This project presents an analysis and visualization of pizza sales data from a fictional pizza restaurant chain. The project utilizes SQL for data extraction and transformation, and Power BI for data visualization.

Pizza Sales Analysis and Visualization

A Data_driven approach to Optimize Operations and Increase the Business Revenue

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Project Scenario

As a data analyst working for a pizza restaurant chain that operates in the US. The chain wants to improve its sales performance and customer satisfaction by leveraging data-driven insights and recommendations. You are tasked with creating a pizza sales report using SQL and Power BI tools, based on a dataset containing information about pizza orders from January 2015 to December 2015. The dataset includes information such as product details, Categories, order dates, and transaction amounts. You will use SQL to clean, filter, and transform the data, and Power BI to create interactive and informative visualizations. The report will cover the following aspects of pizza sales:

- KPI's REQUIREMENT
- Charts Requirement
- Daily/Monthly Trend of Sales
- Sales of Product by Category
- Total Revenue and Avg. order value
- Percentage Sales
- Best/Worst Pizzas by Sale

The report will also provide actionable insights and recommendations based on the analysis and visualizations, such as:

- Promoting the most popular pizza flavors and categories
- Implementing marketing strategies to increase sales during low-demand periods
- Offering discounts and incentives to increase order value and retention
- Improving the quality and efficiency of service

The report will be presented to the senior management of the pizza restaurant, who will use it to make informed decisions and implement changes to improve the business performance and customer satisfaction. The report will also be shared with the staff and managers of the individual restaurant locations, who will use it to monitor and improve their operations and sales. The report will be updated periodically with new data and insights, as the pizza restaurant chain continues to grow and expand.

Skills Demonstrated

Some of the skills demonstrated for a pizza sales report are:

- Data acquisition: Obtained the data from various sources and formats, such as databases, CSV files, and other data storage systems.
- Data transformation: I have cleaned, filtered, and transformed data using SQL, a structured query language for manipulating and analyzing data.
- Data modeling: I designed and implemented a data model that represents the relationships and attributes of the data entities, such as customers, product Categories, orders, and transactions.
- Data analysis: Performed in-depth data analysis using SQL queries, such as aggregating, grouping, sorting, filtering, and joining data.

- Data visualization: Created interactive and informative visualizations using Power BI, a business intelligence tool for creating reports and dashboards.
- Data interpretation: Derived insights and recommendations from the data analysis and visualizations, such as identifying sales trends, customer preferences, product performance.
- Communication: Able to present and communicate the data analysis and visualizations in a clear and concise manner, using appropriate language, format, and style.

Tools Used

MS OFFICE/ EXCEL: VERSION 2021

MS SQL SERVER: 19.0

SQL SERVER MANAGEMENT STUDIO - 19.0.20209.0

POWER BI: JUNE 2023 Version

Summary

This report analyzes and visualizes pizza sales data from a fictional pizza restaurant chain using SQL and Power BI tools. The report covers various aspects of pizza sales, such as product categories, flavors, trends, seasonality, preferences, order value, revenue, and restaurant performance. The report also provides insights and recommendations to help the pizza restaurant chain optimize its operations, improve sales, and enhance customer satisfaction. The report is based on a dataset containing information about pizza orders from January 2015 to December 2015. The report is intended for the senior management and the staff of the pizza restaurant chain.

Solution

After analyzing the data and gaining insights from SQL and POWER BI I came up with following recommendations:

- Focus on the products contributed to highest revenue.
- Provide some discounts offers for least sales days and Months.
- Enhance the online ordering, delivery, and carryout services to meet the growing demand and convenience of the customers.
- Use technology to streamline the ordering process, track the delivery status, and collect feedback from the customers.

- The pizza company should optimize its categories and menu design by offering more variety and options for its customers. They can do this by introducing new flavors, toppings, or crusts, or by creating combos or bundles that include drinks or sides.

Approach

The first step in the analysis is to define the objective and scope of the Project**.** This means coming up with a clear and specific question or problem that you want to solve with data, such as

Ask: How can we optimize the sales performance and customer satisfaction of a pizza restaurant chain?

Prepare:

After analyzing the business problem, I have looked into data located in the form of CSV files in the system. A good data source is ROCCC which stands for Reliable, Original, Comprehensive, Current, and Cited.

Reliable — med — it has 48622 rows

Original — high — provided by the company directly

Comprehensive — high — Parameters match parameters

Current — low — Data is 7 years old and somehow relevant

Cited — high — Data collected from company, hence useful

I chose SQL to analyze the data so I imported the data into MS SQL SERVER from system.

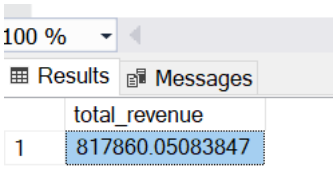
Process:

For KPI's REQUIREMENT

I analyzed key indicators using SQL for our pizza sales data to gain insights into our business performance, calculated the following metrics:

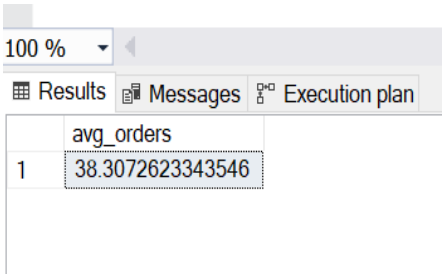
1. **Total Revenue:** The sum of the total price of all pizza orders.

```
SELECT SUM(total_price) as total_revenue from pizzadb.dbo.pizza_sales;
```



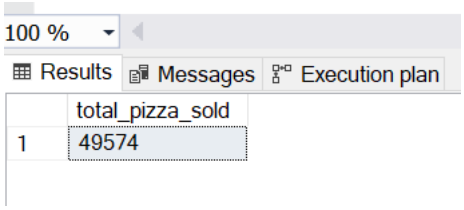
2. **Average Order Value:** The average amount spent per Ord, calculated by dividing the total revenue by the total number of orders.

```
SELECT SUM(total_price) /COUNT(DISTINCT(order_id)) as avg_orders from
pizzadb.dbo.pizza_sales
```



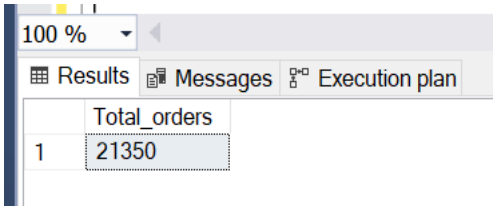
3. **Total Pizzas Sold:** The sum of the quantities of all pizzas sold.

```
SELECT SUM(quantity) as total_pizza_sold from pizzadb.dbo.pizza_sales
```



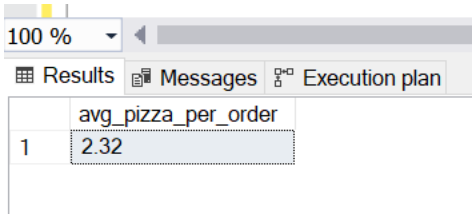
4. **Total Orders:** The total number of orders placed.

```
SELECT COUNT(DISTINCT(order_id)) as Total_orders from pizzadb.dbo.pizza_sales
```



5. **Average Pizzas Per Order:** The average number of pizzas sold per order, calculated by dividing the total number of pizzas sold by the total number of orders.

