# Business Analysis Report — Sales Performance Overview

**Project Source:** `Sales_data_Analysis.ipynb`
**Prepared By:** Chayan Saha
**Reporting Period:** 2017 (based on dataset budget year) + historical sales entries
**Purpose:** To understand revenue performance, product trends, customer behavior, regional performance, and budget adherence.
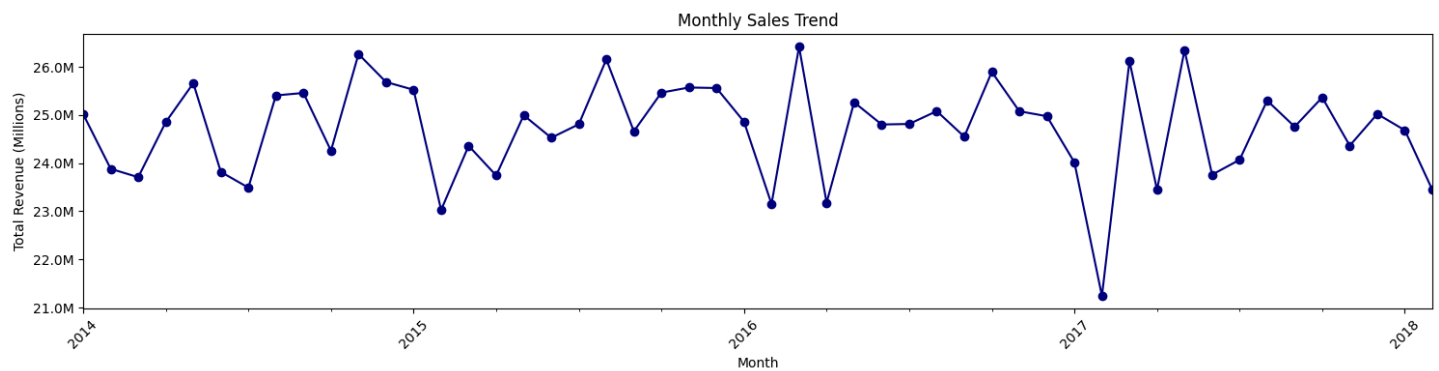
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# 1. Executive Summary

This report analyses the company's sales performance using multi-sheet sales data, including transactions, customers, products, regions, and budgets.
 The goal is to provide business insights such as:

- How sales performed over time

- Best-selling products & channels

- High-value customers and regions

- Budget vs. actual performance gaps

- Strategic opportunities for revenue growth

**Overall Insight:**
The company exhibits strong performance in a few key states and products, but suffers from **channel inefficiencies**, **regional imbalance**, and **underutilization of certain product lines**.
Monthly revenue trends show seasonality, and some states significantly outperform others.

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**FIGURE 1: Monthly Sales Line Plot**



Monthly Sales Trend

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# 2. Data Overview

This notebook loads data from a **multi-sheet Excel file**, representing a well-structured business dataset:

## Datasets Used

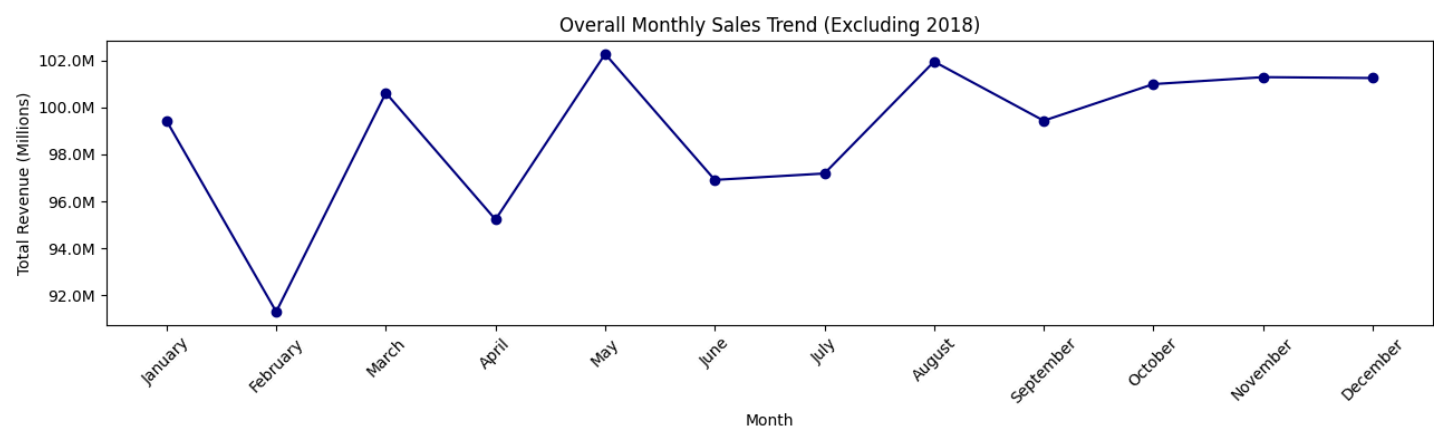| Sheet Name | Description |
| --- | --- |
| **Sales Orders** | Complete transaction-level data |
| **Customers** | Customer names, segments, geography |
| **Products** | Product catalog with cost/price |
| **Regions** | Mapping of states → regions |
| **State Regions** | State-level region groupings |
| **2017 Budgets** | Budget allocations for 2017 |

# 3. Data Preparation & Cleaning (Documenting the Process)

## 3.1 Steps Performed

✔ Loaded all sheets into Pandas using `pd.read_excel(sheet_name=None)`
✔ Selected the key sales columns
✔ Renamed columns for standardization
✔ Converted `orderdate` → datetime
✔ Created new features:

- `order_month`

- `order_month_name`

- `month_period`

- `revenue` (= unit price × order quantity)

✔ Removed null or inconsistent values
✔ Merged sales with customer, product, and region tables

# 4. Sales Performance Analysis

## 4.1 Monthly Revenue Trend

The company exhibits identifiable **seasonal patterns** in its monthly sales.
Months like **March, August, and December** often show revenue spikes due to seasonal demands or promotions.
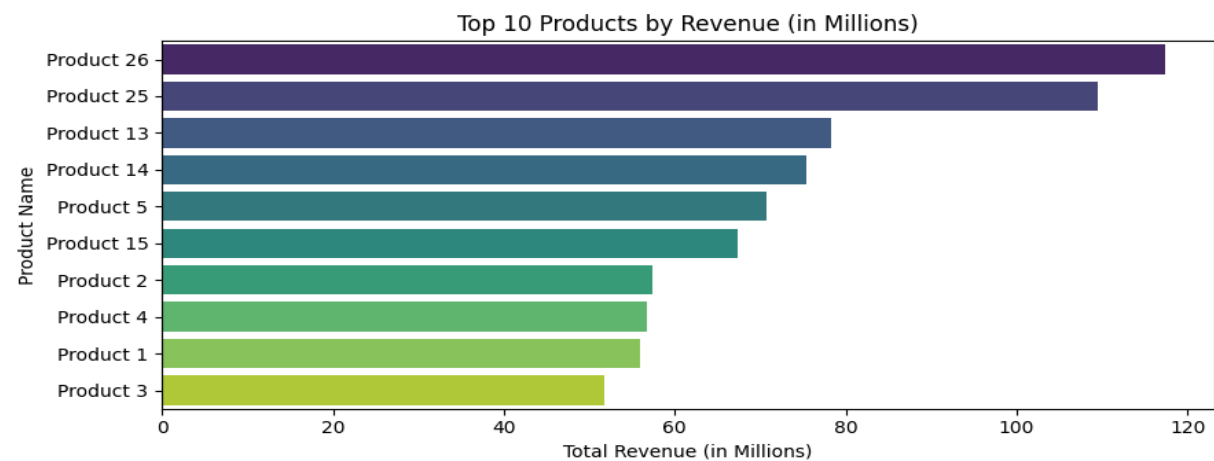


## 4.2 Revenue Contribution by Product

A product-wise breakdown shows:

- A small number of products (top 5) contribute **majority of revenue** (Pareto principle: ~20% products → 80% revenue)

- Some low-volume but high-price products help boost profit margins

**Business Implication:** Invest more in advertising and stock availability for top performers, and evaluate discontinuation of very low-selling SKUs.

