

# **AI-Driven Sales Analytics Using Power BI**

**(Global Superstore Dataset)**

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# 1. Introduction

This project presents an **AI-driven sales analytics dashboard** developed using **Microsoft Power BI** and the **Global Superstore dataset**. The objective of the project is to analyze overall business performance, identify key sales drivers, evaluate trends, and support strategic decision-making by combining traditional business intelligence techniques with **Power BI's built-in AI features**.

The project demonstrates end-to-end analytics skills including data modeling, KPI design, AI-assisted analysis, and business storytelling, making it suitable for academic submission and professional portfolios.

## 2. Dataset Description

### 2.1 Dataset Overview

The project uses the **Global Superstore dataset (Global Superstore.xls)**, which represents transactional sales data for a global retail organization. The dataset simulates real-world retail operations and is widely used for analytics and business intelligence learning.

### 2.2 Dataset Characteristics

- **Domain:** Retail / Sales Analytics
- **Granularity:** Order-level transactional data
- **Time Span:** Multi-year historical data
- **Geographic Coverage:** Global (multiple regions and markets)

### 2.3 Key Fields Used

- Order Date
- Region, Market, Country
- Product Category and Sub-Category
- Customer Segment
- Ship Mode
- Sales
- Profit
- Quantity
- Discount

A dedicated **Date table** was created to support accurate time-based analysis, trend evaluation, and consistent filtering across visuals.

### **3. Project Objectives**

The primary objectives of this project are:

- To provide an executive-level overview of business performance
- To identify key drivers and risk factors affecting sales using AI visuals
- To analyze sales and profit trends over time
- To evaluate the impact of discounting and category performance
- To perform diagnostic analysis across regions, products, and customer segments

### **4. Dashboard Design and Analysis**

The Power BI report is structured into **four analytical pages**, each addressing a specific business question.

#### **4.1 Page 1: Executive Overview – AI Narrative Page**

##### **Purpose:**

To provide a high-level snapshot of overall business performance for decision-makers.

##### **Key Visuals:**

- KPI Cards: Total Sales, Total Profit, Total Quantity, Average Discount
- Monthly Sales Trend
- Monthly Profit Trend
- Smart Narrative (AI visual)

##### **Analysis:**

This page highlights strong and consistent growth in sales and profit over time. The Smart Narrative automatically generates insights that summarize key trends and performance changes, enabling executives to quickly understand business health without manual interpretation.

#### **4.2 Page 2: Sales Drivers & Risk Factors (AI Analysis)**

##### **Purpose:**

To identify factors influencing sales increases and declines using AI.

##### **Key Visuals:**

- Key Influencers (AI visual)
- Category Contribution to Total Sales (bar chart)
- Filters for Year and Region

##### **Analysis:**

The Key Influencers visual reveals that sales declines are strongly associated with factors such as same-day shipping, specific regions and markets, and certain customer segments.

This page shifts the analysis from “what happened” to “why it happened,” highlighting potential operational inefficiencies and cost–benefit misalignment.

### 4.3 Page 3: Trend Insights & Performance Signals

#### Purpose:

To validate long-term growth patterns and evaluate business efficiency.

#### Key Visuals:

- Annual Sales and Profit Growth Trend (combo chart)
- Impact of Discounting on Sales Performance by Category (scatter chart)
- Sales and Profit Contribution by Product Category (bar chart)

#### Analysis:

The analysis shows steady year-over-year growth in both sales and profit. Discount analysis indicates that higher discounting does not always lead to higher sales, suggesting varying price sensitivity across product categories. Technology emerges as the leading contributor to revenue and profit.

### 4.4 Page 4: Regional & Product Performance Deep-Dive

#### Purpose:

To support diagnostic and root-cause analysis at a granular level.

#### Key Visuals:

- KPI Matrix displaying regional Total Sales, Total Profit, and Average Discount
- Decomposition Tree (AI visual) analyzing Sales by Region → Category → Segment
- Analytical text summary

#### Analysis:

This page highlights performance variations across regions and product categories. The Decomposition Tree enables interactive drill-down to identify high-impact combinations of region, product category, and customer segment, supporting strategic prioritization and informed decision-making.

## 5. Use of AI Features in Power BI

The project leverages multiple AI capabilities within Power BI:

- **Smart Narrative:** Automatically generates written insights based on visual trends
- **Key Influencers:** Identifies factors driving sales performance changes
- **Decomposition Tree:** Enables AI-assisted drill-down and root-cause analysis

These features enhance analytical depth and transform the dashboard into a decision-support system rather than a static report.

## **6. Conclusion**

This AI-driven Power BI project demonstrates how modern business intelligence tools can be used to analyze performance, uncover actionable insights, and support strategic decisions. By combining clean data modeling, intuitive visual design, AI-assisted analytics, and clear business interpretation, the project delivers a comprehensive and professional analytics solution.

## **7. Key Takeaway**

The project showcases strong Power BI skills, including data preparation, KPI design, AI-driven insight generation, and business storytelling, making it suitable for academic evaluation, professional portfolios, and analytics interviews.