Fufu Republic Dimensional Model for Sales Analysis

Overview

Fufu Republic is a popular restaurant chain across Nigeria with varying menu offerings at different branches and multiple payment methods for customer orders. The restaurant aims to leverage data to:

- Understand sales trends by location, payment method, and dining option (dine-in, take-out, or online).
- Improve inventory management.
- Enhance customer experience by tailoring promotions based on purchasing behavior.

To achieve these objectives, we have designed a dimensional model for analyzing sales data across Fufu Republic's branches.

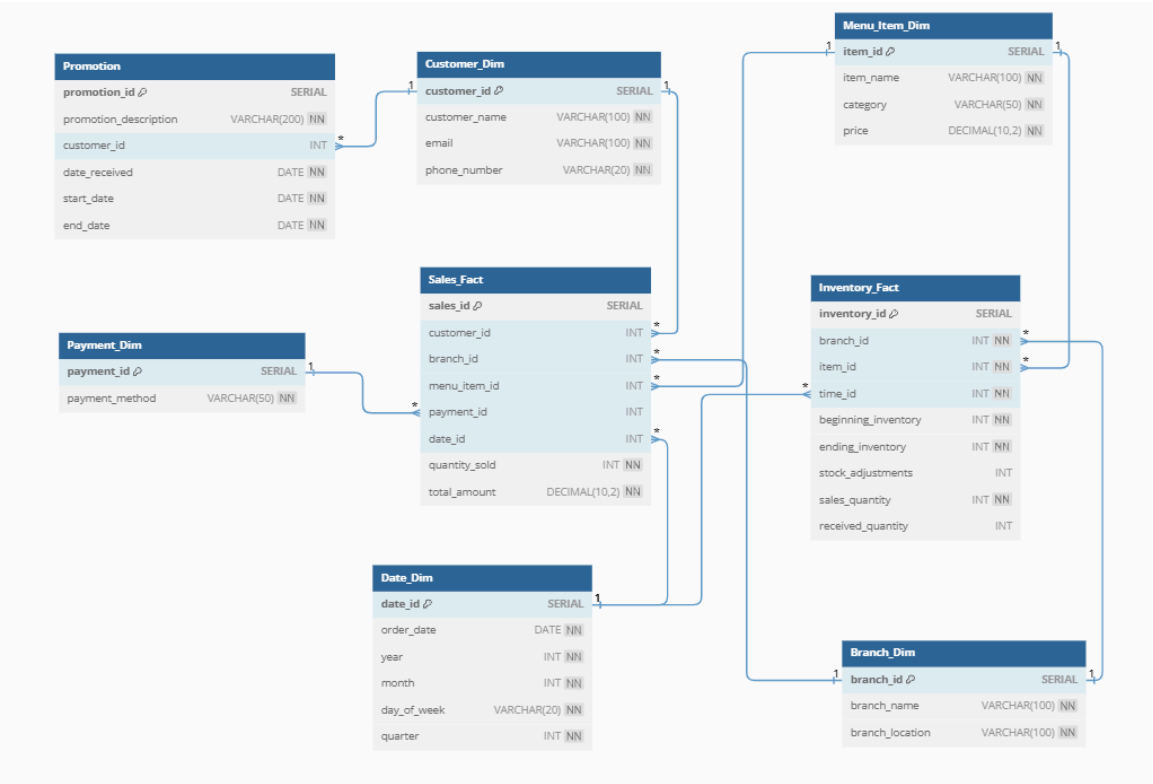
1. Entities, Relationships, and Constraints

Key Entities

• Branch: Represents the different outlets of Fufu Republic. Each branch operates independently with unique inventory and menu items.
• Menu Item: The food or beverage sold, with variations across branches.
• Customer: The individual purchasing from Fufu Republic, either in-person or online.
• Order: A record of every transaction, including payment method and items purchased.
• Payment: Information on how the transaction was paid for (cash, card, online).
• Inventory: Stock levels at each branch for the menu items.

Entity Relationships

• Branch ↔ Menu Item: A branch can offer multiple menu items, and an item can be available in multiple branches.
• Order ↔ Customer: Customers place orders, though some may be guest checkouts.
• Order ↔ Payment: Each order is paid using one payment method.
• Order ↔ Menu Item: Each order can include multiple menu items.



Constraints

- Inventory must belong to a branch.
- Every order must have a payment method.
- A customer is optional for orders (guest checkouts).

2. Dimensional Model for Sales

We have chosen the Sales Process for our dimensional model to help Fufu Republic analyze trends and behaviors related to customer orders.

Business Questions to Address

- What are the sales trends across branches?
- Which payment methods are most popular?
- What are the top-selling menu items?
- How do dine-in orders compare to take-out and online orders?

Grain

The grain is the most detailed level we track, which is one line item in a customer's order.

Fact Table: Sales Fact Table

• order_id: Unique identifier for each order

• branch_id: Identifier for the branch

• item_id: Identifier for the menu item

• customer_id: Identifier for the customer (optional)

• payment_method_id: Identifier for the payment method

• order_type_id: Type of order (dine-in, take-out, etc.)

