Grocery Store Dashboard (PowerBI)

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Introduction

I am using a comprehensive grocery store dataset to analyze customer behavior, purchasing patterns, customer segmentation, and market basket analysis. The dataset includes detailed information about customers, such as customer ID and name, alongside category details like category name and ID. It also encompasses product information, including product name and ID, as well as order-specific data, such as order date and order number. This rich data allows for a deeper understanding of customer preferences and trends, helping to unlock valuable insights for strategic decision-making.

Objective

To boost revenue and expand customer reach. Utilize advanced data analytics for Strategic insights. Empower teams with actionable intelligence. Drive growth and enhance customer engagement. Revolutionize market presence through data-driven decisions.

KPIs

Average Order Value (AOV): It shows average spend per transaction.

Sales Growth Rate: Increase in revenue over specific timeframes.

Number customer increase by Month: Increase in number of customers every month.

Repeat Purchase Rate: Proportion of customers making multiple purchases.

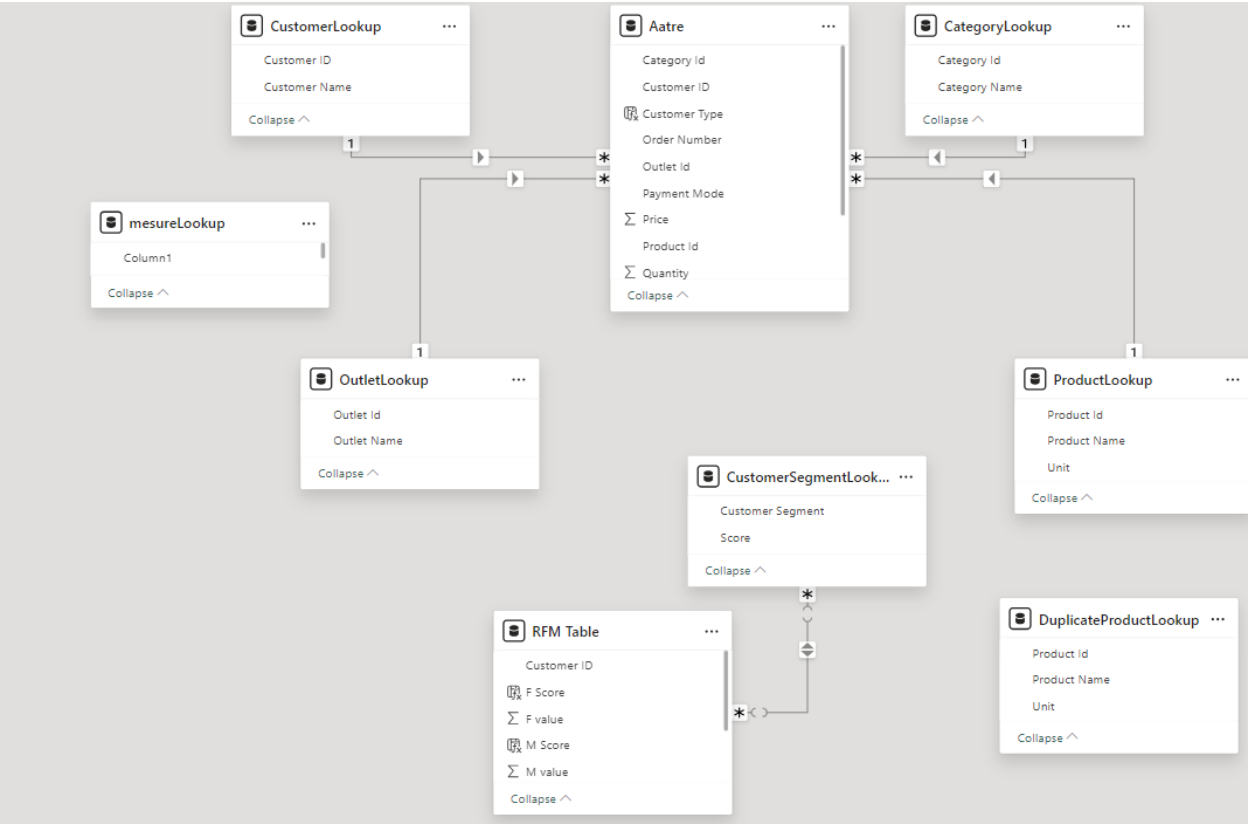
Net Promoter Score (NPS): Indicates customer satisfaction and the likelihood of recommendations.

