

SALES PERFORMANCE ANALYSIS REPORT

[Group Assignment]

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1. Introduction

The purpose of this report is to provide a comprehensive analysis of the sales performance dataset by preprocessing the data and extracting valuable insights. This report focusing on analysis focuses on critical sales metrics, including total revenue, profitability by category, and performance across different regions, with the goal of identifying trends. The dataset, which has been refined and visualized in this report, consists of sales records covering multiple years, allowing for an in-depth exploration of sales trends and patterns. Key questions addressed in this analysis include: Which product categories contribute most significantly to overall sales? What are the profitability trends across different regions?

2. Data Cleaning and Preprocessing

Data cleaning and preprocessing are essential steps in data analysis to ensure accuracy and reliability.

Sr No	Stage	Issue/Task	Details/Action Taken	Reason/Justification
1	Missing Values	Sales: 2 Quantity: 3 Profit: 2	Removed missing value rows	The missing values were correlated with other attributes and keeping them would skew the analysis.
2	Duplicates	3 duplicate entries	Removed duplicates	Entries were repeated due to human error, which could lead to inaccurate aggregation and analysis.
3	Date Format	Uncertain about date format	Standardized to a consistent date format	Ensured consistency in date entries to prevent complications during analysis and time-based insights.
4	Wrong Values	Quantity values (5.5 and 6.5)	Rounded to 6 and 7, respectively	Non-integer values for quantity were inaccurate; rounding aligns with realistic sales data entry.
5	Spelling Errors	Category: 'Technologie' Sub-Category: 'Bindeers'	Corrected to 'Technology' and 'Binders'	Spelling errors corrected for accuracy.
6	Data Reduction	Country column contained only "USA" entries	Removed Country column	The column did not provide meaningful variation for analysis since all entries were from the USA.

By addressing issues, we create a refined dataset that supports meaningful and trustworthy insights with the help of Excel. This clean dataset saved and named as Refined Data for further visualization in the tableau.

3. Descriptive Statistics

Sales		Quantity		Discount		Profit	
Mean	228.51	Mean	3.79	Mean	0.16	Mean	28.48
Standard Error	6.23	Standard Error	0.02	Standard Error	0.00	Standard Error	2.34
Median	54.38	Median	3.00	Median	0.20	Median	8.65
Mode	12.96	Mode	3.00	Mode	0.00	Mode	0.00
Standard Deviation	623.12	Standard Deviation	2.23	Standard Deviation	0.21	Standard Deviation	233.77
Sample Variance	388275.32	Sample Variance	4.95	Sample Variance	0.04	Sample Variance	54646.57
Kurtosis	308.05	Kurtosis	2.01	Kurtosis	2.41	Kurtosis	400.70
Skewness	13.11	Skewness	1.28	Skewness	1.68	Skewness	7.59
Range	22638.04	Range	14.00	Range	0.80	Range	14999.95
Minimum	0.44	Minimum	1.00	Minimum	0.00	Minimum	-6599.98
Maximum	22638.48	Maximum	15.00	Maximum	0.80	Maximum	8399.98
Sum	2282390.79	Sum	37844.00	Sum	1559.79	Sum	284481.38
Count	9988.00	Count	9988.00	Count	9988.00	Count	9988.00

- **Sales:** The average sales per transaction is \$229.86, with a minimum sale amount of \$0.44 and a maximum of \$22,638.48. This wide range suggests variability in transaction sizes.
- **Quantity:** The mean quantity sold per transaction is approximately 4 units, with a minimum of 1 and a maximum of 14 units.
- **Discount:** The average discount given is 15%, with a minimum of 0% and a maximum of 80%, indicating diverse discounting practices.
- **Profit:** The mean profit per transaction is \$28.65, ranging from -\$6,749.47 indicating losses on some transactions

Reason for Keeping Outliers in the Data

We kept the outliers because they reflect real differences in sales, profit, and quantities across sub-categories. These variations help us spot high-demand products, seasonal trends, and other unique opportunities or risks. Keeping them gives us a fuller picture of customer behavior and product performance.

