

Regional Sales Analysis Report

1. Summary

This report presents a detailed exploratory data analysis (EDA) of five years of U.S. sales data, with the goal of uncovering key trends, evaluating profitability, and identifying opportunities for strategic improvement. The study reveals significant financial volatility, an over-reliance on certain products, customers, and regions, and profitability that is primarily driven by pricing strategies rather than sales volume. Insights from the analysis are consolidated into actionable recommendations, supported by a Power BI dashboard for interactive exploration.

2. Business Problem & Objective

Organizations often face challenges in maintaining balanced growth across products, customers, and regions. In this case, uneven sales and profit distribution across U.S. regions, lack of visibility into seasonal patterns, and concentration of revenue in a few channels and products posed significant business challenges.

The main objectives of this project were:

- To explore and visualize historical sales data to identify trends and correlations.
- To evaluate the profitability of customers, products, and regions.
- To highlight risks associated with over-dependence on specific areas.
- To provide actionable recommendations for stabilizing growth and improving profitability.

3. Data Overview

The dataset combined information from multiple tables, including Sales, Products, Customers, Regions, States, and Budgets. Initially, these tables were unlinked and required preprocessing before analysis.

Preprocessing steps included:

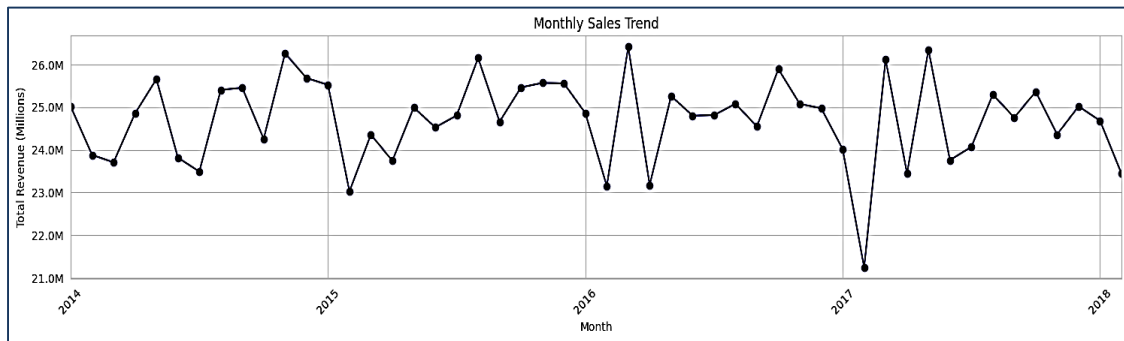
- Merging multiple tables into a unified dataset.
- Removing redundant or duplicate columns.
- Standardizing column names for consistency.
- Selecting only relevant fields required for analysis.
- Creating calculated metrics such as profit and profit margin percentage.

Data quality checks confirmed there were no missing values or duplicate records.

4. Exploratory Analysis & Findings

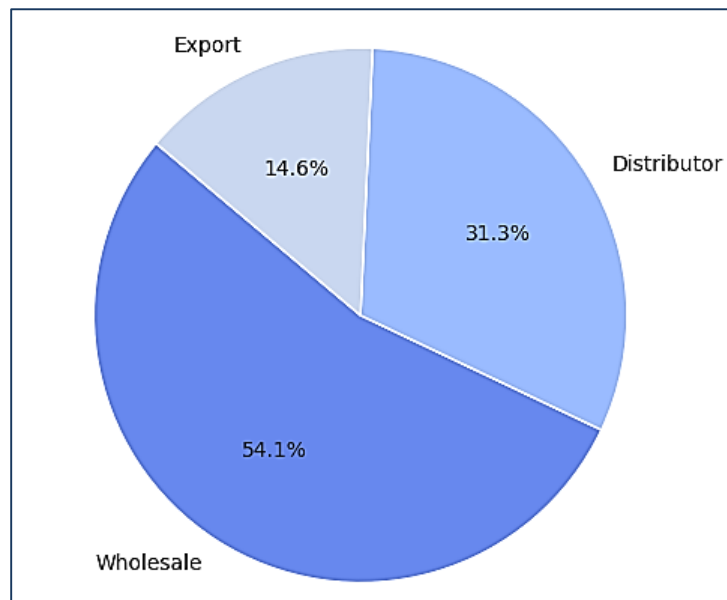
4.1 Monthly Sales Trend

The monthly sales analysis showed significant volatility, with revenues fluctuating between \$21M and \$26.5M. Peaks were observed in May and June, while early 2017 recorded the sharpest decline. Despite occasional spikes, there was no evidence of a consistent long-term upward trend. Seasonality was also evident, with January averaging \$124M compared to April's lower \$95M.