Expecting To find in Datasets

- Sales growth
- Customer segmentation
- Market basket analysis

Data Model

In Power BI, a data model is a conceptual representation of your data. It defines relationships between different tables, allowing you to create complex calculations and visualizations. Think of it as the foundation upon which you build your reports and dashboards.



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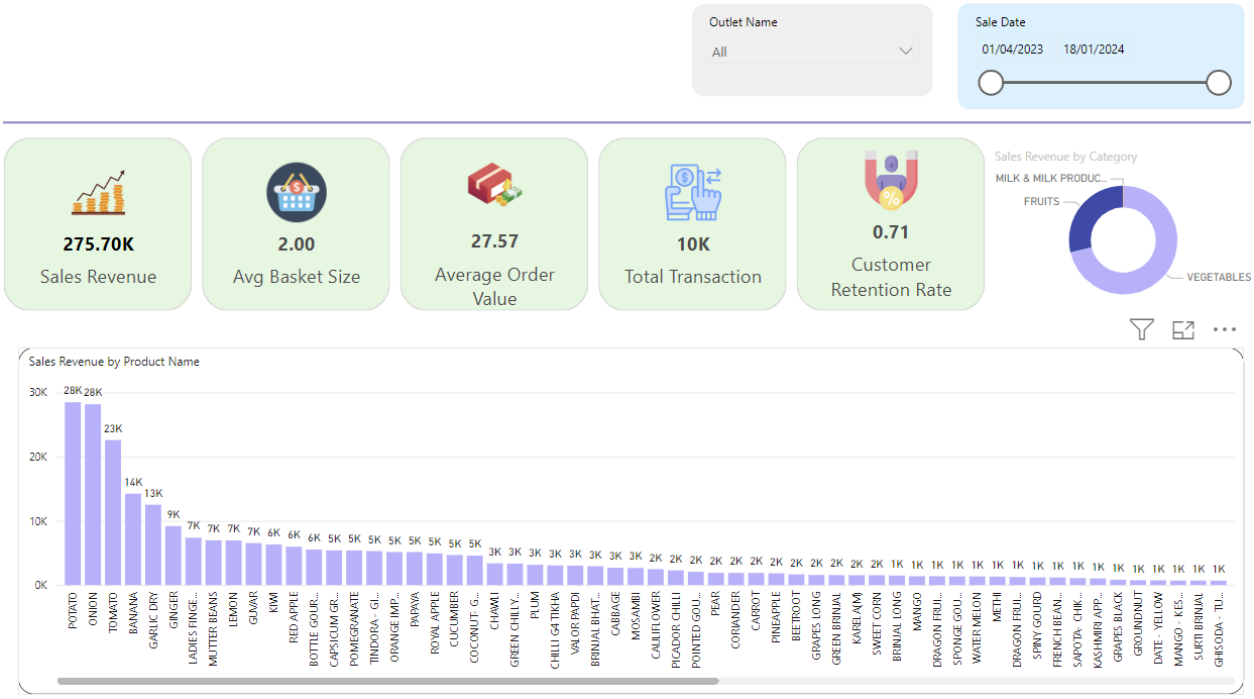
PowerBI Graphs Explanation



It displays a key performance indicator (KPI) related to **Sales Revenue**. The specific value shown is 275.70K, indicating the total sales revenue generated.

It displays the **average basket size**. This indicates the average number of items, or the average monetary value of items purchased in a single transaction.

It displays a key performance indicator (KPI) related to **Average Order Value**.
which indicate the average monetary value of each order placed.
monetary value of items purchased in a single transaction.

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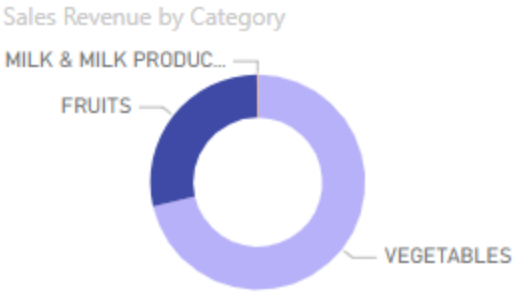
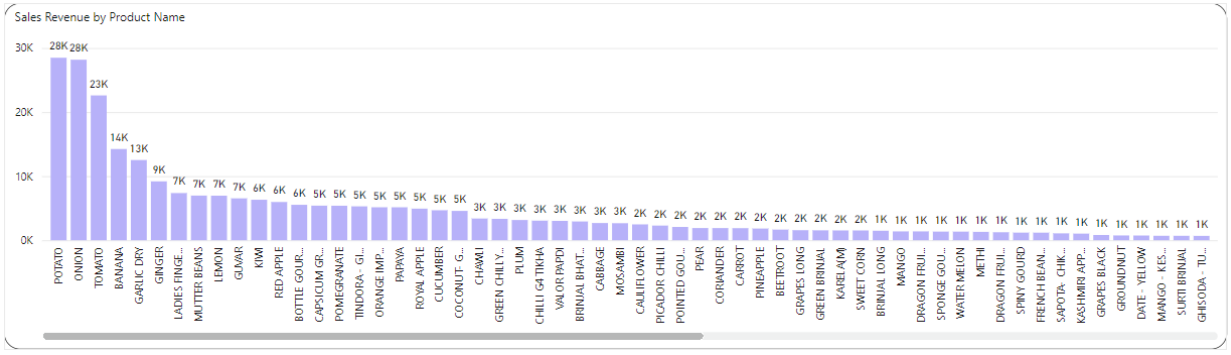
This KPI indicates that the total number of transactions are made. The specific value shown is 10K, indicating that there have been 10,000 transactions.

It displays a key performance indicator (KPI) related to **Customer Retention Rate**. The specific value shown is 0.71, which can be interpreted as 71% of customers remained loyal or continued to do business with the company over a specific period.



It is showing the **Sales Revenue by Category** for three product categories: Milk & Milk Products, Fruits, and Vegetables. The size of each pie slice corresponds to the proportion of total sales revenue generated by each category.
it appears that **Vegetables** have the largest share of sales revenue, followed by **Fruits** and then **Milk & Milk Products**.



horizontal bar chart represents the sales revenue for different products. The x-axis shows the **product names**, while the y-axis represents the **sales revenue** in thousands of dollars.

- **Top-selling products:** The chart clearly shows the top-selling products based on their sales revenue. "Potato" is the highest-selling product, followed by "Onion" and "Tomato."

- **Product categories:** The chart also reveals that certain product categories, such as vegetables and spices, are more popular than others.

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- **Sales revenue distribution:** The distribution of sales revenue among products is skewed, with a few products accounting for a significant portion of the total sales.

- **Low-selling products:** The chart also highlights products with low sales revenue, such as "Date Yellow" and "Valor Papdi."

- **Product comparison:** The chart allows for easy comparison of sales revenue between different products. For example, you can quickly see that "Potato" sells significantly more than "Cabbage."

RFM analysis

RFM analysis is a customer segmentation technique that uses three key metrics to categorize customers:

- **Recency:** How recently a customer has made a purchase.
- **Frequency:** How often a customer makes purchases.
- **Monetary Value:** How much money a customer spends on average.