4. Data Transformation:

Sr No	Transformation Type	Field Name	Formula / Hierarchy Components	Purpose
1	Hierarchy Creation	Customer Hierarchy	Customer ID, Segment	Enables segmentation analysis by customer type.
		Geographic Hierarchy	Region	Supports analysis of sales performance by location.
		Product Hierarchy	Category, Sub-Category, Product Name	Allows for detailed product-level insights.
		Order Hierarchy	Order ID, Order Date	Facilitates time-based analysis of sales trends.
2	Calculated Field	Profit Margin	$(\text{Profit} / \text{Sales}) * 100$	Calculates profit margin percentage to identify product and segment profitability.
3	Calculated Field	Profit per Sale	Profit / Quantity	Shows average profit per unit sold, useful for product-level profitability analysis.
4	Calculated Field	Previous Year Sales	LOOKUP(SUM([Sales]), -1)	Captures sales from the previous year for year-over-year performance comparison.
5	Calculated Field	Above Average Sales	$\text{SUM}([\text{Sales}]) \geq \text{WINDOW_AVG}(\text{SUM}([\text{Sales}]))$	Categorizes products or regions as above or below average in sales.
6	Calculated Field	String Revenue	STR([Revenue])	Converts revenue values into string format for labelling in visualizations.
7	Calculated Field	Loss	$[\text{Profit Margin}] < 0$	Flags entries where profit is negative, identifying loss-making products or regions.
8	Calculated Field	Delivery Time	DATEDIFF('day', [Order Date], [Ship Date])	This calculation made to analyse delivery efficiency.

5. Analysis and Interpretation

In our analysis, we created multiple visualizations to gain insights into sales performance across different dimensions. While each visualization provided valuable information, 4 key insights stood out as most critical for strategic decision-making. Here's a summary of these top insights and the reasoning behind their importance. **Please refer charts in Annexture- I**

Sr No	Aspect Analysed	Method of Analysis	Chart Type	Findings	Logical Interpretation
1	Total Sales, Orders, Profit, and Customers Over Time	Tracked trends across years	Line Chart	Sales, orders, and profits have grown steadily from 2011 to 2014, with a peak in 2014.	The consistent upward trend reflects business growth and increasing market demand, especially in 2014. Efforts to maintain customer growth could sustain revenue increases.
2	Total Sales by Subcategory	Sales performance broken down by subcategory	Bar Chart	Phones and Chairs lead in sales, while Supplies and Labels contribute minimally.	The demand for Phones and Chairs is strong, signalling a need for inventory and marketing emphasis in these areas. Supplies and Labels may require re-evaluation or targeted promotions.
3	Sales and Profit by Region	Analyzed revenue and profit by region	Text Box	The West region has the highest revenue (\$730K) and profit (\$108K), while Central has the lowest profit.	The West is a high-performing market, indicating potential for expansion or increased resource allocation. They may need targeted strategies to improve profitability.
4	Discount vs. Profit Margin Analysis	Analyzed impact of discount rates on profit margin	Scatter Plot	Higher discounts are generally linked to lower profit margins; Supplies and Machines have lower margins with high discounts.	Reducing discount rates for certain products, like Supplies, may help improve profit margins without heavily impacting sales volume.

