QuickCart : An Online Retail Store

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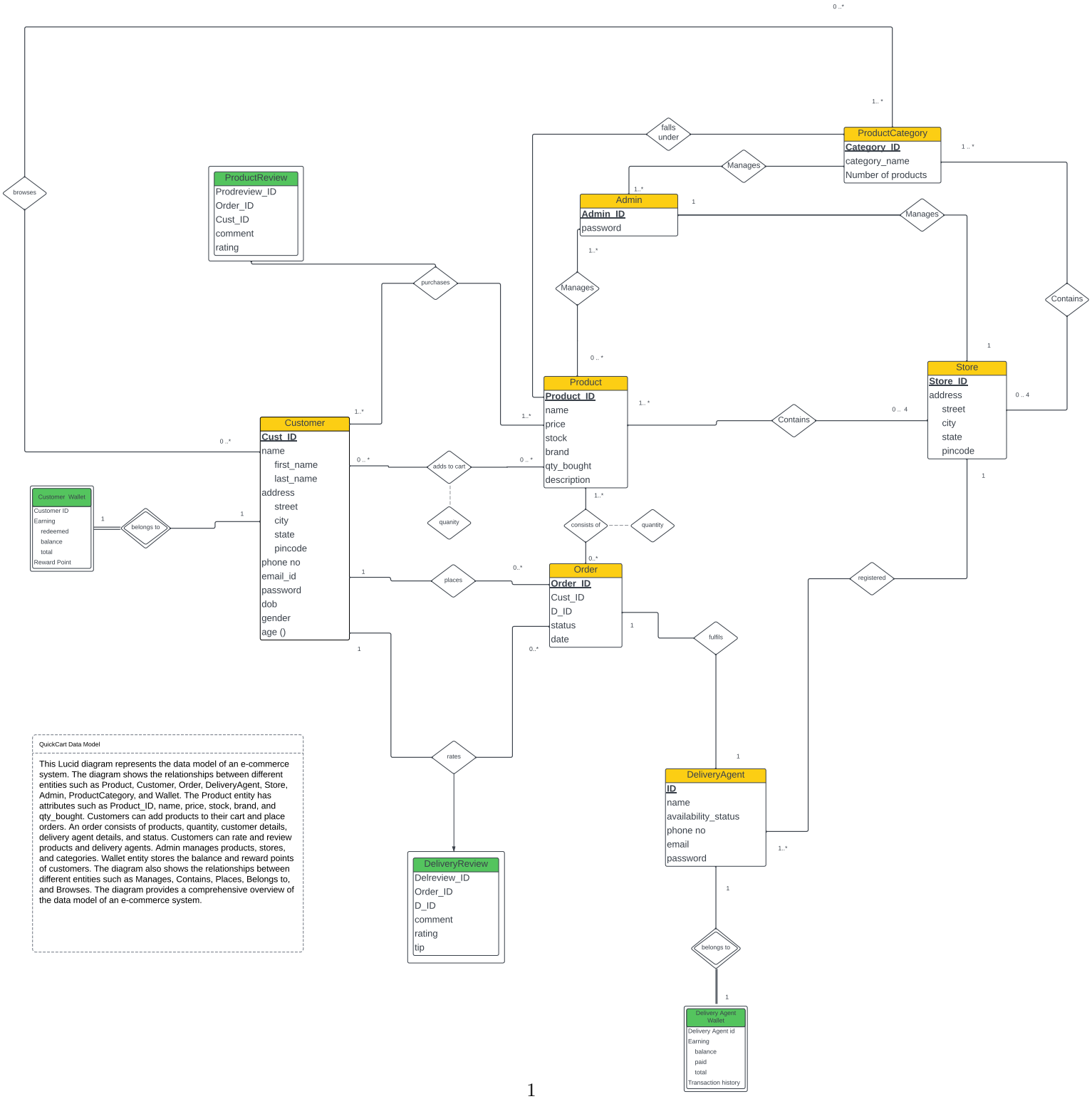
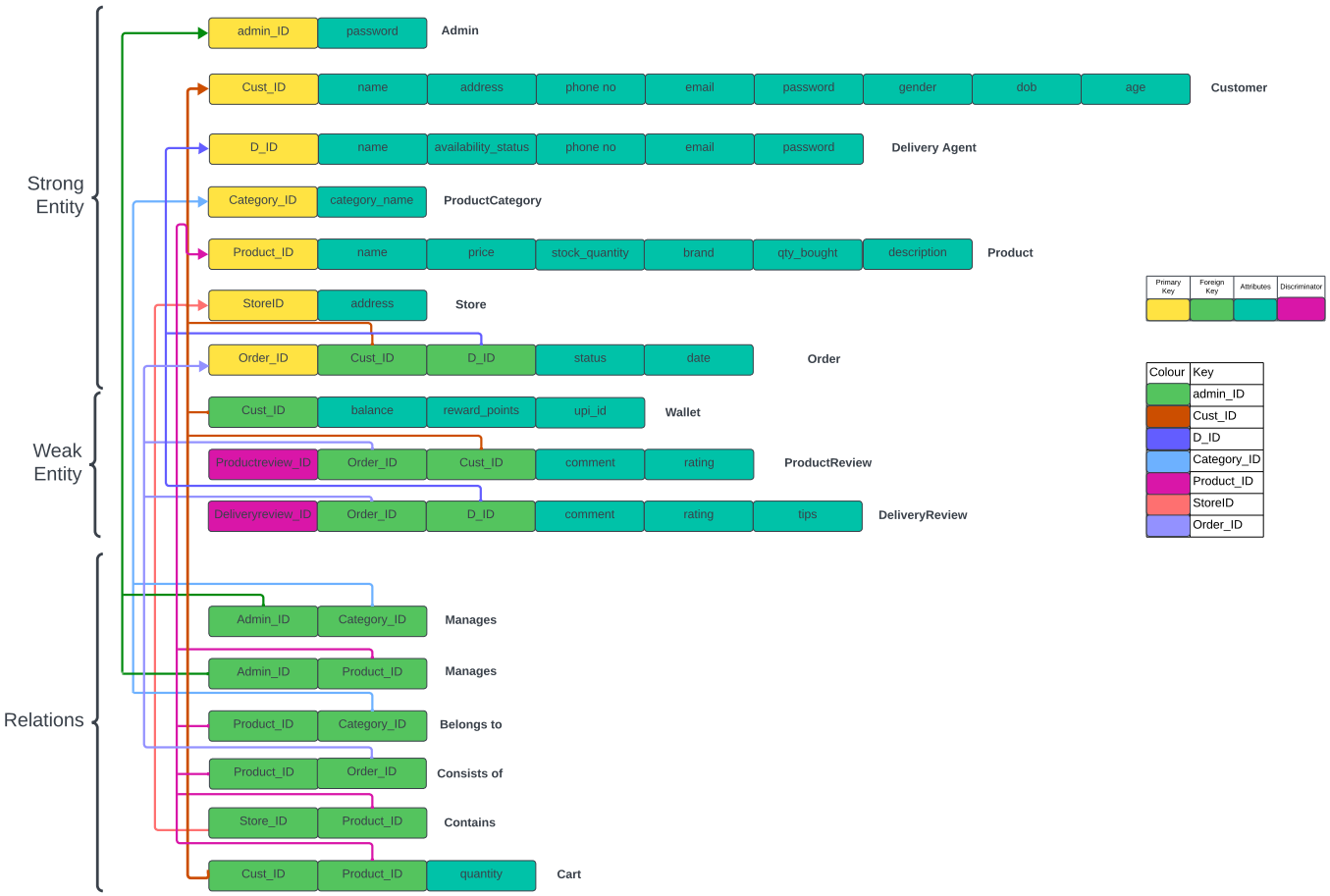
1 Entity-Relational Model