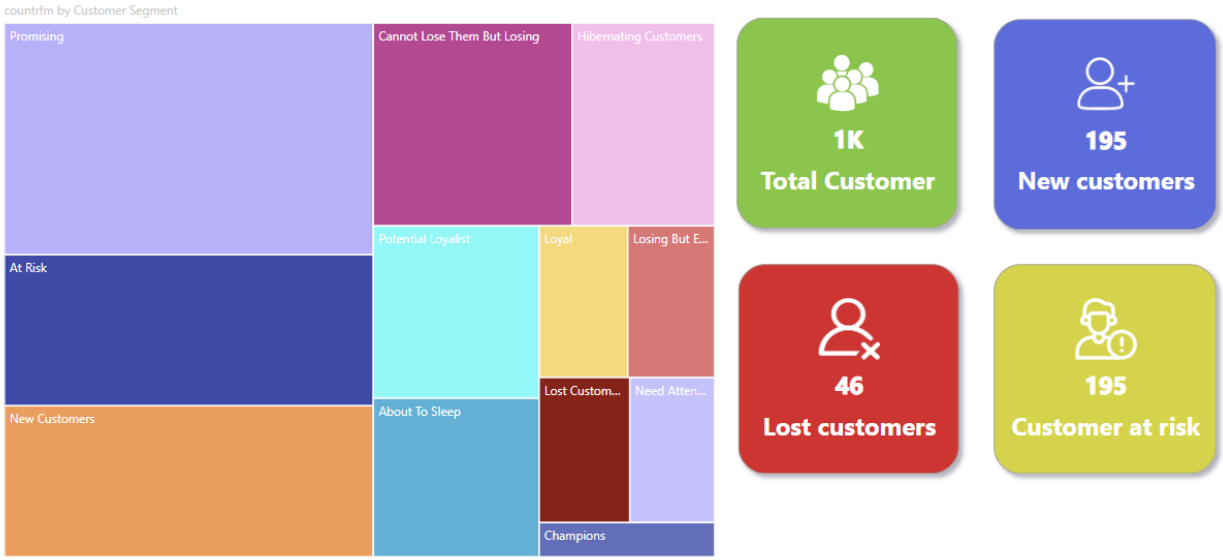
By combining these three factors, RFM analysis can help businesses identify their most valuable customers and tailor their marketing efforts accordingly.

Here's a breakdown of the RFM scoring system:

- **Recency:** Customers are assigned a score based on their most recent purchase date. Customers who have made recent purchases receive a higher score.
- **Frequency:** Customers are assigned a score based on the number of purchases they have made over a specific period. Customers who have made frequent purchases receive a higher score.
- **Monetary Value:** Customers are assigned a score based on the total amount they have spent over a specific period. Customers who have spent more money receive a higher score.

Once customers have been assigned an RFM score, they can be grouped into different segments based on their overall RFM score. For example, customers with a high RFM score (high recency, frequency, and monetary value) are the most valuable customers and should be targeted with personalized marketing campaigns.

RFM analysis is a valuable tool for businesses of all sizes. It can help businesses improve customer retention, increase customer loyalty, and drive sales growth.



This Power BI graph show that represents the number of customers in different segments based on their RFM (Recency, Frequency, Monetary Value) scores.

Here's a breakdown of the different segments and what they mean:

- **Promising:** These customers have made recent purchases, but their overall spending and purchase frequency are relatively low. They have the potential to become loyal customers if they are targeted with appropriate marketing efforts.
- **Cannot Lose Them but Losing:** These customers have made recent purchases and have a decent spending history, but their purchase frequency has decreased. They are at risk of becoming lost customers if they are not re-engaged.
- **Hibernating Customers:** These customers have made recent purchases, but their overall spending and purchase frequency are low. They are not currently active, but they could be reactivated with targeted marketing campaigns.
- **Potential Loyalist:** These customers have made recent purchases and have a good spending history, but their purchase frequency is still relatively low. They are likely to become loyal customers if they continue to make purchases.
- **Loyal:** These customers have made recent purchases, have a good spending history, and have a high purchase frequency. They are the most valuable customers and should be rewarded for their loyalty.
- **New Customers:** These customers have recently made their first purchase. They have the potential to become loyal customers if they are provided with a positive customer experience.

