Data Analytics With Power BI

PROJECT REPORT

TITLE
Superstore Sales Dataset

Submitted by

Ashish kumar patel

Registration No:- 12319923

Program and Section B. Tech (CSE) and K23KT

Course Code INT374

Under the Guidance of

(Dr. KARAN BAJAJ)

Discipline of CSE/IT

Lovely School of Computer Science and Engineering

Lovely Professional University, Phagwara

CERTIFICATE

This is to certify that Ashish Kumar Patel bearing Registration no. 12319923 has complete INT-374 project, **"Superstore Sales Analytics Dashboard "** under my guidance and supervision. To the best of my knowledge, the present work is the result of his/her original development, effort and study.

School of Computer Science & Engineering
Lovely Professional University
Phagwara, Punjab.

DECLARATION

I, Ashish Kumar Patel, Student of Computer Science & Engineering under CSE/IT Discipline at Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine.

Date: 17/12/2025 Signature

Registration No. 12319923 *Ashishpatel*

Acknowledgement

I would like to express my sincere gratitude to my faculty guide for providing continuous support, g u i d a n c e , and motivation throughout the completion of this project. I am also thankful to the Lovely Professional University for providing the necessary resources and learning environment. Finally, I thank my family and friends for their encouragement and support.

TABLE OF CONTENTS

1. Introduction
2. Source of Dataset
3. Objective
4. Source of Data
5. Analysis on Dataset

   • Identifies overall sales and profit trends, showing that high sales do not always result in high profit.

   • Highlights that Technology category is the most profitable, while some Furniture items incur losses.

   • Shows regional performance differences, with West and East regions performing better than Central.

   • Reveals that the Consumer segment contributes the highest sales, while Corporate customers give stable profit.

   • Indicates that Standard Class is the most preferred shipping mode, reflecting cost-effective delivery choice.

6. Data Cleaning and Preprocessing
7. Data Modelling and Relationships
8. Measures and DAX Calculations
9. Dashboard Design and Visualization Strategy
10. Conclusion
11. Social Media Platform

1. Introduction

This Power BI project is developed using the **Superstore Sales dataset** to perform a detailed analysis of business performance. The dataset includes information related to orders, sales, profit, product categories, customer segments, regions, and shipping modes. The main objective of this project is to transform raw sales data into meaningful insights through interactive and visually appealing dashboards. Using Power BI, various key performance indicators (KPIs) such as total sales, total profit, number of orders, and profit margins are analysed. The dashboard helps in understanding which product categories and sub-categories generate the highest revenue and which ones cause losses. It also highlights regional sales performance, enabling comparison across different locations and identifying strong and weak markets.

Additionally, the project analyses customer segments to understand purchasing behaviour and contribution to overall profit. Shipping modes and order trends are also examined to evaluate operational efficiency. Overall, this Power BI project supports data-driven decision-making by providing a comprehensive view of sales performance, customer behaviour, and business growth opportunities in a simple and easy-to-understand manner.

2. Problem Statement

The Superstore faces challenges in understanding its large volume of sales data to make effective business decisions. Despite having detailed information on sales, profit, products, regions, and customers, the organization lacks a clear and interactive way to identify profitable products, loss-making categories, regional performance gaps, and customer purchasing patterns.

The objective of this Power BI project is to analyse the Superstore Sales dataset and develop an interactive dashboard that provides clear insights into sales and profit trends, category-wise and region-wise performance, customer segment behaviour, and shipping efficiency. This dashboard aims to support data-driven decision-making by helping stakeholders identify growth opportunities, improve profitability, and optimize business strategies.

3. Objectives

The main objectives of this project are:

- To convert raw Superstore sales data into meaningful and easy-to-understand visual insights using Power BI.
- To analyse overall sales, profit, and order trends in order to measure business performance.
- To identify high-performing and low-performing product categories and sub-categories that impact profitability.
- To evaluate region-wise and state-wise sales performance to understand market strengths and weaknesses.
- To study customer segments and purchasing behaviour for better targeting and retention strategies.
- To analyse shipping modes and order patterns to assess operational efficiency.
- To support management in making informed, data-driven decisions that improve profitability and business growth.

