

# **WALMART SALES PERFORMANCE DASHBOARD**

## **INTRODUCTION**

In today's data-driven world, organizations rely heavily on data analytics to understand business performance and make informed decisions.

Retail companies like Walmart generate huge volumes of sales data daily, which includes information about customers, products, regions, and revenue.

This project, "Walmart Sales Performance Dashboard", demonstrates an end-to-end data analytics workflow using

Excel, Python, SQL, and Power BI to transform raw sales data into meaningful business insights.

## **PROBLEM STATEMENT**

Raw retail sales data is difficult to analyze without proper tools and visualization.

Major challenges include:

- Large volume of unstructured data
- Difficulty in identifying trends and patterns
- No centralized view of KPIs like sales, profit, and orders

Problem

How can Walmart sales data be analyzed and visualized to track performance, trends, and customer behavior efficiently?

## **PROJECT OBJECTIVES**

- Clean and prepare raw sales data
- Store and query data efficiently using SQL
- Perform analysis using Python
- Build an interactive and professional dashboard in Power BI
- Generate insights related to sales, profit, customers, and products

## **TOOLS & TECHNOLOGIES USED**

- ◆ Microsoft Excel
  - Initial data inspection
  - Data validation and formatting
  - Understanding column structure
  - Removing obvious errors and blanks
- ◆ Python
  - Data analysis and preprocessing
  - Exploratory Data Analysis (EDA)
  - Handling missing values
  - Data consistency checks
- ◆ SQL
  - Storing cleaned data
  - Writing analytical queries

- Preparing SQL-ready datasets
- Aggregation and filtering
- ◆ Power BI
  - Data modeling
  - DAX calculations
  - Interactive dashboard creation
  - Visual storytelling

## **DATASET DESCRIPTION**

The dataset represents Walmart retail sales transactions and includes the following fields:

- Order ID
- Order Date
- City, State, Region
- Product Category, Sub-category, Product Name
- Customer Segment
- Sales Revenue
- Profit
- Quantity Sold
- Shipping Cost

The dataset is SQL-ready and structured in tabular format.

## **DATA PREPARATION USING EXCEL**

Excel was used as the first-level data preparation tool.

Tasks performed:

- Checked column names and data types
- Removed duplicate rows
- Verified numeric columns (Sales, Profit, Quantity)
- Converted date columns to standard format
- Saved cleaned file for further processing

Excel helped in understanding the basic structure and quality of the dataset.

## **DATA ANALYSIS USING PYTHON**

Python was used for Exploratory Data Analysis (EDA).

Libraries Used:

- pandas
- numpy
- matplotlib / seaborn

Key tasks:

- Loaded dataset using pandas
- Checked missing values
- Analyzed sales distribution
- Identified outliers
- Verified monthly sales trends

Python helped validate the data before loading it into SQL and Power BI.

## **DATA STORAGE & QUERYING USING SQL**

After cleaning, the dataset was stored in a SQL database.

SQL tasks performed:

- Created a sales table
- Inserted cleaned data
- Wrote queries for:
  - Total sales
  - Total profit
  - Orders count
  - City-wise sales
  - Product-wise sales

## **DATA MODELING IN POWER BI**

The SQL-ready dataset was imported into Power BI.

Data Modeling Steps:

- Verified data types
- Created calculated columns:
  - Month
  - Month Number
  - Year
- Fixed month sorting using Month Number
- Removed blank dates to avoid incorrect aggregation

## **DAX IN POWER BI**

DAX (Data Analysis Expressions) formulas were used in this project to perform dynamic calculations and create meaningful business metrics in Power BI. Since the dashboard needed to show real-time insights based on filters such as year, region, city, and product category, DAX measures were essential. Using DAX, key performance indicators like Total Sales, Net Profit, Orders Count, Units Sold, and Average Order Value were calculated accurately and updated automatically whenever the user interacted with the dashboard. Calculated columns created using DAX, such as Month, Month Number, and Year, helped organize the data correctly and enabled proper time-based analysis. Overall, DAX made the dashboard interactive, flexible, and reliable, allowing raw sales data to be transformed into actionable business insights.

## **DASHBOARD DESIGN (POWER BI)**

The dashboard follows a dark theme professional layout.

Dashboard Sections:

1. KPI Cards
  - Sales Revenue
  - Net Profit
  - Orders Count
  - Units Sold
  - Average Order Value
2. Trend Analysis

- Monthly Sales Trend
  - Sales vs Profit comparison
- 3. Insights Section
  - Top 5 Cities by Sales
  - Top 5 Products by Sales
  - Sales by Customer Segment (Donut Chart)
- 4. Filters
  - Year
  - Region
  - Product Category

### **KEY INSIGHTS GENERATED**

- Certain months contribute significantly to annual sales
- A small number of cities drive most of the revenue
- Top products generate a major share of sales
- Customer segments show different purchasing behavior

### **BUSINESS IMPACT**

- Helps management track performance quickly
- Identifies growth opportunities
- Improves decision-making using visual insights
- Reduces manual reporting effort

### **CHALLENGES FACED**

- Incorrect month sorting
- Blank order dates causing aggregation issues
- Visual sorting conflicts in Power BI

Solutions:

- Created Month Number column
- Removed blank dates
- Applied correct column-level and visual-level sorting

### **CONCLUSION**

This project successfully demonstrates an end-to-end data analytics solution using Excel, Python, SQL, and Power BI.

It highlights the importance of:

- Data cleaning
- Proper modeling
- Correct sorting logic
- Visual storytelling

## **FUTURE ENHANCEMENTS**

- Year-over-Year (YoY) analysis
- Month-over-Month (MoM) growth
- Sales forecasting
- Real-time database integration