conversions.  
 The design decision of the following shopping cart attributes (ID and CreatedDate) helps Amazon analyze the time customers spend considering purchases, abandoned cart trends, and supports targeted remarketing efforts, improving the shopping experience and potentially increasing conversion rates.

Cases Supporting Wishlist Design Decisions  
 The wishlist entity represents items customers save for potential future purchases. It plays a role in enhancing customer engagement and insights into customer preferences.  
 The design decision of the following wishlist attributes (ID and CreatedDate) supports tracking customer preferences over time, allowing for personalized recommendations, and helping Amazon identify trending products, which can inform stock and promotion strategies.

Cases Supporting Subscription Design Decisions  
 The subscription entity tracks subscription details for customers who enroll in programs such as Amazon Prime. It is essential for analyzing subscription-based revenue and loyalty.  
 The design decision of the following subscription attributes (ID, Type, StartDate, and EndDate) supports tracking subscription lifecycle stages, enabling renewal reminders, and enhancing customer retention by understanding subscription trends, aiding in targeted marketing for subscription upgrades.

Cases Supporting Warehouse Design Decisions  
 The warehouse entity represents the physical locations where Amazon stores inventory. It’s a key component in the supply chain and impacts shipping efficiency and costs.  
 The design decision of the following warehouse attributes (ID, Location, and Capacity) facilitates tracking storage capacity and optimizing inventory allocation across locations, enabling Amazon to minimize delivery times and shipping costs, and supports warehouse management by analyzing capacity and stock levels.

Cases Supporting Promotion Design Decisions  
 The promotion entity tracks promotional offers available to customers, which play a vital role in marketing and driving sales. Promotions encourage purchases and attract new customers to Amazon.  
 The design decision of the following promotion attributes (ID, Name, Discount, StartDate, and EndDate) helps Amazon monitor promotion effectiveness, track customer response to discounts, and optimize promotional timing and duration, supporting sales growth and customer acquisition strategies.

Multiplicity

1. Customer
   1. Places: each customer can place multiple orders, but each order is placed by 1 customer   
      Multiplicity: Customer (1) — (0..\*) Order
   2. Writes: each customer can write multiple reviews, but each review is written by 1 customer.  
      Multiplicity: Customer (1) — (0..\*) Review
2. Order
   1. Includes: each order can include multiple items, and each item can be included in multiple orders.  
      Multiplicity: Order (0..*)* — (0..) Item
3. Review
   1. About: each review is about 1 item, but each item can have multiple reviews.  
      Multiplicity: Review (1) — (0..\*) Item
4. Vendor
   1. Supplies: each vendor can supply multiple items, and each item can be supplied by multiple vendors.  
      Multiplicity: Vendor (0..) — (0..) Item
5. Item
   1. BelongsTo: each item belongs to one category, but each category can have multiple items.  
      Multiplicity: Item (1) — (0..\*) Category
   2. StoredIn: each item can be stored in multiple stock locations, and each stock location can store multiple items.  
      Multiplicity: Item (0..) — (0..) Stock
6. Category
   1. Contains: each category can contain multiple items, but each item belongs to one category.  
      Multiplicity: Category (1) — (0..\*) Item
7. Stock
   1. Contains: each stock location can store multiple items, and each item can be stored in multiple stock locations.  
      Multiplicity: Stock (0..) — (0..) Item
8. Payment
   1. HasPayment: Each order can have multiple payments (for cases like partial payments), but each payment is associated with only one order.
   2. Multiplicity: Order (1) — (0..\*) Payment
9. Shipment
   1. ShippedVia: Each order can have multiple shipments (e.g., if items are shipped separately), and each shipment is related to only one order.

Multiplicity: Order (1) — (0..\*) Shipment

1. Return
   1. HasReturn: Each order can have multiple returns (for different items in the same order), but each return is associated with only one order.

Multiplicity: Order (1) — (0..\*) Return

1. Refund
   1. ResultIn: Each return may result in one or more refunds, but each refund is associated with only one return.

Multiplicity: Return (1) — (0..\*) Refund

1. ShoppingCart
   1. CartContains: Each shopping cart can contain multiple items, and each item can appear in multiple shopping carts.

Multiplicity: ShoppingCart (0..) — (0..) Item

1. Wishlist
   1. WishlistContains: Each wishlist can contain multiple items, but each item can appear in multiple wishlists.

Multiplicity: Wishlist (0..) — (0..) Item

1. Subscription
   1. HasSubscription: Each customer can have multiple subscriptions (e.g., different types or renewal subscriptions), but each subscription is associated with only one customer.

Multiplicity: Customer (1) — (0..\*) Subscription

1. Recommendations
   1. Recommends: Each recommendation can be generated for multiple customers, and each customer can receive multiple recommendations.  
      Multiplicity: Recommendation (0..) — (0..) Customer
   2. Suggests: Each recommendation can suggest multiple items, and each item can be suggested in multiple recommendations.  
      Multiplicity: Recommendation (0..) — (0..) Item
2. Warehouse
   1. LocatedAt: Each stock location is associated with one warehouse, and each warehouse can contain multiple stock locations.

Multiplicity: Stock (1) — (0..\*) Warehouse

1. Promotion
   1. *PartOf*: Each promotion can apply to multiple items, and each item can be part of multiple promotions.  
      *Multiplicity*: Promotion (0..*) — (0..*) Item

Referenced Datasets

"Amazon Sales Dataset EDA." Kaggle.com, www.kaggle.com/code/mehakiftikhar/amazon-sales-

dataset-eda.

Lokesh Parab. "Amazon Products Sales Dataset 2023." Kaggle.com, 2023, www.kaggle.com/ datasets/lokeshparab/amazon-products-dataset?select=All+ Appliances.csv. Accessed 1

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