BI ANALYST CASE STUDY

CRM, Sales, Inventory & Marketing Insights

Submitted by

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Project Objectives

- Analyze complex datasets to extract meaningful business insights.

- Build an interactive, visually compelling Power BI dashboard.

- Communicate findings clearly through cross-functional analysis.

- Provide actionable recommendations for sales optimization, customer engagement, inventory efficiency, and campaign performance.

Analysis Area & Key Focus

1. Sales Performance Analysis
- Identify trends in sales over time and across different channels and regions.
- Compare performance across various regions and product lines.
- Highlight top-performing sales representatives and customers, using fields like age and gender for demographic insights.

2. Customer Interaction Insights
- Analyze the frequency and types of interactions with customers.
- Track key customer metrics, including average deal size and conversion rates.
- Identify trends or anomalies in customer interactions that may indicate opportunities or challenges.

3. Product Demand and Inventory Management
- Analyze demand patterns for different products.
- Identify products with the highest and lowest demand.
- Provide insights on inventory management, highlighting stock levels, turnover rates, and potential stockout risks.
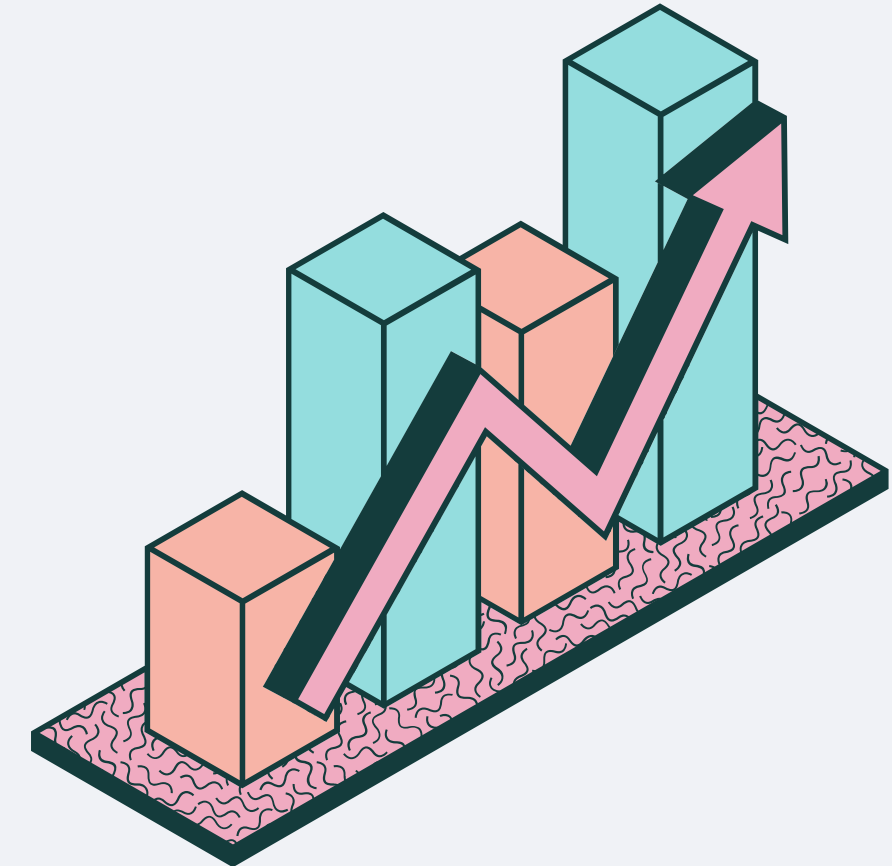
Analysis Area & Key Focus

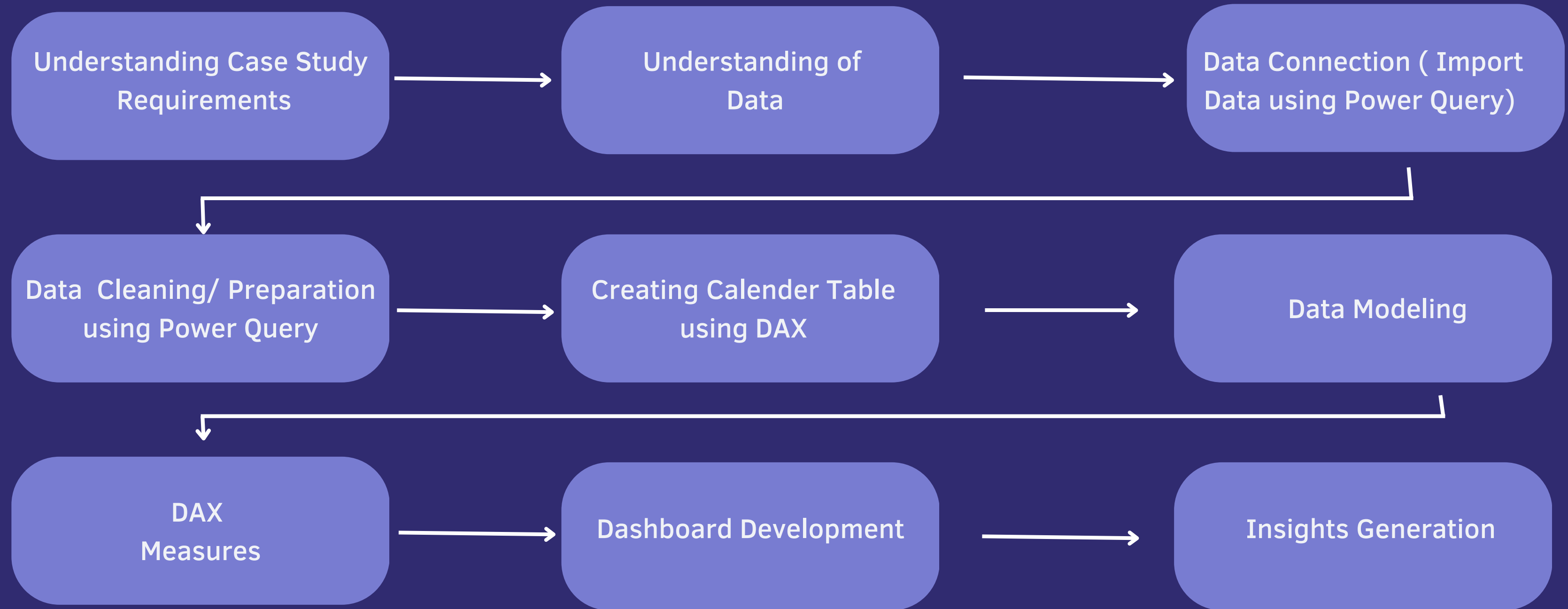**4. Marketing Campaign Effectiveness**
- Assess the reach, conversion rates, and revenue generated by various marketing campaigns.
- Visualize the impact of each channel (e.g., Online, Retail, Wholesale) on conversions and revenue generation.

5. Regional Sales Target Analysis
- Track sales performance against quarterly and annual targets by region.
- Highlight regions performing above or below target expectations.

Project Steps

Understanding Case Study Requirements → Understanding of Data → Data Connection (Import Data using Power Query)

Data Cleaning/ Preparation using Power Query → Creating Calender Table using DAX → Data Modeling

DAX Measures → Dashboard Development → Insights Generation

Data Source

An Excel file contains following tabs :

- **Sales Data:** Includes fields such as Order ID, Date, Region, Sales Representative, Customer, Product, Channel, Geo Location, Quantity, and Sales Amount.

- **Customer Interactions**: Includes fields such as Customer ID, Interaction Type, Date, Sales Representative, Outcome, Agent Age, and Gender.

- **Product Inventory**: Includes fields like Product ID, Product Name, Category, Stock Level, Stock Turnover Rate, Supplier, and Reorder Level.

- **Marketing Campaigns**: Contains fields such as Campaign ID, Start Date, End Date, Channel, Total Reach, Total Conversions, Conversion Rate (%), and Revenue Generated.

- **Regional Sales Targets**: Includes quarterly and yearly sales targets for each region.

Tools and Techniques

- Utilized Microsoft Power BI for end-to-end data analysis, including data cleaning using Power Query, creation of custom DAX measures, building a robust data model, implementing a custom calendar table, and designing interactive, insight-driven dashboards.

Custom Calender Table

```
1  CalenderData =
2  var _mindate=DATE(YEAR(MIN('Sales Data'[Date])),1,1)
3  var _maxdate=DATE(YEAR(MAX('Sales Data'[Date])),12,31)
4  RETURN
5  ADDCOLUMNS(
6       CALENDAR(_mindate,_maxdate),
7     "Year",Year([Date]),
8     "Month",FORMAT([Date],"mmm"),
9     "MonthNUM",MONTH([Date]),
10     "Weekday",FORMAT([Date],"ddd"),
11    "weeknum",WEEKDAY([Date]),
12    "Quarter","Q" & FORMAT(QUARTER([Date]),"")
13  )
```

Date	Year	Month	MonthNUM	Weekday	weeknum	Quarter
27/01/2023	2023	Jan	1	Fri	6	Q1
26/01/2023	2023	Jan	1	Thu	5	Q1
25/01/2023	2023	Jan	1	Wed	4	Q1
24/01/2023	2023	Jan	1	Tue	3	Q1
23/01/2023	2023	Jan	1	Mon	2	Q1
22/01/2023	2023	Jan	1	Sun	1	Q1
21/01/2023	2023	Jan	1	Sat	7	Q1
20/01/2023	2023	Jan	1	Fri	6	Q1
19/01/2023	2023	Jan	1	Thu	5	Q1
18/01/2023	2023	Jan	1	Wed	4	Q1
17/01/2023	2023	J	1	T	3	Q1

Created a custom calendar table using DAX to enable seamless date-based analysis and establish relationships across multiple tables within the data model.

