Pizza Sales Report Documentation - (ENG)

Special Thanks to Data Tutorials

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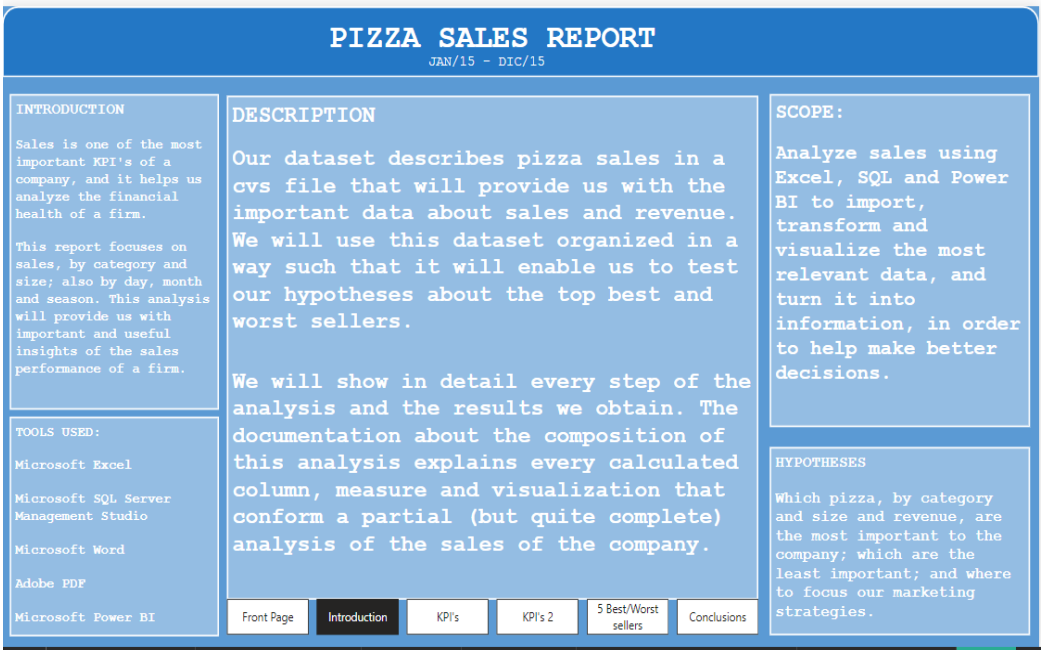
1. Introduction

The success of any organization in today's dynamic business environment depends on the ability to make informed strategic decisions. As one of the main performance indicators, sales is essential for assessing the future and financial health of a company. With sophisticated technological tools like Power BI, companies can now turn raw data into valuable and visually striking information.

This article focuses on the analysis of Pizza Sales, using Power BI and SQL as the main tools. The sales analysis facilitates decision-making for companies and enhance business success by turning this dataset into visually appealing and easy-to-understand information.

We show a screenshot of the *Introduction* page of the report.



In the introductory page of the report, we provide a brief introduction to the analysis, list the technological tools used, describe the dataset, and outline the steps taken in the research.

We also briefly describe the scope of the analysis and the hypotheses proposed.

2. Dataset theme description

The dataset provides a comprehensive and detailed view of one of the most important financial aspects of a company by addressing the issue of its sales. This dataset gathers information on sales and revenue over a specific period, allowing for the analysis and understanding of the company's economic dynamics. The dataset contains a variety of relevant variables that capture different aspects of sales, including the date of each transaction, the goods sold, unit prices, quantities sold, pizza size and category, etc.

By analyzing this dataset, trends and patterns in revenue over time can be identified, the most popular products among customers can be determined, the effectiveness of pricing strategies can be evaluated, and potential growth opportunities or areas that need improvement in terms of sales can be uncovered.

The main objective of this dataset is to allow financial analysts, managers, and company stakeholders to examine the company's sales performance from a revenue-centered perspective. Using data analysis techniques and tools like Power BI helps make informed strategic decisions and increases business success.

3. Scope of analysis

A Power BI project focused on analyzing a company's sales can encompass a variety of stages and key objectives to gain a comprehensive and valuable understanding of the financial aspects. These are some examples of the typical scope of this type of project:

1. *Definition of objectives*: to establish clear goals for the project, such as identifying sales patterns, analyzing product profitability, and understanding trends over time.

2. *Data collection*: obtain and prepare the company's sales data, which will include information on transactions, products, prices and dates.

3. *Data cleaning and transformation*: perform data cleaning to handle null values, duplicate data, or inconsistencies. Transform the data as needed to create a suitable structure for analysis, such as creating fact and dimension tables.

4. *Creation of a data model*: design a data model in Power BI that reflects the relationships between the tables and allows for coherent and effective analysis.

