**Retail Sales Analysis Report**

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**Data Cleaning and Preparation**

Before analysis, the dataset was carefully cleaned and prepared to ensure data quality.

* Missing Values: Checked across all columns — no null or missing values were found.
* Duplicate Records: While Order ID and Customer ID repeat (which is expected due to multiple items per order and repeat customers), a full-row check revealed no exact duplicate rows in the dataset.
* Data Formatting: Date fields like Order Date and Ship Date were converted into date format. Numeric fields such as Sales, Profit, and Quantity were also validated and formatted correctly.
* Derived Metrics:
  + Revenue Per Item = Sales/Quantity
  + Shipping Duration = Ship Date − Order Date (in days)
  + Profit Margin = Profit/Sales
  + Extracted Order Month, Order Year, and Order Month-Year from the Order Date to support time-based analysis.

**Exploratory Data Analysis (EDA)**

To understand the underlying trends and patterns in the dataset, I conducted a detailed exploratory analysis using Excel pivot tables. The analysis focused on sales performance, profit distribution, customer behaviour, and product/category insights.

Excel Pivot Table Analysis

I used Excel pivot tables to quickly slice and summarize key metrics:

* *Category & Sub-Category Analysis:*
  + Technology led in overall sales with $836,154 and the highest profit of $145,455, mainly driven by Phones and Copiers.
  + Furniture generated $741,999 in sales but had a relatively low profit of $18,451, with losses noted in Tables and Bookcases.
  + Office Supplies had sales of $719,047 and decent profit of $122,491, especially in Paper and Binders.
* *Region-Wise Summary:*
  + The West and East regions were the top performers in both sales and profit.
  + The South region had the lowest sales and profit contribution.
* *Segment-Wise Sales:*
  + The Consumer segment dominated with over $1.16 million in sales.
  + Corporate and Home Office segments followed with moderate contributions.
* *Monthly Sales Trend:*
  + Peak sales months were November and December, followed by September and October.
  + Lower sales occurred in the early months of each year, especially in February.
* *Year-Wise Trend:*
  + Sales steadily increased from 2014 to 2017, reaching the highest value of $733,215 in 2017.
  + Profit also improved year-on-year, indicating consistent business growth.
* *Discount & Quantity Metrics:*
  + The average discount offered remained around 15–16% annually.
  + Quantity sold increased each year, showing growing customer demand and sales volume.

**Power BI Visual Insights**

In addition to Excel-based pivots, I built interactive dashboards using Power BI to get a more intuitive and visual understanding of the data:

***Executive Summary Dashboard***

* *KPI Cards: Highlighted key performance metrics:*
  + Total Sales: $2.29 million
  + Total Profit: $286k
  + Total Quantity Sold: 37,873
  + Average Shipping Duration: 4 days
  + Return Rate: 5.93% *(Total Return Orders/Total Unique Order \* 100)*
* *Sales Trends:*
  + A Line Chart displayed a clear upward trend in annual Sales & Profit from 2014 to 2017.
  + November and December consistently emerged as peak months.
* *Sales by Category:*
  + Technology took the lead, with Phones and Copiers driving both revenue and profit.
* *Region & Segment Performance:*
  + The West region and Consumer segment were the top contributors in both sales and profitability.
* *Shipping Mode Impact:*
  + Sales & profit varied significantly by ship mode. Visuals helped understand customer preference and cost impact.
* *Profit Margin by Category:*
  + Technology showed higher profit margins compared to Furniture, where some sub-categories even faced losses.

***Customer & Product Insights***

* *Top 10 Customers by Sales:*
  + Identified the key revenue-generating customers to prioritize for loyalty programs or premium services.
* *Top 10 Profitable Products:*
  + These insights can guide inventory and marketing focus.
* *Best-Selling Sub-Categories:*
  + Sub-categories like Phones, Chairs, and Binders showed consistently high sales volumes.
* *Top 10 Profitable Sub-Categories:*
  + Copiers, Phones, and Accessories stood out with the highest total profits among all sub-categories.
  + These categories should be prioritized for marketing and bulk stocking strategies due to their high profitability.
* *Slicers enabled interactive filtering by:*
  + Order Year & Month
  + Region
  + Customer Segment
  + Product Category

**Actionable Recommendations**

1. *Boost Sales During Low-Performing Months (e.g., Jan–Feb)*

* Launch seasonal promotions and targeted discounts to drive purchases during slower months.
* Re-engage inactive customers through email campaigns and personalized offers.
* Introduce bundled deals or free shipping to incentivize larger purchases.

2. *Retain High-Value Customers*

* Implement a loyalty program that rewards frequent and high-spending customers.
* Offer exclusive deals or early access to new products for top customers (e.g., Top 10 by Sales).
* Personalize communication and recommendations based on past purchases to increase engagement.

3. *Improve Product Strategy*

* Focus marketing and inventory on high-performing, high-profit products like Copiers, Phones, and Accessories.
* Consider discontinuing or reevaluating underperforming and loss-making products like Tables and Bookcases.
* Use product bundling strategies to increase the sale of slower-moving items by pairing them with best-sellers.

4. *Optimize Shipping and Reduce Returns*

* Analyse shipping methods to identify the most cost-effective and timely options.
* Encourage the use of reliable shipping modes that balance speed and cost.
* Reduce return rates by ensuring better packaging, clear product descriptions, and pre-shipment quality checks.

5. *Targeted Marketing by Segment*

* Focus campaigns on the Consumer segment, which contributes the most to overall sales.
* Offer tailored discounts or bulk deals to Corporate and Home Office customers to boost engagement and retention.

**Conclusion**

This analysis provided a comprehensive view of the retail sales data from 2014 to 2017. With clean data and strong visualizations, key trends were uncovered across products, regions, customer segments, and shipping performance.

*Key takeaways include:*

* Technology emerged as the most profitable category.
* Copiers, Phones, and Accessories showed the highest profitability.
* The Consumer segment and West region drove the highest sales.
* November and December were peak sales months.
* Actionable strategies have been proposed to boost performance, reduce returns, and retain valuable customers.

**Additional Files Submitted**

* **Retail\_Data\_Analysis\_Dashboard-Snips.pdf**  
  → Contains the Power BI dashboard visuals created as part of the analysis.