E-commerce Sales Performance Analysis

(A complete Data Analytics Project using SQL and Power BI)

By-

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1. Executive Summary

1) Overview:

The **E-commerce Sales Performance Analysis** project aims to evaluate key aspects of an online retail business's performance, using a combination of SQL-based data analysis and visual insights generated through Power BI. The analysis provides insights into customer behavior, product profitability, and sales trends across different regions and periods.

2) Key Objectives:

- Segment customers based on their purchasing behavior using SQL and RFM (Recency, Frequency, Monetary) analysis.
- Analyze product profitability to determine which products drive the most revenue and which are underperforming.
- Evaluate sales trends over time to identify seasonal patterns and growth opportunities.
- Assess supplier performance by region to optimize sourcing and distribution strategies.

3) Key Findings:

a) Sales Performance vs. Targets

- **Sales Target Achievement Rate**: The company achieved an average sales target rate of around 98.99% for the period from April 2018 to March 2019. Certain months, such as June, October and February showed underperformance while July & September showed significant underperformance compared to targets, indicating periods of under-projection of sales goals. The other remaining months show overachievement compared to targets, indicating periods of increased demand.
- **Seasonal Trends**: There are noticeable sales peaks in November, January and March suggesting that promotional campaigns or seasonal demand played a significant role in boosting sales.

b) Customer Retention Rate (CRR)

- **Average Customer Retention Rate**: The overall average CRR was10.75%, indicating low customer loyalty. Retention rate trends over the analysed months showed no positive fluctuation.
- **Customer Behavior**: Higher retention rates were observed only in March after (probable) successful promotional campaigns in January-February, suggesting that targeted offers could effectively boost loyalty.

c) Category-Level Profitability

- **Top-Performing Categories**: Categories of clothing and electronics were the most profitable, contributing significantly (~ 47% and 44% respectively) to the overall profit margins. These categories showed higher order volumes and consistent sales across multiple months.
- **Low-Performing Categories**: Furniture category consistently showed lower profitability, indicating the need for reassessment or promotion of underperforming products and assessing consumer demand accordingly.

d) Regional Sales Trends

- **Sales by State**: States like Madhya Pradesh and Maharashtra generated the highest sales volume, suggesting that marketing and inventory focus could be concentrated in these regions to maximize returns.
- **Profit vs. Quantity Sold**: Certain states like Bihar and Punjab had higher quantities sold but lower profit margins, indicating that there may be opportunities to optimize pricing strategies in these regions to improve profitability.

e) Customer Segmentation by Order Value

- **High-Value Segments**: Customers placing larger order values were more likely to make repeat purchases. Segmenting customers by order value revealed distinct groups of high-value buyers who contribute significantly to the overall sales.
- **Low-Value Segments**: Low-value customers had a lower retention rate, suggesting the need for personalized marketing or promotions to encourage repeat purchases from this segment.

f) Profit Trends

- **Monthly Profit Fluctuations**: Profit trends showed a steady increase from October onwards, with November having the highest total profit. The dip in profit during before October might indicate periods of reduced demand or increased competition.
- **Profit by Category**: Categories of clothing and electronics were the most profitable, contributing significantly (~ 47% and 44% respectively) to the overall profit margins. These categories showed higher order volumes and consistent sales across multiple months.

4) Recommendations for Sales Growth and Retention

- **Focus on High-Performing Categories**: Continue investing in marketing and inventory for the top-performing product categories clothing and electronics, while reassessing or discontinuing underperforming category of furniture.
- **Focus on high-value customers:** Focus marketing efforts on retaining **high-value customers** by offering loyalty programs and personalized discounts.
- **Regional Targeting**: Enhance marketing efforts in states with high sales volumes but lower profitability by optimizing pricing and improving local demand understanding.
- **Retention Strategies**: Implement loyalty programs or personalized offers to retain customers, especially those in lower-value segments. This will help improve the overall CRR.