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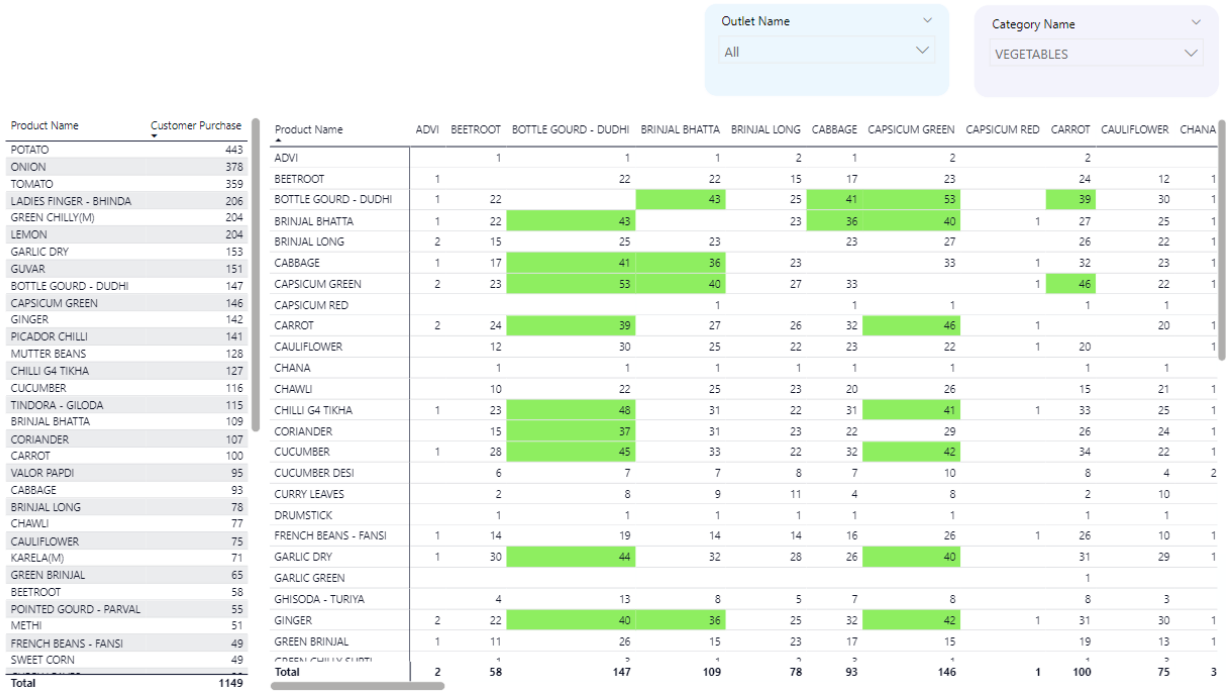
- **About To Sleep:** These customers have not made recent purchases, but they have a decent spending history and have made a few purchases in the past. They are at risk of becoming lost customers if they are not re-engaged.
- **Lost Customer:** These customers have not made recent purchases and have a low overall spending history. They are likely to be lost customers.
- **Need Attention:** These customers have not made recent purchases, but they have a good spending history and have made frequent purchases in the past. They are at risk of becoming lost customers if they are not re-engaged.
- **Champions:** These customers have made recent purchases, have a high overall spending history, and have a high purchase frequency. They are the most valuable customers and should be rewarded for their loyalty.

By analyzing this tree map, you can gain valuable insights into the customer base and identify areas for improvement. For example, you might want to focus on re-engaging lost customers, targeting promising customers with personalized offers, or rewarding loyal customers for their continued support.

Market Basket analysis



Product Name	Customer Purchase
POTATO	443
ONION	378
TOMATO	359
LADIES FINGER - BHINDA	206
GREEN CHILLY(M)	204
LEMON	204
GARLIC DRY	153
GUVAR	151
BOTTLE GOURD - DUDHI	147
CAPSICUM GREEN	146
GINGER	142
PICADOR CHILLI	141
MUTTER BEANS	128
CHILLI G4 TIKHA	127
CUCUMBER	116
TINDORA - GILODA	115
BRINJAL BHATTA	109
CORIANDER	107
CARROT	100
VALOR PAPDI	95
CABBAGE	93
BRINJAL LONG	78
CHAWLI	77
CAULIFLOWER	75
KARELA(M)	71
GREEN BRINJAL	65
BEETROOT	58
POINTED GOURD - PARVAL	55
METHI	51
FRENCH BEANS - FANSI	49
SWEET CORN	49
Total	1149