Data Modeling
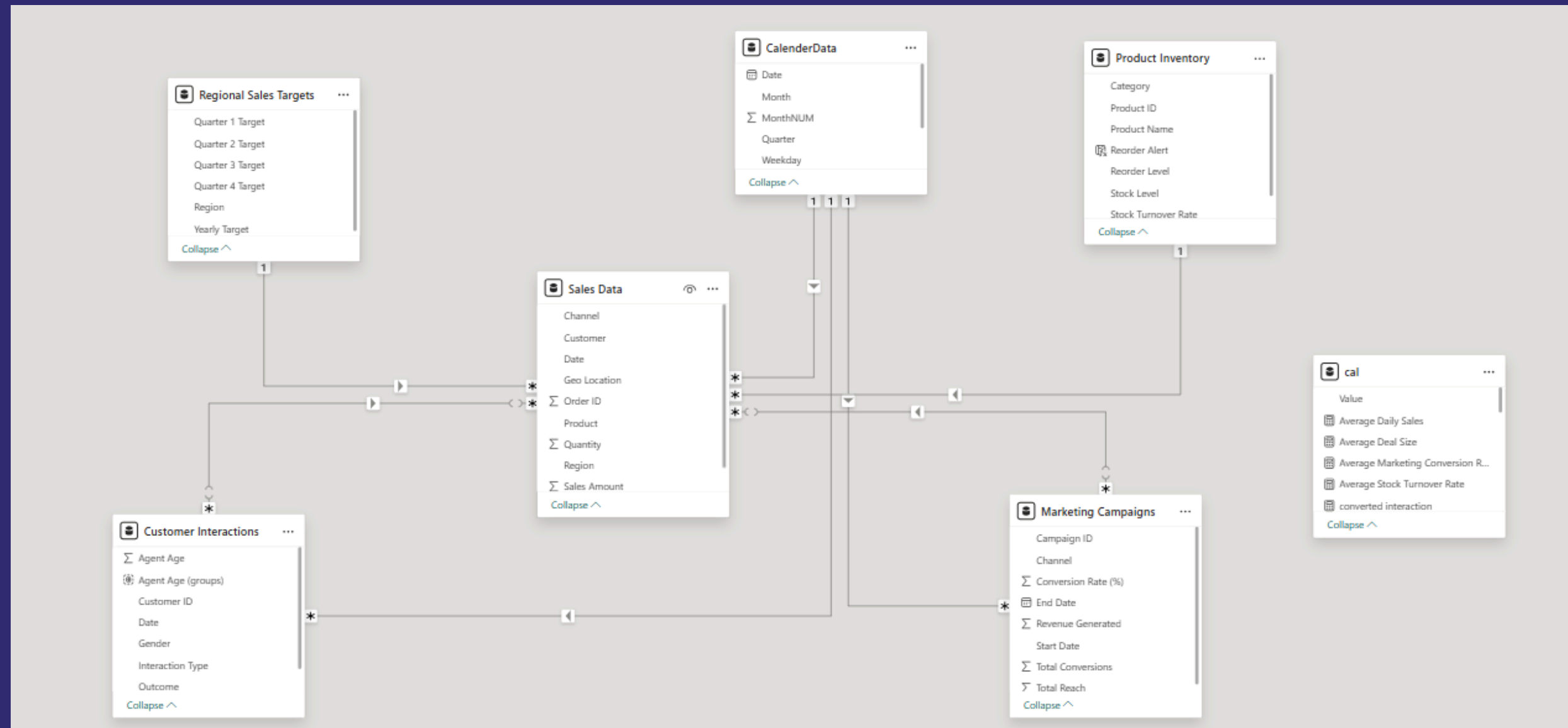
Established relationships across tables within a data model structured using a snowflake schema, with the Sales table serving as the central fact table.
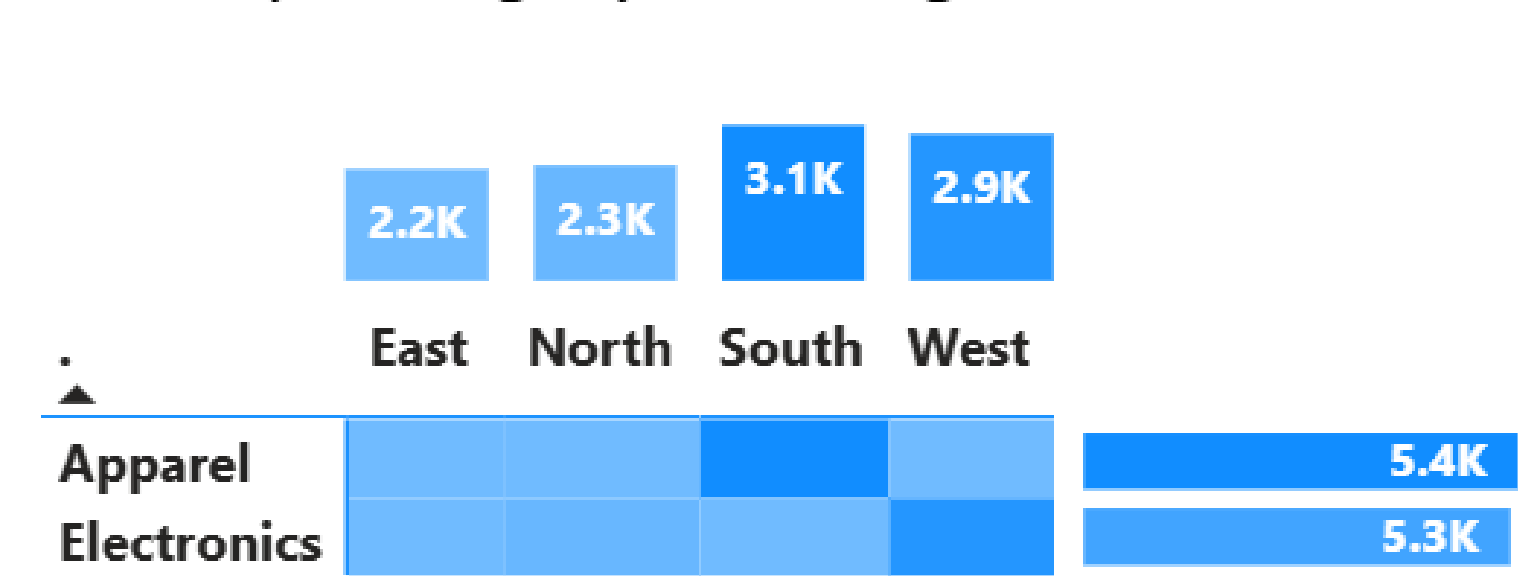
Sales Performance Analysis

Sales Performance Analysis

Total sales by Month

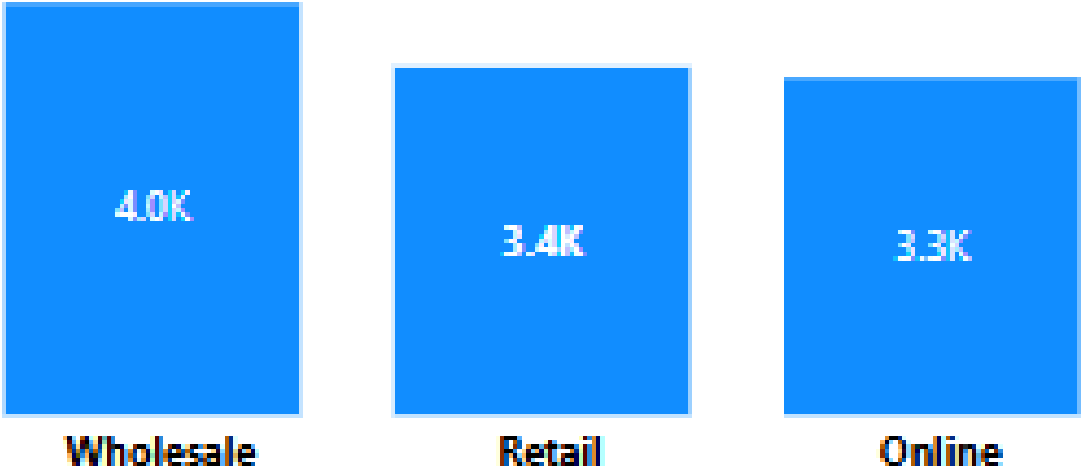April recorded the peak sales with a total of 1,220, December saw the lowest sales of the Year with Total of 550

Sales by Category and Region

📍 South Region achieved the highest total sales of 3110,

📍 East Region recorded the lowest total sales of 2,240

👕 Apparel emerged as the top-selling category with total sales of ₹5,350

📱 Electronics followed closely with ₹5,250 in sales,

Total sales by Channel

Wholesale	4.0K
Retail	3.4K
Online	3.3K

🏛️ Wholesale was the dominant sales channel, contributing ₹,3980 in total sales

🛒 Online sales accounted for 3,260, the lowest

Top Customers by Sales

Customer ID	Region	Total sales
Customer 10	East	250
Customer 10	South	310
Customer 15	East	250
Customer 15	West	310
Customer 20	North	250
Customer 20	West	310
Customer 25	North	250
Customer 25	South	310
Total		2800

