

# Retail Performance Dashboard

Empowering Data-Driven Decisions Across Regions and Product Lines

**Estarta AI & DS training**

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## Introduction

In this project, I am taking the role of a **Data Analyst at a consulting firm**, working with a large retail client. The client operates across multiple regions and product categories, and they've observed inconsistencies in their revenue trends. They aim to better understand:

- Which products and regions are performing best
- How performance changes over time
- How to identify underperforming areas

To support this, they have provided raw sales data and requested an **interactive Power BI dashboard** to help their management team make informed, data-driven decisions.

## About the Data

The dataset consists of historical retail sales transactions with rich details across orders, customers, products, and logistics. It provides the foundation for analyzing performance metrics and identifying trends across time, region, and product categories.

Key Columns:

- **Order ID, Order Date, Ship Date** – Track individual transactions and timelines.
- **Ship Mode** – Delivery method used (Standard, Express, etc.).
- **Customer Name, Segment** – Customer information and business segment.
- **State, Country, Market, Region** – Geographic fields for location-based analysis.
- **Product ID, Category, Sub-Category, Product Name** – Product hierarchy and identifiers.
- **Sales, Quantity, Discount, Profit, Shipping Cost** – Core business performance metrics.
- **Order Priority** – Indicates urgency/priority of the order.
- **Year** – Derived from the order date to support time-series analysis.

## Data Cleaning and Preparation using Power Query Editor

### Step 1: Checking for Missing Values

To ensure the dataset was complete and ready for analysis, I began by checking for any missing or empty values across all columns using Power Query Editor in Power BI.

I added a custom column with the following logic:

```
if List.ContainsAny(Record.ToList(), {null, ""}) then "Missing" else "OK"
```

This expression converts each row into a list and checks whether any of the values are either null or empty strings "".

After applying this step:

- All rows returned "OK"
- so No missing values were detected in the dataset

This confirmed that the data was complete and no further handling (like filling, replacing, or deleting) was required at this stage.

## Step 2: Checking for Duplicate Rows

To maintain data integrity, I examined the dataset for any duplicate rows that could skew analysis results.

Using Power Query Editor, I applied a Remove Duplicates operation across all columns to identify duplicate entries.

Result:

- No duplicate rows were found in the dataset.
- This confirmed that each order record is unique, so no rows were removed or consolidated.

## Step 3: Duplicate Order IDs

I noticed that some order\_id values appear multiple times. This happens because a single order can include multiple products.

These duplicate order\_ids have the same customer name, order date, and ship date, but different products and prices.

This means one customer placed one order containing several products, each listed as a separate row.

## Step 4: Outliers

I reviewed the data for potential outliers, such as unusually high prices or quantities.

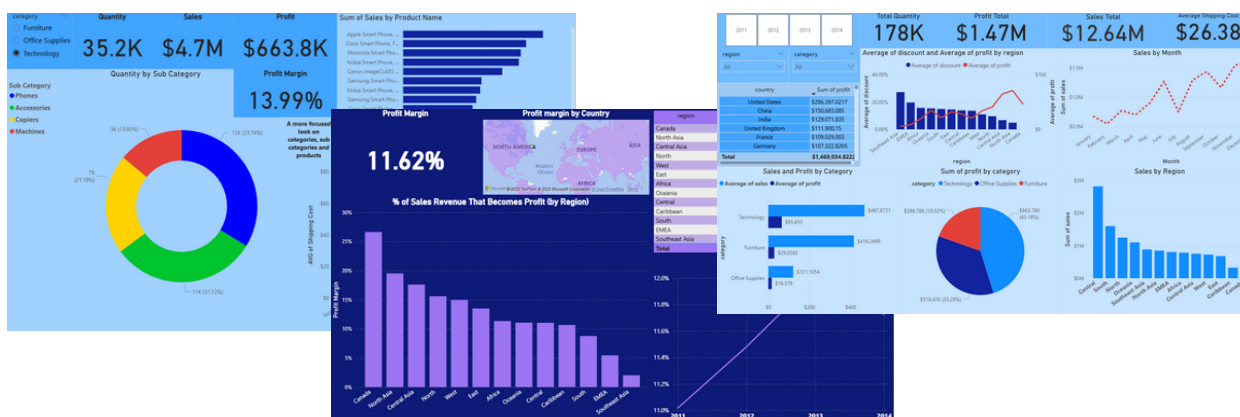
After careful examination, the highest prices corresponded to premium products and were consistent with expectations.

Therefore, no outlier removal or adjustments were necessary.

Note: The 'Year' column was removed, as the information can be derived from the 'Order Date' and does not add value to the analysis.

