

Electronics Vendor Database Project

Overview

This database project aims to redesign a major part of the database underlying the operations of our hypothetical electronics vendor company, which operates both a website and a chain of physical stores similar to Best Buy or Circuit City.

Purpose

The purpose of this database redesign is to ensure efficient management of various aspects of the company's operations including product inventory, sales, customer billing, shipping, and corporate planning.

Database Design

E-R Model

- The E-R diagram represents the conceptual design of the database, including primary keys and relationship cardinalities.

Relational Model

- The initial relational design was created based on the E-R diagram and refined following the principles of relational design.
- Relations were created in an Oracle database with appropriate indices and constraints.

Database Schema

Entities and Relationships

- **Customers:** Stores information about customers, including their name, address, and email.
- **Contracts:** Tracks contracts with customers who bill their purchases to an account number.
- **OnlineCustomers:** Stores information about customers who make purchases online, including login credentials and credit card details.

- **OfflineCustomers:** Records information about customers who make purchases in physical stores.
- **Manufacturer:** Contains details about product manufacturers.
- **Products:** Stores information about individual products, including name, description, manufacturer, and price.
- **Categories:** Represents different categories of products.
- **ProductCategories:** Establishes a many-to-many relationship between products and categories.
- **Sales:** Records sales transactions, including customer ID, product ID, sale date, quantity, and total price.
- **Shippers:** Stores information about companies responsible for shipping.
- **Shipments:** Tracks shipments, including sale ID, shipper ID, tracking number, shipment date, delivery date, and promised delivery date.
- **Stores:** Contains information about physical store locations.
- **Inventory:** Manages inventory levels for products in stores.
- **Warehouses:** Stores details about warehouse locations.
- **WarehouseInventory:** Tracks inventory levels for products in warehouses.
- **Reorders:** Records reorders for products, including product ID, quantity, order date, arrival date, and status.

Data Population

- Sufficient test data was generated to ensure interesting and nontrivial queries.

Queries

- Several test queries were run to ensure the database was loaded correctly and to meet client requirements.
- Examples of queries include finding customer contact information for a lost shipment, identifying top-selling products, and generating customer bills.

Query Examples

1. Find the contact information for the customer whose shipment was reported destroyed and create a new shipment for replacement items.
2. Find the customer who has spent the most in the past year.
3. Find the top 2 products by dollar-amount sold and by unit sales in the past year.
4. Find products that are out-of-stock at every store in California.

5. Find packages that were not delivered within the promised time.
6. Generate the bill for each customer for the past month.

Instructions for Running Queries

- Ensure the database is properly set up and populated with test data.
- Use SQL queries provided in the README or execute them directly on the database.

Technologies Used

- Database: MySQL
- Languages: SQL

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