5. *Development of visualizations*: create interactive visualizations, such as bar charts, line graphs, pie charts, to display revenue by period, products, categories, etc. Develop interactive dashboards that allow users to explore data and gain relevant insights.

6. *Analysis and discovery*: identifying trends in revenue over time and conducting comparative analyses between products and categories.

7. *Implementation of key metrics*: calculate and display key financial metrics, such as total revenue, average sales per order, total pizzas sold, etc.

8. *Report and Dashboard Generation*: design executive reports and dashboards that present findings and allow users to quickly access relevant data.

9. *Training and documentation*: provide training to end users on how to interact with the dashboard and perform custom analyses. Document the process of data preparation, modeling, and visualization for future reference.

10. *Delivery and follow-up*: present the project to stakeholders and end users, gathering feedback and making adjustments if necessary.

11. *Continuous maintenance*: regularly update the dashboard with new data to maintain the relevance and accuracy of the visualizations.

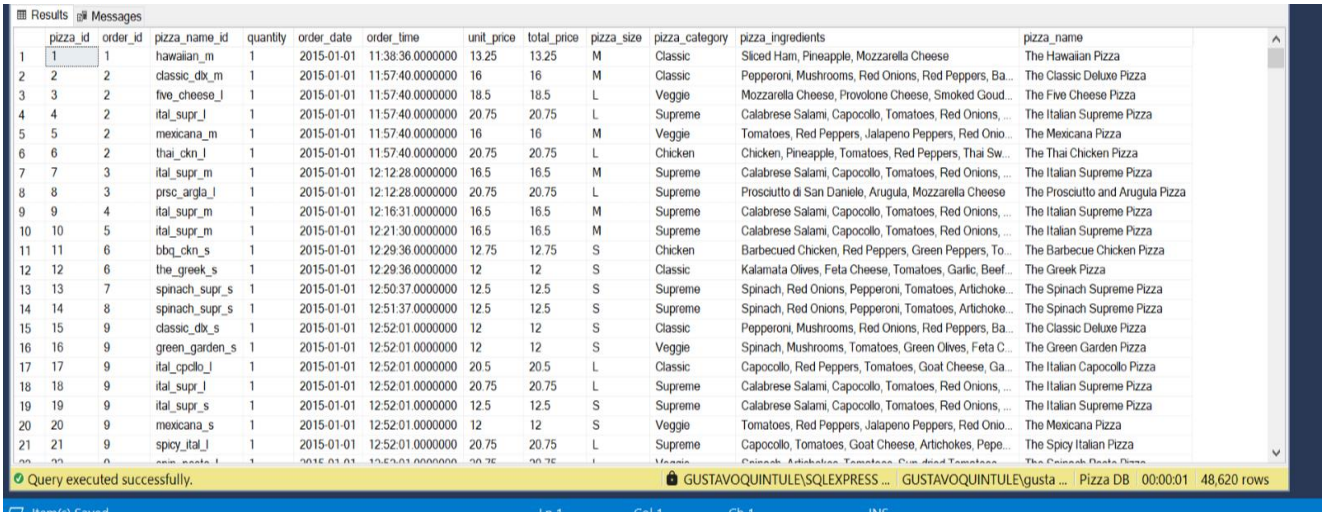
This scope provides a general framework for addressing a company's sales Power BI project. However, the exact scope may vary depending on the needs and objectives of the organization.

4. Data Import and Queries (SQL), and its results

We imported our csv files into SQL and made a number of queries in order to visualize, analyze the data and organize it.

We generate a database in SQL to utilize in our project. Next, we show the queries and results from SQL.

The first command is **SELECT * FROM** and we obtain a view of all the columns included in the cvs file:



Results Messages

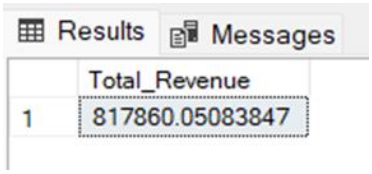
	pizza_id	order_id	pizza_name_id	quantity	order_date	order_time	unit_price	total_price	pizza_size	pizza_category	pizza_ingredients	pizza_name
1	1	1	hawaiian_m	1	2015-01-01	11:38:36.0000000	13.25	13.25	M	Classic	Sliced Ham, Pineapple, Mozzarella Cheese	The Hawaiian Pizza
2	2	2	classic_dlx_m	1	2015-01-01	11:57:40.0000000	16	16	M	Classic	Pepperoni, Mushrooms, Red Onions, Red Peppers, Ba...	The Classic Deluxe Pizza
3	3	2	five_cheese_l	1	2015-01-01	11:57:40.0000000	18.5	18.5	L	Veggie	Mozzarella Cheese, Provolone Cheese, Smoked Goud...	The Five Cheese Pizza
4	4	2	ital_supr_l	1	2015-01-01	11:57:40.0000000	20.75	20.75	L	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, ...	The Italian Supreme Pizza
5	5	2	mexicana_m	1	2015-01-01	11:57:40.0000000	16	16	M	Veggie	Tomatoes, Red Peppers, Jalapeno Peppers, Red Onio...	The Mexicana Pizza
6	6	2	thai_ckn_l	1	2015-01-01	11:57:40.0000000	20.75	20.75	L	Chicken	Chicken, Pineapple, Tomatoes, Red Peppers, Thai Sw...	The Thai Chicken Pizza
7	7	3	ital_supr_m	1	2015-01-01	12:12:28.0000000	16.5	16.5	M	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, ...	The Italian Supreme Pizza
8	8	3	prsc_argla_l	1	2015-01-01	12:12:28.0000000	20.75	20.75	L	Supreme	Prosciutto di San Daniele, Arugula, Mozzarella Cheese	The Prosciutto and Arugula Pizza
9	9	4	ital_supr_m	1	2015-01-01	12:16:31.0000000	16.5	16.5	M	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, ...	The Italian Supreme Pizza
10	10	5	ital_supr_m	1	2015-01-01	12:21:30.0000000	16.5	16.5	M	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, ...	The Italian Supreme Pizza
11	11	6	bbq_ckn_s	1	2015-01-01	12:29:36.0000000	12.75	12.75	S	Chicken	Barbecued Chicken, Red Peppers, Green Peppers, To...	The Barbecue Chicken Pizza
12	12	6	the_greek_s	1	2015-01-01	12:29:36.0000000	12	12	S	Classic	Kalamata Olives, Feta Cheese, Tomatoes, Garlic, Beef...	The Greek Pizza
13	13	7	spinach_supr_s	1	2015-01-01	12:50:37.0000000	12.5	12.5	S	Supreme	Spinach, Red Onions, Pepperoni, Tomatoes, Artichoke...	The Spinach Supreme Pizza
14	14	8	spinach_supr_s	1	2015-01-01	12:51:37.0000000	12.5	12.5	S	Supreme	Spinach, Red Onions, Pepperoni, Tomatoes, Artichoke...	The Spinach Supreme Pizza
15	15	9	classic_dlx_s	1	2015-01-01	12:52:01.0000000	12	12	S	Classic	Pepperoni, Mushrooms, Red Onions, Red Peppers, Ba...	The Classic Deluxe Pizza
16	16	9	green_garden_s	1	2015-01-01	12:52:01.0000000	12	12	S	Veggie	Spinach, Mushrooms, Tomatoes, Green Olives, Feta C...	The Green Garden Pizza
17	17	9	ital_cpclo_l	1	2015-01-01	12:52:01.0000000	20.5	20.5	L	Classic	Capocollo, Red Peppers, Tomatoes, Goat Cheese, Ga...	The Italian Capocollo Pizza
18	18	9	ital_supr_l	1	2015-01-01	12:52:01.0000000	20.75	20.75	L	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, ...	The Italian Supreme Pizza
19	19	9	ital_supr_s	1	2015-01-01	12:52:01.0000000	12.5	12.5	S	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, ...	The Italian Supreme Pizza
20	20	9	mexicana_s	1	2015-01-01	12:52:01.0000000	12	12	S	Veggie	Tomatoes, Red Peppers, Jalapeno Peppers, Red Onio...	The Mexicana Pizza
21	21	9	spicy_ital_l	1	2015-01-01	12:52:01.0000000	20.75	20.75	L	Supreme	Capocollo, Tomatoes, Goat Cheese, Artichokes, Pepe...	The Spicy Italian Pizza

Query executed successfully. GUSTAVOQUINTULE\SQLEXPRESS ... GUSTAVOQUINTULE\gusta ... Pizza DB 00:00:01 48,620 rows

Next, we'll write the queries we need and obtain the results to use in our analysis and dashboard.

A) Total Revenue:

SELECT SUM(total_price) AS Total_Revenue FROM pizza_sales;

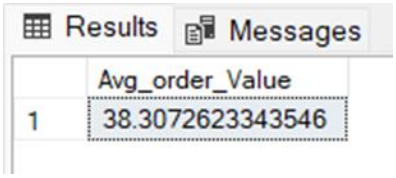


Results Messages

	Total_Revenue
1	817860.05083847

B) Average Order Value:

SELECT SUM(total_price) / COUNT(DISTINCT order_id) as Avg_Order_Value from pizza_sales;

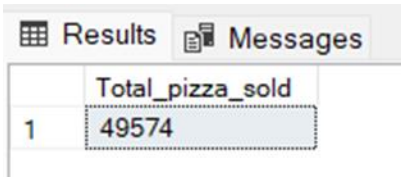


Results Messages

	Avg_order_Value
1	38.3072623343546

C) Total Pizzas Sold:

SELECT SUM(quantity) AS Total_Pizza_Sold from pizza_sales;

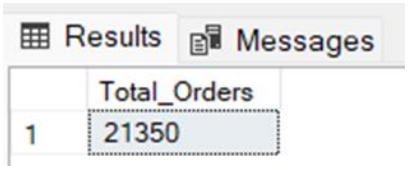


Results Messages

	Total_pizza_sold
1	49574

D) Total Orders:

SELECT COUNT(DISTINCT order_id) AS Total_orders from pizza_sales;



Results Messages

	Total_Orders
1	21350

E) Average Pizzas Per Order:

```
SELECT
  CAST(SUM(quantity) AS decimal(10,2)) /
  CAST(COUNT(DISTINCT order_id) AS decimal(10,2)) AS average_quantity_per_order
FROM pizza_sales;
```

Results | Messages

	Avg_Pizzas_per_order
1	2.32

F) Daily Trend for Total Orders:

```
SELECT DATENAME(DW, order_date) AS order_day,
COUNT(DISTINCT order_id) AS Total_orders
FROM pizza_sales
GROUP BY DATENAME(DW, order_date)
```

Results | Messages

	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

G) Monthly Trend for Total Orders:

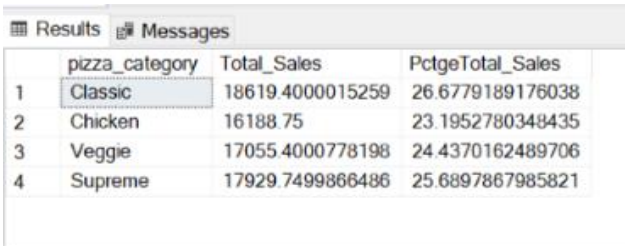
```
SELECT DATENAME(MONTH, order_date) AS Month_Name,
COUNT(DISTINCT order_id) AS Total_Orders
FROM pizza_sales
GROUP BY DATENAME(MONTH, order_date)
ORDER BY Total_Orders DESC
```

Results | Messages

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

H) Percentage of sales by pizza category:

```
SELECT pizza_category,
sum(total_price) AS Total_Sales,
sum(total_price) * 100 / (SELECT sum(total_price) from pizza_sales WHERE
MONTH(order_date) = 1) AS PctgeTotal_Sales
FROM pizza_sales
WHERE MONTH(order_date) = 1
GROUP BY pizza_category
```

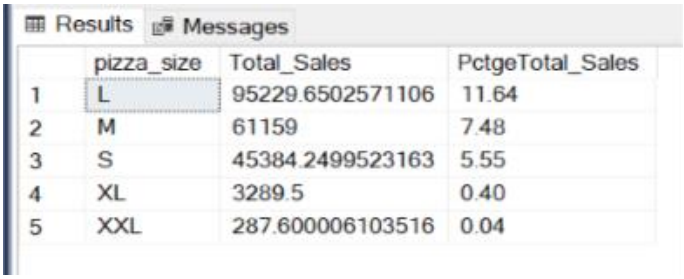


Results | Messages

	pizza_category	Total_Sales	PctgeTotal_Sales
1	Classic	18619.4000015259	26.6779189176038
2	Chicken	16188.75	23.1952780348435
3	Veggie	17055.4000778198	24.4370162489706
4	Supreme	17929.7499866486	25.6897867985821

I) Percentage of Total Sales by Pizza Size:

```
SELECT pizza_size,
sum(total_price) AS Total_Sales,
CAST(sum(total_price) * 100 /
(SELECT sum(total_price) from pizza_sales) AS DECIMAL(10,2)) AS PctgeTotal_Sales
FROM pizza_sales
WHERE DATEPART(quarter, order_date) = 1
GROUP BY pizza_size
ORDER BY PctgeTotal_Sales DESC
```



Results | Messages

	pizza_size	Total_Sales	PctgeTotal_Sales
1	L	95229.6502571106	11.64
2	M	61159	7.48
3	S	45384.2499523163	5.55
4	XL	3289.5	0.40
5	XXL	287.600006103516	0.04

J) Total Quantity Sold by Pizza Category:

```
SELECT pizza_category, SUM(quantity) as Total_Quantity_Sold
FROM pizza_sales
WHERE MONTH(order_date) = 2
GROUP BY pizza_category
ORDER BY Total_Quantity_Sold DESC
```

Results | Messages

	pizza_category	Total_Quantity_Sold
1	Classic	1178
2	Supreme	964
3	Veggie	944
4	Chicken	875

K) Top 5 Pizzas Sold by Revenue:

SELECT TOP 5 pizza_name, SUM(total_price) AS Total_Revenue

FROM pizza_sales

GROUP BY pizza_name

ORDER BY Total_Revenue DESC

Results | Messages

	pizza_name	Total_Revenue
1	The Thai Chicken Pizza	43434.25
2	The Barbecue Chicken Pizza	42768
3	The California Chicken Pizza	41409.5
4	The Classic Deluxe Pizza	38180.5
5	The Spicy Italian Pizza	34831.25

L) Bottom 5 Pizzas Sold by Revenue:

SELECT TOP 5 pizza_name, SUM(total_price) AS Total_Revenue FROM pizza_sales

GROUP BY pizza_name

ORDER BY Total_Revenue ASC

Results Messages

	pizza_name	Total_Revenue
1	The Brie Carre Pizza	11588.4998130798
2	The Green Garden Pizza	13955.75
3	The Spinach Supreme Pizza	15277.75
4	The Mediterranean Pizza	15360.5
5	The Spinach Pesto Pizza	15596

M) Top 5 Sales by Quantity:

SELECT TOP 5 pizza_name, SUM(quantity) AS Total_Quantity FROM pizza_sales

GROUP BY pizza_name

ORDER BY Total_Quantity DESC

Results Messages

	pizza_name	Total_Quantity
1	The Classic Deluxe Pizza	2453
2	The Barbecue Chicken Pizza	2432
3	The Hawaiian Pizza	2422
4	The Pepperoni Pizza	2418
5	The Thai Chicken Pizza	2371

N) Bottom 5 Pizzas Sold by Quantity:

SELECT TOP 5 pizza_name, SUM(quantity) AS Total_Quantity

FROM pizza_sales

GROUP BY pizza_name

ORDER BY Total_Quantity ASC

Results | Messages

	pizza_name	Total_Quantity
1	The Brie Carre Pizza	490
2	The Mediterranean Pizza	934
3	The Calabrese Pizza	937
4	The Spinach Supreme Pizza	950
5	The Soppressata Pizza	961

O) Top 5 Sales by Total Orders:

SELECT TOP 5 pizza_name, COUNT(DISTINCT order_id) AS Total_Orders FROM pizza_sales

GROUP BY pizza_name

ORDER BY Total_Orders DESC

Results | Messages

	pizza_name	Total_Orders
1	The Classic Deluxe Pizza	2329
2	The Hawaiian Pizza	2280
3	The Pepperoni Pizza	2278
4	The Barbecue Chicken Pizza	2273
5	The Thai Chicken Pizza	2225

P) Bottom 5 by Total Orders:

SELECT TOP 5 pizza_name, COUNT(DISTINCT order_id) AS Total_Orders

FROM pizza_sales

GROUP BY pizza_name

ORDER BY Total_Orders

Results | Messages

	pizza_name	Total_Orders
1	The Brie Carre Pizza	480
2	The Mediterranean Pizza	912
3	The Spinach Supreme Pizza	918
4	The Calabrese Pizza	918
5	The Chicken Pesto Pizza	938

5. **Possible Hypotheses:**

It is possible to explore and validate a variety of hypotheses in the analysis of the company's sales. These hypotheses are preliminary assumptions that can be tested with the available data. These are some relevant hypotheses that we will try to demonstrate and explain.

Season: the company's revenue varies according to the seasons of the year. For example, one could hypothesize that the company experiences a significant increase in sales during the holiday seasons.

Star product: there is a product or a set of products that disproportionately contribute to the company's total revenue. It could be investigated whether some products generate the majority of the income.

Customer segmentation: the different customer segments can have a significant impact on revenue. It could be investigated whether certain customer groups contribute more than others to the company's revenue.

Sales channels: it could be hypothesized that certain sales channels (for example, physical stores vs. e-commerce) have a different impact on total revenue.

Response to external events: one could hypothesize that external events, such as changes in the economy or market trends, have an impact on the company's revenue.

These are just a few examples of potentially relevant hypotheses for a business sales analysis. It is crucial to keep in mind that hypotheses must be supported by data and statistically tested in order to be considered valid.

We will try to determine which pizza categories and sizes are the best and worst sellers for the company, in order to identify where marketing strategies should be focused on. To achieve this, we will make use of SQL and Power BI to organize, calculate and visualize the most important KPI's and other crucial aspects of the company under analysis. This will also be very useful for other users of this information and data, so that they can grasp their own insights and understanding of the company's financial health.

6. **List of columns in table:**

In the following section, we provide a breakdown of the structure of each column and a detailed specification of the data types assigned to each of them. This thorough analysis of the arrangement and characteristics of the data will allow for a deeper and more complete understanding of the database in question, providing a comprehensive view of its design and operation.

