



“Amazon Sales Performance Data Analysis”

Presented by-

Swetha Srinivas

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Introduction

In today's competitive and dynamic e-commerce market, Amazon faces constant pressure to refine its sales strategies. Leveraging data-driven insights is crucial to stay at the forefront. This approach helps optimize profitability, enhance operational efficiency, and ensure high levels of customer satisfaction.

Analyzing sales performance through detailed data is essential for Amazon to respond effectively to market changes and maintain its competitive edge.



ANALYSIS

Business Problem Statement:

Amazon must continuously refine its sales strategies to stay ahead in a rapidly evolving market. The challenge is to effectively utilize data-driven insights to:

- Optimize profitability.
- Improve operational efficiency.
- Ensure high levels of customer satisfaction.

A comprehensive analysis of Amazon's sales data is essential for identifying growth opportunities, enhancing profit margins, and improving sales tactics. By addressing these issues, Amazon can maintain its competitive edge and drive sustained success.

Data Source

The dataset used for this analysis comprises sales information from XYZ Company, focusing on various factors affecting sales performance. It includes a total of 100 records with 14 attributes per transaction.

Key features such as Region, Country, Item Type, Sales Channel, Order Priority, Units Sold, Unit Price, Total Revenue, and Total Profit are included, providing a comprehensive view of sales dynamics across different regions and product types.

The dataset has been preprocessed for analysis, ensuring it is clean and ready for generating actionable insights to enhance sales strategies and optimize performance.

Project Statement

This project will focus on analyzing Amazon's sales data with the following objectives:

Trend Analysis: Evaluate monthly, yearly, and combined sales trends to identify patterns, seasonal effects, and potential growth opportunities.

Key Metrics Extraction: Analyze total revenue, costs, and profits to understand performance metrics and uncover key drivers of success.

Factor-Wise Analysis: Investigate the impact of factors such as region, product type, sales channel, and order priority on overall sales and profitability.

The analysis will provide actionable insights to refine Amazon's sales strategies, enhance profitability, and adapt to evolving market conditions. Advanced visualizations will be employed to support strategic decision-making and improve operational efficiency.

Tools Used:

Python: For Data cleaning and Exploratory Data Analysis(EDA)



Pandas: For Data Manipulation



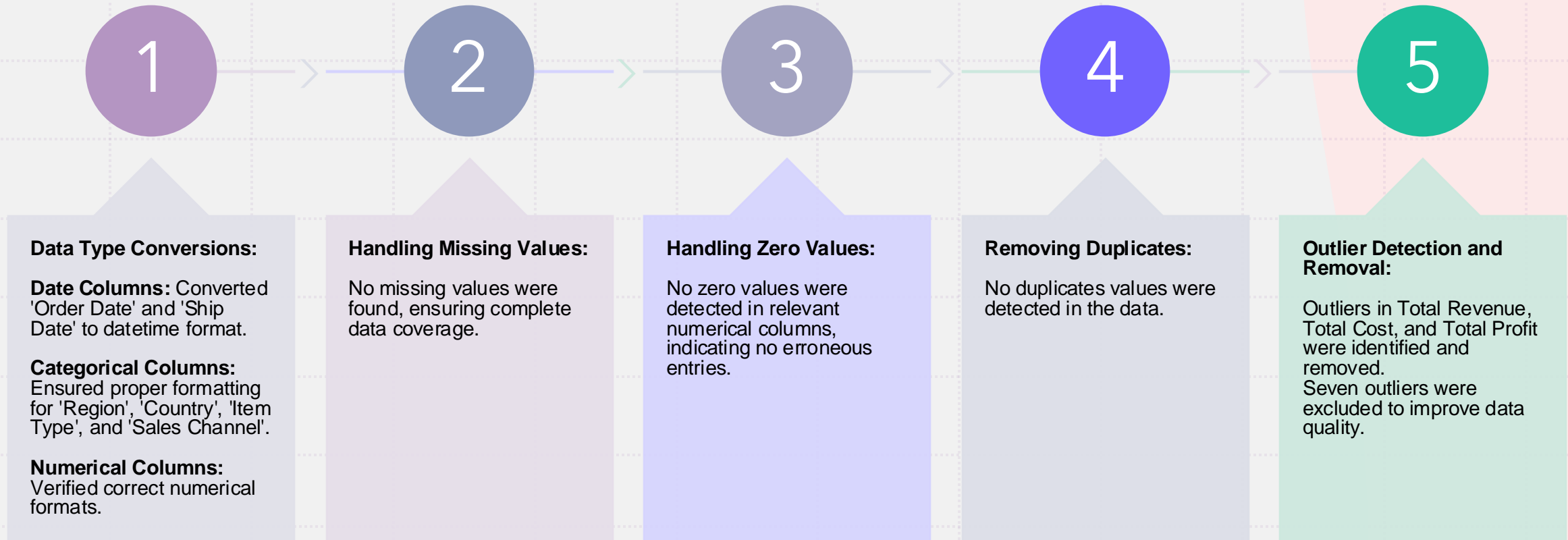
Matplotlib & Seaborn: For Data Visualization



Power BI: For Data Visualization using Interactive dashboards

Data Preparation

Data preparation process involves fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset, to prepare data for analysis.



Descriptive Statistics

Our analysis of the Amazon sales dataset reveals that out of 100 there are **93 unique Order IDs**, showcasing a variety of transactions. The dataset includes **12 item types**, with Clothes being the most frequent, followed by Office Supplies and Fruits.

Sales are distributed across **72 countries**, with notable activity in **Sub-Saharan Africa, Europe, and Asia**. Sales channels are fairly balanced between **Online and Offline**, and orders are categorized into four priority levels, with **High priority** being the most common.

These findings provide a clear overview of the sales distribution across different categories, geographic locations, and sales channels, offering valuable insights for optimizing sales strategies.

Key Performance Indices (KPIs)

Key Performance Indicators (KPIs) are essential metrics that help evaluate business performance and guide decision-making processes. They offer insights into sales, costs, profitability, and overall operational efficiency.

The **total revenue** generated from the dataset is **\$104,233,116.00**, while the **total profit** stands at **\$33,821,335.00**. This results in a **profit margin** of **32.45%**, showcasing the company's profitability.

The **average unit price** is **\$231.48**, and the **average unit cost** is **\$156.37**, reflecting the costs and pricing structure of products sold. The company achieved a **return on investment (ROI)** of **48.03%**, highlighting efficient cost management and profitability.

These KPIs provide key insights into financial performance, helping to monitor revenue generation, cost efficiency, and profitability.

Total Revenue: \$104.42 M

Total Profit: \$33.82 M

Total Cost: \$70.41 M

Profit Margin: 32.45%

Average Unit Price: \$231.48

Average Unit Cost: \$156.37

Return on Investment (ROI): 48.03%

Analysis & Insights

To facilitate a comprehensive understanding of the factors influencing Amazon's sales performance, we have categorized these factors into key areas.

These groupings are crucial as no single factor can fully explain sales trends or outcomes. By organizing related factors, we can gain a detailed insight into the drivers of sales performance and identify areas that require targeted strategies for improvement.

This approach helps in addressing the complexities of sales dynamics and enhancing overall business effectiveness.



Sales
Trend
Analysis

Factor-
Wise
Analysis

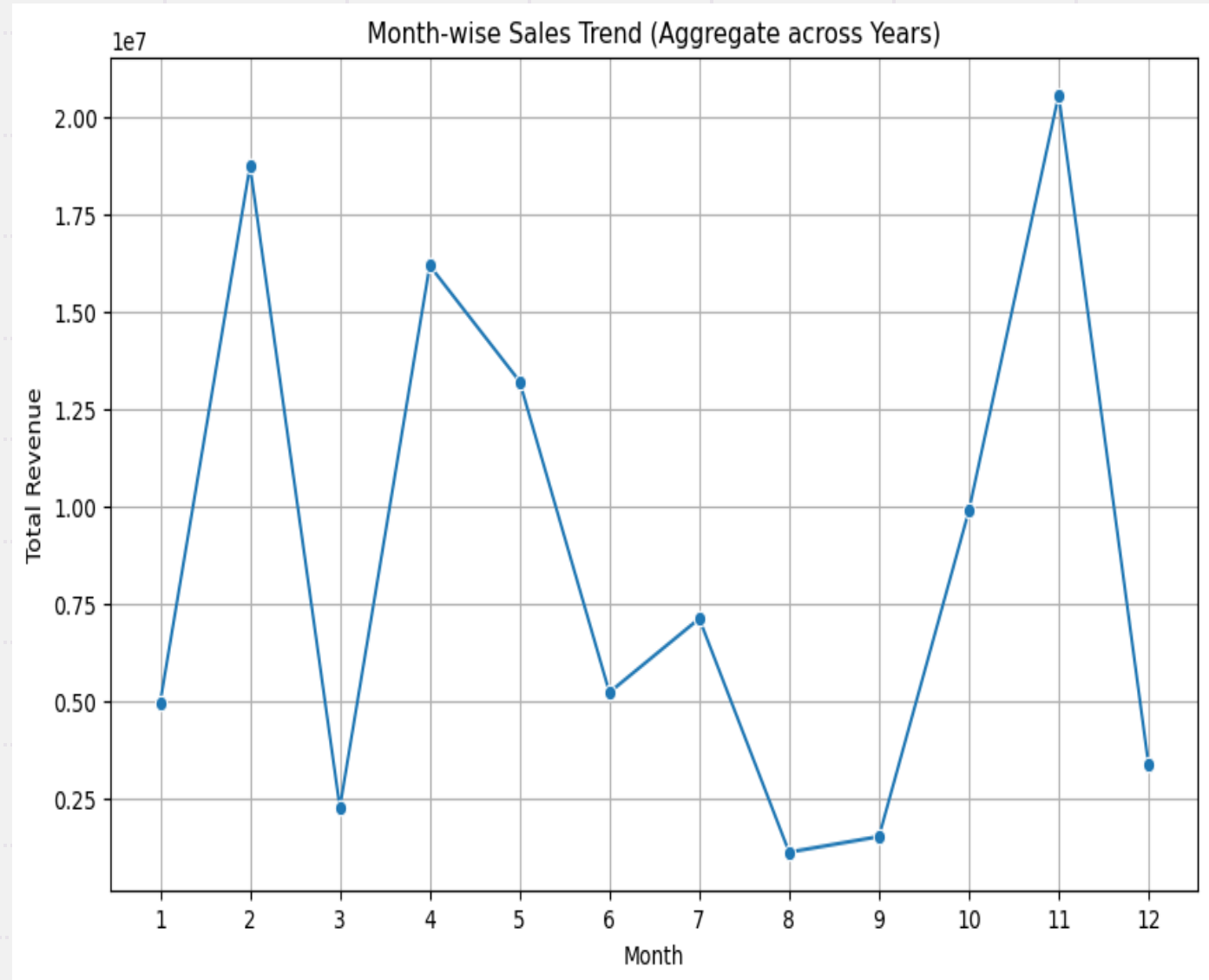
Correlation
Analysis

Sales Trend Analysis

Monthly Sales Trend

The monthly revenue data highlights clear seasonal trends where November and April are peak revenue months, while August and December see the lowest sales. Revenue trends rise through the year, peak in November, dip in summer, and decline sharply thereafter, reflecting seasonal buying behaviors.

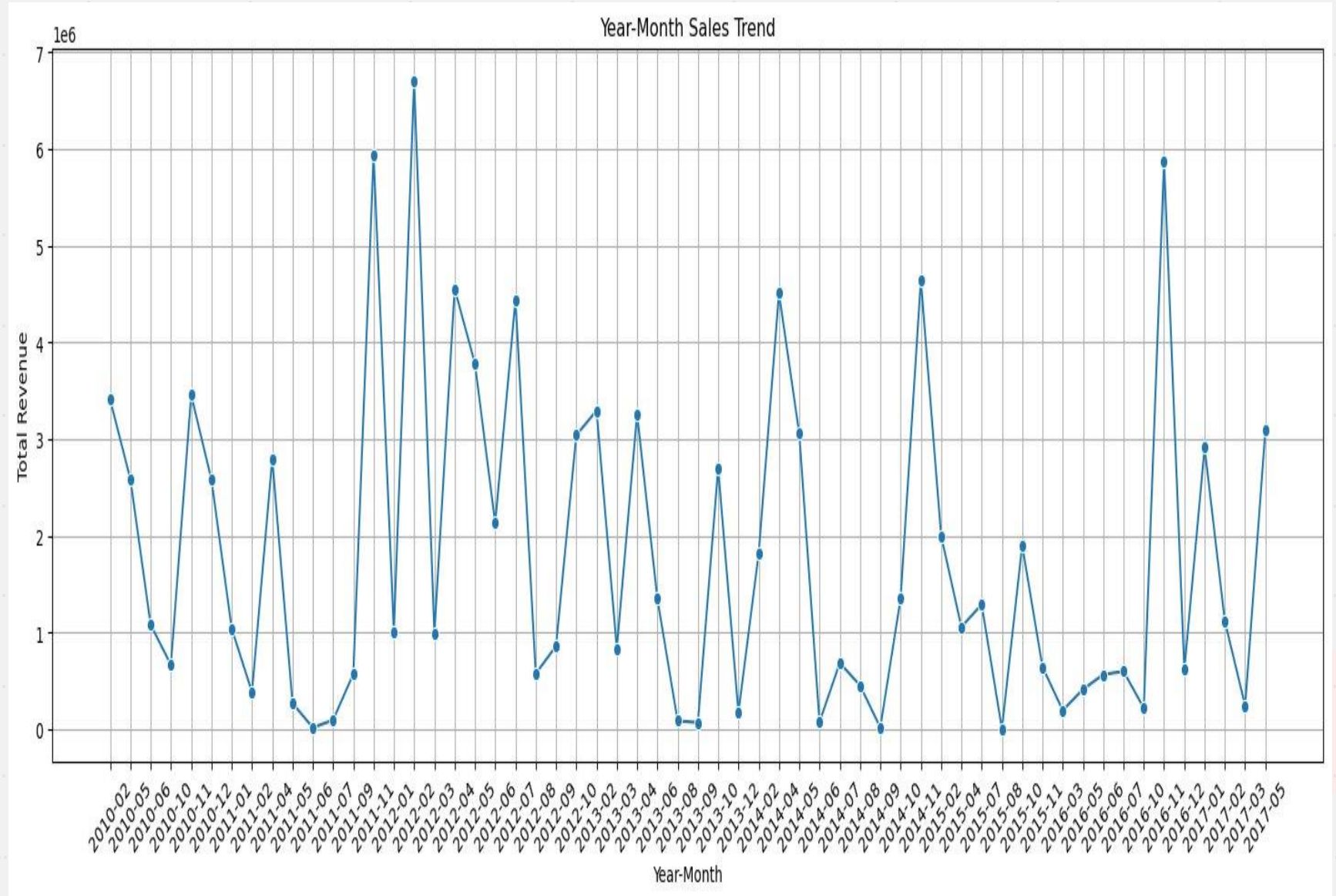
The peaks in November and April likely reflect seasonal demand or promotions, while the drops in August and December suggest reduced consumer spending during these months.



Yearly Month wise Sales Trend

The revenue analysis shows that February 2012 (\$6.7M) and November 2016 (\$5.9M) are the highest revenue months, with consistent strong performance during these periods. Conversely, summer months tend to exhibit lower revenue, and June 2011 and August 2015 experienced particularly low sales, each under \$10,000.

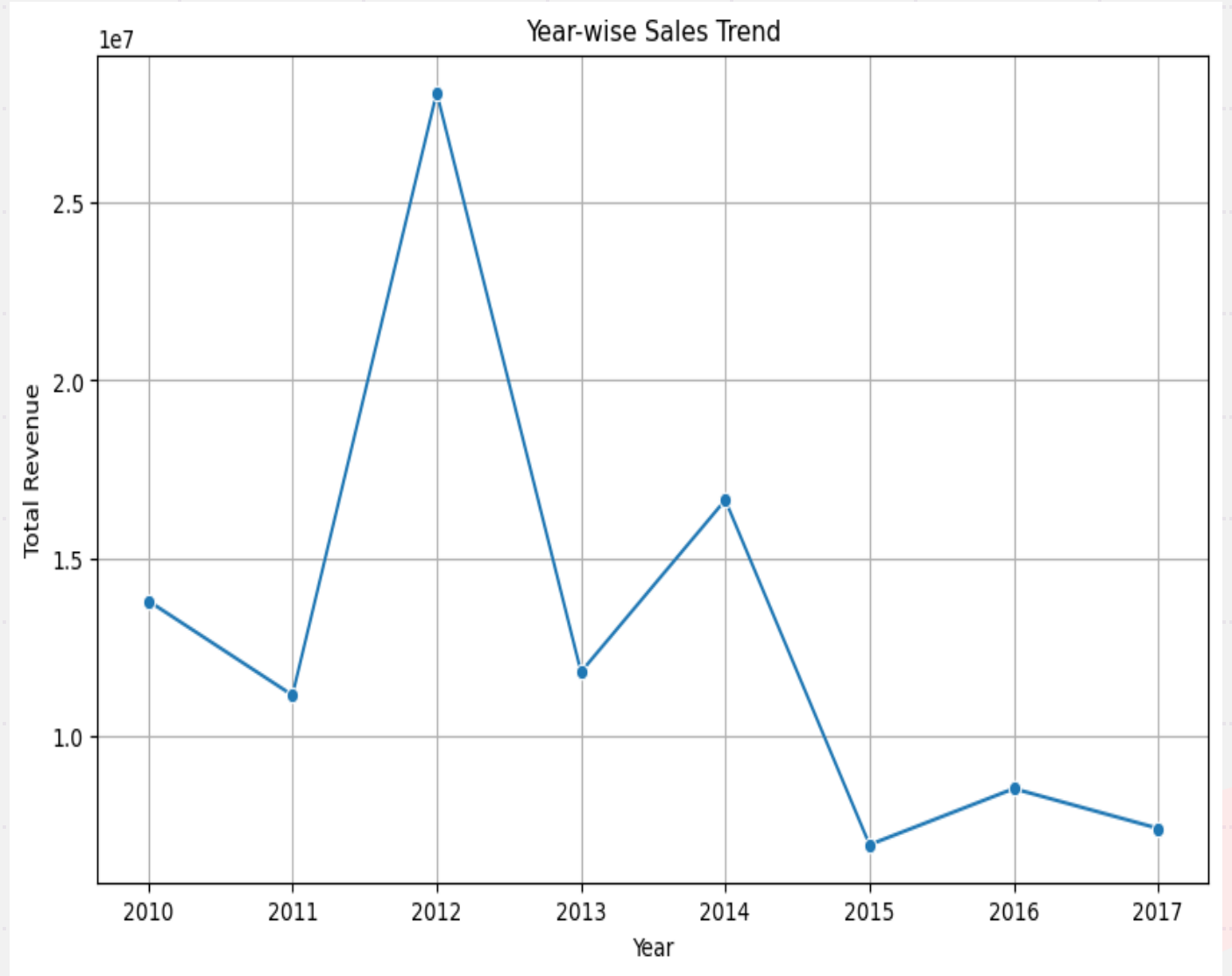
The peaks in February and November likely reflect seasonal demand or targeted promotions, while the summer decline may be due to decreased consumer spending during vacation periods.



Yearly Sales Trend

The peak revenue year was 2012, with \$28.1M, while 2015 had the lowest revenue at \$6.9M. Revenue trends show a decline from 2014 to 2015, followed by a slight increase in 2016, though still below the 2012 peak. The overall pattern highlights fluctuating revenue in recent years, with a significant dip in 2015.

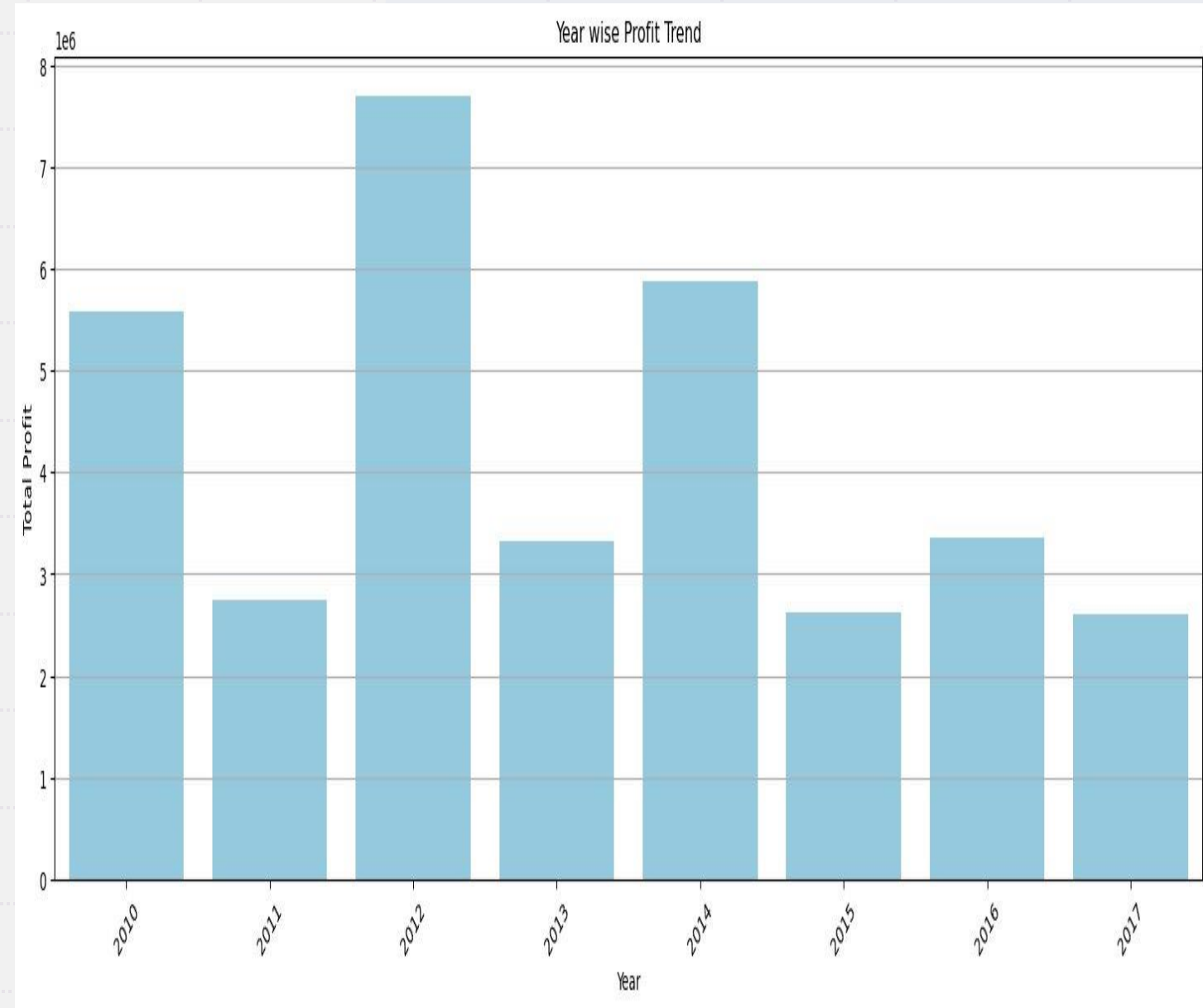
The peak in 2012 may be due to market expansion or successful product launches, while the sharp drop in 2015 could point to economic challenges or reduced demand.



Yearly Profit Trend

In 2012, total profit peaked at \$7.7M, while 2011 had the lowest profit at \$2.7M. 2013 and 2015 also saw lower profits at \$3.3M and \$2.6M, respectively. 2014 was the second most profitable year with \$5.8M, and 2017 had a low profit of \$2.6M, similar to 2015. This highlights 2012 as the peak year, with 2011, 2015, and 2017 as the lowest.

The high profit in 2012 likely reflects exceptional business performance or successful strategies, while the dips in 2011, 2015, and 2017 may indicate economic challenges or reduced operational efficiency during those years.



Factor-Wise Analysis

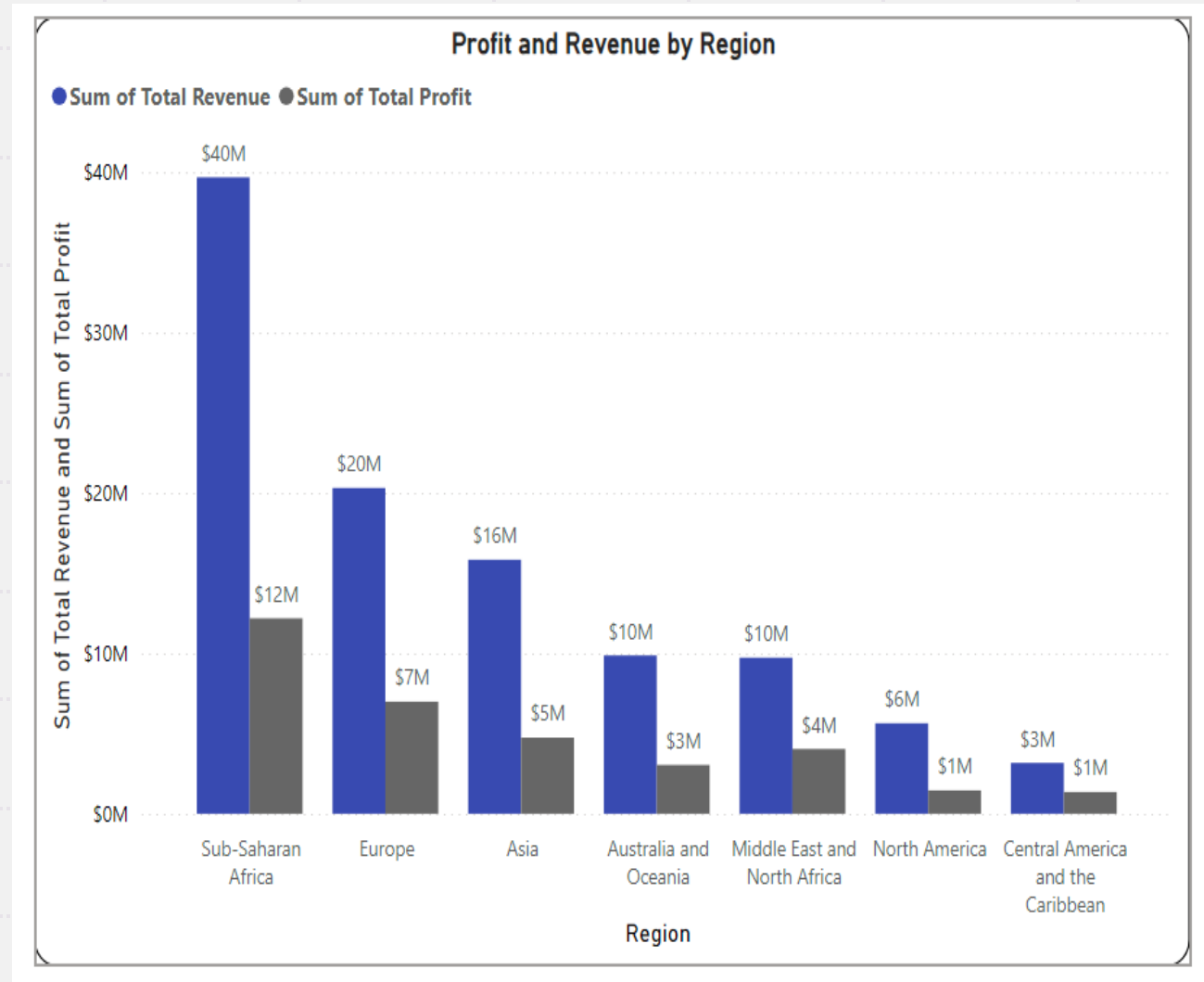
REGION

Sales Performance Across Regions: Sub-Saharan Africa leads with \$40M in revenue, reflecting a strong market presence, while Central America and the Caribbean has the lowest revenue at \$3M, suggesting market challenges.

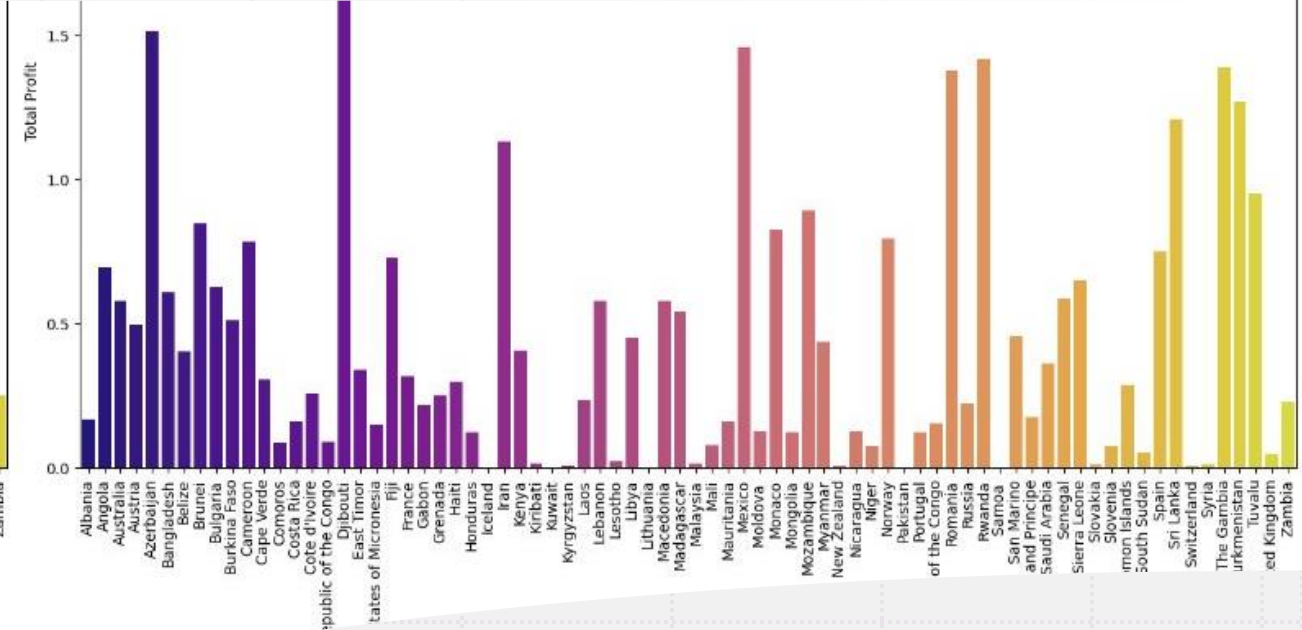
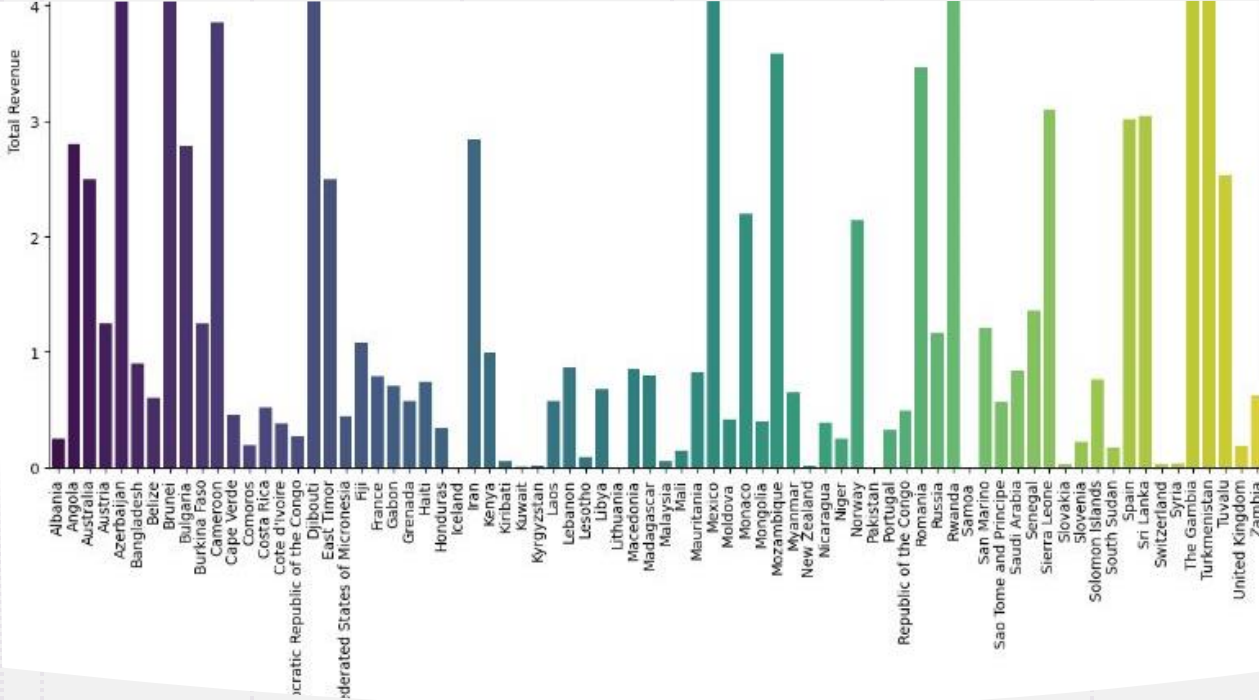
Most Profitable Regions: Sub-Saharan Africa tops with \$12M in profit, indicating efficient cost management, while Central America and the Caribbean shows the lowest profit at \$1M suggesting higher costs or lower profit margins.

Regions with Higher Costs: Europe and the Middle East and North Africa show high revenue but moderate profits, implying potentially higher costs.

Sub-Saharan Africa excels in both revenue and profit, whereas Central America and the Caribbean face challenges. High-revenue regions with lower profit margins may be encountering higher costs.



COUNTRY



Top Revenue: The Gambia (\$5.4M), Turkmenistan (\$5.8M), and Azerbaijan (\$4.5M) lead in sales.

Lowest Revenue: United Kingdom (\$188K) and Albania (\$248K) show the lowest revenue.

Top Contributors: Azerbaijan, The Gambia, and Turkmenistan excel in revenue and profit.

High Costs Relative to Revenue: The United Kingdom and Austria may face high costs compared to their revenue.

The Gambia and Turkmenistan are strong performers in revenue, while Azerbaijan excels in both revenue and profit. Countries with lower profit margins, like the United Kingdom and Austria, may be experiencing higher relative costs.

ITEM TYPES

Most Popular Items : Clothes lead with 71,260 units, showing strong demand. Personal Care follows with 48,708 units, and Cosmetics ranks third with 46,644 units, indicating solid sales but slightly lower volume.

Most Profitable Items: Cosmetics tops with \$8.1M in profit, indicating effective cost management. Clothes generate \$5.2M, reflecting strong margins despite high sales, while Household earns \$4.6M, ranking third.

Cost Insights: High-profit items like Cosmetics and Clothes benefit from better cost control or higher pricing, while lower-profit items face higher production costs or pricing pressures.

Despite lower sales volume, Cosmetics is the most profitable due to effective cost control. Top sellers like Clothes and Personal Care have lower profit margins, likely due to higher costs or competitive pricing.

Item Type	Sum of Units Sold	Sum of Total Profit
Baby Food	40545	\$3,886,641
Beverages	56708	\$888,043
Cereal	25877	\$2,292,441
Clothes	71260	\$5,233,329
Cosmetics	46644	\$8,109,988
Fruits	49998	\$120,491
Household	27503	\$4,558,068
Meat	10675	\$610,609
Office Supplies	38680	\$4,883,346
Personal Care	48708	\$1,220,619
Snacks	13637	\$751,942
Vegetables	20051	\$1,265,818

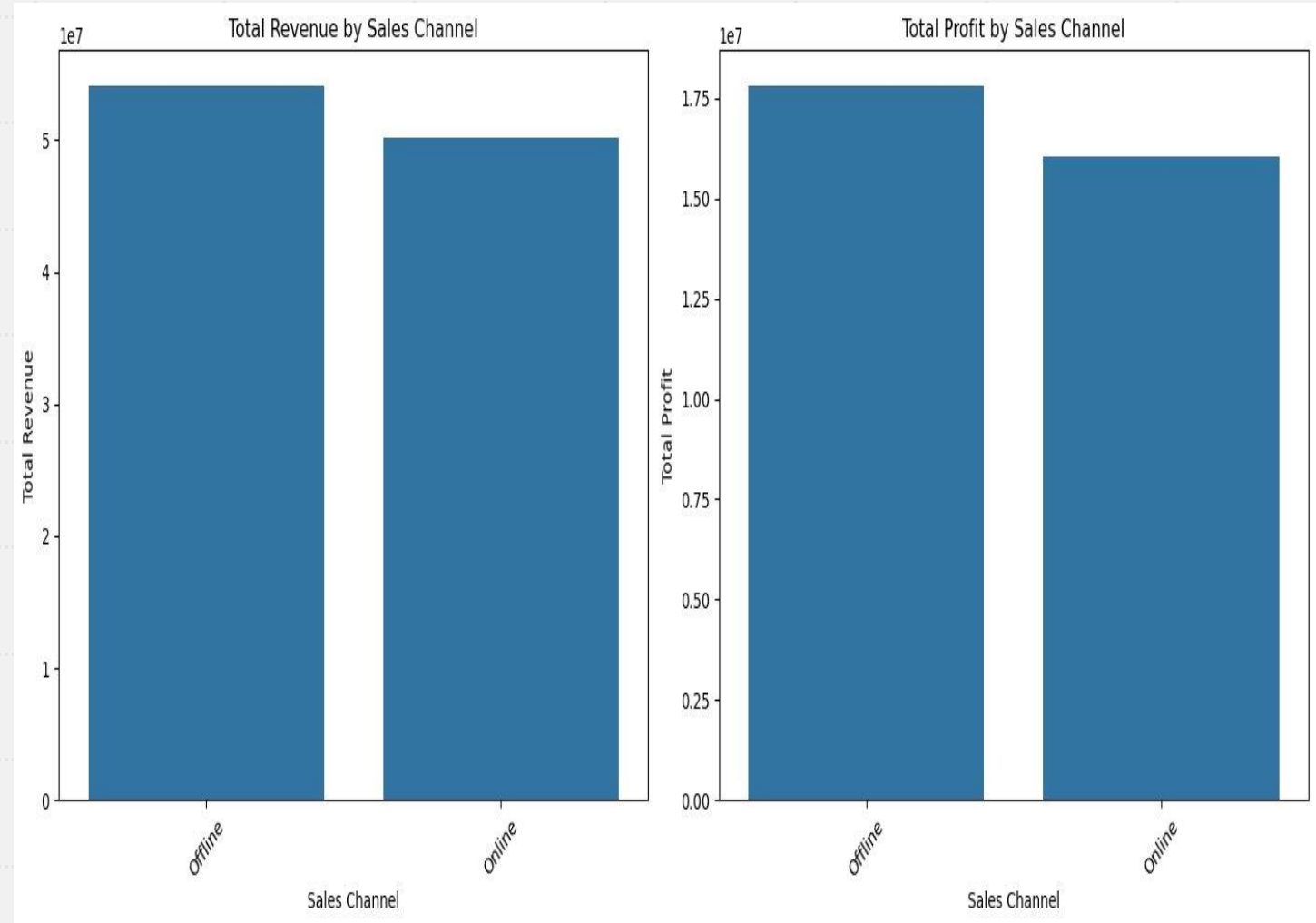
SALES CHANNEL

Sales Channel Performance: The Offline channel leads with \$17.8M in revenue, outperforming the Online channel.

Effectiveness for Item Types: Offline channels generally show better performance, but effectiveness varies by item type.

Cost Considerations: Offline channels may incur lower costs or have higher profit margins compared to Online.

The Offline channel is more effective in terms of revenue and profitability. This suggests that Offline sales might be better managed or incur lower costs, whereas Online channels may need strategies to improve their performance.

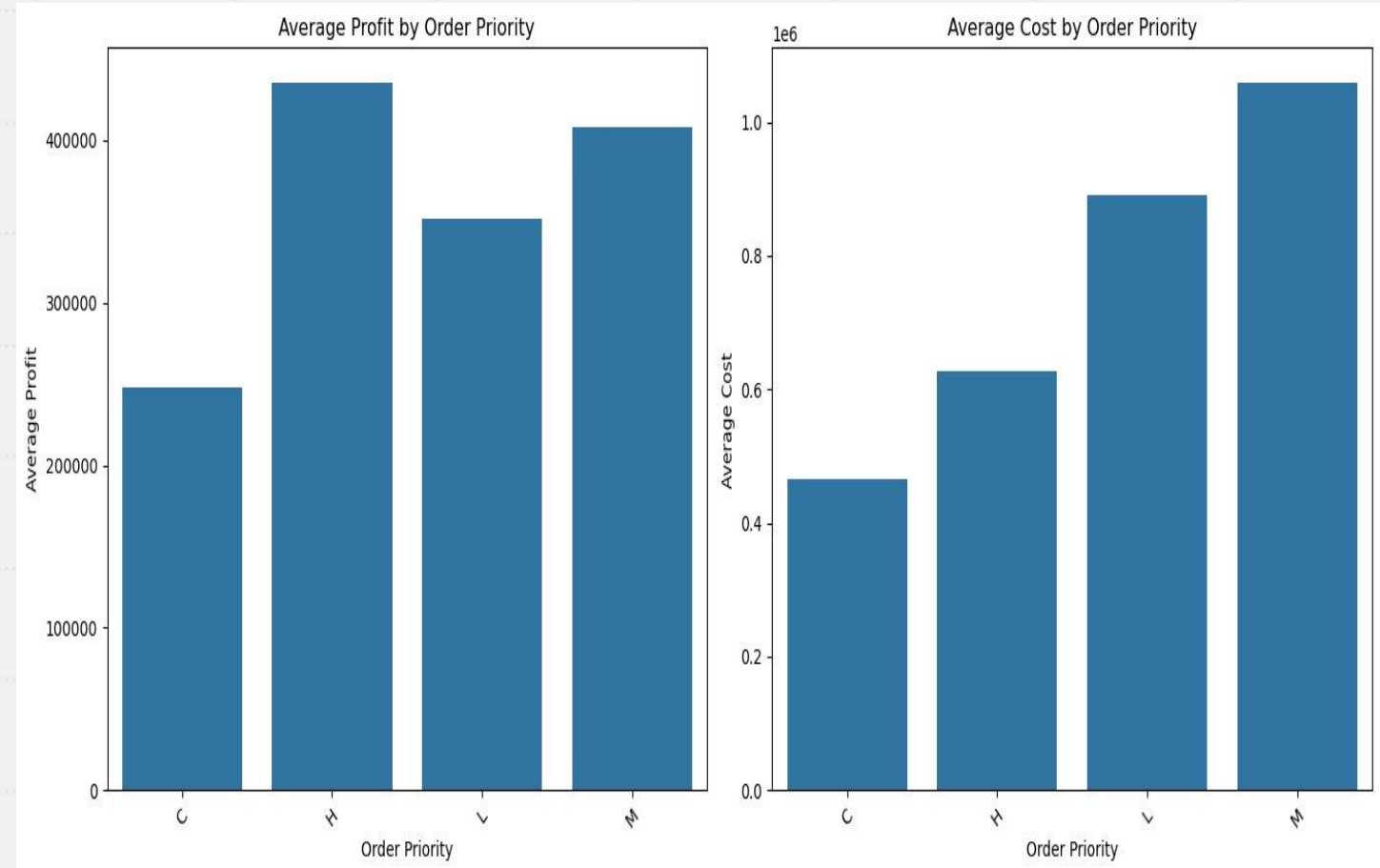


ORDER PRIORITY

Correlation with Profitability: High-priority (H) orders yield the highest profit at \$435K, while Critical (C) orders have the lowest profit at \$247K.

Cost to Fulfill Orders: Medium-priority (M) orders are the most expensive to fulfill, costing \$1.05M, whereas Critical (C) orders are the least expensive at \$465K.

High-priority orders are the most profitable, while Critical orders are the least. Despite High-priority orders generating the most profit, Medium-priority orders have the highest fulfillment costs, indicating High-priority orders may not be the costliest to handle.



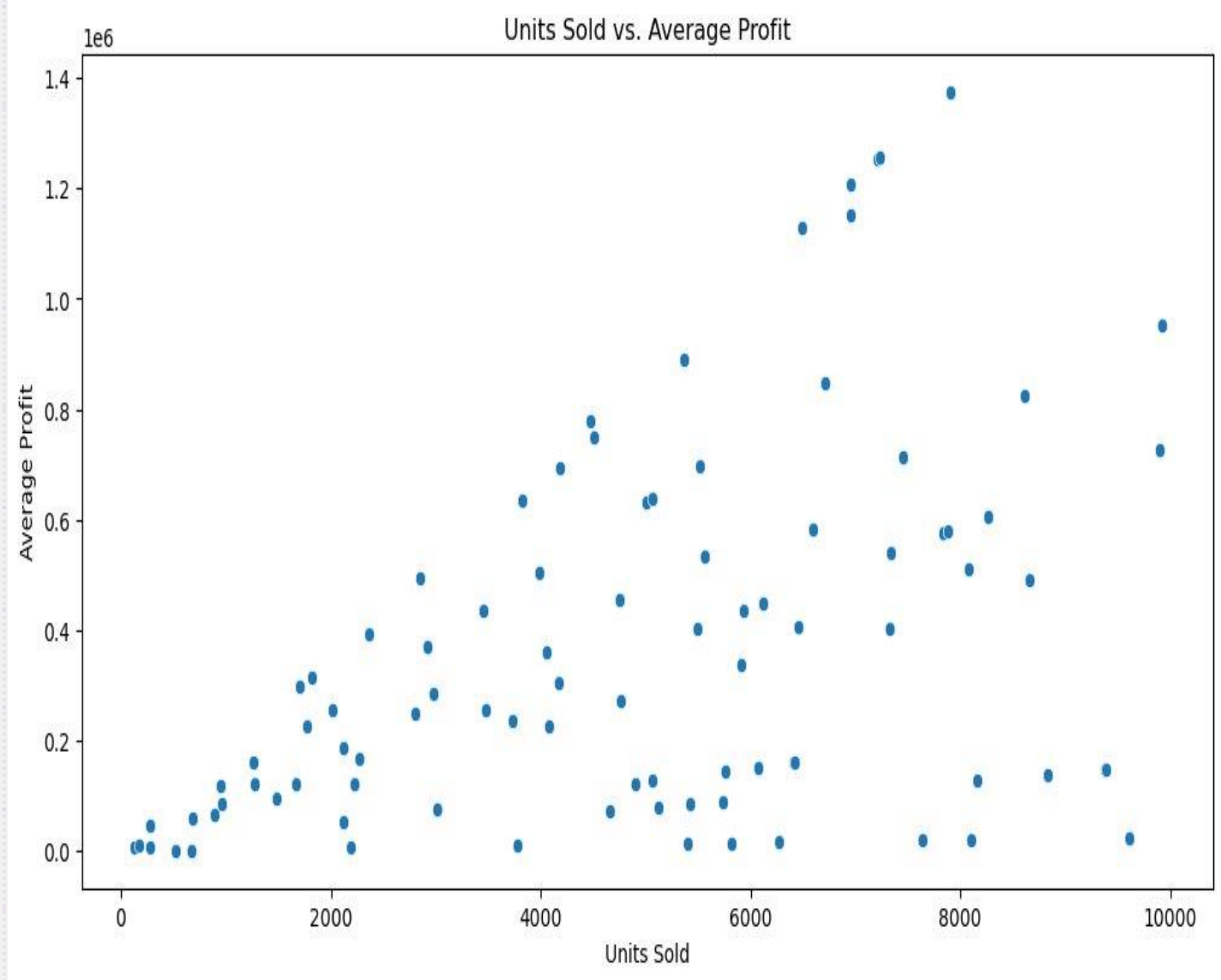
UNITS SOLD

The plot shows a positive correlation between units sold and average profit.

Distribution of Units Sold: Units sold range from 124 to 9,925, with a mean of 4,842 units and 25% of orders below 2,370 units.

Profit Trends: Higher units sold generally lead to greater profits, though smaller orders can also be profitable.

Orders with more units sold typically yield higher profits, but profitability is also influenced by product type and cost structure. Further analysis by item type or region can help identify demand patterns and profitability drivers.



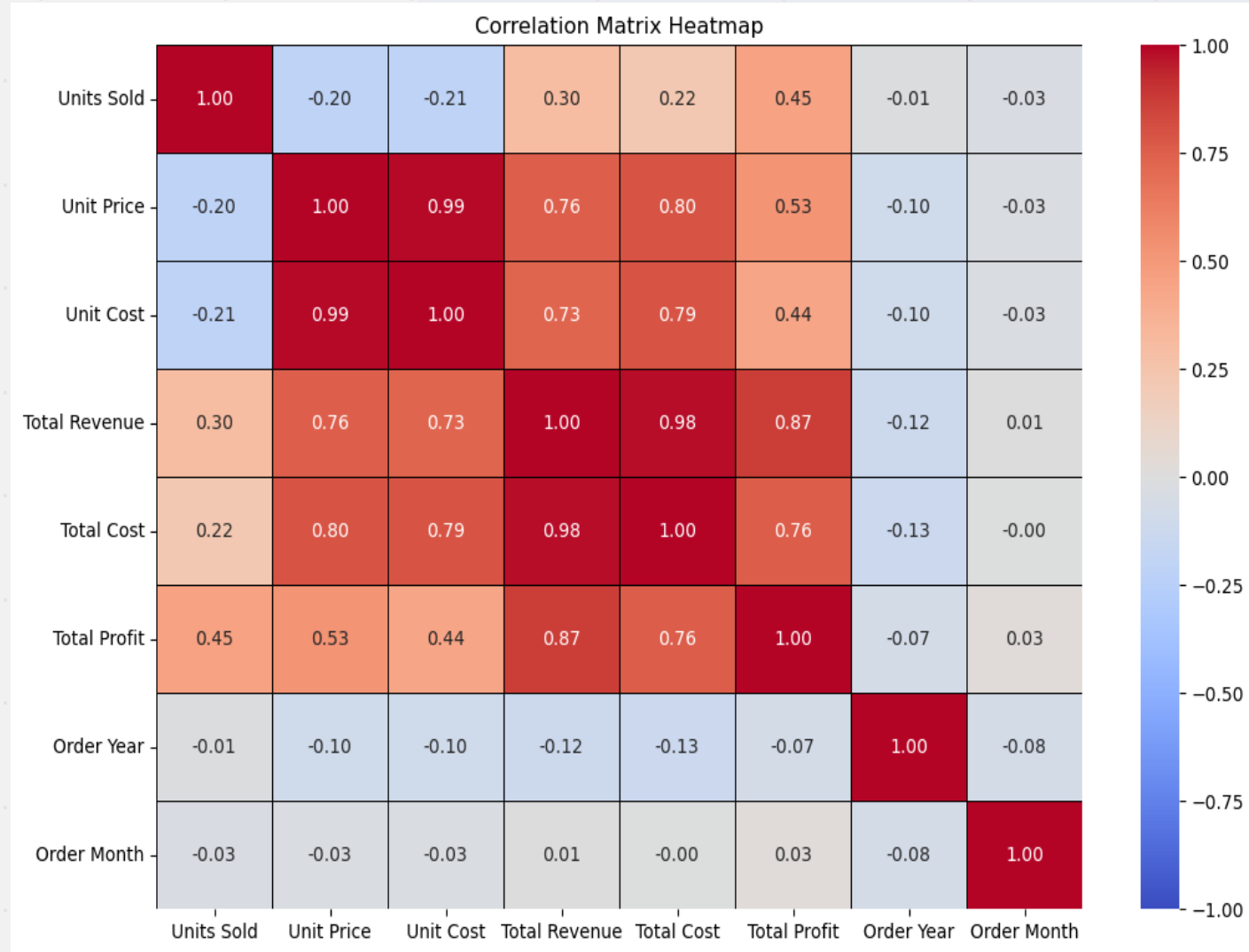
CORRELATION ANALYSIS

Strong Correlations: Total Revenue correlates closely with Total Cost (0.98) and Total Profit (0.87). Unit Price is highly correlated with Unit Cost (0.98), indicating that costs and prices are closely linked.

Moderate Correlations: Units Sold shows a moderate positive correlation with Total Profit (0.45) and Total Revenue (0.30), suggesting that more units sold generally boosts profit and revenue.

Weak Correlations: Order Year/Month has minimal effect on financial metrics, and Units Sold has a slight negative correlation with Unit Price (-0.20), indicating that higher sales volumes may reduce unit prices.

Revenue and cost are closely related, with high revenue often leading to high costs and profits. While more units sold tend to increase profit and revenue, order timing has minimal impact, and higher sales volumes may slightly lower unit prices.



SUMMARY

Monthly & Yearly Revenue Trends: February and November peak in revenue due to seasonal demand, with 2012 being the highest revenue year and 2015 the lowest, likely due to market challenges.

Most Profitable Regions: Sub-Saharan Africa leads in profitability, while Central America struggles with higher costs and lower margins. The Gambia and Turkmenistan excel in both revenue and profit.

Top-Selling & Profitable Items: Clothes dominate in sales volume, while Cosmetics are the most profitable, benefiting from better cost control. Lower-profit items face higher production costs.

Sales Channel Performance: Offline channels generate more revenue and may incur lower costs, showing better cost efficiency compared to Online sales across most item types.

Order Priority & Profitability: High-priority orders yield the highest profit, though medium-priority orders have the highest fulfillment costs, highlighting that profitability and costs don't always align.

Units Sold & Profit: Higher units sold generally lead to greater profits, but smaller orders can still be profitable, depending on product type and cost structure.

Correlation Analysis: Strong links exist between revenue, cost, and profit, while selling more units increases revenue and profit slightly, though higher volumes may reduce unit prices.

Recommendations

Sales Channel Optimization:

Focus on Offline Sales: With offline channels generating higher revenue and profitability, further investment and operational improvements can drive overall performance.

Improve Online Channel Strategies: Develop targeted promotions and cost-efficiency measures to enhance the performance of online sales, which currently underperform offline channels.

Regional Strategy Enhancement:

Leverage Strong Markets: Prioritize regions like Sub-Saharan Africa and high-performing countries such as The Gambia and Turkmenistan with tailored marketing and expansion strategies.

Revitalize Underperforming Regions: Address challenges in regions like Central America and the Caribbean, and countries like the UK, by exploring new growth opportunities.

Product-Specific Strategies:

Capitalize on High-Profit Items: Focus marketing efforts on high-profit products like Cosmetics to maximize profitability.

Optimize Costs for Popular Products: Reduce costs for high-sales items like Clothes and Personal Care, which have lower profit margins, to boost overall profitability.

Order Management for Profitability:

Focus on High-Priority Orders: High-priority orders yield the highest profits, so streamlining fulfillment or expanding this category can enhance margins.

Monitor Medium-Priority Fulfillment Costs: Medium-priority orders have the highest fulfillment costs; operational efficiency improvements are needed to reduce these costs.

Revenue and Profitability Growth:

Utilize Peak Seasons: Leverage peak months like November and February with promotions, inventory planning, and targeted campaigns to maximize profitability.

Address Low Sales Periods: Implement strategies to boost sales during low-revenue months such as August and December, using discounts or promotions to stimulate demand.

Unit Pricing and Volume Considerations:

Balance Volume and Pricing: Adjust pricing models to maintain profitability while increasing sales volume, addressing the slight negative correlation between units sold and unit price.

Cost Management Improvements:

Increase Efficiency in High-Cost Regions: Focus on reducing operational costs in regions like Europe and the Middle East while maintaining revenue levels.

Sustain Effective Cost Management: Continue successful cost-efficiency practices seen in high-profit regions like Sub-Saharan Africa to maintain profitability.

By implementing these organized strategies, Amazon can optimize sales, reduce costs, and enhance long-term profitability across regions, products, and sales channels.

Limitations

Data Completeness: Potential gaps and inaccuracies may impact results.

Temporal Constraints: Historical data may not reflect recent trends or economic changes.

Granularity Issues: Insights may miss details at a finer level, such as individual orders or specific customer behaviors.

Sales Channel Variability: Differences in channel performance might be influenced by unaccounted factors.

Profitability Factors: Variations in cost structures and pricing strategies might not be fully analyzed.

Correlation vs. Causation: Correlations identified do not imply causation; other factors may influence trends.

Contextual Factors: External elements like competitive actions and regulatory changes are not included.

Data Aggregation: Aggregated data might obscure significant regional or temporal variations.



Thankyou