**PRODUCT DISSECTION FOR AMAZON E-COMMERCE**

#### [Product Dissection Amazon](https://drive.google.com/drive/folders/1NZN_AEv7jOmjeRqBDWpuUTRpIux1xyrs?usp=drive_link)

#### **1. Introduction**

Amazon, the global e-commerce leader, has revolutionised online shopping by providing a seamless platform for users to buy, review, and receive products. This project delves into Amazon’s schema design, exploring how its data structure supports key features like personalised recommendations, Prime delivery, and customer reviews, solving real-world problems such as product uncertainty, content overload, and convenience.

#### **2. Platform Overview**

Amazon was founded in 1994 by Jeff Bezos as an online bookstore. Over the years, it expanded into various domains, offering everything from electronics to groceries. Amazon's key strengths lie in its recommendation algorithms, user-friendly interface, and extensive logistics network, allowing for fast and reliable deliveries.

**Core Features:**

* Product Search and Filtering: Users can filter based on price, category, and customer reviews.
* Personalised Recommendations: Data-driven suggestions based on user interactions.
* Prime Delivery: Subscribers get faster shipping and additional benefits.
* Customer Reviews and Ratings: Ensures users can make informed purchase decisions.

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#### **3. Real-World Problems and Amazon's Solutions**

1. Problem: *Shopping Convenience and Time Efficiency*Solution: Amazon’s easy-to-navigate interface, coupled with powerful search tools and personalised recommendations, reduces the time users spend searching for products.
2. Problem: *Product Uncertainty*Solution: The review system allows customers to provide feedback on products they’ve purchased, helping future buyers make more informed choices.
3. Problem: *Delivery Delays*Solution: Amazon Prime provides fast, reliable shipping to millions of users, addressing concerns over delayed deliveries.

#### **4. Case Study: Real-World Application**

During the COVID-19 pandemic, Amazon's reliable logistics network provided essential products when traditional retail struggled due to lockdowns. By offering fast delivery through Prime, users could access food, medical supplies, and other essentials without leaving their homes, reducing risks during the pandemic.

The Recommendation Engine is another crucial feature, using machine learning algorithms to suggest products based on past purchases and browsing habits. This tackles the problem of overwhelming product choices, guiding users toward relevant products.

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#### **5. Schema Design**

The design consists of seven critical tables that support core functionalities such as managing users, processing orders, handling payments, and maintaining shipment records.

##### 1. Users Table

Captures essential information about each registered user.

* Attributes: UserID (PK), Name, Email, Password, Address, Prime\_Status, Registration\_Date

##### 2. Products Table

Stores information about products available for sale.

* Attributes: ProductID (PK), Name, Description, Price, Category, Stock, SellerID (FK)

##### 3. Cart Table

Manages users' temporary selections before final purchase.

* Attributes: CartID (PK), UserID (FK), ProductID (FK), Quantity

##### 4. Orders Table

Tracks purchases made by users.

* Attributes: OrderID (PK), UserID (FK), Total\_Amount, Order\_Date, Status

##### 5. Payments Table

Handles payment information related to orders.

* Attributes: PaymentID (PK), OrderID (FK), Payment\_Method, Payment\_Date, Amount

##### 6. Shipments Table

Manages shipment details for each order.

* Attributes: ShipmentID (PK), OrderID (FK), Shipment\_Date, Delivery\_Status, Shipping\_Address

##### 7. Reviews Table

Contains feedback provided by users on purchased products.

* Attributes: ReviewID (PK), UserID (FK), ProductID (FK), Rating, Comment, Review\_Date

#### **6. Rationale Behind the Schema**

The schema is designed to focus on the interactions between users and products, from the point of selection in the Cart to final delivery via Shipments. By leveraging the relationships between tables like Users, Products, and Orders, the schema efficiently supports Amazon’s business logic, ensuring that customers can browse, purchase, and review products effortlessly.

* Users can add products to their Cart.
* Orders are generated once a cart is checked out.
* Payments and Shipments are associated with the Orders table.
* Reviews provide feedback on products, informing other users.

#### **7. ER Diagram**

The Entity-Relationship Diagram (ERD) visualises the schema's structure, highlighting how the seven tables interact with each other to support the platform's functionality.

### **8. Relationships Between Tables**

1. Users ↔ Cart:
   * Relationship: One-to-many. Each user can have multiple carts with different products before placing an order.
   * Link: UserID (FK in Cart) connects users to their respective shopping carts.
2. Users ↔ Orders:
   * Relationship: One-to-many. A user can place multiple orders.
   * Link: UserID (FK in Orders) connects users with their respective orders.
3. Users ↔ Reviews:
   * Relationship: One-to-many. A user can leave multiple reviews on different products.
   * Link: UserID (FK in Reviews) connects users to their product reviews.
4. Cart ↔ Products:
   * Relationship: Many-to-many. A cart can contain multiple products, and a product can appear in many different carts.
   * Link: ProductID (FK in Cart) connects specific products to each cart.
5. Orders ↔ Cart:
   * Relationship: One-to-one. Each cart becomes a single order when checked out.
   * Link: The Cart is used to generate the Order, but this isn't typically a direct relational table link.
6. Orders ↔ Payments:
   * Relationship: One-to-one. Each order has exactly one payment transaction.
   * Link: OrderID (FK in Payments) links orders to their respective payment records.
7. Orders ↔ Shipments:
   * Relationship: One-to-one. Each order generates one shipment, although multiple items can be shipped together.
   * Link: OrderID (FK in Shipments) connects the order to its shipment details.
8. Products ↔ Reviews:
   * Relationship: One-to-many. Each product can have multiple reviews from different users.
   * Link: ProductID (FK in Reviews) connects products to their respective reviews.
9. Products ↔ Orders:
   * Relationship: Many-to-many. Multiple products can be part of one order, and the same product can be included in many orders.
   * Link: Managed through the Cart, where products are added and later transformed into an order.
10. Shipments ↔ Users:
    * Relationship: Many-to-one. A user can have multiple shipments from different orders, but each shipment corresponds to one user.
    * Link: Shipment is ultimately tied to the user's order details via UserID.

