

Vendor Dashboard Presentation

Business Problem:

Effective inventory and sales management are critical for optimizing profitability in the retail and wholesale industry. Companies need to ensure that they are not incurring losses due to inefficient pricing, poor inventory turnover, or vendor dependency.

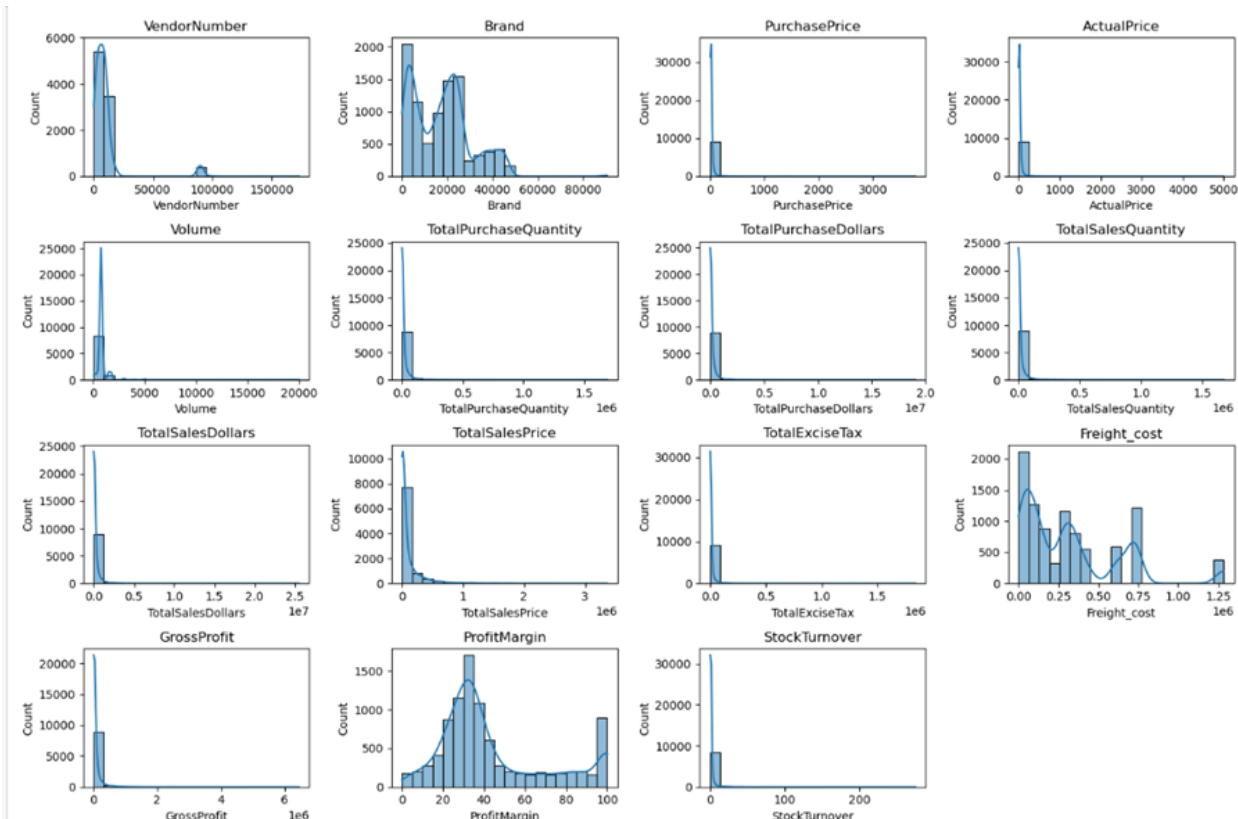
The goal of this analysis is to:

- i. 1. Identify underperforming brands that require promotional or pricing adjustments.*
- ii. Determine top vendors contributing to sales and gross profit.*
- iii. Analyze the impact of bulk purchasing on unit costs.*
- iv. Assess inventory turnover to reduce holding costs and improve efficiency.*
- v. Investigate the profitability variance between high-performing and low-performing*