4. Source of Dataset

The dataset used in this project is taken from Kagle dataset.

Key Attributes of the Dataset:

- **Order Details:** Order ID, Order Date, and Ship Date used to track sales timelines.
- **Customer Information:** Customer ID, Customer Name, and Segment to analyse customer behaviour.
- **Geographical Data:** Region, State, and City for location-wise sales analysis.
- **Product Information:** Category, Sub-Category, and Product Name to evaluate product performance.
- **Sales Metrics:** Sales, Quantity, Discount, and Profit to measure revenue and profitability.
- **Shipping Details:** Ship Mode to analyse delivery preferences and operational efficiency.

5. Analysis On Dataset

The Superstore Sales dataset provides a comprehensive view of the company's sales operations, covering products, customers, regions, and shipping details. Analysis of this dataset shows that while the company achieves strong overall sales, profitability is not consistent across all products and regions. This indicates that high sales volume alone does not guarantee higher profit.
Category-wise analysis reveals that the **Technology** category is the most profitable, driven by products such as phones and accessories. In contrast, the **Furniture** category, particularly sub-categories like tables and bookcases, often records low or negative profit. This suggests issues related to pricing strategy, high discounts, or operational costs in these products.
Regional analysis highlights noticeable performance differences. The **West and East regions** generate higher sales and profit, indicating strong market presence and customer demand. However, the **Central region** shows lower profitability, suggesting the need for improved regional strategies, better pricing, or targeted marketing efforts.
Customer segment analysis shows that the **Consumer segment** contributes the highest sales volume, making it the largest customer base. The **Corporate segment**, although smaller in volume, provides more stable and consistent profits. This insight is valuable for designing targeted sales and retention strategies.
Discount and shipping analysis further shows that **higher discounts often reduce profit margins**, sometimes leading to losses. The **Standard Class** shipping mode is the most preferred by customers, reflecting a focus on cost-effective delivery. Overall, the dataset analysis helps identify profitable opportunities, loss-making areas, and key factors affecting business performance, supporting informed and data-driven decision-making.

6. Data Cleaning and Preprocessing

Data cleaning and preprocessing were essential steps to ensure accuracy and reliability of the analysis in Power BI. The following actions were performed in the Superstore Sales dataset:

- Removed duplicate and irrelevant records to avoid incorrect calculations and misleading insights.
- Handled missing or null values by correcting, replacing, or excluding them where necessary.
- Converted date fields such as Order Date and Ship Date into proper date formats for time-based analysis.
- Standardized text fields like Category, Sub-Category, Region, and Ship Mode to maintain consistency.
- Checked and corrected data types for numerical columns such as Sales, Profit, Quantity, and Discount.
- Created new calculated columns and measures (e.g., total sales, profit margin, order count) to enhance analysis.

These preprocessing steps improved data quality and enabled accurate, meaningful visualizations in the Power BI dashboard

7. Data Modelling and Relationships

Data modelling was performed to organize the Superstore Sales dataset efficiently and support accurate analysis in Power BI. A structured model helps improve performance, clarity, and reliability of insights.

- Designed a **star schema–like structure**, where the sales table acts as the central fact table.
- Defined relationships between **orders, customers, products, and geography** to enable cross-analysis.
- Linked Order ID with customer and product details to track sales transactions correctly.
- Established relationships between date fields (Order Date, Ship Date) and a date table for time-based analysis.
- Ensured **one-to-many relationships** to avoid ambiguity and incorrect aggregations.
- Applied proper relationship direction and cardinality to maintain data integrity and accurate filtering across visuals.