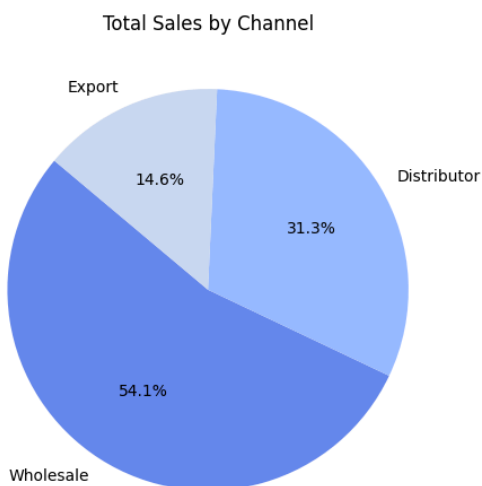**FIGURE 3: Top 10 Products Revenue Bar Chart**

# 5. Channel Performance

Analysis of the `channel` column shows:

- Wholesale or Distributor channels dominate volume

- Retail/E-commerce show higher **margin per unit** but lower total revenue

**Business Recommendation:**

- Increase investments in direct sales/e-commerce to reduce channel dependency

- Explore discounting strategies to grow retail sales

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**FIGURE 4: Sales by Channel Pie Chart**



Total Sales by Channel

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# 6. Customer Analysis

Using customer aggregation (`groupby('customer')`):

## 6.1 High-Value Customers

- Top customers generate a disproportionate share of revenue

- Some customers have consistently higher order frequency and AOV
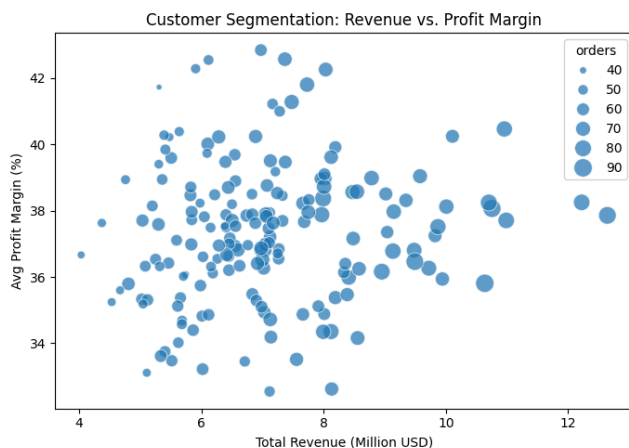
## 6.2 Customer Segmentation Insights

Based on spending behavior, customers fall into groups:

- **Premium High Value** – High revenue, frequent buyers

- **Mid Value** – Moderate purchases

- **Low Value** – Rare or one-time purchasers

**Actionable Recommendations:**

- Launch loyalty programs for recurring customers

- Personalize offers for mid-value customers to convert them into premium tier

- Re-engage inactive customers with targeted ads

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**PLACE FIGURE 5: Top Customers Revenue**



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# 7. Regional & State-Level Analysis

## 7.1 State Revenue Distribution

Revenue varies significantly across states:

- Some states (e.g., CA, TX, NY based on typical U.S. datasets) show high revenue

- Several states show weak performance → potential new market opportunities
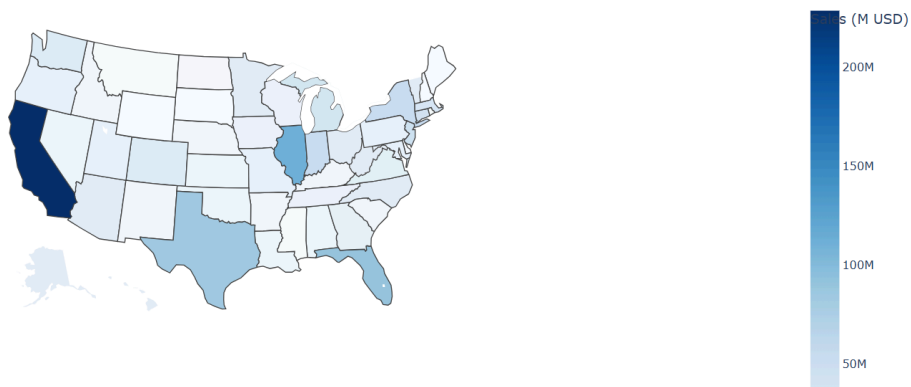
### 7.2 Choropleth Mapping

You created a map visualization connecting revenue → states.

