

Concept Overview

The **Walmart Sales Database** is structured to capture and analyze key business operations, from individual sales transactions to employee performance, product details, customer demographics, and departmental data. The goal is to use this data for **real-time descriptive analysis** to extract actionable insights about sales trends, customer behavior, employee performance, and operational metrics.

The **four key entities** in the system are:

1. **Sales:** Stores transaction details such as the products sold, customer, quantity, and method of payment.
2. **Products:** Contains information about the products, their pricing, and which department they belong to.
3. **Employees:** Keeps track of employee information, their department, and how they contribute to sales.
4. **Customers:** Holds data about customers including their unique identifiers and their purchasing behaviors.

Table Structures

Each table has its own role and stores different types of information related to sales, products, employees, customers, and departments.

Column Name	Data Type	Description
sale_id	INT	Unique identifier for each sale transaction.
sale_reference	VARCHAR	Reference code for the sale transaction, often used for tracking purposes.
product_id	INT	Foreign key that references the <code>product_id</code> from the Products table.
customer_id	INT	Foreign key that references the <code>customer_id</code> from the Customers table.
employee_id	INT	Foreign key that references the <code>employee_id</code> from the Employees table (the salesperson).
quantity	INT	Quantity of the product sold in this transaction.
sale_date	DATETIME	Date and time of the sale transaction.
state	VARCHAR	State where the sale occurred.
town	VARCHAR	Town or city where the sale occurred.
method_of_payment	VARCHAR	Payment method used for the transaction (e.g., credit card, cash, etc.).

Relationships Between Tables

- **Sales → Products:** The `product_id` in the **Sales** table links to the **Products** table. This relationship helps to identify which product was sold during the transaction.
- **Sales → Customers:** The `customer_id` in the **Sales** table links to the **Customers** table, allowing us to track sales per customer.

- **Sales → Employees:** The `employee_id` in the **Sales** table links to the **Employees** table.
This helps identify the salesperson involved in the transaction.
- **Products → Department:** The `department_id` in the **Products** table links to the **Department** table, categorizing products by department.
- **Employees → Department:** The `department_id` in the **Employees** table links to the **Department** table, assigning employees to specific departments.

Project Question (Descriptive Analysis)

“Using Walmart’s sales database, perform a real-time descriptive analysis to identify sales trends, customer purchasing behavior, and employee performance across different departments, states, and towns. The analysis should address:

1. Sales Trends:

- What is the total sales volume and revenue by **day, week, and month**?
- Which **products** generate the highest revenue and which have the highest sales quantity?
- Which **departments** contribute most to overall revenue?

2. Customer Insights:

- How many **unique customers** are active over time (daily, weekly, monthly)?
- What are the most **common payment methods** used?
- Which **towns or states** have the highest sales activity?

3. Employee & Department Performance:

- Which **employees** have the highest sales contribution?
- How does employee performance vary across **departments**?
- Is there a correlation between **department sales** and **employee workload**?

4. Product-Department Relationship:

- Compare **price vs. quantity sold** across departments.
- Which products are **fast-moving (high quantity, low price)** vs. **high-value (low quantity, high price)**?

5. Operational Metrics:

- Average **quantity per sale transaction**.
- Average **revenue per customer**.
- Sales distribution by **method of payment** (cash, card, digital, etc.).

Expected Outputs

- **Dashboards / Reports** with:

- Sales revenue trends over time.
- Top-selling products and departments.
- Customer segmentation by state/town.
- Employee sales leaderboard.
- Payment method distribution chart.

- **KPIs** such as:

- Daily revenue, average basket size, customer retention rate, department contribution %, employee sales efficiency.