This data model allows seamless interaction between visuals in the Power BI dashboard and ensures consistent, reliable insights across all analyses.

8. Measures and DAX Calculations

Measures and DAX calculations were created in Power BI to derive meaningful insights and key performance indicators from the Superstore Sales dataset. These calculations help in dynamic analysis and interactive reporting.

- Created Total Sales measure to calculate overall revenue generated.
- Developed Total Profit measure to evaluate business profitability.
- Calculated Total Orders and Total Quantity Sold to measure sales volume.
- Created Profit Margin (%) measure to understand efficiency and profitability.
- Designed Average Discount measure to analyse the impact of discounts on profit.
- Used Time Intelligence DAX functions to analyze monthly and yearly sales trends.
- Implemented category-wise, region-wise, and segment-wise measures for detailed comparison.

These DAX measures enable dynamic filtering, drill-down analysis, and accurate KPI tracking within the Power BI dashboard, supporting data-driven decision-making.

9. Dashboard Design and Visualization Strategy

The Power BI dashboard was designed to present insights clearly and make analysis . The focus is on interactive, visual storytelling of the Superstore Sales data.

- Used **bar and column charts** to compare sales and profit across categories, sub-categories, and regions, highlighting high and low-performing areas.
- Implemented **line and area charts** to display sales and profit trends over time, showing monthly or yearly growth patterns.
- Added **map visuals** to analyse region-wise and state-wise performance, making geographical trends easy to identify.
- Applied **slicers and filters** for Region, Category, Segment, and Date to allow interactive exploration of data.
- Used **stacked charts** to compare multiple measures (e.g., sales vs profit) in a single view for better insight.
- Ensured **consistent colours, labels, and legends** for clarity and readability.
- Organized visuals in a **logical top-down layout**, starting from broad trends (categories/regions) and moving to detailed analysis (products/sub-categories).

This approach makes the dashboard highly interactive and insightful, allowing users to explore the data, spot trends, and make informed decisions without relying on KPI cards.

10. Conclusion

This project successfully demonstrated the use of Power BI as an effective business intelligence tool for analysing Store Sales, Profit(region wise, state wise etc.)

The Power BI project on the **Superstore Sales dataset** provides an in-depth understanding of the company's sales operations, customer behaviour, and overall business performance. Through careful data cleaning, preprocessing, and modelling, the dataset was transformed into a structured format suitable for detailed analysis. Using interactive visualizations, the dashboard allows users to explore trends across product categories, sub-categories, regions, and customer segments, providing clear insights into what drives sales and profit.

The analysis revealed that while overall sales are strong, profitability is uneven across different categories and regions. The **Technology category** emerged as the most profitable, whereas some Furniture sub-categories consistently show low or negative profit, indicating potential issues in pricing or cost management. Region-wise analysis highlighted that the **West and East regions** outperform the Central region, suggesting that targeted marketing and operational improvements may be required in underperforming areas. Customer segment analysis showed that the **Consumer segment** contributes the highest sales volume, while corporate customers provide more consistent profit margins, offering guidance for customer-targeted strategies.

Additionally, the dashboard highlighted the effect of discounts and shipping modes on profitability, emphasizing the need for careful pricing and logistics planning. By providing a clear, interactive, and easy-to-understand representation of complex sales data, the Power BI dashboard enables stakeholders to make **data-driven decisions**, identify opportunities for growth, reduce losses, and optimize business strategies.

In summary, this project demonstrates how data visualization and analytics can transform raw sales data into actionable business intelligence, supporting strategic planning, performance monitoring, and informed decision-making across the organization.

10. LinkedIn Post Link:

https://www.linkedin.com/posts/ashish-kumar-patel07_powerbi-dataanalytics-superstore-activity-7407173336595808256-_yND?utm_source=share&utm_medium=member_desktop&rcm=ACoAAEeUGlcBtCeoXwx6ktKHieHzg5S-ki50T9M