Purchase-Order Entity Relationship Diagram

This diagram is meant to explain the structure of the database that describe the purchasing process of products produced by a specific company.

Entity

CUSTOMER Entity

Attributes (5): Customer_ID (Key), Customer_Name, Phone #, Address, Email

Relationship involved (2): pays, places

ORDER Entity

Attributes (3): Order_Number (Key), Order_Date, Invoice_Amount (the total amount of money that the customer needed to pay)

Relationship involved (3): processes**,** places**,** contains (weak relationship)

PAYMENT ENTITY

Attributes (3): Payment_ID (Key), Payment_Amount, Payment_Type (How will customers pay for the orders? Ex: cash, credit card, check, etc.)

Relationship involved (2): pays, processes

ORDERITEM ENTITY (Weak entity set)

An orderItem (ordered item) is a product that is purchased by a customer with a certain quantity. Therefore, to determine a specific orderItem, we need the key of that order and the key of the product.

Attributes (3): Item_ID (Key), Quantity, Item_Price

Relationship involved (2): contains (weak relationship), has (weak relationship)

PRODUCT ENTITY

Attributes (4): Product_ID (Key), Product_Name, Product_Price, Description

Relationship involved (2): has (weak relationship), includes

PRODUCTCATEGORY ENTITY

Attributes (2): Category_ID (Key), Category_Name

Relationship involved (1): includes

Relationship explanation and its type:

places

The customer purchase relationship can be defined as a customer can **place** zero or more orders, while a unique order (a purchase) is **placed** by exactly one customer (one to many relationship)

pays

The customer, after placing the orders, must **pay** for the orders through payments. One customer can **pay** many payments based on the number of their orders. However, one payment **is paid** by exactly one customer (one to many relationship).

processes

Order entity contains the information of the order placed by the customers. Payments will be **processed** based on the orders' information. An order can only create one payment and vice versa (one to one relationship).

contains (weak relationship)

Each order entity **contains** many different items, yet, one specific ordered item **is contained** in only 1 order (one to many relationship). An item is basically a product but with quantity; and an ordered item is a product with a certain quantity that is ordered by a customer.

has (weak relationship)

A product entity can **have (derive)** many orderItems. For example, the Boston T-shirt is considered as one product. Ordered items, derived from this product, can be "5 Boston T-shirt" or "3 Boston T-shirt".

However, an orderItem **has (is derived from)** only 1 product. A "3 Boston T-short" cannot have the Boston T-shirt and the New Hampshire T-shirt all together. Thus, this is a one to many relationship

includes

A product should only **belong to** one product category. However, a product category can **include** many different types of products,. This relationship is one to many.