Database Topic – Online Retail Database (Women's Clothes & Accessories)

Database Purpose

The purpose of this database is to maintain the online shopping data used by a women's clothing and accessories store to track information about and related to sales, inventory/suppliers, customers, and products. It will be used by retail, warehouse, and customer staff.

Business Problems Addressed

- Provide customer-specific information related to buying history (e.g., sales, returns), order amounts, contact information, and payment methods to better understand customer needs
- Understand customer sentiment as it relates to specific products via reviews (e.g., text, Likert scale)
- Supply chain management to maintain the warehouse inventory and ensure timely product delivery to customers
- Analyze sales data to understand daily, monthly, and quarterly revenue patterns
- Predict sales and product patterns to increase store profit and inform company goals

Business Rules

- Each customer must be associated with at least one transaction, as identified by an order number
- A customer can place multiple orders
- Each transaction will have a unique order number
- There is one, unique contact for each warehouse, supplier, and customer
- An order can include multiple products
- Payment must be when placing an order (i.e., the order and payment day are the same)
- Each order only ships to one customer
- A warehouse stores multiple products
- Every order will be shipped out together (orders will NOT be split for shipment)
- Each supplier only supplies one product
- An order is refunded the same day it is returned (i.e., the return date is the same as the refund date)

Design Requirements

- Create a 3NF-normalized relational database
- Use Crow's Foot notation to show the relationship between entities (e.g., cardinality and participation)
- Implement the database into a logical model using the class SQL server.
- Specify the primary and foreign keys in the diagram by using "PK" and "FK," respectively

Design Decisions

Entity Name	Why is the Entity Included	What is included in this Entity	How Entity is Related to Other Entities
Customer	This database exists to facilitate the connection between customers and suppliers in an online retail shop. The Customer entity is fundamental to the system as it represents the users who purchase goods or services. It allows the platform to store and manage individual customer details, enabling personalized services, order tracking, and targeted marketing. The Customer entity maintains customer profiles and establishes a connection to their orders and communication preferences.	customer_id, location_id contact_id, first_name, last_name	The Customer entity is related to the Contact entity through the contact_id attribute, allowing access to detailed contact information. It is also directly linked to the Order_Header entity via the customer_id to record which customer placed a particular order. This relationship enables the connection between customer information and their orders.
Order_Header	The Order_Header entity manages the customer's order-level transactions. It captures the overall information about the sale, allowing for sales reporting, billing, and inventory adjustments.	order_id, order_detail_id, order_date, customer_id, payment_id, shipment_id, review_id, return_id, total_order_price	The Order_Header entity connects to several entities: the Customer entity via customer_id to record who placed the order; the Shipments entity to track shipment(s) associated with the order; and also the Order_Detail entity, Payment entity, Review entity, and Return entity. These relationships ensure that the various details of each order can be traced back to its customer.
Order_Detail	The Order_Detail entity contains the specific itemized order details such as product_id and product_quantity.	order_detail_id, product_id, product_order_qu antity	The Order_Detail entity links the Order_Header table to the Product table to track details about the products contained in the order.
Shipments	The Shipments entity ensures efficient tracking of the delivery process, which is a key component	shipment_id, shipment_date, carrier, tracking_number,	The Shipments entity is linked to the Order entity, ensuring that the delivery process is accurately tracked for each

	of online retail operations. This entity allows the system to record shipping details, such as the tracking number, delivery status, and expected delivery date. This information is important to be able to provide customers with real-time updates about their orders and for handling any delivery issues or delays.	shipment_status, delivery_date	specific order.
Contact	The Contact entity contains all communication details for customers, such as phone numbers, email addresses, and shipping locations. This entity will enable efficient customer communication preferences and ensure that the online shop can send notifications, promotional offers, and order updates to the correct and relevant contacts.	contact_id, phone, email	The Contact entity is related to the Customer entity via the contact_id attribute, linking each customer to their preferred contact information. It ensures that communications with customers are conveyed accurately.
Product	The Product entity is a fundamental component of the database that maintains this information, and ensures smooth order processing. Additionally, the inclusion of the Product entity enables tracking of product availability, pricing updates, and sales trends, which are crucial for both suppliers and customers.	product_id, supplier_id, category_id, inventory_id, warehouse_id, product_name, product_price	The Product entity is linked to both the Order_Detail and Product_Category entities, storing information about purchased products. It is also related to the Supplier and Warehouse entities, which manage supplier relationships, as well as to Inventory, which tracks products' inventory status.
Supplier	The Supplier entity is included in the database to represent the vendors	supplier_id contact_id, supplier_name	The Supplier entity connects to the Product entity through supplier_id, ensuring that the