Exploratory Data Analysis

	count	mean	std	min	25%	50%	75%	max
VendorNumber	12261.0	1.081486e+04	19007.682322	2.0	3960.000000	7153.000000	9552.000000	1.733570e+05
Brand	12261.0	1.798907e+04	12528.503464	58.0	5990.000000	18788.000000	25117.000000	9.063100e+04
PurchasePrice	12261.0	2.648822e+01	156.182948	0.0	6.890000	10.650000	20.130000	1.111103e+04
ActualPrice	12261.0	3.864024e+01	206.151172	0.0	10.990000	15.990000	29.990000	1.399990e+04
Volume	12261.0	8.425777e+02	679.604184	0.0	750.000000	750.000000	750.000000	2.000000e+04
TotalPurchaseQuantity	12261.0	1.365781e+04	52054.608267	0.0	65.000000	665.000000	7400.000000	1.688300e+06
TotalPurchaseDollars	12261.0	1.308666e+05	576662.703715	0.0	952.200000	9685.350000	79655.100000	1.905626e+07
TotalSalesQuantity	12261.0	1.338776e+04	51382.941903	0.0	75.000000	660.000000	7105.000000	1.674695e+06
TotalSalesDollars	12261.0	1.838680e+05	785779.351307	0.0	1596.000000	14487.700000	108280.200000	2.550960e+07
TotalSalesPrice	12261.0	8.181062e+04	212133.094103	0.0	629.650000	7664.550000	60926.450000	3.364097e+06
TotalExciseTax	12261.0	7.710604e+03	51306.753854	0.0	11.100000	114.350000	1466.300000	1.841214e+06
Freight_cost	12261.0	3.053432e+05	306272.918272	0.0	68027.050000	251468.100000	397644.950000	1.285160e+06
GrossProfit	12261.0	5.300139e+04	216744.804042	-260013.9	40.350000	3692.450000	33415.300000	6.453340e+06
ProfitMargin	11403.0	-inf	NaN	-inf	16.266626	31.564898	44.479656	1.000000e+02
StockTurnover	11403.0	inf	NaN	0.0	0.833333	0.989550	1.133464	inf

Summary Of Data:



Negative & Zero Values:

Gross Profit:

Minimum of -260013.9, indicating potential losses due to high costs or heavy discounts. This could be due to selling products at lower prices than their purchase costs.

Profit Margin:

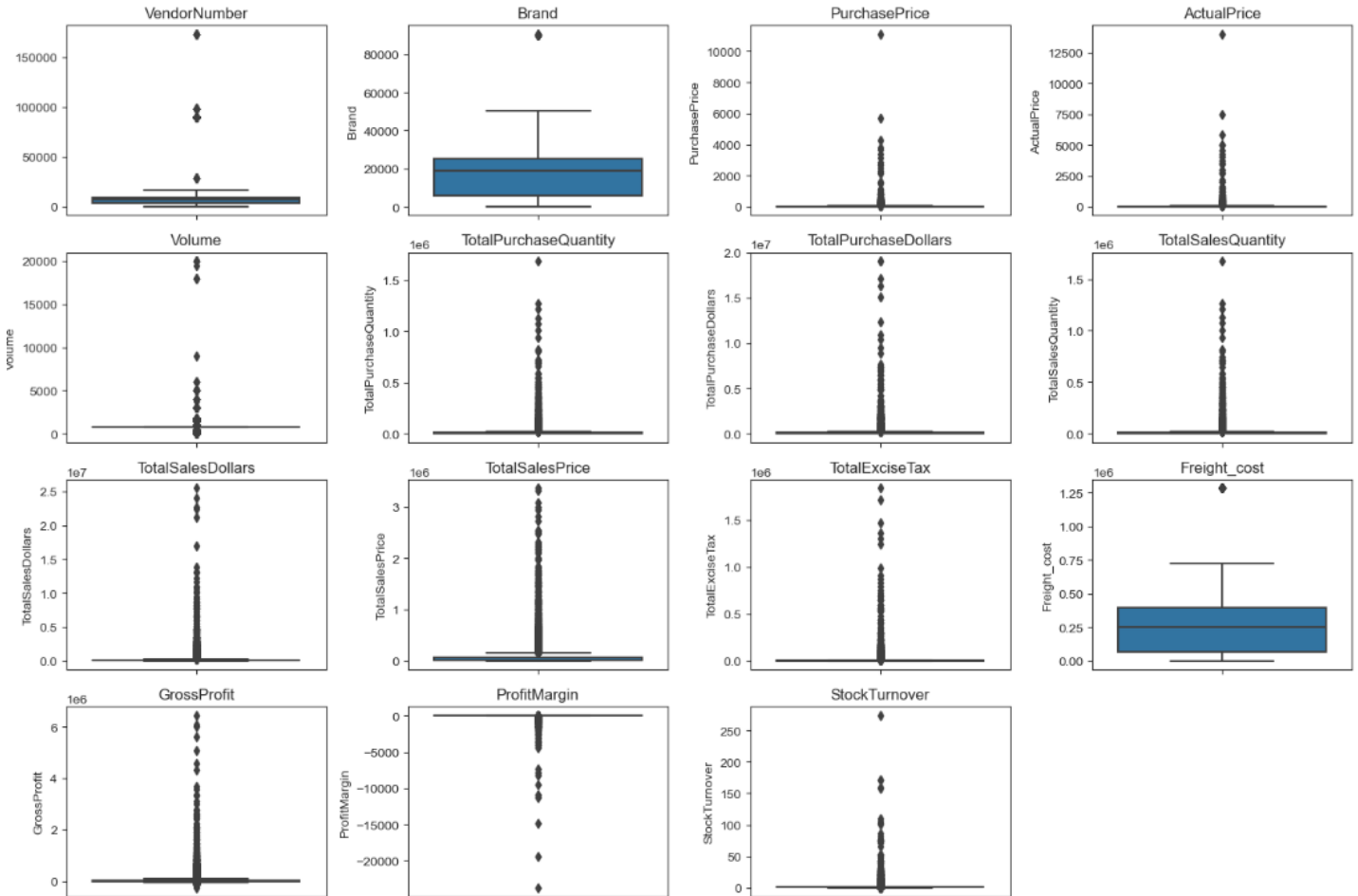
Has a minimum of $-\infty$, which suggests instances where revenue is zero or even lower than the total cost, leading to extreme negative profit margins.

Total Sales Quantity & Sales Dollars:

Some products show zero sales, indicating they were purchased but never sold. These may be slow-moving or obsolete stock, leading to inventory inefficiencies.

Outliers Detected by High Standard Deviations:

Purchase & Actual Prices: The maximum values (14000 & 20000) are significantly higher than the mean (26.8 & 38.64), indicating premium product offerings.



Freight Cost:

Extreme variation from 0.00 to 1285,560 suggests logistics inefficiencies, bulk shipments, or erratic shipping costs across different products.

Stock Turnover:

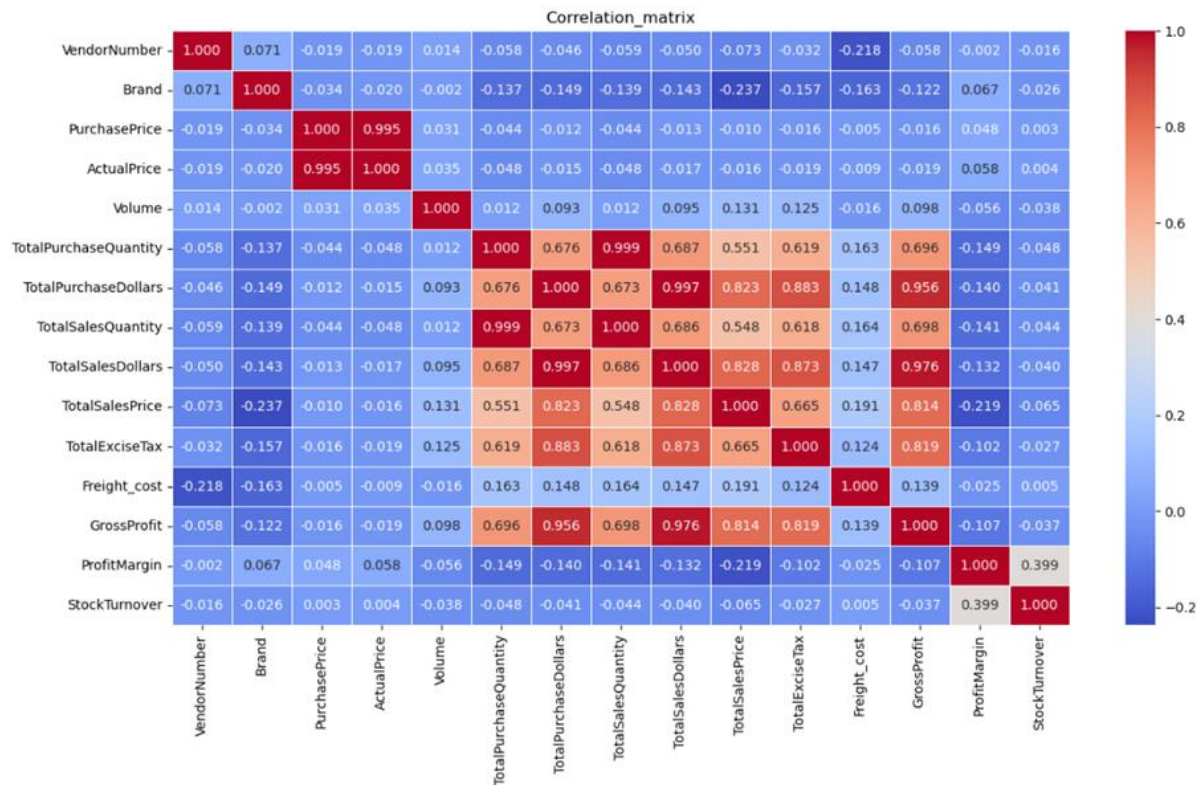
Ranges from 0 to ∞ , suggesting some products sell rapidly while others remain unsold for Infinite periods. A value greater than 1 indicates that sales for a product exceed the purchased quantity, as older stock is fulfilling orders.

Data Filtering:

To enhance the reliability of the insights, we removed inconsistent data points where:

- **Gross Profit ≤ 0** (to exclude transactions leading to losses).
- **Profit Margin ≤ 0** (to ensure analysis focuses on profitable transactions).
- **Total Sales Quantity = 0** (to eliminate inventory that was never sold).

Correlation Insights:



- Purchase Price vs. Total Sales Dollars & Gross Profit:** Weak correlation (-0.013), indicating that price variations do not significantly impact sales revenue or profit.
- Total Purchase Quantity vs. Total Sales Quantity:** Strong correlation (0.999), confirming efficient inventory turnover.
- Profit Margin vs. Total Sales Price:** Negative correlation (-0.219), suggesting increasing sales prices may lead to reduced margins, possibly due to competitive pricing pressures.

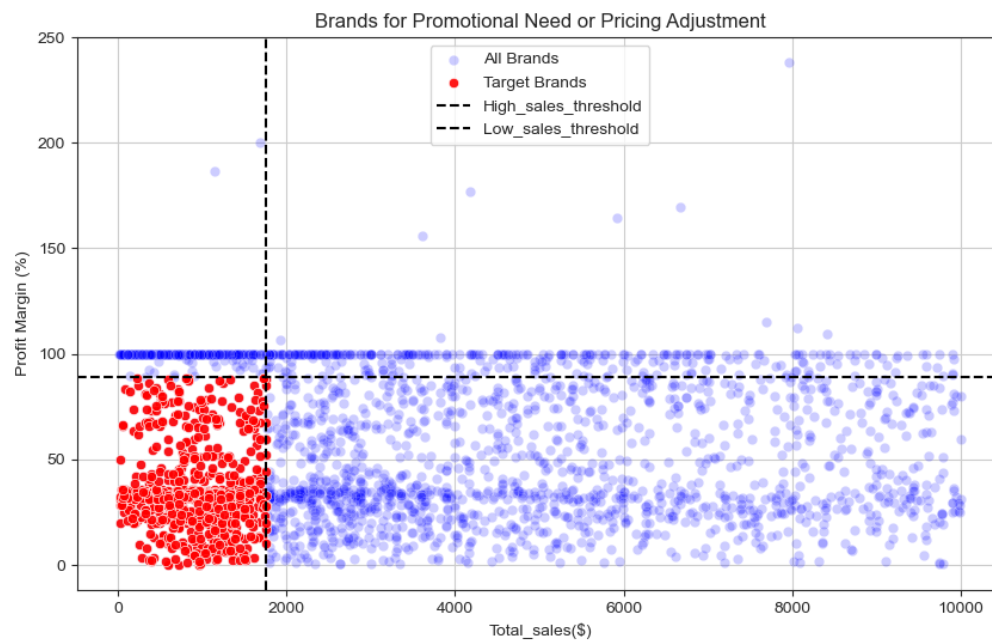
- iv. **Stock Turnover vs. Gross Profit & Profit Margin:** Weak negative correlation (-0.037 & 0.399), indicating that faster stock turnover does not necessarily equate to higher profitability.
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Research Question and Key Findings

1. Brands For Promotional and Pricing Adjustment:

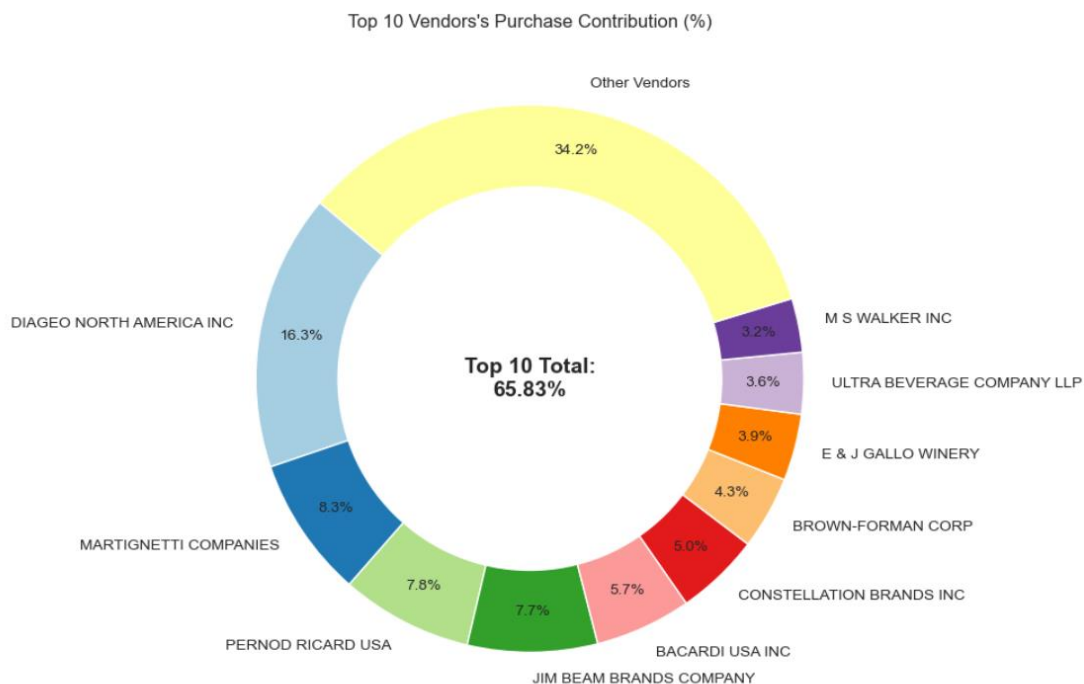
Brand With High Profit Margin & Low Sell			
	Description	TotalSalesDollars	ProfitMargin
7580	Terruzzi & Puthod Vernaccia	24.95	32.464930
3172	Firefly Ridge Chard	28.95	31.088083
154	Albero Sparkling Wh Organic	28.95	28.497409
7084	Smirnoff Light Strawberry	29.70	50.168350
187	Allen's Blue Curacao Liqueur	29.95	20.033389
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5801	Olivier Chablis Savary	1753.65	84.979899
4339	Jose Cuervo Tropina	1754.10	28.578758
4049	Iron Horse Wedding Cuvee	1754.55	16.764982
4143	Jacques Bonet Brandy	1757.80	32.884856
3720	Grooner Gruner Veltliner	1758.20	59.390286

- i. *More than 400 brands exhibit higher profit and Lower Sales. We can optimize their sales by Marketing strategies And Price adjustment to increase Sales*



2. Top Vendors by Purchase Contribution:

- i. The top 10 vendors account for **65.83%** of total purchases, while the remaining vendors contribute only **34.17%**. This heavy reliance on a limited set of vendors increases the risk of supply chain disruptions, highlighting the importance of diversifying the vendor base.



3. Impact Of Bulk Purchasing on Cost Savings:

- i. Vendors buying in large quantities receive a 75% lower unit cost (\$ 11.08) per unit vs higher unit costs in smaller orders.
- ii. Bulk pricing strategies encourage larger orders, increasing total sales while maintaining profitability

OrderSize	
Small	44.211002
Medium	15.550968
Large	11.086340

4. Identifying Vendors with Lower Inventory turnover

- i. Total Unsold Inventory Capital: \$ 12.31 M
- ii. Slow-moving inventory increases storage costs. reduce cash flow efficiency and affect overall profitability.
- iii. Identifying vendors with low inventory turnover enables better stock management, minimizing financial strain

StockTurnover	
VendorName	
ALISA CARR BEVERAGES	0.615385
HIGHLAND WINE MERCHANTS LLC	0.708333
PARK STREET IMPORTS LLC	0.751306
Circa Wines	0.755676
Dunn Wine Brokers	0.766022
CENTEUR IMPORTS LLC	0.773953
SMOKY QUARTZ DISTILLERY LLC	0.783835
TAMWORTH DISTILLING	0.797078
THE IMPORTED GRAPE LLC	0.807569
WALPOLE MTN VIEW WINERY	0.820548

	VendorName	UnsoldInventoryValue
26	DIAGEO NORTH AMERICA INC	3601503.45
47	JIM BEAM BRANDS COMPANY	2744830.80
69	PERNOD RICARD USA	2346958.55
118	WILLIAM GRANT & SONS INC	2007514.15
31	E & J GALLO WINERY	1134513.95
12	BROWN-FORMAN CORP	881452.50
80	SAZERAC CO INC	864721.00
21	CONSTELLATION BRANDS INC	660828.90
62	MOET HENNESSY USA INC	626040.30
78	REMY COINTREAU USA INC	592990.75

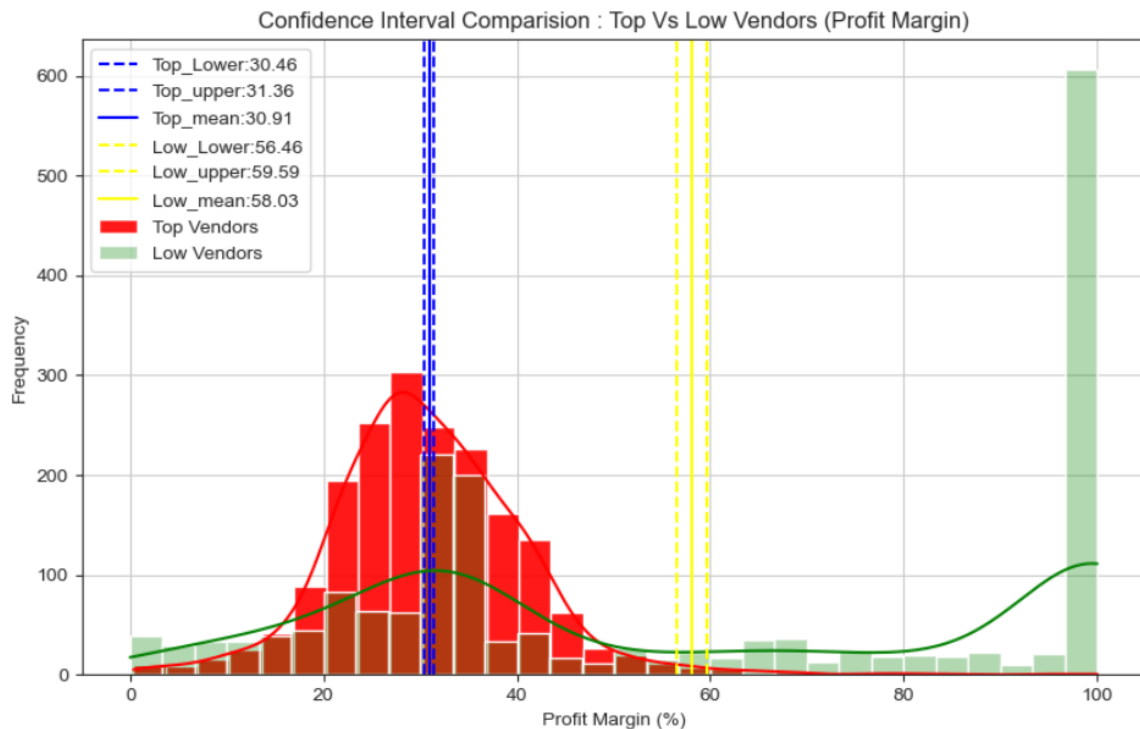
5. Profit Margin Comparision: High Vs Low – Performing Vendors:

- i. *Top Vendors Profit Margin (95%CI): (30.46 %, 31.36%), Mean: 30.91%*
 - ii. *Low Vendors Profit Margin (95% CI): (56.46%, 59.59%), Mean: 58.03%*
 - iii. *Low Performing vendors maintain higher margins but struggle with sales volumes, indicating potential pricing inefficiencies or market reach issues*
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Actionable Insights:

Top – Performing vendors: Optimize Profitability by adjusting pricing operational costs or offering bundles promotions or extra discount

Low - performing vendors: marketing efforts, optimize pricing strategies and enhance distribution networks



Hypothesis Testing:

- **H0(Null hypothesis):** No significant differences in profit margins between top and low-performing vendors.
- **H1(Alternative Hypothesis):** A significant difference exists in profit Margins between the two vendor groups.
- **Result:** The Null hypothesis is rejected, confirming that the two groups operate under different profitability models.

Implication: High-margin vendors may benefit from better pricing adjustment and strategies, while top-selling vendors could focus on cost efficiency

Final Recommendations:

- *Re-evaluate pricing for lower sales, high margin brands to boost sales volume without sacrificing profitability.*
- *Diversify vendor partnership to reduce dependency on a few suppliers and mitigate supply chain risks*
- *Leverage bulk purchasing advantage is to maintain competitive pricing while optimizing inventory management*
- *Optimize slow moving inventory by adjusting purchase quantities, launching clearance sales or revising storage strategies*
- *Enhance marketing and distribution strategies for low performing vendors to drive higher sales volumes without compromising profit margins*
- *By implementing these recommendations, the company can achieve sustainable profitability, mitigate risks and enhance overall operational efficiency*