

Exploratory Data Analysis (EDA) and Business Insights Report

Introduction

This report presents an Exploratory Data Analysis (EDA) of the given transaction, product, and customer datasets. The goal is to uncover business insights through visualizations and statistical analysis. The report includes key trends related to revenue growth, product sales, customer behaviour, and regional performance.

1. Data Overview

Transactions Dataset: Contains transaction details, including customer purchases, product quantities, and total values.

Products Dataset: Provides product-level details such as category and pricing.

Customers Dataset: Includes customer demographics and signup dates.

2. Key Visualizations

- Monthly Revenue Growth

This visualization illustrates how revenue has evolved over time, highlighting growth trends and seasonality.

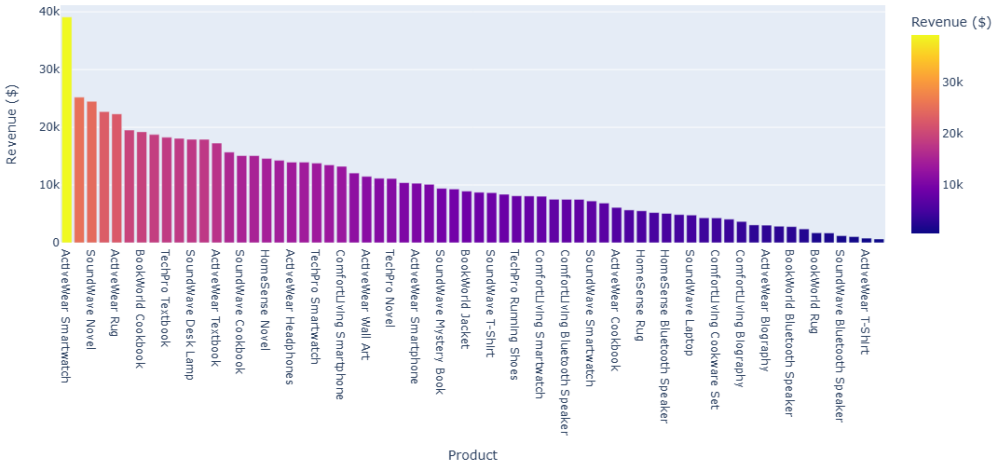
Monthly Sales Trend



- Total Revenue by Product

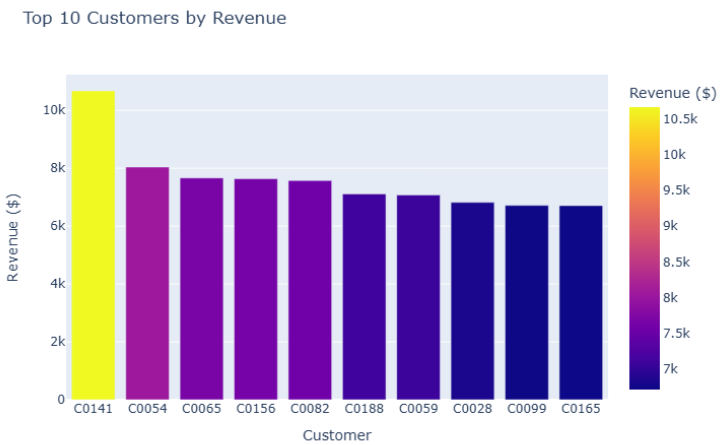
Identifies the products that generate the highest revenue, helping businesses prioritize inventory and marketing efforts.

Total Revenue by Product



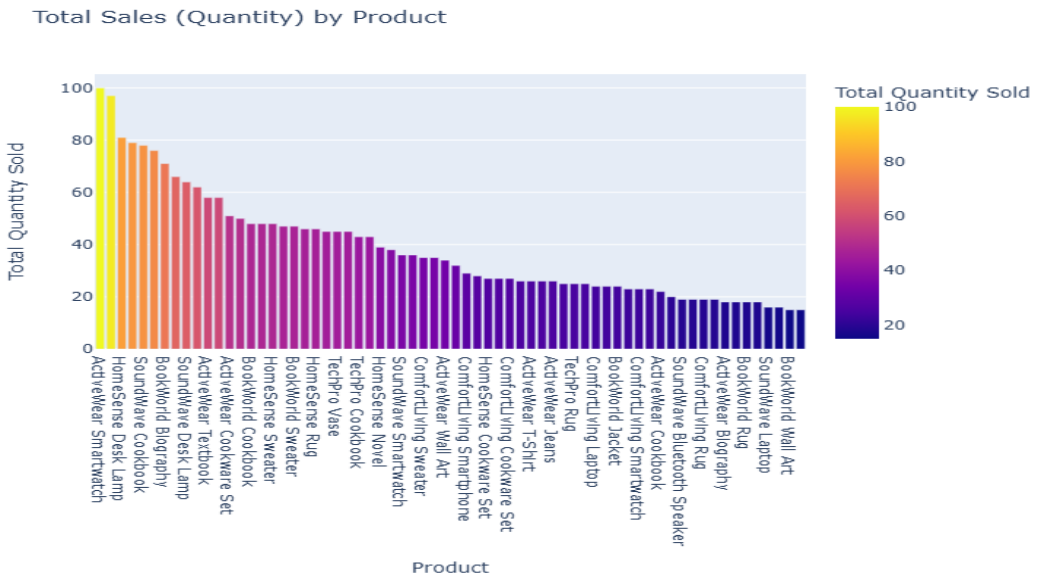
• **Top 10 Customer Revenues**

Highlights the most valuable customers based on total revenue contribution.



• **Total Sales (Quantity) by Product**

Shows the total number of units sold per product, indicating demand trends.