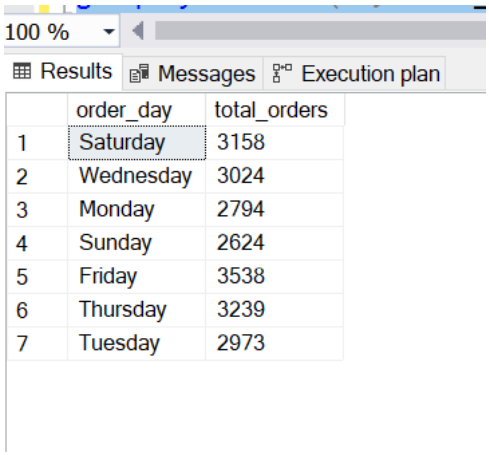
```
SELECT CAST(CAST(SUM(quantity) AS decimal(10,2)) / CAST(COUNT(DISTINCT(order_id))
AS decimal(10,2)) AS decimal(10,2)) as avg_pizza_per_order from
pizzadb.dbo.pizza_sales
```



	avg_pizza_per_order
1	2.32

6. **Daily Trend for Total Orders:** the total number of orders daily by using distinct count function for order_id, used the DATENAME function to split the day name from the date column and grouped data by datename.

```
SELECT DATENAME(DW, order_date) as order_day, count(distinct(order_id)) as
total_orders from pizzadb.dbo.pizza_sales
group by DATENAME(DW, order_date)
```



	order_day	total_orders
1	Saturday	3158
2	Wednesday	3024
3	Monday	2794
4	Sunday	2624
5	Friday	3538
6	Thursday	3239
7	Tuesday	2973

7. **Monthly Trend for Total Orders:** I repeated the previous process only changed the DATENAME function to MONTH function.

```
SELECT DATENAME(MONTH, order_date) as order_Month, count(distinct(order_id)) as
total_orders from pizzadb.dbo.pizza_sales
group by DATENAME(MONTH, order_date)
order by order_Month
```

100 %

Results | Messages | Execution plan

	order_Month	total_orders
1	April	1799
2	August	1841
3	December	1680
4	February	1685
5	January	1845
6	July	1935
7	June	1773
8	March	1840
9	May	1853
10	November	1792
11	October	1646
12	September	1661

8. **Percentage of Sales by Pizza Category:** first I find the sum of total price from table and then used it in subquery to find the percentage total by category and ordered by sales percentage.

```
SELECT pizza_category, CAST(SUM(total_price) * 100 /
(SELECT sum(total_price) from pizzadb.dbo.pizza_sales) AS DECIMAL(10,2)) as sales_percentage
FROM pizzadb.dbo.pizza_sales
GROUP BY pizza_category
ORDER BY sales_percentage desc;
```

100 %

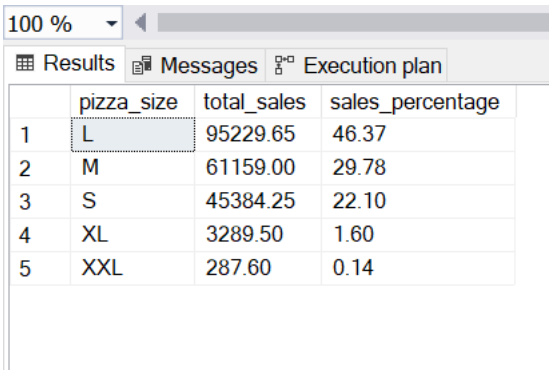
Results | Messages | Execution plan

	pizza_category	sales_percentage
1	Classic	26.91
2	Supreme	25.46
3	Chicken	23.96
4	Veggie	23.68

9. **Percentage of Sales by Pizza Size:** first I find the sum of total price from table and then used it in subquery to find the percentage total by size and ordered by sales percentage. Used the CAST function for up to two decimal values:

```
--if we filter the data by per month we can use the following function:
```

```
SELECT pizza_size, CAST(SUM(total_price) AS DECIMAL(10,2)) AS total_sales,
CAST(SUM(total_price) * 100 /
(SELECT SUM(total_price) FROM pizzadb.dbo.pizza_sales WHERE MONTH(order_date) =1) AS
DECIMAL(10,2)) AS sales_percentage FROM pizzadb.dbo.pizza_sales
WHERE MONTH(order_date) = 1
GROUP BY pizza_category
ORDER BY sales_percentage desc;
```



