ER Diagram for E-Commerce Website

E-Commerce Website allows easy management of **products**, **orders**, **users**, **addresses**, **payments**, **tracking** information as well as **cart management**. **Products** are categorized in a user-friendly manner, as well as users can register and create multiple addresses in one account. **Orders** are placed by users.

Payment methods are diversified which is aimed at enhancing **security** and **flexibility** in **transactions**. **Tracking details** allow users to access their Order status from processing through to delivery. The **shopping cart** management system enables users to add, and check out products thereby helping with a smooth shopping process.

Entities and Attributes for the E-commerce Website

Entities and Attributes are defined below:

1. Product:

- **P-ID(Primary Key):** Unique identifier for each product.
- **Name:** Name of the product.
- **Price:** Price of the product.
- **Description:** Description of the product.

2. Pro-category:

- **Category – ID(Primary Key):** Unique identifier for each category.
- **Name:** Name of the category.

3. Order:

- **Order – No(Primary Key):** Unique identifier for each order.
- **Order – Amount:**
- **Order – Date:**

4. User:

- **User – ID(Primary Key):** Unique identifier for each user or customer.
- **Name:** Name of the user.
- **Email:** Email of the user.

5. Address:

- **Address – ID(Primary Key):** Unique identifier for each address
- **Country:** Country of the user.
- **State:** State of the user.
- **City:** City of the user.
- **Pin – code:** Pin code of the user.

6. Payment:

- **Payment – ID(Primary Key):** Unique identifier for each payment.

- **Method:** Payment method like UPI or Credit Card etc.
- **Amount:** Total amount paid by user.

7. Tracking Detail:

- **Tracking – ID(Primary Key):** Unique identifier for each tracking detail.
- **Status:** Tracking status like on the way or delivered etc.
- **Order – No(Foreign Key):** Reference to the order which need to be tracked.

8. Cart:

- **Cart – ID(Primary Key):** Unique identifier for each cart.
- **User – ID(Foreign Key):** Reference to the user.

Relationships Between These Entities

1. Product – Prod-Category Relationship:

- One product can belong to only one category.
- One category can have multiple products.
- So this is a **Many-to-one** relationship, showing that many products can belong to a single category.

2. Order-User Relationship:

- One user can place multiple orders.
- Each order is placed by exactly one user.
- This is a **one-to-many** relationship, showing that a user can place multiple orders, but each order is placed by exactly one user.

3. User-Address Relationship:

- One user can have multiple addresses.
- Each address belongs to exactly one user.
- This is a **one-to-many** relationship, indicating that a user can have multiple addresses associated with their account.

4. Tracking Detail – Order Relationship:

- One order can have multiple tracking details.
- Each tracking detail corresponds to exactly one order.
- This is **Many-to-one** relationships showing that an order can have one or multiple associated tracking details.

5. Product – Cart Relationship:

- One product can be added to multiple carts.
- Each cart can contain multiple products.
- This is **many-to-many** relationship.

6. User-Payment Relationship:

- One user can make multiple payments.
- Each payment is made by exactly one user.
- This is **one-to-many** relationship because each user can make multiple payments, and each payment is made by a single user.

7. Order-Product Relationship:

- One order can contains multiple products.
- Many products are get ordered in each order.
- So this is **one-to-many** relationship we can order multiple products on each order.

Representation of ER Diagram

Below is the ER diagram of large scale E-commerce platforms which meets all our requirements: