## Final Report

### **Data Preparation and Cleaning Process** using Power Query

1. **Data Types Adjusted**
   * Changed **Order Date** and **Ship Date** to **Date format** to enable accurate time-based analysis.
2. **Handling Missing Values**
   * Checked for **null values** in critical columns (Sales, Quantity, Profit, etc.) and ensured no missing data affects the analysis.
   * If missing values were found, they were either **replaced with appropriate values** or **removed** if insignificant.
3. **Duplicate Records Identified & Removed**
   * Checked for duplicate entries based on Order ID.
   * Removed redundant records to prevent **double counting in sales reports**.
4. **Inconsistencies Resolved**
   * Verified **category and sub-category mapping** to ensure accurate drill-through analysis.
   * Standardized **naming conventions** for regions, customer segments, and product categories.

### **Key Insights from the KPI Dashboard:**

1. **Overall Performance:**
   * **Total Sales:** **514K**
   * **Total Quantity Sold:** **5,491** units
   * **Total Profit:** **92K**
   * The profit margin appears to be around **17.9%** (**92K/514K**), which could indicate areas for improvement in cost efficiency or pricing strategy.
2. **Profitability Assessment:**
   * Despite achieving high sales, the **profit ratio** suggests that some products or segments may have lower margins.
   * Further analysis is needed to determine which categories or regions contribute the most to profit and which may be underperforming.
3. **Filtering Capabilities:**
   * The **Customer Segment**, **Category**, and **Region** filters provide the flexibility to drill down into specific areas.
   * These filters can help identify high-profit products, top-performing regions, and key customer segments.

### **Recommendations for Improvement:**

1. **Optimize High-Margin Products:**
   * Identify which **categories (Furniture, Office Supplies, Technology)** have the best profit margins and prioritize them in marketing strategies.
   * Consider phasing out or improving pricing for low-margin products.
2. **Customer Segment Analysis:**
   * Check which **customer segments (Consumer, Corporate, Home Office, Small Business)** contribute the most to profit.
   * Develop targeted strategies for each segment, such as loyalty programs or exclusive discounts.
3. **Regional Sales Strategy:**
   * Analyze sales and profit contributions across **Central, East, South, and West** regions.
   * Allocate resources to high-performing regions while improving marketing efforts in lower-performing ones.
4. **Monitor Discounting Strategy:**
   * If profit margins are lower than expected, evaluate whether **discounts or promotions** are affecting profitability.
   * Adjust pricing strategies accordingly to maintain profitability while driving sales.

### **Key Insights from the Monthly Sales Dashboard:**

1. **Sales Trends:**
   * Sales fluctuate significantly throughout the year.
   * A peak is observed in **April and October**, indicating strong seasonal demand.
   * The lowest sales appear in **May and June**, suggesting a possible seasonal slowdown.
2. **Sales Volatility:**
   * The sales trend shows multiple ups and downs, indicating variability in revenue generation.
   * Sales increase in certain months but dip sharply in others, which may be due to external factors like demand fluctuations or marketing campaigns.
3. **Filtering Options:**
   * The dashboard provides filters for **Customer Segment, Category, and Region**, allowing deeper drill-down analysis.
   * The **Order Date** filter (Jan 1, 2023 - Jan 1, 2024) ensures a full year’s worth of data is considered.

### **Recommendations:**

1. **Investigate Sales Peaks & Dips:**
   * Analyze **April and October** to understand why sales peaked (e.g., promotions, seasonal trends).
   * Examine **May and June** to determine reasons for low sales and strategies for improvement.
2. **Segment-Specific Analysis:**
   * Use the **Customer Segment** filter to check which segment (Consumer, Corporate, Home Office, Small Business) contributes most to peak and low sales.
   * Adjust marketing and pricing strategies accordingly.
3. **Category-Based Insights:**
   * Identify which **product categories (Furniture, Office Supplies, Technology)** drive the highest revenue.
   * Focus on underperforming categories and strategize promotions or product improvements.
4. **Regional Performance:**
   * Utilize the **Region** filter (Central, East, South, West) to analyze geographical sales trends.
   * Allocate resources effectively in high-performing regions and address low-sales areas with targeted campaigns.
5. **Strategic Planning:**
   * Plan marketing campaigns around peak months to maximize revenue.
   * Introduce discounts or promotions during **May and June** to boost sales.
   * Consider inventory and supply chain adjustments based on demand patterns.

### **Key Insights from the Discount vs. Profit Margin Analysis:**

1. **General Trend:**
   * The scatter plot shows **discounts (x-axis) vs. profit margin (y-axis)** with a dotted trend line.
   * The trend line suggests a **slightly positive correlation**, but the data points are widely dispersed, indicating variability.
2. **Dense Clustering at Lower Discounts:**
   * Most data points are concentrated at **discounts below 0.4 (40%)**.
   * This suggests that lower discount levels are more commonly used, which may help maintain profitability.
3. **Higher Discounts and Profit Margin Variability:**
   * As the discount increases beyond 0.4, the profit margins **fluctuate significantly**.
   * Some instances show high profit margins even with high discounts, possibly due to **high-margin products or bulk sales**.
4. **Potential Outliers:**
   * A few data points in the **higher discount range (>0.8 or 80%)** still show notable profit margins.
   * These could represent specific products or customer segments where heavy discounting does not necessarily erode profitability.

### **Recommendations for Improvement:**

1. **Identify Profit-Optimal Discount Levels:**
   * Analyze products or customer segments where high discounts still yield good profits.
   * Set an optimal discount threshold to avoid excessive price cuts that harm profitability.
2. **Segment Analysis for Smarter Discounting:**
   * Use filters (**Customer Segment, Category, Region**) to see where discounts have the best impact.
   * Adjust pricing strategies based on which segments are most sensitive to discounts.
3. **Reduce Deep Discounting on Low-Margin Items:**
   * If certain product categories (e.g., **Furniture, Office Supplies, Technology**) show diminishing returns on high discounts, consider **limiting discounts** or bundling products instead.
4. **Data-Driven Promotional Strategies:**
   * Instead of broad discounting, implement **targeted discounts** for:
     + **High-margin products** to attract volume sales.
     + **Low-selling but profitable items** to boost movement.
     + **Specific customer segments** that respond well to discounts.

### **Key Insights from Top 10 and Bottom 10 Products by Sales:**

Used DAX query to create measure such as TopBottomCategory and Product Profit rank

1. **High-Selling Products:**
   * The **top-selling products** include **Paper, Binders, Pens, Chairs, Laptops, and Sofas**.
   * Office supplies such as **Paper, Pens, and Binders** dominate the high-sales category, indicating strong demand in corporate or educational sectors.
2. **Low-Selling Products:**
   * The **bottom 10 products** include **Tables, Monitors, Bookcases, and Printers**.
   * Large furniture items (Tables, Bookcases) and **technology-based products (Monitors, Printers)** appear among the lowest sellers, possibly due to:
     + Higher price points.
     + Longer purchase cycles.
     + Lower frequency of repurchase.
3. **Category Trends:**
   * **Office Supplies (e.g., Binders, Paper, Pens)** sell in higher volumes.
   * **Furniture (e.g., Chairs, Sofas, Tables, Bookcases)** has mixed sales performance—Chairs perform well, but Tables and Bookcases underperform.
   * **Technology (Laptops, Monitors, Printers)** has inconsistent sales; Laptops perform well, but Monitors and Printers lag.

### **Recommendations for Sales Improvement:**

1. **Boosting Low-Selling Items:**
   * **Targeted promotions**: Offer discounts, bundles, or financing options for high-priced items like **Monitors, Printers, and Tables**.
   * **Marketing & Awareness**: If certain products are underperforming due to lack of visibility, increase promotional efforts via digital campaigns.
2. **Maintaining High-Sellers:**
   * Ensure **consistent stock availability** for high-demand products.
   * Offer **bulk purchase discounts** for items like **Binders, Pens, and Paper** to encourage repeat purchases.
3. **Category-Based Strategy:**
   * **Furniture:** Explore consumer preferences—offer **ergonomic chairs and modular furniture**.
   * **Technology:** Assess reasons behind low sales—consider pricing strategies, improved warranties, or free accessories.
   * **Office Supplies:** Expand product range or offer **subscription-based deliveries** for frequently used items.

### **Insights from Region-Wise Average Profit Analysis:**

1. **Highest Profit Region:**
   * **Central Region** has the highest average profit (**94.97**), indicating strong sales performance and possibly better pricing strategies or lower costs.
2. **Moderate Profit Regions:**
   * **South Region (92.24)** and **West Region (91.85)** show similar profit levels, suggesting stable but slightly lower profitability compared to Central.
3. **Lowest Profit Region:**
   * **East Region (90.25)** has the lowest average profit, which might be due to:
     + Higher operational costs.
     + Competitive pricing pressures.
     + Lower demand or lower-margin products.