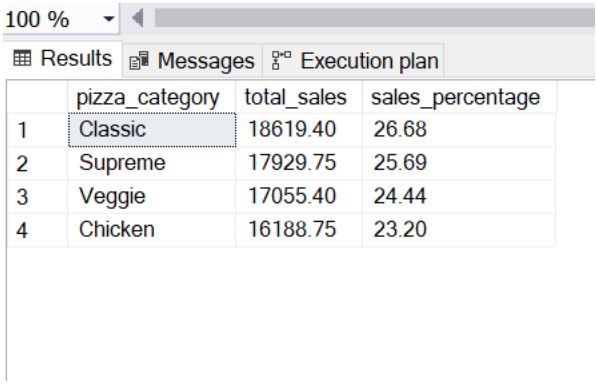
100 %

Results | Messages | Execution plan

	pizza_size	total_sales	sales_percentage
1	L	95229.65	46.37
2	M	61159.00	29.78
3	S	45384.25	22.10
4	XL	3289.50	1.60
5	XXL	287.60	0.14

```
--percentage of sales by pizza size quarterly:

SELECT pizza_size, CAST(SUM(total_price) AS DECIMAL(10,2)) AS total_sales,
CAST(SUM(total_price) * 100 /
(SELECT SUM(total_price) FROM pizzadb.dbo.pizza_sales WHERE DATEPART(quarter, order_date)=
1 ) AS DECIMAL(10,2)) AS sales_percentage
FROM pizzadb.dbo.pizza_sales
WHERE DATEPART(quarter, order_date)= 1
GROUP BY pizza_size
ORDER BY sales_percentage desc;
```



100 %

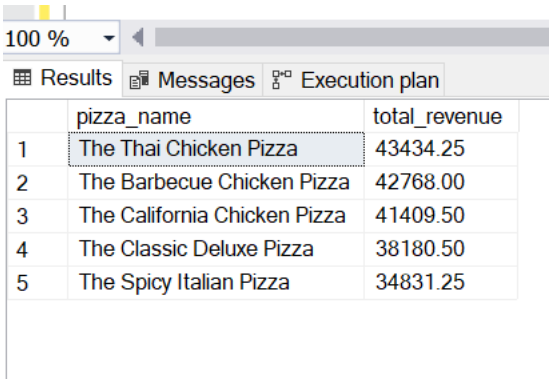
Results | Messages | Execution plan

	pizza_category	total_sales	sales_percentage
1	Classic	18619.40	26.68
2	Supreme	17929.75	25.69
3	Veggie	17055.40	24.44
4	Chicken	16188.75	23.20

10. Top 5 Best Sellers by Revenue, Total Quantity and Total Orders

```
--top 5 pizzas by revenue
```

```
SELECT top 5 pizza_name, cast(SUM(total_price)as decimal(10,2)) as total_revenue FROM
pizzadb.dbo.pizza_sales
GROUP BY pizza_name
order by total_revenue desc
```



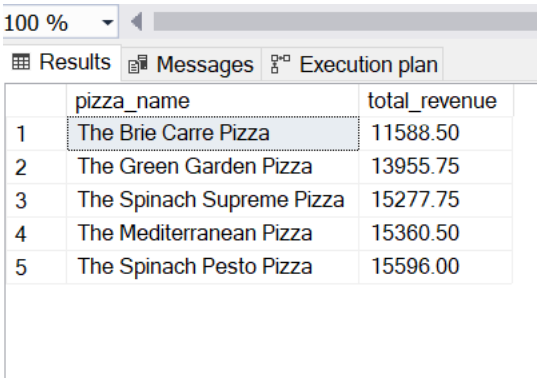
100 %

Results | Messages | Execution plan

	pizza_name	total_revenue
1	The Thai Chicken Pizza	43434.25
2	The Barbecue Chicken Pizza	42768.00
3	The California Chicken Pizza	41409.50
4	The Classic Deluxe Pizza	38180.50
5	The Spicy Italian Pizza	34831.25

```
--top bottom 5 pizzas by revenue

SELECT top 5 pizza_name, cast(SUM(total_price)as decimal(10,2)) as total_revenue
FROM pizzadb.dbo.pizza_sales
GROUP BY pizza_name
order by total_revenue asc;
```