2. Introduction

The e-commerce industry generates vast amounts of data every day, offering valuable opportunities to analyze customer behavior, optimize sales performance, and improve business strategies. This project focuses on extracting actionable insights from an e-commerce dataset containing customer details, order transactions, and sales targets.

The primary objective of this project is to analyze customer purchasing patterns, assess sales performance across product categories, and compare actual sales against predefined sales targets. By leveraging **advanced SQL techniques** and **Power BI dashboards**, we aim to uncover key business insights and support decision-making.

This report is structured to address the following goals:

- **Customer Behavior Analysis**: Identify key customer segments and purchase patterns.
- **Sales Performance Analysis**: Evaluate sales across different product categories and time periods.
- **Target Performance**: Compare actual sales with predefined targets for each product category.
- **Data Visualization**: Create dynamic Power BI dashboards to visualize the findings.

The data has been collected from Kaggle.

Kaggle link - https://www.kaggle.com/datasets/benroshan/ecommerce-data

The analysis will be carried out using three tables:

- **Customer Details**: Provides customer-specific information such as IDs and contact details.
- **Order Details**: Contains transaction-level information, including product category, quantity, profit, and transaction dates.
- **Sales Targets**: Holds the sales target data by product category and date, allowing us to evaluate how well the business is meeting its targets.

By using these datasets, we will apply SQL queries for in-depth analysis and generate interactive Power BI dashboards to present the results in a visually compelling way.

3. Data Overview

In this section, we will provide an overview of the dataset, describe the structure and relationships of the data, and highlight key variables and initial observations.

1) Description of the Datasets

Our project utilizes an e-commerce dataset that consists of three tables: customer_details, order_details, and sales_targets. Here's an overview of each table:

- **customer_details:** This table contains information about customers, including their unique ID, name, contact details, and other demographic information.
- **order_details:** This table holds details of each order, such as order ID, product information, quantity, price, order date, and the customer associated with each order.
- **sales_targets:** This table contains information about the sales targets set for different product categories, including the target date and target amount.

2) Data Structure and Relationships

The dataset contains relationships among these tables:

- The customer_details table links to the order_details table via the customer_id field, establishing a one-to-many relationship (a customer can place multiple orders).
- The order_details table connects to the sales_targets table through the category_id field, showing sales performance compared to predefined targets for each product category.

3) Initial Observations and Key Variables

- **customer_details:** Contains essential customer data like customer_id, customer_name, contact, location.
- **order_details:** Key variables include order_id, order_date, product, quantity, price, profit, and category_id.
- **sales_targets:** Key variables include category_id, target_amount, and target_date.

These variables will be crucial for analyzing customer behavior, sales trends, product profitability, and evaluating sales targets.

4. Data Preprocessing

In this step, we'll load the data into **MSSQL** and perform data cleaning, transformation, and preparation to ensure it's ready for analysis. We'll handle missing values, duplicates, and inconsistencies and perform any necessary data type conversions.

1) Loading Data into MSSQL

The data was loaded into my MSSQL database using the **SSMS Import Wizard (**E-commerce sales – Tasks – Import Flat File**)**

2) Checking Data Types

Verify the data types in each table to ensure they are correct and compatible with our analysis.

SQL queries to inspect the data types:

```
-- Check data types in customer_details
SELECT COLUMN_NAME, DATA_TYPE
FROM INFORMATION_SCHEMA.COLUMNS
WHERE TABLE_NAME = 'customer_details';
```

Results | Messages

	COLUMN_NAME	DATA_TYPE
1	Order_ID	nvarchar
2	Order_Date	date
3	Customer_Name	nvarchar
4	State	nvarchar
5	City	nvarchar

```
-- Check data types in order_details
SELECT COLUMN_NAME, DATA_TYPE
FROM INFORMATION_SCHEMA.COLUMNS
WHERE TABLE_NAME = 'order_details';
```

Results | Messages

	COLUMN_NAME	DATA_TYPE
1	Order_ID	nvarchar
2	Amount	float
3	Profit	float
4	Quantity	tinyint
5	Category	nvarchar
6	Sub_Category	nvarchar

```
-- Check data types in sales_targets
SELECT COLUMN_NAME, DATA_TYPE
FROM INFORMATION_SCHEMA.COLUMNS
WHERE TABLE_NAME = 'sales_targets';
```

Results | Messages

	COLUMN_NAME	DATA_TYPE
1	Month_of_Order_Date	nvarchar
2	Category	nvarchar
3	Target	float

Now as we can see, I do not have data type issues in the tables. But in case there were any, then we can update the data types using ALTER TABLE.

For example:

```
-- Convert Order_Date to DATE in customer_details (if not already in DATE format)
ALTER TABLE customer_details
```

```
ALTER COLUMN Order_Date DATE;
```

3) Handling Missing Values

Check for missing values in each table:

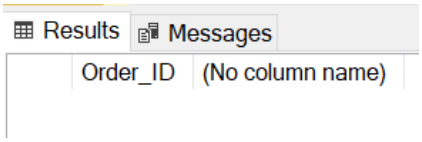
```
-- Check for missing values in customer_details
SELECT *
FROM customer_details
WHERE Order_ID IS NULL
   OR Order_Date IS NULL
   OR Customer_Name IS NULL
   OR State IS NULL
   OR City IS NULL;

-- Check for missing values in order_details
SELECT *
FROM order_details
WHERE Order_ID IS NULL
   OR Amount IS NULL
   OR Profit IS NULL
   OR Quantity IS NULL
   OR Category IS NULL
   OR Sub_Category IS NULL;

-- Check for missing values in sales_targets
SELECT *
FROM sales_targets
WHERE Month_of_Order_Date IS NULL
   OR Category IS NULL
   OR Target IS NULL;
```

I do not have any missing values in the tables. But in case there were any, we can decide how to handle them (e.g., deleting rows, replacing with averages/medians, or using other imputation techniques).

4) Handling Duplicates

Check for and remove duplicate entries in each table.

```
-- Find duplicates in customer_details
SELECT Order_ID, COUNT(*)
FROM customer_details
GROUP BY Order_ID
HAVING COUNT(*) > 1;
```




```
-- Find duplicates in order_details
SELECT Order_ID, Amount, Category,Sub_Category, COUNT(*) as No_of_Probable_Dupes
FROM order_details
GROUP BY Order_ID, Amount, Category, Sub_Category
HAVING COUNT(*) > 1;


-- Find duplicates in sales_targets
SELECT Month_of_Order_Date, Category, COUNT(*)
FROM sales_targets
GROUP BY Month_of_Order_Date, Category
HAVING COUNT(*) > 1;
```

*** I do not have any duplicates here, but let's say in case I did (e.g. in the `customer_details` table), then we can use a window function to remove duplicates –

```
-- Remove duplicates
WITH CTE AS (
    SELECT *, ROW_NUMBER() OVER (PARTITION BY Order_ID ORDER BY Order_ID) AS row_num
    FROM customer_details
)
DELETE FROM CTE WHERE row_num > 1;
```

5) Data Transformation and Formatting

We can perform necessary transformations such as date conversions, aggregations, or data formatting to ensure consistency.

Data Consistency

Ensure that categories and sub-categories in order_details are consistent (e.g., same spelling and capitalization):

```
-- Standardize Category values to uppercase
UPDATE order_details
SET Category = UPPER(Category);

-- Standardize Sub-Category values to uppercase
UPDATE order_details
SET Sub_Category = UPPER(Sub_Category);
```

Check for changes:

```
select top 5 * from order_details
```

Results | Messages

	Order_ID	Amount	Profit	Quantity	Category	Sub_Category
1	B-25601	1275	-1148	7	FURNITURE	BOOKCASES
2	B-25601	66	-12	5	CLOTHING	STOLE
3	B-25601	8	-2	3	CLOTHING	HANKERCHIEF
4	B-25601	80	-56	4	ELECTRONICS	ELECTRONIC GAMES
5	B-25602	168	-111	2	ELECTRONICS	PHONES

I just noticed that the spelling 'HANKERCHIEF' is incorrectly present in the 'Sub_Category' column. Let's change that to correct spelling 'HANDKERCHIEF'.

```
UPDATE order_details
SET Sub_Category = REPLACE(Sub_Category, 'HANKERCHIEF', 'HANDKERCHIEF')
WHERE Sub_Category LIKE '%HANKERCHIEF%';
```

Check for changes:

```
select top 5 * from order_details
where Sub_Category='HANKERCHIEF'
```

Results | Messages

Order_ID	Amount	Profit	Quantity	Category	Sub_Category

```
select top 5 * from order_details
where Sub_Category='HANDKERCHIEF'
```

Results Messages

	Order_ID	Amount	Profit	Quantity	Category	Sub_Category
1	B-25601	8	-2	3	CLOTHING	HANDKERCHIEF
2	B-25603	12	1	2	CLOTHING	HANDKERCHIEF
3	B-25608	257	23	5	CLOTHING	HANDKERCHIEF
4	B-25615	68	20	5	CLOTHING	HANDKERCHIEF
5	B-25616	42	12	5	CLOTHING	HANDKERCHIEF

So, we can see above that all incorrect data is replaced by the correct/intended data.

5. SQL Analysis

In this section, we'll use advanced SQL queries to gain insights from the dataset. The following subsections cover various analytical queries and their corresponding business insights.

1) Customer Segmentation

Here, we'll identify different customer segments based on their spending patterns, frequency, and recency of purchases.

a) Top Customers by Total Spending

```
-- Find top customers based on total spending
SELECT Customer_Name, SUM(Amount) AS Total_Spending
FROM customer_details cd
JOIN order_details od ON cd.Order_ID = od.Order_ID
GROUP BY Customer_Name
ORDER BY Total_Spending DESC;
```

Results Messages

	Customer_Name	Total_Spending
1	Yaanvi	9177
2	Pooja	9030
3	Abhishek	8135
4	Surabhi	6889
5	Soumya	6869
6	Harshal	6026
7	Priyanka	5762
8	Shruti	5750
9	Abhijeet	5691
10	Sarita	5449

b) Recency Analysis

Find the most recent purchase date for each customer:

```
-- Find the most recent purchase date for each customer
SELECT Customer_Name, MAX(Order_Date) AS Last_Purchase_Date
FROM customer_details
GROUP BY Customer_Name
ORDER BY Last_Purchase_Date DESC;
```

Results Messages

	Customer_Name	Last_Purchase_Date
1	Hitika	2019-03-31
2	Bhishm	2019-03-30
3	Pinky	2019-03-29
4	Monisha	2019-03-28
5	Atharv	2019-03-28
6	Vini	2019-03-28
7	Deepak	2019-03-27
8	Manju	2019-03-27
9	Ramesh	2019-03-27
10	Sagar	2019-03-27

2) Product Profitability Analysis

Identify the most profitable and least profitable products.

a) Top 5 Most Profitable Products

```
-- Find top 5 most profitable products
SELECT TOP 5 Sub_Category, SUM(Profit) AS Total_Profit
FROM order_details
GROUP BY Sub_Category
ORDER BY Total_Profit DESC;
```

Results | Messages

	Sub_Category	Total_Profit
1	PRINTERS	5964
2	BOOKCASES	4888
3	ACCESSORIES	3559
4	TROUSERS	2847
5	STOLE	2559

b) Least Profitable Products

```
-- Find least profitable products
SELECT TOP 5 Sub_Category, SUM(Profit) AS Total_Profit
FROM order_details
GROUP BY Sub_Category
ORDER BY Total_Profit ASC;
```

Results | Messages

	Sub_Category	Total_Profit
1	TABLES	-4011
2	ELECTRONIC GAMES	-1236
3	KURTI	181
4	SKIRT	235
5	LEGGINGS	260

3) Sales Trends Over Time

Analyze sales growth over different time periods, such as monthly or yearly.

a) Monthly Sales Trend

```
-- Find monthly sales trend
SELECT YEAR(Order_Date) AS Year, MONTH(Order_Date) AS Month, SUM(Amount) AS Total_Sales
FROM customer_details cd
JOIN order_details od ON cd.Order_ID = od.Order_ID
GROUP BY YEAR(Order_Date), MONTH(Order_Date)
ORDER BY Year, Month;
```

Results | Messages

	Year	Month	Total_Sales
1	2018	4	32726
2	2018	5	28545
3	2018	6	23658
4	2018	7	12966
5	2018	8	30899
6	2018	9	26628
7	2018	10	31615
8	2018	11	48086
9	2018	12	37579
10	2019	1	61439
11	2019	2	38424
12	2019	3	58937

4) Sales Targets vs. Actual Sales

Compare actual sales with the targets set for each category over time.

```
-- Compare sales targets with actual sales
SELECT
    st.Month_of_Order_Date,
    st.Category,
    st.Target AS Sales_Target,
    SUM(od.Amount) AS Actual_Sales
FROM sales_targets st
LEFT JOIN order_details od ON st.Category = od.Category
LEFT JOIN customer_details cd ON cd.Order_ID = od.Order_ID AND MONTH(cd.Order_Date) =
MONTH(st.Month_of_Order_Date)
GROUP BY st.Month_of_Order_Date, st.Category, st.Target
ORDER BY st.Month_of_Order_Date;
```

Results | Messages

	Month_of_Order_Date	Category	Sales_Target	Actual_Sales
1	Apr-18	Electronics	9000	165267
2	Apr-18	Furniture	10400	127181
3	Apr-18	Clothing	12000	139054
4	Aug-18	Clothing	14000	139054
5	Aug-18	Furniture	10900	127181
6	Aug-18	Electronics	9000	165267
7	Dec-18	Electronics	9000	165267
8	Dec-18	Clothing	16000	139054
9	Dec-18	Furniture	11400	127181
10	Feb-19	Electronics	16000	165267

5) RFM Analysis (Recency, Frequency, Monetary)

Segment customers based on their Recency, Frequency, and Monetary value.

1) Frequency and Monetary Value

```
-- Calculate RFM values
SELECT
    cd.Customer_Name,
    DATEDIFF(DAY, MAX(cd.Order_Date), GETDATE()) AS Recency,
    COUNT(cd.Order_ID) AS Frequency,
    SUM(od.Amount) AS Monetary
FROM customer_details cd
JOIN order_details od ON cd.Order_ID = od.Order_ID
GROUP BY cd.Customer_Name
ORDER BY Monetary DESC;
```

Results | Messages

	Customer_Name	Recency	Frequency	Monetary
1	Yaanvi	2025	13	9177
2	Pooja	2039	17	9030
3	Abhishek	2118	25	8135
4	Surabhi	2205	12	6889
5	Soumya	2073	11	6869
6	Harshal	2060	7	6026
7	Priyanka	2019	21	5762
8	Shruti	2017	17	5750
9	Abhijeet	2145	14	5691
10	Sarita	2008	14	5449