## Building the Dashboard

I created a Power BI report with three highly interactive pages, designed to give a comprehensive view of the retail client's sales performance. Each page delivers key insights to help management explore trends, regional and product performance, and identify areas for improvement through dynamic, user-driven interactions.

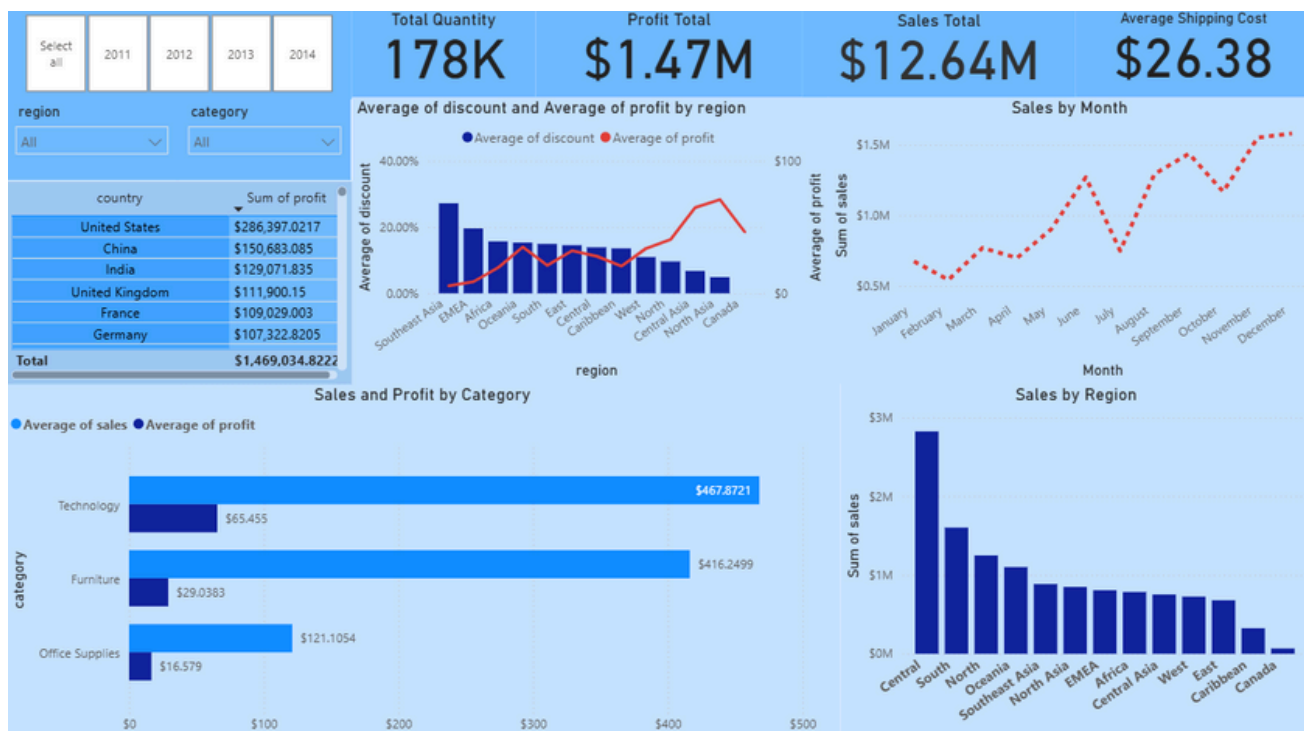


## First Dashboard: General Overview

This page provides a comprehensive snapshot of overall sales performance with interactive filters and key visualizations, including:

- Interactive slicers:
  - Year
  - Region
  - Category
- Key Performance Indicators (KPIs):
  - Total quantity sold
  - Total profit
  - Total sales
  - Average shipping cost
- Visualizations:
  - Column-line chart showing average discount and average profit by region
  - Line chart displaying sales trends by month
  - Bar chart comparing sales and profit by category
  - Pie chart illustrating profit distribution by category (removed)
  - Column chart presenting sales by region
  - Table listing countries alongside their total profit

This dashboard offers a general, high-level view, enabling users to explore sales and profit metrics across different dimensions.