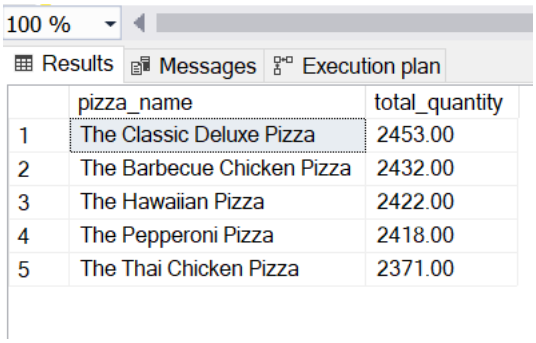
100 %

Results | Messages | Execution plan

	pizza_name	total_revenue
1	The Brie Carre Pizza	11588.50
2	The Green Garden Pizza	13955.75
3	The Spinach Supreme Pizza	15277.75
4	The Mediterranean Pizza	15360.50
5	The Spinach Pesto Pizza	15596.00

11. Bottom 5 Best Sellers by Revenue, Total Quantity and Total Orders

```
--top 5 pizzas revenue by quantity
SELECT top 5 pizza_name, cast(SUM(quantity)as decimal(10,2)) as total_quantity FROM
pizzadb.dbo.pizza_sales
GROUP BY pizza_name
order by total_quantity desc
```

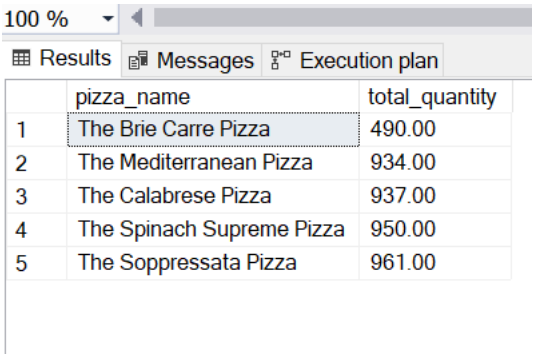


100 %

Results | Messages | Execution plan

	pizza_name	total_quantity
1	The Classic Deluxe Pizza	2453.00
2	The Barbecue Chicken Pizza	2432.00
3	The Hawaiian Pizza	2422.00
4	The Pepperoni Pizza	2418.00
5	The Thai Chicken Pizza	2371.00

```
SELECT top 5 pizza_name, cast(SUM(quantity )as decimal(10,2)) as total_quantity FROM
pizzadb.dbo.pizza_sales
GROUP BY pizza_name
order by total_quantity asc;
```



100 %

Results | Messages | Execution plan

	pizza_name	total_quantity
1	The Brie Carre Pizza	490.00
2	The Mediterranean Pizza	934.00
3	The Calabrese Pizza	937.00
4	The Spinach Supreme Pizza	950.00
5	The Soppressata Pizza	961.00

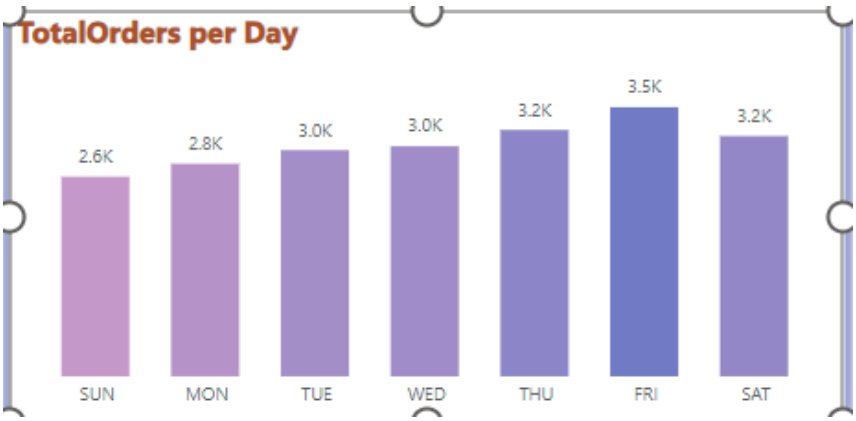
Insights:

I would like to visualize various aspects of pizza sales data to gain insights and understand key trends. For that, I connected power BI with SQL server and imported the data from SQL server and then started transforming the data using Power BI. After loading data I had to do some cleaning for the charts

- Extracted the day name , first three letters of the day name using from date column.
- Repeated the Same process for extracting month as well. For that I used the following function:
- Order day = UPPER(LEFT(pizza_sales[Day Name] ,3))
- Transformed the category s, m, l, xl, xxl into regular, medium, large , x-large, xx-large.
- I used conditional formatting to order the day by day number. I chose Sunday as 1 and Saturday as 6.
- Then I have identified the following requirements for creating charts:

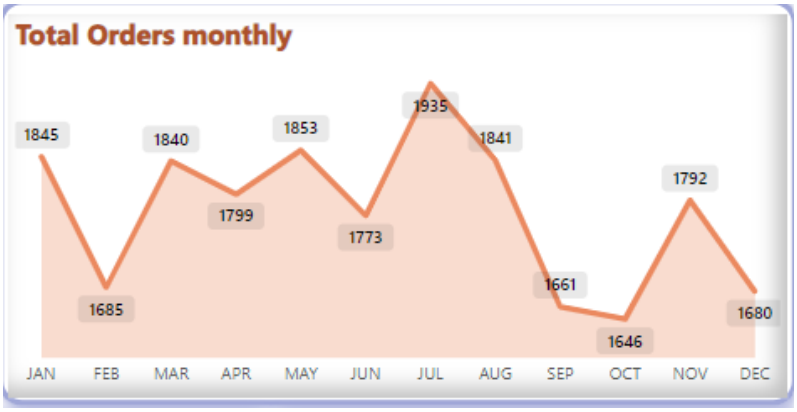
1.Daily Trend for Total Orders:

Created a bar chart that displays the daily trend of total orders over a specific time period. This chart helps us identify the patterns or fluctuations in order volumes on a daily basis. **Orders are highest on the weekends, Friday/Saturday Evening. And lowest on Sunday.**



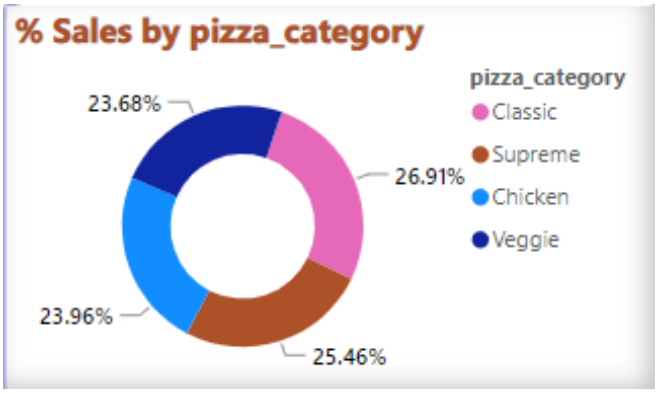
2.Monthly Trend for Total Orders:

Created a line chart that illustrates the hourly trend of total orders throughout the day. This chart allows us to identify peak hours or periods of high order activity. **Highest number of Orders are in July/Jan. The month of Oct/Feb/Sep/Dec is having the least orders.**