6) Customer Retention Rate Analysis

To calculate the retention rate, we'll find out how many customers made repeat purchases over different periods (e.g., monthly).

```
-- Monthly Customer Retention Rate with Month Names and Two Decimal Points
```

```sql
WITH Customer_Monthly_Purchases AS (
    SELECT
        Customer_Name,
        YEAR(Order_Date) AS Year,
        MONTH(Order_Date) AS Month,
        DATENAME(month, Order_Date) AS Month_Name, -- Adding Month Name
        COUNT(DISTINCT Order_ID) AS Total_Purchases
    FROM customer_details
    GROUP BY Customer_Name, YEAR(Order_Date), MONTH(Order_Date), DATENAME(month, Order_Date)
),
Retention AS (
    SELECT
        CurrentPeriod.Customer_Name,
        CurrentPeriod.Year AS Current_Year,
        CurrentPeriod.Month AS Current_Month,
        CurrentPeriod.Month_Name AS Current_Month_Name, -- Including Month Name
        CASE
            WHEN PreviousPeriod.Customer_Name IS NOT NULL THEN 1
            ELSE 0
        END AS Retained
    FROM Customer_Monthly_Purchases CurrentPeriod
    LEFT JOIN Customer_Monthly_Purchases PreviousPeriod
    ON CurrentPeriod.Customer_Name = PreviousPeriod.Customer_Name
       AND CurrentPeriod.Year = PreviousPeriod.Year
       AND CurrentPeriod.Month = PreviousPeriod.Month + 1
)
SELECT
    Current_Year,
    Current_Month,
    Current_Month_Name, -- Display Month Name
    COUNT(DISTINCT Customer_Name) AS Total_Customers,
    SUM(Retained) AS Retained_Customers,
    ROUND((CAST(SUM(Retained) AS FLOAT) / COUNT(DISTINCT Customer_Name)) * 100, 2) AS Retention_Rate
-- Retention Rate with 2 decimal points
FROM Retention
GROUP BY Current_Year, Current_Month, Current_Month_Name
ORDER BY Current_Year, Current_Month;
```

Results | Messages

	Current_Year	Current_Month	Current_Month_Name	Total_Customers	Retained_Customers	Retention_Rate
1	2018	4	April	44	0	0
2	2018	5	May	31	0	0
3	2018	6	June	29	1	3.45
4	2018	7	July	31	2	6.45
5	2018	8	August	27	1	3.7
6	2018	9	September	29	3	10.34
7	2018	10	October	43	1	2.33
8	2018	11	November	45	4	8.89
9	2018	12	December	39	4	10.26
10	2019	1	January	56	0	0
11	2019	2	February	52	1	1.92
12	2019	3	March	58	27	46.55

7) Category-Level Profit Analysis

We will analyze profit margins at the category level to identify underperforming categories.

```sql
-- Category-Level Profit Analysis with Profit Percentage in Two Decimal Points
SELECT
    Category,
    ROUND(SUM(Profit), 2) AS Total_Profit, -- Total profit with 2 decimal points
```

```
    ROUND(SUM(Amount), 2) AS Total_Sales,  -- Total sales with 2 decimal points
    ROUND((SUM(Profit) / NULLIF(SUM(Amount), 0)) * 100, 2) AS Profit_Percentage -- Profit percentage
with 2 decimal points
FROM order_details
GROUP BY Category
ORDER BY Profit_Percentage DESC;
```

Results | Messages

	Category	Total_Profit	Total_Sales	Profit_Percentage
1	CLOTHING	11163	139054	8.03
2	ELECTRONICS	10494	165267	6.35
3	FURNITURE	2298	127181	1.81

8) Region-wise Sales and Profit Analysis

We'll analyze sales trends and profitability by region (using 'State' from customer_details)

```
-- Sales and Profit Analysis by Region
SELECT
    cd.State,
    COUNT(DISTINCT cd.Customer_Name) AS Total_Customers,
    ROUND(SUM(od.Amount),2) AS Total_Sales,
    ROUND(SUM(od.Profit),2) AS Total_Profit,
    ROUND((SUM(od.Profit) / NULLIF(SUM(od.Amount), 0)) * 100,2) AS Profit_Margin
FROM customer_details cd
JOIN order_details od ON cd.Order_ID = od.Order_ID
GROUP BY cd.State
ORDER BY Total_Sales DESC;
```

Results | Messages

	State	Total_Customers	Total_Sales	Total_Profit	Profit_Margin
1	Madhya Pradesh	81	105140	5551	5.28
2	Maharashtra	77	95348	6176	6.48
3	Delhi	21	22531	2987	13.26
4	Uttar Pradesh	19	22359	3237	14.48
5	Rajasthan	25	21149	1257	5.94
6	Gujarat	23	21058	465	2.21
7	Punjab	21	16786	-609	-3.63
8	Karnataka	15	15058	645	4.28
9	West Bengal	16	14086	2500	17.75
10	Kerala	11	13459	1871	13.9
11	Andhra Pradesh	13	13256	-496	-3.74
12	Bihar	12	12943	-321	-2.48
13	Nagaland	11	11903	148	1.24
14	Jammu and Kashmir	8	10829	8	0.07
15	Haryana	10	8863	1325	14.95
16	Himachal Pradesh	11	8666	656	7.57
17	Goa	10	6705	370	5.52
18	Tamil Nadu	6	6087	-2216	-36.41
19	Sikkim	9	5276	401	7.6