Field Names	Data Type
Pizza_ID	Int
Order_ID	Int
Pizza_name_ID	Varchar(50)
Quantity	Tinyint
Order_Date	Date
Order_Time	Time(7)
Unit_Price	Float
Total_Price	Float
Pizza_Size	Varchar(50)
Pizza_Category	Varchar(50)
Pizza_Ingredients	Varchar(200)
Pizza_Name	Varchar(50)

7. **Background and icons for dashboard**

We develop a background to be applied in our Power BI dashboard, using pictures and icons in order to make it easier and accessible to the users of this data report.

We'll show a list of the icons and pictures utilized:

For the backgrounds, we used the color palette provided by Power BI. Below, we provide the hexadecimal codes that represent the colors used:

Front Page: #118DFF: "blue"; #252423 "black"; image of pizza in PNG format.

Introduction: #0D6ABF "light blue"; font color: white.

KPI's: #252423 "black"; #0D6ABF "blue"; font color: white; charts with #26ADB6 "green".

KPI's 2: #252423 "black"; #0D6ABF "blue"; font color: white; charts with #26ADB6 "green".

5 Best/Worst Sellers: #252423 "black"; #0D6ABF "blue"; font color: white; charts with #26ADB6 "green", remaining colors in conditional formatting.

Conclusions: #0D6ABF "blue" in the text box with the conclusions. White font. #E6E6E6 as background visualization cards. Additionally, a pizza image in PNG format.

The font used throughout the report is Courier New

8. Importing tables to Power BI and Transforming Data (Power Query)

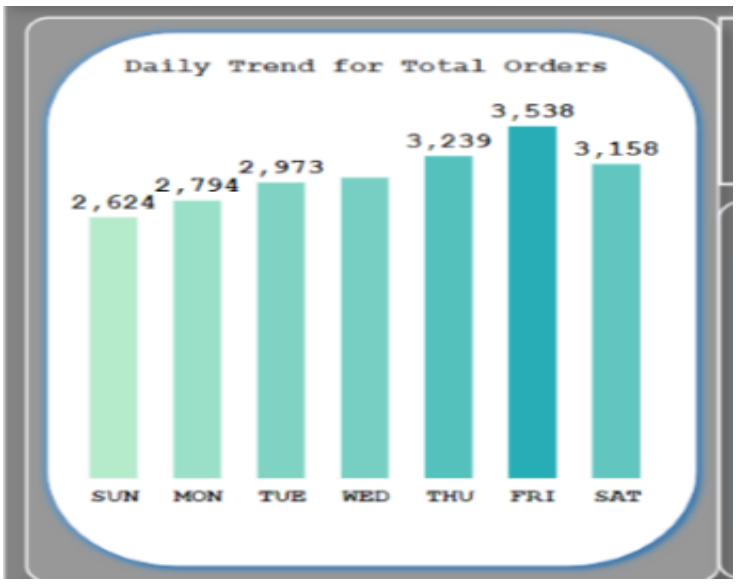
We import our database (called PizzaDB) from SQL to Power BI and make transformations on the data to sort, organize, and utilize it.

First, we modified the "pizza_size" column, in which pizza sizes are represented by a single letter ("L" for "Large," "M" for "Medium," etc.). First of all, we open Power Query to be able to transform the data. Next, we modify the mentioned column and replace the values

(initial letters) in each record with values that fully describe the size, i.e., "L" is replaced by "Large," "M" is replaced by "Medium," and so on with the remaining sizes. Our goal is to use the full word to describe the sales of each pizza size.

In Power Query we generate a conditional column named “Day Number” that will show us the number of the day in the following order: Sunday = 1; Monday = 2; ....; Saturday = 7. -

This column is used to sort days by number in the following chart:



9. Scope, Glossary, and Tech Tools implemented

For the development of this particular project, we selected and employed certain applications and technological tools in order to meet the requirements of the tasks and the analysis of the data in question. These tools are:

- Microsoft Excel for reading the CSV files that make up the dataset.

- SQL Server Management Studio to retrieve the files that make up the Dataset. (CVS files).
- Power BI for dashboard creation.
- Adobe PDF
- Microsoft Word.

10. Calculated columns/Measures/Visualizations

Next, we will demonstrate the generation of calculated columns, measures, and visualizations implemented in the report.

First, we generate the measures using DAX functions.

The first measure is "Total Income":

Total Revenue = SUM(pizza_sales[total_price]),

which has a value of $817,860.

The second is "Average value per order." Before obtaining the average, we need to generate a measure with the total number of orders. This is called "Total Orders":

Total Orders = DISTINCTCOUNT(pizza_sales[order_id]),

with a result of 21,350. -

Next, we obtain "Average value per order":

Average Order Value = [Total Revenue] / [Total Orders],

for a value of $38.31 for each order.