### **Actionable Recommendations:**

1. **Boosting Profits in the East Region:**
   * **Analyze product mix**: Identify if lower-margin products dominate in this region.
   * **Review pricing strategies**: Ensure competitive pricing while maintaining profitability.
   * **Marketing campaigns**: Target specific customer segments to drive higher sales.
2. **Maintaining High Performance in Central Region:**
   * **Leverage existing strengths**: Expand high-performing product categories.
   * **Expand customer base**: Promote loyalty programs or discounts for repeat customers.
3. **Improving Profitability Across All Regions:**
   * **Cost Optimization**: Identify cost-saving opportunities in logistics, inventory, or supply chain.
   * **Product Bundling**: Increase revenue per transaction by bundling high-margin products.
   * **Region-Specific Promotions**: Tailor discounts and promotions based on region-specific preferences.

### **Insights from Categorical Sales Analysis:**

1. **Sales Breakdown by Category:**
   * **Furniture:** **177K** (Highest)
   * **Office Supplies:** **170K** (Moderate)
   * **Technology:** **167K** (Lowest, but close to others)
2. **Top-Selling Sub-Categories:**
   * **Sofas** (**$58,750.99**) lead in **Furniture**.
   * **Binders** (**$46,039.48**) and **Paper** (**$46,329.49**) dominate **Office Supplies**.
   * **Monitors** (**$44,821.69**) and **Phones** (**$41,222.79**) perform best in **Technology**.
3. **Region Drill-Through Advantage:**
   * This allows analysis of category performance across different regions.
   * Helps in identifying region-specific demand for each category.

### **Actionable Recommendations:**

* **Furniture:** Focus on high-selling items like **Sofas & Tables**, possibly bundling with related products.
* **Office Supplies:** **Binders & Paper** are strong, so target bulk sales or subscriptions.
* **Technology:** **Monitors & Phones** show strong demand, indicating an opportunity for tech bundles or promotions.

### **Segment-wise Sales Insights:**

1. **Sales Breakdown by Customer Segment:**
   * **Home Office:** **141K** (Highest sales)
   * **Corporate:** **131K**
   * **Consumer:** **122K**
   * **Small Business:** **120K** (Lowest, but close to Consumer)
2. **Category-Wise Sales Distribution:**
   * **Furniture:** Highest sales from **Home Office** (**50,673.73**).
   * **Office Supplies:** Corporate leads (**46,230.36**).
   * **Technology:** Home Office dominates (**46,210.36**).
3. **Region Drill-Through Usage:**
   * Enables deeper insights into sales distribution across different **regions**.
   * Helps in identifying location-based trends in segment preferences.

### **Actionable Strategies:**

* **Home Office:** Focus on premium office **furniture & technology bundles**.
* **Corporate:** Offer discounts on **bulk office supplies**.
* **Consumer & Small Business:** Leverage personalized marketing for targeted sales.

### **Key Insights from Regional Sales Analysis**

1. **South Region has the highest total sales** (132.7K), followed by **East (128.3K)** and **West (127.9K)**.
2. **Technology Sales are highest in the West** (52.7K), indicating strong demand for tech products in this region.
3. **Furniture Sales are highest in the South** (52.4K), suggesting a preference for home or office furnishing in this region.
4. **Office Supplies Sales are highest in the Central region** (44.8K), possibly due to the presence of many businesses requiring these products.
5. **The Central region has the lowest total sales** (125.2K), showing an opportunity for growth in this area.

**Category-wise Drill Through** was used to analyze sales at a granular level, helping to identify key product categories contributing to sales in each region.

### **Recommendations for Boosting Sales**

1. **Target the Central Region for Growth:**
   * Launch **discount campaigns** on popular products.
   * Improve **marketing strategies** by targeting businesses and offices.
   * Offer **bundle deals** for Office Supplies and Technology to encourage higher spending.
2. **Leverage High Technology Sales in the West:**
   * Promote **latest tech products** with exclusive discounts.
   * Expand **after-sales support** to improve customer retention.
   * Target **corporates and professionals** for bulk orders of technology items.
3. **Strengthen Furniture Sales in the South:**
   * Offer **customized furniture solutions** for businesses and home offices.
   * Provide **seasonal discounts and promotions** on premium furniture.
   * Partner with **interior designers** to boost bulk sales.
4. **Enhance Office Supplies Marketing in the Central Region:**
   * Run **special promotions for businesses and corporate clients**.
   * Introduce **subscription models** for recurring purchases.
   * Expand the **distribution network** for better product availability.

**Screenshot of Dashboard**