Top Represenative by Sales

Sales Representative	Total sales
Rep A	2310
Rep B	3110
Rep C	2240
Rep D	2940
Total	10600

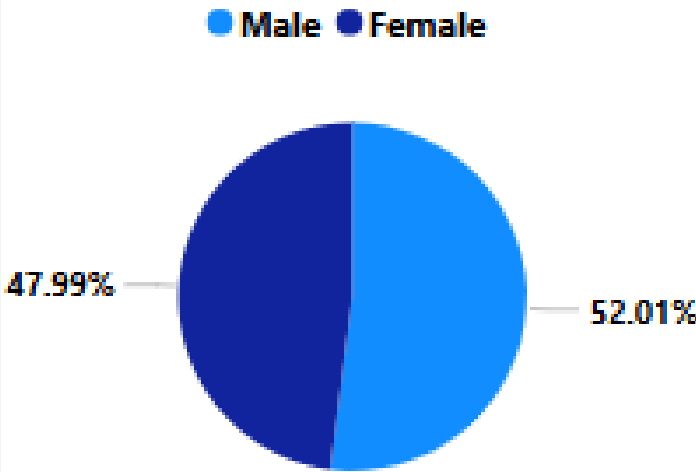🧍‍♂️ Customer 10: Highest customer by sales with ₹560
🧑‍💼 Rep B: Top sales representative with ₹2,940 in total sales

Total Sales by CustomerAge

40-49	7.8K
30-39	4.8K
50-59	3.4K
20-29	1.5K

Sales by Gender

- Male
- Female

47.99%   52.01%
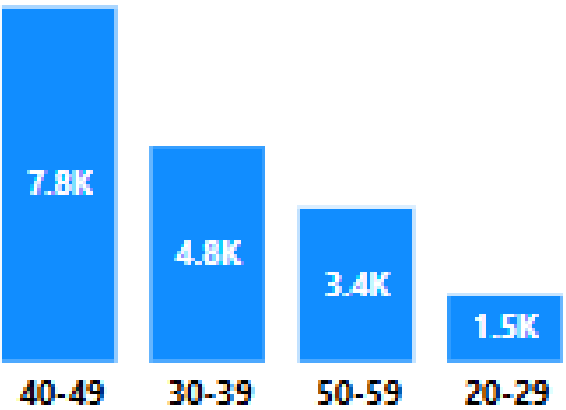
Age 40–49 group drove the highest engagement with sales totaling ₹7,830
👶 Age 20–29 showed least interest, contributing only ₹1,470
👦 52% of customers were male
👧 47% were female

10.6K
Total sales

50
Total Orders

Total Sales Made -10.6K

Total Orders - 50

Customer Analysis Insights

Customer Analysis Insights

Interaction type and Outcome

● Failure ● Pending ● Success

| Call | Email | Follow-up | Meeting |

📞 Calls and ✉ Emails were the most used interaction channels

✅ Emails and Follow-ups led to the highest success rates

❌ Meetings often resulted in failure

⏳ Calls had the highest number of pending outcomes

Success Rate Over Time

● Interactions ● Interaction conversion rate

January February March April May June July August September October November December

📅 January, April, July, and October recorded the highest customer interactions (5 each), indicating strong engagement during the start of each quarter.

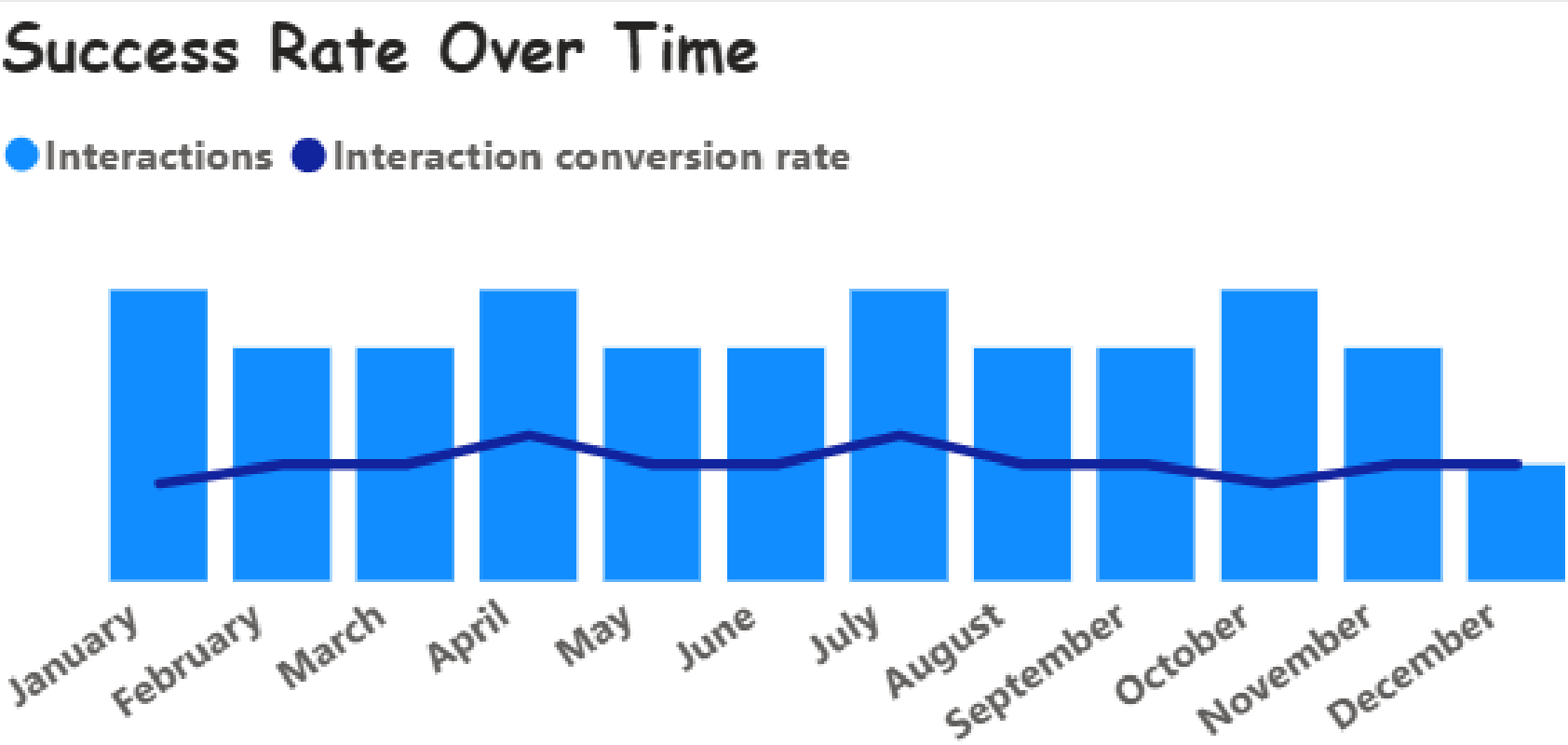📉 December had the lowest interactions, with only 2 recorded, possibly due to holiday season slowdown.

Sales Representative Performance

Sales Representative	Interactions	converted interaction	Interaction conversion rate	Average Deal Size
Rep A	50	25	2.00	177.69
Rep B	50	25	2.00	239.23
Rep C	50	25	2.00	186.67
Rep D	50	25	2.00	245.00
Total	**50**	**25**	**2.00**	**424.00**

👩‍💼 Rep D had the highest average deal size: 245
👩‍💼 Rep A had the lowest average deal size: 177.69
All sales reps interacted with 50 customers each, with 25 successful conversions
📊 Overall average deal size across reps: 424.00, Conversion Rate of 2.0

Total Orders by Agent Age (groups)

10%
17.5%
45%
27.5%
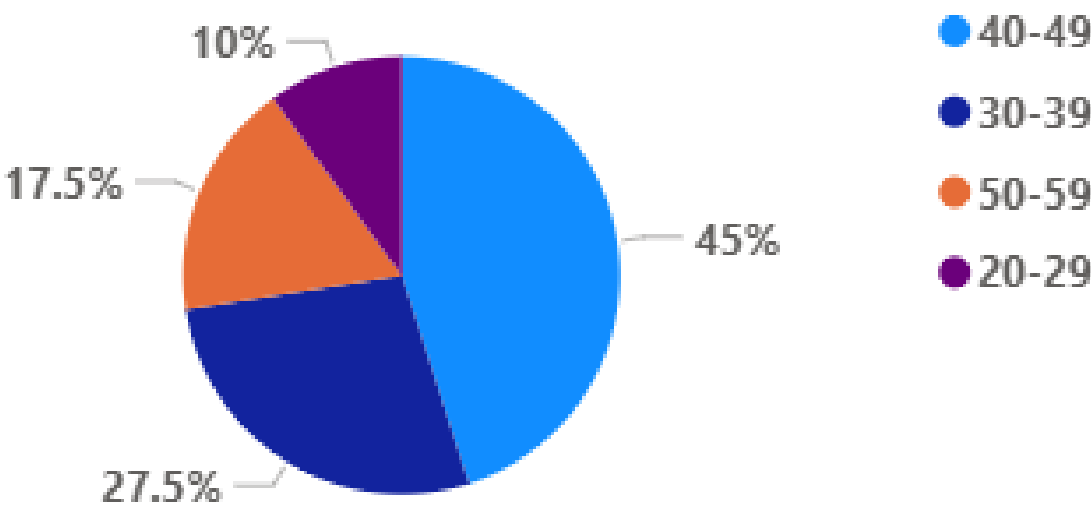
- 40-49
- 30-39
- 50-59
- 20-29

👤 Age 40–49: 46% of total orders (highest)
👤 Age 20–29: 10% of total orders (lowest)

Product Demand and Inventory Management

Product Demand and Inventory Management
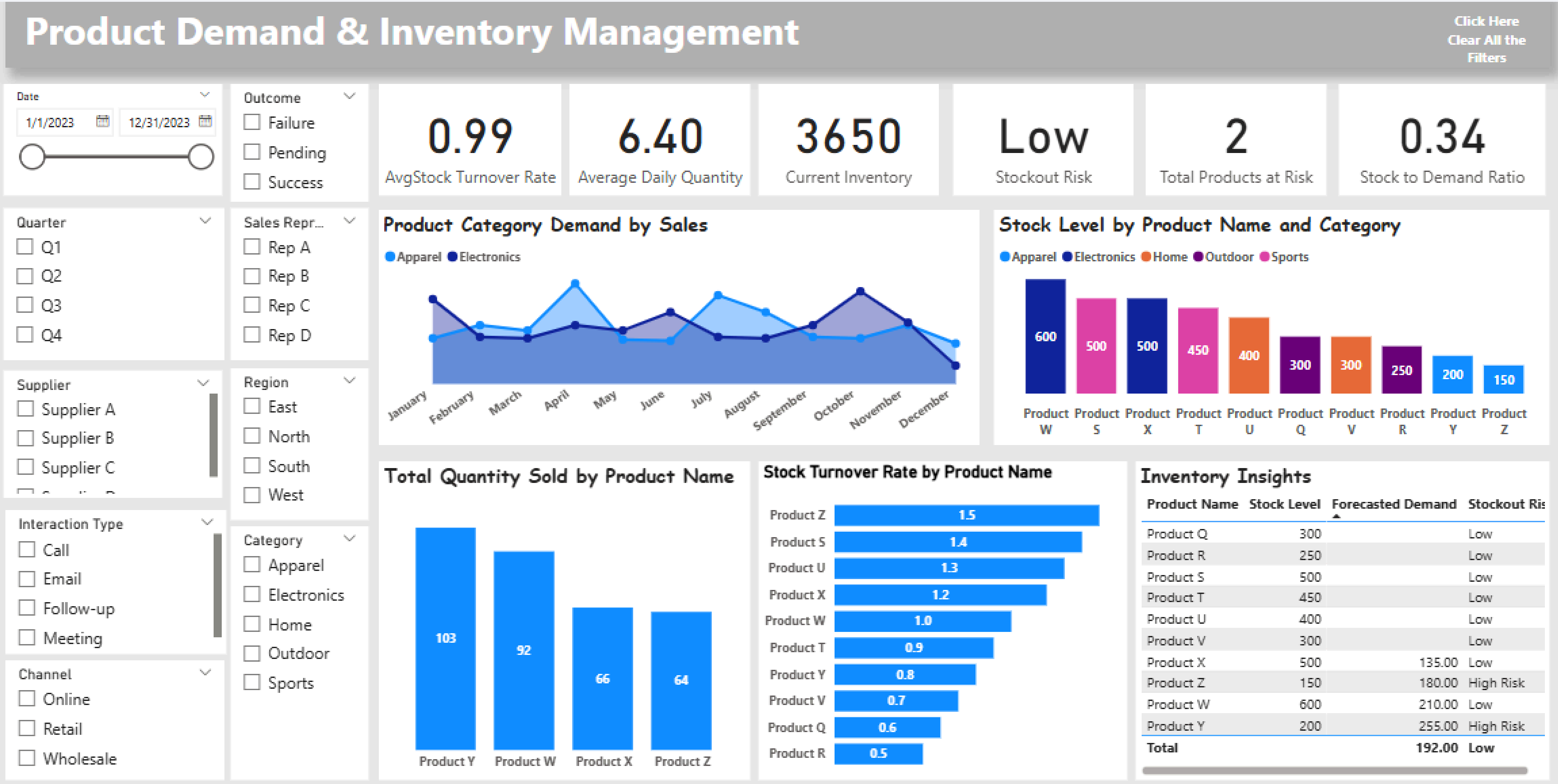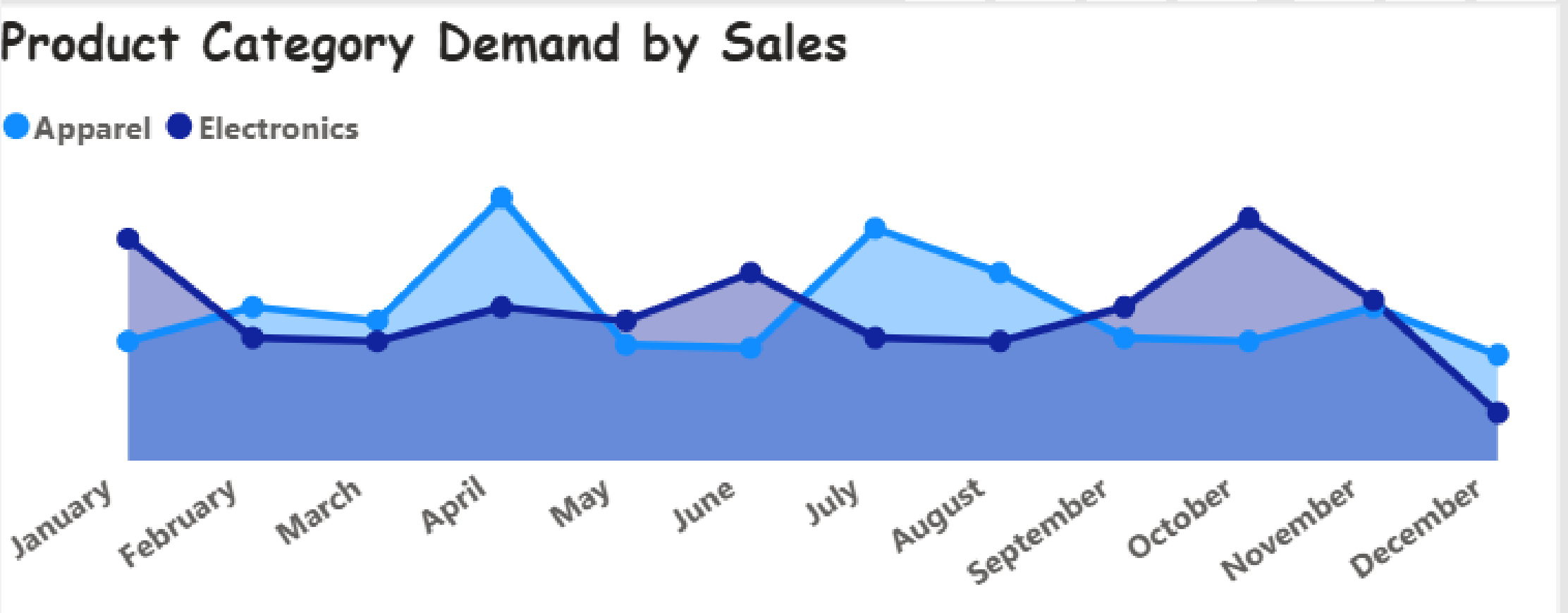
Product Category Demand by Sales

● Apparel ● Electronics

Apparel saw significant spikes in April, July, and August,with the highest sales in July (680) and the lowest in December (310).

📱 Electronics peaked in January, June, September, October, and November,with October leading at 710 and the lowest also in December (140).

Total Quantity Sold by Product Name

Product Y	Product W	Product X	Product Z
103	92	66	64
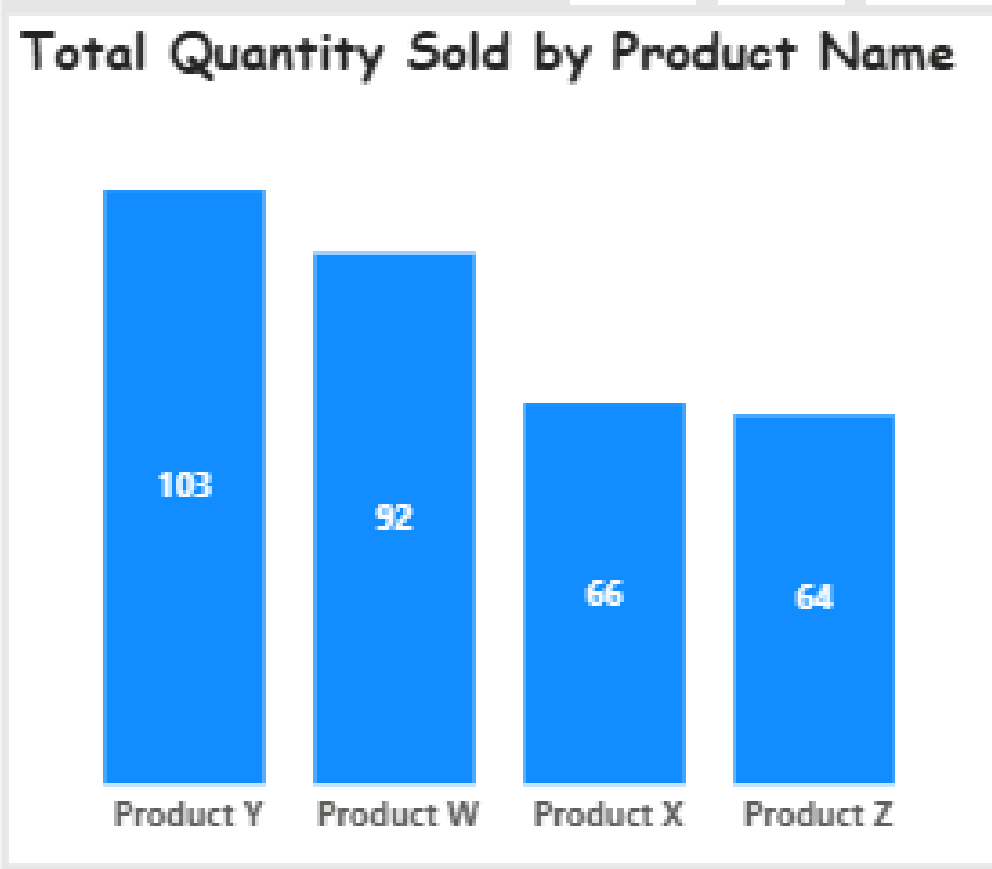
📈 Product Y had the highest demand with 103 units sold

📉 Product Z had the lowest demand with 64 units sold

3650
Current Inventory

0.99
AvgStock Turnover Rate

6.40
Average Daily Quantity

Inventory Insights

Product Name	Stock Level	Forecasted Demand	Stockout Risk
Product Y	200	255.00	High Risk
Product Z	150	180.00	High Risk
Product Q	300		Low
Product R	250		Low
Product S	500		Low
Product T	450		Low
Product U	400		Low
Product V	300		Low
Product W	600	210.00	Low
Product X	500	135.00	Low
Total		**192.00**	**Low**

⚠️ Product Y and Product Z are at high risk of stockout, with current stock levels falling below their reorder thresholds.

✅ All other products are at low risk, maintaining adequate inventory above reorder levels.

📦 Products S, T, U, V, Q, and R have unsold stock — zero units sold, indicating possible issues with demand, visibility, or relevance. Proactive restocking of high-risk ite
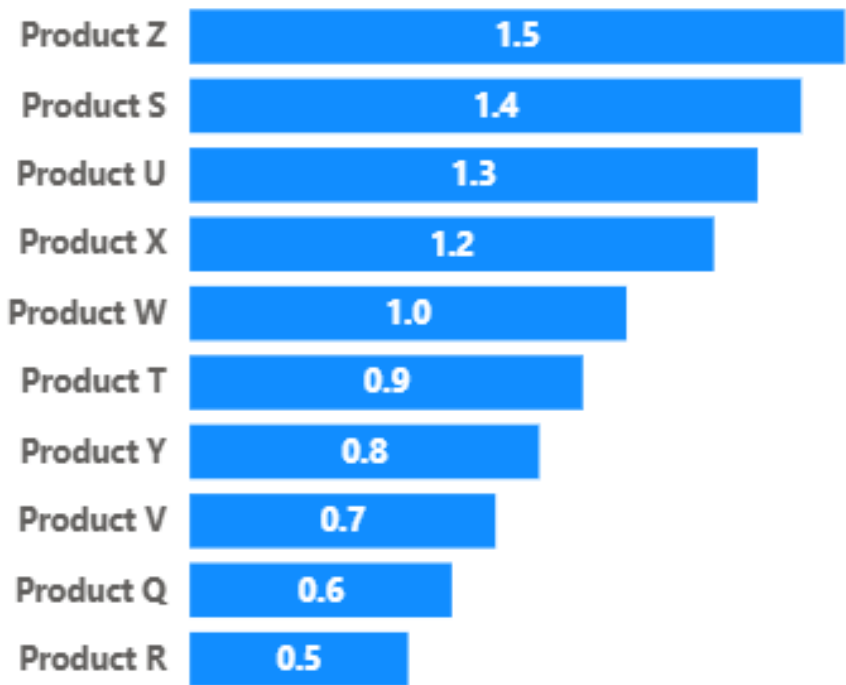
2
Total Products at Risk

0.34
Stock to Demand Ratio

Stock Turnover Rate by Product Name

Product	Rate
Product Z	1.5
Product S	1.4
Product U	1.3
Product X	1.2
Product W	1.0
Product T	0.9
Product Y	0.8
Product V	0.7
Product Q	0.6
Product R	0.5

- 🔄 Product Z has the highest stock turnover rate of 1.5, indicating strong demand and efficient inventory movement.

- 🐢 Product R shows the lowest turnover rate of 0.5, it may need review or promotional push.

Marketing Campaign Effectiveness

Marketing Campaign Effectiveness

Revenue Generated by Campaign ID

19.7K	19.7K	19.6K	16.7K	16.5K	15.0K	12.9K	11.8K	10.0K	5.2K
CAMP4	CAMP8	CAMP9	CAMP2	CAMP6	CAMP10	CAMP5	CAMP7	CAMP1	CAMP3
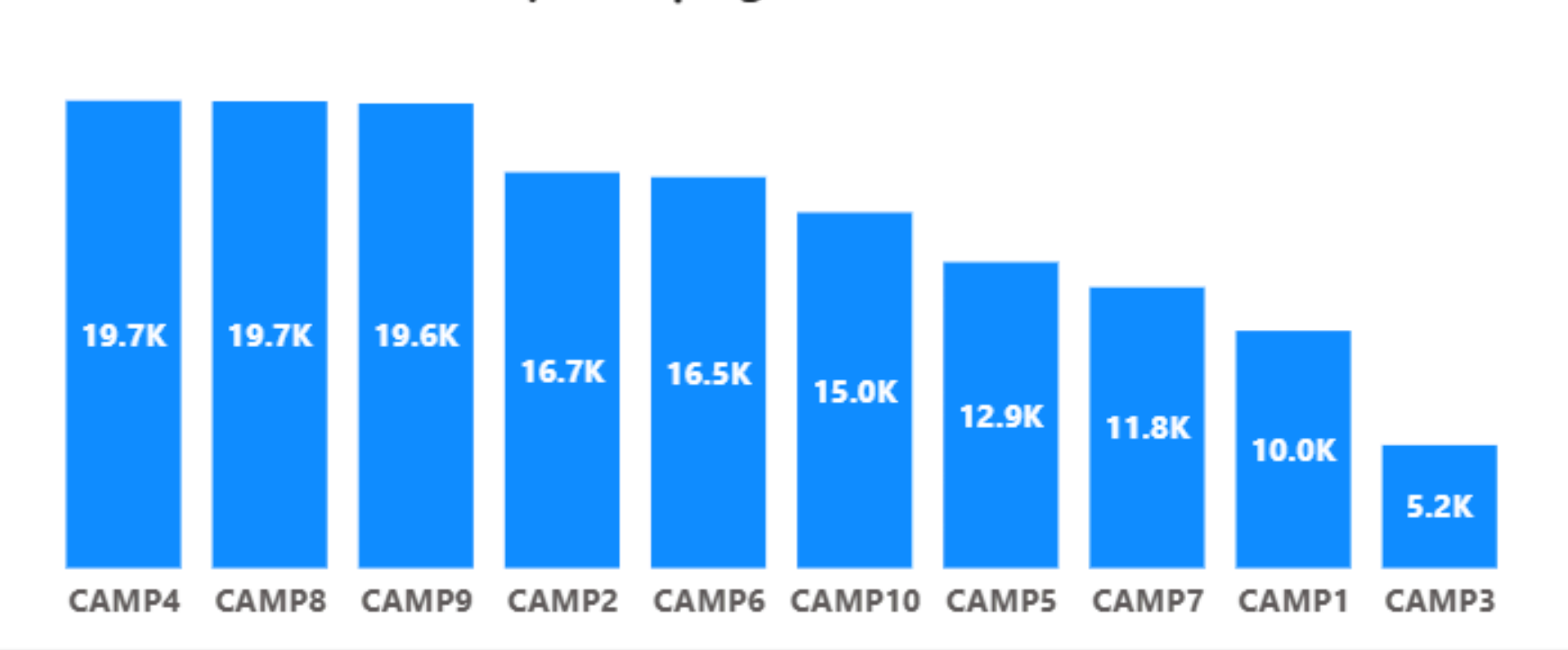
💰 CAMP4, CAMP8, and CAMP9 generated the most revenue, highlighting their effectiveness and strong ROI.

📉 CAMP3 delivered the lowest revenue, suggesting a need for review or strategic adjustment.

Revenue Generated by Channel

Retail	Online	Wholesale
63K	43K	41K

Revenue was Generated from Retail and online

Total Conversions by Channel

Retail	823
Online	798
Wholesale	632

Retail Had the highest Total Conversions by Channel

Total Reach by Channel

● Retail ● Online ● Wholesale

24.64% 44.49%

30.86%

Retail channels drove the highest reach, suggesting strong offline visibility. Online and wholesale can be optimized for broader exposure.
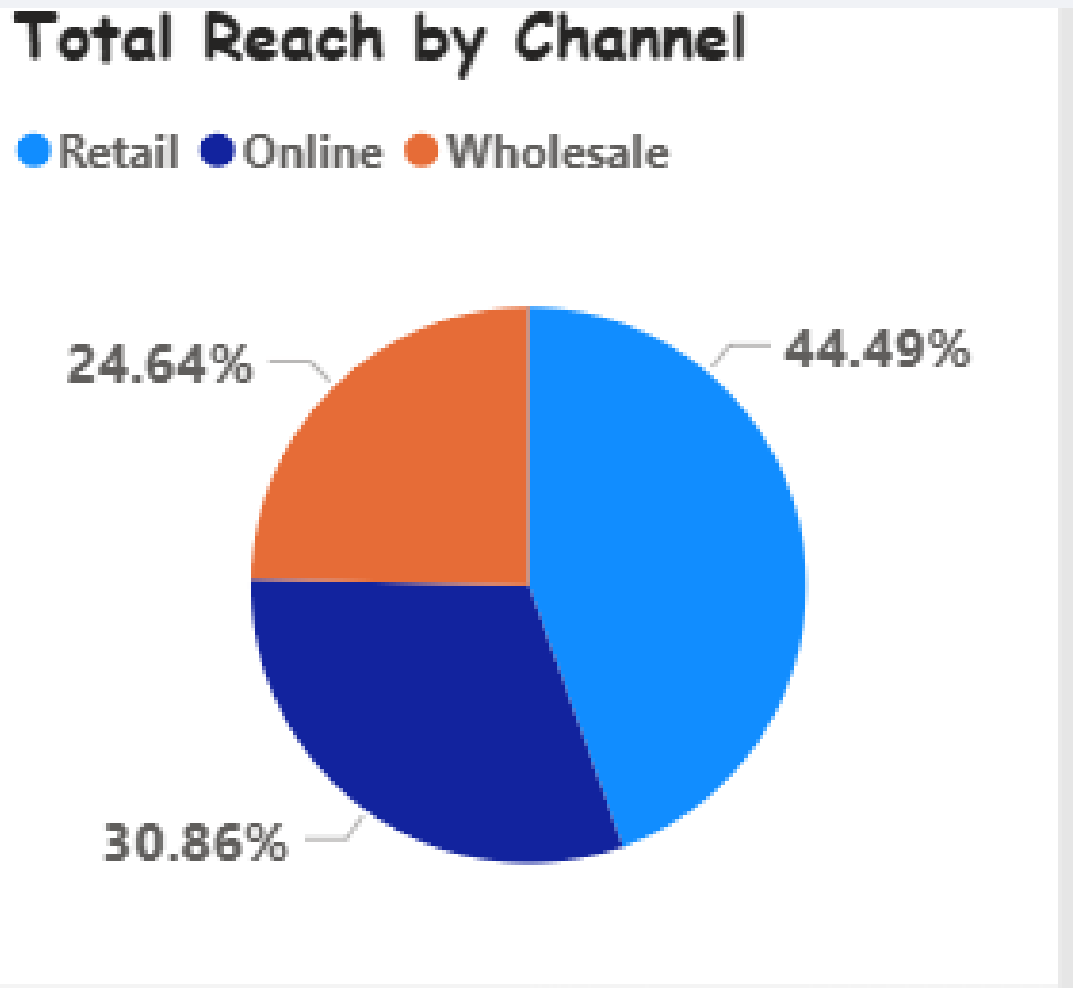
## Marketing Insights

Campaign ID	Channel	Sum of Total Reach	Sum of Revenue Generated	Sum of Total Conversions
CAMP4	Retail	4729	19719	129
CAMP8	Online	3585	19696	239
CAMP9	Wholesale	2246	19602	191
CAMP2	Retail	3370	16696	199
CAMP6	Wholesale	2077	16496	201
CAMP10	Retail	3204	15000	250
CAMP5	Online	4917	12906	292
CAMP7	Retail	4414	11845	245
Total		**35326**	**147157**	**2253**

Campaign Performance Summary
🌐 Total Reach: 35,326
💰 Total Revenue Generated: 147,157
🔄 Total Conversions: 2,253
📈 Revenue per Conversion: 65.32

Regional Sales Target
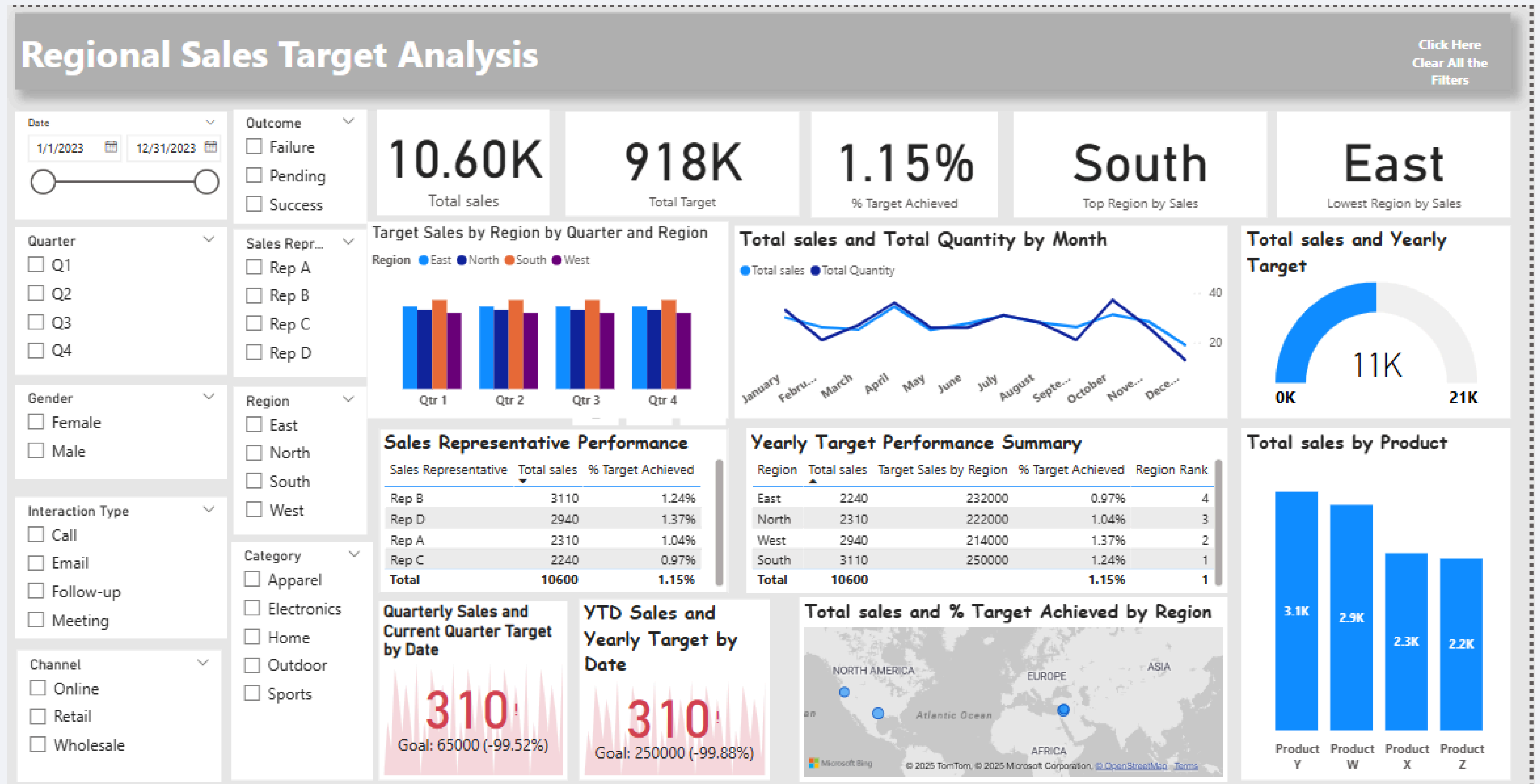
Regional Sales Target

South
Top Region by Sales

South is the Top Region by Sales

East
Lowest Region by Sales

East is the Bottom Region by Sales

10.60K
Total sales

Total Sales by Region

918K
Total Target

Total Target of 918k

1.15%
% Target Achieved

1.15% Target Achieved

Sales Representative Performance

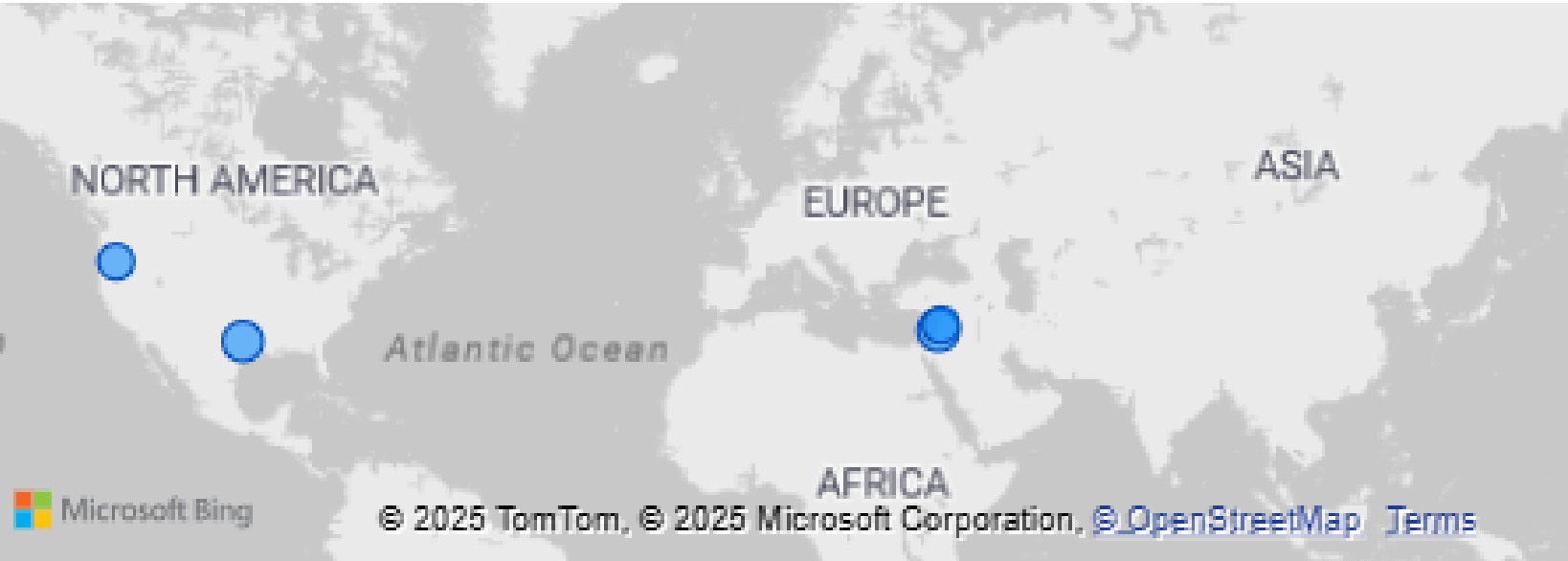| Sales Representative	Total sales	% Target Achieved
Rep C	2240	0.97%
Rep A	2310	1.04%
Rep B	3110	1.24%
Rep D	2940	1.37%
Total	**10600**	**1.15%**

Rep B has the highest sales with 1.24% Target Achieved while Rep has the highest Target Achieved rate of 1.37%
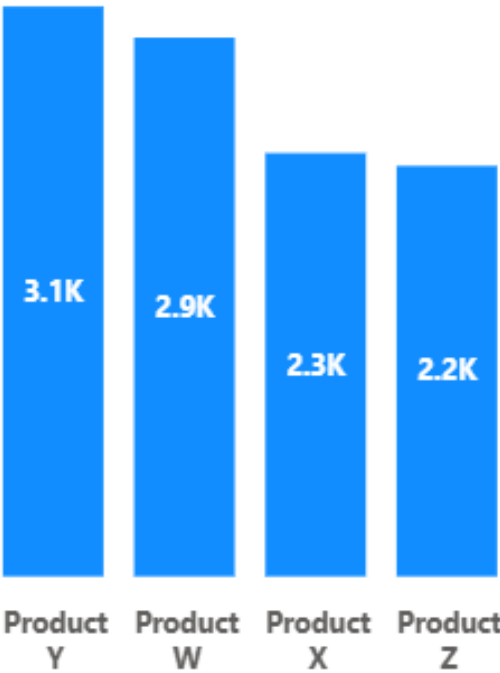
Regional Sales Target

Total sales and % Target Achieved by Region

South Region has the highest sales of 3110 with target of 250000

Total sales by Product

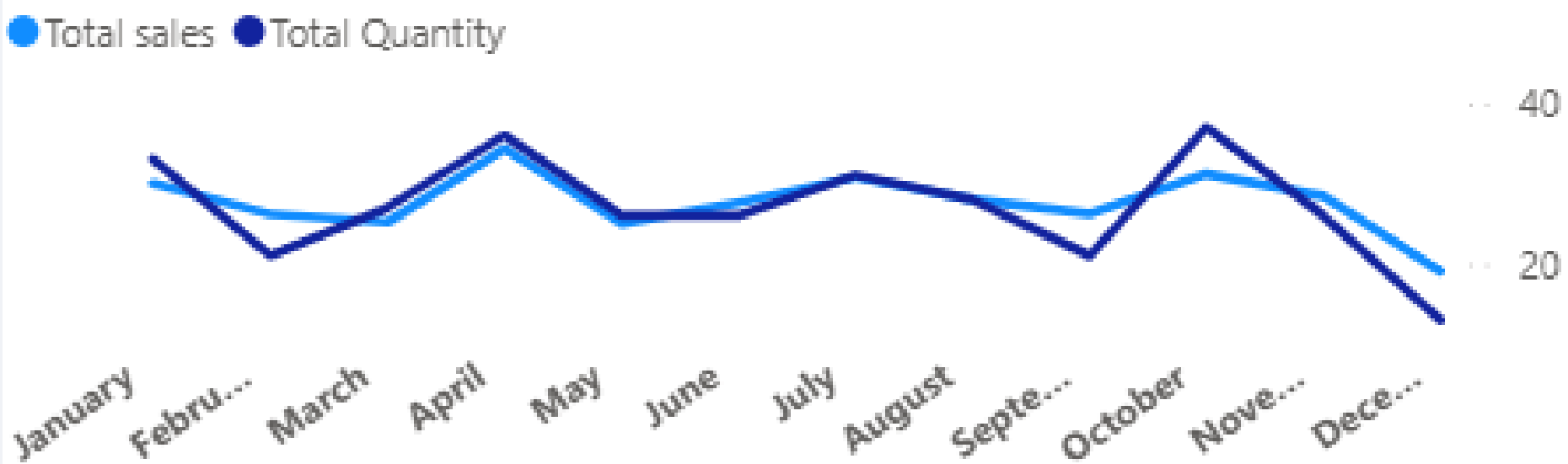Product Y is the highest sold product while Product Z being least sold

Yearly Target Performance Summary

Region	Total sales	Target Sales by Region	% Target Achieved	Region Rank
East	2240	232000	0.97%	4
North	2310	222000	1.04%	3
West	2940	214000	1.37%	2
South	3110	250000	1.24%	1
Total	**10600**		**1.15%**	**1**

None of the Regions were able to hit the target sales by regions

Regional Sales Target

Total sales and Total Quantity by Month

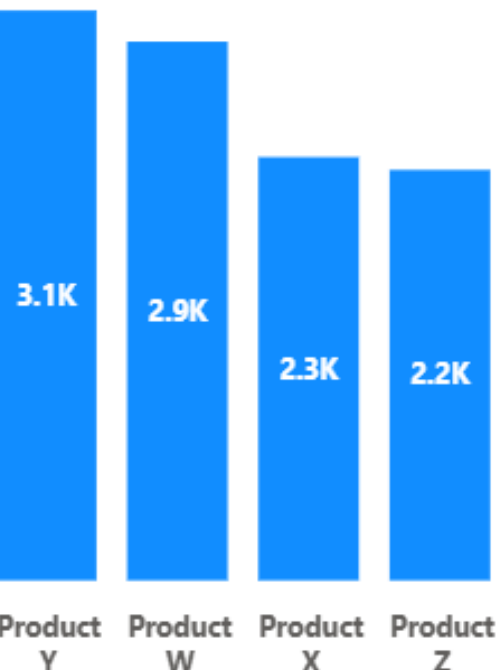● Total sales ● Total Quantity

Total sales peaked in Jan, Apr, Jul, and Oct, with the highest in Apr (1,220) and the lowest in Dec (450).

Orders peaked in Oct, Apr, and Jan, with the highest in Oct (37).

Total sales by Product

Product Y is the highest sold product while Product Z being least sold

Insights

📊 Key Insights

- April recorded the peak sales (1,220), while December had the lowest (550).
- 📍 South Region achieved the highest total sales (3,110); East Region had the lowest (2,240).
- 👕 Apparel was the top-selling category (5,350), followed by 📱 Electronics (5,250).
- 🏬 Wholesale led in channel sales (3,980); 🛒 Online was lowest (3,260)
- 🔢 Total Sales: 10.6K | Total Orders: 50
- None of the regions achieved their respective sales targets.
- 🎯 Overall Target: 918K
- 📈 Total Target Achieved: 1.15%
- Order volume peaked in October, April, and January, with October being the highest at 37 orders.

📞 Interaction Type Analysis

- ✉️ Email: Highest sales (5,080) with 440 pending outcomes.
- 🔁 Follow-up: Second-highest sales (5,050).
- 📞 Call: Highest pending sales (4,990); only 560 successful.
- 🤝 Meeting: Most interactions ended in failure despite 5,080 in sales.

📅 Monthly Interactions

- High interactions: January, April, July, October (5 each).
- Lowest interaction: December (2) – likely due to holidays.

Insights

👨‍💼 Sales Rep Performance

- Rep D: Highest average deal size (245).
- Rep A: Lowest average deal size (177.69).
- All reps interacted with 50 customers; 25 successful conversions each.
- 📈 Overall Avg Deal Size: 424.00 | Conversion Rate: 2.0

👥 Order Distribution by Agent Age

- Age 40–49: 46% of total orders.
- Age 20–29: 10% of total orders.