6. Power BI Visualization - Sales Performance Dashboard Report

1) Introduction

This dashboard presents a comprehensive analysis of the sales performance, customer retention, and profitability for the fiscal year spanning April 2018 to March 2019. Utilizing data from the **Order Details**, **Sales Targets**, and **Customer Details** tables, this dashboard is designed to provide valuable insights into sales trends, customer behaviors and operational performance.

The primary goals of this dashboard are to track key performance indicators (KPIs) and identify areas for improvement in sales and customer engagement.

2) Dashboard Snapshot

3) KPI Overview

The dashboard features five key performance indicators that are crucial for assessing the sales performance:

1. **Total Sales**: Represents the overall revenue generated from all sales transactions during the specified period. This metric is fundamental for understanding revenue generation and business growth.
2. **Total Profit**: Indicates the total profit earned after deducting costs from total sales. Monitoring profit levels helps evaluate the effectiveness of pricing and cost management strategies.
3. **Average Order Value (AOV)**: Calculated as the total sales divided by the number of orders, this metric helps gauge customer spending behavior. A higher AOV indicates increased customer engagement and sales strategies' effectiveness.
4. **Average Customer Retention Rate (CRR)**: Measures the percentage of customers retained over a specified period, indicating customer loyalty and satisfaction. A higher CRR suggests effective customer engagement strategies.
5. **Average Sales Achievement Rate**: This KPI compares actual sales against the sales targets, providing insights into how well the business is performing relative to its goals.

4) Visualization Descriptions

- **Category-wise Sales Trend (Line Chart)**
- **Description:** This line chart compares different categories and their sales for each month.
- **Insights:**
    - The chart indicates which categories were bought most or least and during which months.

    - Notable spikes in sales may suggest seasonal demand.

- **Sales vs Targets (Combo Chart)**
- **Description**: This combo chart compares actual sales against sales targets for each month.
- **Insights**:
    - The chart indicates which months exceeded sales targets and which months fell short.
    - Notable spikes in sales may suggest successful promotional efforts or seasonal demand.
- **Monthly Customer Retention Rate (Line Chart)**
- **Description**: This line chart visualizes the average customer retention rate over the months.
- **Insights**:
    - Identifying months with low retention can help pinpoint issues that might have affected customer satisfaction.
    - High retention months may correlate with effective marketing campaigns or customer service improvements.
- **Total Profit, Quantity & Sales by State (Map)**
- **Description**: A geographical map illustrating total profit and sales distribution across different states.
- **Insights**:
    - The map highlights regions with strong sales performance, aiding in targeted marketing strategies.
    - Underperforming states may require additional resources or promotional efforts to boost sales.
- **Category-Level Profit (Donut Chart)**
- **Description**: This chart displays the distribution of total profits by product category.
- **Insights**:
    - Certain categories may dominate profits, indicating successful product lines.
    - Identifying low-performing categories could guide inventory and marketing decisions.
- **Customer Segmentation by Category-wise Order Value (Pie Chart)**
- **Description**: This chart segments customers based on their order value within different categories.
- **Insights**:
    - Understanding which customer segments contribute most to revenue can inform targeted marketing and product strategies.
    - This segmentation can highlight opportunities for upselling or cross-selling based on customer preferences.

7. Conclusion

The Sales Performance Dashboard offers a comprehensive view of key metrics essential for strategic decision-making. By continually monitoring sales performance, customer retention, and profitability, businesses can identify opportunities for improvement and growth. Future steps may include integrating additional datasets for a more holistic view of customer behaviors or exploring customer feedback for deeper insights into satisfaction and engagement.