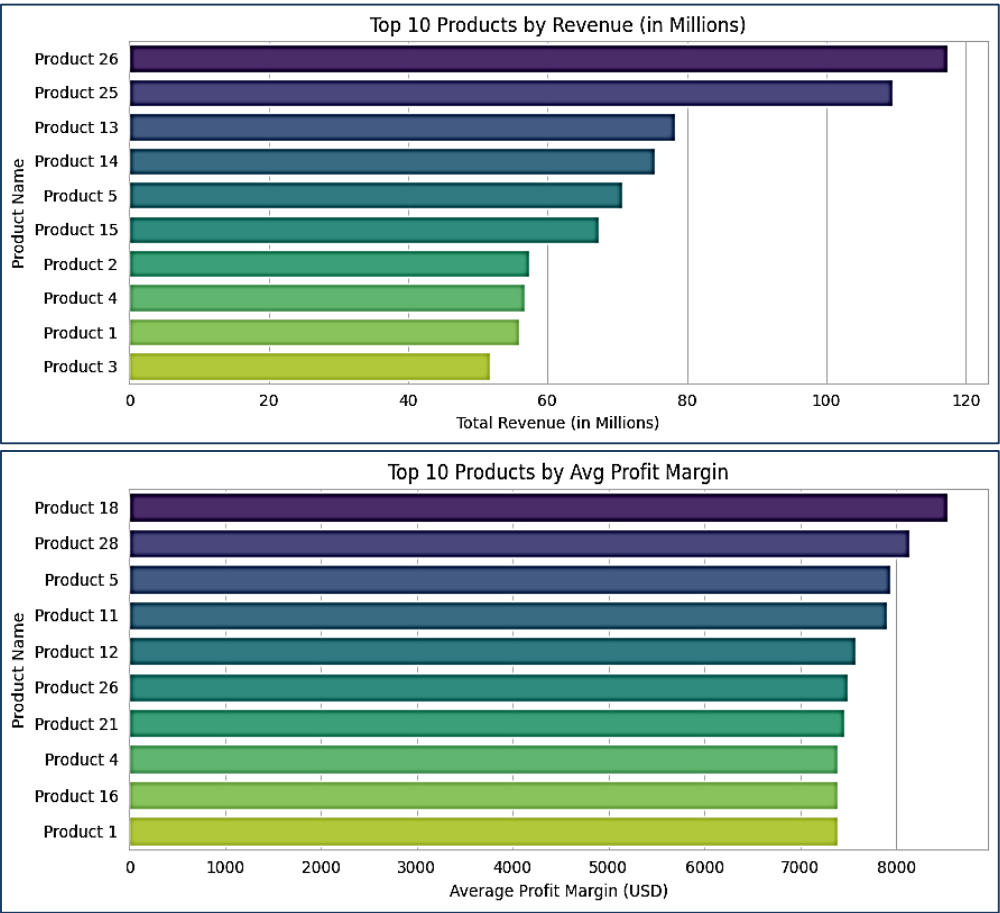
4.2 Sales by Channel

The Wholesale channel was the dominant contributor, accounting for 54.1% of total sales, followed by Distributor with 31.3%. Together, these two channels generated more than 85% of revenue, highlighting dependency risk. In contrast, the Export channel, while contributing only 14.6% of sales, delivered the highest average margins (~38%).