## Second Dashboard: Profit Margin Analysis

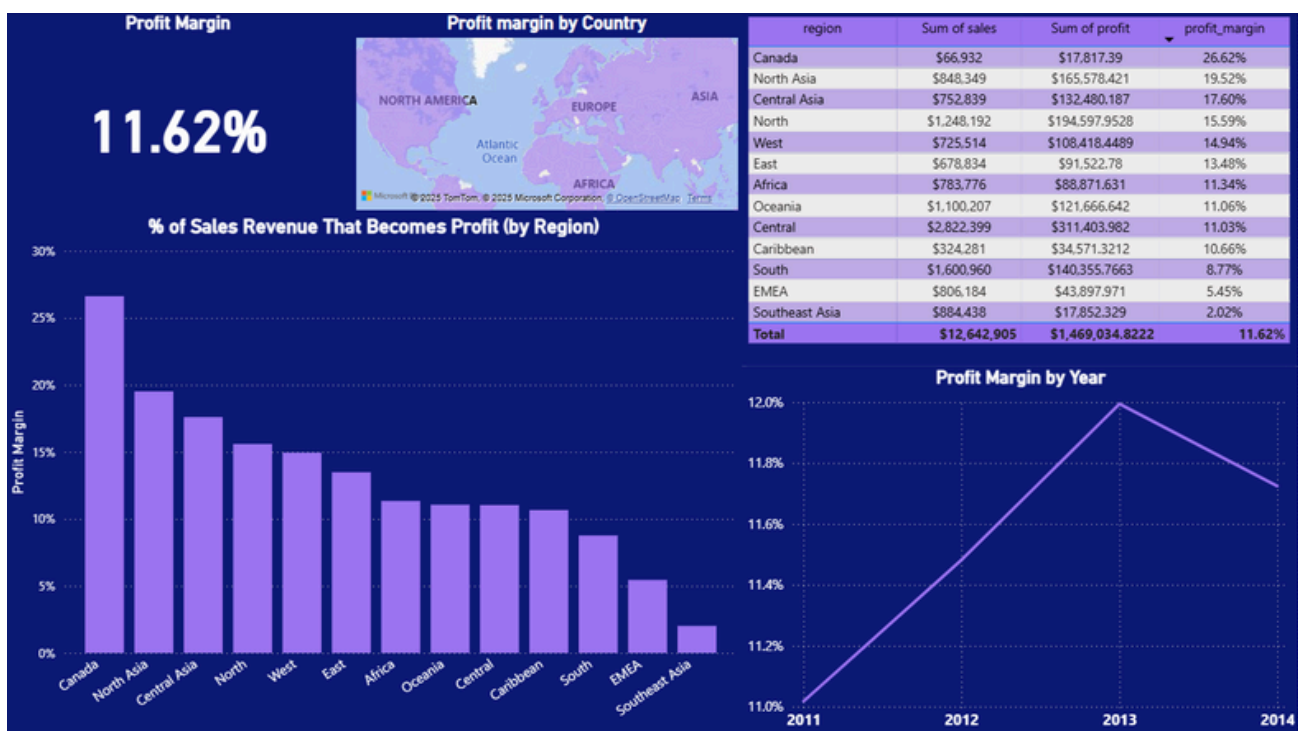
This page focuses on **profit margin**, a key metric in retail that shows how much profit is made from each dollar of sales.

- **Profit Margin Measure:** Calculated as  $(\text{Profit} / \text{Sales}) * 100$  to express profit as a percentage of sales.

This helps assess overall efficiency and profitability across products and regions.

- Visualizations included:
  - KPI showing overall Profit Margin (%)
  - Column chart displaying the percentage of sales revenue that becomes profit by region
  - Line chart tracking profit margin trends by year
  - Interactive map illustrating profit margin by country
  - Table summarizing region, total sales, total profit, and profit margin

This dashboard enables deeper insight into profitability, highlights areas with strong or weak margins and it shows areas with high potential for the company to expand its activity there.