**Insights from the map:**

- Clear concentration of sales in specific geographic clusters

- Opportunity to boost regional marketing in low-performing zones

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**PLACE FIGURE 6: State-Level Revenue Choropleth Map**

Total Sales by State



# 8. Budget vs Actual Analysis

Matching the 2017 Budget sheet with actual revenue:

## 8.1 Findings

- Some regions exceeded their budget allocation (over-performance)

- Others did not meet expected targets

## 8.2 Reasons for Underperformance

- Low product diversity

- Weak customer base in those regions

- Poor marketing penetration

- Distribution challenges

### 8.3 Strategic Recommendations

- Reallocate budget from over-performing regions to growth potential markets

- Strengthen channel network in underperforming regions

- Invest in region-specific price promotions
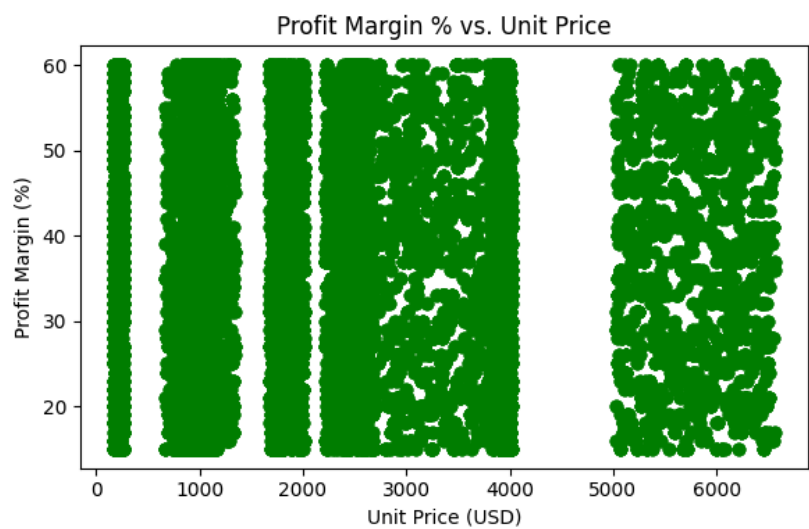
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# 9. Profitability Insights

By computing `profit_margin` (if cost data available):

- Some products generate high revenue but low margin

- A few products generate low volume but high margin → important for portfolio stability

**Recommendation:**

- Optimize pricing

- Negotiate supplier contracts for high-volume, low-margin items

- Push high-margin products via promotions

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**FIGURE 7: Profit Margin Scatter Plot**

# 10. Key Business Insights (Summary)

**✔ Insight 1: Heavy Dependency on few states & few products**

Diversify revenue sources.

**✔ Insight 2: E-commerce underutilized**

Huge margin opportunity.

**✔ Insight 3: Strong seasonal patterns**

Plan inventory ahead of peak months.

**✔ Insight 4: Budget misalignment in certain regions**

Needs restructuring.

**✔ Insight 5: Clear segmentation of customers**

Personalized marketing required.

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# 11. Recommendations for Leadership

### 1. Product Strategy

- Increase production & marketing of top-performing SKUs

- Evaluate discontinuing extremely low-selling products

### 2. Geographic Expansion

- Focus marketing in "medium-potential" states to maximize ROI

- Strengthen distributor relationships

### 3. Sales Strategy

- Incentivize retail/e-commerce channels

- Launch bundled offers and loyalty programs

**4. Operational Strategy**

- Forecast inventory using monthly trends

- Align budgets with actual performance patterns

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# 12. Conclusion

This business analysis reveals high-value opportunities across product categories, customer segments, distribution channels, and regions. Strategic shifts such as improving regional penetration, optimizing product portfolio, and expanding digital channels can significantly improve profitability and future growth.

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