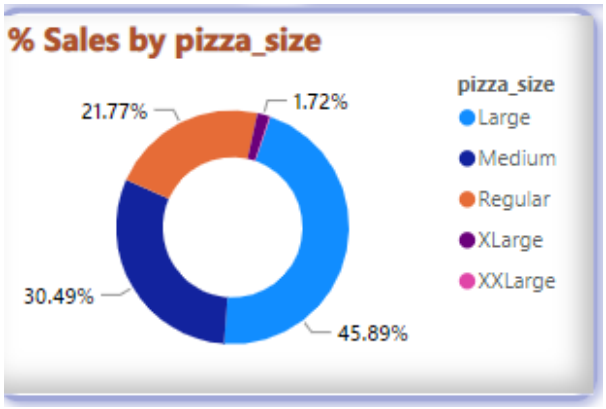
3.Percentage of Sales by Pizza Category:

Created a pie chart that shows the distribution of sales across different pizza categories. This chart will provide insights into the popularity of various pizza categories and their contribution to overall sales. **The classic Pizza has the highest sale and the veggie has the least**.



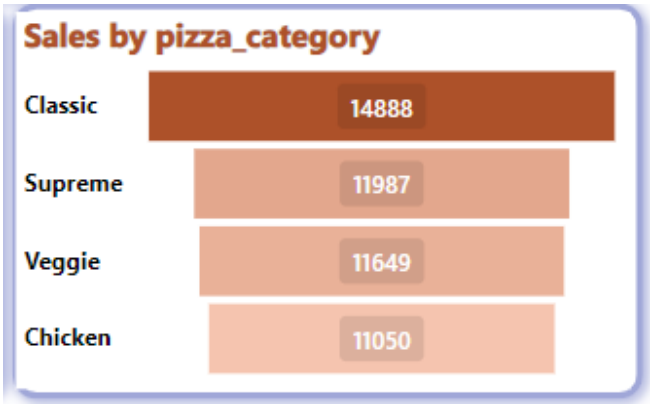
4.Percentage of Sales by Pizza Size:

Generated a pie chart that represents the percentage of sales attributed to different pizza sizes. This chart helps us understand customer preferences for pizza sizes and their impact on sales. The chart shows that the large Pizza has the highest sale and the XXL and XL has the least demand.



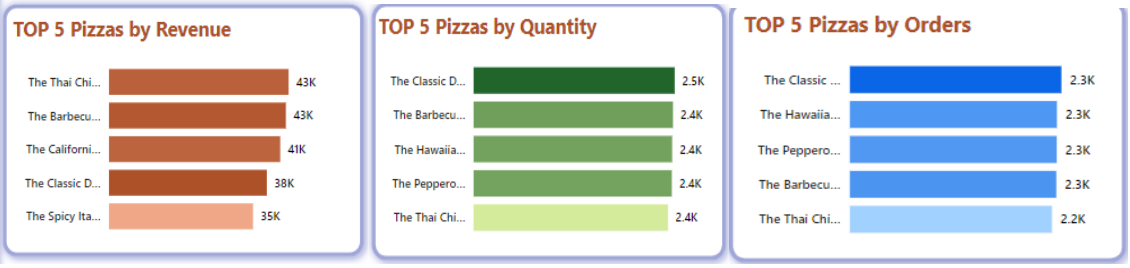
5.Total Pizzas Sold by Pizza Category:

Created a funnel chart that presents the total number of pizzas sold for each pizza category. This chart allows us to compare the sales performance of different pizza categories. The Classic Pizza contributed to maximum sale in year 2015.



6.Top 5 Best Sellers by Revenue, Total Quantity and Total Orders

Created a bar chart highlighting the top 5 best-selling pizzas based on the Revenue, Total Quantity, Total Orders. This chart helps us identify the most popular pizza options. **Maximum Revenue is generated from THAI chicken Pizza. The classic deluxe Pizza has contributed to max quantity/ORDERS**



7. Bottom 5 Best Sellers by Revenue, Total Quantity and Total Orders

Created a bar chart showcasing the bottom 5 worst-selling pizzas based on the Revenue, Total Quantity, Total Orders. This chart enables us to identify underperforming or less popular pizza options. **THE BRIE CARRE contributes to minimum REVENUE/QUANTITY and TOTAL ORDERS.**