Then, we obtain the "Total pizzas sold":

Total Pizzas Sold = SUM(pizza_sales[quantity]),

with a total of 49,574 pizzas sold.

We now obtain the "Average number of pizzas per order":

Average Pizzas Per Order = [Total Pizzas Sold] / [Total Orders],

giving us an average of 2.32 pizzas per order. -

These 5 generated measures are displayed on cards in the conclusions page:

Another measure implemented was the so-called "Order Day," aimed at obtaining the first three letters of each day of the week, thus ensuring that the graphs appear clear and tidy. For this measure, we wrote the code:

Order Day = UPPER(LEFT(pizza_sales[Day Name], 3)),

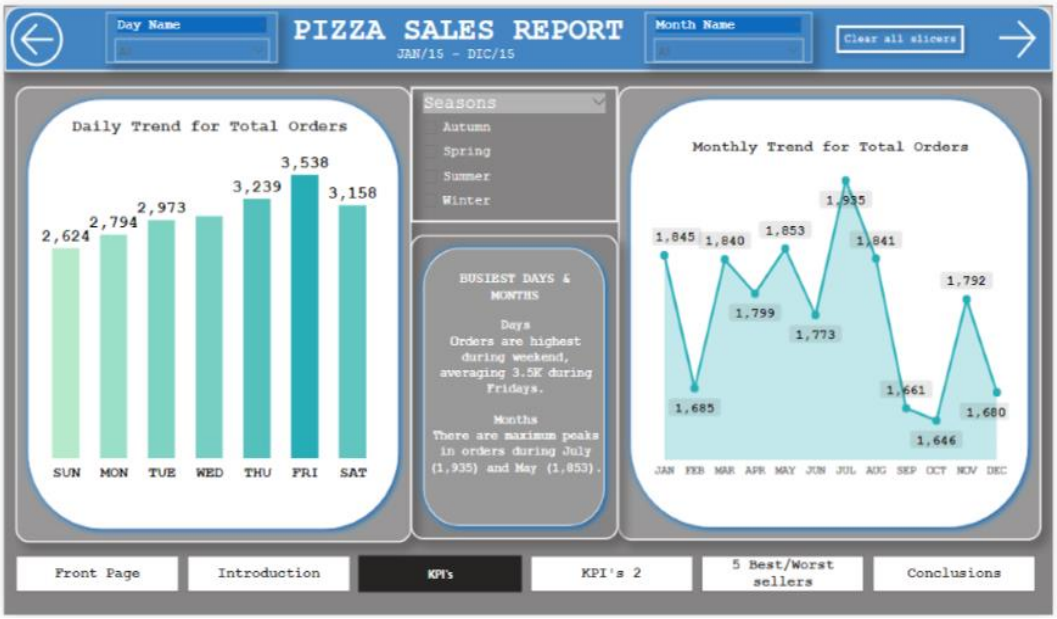
Creating a new column called "Order Day" where the days of the week are recorded, but only considering the first 3 letters of each day. (MON for Monday, FRI for Friday, etc.)

Visualizations:

Next, we see the third report page, named "*KPIs*," where we analyze sales during the days of the week, the months, and the seasons of the year. For that, we use a bar chart in which the "Order Day" column is included on the X-axis and the generated measure called "Total Orders" is on the Y-axis.

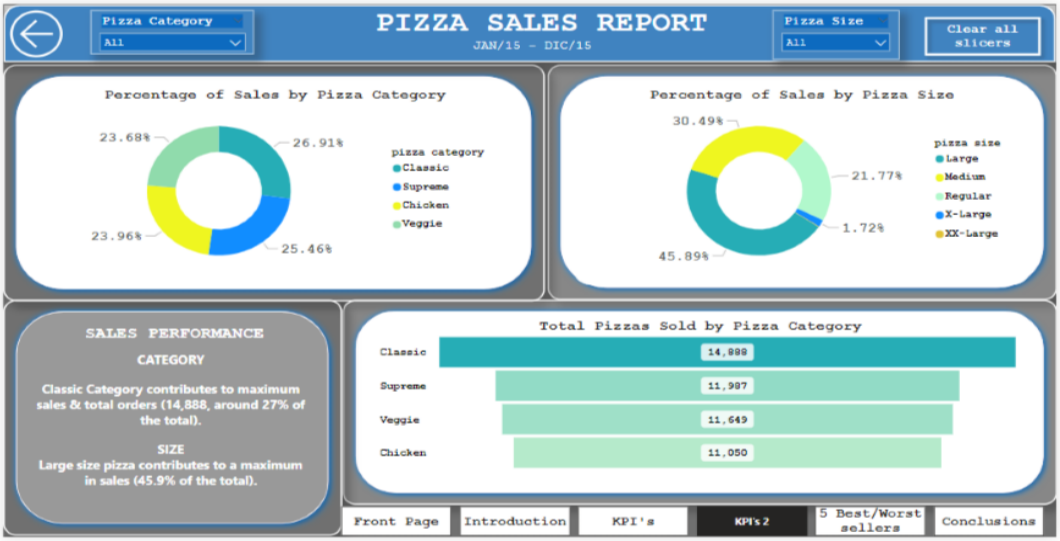
On the right side of the page, we inserted a line graph to analyze the monthly sales trend. In this graph, we include "Order Month" and "Total Orders" (measure) on the Y-axis. In addition to the charts, we included filters (slicers) to segment by day of the week, month, and season of the year. A button was included to deactivate the filters when necessary. (Clear all slicers). A text was added in which the days, months, and seasons with the highest sales are described.