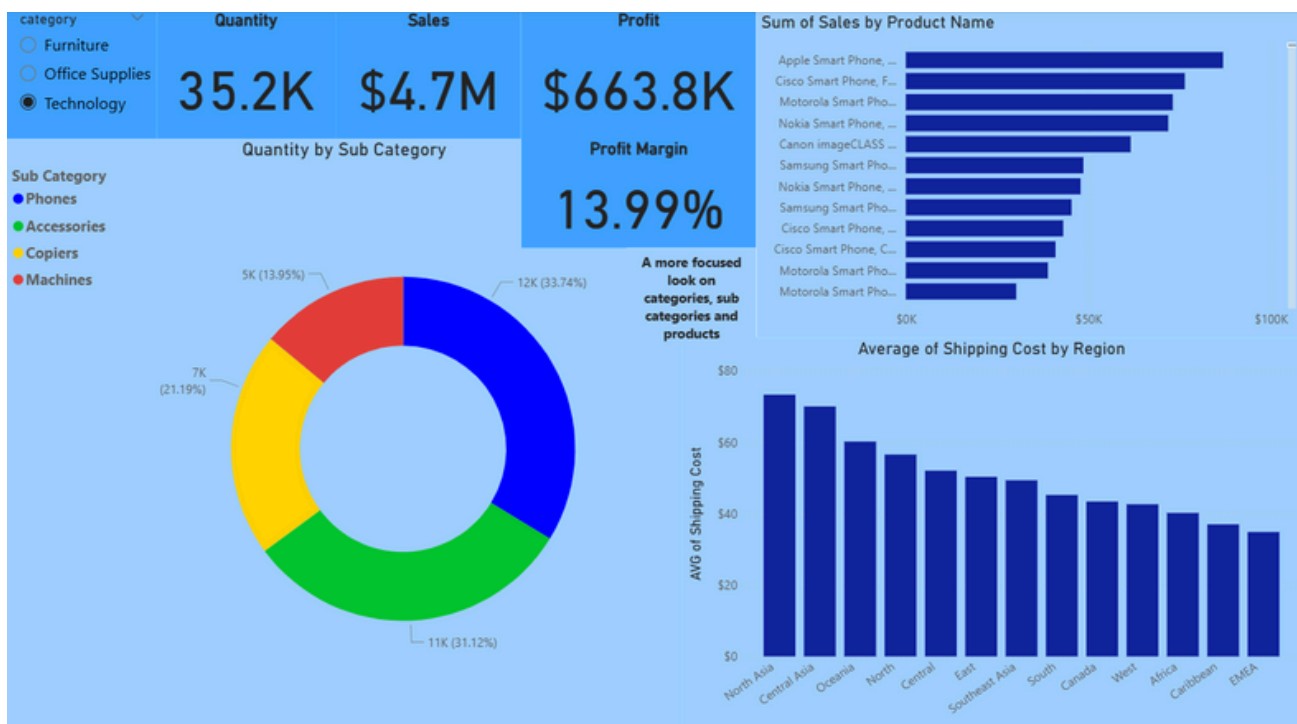


## Third Dashboard: Category & Product-Level Analysis

This page focuses on performance across product categories, sub-categories, and individual products.

- Interactive Slicer:
  - Category slicer (single selection only)
- KPIs:
  - Total quantity
  - Total sales
  - Total profit
  - Profit margin (%)
- Visualizations:
  - Donut chart showing quantity by sub-category
  - Bar chart displaying total sales by product name
  - Column chart showing average shipping cost by region

This dashboard allows us to drill into specific product lines and identify which items or sub-categories are driving performance or incurring high costs.



# Key Insights and Strategic Recommendations

## Insight 1: High Discounts Leading to Low Profit in Certain Regions

- In regions like Southeast Asia, average profit is relatively low, even though sales are fairly high.
- This region also has the highest average discount (~27%), suggesting that heavy discounting may be cutting into overall profitability.
- Similar trends appear — though less severely — in EMEA, Africa, and South regions.

### **Recommendation:**

The client should reassess the discounting approach in these regions. More controlled or targeted discount strategies may help boost profit without significantly lowering sales.

## Insight 2: Stronger Sales in the Second Half of Each Year

- The monthly sales trend shows consistent year-over-year growth across the four years analyzed.
- However, in each year, the second half (July–December) significantly outperforms the first half (January–June) in terms of sales.
- This pattern could be influenced by seasonal demand, marketing activity, or internal operational focus shifting between the two halves.

### **Recommendation:**

- The client should analyze internal and external factors contributing to stronger performance in the second half of the year. Understanding what drives this growth could help replicate similar results earlier in the year.
- Additionally, maintaining a controlled growth pattern might be part of a risk management strategy, but there may be untapped opportunities in the first half that are worth exploring.

## Insight 3: High Profit Margins in Low-Sales Regions Indicate Untapped Potential

- Regions such as Canada, North Asia, and Central Asia show low total sales, with Canada being particularly low.
- Despite that, these regions have high profit margins, especially in Canada, indicating that the business model is efficient and profitable when sales do occur.

### **Recommendation:**

- The client should consider investing more in marketing, outreach, or expansion efforts in these regions. Increasing sales volume in already high-margin areas like Canada could lead to significant profit growth with relatively low risk. These regions represent high-potential opportunities for strategic growth.



## **Insight 4: Technology and Office Supplies Drive Most Profitability**

- The Technology and Office Supplies categories both have a profit margin of ~13%, while Furniture lags behind at only ~7%.

In terms of contribution to total profit:

- Technology accounts for ~45%
- Office Supplies for ~35%
- Furniture only ~19.5%

### **Recommendation:**

- The client should consider prioritizing investment, promotions, and expansion in the Technology and Office Supplies categories, as they generate the majority of profit with higher margins.
- Meanwhile, it may be valuable to analyze the cost structure or pricing strategy of the Furniture category to explore why it underperforms in terms of profitability.