2 Relational Model



Link to the Models: Lucid Platform

3 Entity set and their attributes

3.1 Strong Entity

- **Admin** (restricted to 4) - Represents administrative managers, one for each store, responsible for inventory management.
  Attributes – `Admin_ID`, `password`.
- **Customer** - Represents individuals who use the QuickCart platform for online shopping.
  Attributes – `Cust_ID`, `name` (`first_name`, `last_name`), `address` (`street`, `city`, `state`, `pin`), `phone no`, `email`, `password`, `gender`, `age`
- **Delivery Agent** - Represents individuals partnering with QuickCart for delivery services.
  Attributes – `D_ID`, `name`, `availability_status`, `phone no`, `email`, `password`
- **Product Category** - Represents categories in which products are classified for easy navigation.
  Attributes – `Category_ID`, `category_name`, `no_of_products`
- **Product** - Represents individual product listings available for purchase.
  Attributes – `Product_ID`, `name`, `price`, `stock`, `brand`, `qty_bought`, `description`

- **Store** (restricted to 4) - The store entity represents individual stores that supply products available on the QuickCart platform.
  Attributes – `Store_ID`, `address` (`street`, `city`, `state`, `pin`)

- **Order** - Represents individual order placed by customers.
  Attributes – `Order_ID`, `Cust_ID` (foreign key), `D_ID` (foreign key), `status`, `date`)

3.2 Weak Entity

- **Wallet** - Represents the virtual wallet associated with each customer for an easier and faster payment experience.
  Attributes – (`Cust_ID`, `balance`, `reward_points`, `upi_id`)
  Reason for weak entity - The `Wallet` entity doesn't have a unique identifier (primary key) of its own. It relies on the association with the `Customer` entity for identification, and it wouldn't exist without a corresponding customer.