In this schema, Users play a central role as most interactions, such as ordering, reviewing, and cart management, are directly tied to user activity. Products are also critical as they intersect with multiple entities like reviews, orders, and carts, making them the core of e-commerce functionality.

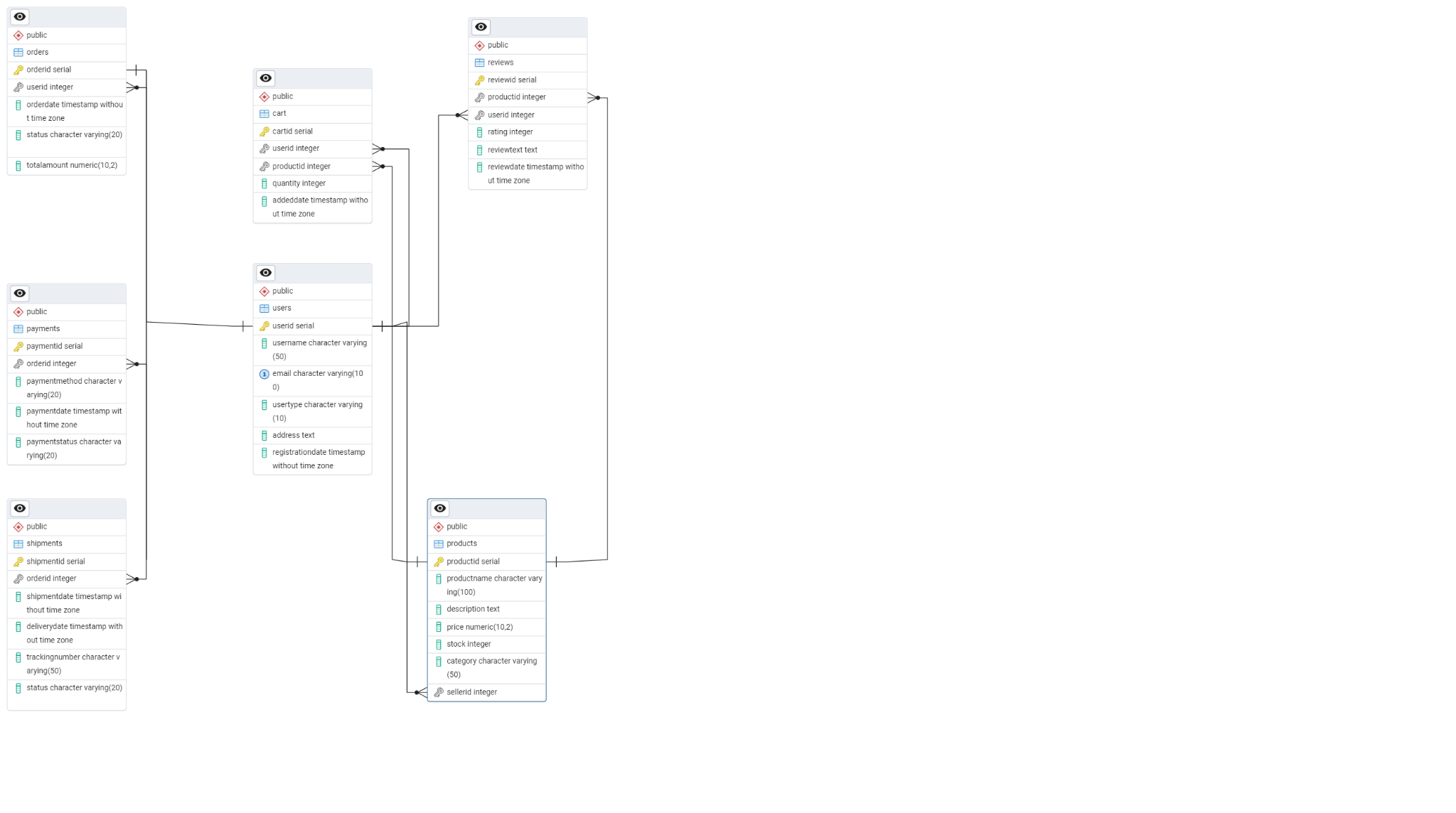
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#### **8. Conclusion**

The schema design for Amazon encapsulates the company’s commitment to providing a seamless shopping experience. By linking key entities such as users, products, and reviews, the design supports personalised recommendations, enhances product discovery, and fosters informed purchasing decisions. This data-driven architecture is fundamental to Amazon’s success, ensuring user satisfaction and driving its growth as a global e-commerce platform.

### **9. Appendix: ER Diagram**

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