Database design

Case study-FreshCo

(DATA 037 -DATA CONCEPTS)

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Introduction

In Calgary's busy retail scene, FreshCo is a shining example of both quality and convenience. The requirement for effective operations is critical because there are various locations serving a variety of consumer needs. To improve customer satisfaction and expedite procedures, FreshCo sets out to install a consolidated database system. The goal of this system is to completely transform order processing, inventory control, supplier coordination, and data management for all FreshCo facilities in Calgary.

Mission Statement: "To provide our customers with fresh, quality groceries at affordable prices, while fostering a culture of sustainability and community engagement."

Objectives:

1. **Customer Satisfaction:**
    - Ensure a seamless shopping experience both in-store and online.
    - Offer a wide variety of fresh and high-quality products to meet diverse customer needs.
2. **Operational Excellence:**
    - Maintain efficient inventory management to minimize stockouts and wastage.
    - Optimize supply chain processes to ensure timely delivery of products.
    - Implement advanced technology solutions to streamline operations and enhance productivity.
3. **Sustainability and Responsibility:**
    - Source products ethically and sustainably, prioritizing local suppliers whenever possible.
    - Reduce environmental impact through energy-efficient practices and waste reduction initiatives.
4. **Employee Development:**
    - Foster a positive work environment that values diversity, equity, and inclusion.
    - Provide opportunities for training and career advancement to empower employees.
5. **Financial Growth:**
    - Drive revenue growth through strategic pricing and promotional activities.
    - Monitor and analyze financial performance to identify areas for improvement and expansion.

Business rules

Data Integrity: Use integrity constraints to guarantee data consistency and accuracy.

Control access to the database by defining who can access it and what can be done with it.

Validate data to make sure it is relevant, accurate, and consistent.

Control concurrency: Handle concurrent access to avoid conflicts and guarantee consistency.

Backup and Recovery: To avoid data loss and to guarantee prompt recovery in the event of an emergency, regularly back up your data.

Audit Trail: Monitor database modifications for compliance, accountability, and troubleshooting.

Performance Optimization: To achieve optimal performance, optimize the parameters and database architecture.

Scalability: Build the database so that it can grow with the amount of data or users.

LIST OF SUBJECTS:

Following in-depth interviews with significant stakeholders and subject matter experts, we have acquired insightful knowledge on the inner workings of FreshCo's business. Here's a identification of some subjects

- **Inventory Management**: This involves the tracking, management, and optimization of inventory levels to ensure adequate stock levels without overstocking or stockouts.
- **Supplier Management**: This refers to the management of relationships with suppliers, including ordering, negotiation of terms, and monitoring of supplier performance.
- **Employee Management**: This involves managing aspects related to employees, such as scheduling, payroll, performance evaluation, and training.
- **Stockouts:** Stockouts occur when a product is out of stock, which can result in lost sales and dissatisfied customers.
- **Overstocking**: Overstocking happens when there is an excessive amount of inventory on hand, leading to potential waste, increased holding costs, and decreased profitability.
- **Customer Satisfaction**: This encompasses measures taken to ensure that customers are satisfied with their shopping experience, including product availability, service quality, and overall shopping environment.
- **Store**: Refers to the physical retail outlet where products are sold to customers.
- **Location of Store**: The geographical location(s) where FreshCo stores are situated, which can impact factors such as accessibility, foot traffic, and market demographics.
- **Order Tracking**: The ability to monitor the status and progress of orders placed by customers, including order processing, shipping, and delivery.
- **Product ID**: A unique identifier assigned to each product in the database, typically used for tracking and inventory management purposes.
- **Category:** Products are often organized into categories or departments based on their characteristics or intended use, facilitating easier navigation and management.
- **Price**: The cost at which a product is sold to customers, which may vary based on factors such as promotions, discounts, and pricing strategies.

LIST OF TABLES:

With these subjects in mind, we carefully selected entities that encapsulate the essential components of FreshCo's operations, ensuring that our database design aligns seamlessly with the organization's strategic objectives. Each chosen entity plays a vital role in facilitating efficient data management, analysis, and decision-making across multiple facets of the business.

- **Stores**: Contains information about FreshCo store locations, including store ID, address, contact details, and geographical coordinates.
- **Customers**: Stores customer data, including customer ID, name, contact information, and purchase history.
- **Products**: Stores information about the products available at FreshCo stores, including product ID, name, category, price, and supplier ID.
- **Orders**: Records details of customer orders, including order ID, customer ID, store ID, order date, and total amount.
- **OrderDetails**: Contains details of individual items within each order, including order detail ID, order ID, product ID, quantity, and unit price.
- **Suppliers**: Stores information about FreshCo's suppliers, including supplier ID, name, contact information, and performance metrics.
- **Inventory**: Tracks inventory levels for each product at each store, including inventory ID, store ID, product ID, quantity on hand, and reorder level.
- **Employees**: Contains information about FreshCo employees, including employee ID, name, contact details, position, and employment history.

LIST OF ATTRIBUTES

1.Stores

- StoreID (Primary Key)
- StoreName
- Address
- City
- State

2.Customers

- CustomerID (Primary Key)
- FirstName
- LastName
- Email
- Phone
- Address
- DateCreated

3.Products

- ProductID (Primary Key)
- ProductName
- Category
- Price
- SupplierID (Foreign Key)
- StockQuantity

4.Orders

- OrderID (Primary Key)
- CustomerID (Foreign Key)
- OrderDate
- ShipDate
- Status
- TotalAmount
- StoreID (Foreign Key)

5.OrderDetails

- OrderDetailID (Primary Key)
- OrderID (Foreign Key)
- ProductID (Foreign Key)
- Quantity
- UnitPrice
- TotalPrice

6.Suppliers

- SupplierID (Primary Key)
- SupplierName
- ContactName
- ContactEmail
- ContactPhone
- Address

7.Inventory

- InventoryID (Primary Key)
- ProductID (Foreign Key)
- StoreID (Foreign Key)
- QuantityInStock
- LastUpdated

8.Employees

- EmployeeID (Primary Key)
- FirstName
- LastName
- Position

Relationships:

Stores - Customers: One-to-Many
A store can have many customers, but a customer is associated with only one store.