- **Product_review** - Represents feedback provided by customers for products, including ratings and comments.
  Attributes – (`productreview_ID`, `Order_ID`, `cust_ID`, `comment`, `rating`)
  Reason for weak entity - The `Product_Review` entity doesn't have an independent primary key. Its existence is tied to both the `Customer` and `Product` entities, as it represents a review given by a customer for a specific product. It is uniquely identified only within the context of a particular customer and product combination.

- **Delivery_review** - Represents reviews and ratings provided by customers for the delivery service.
  Attributes – (`deliveryreview_ID`, `Order_ID`, `D_ID`, `comment`, `rating`, `tip`)
  Reason for weak entity - The `Delivery_Review` entity relies on both the `Customer` and `DeliveryPartner` entities for identification. It represents a review given by a customer for a specific delivery service. A `Delivery_Review` is uniquely identified only within the context of a particular customer and delivery partner combination. It doesn't have an independent identity.

4 Entity Relationship Roles and Constraints

- ***Manages:*** Admin *manages* product, product categories, and store.
- ***Contains:*** A store can *contain* multiple products and a product can belong to multiple stores.
- ***Adds to Cart:*** Cart represents the relationship between customer and product. A customer can add multiple products to the cart and A particular product can be bought by multiple customers.
- ***places:*** A customer can *place* multiple orders and An order belongs to a particular customer.
- ***Belongs to :*** A product *belongs to* a particular product category and a product category can contain multiple products.
- ***fulfils:*** An Order is *fulfilled* by a Delivery Agent and a delivery agent can fulfil only 1 order at a time
- ***consists of:*** An order *consists of* multiple products and a product may belong to multiple products which may belong to various customers.
- ***Belongs to:*** A delivery agent Wallet *belongs to* a particular delivery agent.
- ***Belongs to:*** A Wallet *belongs to* a particular customer.
- ***Rates:*** A customer *rates* an order.
- ***purchases:*** A customer can *purchase* multiple products and a product review is associated with it.
- ***Contains:*** A store can *contain* multiple products and product categories and correspondingly different product categories and products may belong to multiple stores.

5 Relationships

5.1 Ternary Relationships

5.1.1 Customer - Order - Delivery Review

The above 3 entities are associated together using a relation rate in which a customer rates an order i.e. a delivery review is associated with it. The ternary relationship between the 3 can be broken down into binary relationships listed below.

- **Customer - Order (One-Many)**: A customer can place many orders but an oder is associated with only one customer.
- **Customer - Delivery Review (One-Many)**: A customer can give multiple delivery review (for each order they place) but an Delivery Review is associated with only one customer.
- **Order - Delivery Review (One-One)**: A delivery review is given once per order, An order only has one delivery review associated with it.

5.1.2 Customer - Product - Product Review

The above 3 entities are associated together using a relation purchase in which a customer purchases a product and a product review is associated with it. The ternary relationship between the 3 can be broken down into binary relationships listed below.

- - **Customer - Product (Many - Many)** : A customer can add multiple products to cart, A product can be present in multiple user's cart.
- - **Product - Product Review (One - Many)** : A product has multiple product reviews, But a product review has only one product associated with it.
- - **Customer - Product Review (One - Many)** : A customer gives multiple product reviews (for each different product purchased), But product review has only one customer associated with it.

5.2 Many to Many Relationship

- Product and Store
- Product and Order
- Product and Admin
- Admin and Product Category
- Customer and Product
- Product Category and Store

5.3 One to Many/Many to One Relationship

- Customer and Order
- Customer and Product Review
- Product and Product Category

5.4 One to One Relationship

- Customer and Wallet
- Customer and Delivery Review
- Admin and Store
- Delivery Agent and Wallet
- Order and Delivery Agent

6 Contribution

With discussions and meets we together made up the ER Model and Relational Model for this deadline.