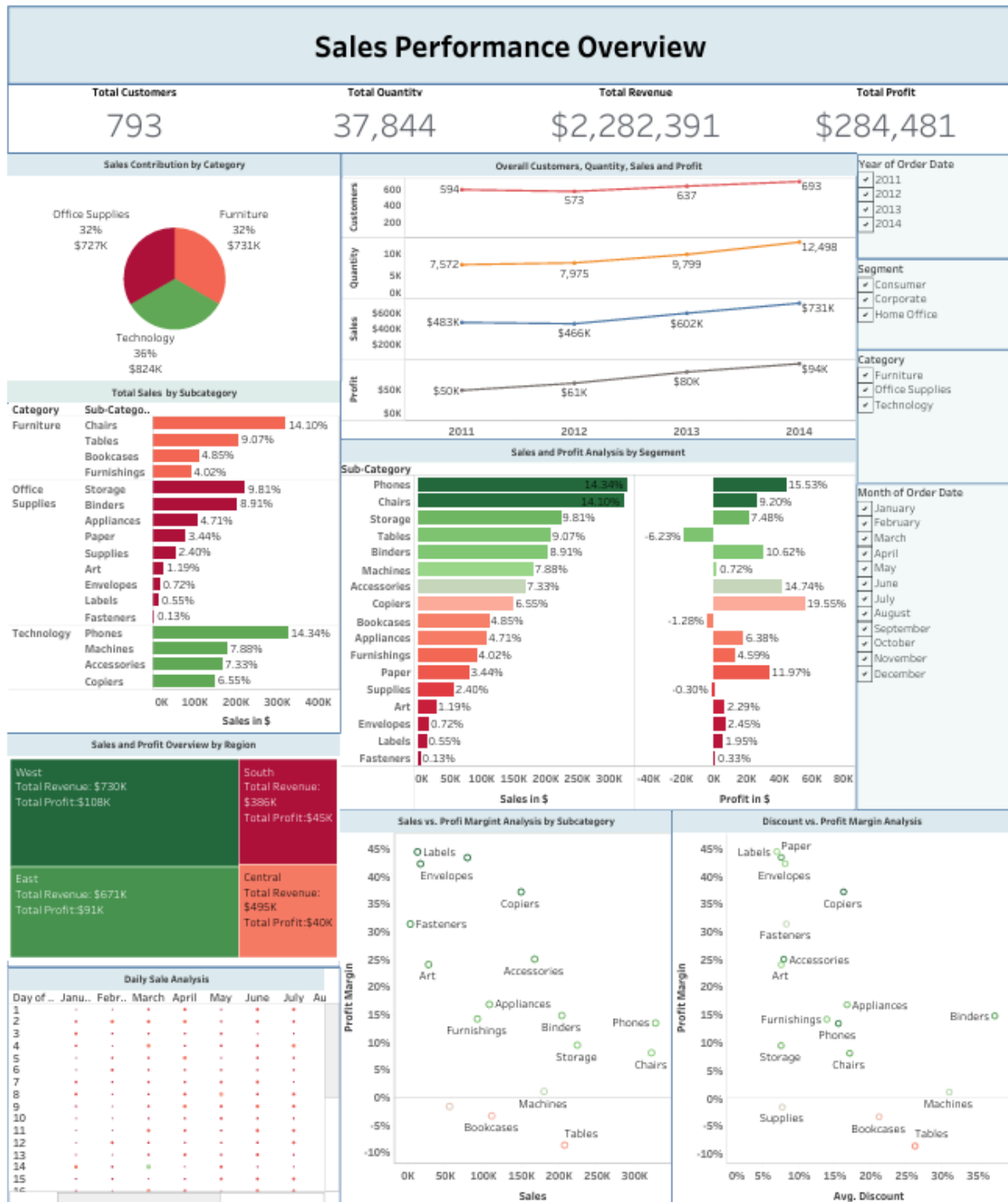
6. Overall Insights

- Technology leads in sales, followed by Office Supplies and Furniture, making it a critical focus area for revenue growth.
- The West region outperforms others in both revenue and profit, presenting an opportunity for expansion and targeted investment.
- High-sales items like Phones and Chairs have moderate profit margins, indicating room for price optimization, while high-margin, low-sales items could benefit from targeted promotions.
- Higher discounts are correlated with lower profit margins, suggesting a review of discount policies to prevent profit erosion.
- November and December show peak sales due to seasonal demand, underscoring the importance of inventory planning for these high-activity months.

7. Conclusion

The sales performance analysis highlights key areas for strategic focus: the Technology category's strong revenue contribution, the West region's profitability, and the Consumer segment's high profit potential. Pricing adjustments for high-sales, low-margin products and refined discount strategies can further enhance profitability. By targeting these insights, the company can make informed decisions to drive growth and maximize revenue.

Annexure- I: Overall Sales Performance Dashboard



Annexure-II Group Work Evidence

1. Task Division

Task	Assigned Member(s)	Responsibilities
Data Cleaning, Preprocessing and Descriptive Statistics	Yashas and Chetan	Yashas and Chetan each conducted separate analyses to explore different perspectives, which informed the next steps.
Data Visualization in Tableau	Saran, Ashutosh, Chetan, Yashas	Each member created individual visualizations, and together, we selected the most insightful charts from all options.
Analysis and Interpretation	Ashutosh and Yashas	Yashas analyzed the visualized data to identify key insights, while Ashutosh interpreted these findings and summarized their business implications to guide recommendations.
Report Writing and Compilation	Chetan, Ashutosh and Saran	Chetan compiled sections on data cleaning and preprocessing. Ashutosh wrote insights, recommendations, and conclusions, and Saran ensured clarity, organization, and alignment with project requirements.

2. Team Collaboration:

We maintained open communication throughout the project, regularly discussing progress and addressing any challenges encountered through WhatsApp group. We conducted meeting on teams review our tasks, share updates, and provide feedback on each other's work. This collaboration ensured that each member was aligned with the assigned goals and aware of others' contributions.

3. Conflict Resolution:

During the project, minor disagreements arose, particularly around the choice of visualizations and interpretation of certain data points. For example, there was a discussion about whether to keep or remove outliers. Two of us argued for removal to ensure accuracy, while other two suggested retaining them as they could represent genuine variations. After a team discussion, we reached a consensus to retain the outliers, supported by a rational explanation in the report.

To address such conflicts, we practiced active listening and encouraged each member to express their viewpoints. We resolved disagreements by discussing the pros and cons of each approach and selecting the option that best aligned with our project objectives. This approach ensured a balanced, well-considered final report

4. Learnings

This assignment reinforced the importance of data cleaning and visualization in uncovering valuable insights. Through refining data and analysing key metrics, we learned how targeted adjustments in pricing, discounting, and marketing can significantly impact business outcomes. These learnings emphasize the role of Business Analytic in informed decision-making, equipping us with skills to apply in future analyses and business contexts