

Vendor Performance Analysis

Problem Statement

You have been provided with a dataset containing vendor sales summary data, including details about vendors, brands, products, purchase and sales quantities, pricing, and financial metrics such as gross profit and profit margin. The dataset is sourced from a database table named `vendor_sales_summary` and includes key variables such as `VendorNumber`, `VendorName`, `Brand`, `Description`, `PurchasePrice`, `ActualPrice`, `Volume`, `TotalPurchaseQuantity`, `TotalSalesQuantity`, `TotalSalesDollars`, `GrossProfit`, and `ProfitMargin`. Your task is to analyze this dataset to uncover key insights related to vendor performance, product profitability, and operational efficiency.

Create a dashboard and answer the following key business questions to help the company optimize its vendor management, improve profitability, and enhance operational strategies:

1. Total Revenue: Calculate the overall revenue generated from all sales.
2. Average Profit Margin: Evaluate the average profit margin across all vendors and identify variations.
3. Monthly Sales Performance: Analyze how sales (in terms of `TotalSalesDollars`) fluctuate across different periods in the dataset (if date information is available, assume aggregation by hypothetical months for 2023).
4. Top Products by Revenue: Identify the top 5 products (by `Description`) contributing to the highest `TotalSalesDollars`.
5. Vendor Profitability Analysis: Determine which vendors achieve the highest and lowest profit margins and analyze contributing factors.
6. Sales Performance by Top 5 Brands: Track the sales performance (`TotalSalesDollars` and `TotalSalesQuantity`) of the top 5 brands.
7. Top Vendors by Sales Volume: Identify the top 10 vendors by `TotalSalesQuantity`.
8. Purchase vs. Sales Ratio Analysis: Examine the `SalesToPurchaseRatio` to understand the efficiency of inventory turnover.
9. Impact of Freight Costs: Analyze the relationship between `FreightCost` and `GrossProfit` to identify if high freight costs impact profitability.
10. Profit Margin Comparison (Top vs. Low Vendors): Compare the confidence intervals of profit margins for top-performing and low-performing vendors to assess performance gaps.

These insights will enable the company to make data-driven decisions to optimize vendor relationships, streamline inventory management, and enhance overall profitability.