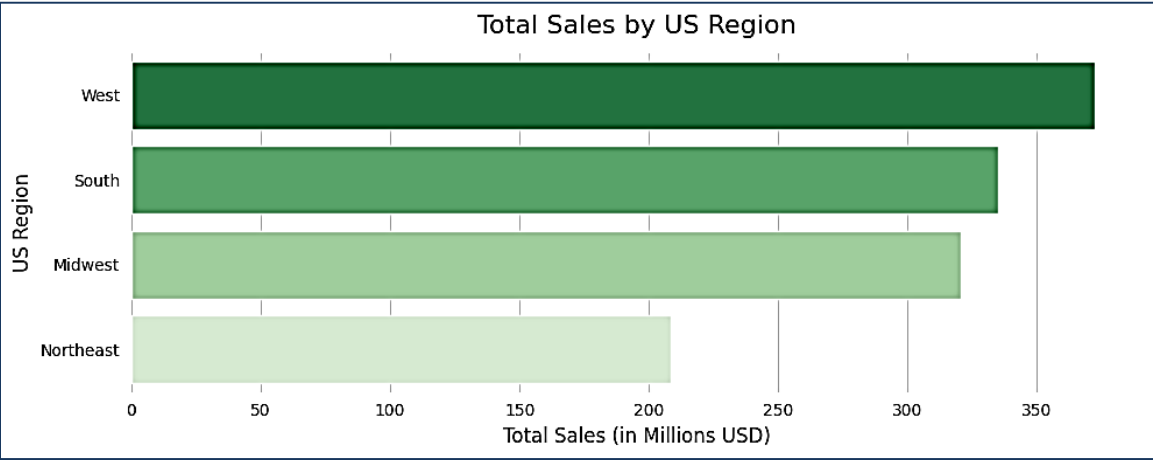
4.3 Product Performance

Revenue was highly concentrated in a few products. The top two SKUs contributed over \$100M each, together accounting for ~25% of total sales. A sharp revenue decline followed, with the third-ranked product generating 30% less than the leader. Bottom-performing products clustered around \$50M–\$65M. While profit margins across the top 10 products were relatively consistent, certain low-margin SKUs were identified for reevaluation.



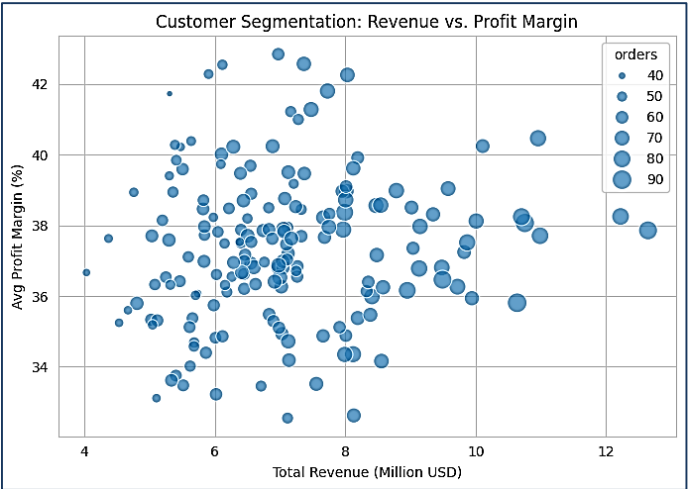
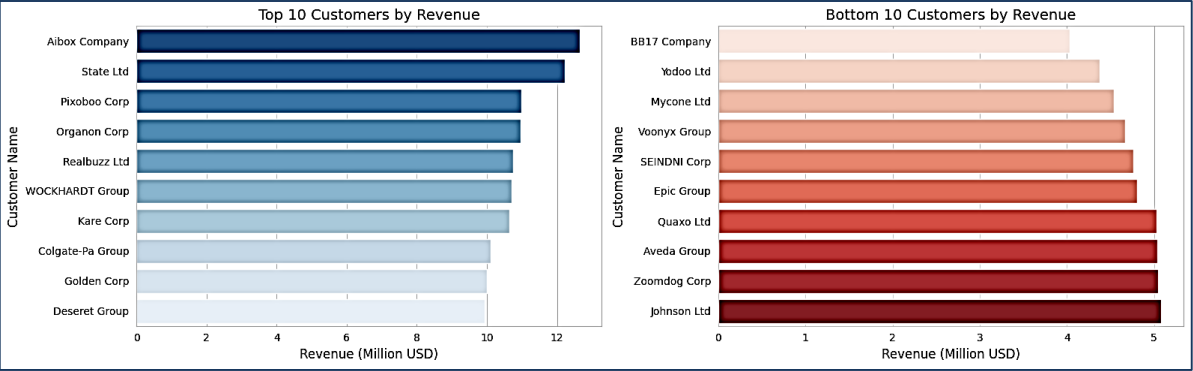
4.4 Regional and State Analysis

The West region dominated sales performance, contributing ~\$350M, while the Northeast lagged behind at ~\$200M. This \$150M gap underscores significant regional imbalance. At the state level, California was the clear leader, achieving \$230M in revenue with ~7,600 orders. The distribution of order sizes was skewed: most orders were under \$100,000, with the highest frequency in the \$0–\$25,000 range. Large orders above \$300,000 were rare and accounted for a small share of revenue.



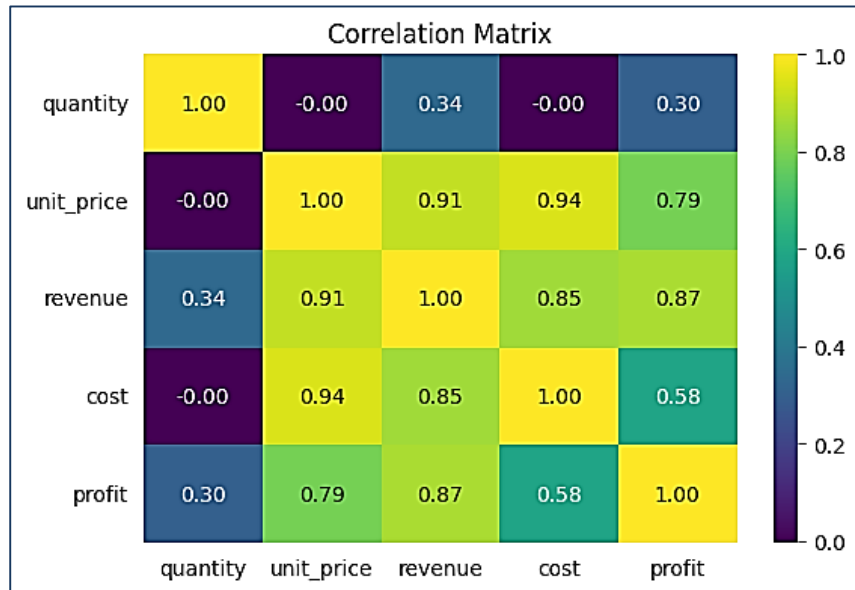
4.5 Customer Analysis

The customer base showed sharp stratification. Top-tier customers generated over \$10M each, more than double the revenue of bottom-tier clients, who averaged only \$4M–\$5M. Revenue concentration posed a risk, with the company relying heavily on a small set of high-value customers. Profitability analysis revealed no consistent correlation between total revenue and profit margins, with many high-revenue customers delivering moderate margins. Most customers clustered in the \$6M–\$9M revenue range with 36–39% margins.



4.6 Correlation Analysis

Correlation analysis confirmed that revenue and profit were strongly related (0.87). Unit price showed very strong positive correlation with both cost (0.94) and revenue (0.91), establishing pricing as a key driver. In contrast, the number of units sold had almost no relationship with price or cost, and only weak correlations with revenue (0.34) and profit (0.30). This suggests that financial performance depends more on pricing strategy and cost management than on sheer sales volume.



5. Key Insights

1. Financial volatility is a major challenge, with revenue fluctuating month-to-month without a steady growth trend.
2. Sales are highly concentrated, with dependence on a few products, customers, regions, and sales channels.
3. Profitability is driven more by unit pricing and cost control than by sales volumes.
4. Regional performance is uneven, with the West far outperforming the Northeast.
5. High revenue does not guarantee high profitability, as customer margins vary significantly.

6. Recommendations

Based on the analysis, the following recommendations are proposed:

1. Manage seasonality by reinforcing sales in weak months (e.g., April) through promotional campaigns, and leveraging January's strong performance with targeted marketing.
2. Optimize the product portfolio by focusing on top-performing SKUs and reconsidering low-margin or stagnant products.
3. Diversify channel strategy by expanding the high-margin Export channel while sustaining Wholesale through volume-based incentives.
4. Address regional disparities by replicating successful strategies from California and the West in underperforming regions like the Northeast.
5. Strengthen customer strategy by protecting high-value clients with loyalty initiatives, while upselling mid-tier customers to bridge the revenue gap.
6. Implement profitability monitoring with alerts for low-margin orders, and adjust pricing dynamically based on cost structures.

7. Power BI Dashboard

An interactive Power BI dashboard was created to complement the analysis. It enables stakeholders to:

- Monitor monthly sales volatility with drill-down capabilities.
- Compare channel contributions and profitability.
- Visualize sales performance by region and state through heatmaps and bar charts.
- Analyze customer and product profitability segments interactively.

Filters were included to allow dynamic exploration by region, product, and customer segment.

8. Conclusion

The project delivered a complete EDA and visualization framework to uncover hidden patterns in regional sales data. Findings confirmed volatility, concentration risks, and the dominance of pricing as a profitability driver. By implementing the recommended strategies—targeting seasonality, optimizing the product mix, diversifying channels, and addressing regional and customer imbalances—the company can achieve more sustainable and balanced growth. The Power BI dashboard provides a practical, interactive tool for ongoing monitoring and data-driven decision-making.