



FROM OVERSTOCK TO ON-POINT: T.T INC.'S INVENTORY OPTIMIZATION JOURNEY



CASE OVERVIEW

AS A DATA ANALYST WORKING FOR T.T INC., A LEADING COMPANY IN THE CONSUMER ELECTRONICS SECTOR. I HAVE BEEN ASKED BY THE HEAD OF SUPPLY CHAIN MANAGEMENT TO PRESENT DATA INSIGHTS AND OPTIMIZATION STRATEGIES FOR INVENTORY MANAGEMENT. WITHIN THE SUPPLY CHAIN MANAGEMENT TEAM,



MY OBJECTIVES ARE TO:

- OPTIMIZE INVENTORY LEVELS TO MINIMIZE OVERSTOCK AND UNDERSTOCK SITUATIONS.
- UNDERSTANDING SEASONAL TRENDS OF SALES FOR DIFFERENT PRODUCTS.
- IMPROVE CUSTOMER SATISFACTION BY ENSURING PRODUCT AVAILABILITY.



ANALYSIS

What is the total number of units sold per product SKU?

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```
select productid, sum(inventoryquantity) As "Total Unit Sold"  
from sales  
group by productid  
order by "Total Unit Sold" desc;
```

RESULT

TOP 10 PRODUCT WITH HIGHEST UNIT SOLD



PRODUCT 9806 = 210

PRODUCT 3381 = 201

PRODUCT 8486 = 186

PRODUCT 8106 = 186

	productid numeric	Total Unit Sold bigint
1	9806	210
2	3381	201
3	8486	188
4	8106	186
5	3993	182
6	9605	178
7	9237	176
8	6364	176
9	3762	173
10	4450	171
11	7265	168
12	5485	164
13	8025	163
14	3906	162
15	3631	160
16	7131	160
17	7834	159
18	5081	158

PRODUCT 3993 = 182

PRODUCT 9605 = 178

PRODUCT 9237 = 176

PRODUCT 6364 = 176

PRODUCT 3762 = 173

PRODUCT 4450 = 171

INSIGHT

Top-Selling Products:

The product with ID 9806 has the highest sales, with 210 units sold. This indicates strong demand and suggests the need to ensure this product is well-stocked to avoid stockouts.

High-Performing SKUs:

Several products, such as 3381, 8486, and 8106, also have significant sales (over 180 units). These products likely contribute a substantial portion of revenue and should be prioritized in inventory planning.

Demand Distribution:

The data shows a mix of sales performance across different products. Understanding the demand patterns for these products over time, including any seasonal trends, could help in fine-tuning inventory levels.

ANALYSIS

b) Which product category had the highest sales volume last month?



```
select product.productcategory, sum(sales.inventoryquantity) as "Sales Volume"
from sales
join product on product.productid = sales.productid
where sales.sales_year = '2021' and sales.sales_month = '11'
group by product.productcategory
order by "Sales Volume" desc
limit 1;
```

RESULT

productcategory
text

Sales Volume
bigint

Electronics

678

INSIGHT

Electronics Dominance:

Electronics is the leading category in terms of sales volume, indicating strong demand in this area. This suggests that T.T. Inc. has a significant customer base interested in electronics products.

Potential Growth Areas:

Laptops and Smartphones also show strong sales figures, though they lag behind Electronics. There could be potential to boost these categories through targeted marketing and inventory strategies.

Lower-Performing Categories:

Home Appliances had a relatively lower sales volume, which might indicate either a smaller customer base or less demand in this segment. It's important to assess whether this category is underperforming due to inventory issues, lack of promotion, or market trends.

ANALYSIS

c) How does the inflation rate correlate with sales volume for a specific month?

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```
select sales.sales_month, sales.sales_year, SUM(inflationrate) as "Inflation Rate",
SUM(inventoryquantity) as "Sales Volume"
from sales
join factors on sales.salesdate = factors.salesdate
group by sales.sales_year,sales.sales_month;
```

RESULT

	sales_month integer		sales_year integer		Inflation Rate numeric		Sales Volume bigint	
1		6		2022		160.64		3020
2		8		2018		124.37		2131
3		7		2022		112.65		2589
4		11		2018		143.34		1743
5		2		2020		210.61		3432
6		12		2021		151.26		2562
7		7		2019		143.98		1874
8		10		2019		120.40		1879
9		10		2022		161.70		3649
10		6		2019		66.39		1198
11		2		2018		91.04		1737
12		11		2021		120.29		2334
13		4		2019		164.04		2001
14		7		2018		250.61		4305
15		11		2020		62.50		1012
16		10		2021		179.30		3372
17		5		2020		126.78		2558
18		5		2018		160.44		2296

INSIGHT

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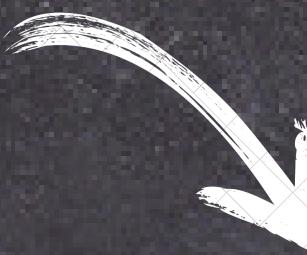
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ANALYSIS

d) What is the correlation between the inflation rate and sales quantity for all products combined on a monthly basis over the last year?