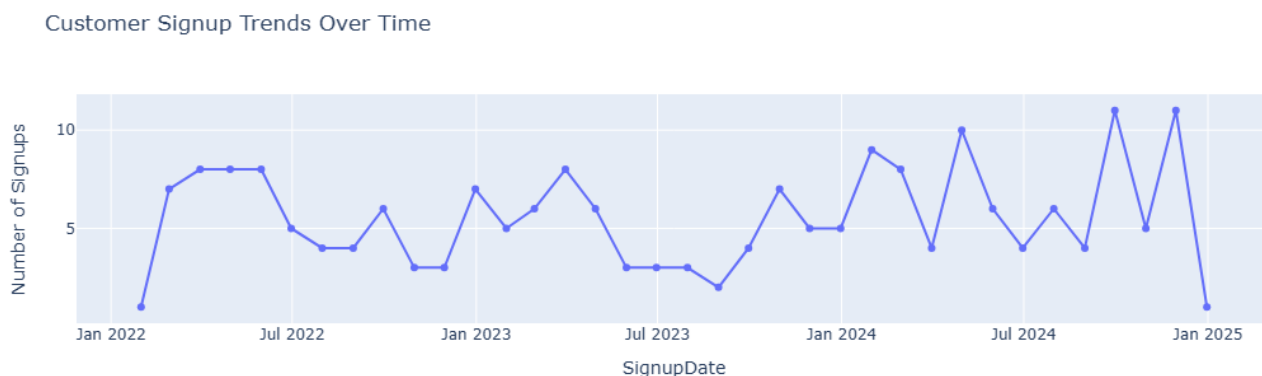
• **Top Products by Quantity Sold**

Focuses on the highest-selling products by volume.



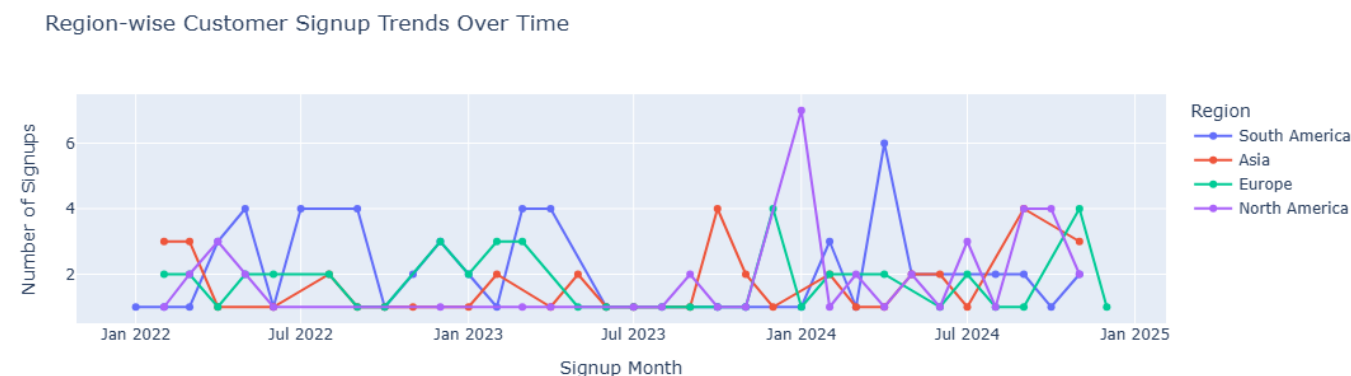
- **Customer Signup Trends Over Time**

Tracks how customer acquisition has changed over time.



- **Region-wise Signup Trends**

Analyzes signups across different regions to understand geographic performance.



3. Key Business Insights

- **Strong Revenue Growth with Seasonal Spikes**

The monthly revenue growth chart reveals a steady upward trend with noticeable spikes during certain months, indicating seasonal demand patterns. Businesses should align marketing campaigns and stock management with these peak periods to maximize revenue.

- **A Small Percentage of Products Drive Most of the Revenue**

A significant portion of revenue comes from a handful of products. This suggests a need for businesses to focus on promoting and optimizing stock levels for these best-sellers while reassessing lower-performing products.

- **High-Value Customers Contribute Disproportionately to Sales**

The top 10 customers generate a substantial share of the total revenue, indicating the importance of personalized marketing strategies, loyalty programs, and exclusive offers to retain these customers.

- **Demand Varies Widely Across Products**

While certain products dominate in terms of sales volume, others contribute more in revenue despite lower quantities sold. A balanced inventory strategy is required to ensure high-margin products receive enough attention while maintaining high-demand, lower-margin items.

- **Geographic Expansion Opportunities**

Region-wise signup trends show certain areas experiencing higher growth, suggesting a strong market demand. Businesses should invest more in advertising and customer engagement strategies in these high-growth regions to boost sales further.

- **Increasing Customer Acquisition Requires Retention Focus**

The customer signup trends indicate steady growth, but retention efforts must match this expansion. Implementing customer loyalty initiatives, improving user experience, and personalized engagement will be key to sustaining long-term growth.

- **Inventory Optimization for Popular Products**

The total sales (quantity) by product analysis shows that some products are consistently in high demand. Businesses must ensure adequate stock levels to prevent stockouts while avoiding overstocking slow-moving items.

4. Conclusion & Recommendations

Focus on Seasonal Promotions: Implement targeted marketing strategies during peak months.

Optimize Inventory for Best-Selling Products: Maintain adequate stock levels for high-demand products.

Loyalty Programs for Top Customers: Reward high-value customers to encourage repeat purchases.

Expand in High-Growth Regions: Allocate more resources to regions with increasing customer signups.

Diversify Product Offerings: Identify gaps in low-revenue products and explore new opportunities.

This provides actionable insights to optimize sales, marketing, and customer retention strategies.

Customer Purchase Frequency Distribution