📦 Category Trends

- 👕 Apparel: Sales spiked in April, July, August; peak in July (680), lowest in December (310).
- 📱 Electronics: Spikes in Jan, Jun, Sept, Oct, Nov; peak in October (710), lowest in December (140).

📢 Campaign & Channel Performance

- 💰 Top Revenue: CAMP4, CAMP8, CAMP9
- 📉 Lowest Revenue: CAMP3
- 🛍️ Most revenue by channel:
  Retail: 63,260, Online: 42,614, Wholesale: 41,283
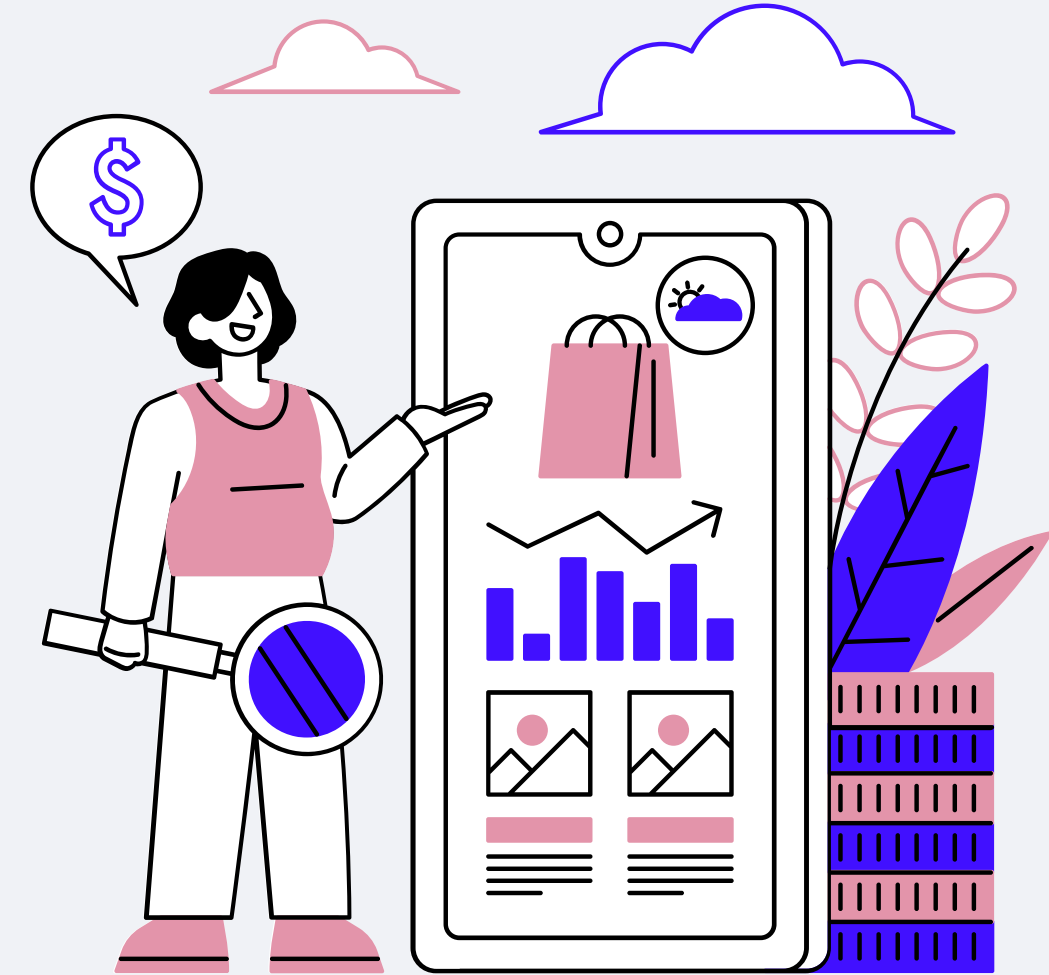
Insights

📈 Product Demand & Inventory

- 🥇 Product Y: Highest demand (103 units sold).
- 🥉 Product Z: Lowest demand (64 units sold).
- 📦 Inventory: 3,650 units | Avg Turnover: 0.99 | Avg Daily Quantity: 6.40
- ⚠️ Stockout Risk: Product Y & Z (stock < reorder level).
- ✅ Other products: Adequate stock above reorder levels.
- 💤 Products S, T, U, V, Q, R: No sales; possible low demand or visibility.
- 🔄 Product Z: Highest turnover rate (1.5).
- 🐢 Product R: Lowest turnover rate (0.5); may need review.
- 📊 Stock-to-Demand Ratio: 0.34

🔄 Conversions by Channel

- 🛍️ Retail: 823
- 💻 Online: 798
- 🏬 Wholesale: 632
- 📡 Reach Share: Retail (44.49%), Online (30.86%), Wholesale (24.64%)

📊 Campaign Summary

- 🌐 Total Reach: 35,326
- 💰 Total Revenue: 147,157
- 🔄 Total Conversions: 2,253
- 📈 Revenue per Conversion: 65.32
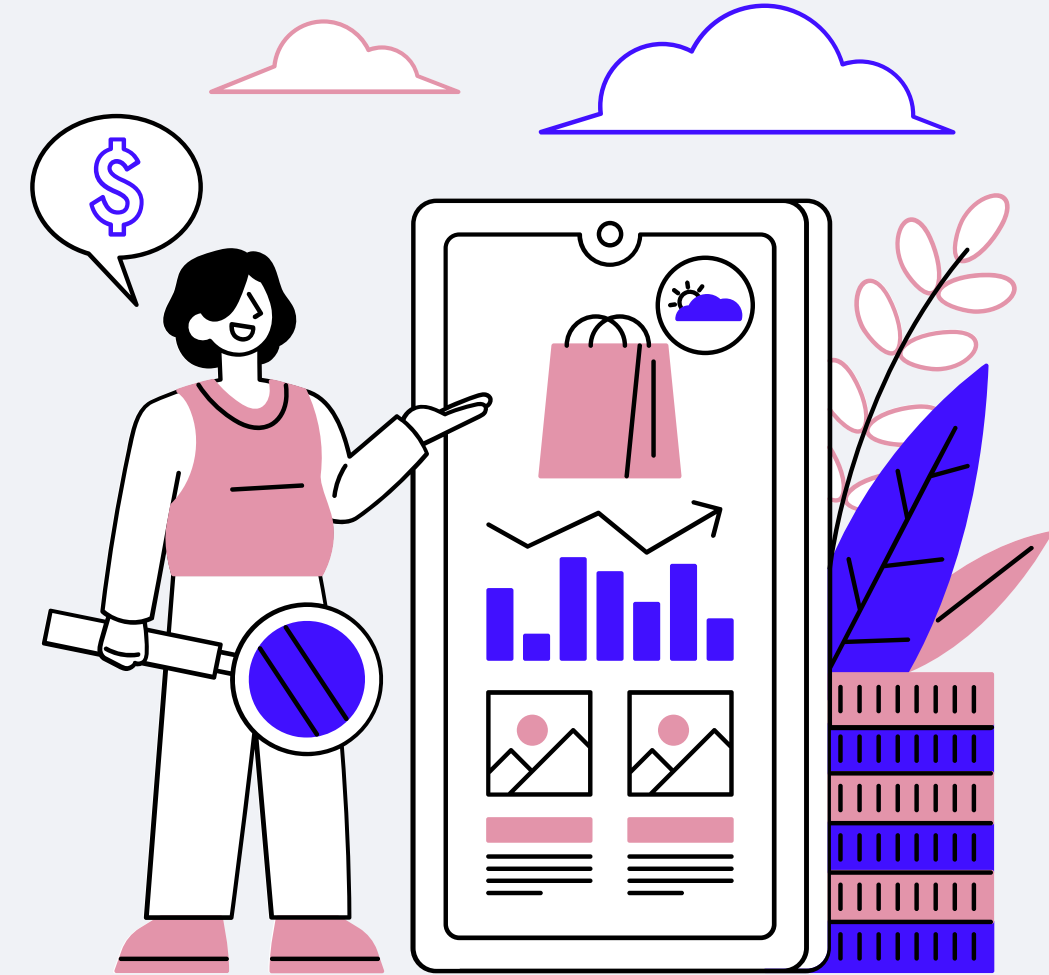
Recommendations

- **Capitalize on Peak Quarters**

Launch promotions in April, July & October to align with historically high engagement and sales.

- **Boost Underperforming Channels**

Strengthen Online and Wholesale strategies through better targeting, offers, and outreach.

- **Target Younger Demographics**

Re-engage the 20–29 age group via youth-centric campaigns, digital ads, and social media.

- **Prioritize Email & Follow-Ups**

Focus on channels with the highest success rates. Email and Follow-up interactions convert better.

- **Enhance Call Efficiency**

Calls show the most pending cases. Introduce better follow-up systems and train agents for quicker conversions.

- **Review Unsold Inventory**

Reassess Products S, T, U, V, Q, R — consider visibility, relevance, or retirement strategy.

- **Prevent Stockouts for Fast Movers**

Products Y & Z need proactive restocking based on their high turnover and demand levels.

- **Improve Underperforming Campaigns**

Audit Campaign 3 for effectiveness and retarget with revised positioning.

THANK YOU !