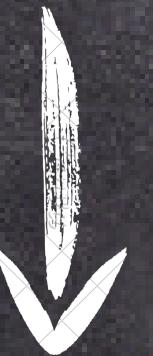


```
select sales.productid, sales.sales_month, sales.sales_year,  
cast(AVG(inflationrate) as numeric (10,1)) as "Average Inflation",  
COUNT(inventoryquantity) as "Sales Quantity"  
from sales  
join factors on sales.salesdate = factors.salesdate  
where sales.salesdate >= (current_Date - interval '1')  
group by sales.productid, sales.sales_year, sales.sales_month  
order by "Sales Quantity" desc;
```

RESULT

productid	sales_month	sales_year	Average Inflation	Sales Quantity
numeric	integer	integer	numeric (10,1)	bigint

INSIGHT



The result indicates that inflation, at least within the period analyzed, may not be a significant factor in determining sales performance.

ANALYSIS

f) What is the average sales quantity per product category?

```
select product.productcategory, Round(AVG(sales.inventoryquantity)) as "Average Sales Quantity"  
from product  
join sales on sales.productid = product.productid  
group by product.productcategory  
order by "Average Sales Quantity" desc;
```

RESULT

	productcategory	Average Sales Quantity
1	Electronics	53
2	Home_Appliances	52
3	SmartPhones	51
4	Laptops	50

INSIGHT

Electronics Lead:

The Electronics category has the highest average sales quantity (53 units), indicating strong and consistent demand. This suggests that T.T. Inc.'s customers are more inclined toward purchasing electronic items, possibly due to their essential nature or high demand in the market.

Close Performance Among Categories:

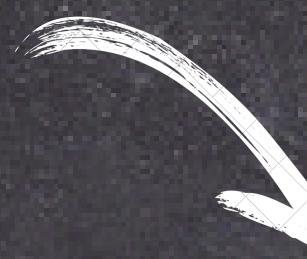
Home Appliances (52 units), Smartphones (51 units), and Laptops (50 units) have similar average sales quantities. This indicates that these categories are also performing well, though slightly behind Electronics.

Balanced Sales Across Categories:

The data shows a relatively balanced performance across the major product categories. This implies that T.T. Inc.'s product offerings are well-rounded and that customers are purchasing from various categories at similar rates.

ANALYSIS

g) How does the GDP affect the total sales volume?



```
select sales.sales_year, SUM(factors.gdp) as "Total GDP",
SUM(inventoryquantity) as "Sales Volume"
from sales
join factors on sales.salesdate = factors.salesdate
group by sales.sales_year
order by "Sales Volume" desc;
```

RESULT

	sales_year integer		Total GDP numeric		Sales Volume bigint	
1	2022		11784921.53		30376	
2	2020		10809156.99		29068	
3	2018		11720114.38		28494	
4	2019		10959585.47		27529	
5	2021		10437239.33		27349	

INSIGHT

Positive Correlation:

The data suggests a positive relationship between GDP and sales volume. In years with higher GDP (e.g., 2022 with a GDP of 11,784,921.53), sales volume also appears to be higher (30,376 units). Conversely, in years with lower GDP (e.g., 2021 with a GDP of 10,437,239.33), sales volumes are somewhat lower (27,349 units).

Economic Influence:

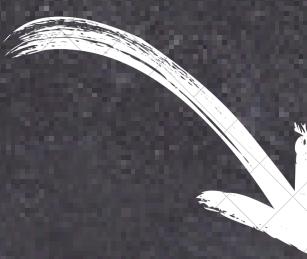
GDP reflects the overall economic health of the market. A higher GDP generally indicates stronger economic performance, increased consumer spending, and higher demand for products. This trend is evident in the years like 2022 and 2020, where higher GDP levels corresponded with higher sales volumes.

Consistency in Sales:

Despite some fluctuations in GDP, sales volumes remain relatively stable across the years, suggesting that T.T. Inc.'s products have a strong market presence that can endure minor economic fluctuations.