On every page of the report, there are navigation buttons that allow access to different sections of the document.



On the fourth page, which we call "KPI's 2," we included two donut charts that define the percentages of sales, categorized by size and by category.

Below, we include a funnel chart to show total sales by category. And in the bottom left corner, a text in which we describe the results shown in the charts.



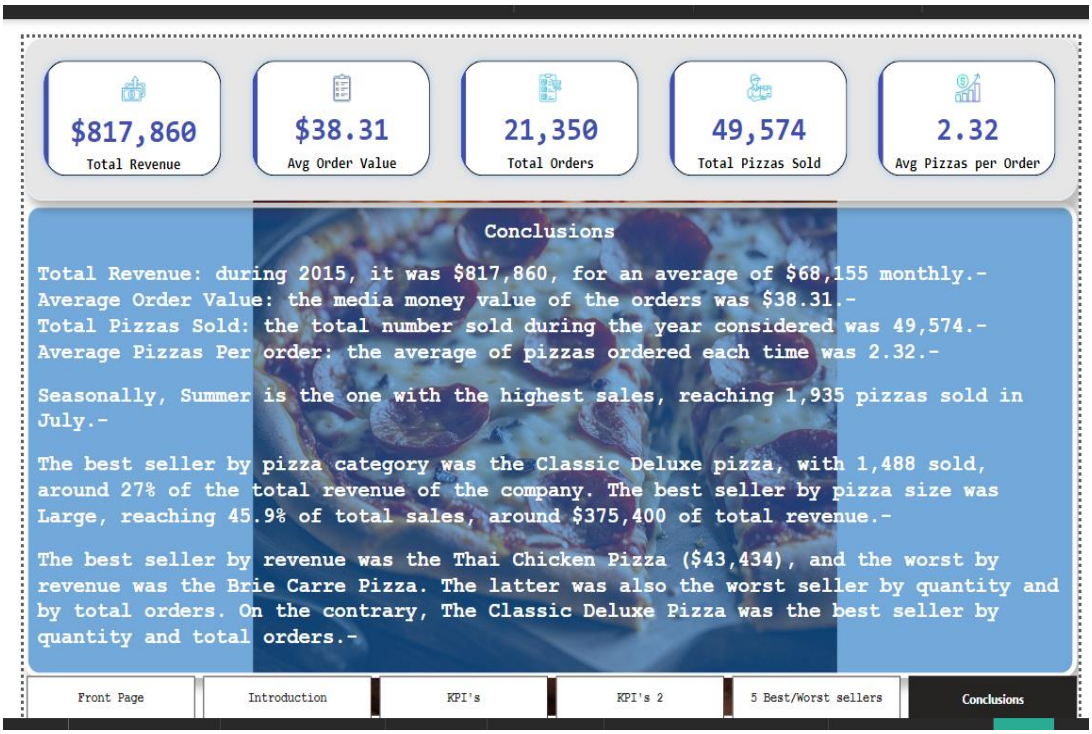
The fifth page of the report is called “5 Best/Worst Sellers” and shows in 6 bar charts (horizontal bars), the top 5 sales by revenue, quantity, and total orders. In the bottom we show the bottom 5 sales by revenue, quantity and total orders.

In the lower part of the page, we added texts describing the results of the charts.

A page navigator button was included in the lowest part of the page.

11. Conclusions

The last page of the report describes the conclusions obtained. We included the cards with the first measures created, to show the KPI's of the firm during 2015.



Our hypotheses was to show which pizzas were the best sellers and which were the worst, in order to help decision makers improve sales or apply strategic marketing decisions with analyzed and processed data.

The results we obtained were clear, the best sellers are the Thai Chicken Pizza (by revenue), and the Classic Deluxe (by size and category). The worst seller is the Brie Carre, by revenue, size and category. Our data shows that those are the key products to focus on.