Stores - Orders: One-to-Many
A store can have many orders, but an order is associated with only one store.

Customers - Orders: One-to-Many
A customer can place many orders, but an order belongs to only one customer.

Orders - OrderDetails: One-to-Many
An order can have many order details, but an order detail belongs to only one order.

Products - OrderDetails: One-to-Many
A product can appear in many order details, but an order detail references only one product.

Suppliers - Products: One-to-Many
A supplier can supply many products, but a product is supplied by only one supplier.

Products - Inventory: One-to-Many
A product can have inventory records in multiple stores, but each inventory record corresponds to one product and one store.

Stores - Inventory: One-to-Many
A store can have many inventory records, but an inventory record belongs to only one store.

Stores - Employees: One-to-Many
A store can have many employees, but an employee is associated with only one store.

Final Table layouts:

With distinct fields that meet particular data needs, every table in the database has been thoughtfully constructed. Everything is painstakingly arranged to guarantee correctness and accessibility, from store IDs to product descriptions.

Store table

Attributes	Datatype	Description
Store_id (Primary Key)	INT	Unique identifier for each store.
StoreName	VARCHAR	This attribute stores the name of the store..
Address	VARCHAR	Physical address of the store

Customers Table

Attributes	Datatype	Description
CustomerID (Primary Key)	INT	A unique identifier for each customer.
FirstName	VARCHAR	Stores the first name of the customer.
lastName	VARCHAR	Stores the last name of the customer.
Email	VARCHAR	Contain email address
Phone	VARCHAR	Contain phone number
DateCreated	DateTime	Stores the date when the customer record was created.
Address	VARCHAR	Contain address

Products Table

Attributes	Datatype	Description
ProductID (Primary Key)	INT	A unique identifier for each product.
ProductName	VARCHAR	Stores the name of the product.
Category	VARCHAR	Indicates the category or type of the product.
Price	FLOAT	Stores the price of the product.
SupplierID (Foreign Key)	INT	A reference to the supplier providing the product.
StockQuantity	INT	Indicates the quantity of the product available in stock.

Order table

Attributes	Datatype	Description
OrderID (Primary Key):	INT	A unique identifier for each order.
CustomerID (Foreign Key)	INT	References the customer who placed the order.
OrderDate	DATETIME	The date when the order was placed.
ShipDate	DATETIME	The date when the order was shipped.
Status	VARCHAR	Indicates the status of the order.
TotalAmount	FLOAT	Represents the total amount of the order.
StoreID (Foreign Key)	INT	References the store from which the order was placed

Orderdetails table

Attributes	Datatype	Description
OrderDetailID (Primary Key)	INT	A unique identifier for each order.
OrderID (Foreign Key	INT	References the order to which the order detail belongs.
ProductID (Foreign Key)	INT	References the product included in the order detail
Quantity	INT	Indicates the quantity of the product ordered.
UnitPrice	FLOAT	Represents the price per unit of the product at the time of the order.
TotalPrice	FLOAT	Represents the total price for the quantity of the product ordered

Supplier table

Attributes	Datatype	Description
SupplierID (Primary Key):	INT	This attribute uniquely identifies each supplier in the database
SupplierName	VARCHAR	Stores the name of the supplier.
ContactName	VARCHAR	Stores the name of the contact person at the supplier's company.
ContactEmail	VARCHAR	Stores the email address of the contact person at the supplier's company.
ContactPhone	VARCHAR	Stores the phone number of the contact person at the supplier's company
Address	VARCHAR	Stores the street address of the supplier.

Inventory table

Attributes	Datatype	Description
InventoryID (Primary Key)	INT	Unique identifier for each inventory record
ProductID (Foreign Key)	INT	References the product associated with the inventory record.
StoreID (Foreign Key)	INT	References the store associated with the inventory record.
QuantityInStock	INT	Represents the quantity of the product currently in stock at the specified store.
LastUpdated	DATETIME	Indicates the date and time when the inventory record was last updated.

Employee table

Attributes	Datatype	Description
EmployeeID (Primary Key)	INT	Unique identifier for each employee.
FirstName	VARCHAR	Stores the first name of the employee.
LastName	VARCHAR	Stores the last name of the employee.
Position	VARCHAR	Indicates the position or job title of the employee
Email	DATETIME	Stores the email address of the employee.
Phone	VARCHAR	Stores the phone number of the employee.
HireDate	DATETIME	Indicates the date when the employee was hired.

Conclusion

- In order to accomplish its mission of revolutionizing retail operations in Calgary, FreshCo has identified the installation of a centralized database system as a critical first step.
- FreshCo can achieve new levels of customer-centricity, efficiency, and agility by leveraging data. This effort offers numerous advantages, such as expedited inventory management and customized consumer experiences.
- A key component of FreshCo's path to operational excellence and customer satisfaction is its centralized database system, which it uses to map out its plan for a better future. With data serving as its compass and innovation at its heart, FreshCo is well-positioned to completely transform Calgary's retail scene and beyond.