ANALYSIS

i) How do seasonal factors influence sales quantities for different product categories?



```
Select product.productcategory, Round(AVG(factors.seasonalfactor)) "Average Seasonal Factor"  
SUM(inventoryquantity) as "Sales Quantity"  
from sales  
join product on sales.productid = sales.productid  
join factors on sales.salesdate = factors.salesdate  
group by product.productcategory
```

RESULT

	productcategory text	Average Seasonal Factor numeric	Sales Quantity bigint
1	Home_Appliances	1	51128128
2	Electronics	1	53698816
3	SmartPhones	1	55698240
4	Laptops	1	53698816

INSIGHT

No Significant Seasonal Impact:

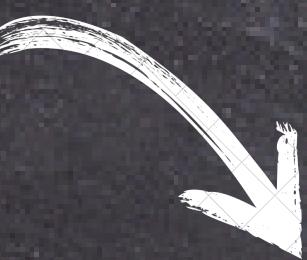
Since the seasonal factor is 1 across all categories, it suggests that seasonal fluctuations do not have a notable impact on sales volumes for the product categories analyzed (Home Appliances, Electronics, Smartphones, and Laptops). This could indicate either consistent demand throughout the year or a lack of granular data to detect seasonal trends.

High and Consistent Sales:

Despite the lack of seasonal variation, sales quantities across all categories are substantial. Categories like Smartphones and Electronics show particularly strong performance, which could indicate stable demand irrespective of the season.

ANALYSIS

j) What is the average sales quantity per product category, and how many products within each category were part of a promotion?



```
select product.productcategory, Round(AVG(sales.inventoryquantity)) as "Average Sales Quantity"
COUNT(case when product.promotions = 'YES' then 1 end) as "Count of Promotions"
from sales
join product on product.productid = sales.salesid
group by product.productcategory
order by "Average Sales Quantity" desc;
```

RESULT

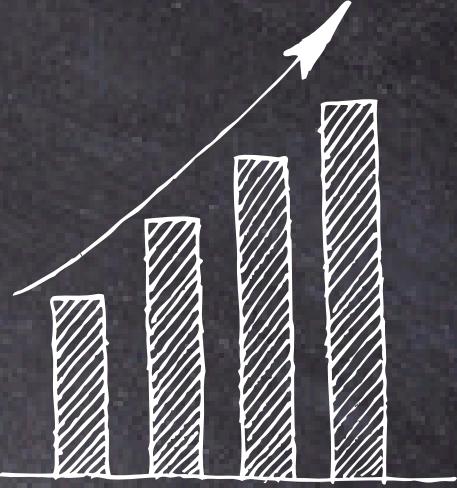
	productcategory	Average Sales Quantity	Count of Promotions
1	Laptops	62	0
2	Electronics	54	0
3	SmartPhones	50	0
4	Home_Appliances	44	0

INSIGHT

High Sales Without Promotions: Categories like Laptops and Electronics have high average sales quantities (62 and 54 units, respectively) without any promotional efforts. This suggests that these products have strong demand even without discounts or special offers.

Potential Untapped Promotional Impact: Given that no promotions were applied, there is potential for increasing sales even further through targeted promotional campaigns. Promotions could be particularly beneficial for categories with lower average sales quantities, like Home Appliances (44 units).

RECOMMENDATIONS



By focusing on data-driven decisions, diversifying products and promotions, and investing in customer experience, T.T. Inc. can enhance its overall operational efficiency and continue to grow in a competitive market.

Enhance Data-Driven Decision-Making

Implement advanced analytics and business intelligence tools to continuously monitor and analyze sales, inventory, customer behavior, and market trends. Empower teams with access to real-time data to make informed decisions that improve operations and customer satisfaction.

Invest in Customer Experience and Retention

Focus on enhancing the overall customer experience by offering personalized recommendations, loyalty programs, and top-tier customer service. Use customer data to identify at-risk customers and implement targeted retention strategies.

Diversify Product and Promotion Strategies

Diversify product offerings by identifying high-demand categories and introducing complementary products. Simultaneously, experiment with targeted promotional campaigns, especially in underperforming categories, to boost overall sales.

CONCLUSION

In conclusion, T.T. Inc. is positioned for continued success by leveraging data-driven strategies, optimizing product offerings, and enhancing customer experiences. By focusing on efficient inventory management, targeted promotions, and customer retention, the company can maintain its competitive edge and drive sustainable growth in the evolving consumer electronics market. With a commitment to innovation and adaptability, T.T. Inc. is well-equipped to meet future challenges and capitalize on emerging opportunities.



THANK YOU