	who provide products for the platform. Suppliers play a critical role in ensuring that the platform can source and stock products efficiently. By maintaining structured information on suppliers, the system can track sourcing details, manage supplier performance, and streamline the procurement process.		system accurately tracks which suppliers provide specific products. This supports efficient procurement and supply chain management. It is also connected to Contact via the contact_id, ensuring that each supplier's contact information can be managed and accessed.
Inventory	The Inventory entity tracks the stock quantity of each product available in the warehouse. The inventory team may be interested in capturing information on the stock quantity to order optimal quantities into the warehouse. Additionally, customers may be interested in the stock remaining for each product to influence them to purchase products before they run out of stock.	inventory_id, stock_quantity	The Inventory entity is directly related to the Product entity via the inventory_id attribute, linking each product_id to its stock quantities. It ensures that information regarding product stock is conveyed to customers and the business team accurately.
Warehouse	The team is interested in tracking the name of the warehouse, the address of where each warehouse is located, and the contact information of the warehouse in each location. This entity will enable efficient communication with the correct warehouse regarding products stored and the relevant contact point within the warehouse.	warehouse_id, location_id, contact_id, warehouse_name	The Warehouse entity is directly related to the Location and Product entities so that the business team is able to obtain information about both the location(s) of relevant warehouses and the products that are located there.
Payment	Another key function of the database is to track	payment_id, payment_method,	The Payment entity is related to the Order_Header entity in

	the transaction status, payment method, and payment amount completed by customers to ensure that every product ordered is paid for. This also helps the team to calculate revenue	payment_amount, payment_status	order to tie the payment information and status to each order made by customers. As the customer information may be acquired through the order header entity, the payment entity does not contain this attribute.
Return	Returns are an essential part of retail operations. The Return entity helps track return history, analyze trends (e.g., frequent return reasons), and manage reverse logistics efficiently.	return_id, return_date, return_status, return_reason refund_amount	The Return entity connects with Order_Header and Date, enabling the tracking of customer-initiated returns, linking them to specific orders and products, and managing associated refunds.
Review	The Review entity provides data for product performance analysis and customer engagement. It collects customer feedback to understand sentiment about products and improve future offerings.	review_id, review_date, rating, review_text	The Review entity links Order_Header and Date, allowing customers to provide feedback on purchased products and indirectly verifying purchase details through orders.
Date	The Date entity provides a centralized reference for all dates used in the database (e.g., order dates, shipping dates, return dates). It can support time-based analysis, such as sales trends, shipping delays, or return patterns.	date_id, full_date, day_of_week, date_number, month_name, month_number, quarter_number, calendar_year	The Date entity centralizes date information for key activities, such as order placements, shipments, payments, and returns, ensuring consistency across Order , Shipment , Payment , Return , and Review entities.
Location	The Location entity centralizes all location data, reducing redundancy and simplifying updates. It can support geographic analysis (e.g., sales by region, and warehouse	location_id, street_address, city, state_province, postal_code, country	The Location entity stores addresses for Customer and Warehouse management.

	locations).		
Product_Category	The Product_Category entity organizes products into logical groups for easier management and customer browsing. It can facilitate sales analysis by category (e.g., dresses vs. accessories).	category_id, product_category	The Product_Category entity organizes products into groups, facilitating the classification and analysis of items in the Product entity via the category_id attribute.