CSE 305 ER Diagram Document
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Item

An item is an entity which represents any particular item that can be sold on the e-commerce website. So, an item can be a book, a laptop, clothing, etc. Each item has the following attributes: picture, product description, type (like if the item is an electronic, clothing, book, etc. Similar to category), product name, price, seller, the quantity left for the item (determines if the item is in stock or out of stock), and the item ID. The item ID is the key attribute because each item will have its own unique item ID. Item has a relationship with Shopping Cart, Review, and Admin. The shopping cart has a 1:1 relationship with Item because one shopping cart instance for a customer (out of many) will be particular to one item. For Review, an item can have 0 or many reviews for that item. Therefore, it's a one-to-many relationship.

User

User is an entity that represents any user that utilizes the platform. This means it is a supertype for more specific types of users such as customers, vendors, and admins. User is made into a supertype because a lot of the attributes customers, vendors, and admins share can be similar. These attributes are: the user ID, type of account (customer, vendor, admin), first name, last name, e-mail, the date they joined, phone number, password (must be encrypted), and address. Address is a composite attribute, so it consists of country, state, city, zip code, and street. User has a many-to-many relationship with Admin because many admins will be allowed to edit many users if given the power to do so.

Admin

Admin is a subtype of the User entity and is responsible for the upkeep of the website. They will be able to edit, delete, or add new instances for particular entities such as Items, Users, Reviews, and Orders. Their attributes are: admin ID and privileges. Privileges is a set valued attribute and will hold values that indicate what the admin can change in the application. For example an admin can have a privilege of {Items, Reviews} which means they have only access to this information. The key attribute will be the admin ID which is unique. As mentioned, Admins have a relationship with Item and User, but also has a many-to-many relationship with Review because many admins can be allowed to edit many reviews.

Customer

The Customer is a subtype of the User entity and is a user who only buys from the e-commerce website. Customers have a unique Customer ID, a set of payment options because the user can have multiple payment options (different credit cards), and a set of order IDs of orders they have placed. The key attribute will be the customer ID which is unique. Customer has a relationship with Payment Option, Order, and Shopping Cart. A customer can have multiple payment options (multiple credit cards), but a payment option can only be specific to one customer because we do not want 2 people using the same card. Therefore, it is many-to-one relationship. The Customer can have multiple orders but one order will only be specific to one customer. So, it is also a many-to-one relationship. Finally, a customer can have multiple Shopping cart instances (design is explained below) but one particular shopping cart instance is unique to one customer. This is also a many-to-one relationship.

Vendor

The vendor is a subtype of the User entity and is a user who only sells on the e-commerce website. A vendor will have the attributes: description of the vendor, the vendor ID, a set of payment options (can send/receive money in multiple ways), and a set of order IDs for all the orders they have placed. The key attribute for vendors will be their vendor ID. Vendor has relationships with Review, Order, Inventory, and Payment Option. One vendor will have zero or many reviews on their products after an order is completed (one-to-many relationship). A vendor can have many orders but all these orders are unique to the vendor (one-to-many relationship). A vendor has an inventory that holds all their products. Inventory is designed such that a vendor has many inventory instances (each particular to an item) but all of them are particular to the one vendor (one-to-many relationship). Finally, a vendor can have multiple payment options but each payment option must be unique to that vendor (one-to-many relationship).

Payment Option

A payment option is an instance of all the payment information a customer or vendor will need to conduct orders. The payment option has the attributes: cardholder first name, cardholder last name, card number, card CVV, card expiration date, and billing address. The billing address is a composite attribute because it is made up of county, state, city, zip code, and street. The key attribute will be the card number because no two people will ever have the same card number. All relations have already been discussed.

Order

An order is a transaction between a vendor and a customer in which the customer buys an item from the vendor. The order has the attributes: Customer ID, Vendor ID, Order ID, shipment company, ordered date (the date the order was placed), shipment date (the date the order was shipped), type of delivery (fast delivery, expedited delivery, regular, etc.), tracking number, and shipping address. The key attributes is the order ID because each order will have its own unique ID. All relations have already been discussed prior except the relation with Order Details. Order Details works similar to shopping cart/inventory in that multiple order detail instances are particular to one order, but each respective order detail is unique to an item. Therefore, it is a one-to-many relationship.

Order Details

Order details is dependent on the Order entity and keeps track of the items and the quantities of those items for a particular order. Therefore the attributes are: the order ID, item ID, and the quantity for that item ID. The key attributes are the order ID and the item ID because an order detail specifies the information for one item, but there can be multiple order details (for multiple items) for one order. Relationship is discussed above.

Shopping Cart

Shopping cart is specifically for Customers only because at any time a user can have items in their shopping cart but did not complete an order for them yet. Therefore, the attributes are: customer ID, item ID, and a quantity that corresponds with the item ID. The key attribute is a customer ID and the item ID because, following the same design of order details, there can be multiple shopping cart instances where each specifies the information on one item and all of them are for one particular customer. Relationships are discussed prior.

Inventory

The inventory is similar to shopping cart but it is for vendors. The inventory keeps track of all the items that vendors currently have for sale. The attributes are: vendor ID, item ID, a quantity for that particular item ID. The key attribute is the vendor ID and the item ID because we are following the same design as the shopping cart entity. We can have multiple inventory instances particular to one item (item ID) and all of these instances are particular to one vendor (vendor ID). Relationship is discussed prior.

Review

A review is done by customers for a particular item. It contains information on what they wrote, their rating, how many people upvoted the review, and more. So, the attributes are: customer ID, vendor ID, order ID, description, rating, date posted, and upvotes. The key attribute is the order ID because it will be made that a customer can only write a review once they have placed a completed order. Relationship is discussed prior.