E-commerce Entity Relationship Diagram (ERD)

Entities and Attributes

Customer

Field	Type	Key/Constraint	Description
id	UUID	PK	Unique identifier for each customer
email	String	Unique	Customer email address
password	String		Hashed password
is_active	Boolean		Account status
created_at	Timestamp		Account creation date

Customer_Profile

Field	Type	Key/Constraint	Description
id	UUID	PK	Unique identifier for profile
customer_id	UUID	FK → Customer.id, Unique	Associated customer
first_name	String		Customer first name
last_name	String		Customer last name
phone	String		Phone number
avatar	String		Profile image URL
role	String		User role (e.g., admin, buyer)

Address

Field	Type	Key/Constraint	Description
id	UUID	PK	Unique identifier for address
customer_id	UUID	FK → Customer.id	Associated customer
type	Enum(shipping, billing)		Address type
country	String		Country name
city	String		City name
street	String		Street address
postal_code	String		Postal code
is_default	Boolean		Indicates default address

Category

Field	Type	Key/Constraint	Description
category_id	UUID	PK	Unique identifier for category
name	String		Category name
description	Text		Category description
parent_id	UUID	FK → Category.category_id (nullable)	Parent category reference

Product

Field	Type	Key/Constraint	Description
product_id	UUID	PK	Unique identifier for product
category_id	UUID	FK → Category.category_id	Associated category
name	String		Product name
slug	String	Unique	SEO-friendly identifier
description	Text		Product description
price	Decimal		Product price
currency	String		Currency code
is_active	Boolean		Product availability
created_at	Timestamp		Creation date

Inventory

Field	Type	Key/Constraint	Description
id	UUID	PK	Unique identifier for inventory record
product_id	UUID	FK → Product.product_id, Unique	Associated product
quantity	Integer		Available stock
reserved_quantity	Integer		Reserved stock
updated_at	Timestamp		Last update timestamp

Order

Field	Type	Key/Constraint	Description
order_id	UUID	PK	Unique identifier for order
customer_id	UUID	FK → Customer.id	Customer who placed the order
shipping_address_id	UUID	FK → Address.id	Shipping address
order_date	Timestamp		Date of order placement
status	String		Order status (e.g., pending, shipped, delivered)
total_price	Decimal		Total order amount
currency	String		Currency code

Order_Item

Field	Type	Key/Constraint	Description
order_item_id	UUID	PK	Unique identifier for order item
order_id	UUID	FK → Order.order_id	Associated order
product_id	UUID	FK → Product.product_id	Purchased product
quantity	Integer		Quantity ordered
unit_price_at_purchase	Decimal		Price per unit at purchase time
subtotal	Decimal		Subtotal for this item

Payment

Field	Type	Key/Constraint	Description
payment_id	UUID	PK	Unique identifier for payment
order_id	UUID	FK → Order.order_id, Unique	Associated order
provider	String		Payment provider (e.g., Stripe, PayPal)
amount	Decimal		Payment amount
currency	String		Currency code
status	String		Payment status (e.g., completed, failed)
transaction_reference	String		External transaction reference
payment_date	Timestamp		Date of payment

Review

Field	Type	Key/Constraint	Description
review_id	UUID	PK	Unique identifier for review
product_id	UUID	FK → Product.product_id	Reviewed product
customer_id	UUID	FK → Customer.id	Reviewer
rating	Integer		Rating score (e.g., 1–5)
comment	Text		Review text
review_date	Timestamp		Date of review submission

Relationships

Relationship	Type	Description
Customer → Customer_Profile	1–1	Each customer has one profile
Customer → Address	1–N	A customer can have multiple addresses
Customer → Order	1–N	A customer can place multiple orders
Order → Order_Item	1–N	Each order can contain multiple items
Product → Order_Item	1–N	A product can appear in multiple order items
Product → Inventory	1–1	Each product has one inventory record
Category → Product	1–N	A category can contain multiple products
Category → Category (self-reference)	1–N	A category can have subcategories
Customer → Review	1–N	A customer can write multiple reviews
Product → Review	1–N	A product can have multiple reviews
Order → Payment	1–1	Each order has one payment record

ERD Structure (Textual Representation)

Customer (1) ——— (1) Customer_Profile
Customer (1) ———< (N) Address
Customer (1) ———< (N) Order ——— (1) Payment
Order (1) ———< (N) Order_Item >——— (1) Product ——— (1) Inventory
Product (N) >——— (1) Category ———< (N) Category (self)
Customer (1) ———< (N) Review >——— (1) Product

This ERD defines a comprehensive relational structure for an e-commerce system, ensuring data integrity, scalability, and clear entity relationships across customers, products, orders, and payments.

E-commerce ERD

Detailed entity relationship diagram

This document details the Entity Relationship Diagram (ERD) for an e-commerce platform. The ERD outlines the core entities, their attributes, and the relationships between them. Understanding this structure is crucial for database design and application development.

Key Entities:

- Customer
- Customer Profile
- Address
- Category
- Product
- Inventory
- Order
- Order Item
- Payment

Entities and Attributes

Customer

- id (UUID, PK)
- email (unique)
- password
- is_active
- created_at

Customer_Profile

- id (UUID, PK)
- customer_id (FK, unique)
- first_name
- last_name
- phone
- avatar
- role

Address

- id (UUID, PK)
- customer_id (FK)
- type (shipping, billing)
- country
- city
- street
- postal_code
- is_default

Category

- category_id (PK)
- name
- description
- parent_id (FK to Category, nullable)

Product

- product_id (PK)
- category_id (FK)
- name
- slug (unique)
- description
- price
- currency
- is_active
- created_at

Inventory

- id (PK)
- product_id (FK, unique)
- quantity
- reserved_quantity
- updated_at

Order

- order_id (PK)
- customer_id (FK)
- shipping_address_id (FK)
- order_date
- status
- total_price
- currency

Order_Item

- order_item_id (PK)
- order_id (FK)
- product_id (FK)
- quantity
- unit_price_at_purchase
- subtotal

Payment

- payment_id (PK)
- order_id (FK)
- provider
- amount
- currency

Relationships

The following relationships exist between the entities:

- **Customer** 1:1 **Customer_Profile**: A customer has one profile.
- **Customer** 1:N **Address**: A customer can have multiple addresses (shipping and billing).
- **Category** 1:N **Product**: A category can contain many products.
- **Category** 1:N **Category**: Categories can have child categories.
- **Product** 1:1 **Inventory**: Each product has one corresponding inventory record.
- **Customer** 1:N **Order**: A customer can place multiple orders.
- **Order** 1:N **Order_Item**: An order can contain multiple order items.
- **Product** 1:N **Order_Item**: A product can be part of multiple order items across different orders.
- **Order** 1:N **Payment**: An order can have multiple payments (although typically it's one).

Summary

This document presented a comprehensive ERD for an e-commerce platform, detailing the entities, their attributes, and the relationships between them. This model serves as a blueprint for database

design and application development, ensuring data integrity and efficient data management.