Product Name	ADVI	BEETROOT	BOTTLE GOURD - DUDHI	BRINJAL BHATTA	BRINJAL LONG	CABBAGE	CAPSICUM GREEN	CAPSICUM RED	CARROT	CAULIFLOWER	CHANA
ADVI		1	1	1	2	1	2		2		
BEETROOT	1		22	22	15	17	23		24	12	1
BOTTLE GOURD - DUDHI	1	22		43	25	41	53		39	30	1
BRINJAL BHATTA	1	22	43		23	36	40	1	27	25	1
BRINJAL LONG	2	15	25	23		23	27		26	22	1
CABBAGE	1	17	41	36	23		33	1	32	23	1
CAPSICUM GREEN	2	23	53	40	27	33		1	46	22	1
CAPSICUM RED				1		1	1		1	1	
CARROT	2	24	39	27	26	32	46	1		20	1
CAULIFLOWER		12	30	25	22	23	22	1	20		1
CHANA		1	1	1	1	1	1		1	1	
CHAWLI		10	22	25	23	20	26		15	21	1
CHILLI G4 TIKHA	1	23	48	31	22	31	41	1	33	25	1
CORIANDER		15	37	31	23	22	29		26	24	1
CUCUMBER	1	28	45	33	22	32	42		34	22	1
CUCUMBER DESI		6	7	7	8	7	10		8	4	2
CURRY LEAVES		2	8	9	11	4	8		2	10	
DRUMSTICK		1	1	1	1	1	1		1	1	
FRENCH BEANS - FANSI	1	14	19	14	14	16	26	1	26	10	1
GARLIC DRY	1	30	44	32	28	26	40		31	29	1
GARLIC GREEN									1		
GHISODA - TURIYA		4	13	8	5	7	8		8	3	
GINGER	2	22	40	36	25	32	42	1	31	30	1
GREEN BRINJAL	1	11	26	15	23	17	15		19	13	1
Total	2	58	147	109	78	93	146	1	100	75	3

This Power BI report focuses on Market Basket Analysis for vegetable purchases. Here's a breakdown of the components and insights:

Breakdown of the Report:

1. **Left Table:**
    - **Product Name**: Lists different vegetables sold.

- **Customer Purchase**: Shows the total number of customers who purchased each vegetable.

2. **Right Matrix Visualization:**
    - This matrix shows co-occurrence counts of different vegetables being purchased together.
    - Each row and column represent a vegetable, while the cells show how often pairs of vegetables were purchased together. For example, the cell intersection of "BEETROOT" and "BOTTLE GOURD - DUDHI" indicates the number of transactions where these two vegetables were bought together.
3. **Color Highlighting (Conditional Formatting):**
    - The green highlighting indicates higher co-occurrence counts, making it easier to see which vegetable pairs are frequently bought together.
    - Darker or more saturated green suggests stronger associations between those vegetables, while lighter or no highlighting means lower or no purchase correlation.
4. **Filters on Top Right:**
    - **Outlet Name**: Allows filtering the data for a specific outlet or viewing the combined data for all outlets.
    - **Category Name**: Allows the user to focus on specific categories—in this case, "VEGETABLES."

Interpretation:

- The matrix helps identify popular pairings of vegetables. For instance, the highlighted cells like "CAPSICUM GREEN" with "BOTTLE GOURD - DUDHI" or "CHILLI G4 TIKHA" with "CORIANDER" indicate these are often bought together.
- This information can be used for better product placement in stores, bundling offers, or personalized recommendations for customers who have purchased a specific vegetable.

Potential Insights for Business Decisions:

- **Stock Management**: Knowing which items are frequently bought together can help in ensuring adequate stock levels.
- **Store Layout Optimization**: Placing vegetables that are often purchased together near each other can lead to better customer convenience and potentially increase sales.
- **Promotional Bundles**: Offers or discounts can be applied to common pairs, like "Buy CAPSICUM GREEN and get a discount on BOTTLE GOURD - DUDHI," based on these findings.

Conclusion

The analysis of grocery store data using Power BI provided critical insights into customer behavior, purchasing patterns, and strategic growth opportunities. Key metrics like Average Order Value (AOV), Sales Growth Rate, and customer retention helped gauge business performance, while RFM analysis identified valuable customer segments such as "Loyal" and "Champions" for targeted marketing. Market Basket Analysis revealed frequently purchased product pairs, such as "CAPSICUM GREEN" with "BOTTLE GOURD - DUDHI," guiding decisions on stock management, store layout, and promotional bundles. These insights enable the business to optimize operations, enhance customer engagement, and drive revenue growth through data-driven strategies.

Useful links

PowerBI file

Datafile

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