• quantity_sold: Quantity of the item sold

• total_price: Total price for this item

• order_date: Date and time of the order

Dimensions:

1. Time Dimension:

• time_id: Unique identifier for time

• date: Actual date

• day: Day of the week

• month: Month of the year

• year: Year

2. Branch Dimension:

• branch_id: Unique branch ID

• branch_name: Name of the branch

• location: Branch location

3. Customer Dimension:

• customer_id: Unique customer ID

• customer_name: Name of the customer

• loyalty_status: Loyalty status (if any)

• contact_info: Email/phone of customer

4. Menu Item Dimension:

• item_id: Unique item ID

• item_name: Name of the item

• category: Category of item

• price: Unit price of item

5. Order Type Dimension:

• order_type_id: Unique order type ID

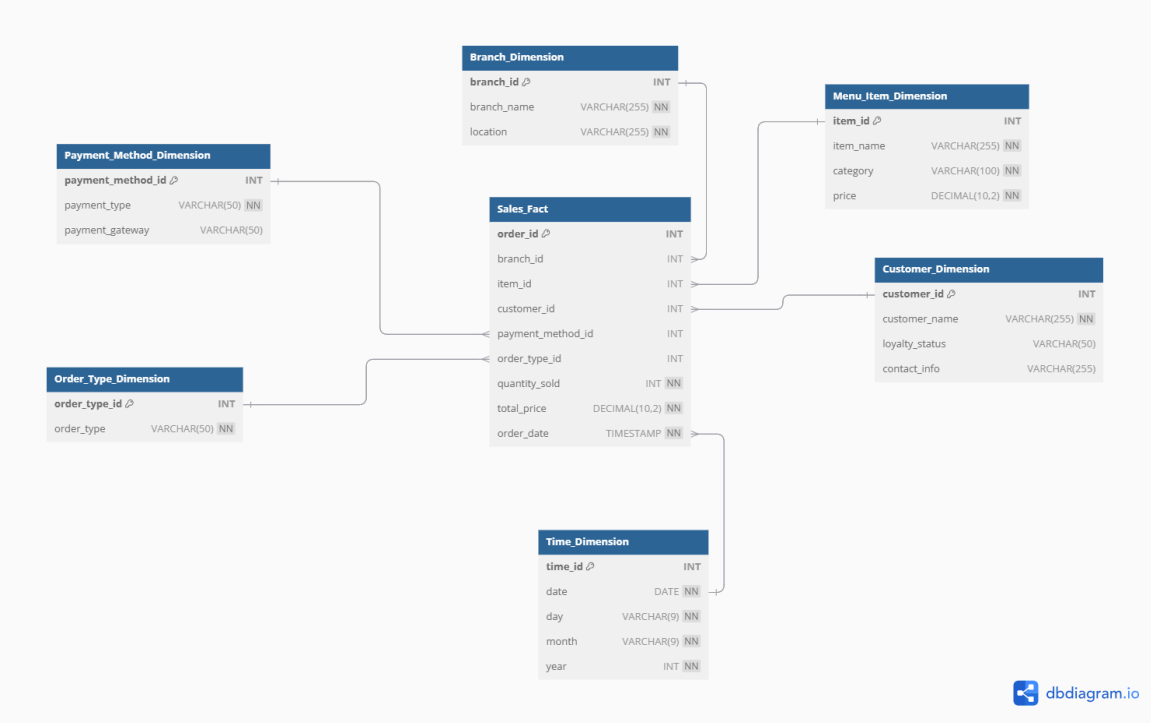
• order_type: Type (dine-in, take-out, online)

6. Payment Method Dimension:

• payment_method_id: Unique payment method ID

• payment_type: Cash, card, or online

• payment_gateway: Nomba, Paystack, Interswitch



2b. Dimensional Model for Inventory Management

For inventory management at Fufu Republic, the dimensional model will focus on tracking inventory levels, managing stock, and understanding how inventory relates to sales and branch performance. Here's a detailed dimensional model tailored to inventory management:

Business Process: Inventory Tracking and Management

Business Questions:

1. What are the current inventory levels for each menu item across different branches?
2. How do inventory levels vary over time?
3. What is the historical trend of inventory usage?
4. How do sales and inventory levels correlate across different branches and menu items?
5. Which branches are experiencing stockouts or overstock situations?

Dimensional Model:

- **Grain:**
    - Each record represents the inventory level of a menu item at a specific branch on a specific date.
- **Dimensions:**
    - **Branch Dimension:** Information about each branch.
    - **Menu Item Dimension:** Details about each menu item.
    - **Time Dimension:** Date-related information for tracking inventory over time.
- **Fact Table:**
    - **Inventory Fact Table:** Records inventory levels, including adjustments and usage.

Explanation:

- **Time Dimension:** Tracks the date, day, month, and year to analyze inventory over time.
- **Branch Dimension:** Contains details about each branch to track inventory at different locations.
- **Menu Item Dimension:** Includes details about each menu item to manage and track inventory levels for different items.
- **Inventory Fact Table:**

- `beginning_inventory` and `ending_inventory` capture inventory levels at the start and end of a period.
- `stock_adjustments` accounts for changes in inventory due to factors like losses or additions.
- `sales_quantity` records the amount sold during the period.
- `received_quantity` tracks the amount received from suppliers.